



Chapter 4 Integrating Stormwater Management with Site Design

4.1 General Design and Review Process for New Development and Redevelopment

The design process outlined in this chapter provides guidance for implementing the runoff reduction and stormwater management strategies necessary to comply with the City's stormwater management program. The design process includes:

- Identifying and protecting sensitive environmental features
- Minimizing impervious cover
- Managing stormwater runoff at the source
- Integrating stormwater management throughout the design process
- Quantifying the benefits of soil and vegetation to achieve stormwater goals

This process requires integration of site design, natural hydrology, and smaller decentralized stormwater control measures to capture and treat stormwater runoff. This process also requires a new approach, both to site planning and to the design of specific stormwater practices for each site. Specifically:

1. The stormwater solution for a project should be designed as a distributed system that may serve multiple functions and that achieves a number of different purposes.
2. Each stormwater intervention should be designed as a part of a larger (connected) and integrated system where individual practices work together in an appropriate sequence to achieve the overall objective.
3. With this integrated approach, it is a basic assumption that in the design of the stormwater management system, soils and vegetation will be used together to achieve the required SOV and other goals.

The adoption of this approach is fundamental to successfully achieving project stormwater goals and is a shift from prior methods that may have relied on “end-of-pipe” or single measure solutions. This approach will allow the property owner/developer to achieve greater efficiency and value in the protection and development of land. This approach will also integrate the design and review process to allow for greater communication between designers and reviewers.

4.2 Concept, Preliminary, and Final Stormwater Management Plan Review Process

The design process for stormwater management involves review and approval by City staff at three phases of project development: concept, preliminary, and final. During the concept phase, applicants/owners will provide the City with a concept stormwater management plan and schedule a concept plan review meeting with City staff. The purpose of this meeting is to provide the applicant/owner and the City with an





opportunity to discuss the project and potential stormwater management approaches and requirements before the applicant/owner has proceeded with detailed site investigation or design documentation. The concept stormwater management plan and concept plan review meeting are intended to ensure that all development standards are understood and that opportunities for a more site-sensitive and integrated design plan are explored and discussed with the City.

In the concept phase, the design drawings will be conceptual and diagrammatic, and supporting calculations and details are not required. While accurate property and survey data are necessary, detailed site investigation and testing are not required at the concept plan level. After comment by City staff, these ideas will be developed into comprehensive site plans in the preliminary plan phase, and then into construction drawings for the final plan submission. The final plan must be approved by the City prior to issuance of a Land Disturbing or Building Permit. The applicant/owner is responsible for obtaining all other applicable permits from state and federal agencies.

During all phases, applicants/owners will prepare and provide the City and other appropriate reviewing agencies with a submission package that includes a full set of the required site design drawings specified for that phase. A checklist detailing drawings and materials required for submission at each phase is provided in Appendix H. For the preliminary and final plan set, the drawings should include a site assessment and protection plan, a stormwater management plan, a site landscape plan, and an erosion and sediment control plan, as well as necessary details, and be packaged with supporting calculations, data, and narratives for preliminary and final stormwater management plan approval.

All plan submissions will include the specified number of paper copies as well as electronic files. The electronic file will be treated as a trade secret for purposes of protecting it from disclosure to competitors (*reference Article 202.1*). These submittals are intended to be concurrent with the existing subdivision submittal procedure.

The processes and procedures in this chapter are intended to provide performance guidance for Article 2 of the existing City of Chattanooga Subdivision Regulations as they relate directly to stormwater management. Specifications and items of procedure in Article 2 remain in force. (*Reference Article 1, 106.2.1.*)

4.2.1 Concept Phase

4.2.1.1 Concept Stormwater Management Plan and Concept Review Meeting

A concept review meeting is required for all projects subject to the City's stormwater management requirements. The concept review meeting provides the opportunity for applicants/owners to receive advice and guidance on the requirements necessary to comply with stormwater management standards





and other applicable provisions of the City Code and zoning ordinances. The concept phase is intended to facilitate resolution of any potential issues while the project is in the early design phases.

A low-impact development approach to stormwater management requires integration of site design, natural hydrology, and smaller decentralized stormwater control measures to capture and treat stormwater runoff close to the source. This process also requires a new approach, both to site planning and to the design of specific stormwater practices for each site. Soils, vegetation, and natural features such as riparian buffers play an important role in achieving the stormwater management goals. The adoption of this approach is fundamental to success, and is a shift from prior methods that may have relied on “end-of-pipe” or single measure solutions.

The concept stormwater management plan should be clearly identified as “Concept Stormwater Management Plan” and should include sufficient information to adequately indicate the nature and extent of the proposed development and its relationship to existing conditions and facilities in the area in which it is located. The concept stormwater management plan should also include topographic, physical, and manmade features, as well as sensitive natural features such as steep slopes, woodlands, wetlands, and community waters. Detailed site testing, soils testing, and borings are **not** required at this stage; a desktop analysis of site conditions is acceptable.

Applicants/owners will provide the City with one electronic copy of concept stormwater management plan drawings, as well as one electronic copy each of all applicable supporting data and plans for review and comment.

4.2.1.2 Concept Stormwater Plan Contents

Concept stormwater plan submissions must include the information outlined on the Concept Stormwater Management Plan Checklist, found in Appendix H of this manual.

A signed and completed Concept Stormwater Management Plan Review Meeting Application, found in Appendix G, must be submitted with all concept stormwater management plan submissions when scheduling a concept review meeting with the City.

4.2.1.3 Concept Plan Site Assessment and Stormwater Management

At the concept stormwater management plan level, the existing site conditions assessment plan is an analysis that reflects available information regarding natural and manmade site conditions.

Detailed stormwater calculations are **not** required at the concept plan level. However, estimates of the SOV, required BMP area(s), and proposed BMP type(s) are required to ensure that sufficient and suitable





site areas are reserved for BMPs. The licensed professional will benefit and is **strongly** advised to develop concept level stormwater calculations to confirm that the proposed BMPs will meet the SOV and water quality requirements in terms of proposed BMP type and concept level size, as well as any rate control devices necessary to attenuate peak runoff rate. Guidance on stormwater calculations is provided in Chapter 7.

Applicants/owners are strongly advised to select and locate BMPs that can be anticipated to meet the stormwater requirements at the specific site. If there are significant changes in stormwater management design between the concept plan and the preliminary plan, the City may require a revised concept stormwater management plan submission and approval prior to preliminary plan submission. Significant changes include substantial changes in the type and location of stormwater BMPs (i.e., the elimination of proposed green roofs and replacement with underground detention/infiltration systems). Adjustments to proposed BMPs as a result of infiltration rates or other site-specific testing data are not considered significant changes to the concept plan.

The process for concept stormwater management plan development and approval is outlined on Figure 4-1.





Concept Stormwater Management Plan Development and Approval Process

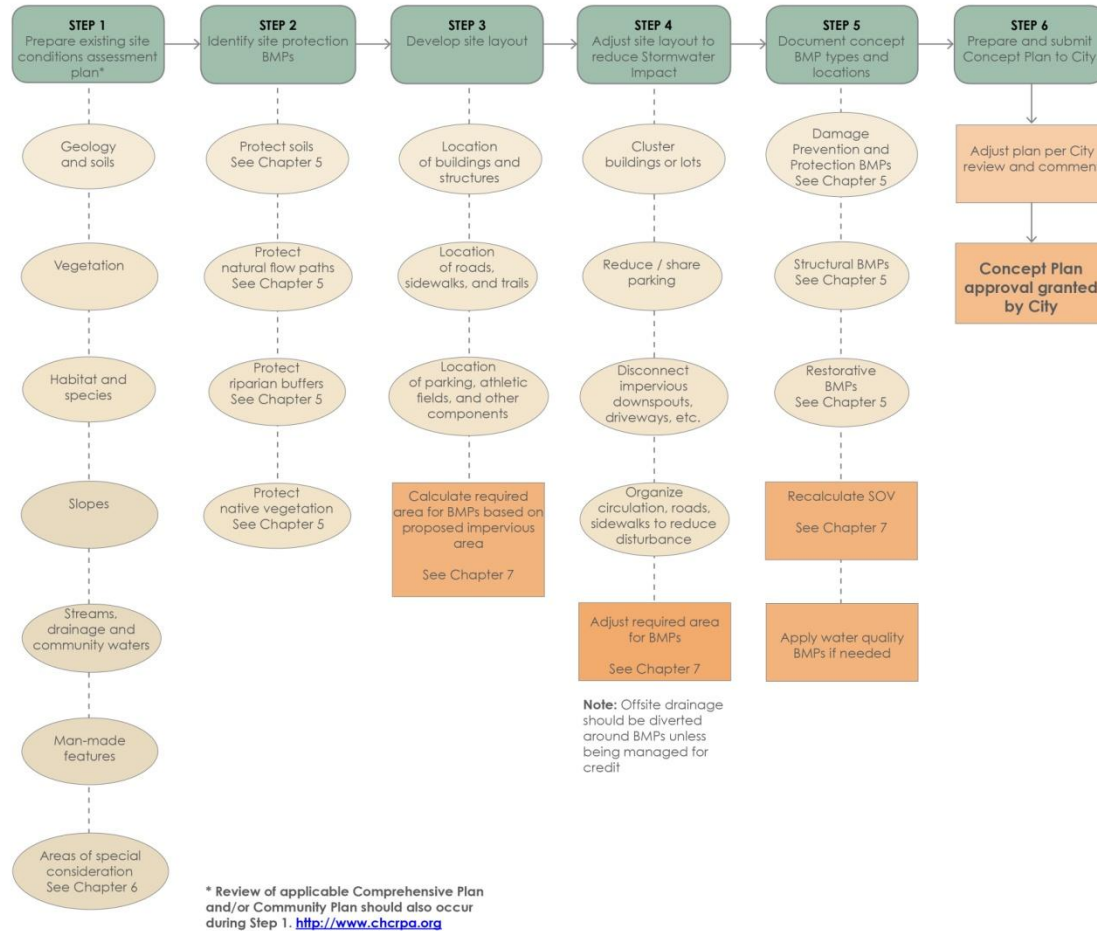


Figure 4-1. Concept Stormwater Plan Process





4.2.1.4 Concept Review Meeting

During the concept review meeting, the City can provide guidance regarding the appropriate rainfall depth for SOV calculation, applicable buffer and planting requirements, and any other relevant design standards. Reviewers may also comment on the proposed initial design ideas and evaluate their success in preserving site character and function. The applicant/owner and engineer/designer must attend the concept review meeting. The following may take place at the meeting:

- The applicant/owner will discuss the existing features, soil, vegetation, structures, and existing drainage pathways. The City will discuss opportunities to protect natural features and their potential for more effective post-construction management.
- The City and the applicant/owner will discuss ways to minimize impacts and stormwater management costs.
- The City will provide guidance regarding the review process and respond to questions the applicant/owner may have.
- The City and applicant/owner will discuss potential volume credits, economic credits, and fees.
- The City and applicant/owner may discuss potential issues related to site conditions, stormwater management, and any other concerns.
- The City and the applicant/owner may discuss concerns of all site reviewers, such as Traffic Engineering, Sanitary Sewers, Zoning, and work with the applicant/owner to resolve conflicts.

The applicant/owner may be asked to submit a revised concept stormwater management plan following the concept meeting to reflect any changes or discussion items. A second concept review meeting is not required, but may be requested by the applicant/owner if desired.

Concept stormwater plan approval is a required prerequisite for preliminary and final approval prior to permitting. Concept stormwater management plan approval by the City does not constitute fulfillment of all requirements necessary to begin construction. Concept stormwater plan approval does not relieve the applicant/owner from meeting regulatory obligations and obtaining necessary permits from all agencies with jurisdiction over the project.

Applicants/owners will provide the City with one hard copy and one electronic copy of concept stormwater management plan drawings, as well of all applicable supporting data and plans for review and comment.





4.2.2 Preliminary Phase

4.2.2.1 Preliminary Stormwater Management Plan Contents and Submission

Preliminary plan packages are submitted after site layout and design have been fully established with regard to the intended use of the site. Preliminary plan approval is a required prerequisite for final approval. The preliminary plan must provide sufficient design documentation and supporting data and calculations (i.e., soil testing data, stormwater calculations) for the City to determine whether the proposed project will meet the City stormwater management requirements.

Applicants/owners will provide the City with one hard copy and one electronic copy of preliminary stormwater management plan drawings, as well as of all applicable supporting data and plans for review and comment.

4.2.2.2 Preliminary Stormwater Management Plan Contents

Preliminary stormwater management plan submissions must include the information outlined on the Preliminary Stormwater Management Plan Checklist found in Appendix H.

4.2.2.3 Preliminary Plan Review and Approval

The City will review and provide comments on preliminary stormwater management plan submissions. The City will approve preliminary stormwater management plans when the submission has satisfied all technical requirements and City Codes. Approval of preliminary plans will not result in the issuance of any permit approval by the City.

4.2.3 Final Phase

4.2.3.1 Final Stormwater Management Plan Contents and Submission

The final stormwater management plan includes any design modifications necessary to address City review comments or to meet the stormwater management requirements. Final stormwater management plan packages should be submitted after all comments provided on the preliminary stormwater management plan package have been satisfactorily addressed.





Applicants/owners will provide the City with two paper copies of final stormwater management plan drawings, as well as two paper copies each of the applicable supporting data and plans for distribution to reviewing agencies. An electronic submission of all materials is also required.

No final plan will be approved until all applicable state and federal permits have been obtained and all applicable bonds have been posted.

4.2.3.2 Final Stormwater Management Plan Contents

Final stormwater management plan submissions must include the information outlined on the Final Stormwater Management Plan Checklist found in Appendix H.

4.2.3.3 Final Plan Review and Approval

The City will review and approve complete final stormwater management plan submissions after all applicable Chattanooga and state and federal permits have been obtained, and all applicable provisions of the City Code have been satisfied.

Following concept stormwater management plan approval by the City, preliminary stormwater management plan and final stormwater management plan approval will follow the process shown on Figure 4-2.

4.2.3.4 As-Built Drawings

Current procedures, requirements, and content with regard to as-built drawings remain in force. These are identified on the City's web page at <http://www.chattanooga.gov/public-works/land-development-office/forms-and-permits>.





Stormwater Management Plan Development and Approval Process

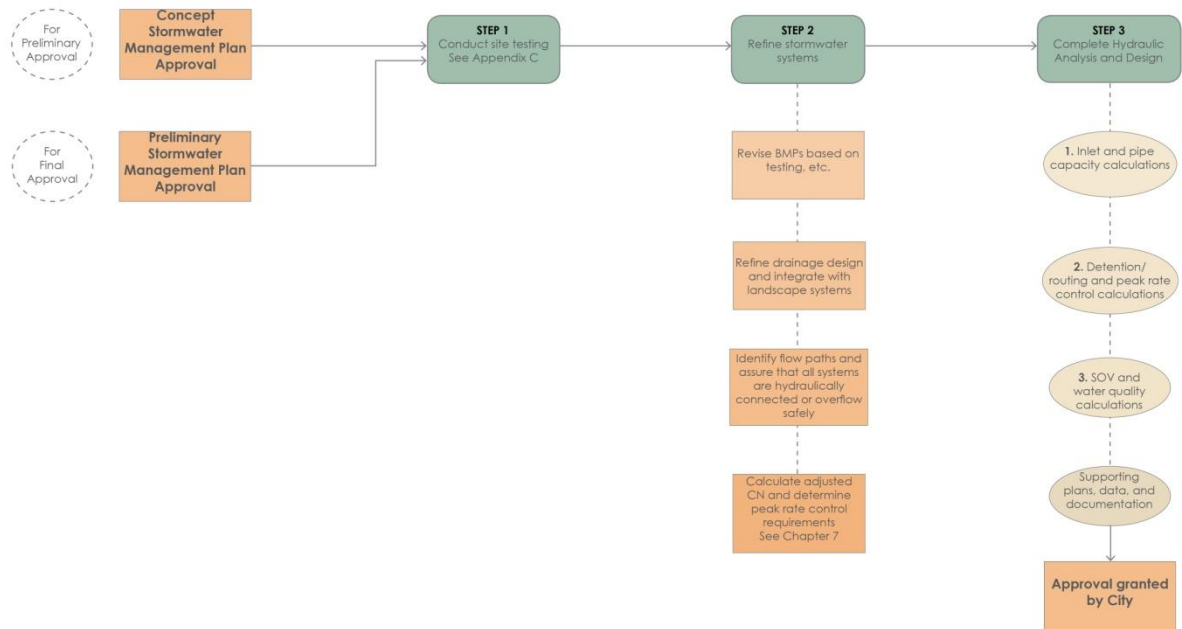


Figure 4-2. Preliminary/Final Stormwater Plan Process

