

Knox County, Tennessee Stormwater Management Manual

VOLUME 1 ADMINISTRATION AND PROCEDURES

Prepared for:

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Knox County, Tennessee
Stormwater Management Manual
Volume 1 – Administration and Procedures

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Preface

Stormwater management in Knox County, Tennessee has changed significantly in recent decades. An ever increasing population and associated need for housing and services, Federal and State regulatory requirements for stormwater quantity control and quality control, and the desire to protect human life, property, aquatic habitats and the quality of life in Knox County have resulted in the need to better manage stormwater in our developed and developing areas.

The Knox County Stormwater Management Manual has been developed to assist property owners, developers, engineers, and landscape architects in understanding and implementing the requirements for grading and stormwater management in Knox County. This manual represents Knox County's efforts to move forward with a comprehensive approach to stormwater management that integrates drainage design, stormwater quantity, and water quality considerations. Knox County views stormwater as an important resource and its management as an opportunity for our communities. The goal of this manual is to develop and promote a consistent and effective approach for the implementation of stormwater management in Knox County.

Acknowledgements

This Stormwater Management Manual reflects the hard work, time and contributions of many individuals and organizations. The manual is the culmination of a collaborative effort from the following entities:

- the Knox County Department of Engineering and Public Works;
- the Knox County Site Planning Roundtable;
- the Knox County Parks and Recreation Department;
- the Metropolitan Planning Commission;
- the Tennessee Valley Authority; and
- the University of Tennessee Water Resources Research Center.

Thanks to the Tennessee Valley Authority and the University of Tennessee Water Resources Research Center for providing funding and facilitation services for the Knox County Site Planning Roundtable, and for their continued advice and endorsement.

Special thanks are given to Joel Haden who laid the groundwork for the Site Planning Roundtable, to Terry Shupp who provided valuable facilitation assistance, and to Chris Granju, Tim Gangaware, Karen Nolt, Jane Fowler, and Susan Kerr whose guidance and oversight made the Site Planning Roundtable process possible.

Thanks to the County Commission, Metropolitan Planning Commission, and City of Knoxville for supporting this very important project.

Thank you to all those who took the time and effort to provide review comments and constructive suggestions on the draft versions of the manual and ordinance.

And finally, thank you to the participants of the Knox County Site Planning Roundtable who met numerous times over the course of more than three years to provide recommendations for the County stormwater management program, review the progress of the recommendation

implementation, and provide invaluable technical and policy feedback to Knox County Engineering and Public Works. Participants in the Site Planning Roundtable are listed below.

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References/Sources

Although this manual was developed to provide specific information for stormwater management and property development in Knox County, useful regulations and guidance from other communities were used to develop this manual. Portions of the text in this manual were developed from verbiage presented in the Georgia Stormwater Management Manual, the City of Knoxville Land Development Manual, the City of Knoxville Best Management Practices Manual, and the Nashville Stormwater Management Manual, suitably modified to meet Knox County's stormwater management objectives and the needs of the overall County program. This paragraph serves as an acknowledgement of the use of text from these manuals, and shall be considered as a general reference to these sources of information. In some cases, references to these sources are not made individually in the chapters of this manual.



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INTRODUCTION

1.1 Background and Purpose

The Knox County Stormwater Management Ordinance was adopted by the Knox County Commission. The ordinance established the legal framework for reviewing building permits for stormwater management and floodplain management provisions and for requiring grading permits to control erosion and sedimentation problems. The Knox County Flood Damage Protection Ordinance provides further regulation on floodplain management and development in floodplains. These regulations, policies and technical guidelines provided in this Stormwater Management Manual have been developed to assist in the implementation of the regulatory program established by the ordinances. Both ordinances are provided in Volume 1, Appendix A of this manual.

In addition to dealing with the potential for personal injury or property damage associated with the improper management of stormwater and floodplains, these ordinances secure the eligibility of Knox County to participate in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS), which are administered by the Federal Emergency Management Agency (FEMA). The benefits of participation in these federal flood management programs are threefold. First, participation in the NFIP provides local property owners with the opportunity to purchase federal flood insurance. Second, participation in the CRS program may result in decreased costs of federal flood insurance for those property owners. Finally, inclusion in both programs allows Knox County to have a higher degree of eligibility for federal disaster funds beyond emergency relief, along with Federal Housing Administration and Veterans Housing Administration funds than communities that do not participate.

1.2 Authorization and Title

As authorized by Knox County Stormwater Management Ordinance, this Stormwater Management Manual establishes the rules, regulations and technical guidelines that have been developed by the Knox County Department of Engineering and Public Works, consistent with the ordinance, and for the purpose of enforcing the provisions of the ordinance. This manual shall be enforceable, consistent with the authorities and enforcement provisions of the ordinance. This manual shall be cited as the “Knox County Stormwater Management Manual” and is comprised of the following volumes:

Volume 1 – Administration and Procedures

Volume 2 – Technical Guidance

1.3 How to Use This Manual

The following chapter listing provides a guide to the various chapters of Volume 1 of this manual.

- ❑ **Chapter 1 – Introduction.** Chapter 1 provides an overview of the purpose, authorization, scope, language, and legal considerations of this manual.
- ❑ **Chapter 2 – Administration.** Chapter 2 presents the administrative framework for stormwater management in Knox County, including the duties of various departments and agencies, applicable permits, and how variances and enforcement may be handled during the site development process.

- ❑ **Chapter 3 – Regulations.** Chapter 3 provides a description of applicable local ordinances and other State and Federal regulations that may be encountered when grading, development, and/or redevelopment activities are performed in Knox County.
- ❑ **Chapter 4 – Site Planning and Permitting Procedures.** Chapter 4 presents the site development process in Knox County, including a flow chart and descriptions of the various components of the process and applicable requirements such as: the pre-construction conference, stormwater management plan requirements, permit requirements, permit application instructions and plan submittal checklists, review and submittal requirements, bonds, and general inspection and maintenance responsibilities.
- ❑ **Chapter 5 – Drainage System Maintenance and Inspections.** Chapter 5 provides information on Knox County’s approach to drainage system maintenance including a discussion of the level of service offered by Knox County and policies regarding private and public inspection and maintenance responsibilities.
- ❑ **Appendices.** The appendices of Volume 1 provide copies of applicable regulations, plans submittal checklists and other forms and materials necessary for planning and permitting stormwater management for property developments in Knox County.

The chapter listing below provides a guide to the various chapters of Volume 2 of this manual.

- ❑ **Chapter 1 – Stormwater Management Standards and Planning.** Chapter 1 provides a brief discussion of the need for comprehensive stormwater management and an overview of Knox County’s minimum stormwater management standards.
- ❑ **Chapter 2 – Stormwater Hydrology.** Chapter 2 provides an overview of hydrologic methods and procedures that must be used for the design of stormwater management systems in Knox County. The information presented is intended to provide the design engineer with guidance to the methods and procedures, their data requirements, and their applicability and limitations.
- ❑ **Chapter 3 – Criteria for Stormwater Design.** Chapter 3 focuses on design criteria and associated policies for stormwater management systems in Knox County.
- ❑ **Chapter 4 – Design and Maintenance of Stormwater Structural BMPs.** Chapter 4 provides an overview of structural stormwater BMPs that are deemed acceptable for use in Knox County.
- ❑ **Chapter 5 – Stormwater Credits and Better Site Design Practices.** Chapter 5 provides information and design criteria for the water quality volume credits that are available to developers, and gives detailed information on the use of better site design practices that can be implemented to reduce stormwater runoff volumes and design requirements.
- ❑ **Chapter 6 – Water Quality Buffers.** Chapter 6 discusses the regulations, policies and other guidance for water quality buffers on streams, lakes, ponds, and wetlands.
- ❑ **Chapter 7 – Stormwater Drainage System.** Chapter 7 provides design criteria and general guidance on stormwater system components, including street and roadway gutters, inlets and storm drain pipe systems; culverts; vegetated and lined open channels; and energy dissipation devices for outlet protection.
- ❑ **Chapter 8 – Floodplain Management.** Chapter 8 provides regulations, policies and other guidance for development in or near floodplains in Knox County.
- ❑ **Chapter 9 – Construction Site Stormwater Management.** Chapter 9 provides regulations, policies and other guidance for erosion prevention and sediment control and control of other construction related wastes during construction activities.

- ❑ **Chapter 10 – Pollution Prevention After Construction.** Chapter 10 provides an overview of Knox County’s regulatory requirements for general pollution prevention in developed areas, and presents detailed information regarding the Special Pollution Abatement Permit.
- ❑ **Appendices.** The appendices of Volume 2 provide standard plans and specifications for stormwater construction, as well as rainfall, soils, and other information and data pertinent to local stormwater design.

1.4 Scope

If any provision of this manual and any other stormwater management guidance provided by Knox County impose overlapping or contradictory regulations, or contain any restrictions covering any of the same subject matter, that provision which is more restrictive or imposes higher standards or requirements shall govern for all surface alteration and construction within the boundary of Knox County, excluding the City of Knoxville and the Town of Farragut.

1.5 Language Rules

The following rules shall apply to the text of these volumes:

1. The particular shall control the general.
2. In the case of any difference in meaning or implication between the text of these regulations and the text of the Knox County Stormwater Management Ordinance or the Knox County Flood Damage Prevention Ordinance, the text of the ordinance shall control.
3. The words “shall” and “should” are always mandatory and not discretionary. The word “may” is permissive.
4. The word “permitted” or words “permitted as of right” mean permitted without meeting the requirements of these regulations.
5. Words used in the present tense include the future tense. The singular includes the plural, unless the context clearly indicates the contrary.
6. All public officials, bodies, and agencies to which reference is made are those of Knox County, Tennessee, unless otherwise indicated.
7. The term “County” or “Knox County” shall mean the area of jurisdiction of Knox County, Tennessee.
8. The term “Director” shall mean the Director of the Knox County Department of Engineering and Public Works.
9. Reference to “the ordinance” is to the current Knox County Stormwater Management Ordinance unless otherwise specified. This ordinance is included as a part of these regulations in Appendix A.
10. Unless specifically or otherwise noted the term “development” shall include “redevelopment” as defined in Appendix B. In general, redevelopment shall be required to follow the same stormwater management requirements as new developments.

In general, all words used in these regulations shall have their common dictionary definitions. Definitions for certain specific terms as applied to these regulations may be found in Appendix B of this volume.

1.6 Legal Considerations

1.6.1 Caveat

This manual neither replaces the need for professional engineering judgment nor precludes the use of information not presented in the manual. The user assumes full responsibility for determining the appropriateness of applying the information presented herein. Careful consideration should be given to site-specific conditions, project requirements, and engineering experience to ensure that criteria and procedures are properly applied and adapted.

1.6.2 Responsibility

Conformance with this ordinance is a minimum requirement and does not relieve the property owner, utility, facility operator, Lessee, tenant, contractor, permittee, the equipment operator and/or any other person or entity doing work from applying sound judgment and taking measures which go beyond the scope of the requirements of this ordinance where necessary. Nor does this ordinance imply a warranty or the assumption of responsibility on the part of Knox County for the suitability, fitness or safety of any structure with respect to flooding, water quality, or structural integrity. These regulations are a regulatory instrument only, and are not to be interpreted as an undertaking by Knox County to design any structure or facility.

1.6.3 Severability

Each separate provision of these regulations is deemed independent of all other provisions herein so that if any provision or provisions of this ordinance shall be declared invalid, all other provisions thereof shall remain enforceable.

1.6.4 Compatibility

If any provisions of these regulations and any other provisions of law impose overlapping or contradictory regulations, or contain any restrictions covering any of the same subject matter the provision that is more restrictive or imposes higher standards or requirements shall govern. These regulations do not relieve the applicant from provisions of any other applicable codes, ordinances, or regulations that are not explicitly repealed by these regulations.

1.6.5 Saving Provision

These regulations do not abate any action now pending under prior existing regulations unless as expressly provided herein.



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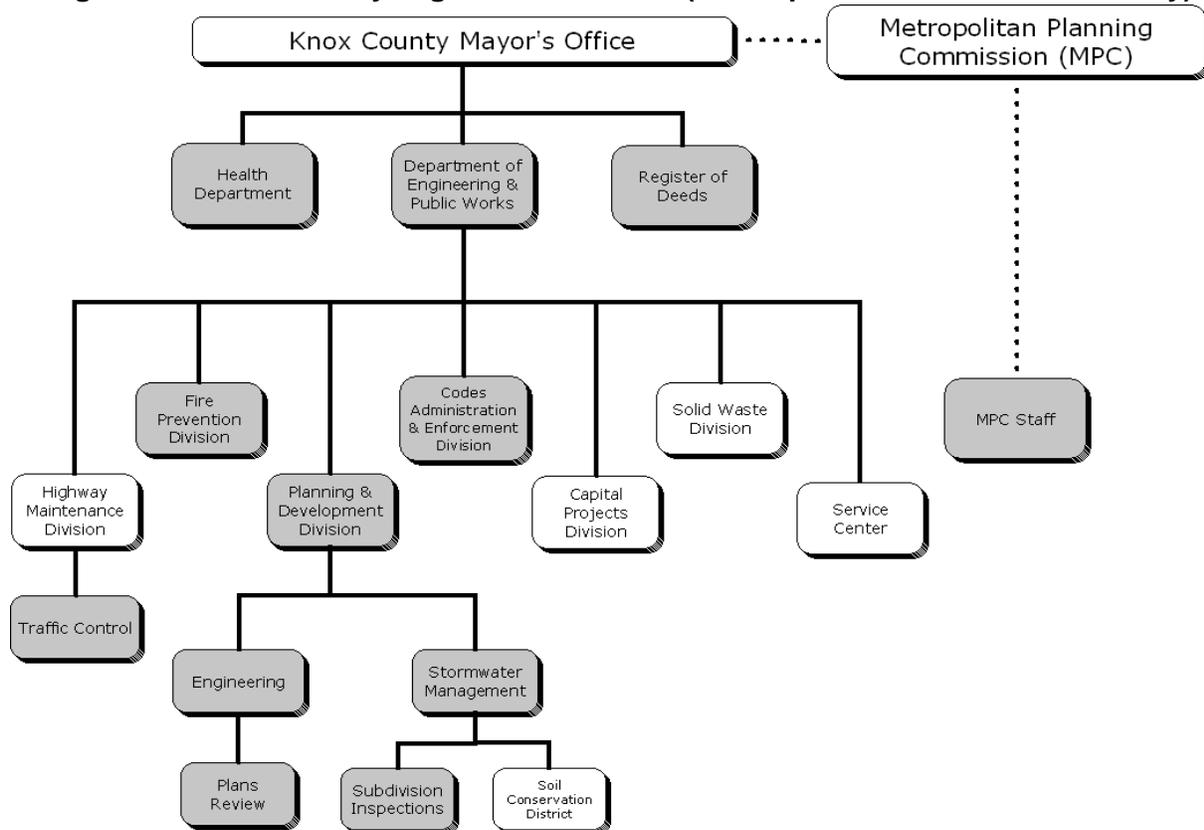
ADMINISTRATION

This chapter summarizes the division of responsibilities for administering stormwater management activities among public agencies and the general requirements, authorities and procedures for administration of the Knox County Stormwater Management Ordinance.

2.1 Organization

An organization chart for the local government and planning entities that are pertinent to property development and stormwater management is presented in Figure 2-1. Shaded boxes indicate the departments, divisions, or agencies that have direct responsibilities with regard to property development regulations and standards.

Figure 2-1. Knox County Organizational Chart (Development Related Services Only)



The responsibilities for each division or agency shown in a shaded box on the organization chart are discussed below. A list of addresses and phone numbers for these and other relevant local, state, and federal agencies is presented in Appendix C.

2.1.1 Planning and Development Division (Knox County Engineering)

In general, Knox County staff that are located in the Department of Engineering and Public Works Planning and Development Division are housed at one location and interact together on a day-to-day basis with regards to development related services. Further differentiation between the

sections of this division in this manual is not necessary because such divisional separations are likely transparent to developers and property owners that are served by these staff. Therefore, for purposes of this manual, the Planning and Development Division, including all of its subsections, will henceforth be referred to as "*Knox County Engineering*".

Knox County Engineering manages all activities within Knox County that relate to new development and redevelopment, both residential and non-residential. All plans and reports pertaining to new development, redevelopment, and grading must be reviewed and approved by Knox County Engineering prior to the start of grading and/or construction activities. Further, this division has the overall responsibility for implementation of Knox County's stormwater management program and enforcement of the Knox County Stormwater Management Ordinance, and the Knox County Stormwater Management Manual. With regards to property development and stormwater management, the responsibilities of Knox County Engineering include:

- Administering and enforcing the Knox County Stormwater Management Ordinance, the Knox County Stormwater Management Manual and other development related codes and regulations;
- Performing engineering reviews of roadway geometry and the stormwater management system for concept plans;
- Performing engineering reviews of stormwater management plans;
- Receiving applications for and issuing grading permits;
- Reviewing preliminary and final plats;
- Reviewing As-Built Certifications;
- Attending any voluntary pre-design conferences and all mandatory pre-construction conferences;
- Reviewing new roads and road closings;
- Performing periodic construction site inspections for compliance with stormwater management plans (including grading and erosion prevention and sediment control), and other development related plans;
- Reviewing development related traffic studies and providing guidance on traffic calming;
- Attending and providing engineering guidance at Metropolitan Planning Commission meetings and County Commission meetings;
- Calculating of performance bonds and executing Performance and Indemnity Agreements;
- Responding to erosion prevention and sediment control complaints;
- Overseeing Knox County's floodplain management program and its participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) program;
- Overseeing Knox County's water quantity/quality program to ensure compliance with applicable state and Federal NPDES and other water quantity/quality related permits and programs;
- Assisting with regulatory and development issues pertaining to construction in and around floodplains, sinkholes and water quality buffers;
- Stormwater master planning and watershed planning;
- Overseeing municipal drainage improvement designs, streambank restoration initiatives, etc.;
- Participating in local watershed and water quality associations; and,
- Public education with regards to any of the above.

2.1.2 Codes Administration and Inspection Division

Knox County Codes Administration and Inspection Division's mission is to protect the safety, health, welfare, and property of the citizens of Knox County. This is accomplished through administration, public education, and enforcement of regulatory codes. With regards to property development in Knox County, the Codes Administration and Inspection Division is responsible for receiving applications for, and issuing, building permits, and performing inspections of new construction for compliance with local building codes.

The Codes Administration and Inspection Division has prepared a detailed procedures manual to assist developers and property owners with understanding applicable building and construction codes, building permit application procedures, construction site inspections, and final approval processes. The procedures manual is available from the Codes Administration and Inspection Division offices, or can be viewed at the following website: <http://www.knoxcounty.org>.

2.1.3 Knox County Health Department

The Knox County Health Department typically becomes involved in development and redevelopment related issues when septic systems are proposed for wastewater management, and/or when demolition landfills are proposed for disposal of construction-related wastes. For septic system issues, the Health Department will review concept and design plans, and will perform inspections of septic system construction in new development. A negative review by the Health Department on any development related plan is cause for denial of a concept plan or a building permit application.

2.1.4 Knox County Register of Deeds

The Knox County Register of Deeds is a constitutional office established by the State Legislature as the custodian of legal documents pertaining to real property. These documents include Warranty Deeds, Deeds of Trust, Releases, Powers of Attorney, Liens, and other miscellaneous documents designated by state law to be recorded by the Register of Deeds. With regards to new development and redevelopment, the Register of Deeds is responsible for recording deeds, final plats, and Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices.

2.1.5 Board of Zoning Appeals

The Knox County Board of Zoning Appeals (BZA) is comprised of a group of nine citizens that are appointed by the County Commission. As authorized in Section 6.60 of the Knox County Zoning Ordinance, the function of the BZA is to hear and decide appeals and variance requests from the requirements of the Knox County Zoning Ordinance and the Knox County Stormwater Management Ordinance. The Board meets monthly for this purpose.

2.1.6 Metropolitan Planning Commission

The Knoxville-Knox County Metropolitan Planning Commission (MPC) is responsible for comprehensive planning and subdivision and development plan review in all of Knox County, excluding the Town of Farragut. With regard to the subdivision and site planning process in Knox County, MPC has the following general responsibilities¹:

- Maintain and administer the county-wide zoning plan, the Knox County Zoning Ordinance, and the Knoxville-Knox County Minimum Subdivision Regulations;
- Receive and distribute all plans and plats, except design plans, to appropriate administrative and utility agencies for review as to conformance with the individual agency's requirements;
- Review all plans and plats for conformance to the Minimum Subdivision Regulations;

¹ Knoxville-Knox County Minimum Subdivision Regulations, Metropolitan Planning Commission, Amended through August 2004.



- Notify the developer and general public of public hearings on concept plans or final plats;
- Recommend approval, disapproval, or postponement of concept plans or final plats;
- Arrange and conduct all conferences and field trips necessary for investigation of plans and plats submitted to MPC;
- Consolidate the review recommendations and comments of MPC and other agencies for concept plans or final plats, and make recommendations for approval or disapproval to the Planning Commission;
- Consolidate the submission of statements certifying approval of design plans from the appropriate reviewing agencies;
- Certify that approved final plats are ready for recording with the Knox County Register of Deeds.
- Distribute final plats to appropriate administrative and utility agencies; and
- Keep all records of plans and plats, agency review comments and Planning Commission actions.

2.2 Permits

Permits and plans that are generally required for most land development activities and are issued by Knox County Engineering include the grading permit, stormwater management plan, and building permit. Other permits and plans that may be required depending upon the characteristics of the development activity include the small lot erosion prevention and sediment control plan, floodplain development permit, buffer enhancement plan, and special pollution abatement permit. Information about the applicability of each plan and permit to development and the application process for permits is found in Chapter 4 of this Volume.

Land development activities may require additional permits administered by state and federal agencies, including but not limited to permits issued by the Tennessee Department of Environment and Conservation (TDEC), the State Fire Marshal, the Tennessee Valley Authority (TVA) and the United States Army Corps of Engineers (USACE). Persons that undertake land development activities are responsible for obtaining all applicable permits.

2.3 Appeals and Variances

The Knox County Board of Zoning Appeals shall hear and decide appeals of decisions made by Knox County Engineering, and requests for variances from the requirements of these regulations. Applications for appeals and variances must be submitted to the Knox County Codes Administration & Inspection Division within 30 days of notification of a decision by Knox County Engineering. Application procedures and submittal requirements for appeals and variances are provided in the Codes Administration & Inspection Division Procedures Manual, available from the division office and/or on-line at <http://www.knoxcounty.org>. The criteria for granting variances are presented in Section 6.60 of the Knox County Zoning Ordinance.

2.4 Enforcement

2.4.1 Notice of Violation

In the event that the Director determines that a violation of any provision of the Knox County Stormwater Ordinance or of this manual has occurred, or that work does not have a required plan or permit, or that work does not comply with an approved plan or permit, the Director may issue a Notice of Violation to the permittee or property owner and/or any other person or entity having responsibility for construction work performed at a site development. Issuance of a Notice of

Violation of the provisions of the Knox County Stormwater Management Ordinance or of the policies required by this manual shall be cause for the issuance of a stop work order, withholding of a permit approval or certificate of occupancy, and/or civil penalties and/or damage assessments.

2.4.2 Civil Penalties and Damage Assessments

Pursuant to Tennessee Code Annotated § 68-221-11, Knox County has the authority to impose a civil penalty of not less than fifty dollars (\$50.00) or more than five thousand dollars (\$5,000) per day for each day of a violation. Damage assessments are determined based on any reasonable expenses incurred in investigating and enforcing violations of this part, or any other actual damages caused by the violation. The Knox County Stormwater Management Ordinance states detailed requirements and authority with regards to civil penalties and damage assessments.

2.4.3 Corrective Measures

The Director may order corrective actions to erosion prevention and sediment control measures, stormwater management facilities, and/or the stormwater system as are necessary to properly maintain the stormwater systems within Knox County for the purposes of flood prevention, channel protection, water quality treatment and/or public safety. If property owner(s) fails to perform corrective action(s) ordered by the Director, the Director shall have the authority to perform the corrective action utilizing County resources or others. In such cases where a Performance and Indemnity Agreement exists, Knox County shall utilize the performance bond to pay for the costs associated with the corrective action(s). In such cases where a Performance and Indemnity Agreement does not exist, the property owner shall reimburse Knox County for double its direct and related expenses. If the property owner fails to reimburse Knox County, the County is authorized to file a lien for said costs against the property and to enforce the lien by judicial foreclosure proceedings.

An order for corrective action that has been imposed by the Director does not authorize access to private property. Arrangements concerning corrective actions that may impact private property must be settled by the person(s) ordered to perform the actions with the adjoining landowner.



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REGULATIONS

The purpose of this chapter is to provide a brief overview of each of the local, state and federal laws, regulations and programs which are applicable to property development activities in Knox County. This chapter is not intended to be a detailed analysis of each requirement, as specific requirements and policies are included throughout the Knox County Stormwater Management Manual. A number of pertinent regulations are provided in Appendix A. Site developers and designers are advised to obtain copies of applicable regulations from the appropriate regulatory agency prior to beginning development planning activities. A list of agency contacts is included in Appendix C.

3.1 Applicable Local Ordinances

3.1.1 Stormwater Management Ordinance

The Knox County Stormwater Management Ordinance is provided in Appendix A. The ordinance regulates grading, excavation, clearance, and other land alteration activities, erosion prevention, sediment and construction related waste control, the design and construction of storm drainage facilities for purposes of water quality and quantity control, floodplain management, developments in or near sinkholes, and water quality buffers. The ordinance strives to limit the dangers of personal injury, and/or property or environmental damage that may be caused by stormwater runoff.

3.1.2 Zoning Ordinance

The Zoning Ordinance for Knox County, Tennessee is administered by the Metropolitan Planning Commission (MPC). A copy of the Zoning Ordinance can be obtained from the MPC website, www.knoxmpc.org.

The Zoning Ordinance serves two functions. First, the ordinance has been adopted as the official zoning “plan” for Knox County, Tennessee, excluding the municipal jurisdictions of the City of Knoxville and the Town of Farragut. As such, the zoning plan is typically the first consideration of a developer in the site planning process (i.e., does the intended use of the proposed development conform to the intentions of the zoning plan). Second, the ordinance regulates the layout and construction of buildings on the lot to be developed. In accordance with Article 1 of the Zoning Ordinance, its purposes are to:

- regulate and restrict the location and use of buildings, structures, and land for residence, trade industry, and other purposes, the height, number of stories and size of buildings and other structures, and the size of yards, courts, and other open spaces on the lot or tract;
- provide definite official land use plans for property publicly and privately owned in Knox County outside the municipal corporations of Knoxville and Farragut;
- guide, control, and regulate the future growth and development of Knox County in accordance with the zoning plan; and,
- provide for the administration of the zoning plan.

3.1.3 Minimum Subdivision Regulations

The Knoxville-Knox County Minimum Subdivision Regulations govern the subdivision of land within the City of Knoxville and Knox County. In general, the subdivision regulations are administered by

MPC, however Knox County and other agencies have regulatory approval for specific aspects of plans submitted to conform with these regulations. A copy of the subdivision regulations can be obtained from the MPC website, www.knoxmpc.org.

The Subdivision Regulations establish procedures for the submission and review of concept plans, subdivision plats, standards for the design and installation of improvements to the subdivision, and provisions for the administration, enforcement and penalties for violations. In accordance with Section 1 of the Subdivision Regulations, its purposes are as follows:

- to provide for the harmonious development of the City of Knoxville and Knox County and their environs;
- for the coordination of roads within the subdivided land, with other existing or planned roads, or with the state or regional plan, or with the plans of municipalities in or near the region;
- for adequate open spaces for traffic, light, air and recreation;
- for the conservation or production of adequate transportation, water, drainage and sanitary facilities;
- for the avoidance of population congestion;
- for the avoidance of such scattered or premature subdivision of land as would involve danger or injury to health, safety, or prosperity by reason of the lack of water supply, drainage, transportation or other public services or would necessitate an excessive expenditure of public funds for the supply of such services; and,
- to control the manner in which roads shall be graded and improved, and water, sewer and other utility mains, piping, connections or other facilities shall be installed.

3.1.4 Flood Damage Prevention Ordinance

The Knox County Flood Damage Prevention Ordinance (No. O-94-3-101) is provided in Appendix A. The ordinance regulates development in and around Special Flood Hazard Areas, as designated by the Federal Emergency Management Agency (FEMA), in Knox County for general purposes of flood damage prevention and the protection of life, health, commerce, property and public funds that can be impacted by flooding. In accordance with Section 1 of the ordinance, its purposes are to:

- restrict or prohibit uses which are dangerous to health, safety, and property due to water, erosion, or damaging increases in flood heights or velocities;
- require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- control the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of flood waters;
- control filling, grading, dredging and other development which may increase erosion or flood damage; and,
- prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.

From a floodplain management perspective, the Flood Damage Prevention Ordinance proceeded, and is complimented by, the Stormwater Management Ordinance. Both ordinances regulate development in the floodplain but differ in overall objectives. The Flood Damage Prevention Ordinance was originally developed to satisfy Federal requirements for Knox County's participation

in the National Flood Insurance Program (NFIP), which is administered by FEMA. Knox County continues to administer the ordinance specifically for that purpose. In addition to the Flood Damage Prevention Ordinance, the floodplain management requirements contained in the Knox County Stormwater Management Ordinance further strengthen Knox County's floodplain management regulations beyond FEMA's minimal requirements. In addition, the Stormwater Management Ordinance expands flood management regulations to unstudied streams and sinkhole areas, and secures the County's participation in FEMA's Community Rating System (CRS).

3.2 Applicable State and Federal Regulations

3.2.1 Tennessee Construction General Permit

The State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities is henceforth referred to as the "Construction General Permit" (CGP). Applicable to all areas of the State of Tennessee, the CGP is intended to regulate the pollution prevention and the control of wastes during construction activities. Specific to site developments, the CGP emphasizes the application of best management practices for purposes of erosion prevention and sediment control and the control of other construction related materials and wastes. In general, the CGP authorizes point source discharges of stormwater from construction activities that result in the disturbance of one acre or more of total land area. Projects or developments of less than one acre of land disturbance are required to obtain authorization under the CGP if the construction activities at the site are part of a larger common plan of development or sale. Further, there are permit provisions for development less than one acre of land disturbance, and for construction support activities.

The CGP is administered by the Tennessee Department of Environment and Conservation (TDEC). Development owners or operators can obtain CGP coverage by filing a Notice of Intent (NOI) with TDEC prior to initiating construction activities. A Stormwater Pollution Prevention Plan (SWPPP) and applicable permit fees must be submitted with the NOI. Both the CGP and the Knox County Stormwater Management Ordinance require that development owners or operators obtain coverage under the CGP and provide proof of such coverage (in the form of a Notice of Coverage) prior to obtaining a grading permit from Knox County. Further, the CGP requires that the owner or operator also submit the CGP Notice of Termination (NOT) to TDEC and a copy to Knox County after construction activities are completed.

The CGP, along with the NOI, NOT and inspection documentation forms can be obtained from the local TDEC office, or on-line at: <http://www.state.tn.us/environment>.

3.2.2 Aquatic Resource Alteration Permit (ARAP)

Persons who conduct any activity that involves the alteration of waters of the State must obtain a State ARAP, and possibly a Federal Section 401 Certification. ARAPs and 401 Certifications are administered by TDEC. The Section 401 Certification is required for projects involving the discharge of dredged or fill material into waters of the United States (US), or wetlands. An ARAP is required for any alteration of State waters, including wetlands that do not require a federal permit. Examples of stream alteration activities that require an individual ARAP include:

- dredging, widening, straightening, or bank stabilization;
- levee construction if excavation or fill of a stream channel is involved;
- channel relocation;
- water withdrawals, diversions or dams;
- flooding, excavating, draining and/or filling a wetland; and,

- bridge construction.

Not every activity requires a separate, individual permit. TDEC issues general permits for specific stream alterations that cause minimum impact to water quality. Typically little or no paperwork is involved with these permits. Typically, the following activities are eligible for a general ARAP permit:

- construction of boat launching ramps;
- alteration of wet weather conveyances;
- construction of road crossings of waters;
- utility line crossings;
- bank stabilization;
- sand and gravel dredging;
- bridge scour repair;
- stream restoration and habitat enhancement; and,
- alteration of up to one acre of isolated wetlands.

3.2.3 Section 404 (Wetlands) Permit

Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. The US Army Corps of Engineers administers the 404 permit program. The program governs such activities on all surface waters, such as inland waters, lakes, rivers, streams and their tributaries; interstate waters and their tributaries; wetlands adjacent to the above (e.g., swamps, marshes, bogs, or other land areas); and isolated wetlands and lakes, intermittent streams, and other waters where degradation could affect interstate commerce. Section 404 permits (and possibly Section 10 permits) are required for stormwater activities that may impact natural wetlands.

3.2.4 26a Permits for Shoreline Construction

The Tennessee Valley Authority (TVA) administers a permit program that governs shoreline construction along, across, or in the Tennessee River or any of its tributaries. Thus, TVA's jurisdiction for the 26a permit extends to the limits of the Tennessee River watershed. In accordance with TVA requirements, the permit applied to construction in the 500-year floodplain or to the upper limits of TVA flowage rights, whichever is higher, for developments located along regulated rivers (tailwaters) and TVA reservoirs (e.g., Fort Loudoun Lake). Along off-reservoir, unregulated streams and rivers, jurisdiction is typically applied to the limits of the 100-year floodplain. More information on the TVA 26a permit can be found at <http://www.tva.gov>.

3.2.5 Section 9 and 10 Permits for Navigable Waters

Sections 9 and 10 of the Rivers and Harbors Act of 1899 address the construction of bridges and other potential modifications or alterations of navigable waters of the United States. A Section 9 permit is required for construction of a bridge or other structure spanning navigable waters of the United States, without fill or dredging. The United States Coast Guard, as a part of the Department of Homeland Security, administers Section 9 permits. Section 10 permits are issued for fill, dredging, and other alterations of navigable waters. Section 10 permits are administered by the United States Army Corps of Engineers.



3.2.6 Endangered Species Act

The Federal Endangered Species Act (ESA) of 1973 protects plants and animals that are listed by the government as “endangered” or “threatened”. The ESA makes it unlawful for any landowner to harm an endangered animal, or to significantly modify an endangered animal’s habitat. This applies to both public and private lands. More information on the Endangered Species Act can be gathered from the Tennessee Wildlife Resources Agency (<http://www.state.tn.us/twra>), or the United States Fish and Wildlife Service (www.fws.gov).

3.3 Other Pertinent Regulations

In accordance with the Knox County Stormwater Management Ordinance, the Director has the authority to require more stringent stormwater management standards in order to comply with State and Federal permits or regulations. For Knox County, there are two major state-administered regulatory programs that would cause the Director to modify stormwater management standards in certain areas: the NPDES General Permit for Discharges from Small Municipal Separate Storm Sewer Systems (MS4s); and the Total Maximum Daily Load (TMDL) program. Knox County Engineering will advise the developer of more stringent requirements that result from MS4 permit conditions or TMDL program prior to approval of a grading permit or stormwater management plan. Both programs are discussed briefly below.

3.3.1 NPDES MS4 (Phase II) Permit

The National Pollutant Discharge Elimination System (NPDES) general permit for discharges from MS4s establishes guidelines for municipalities to minimize pollutants in stormwater runoff to the “maximum extent practicable.” This permit is often referred to as the “NPDES Phase II permit” or as the “MS4 permit”, and is administered by TDEC. The permit is directly applicable to Knox County, and the Department of Engineering and Public Works has the responsibility of maintaining the County’s compliance with the permit requirements. The permit can impact property development regulations within Knox County. For example, the extension of the Knox County stormwater management program to include water quality control in all new developments and redevelopments in accordance with this manual is a direct result of TDEC’s MS4 permit conditions for Knox County. Knox County must renew this permit every five years, at which time permit conditions may become more stringent and could impact local property development regulations, policies or procedures.

While a site developer or property owner has no direct responsibility with regards to compliance with the MS4 permit, Knox County’s Phase II permit conditions can affect design and stormwater management criteria for erosion prevention and sediment control and stormwater quality management on individual development sites. Typically, these sites will be located in watersheds that drain to streams listed on the State’s 303(d) list of impaired waters, or in watersheds that drain to streams listed by the State as “high quality waters”. Knox County Engineering will advise the developer of more stringent requirements that result from MS4 permit conditions prior to approval of a grading permit or stormwater management plan.

3.3.2 Total Maximum Daily Load Program

Under Section 303(d) of the Clean Water Act, the State of Tennessee is required to develop a list of impaired waters that do not meet water quality standards (i.e., the 303(d) list). TDEC must then establish priority rankings for waters on the list and develop TMDLs for listed waters. The TMDL specifies the maximum amount of a specific pollutant of concern that a designated segment of a water body can receive and still meet water quality standards. The TMDL also allocates pollutant loadings among point and non-point pollutant sources, including stormwater runoff. Several TMDLs have been issued for water bodies in Knox County, and more are anticipated.

The TMDL program has the potential for broad impact on Knox County’s stormwater management



program and property development regulations because it requires that non-point sources of pollutants must be addressed at the local level. The program requires the development of a plan that may impose requirements or restrictions for specific local regulations or programs. Adopted TMDL plans are available from TDEC or at TDEC's website (<http://www.state.tn.us/environment>).

3.4 Stormwater Management Policies

The Knox County Stormwater Management Ordinance and other applicable ordinances contain regulatory language pertaining to property development in Knox County. Some of that language is repeated in this manual. This manual also contains additional requirements and guidelines not included in the Stormwater Management Ordinance that shall be considered Knox County stormwater management policy. Such requirements and guidelines are presented throughout the manual, when applicable and appropriate to the stormwater management topic being discussed. Requirements and guidelines stated in this manual are enforceable, consistent with the intent of the ordinance. This manual does not contain a separate section listing all pertinent stormwater management policies.



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SITE PLANNING AND PERMITTING PROCEDURES

4.1 Introduction

The Knox County Stormwater Design Manual is primarily written to describe and regulate the portions of the land development process that pertain to stormwater management and are under the direct control of the Knox County Department of Engineering and Public Works.

The purpose of this Chapter is to define the procedures which shall be followed by site developers when submitting plans for site development to Knox County Engineering, and to specify the information required for plans submittal. Although this Chapter contains general information with regards to the roles and requirements of other agencies that have a role in the development process in Knox County, such as the Metropolitan Planning Commission and various utilities, detailed information on the processes of such agencies is not presented in this manual and the reader is referred to the agency of interest for further information.

4.2 Overview of the Site Development Process

4.2.1 Development Process Flow Charts

Figure 4-1 presents a detailed sequence for the subdivision development process in Knox County, from initial consideration of zoning to the point that a building permit would be obtained for single lots. Note that the graduated shading in Figure 4-1 indicates which agency (e.g., MPC, Knox County Engineering, etc.) is primarily responsible for the task or review. MPC is responsible for receipt and coordination of the concept plan reviews with the appropriate reviewing agencies and the developer.

In general during the subdivision development process, two (2) plans and one (1) plat are required to be submitted: the concept plan; the design plan (which includes the stormwater management plan); and the preliminary plat. The requirements of the concept plan and plat, and more general requirements for the design plan are presented in the Knoxville-Knox County Minimum Subdivision Regulations. Specific requirements of the portion of the design plan dedicated to stormwater management (i.e., the stormwater management plan) are contained in the Knox County Stormwater Management Ordinance and this manual.

Figure 4-2 presents a detailed sequence for the site plan (i.e., building permit) process in Knox County. The notable difference of Figure 4-2 from the previous figure is that MPC handles very little of the site planning process. Design plans are submitted by the applicant directly to Knox County and other appropriate agencies.

4.2.2 Pre-Design Conference

Knox County Engineering is available to meet with the developer and site designer to discuss potential site layout and design prior to submittal of a concept plan or design plan. A pre-design conference is not mandatory. The developer is encouraged to invite representatives of other regulatory or permitting agencies to the pre-design conference. From Knox County's perspective, the objectives of the pre-design conference are:

Figure 4-1. Typical Subdivision Development Process in Knox County

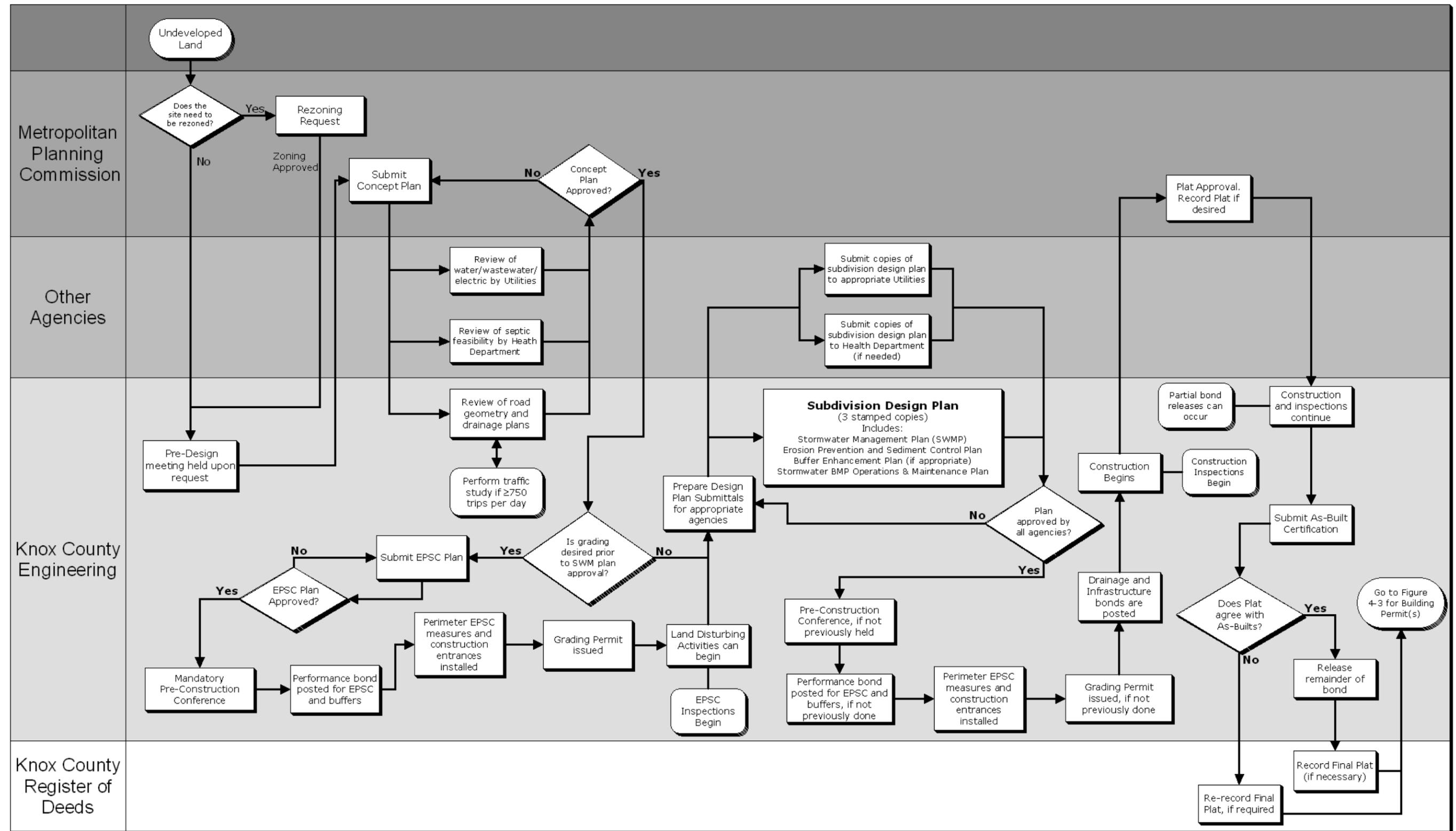
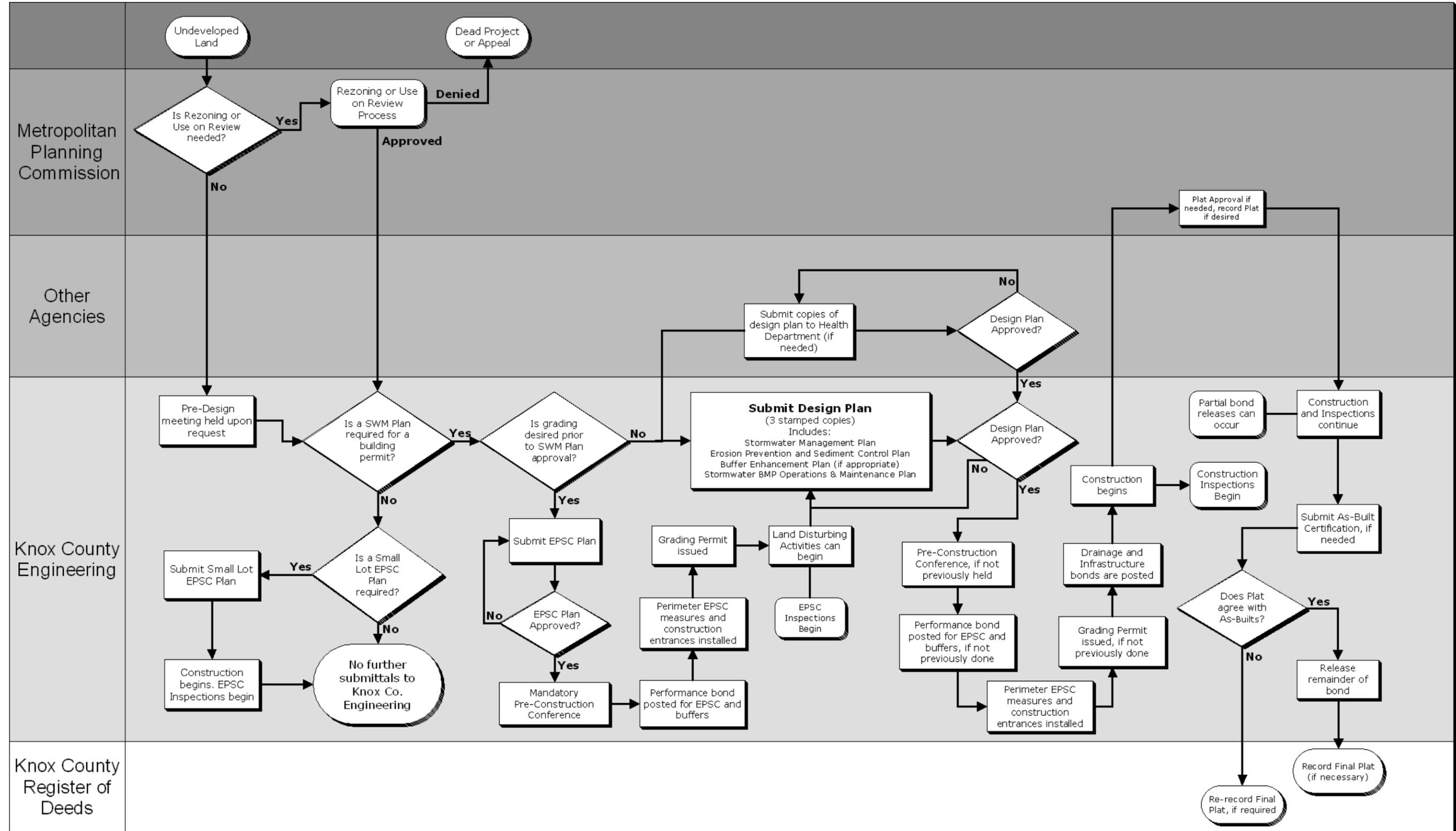


Figure 4-2. Typical Site Plan (Building Permit) Process in Knox County



- review the site topography, existing vegetative condition, and preliminary development lay-out (if determined);
- identify the natural drainage conditions (for new development) and existing drainage conditions (for redevelopments);
- identify any environmentally-sensitive features, such as streams, wetlands, sinkholes, and steep slopes, that should be avoided by the development or redevelopment;
- discuss preliminary strategies for site clearing, grading and construction;
- discuss preliminary design strategies for erosion and sediment control, road geometry and layout, stormwater treatment practices, water quality buffers, and encourage the use of better site design practices and water quality volume (WQv) credits; and,
- determine how the technical guidelines and criteria presented in this manual should be applied to the site.

Knox County staff will not be responsible for development of a concept plan or design plan for the site. Further, the pre-design conference should not be considered by the developer as an endorsement or pre-approval of any concept and/or design plans that will be submitted to Knox County later in the development process. The developer is responsible for requesting and scheduling the pre-design conference, and for inviting others as appropriate for his/her needs (e.g., the site design engineer, representatives of other agencies). The conference can be scheduled by calling the Knox County Engineering plans review staff at: 865-215-5800.

4.2.3 Pre-Construction Conference

Requirements for attendance at a pre-construction conference with Knox County Engineering prior to issuance of a grading permit are included in the Knox County Stormwater Management Ordinance. In addition to the ordinance requirements, the Director may require that the owner or operator of land development activities not listed explicitly in the ordinance attend a pre-construction conference.

The purpose of the pre-construction conference is to review the proposed grading or development for the site, general erosion prevention and sediment control measures, and other site-specific topics or issues. Knox County will document the pre-construction meeting on a standard form, which must be signed by all attendees.

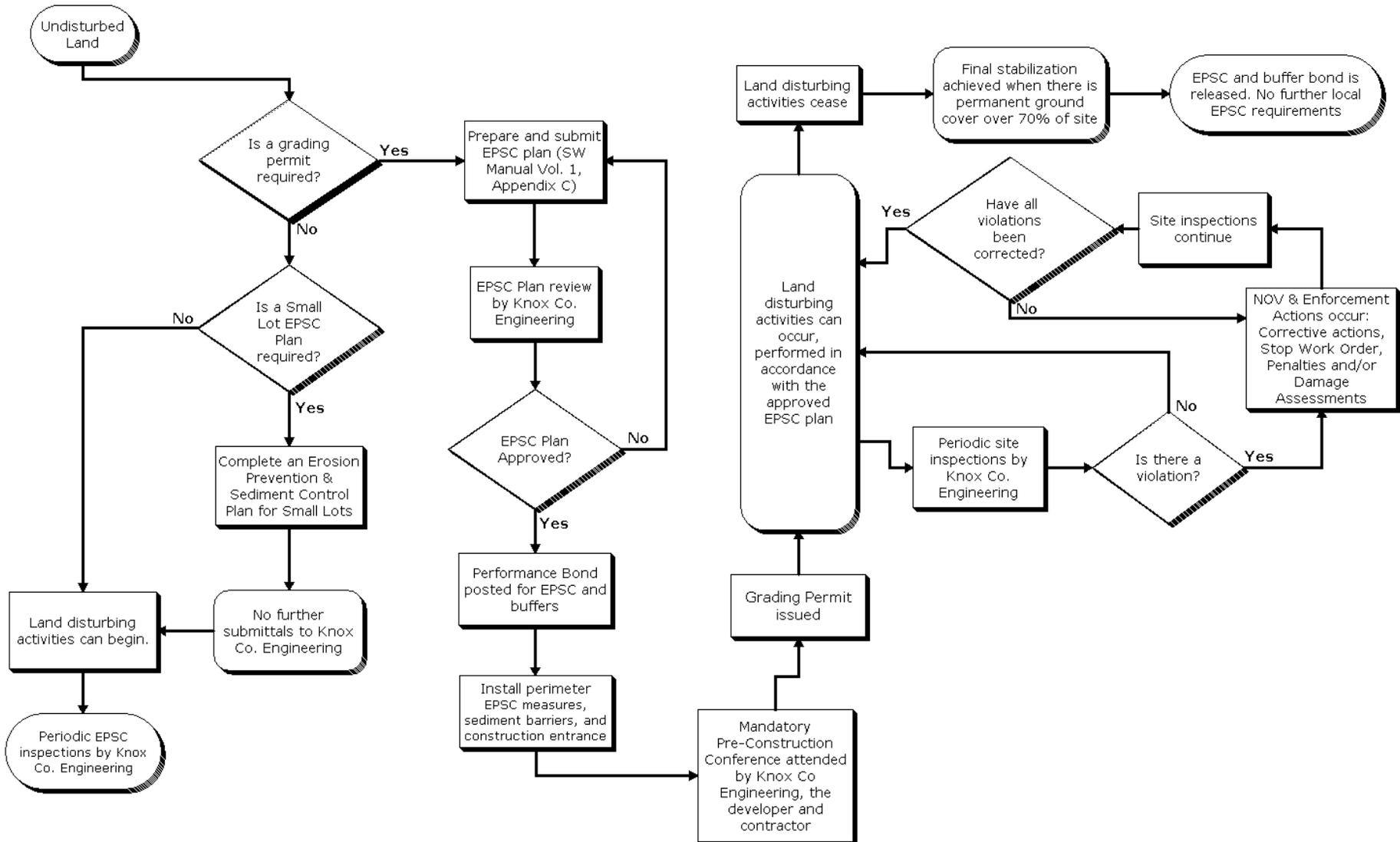
The pre-construction conference is scheduled when the developer is ready to obtain a grading permit. It is the responsibility of the developer to schedule and attend the conference, and to ensure the attendance of the contractor for the site.

4.3 Applicable Permits

4.3.1 Grading Permit

Grading permits are issued by Knox County Engineering prior to grading or other land disturbing activities on a site. An approved grading permit will allow the developer to begin such activities, in accordance with the specifications and details presented in the approved erosion prevention and sediment control (EPSC) plan for the site. The purpose of the grading permit is to require and document proper planning before beginning the land disturbing activity and to reduce or eliminate the potential for off-site sedimentation. A flowchart that depicts the Knox County grading permit process for most development and redevelopment situations is presented in Figure 4-3.

Figure 4-3. Knox County Grading Permit Process





The Knox County Stormwater Management Ordinance requires that a grading permit be obtained before any land disturbing activity occurs on a site that requires a stormwater management plan. Land disturbing activities are defined by the ordinance as:

“any activity on a property that results in a change in the existing soil (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to, development, re-development, demolition, construction, reconstruction, clearing, grading, filling, logging and/or tree-chipping operations, haul roads associated with the development, and excavation”.

In general, a grading permit must be obtained prior to a building permit. See Section 4.4.2 for exemptions to the requirement for a grading permit.

All State and Federal permits that may be applicable to the site must be documented to Knox County Engineering prior to issuance of a grading permit. These State and Federal permits include, but are not limited to, Tennessee permits for NPDES and ARAP coverage, US Army Corps of Engineers section 404 permits, and TVA section 26A permits.

Land disturbing activities performed in accordance with the approved EPSC plan shall commence within one year from the issue date of the grading permit, or the grading permit will become null and void and the plan must be resubmitted for approval. Land disturbing activities that commence within one year from the issue date of the grading permit and are being performed in accordance with the approved EPSC plan shall receive an automatic administrative renewal of the grading permit.

4.3.1.1 Endangered Species Act Review

The NPDES Phase II permit (discussed in Chapter 3) administered by the Tennessee Department of Environment and Conservation (TDEC) requires Knox County to include consideration of potential impacts from stormwater discharges on species that are listed as endangered or threatened under the Endangered Species Act (ESA) and on habitat that is designated as “critical” under the ESA. **As part of Knox County’s compliance with the NPDES Phase II permit, any proposed development that is located within, or discharges stormwater runoff to, a buffer area for threatened species, endangered species, or critical habitat (as defined by the ESA) shall be reviewed by the United States Fish and Wildlife Service (USFWS) prior to Knox County Engineering’s review of a grading permit and/or stormwater management plan.** If USFWS determines that the proposed development may, or will, impact an endangered or threatened species, or critical habitat, an informal consultation may be required by USFWS to determine the best management practices (BMPs) that will mitigate the potential ESA-related impacts. It is the responsibility of the property owner to work with USFWS to ensure compliance with the ESA.

Knox County is not the regulatory agency tasked with enforcing the ESA, and therefore cannot advise the property owner on ESA compliance practices and options. However, BMPs utilized to mitigate ESA-related impacts must be included in the grading and/or stormwater management plans, and once approved, will be enforced by Knox County as a matter of compliance with approved plans. Variations from USFWS accepted BMPs will not be allowed by Knox County without a copy of written acceptance of such variations by USFWS.

Knox County does not have the authority to expedite USFWS reviews and informal consultations. Therefore, person(s) responsible for proposed developments should consider the additional time required to coordinate with USFWS when preparing development schedules and costs. Questions regarding a USFWS consultation for any particular site should be forwarded to the USFWS office in Cookeville, Tennessee. Contact information for USFWS is presented in Appendix C.



The Knox County Tennessee Threatened and Endangered Species Buffer Map shall be used to determine which proposed developments will require review by USFWS. This map is prepared and maintained by the USFWS, and is available for use by the general public on Knox County Engineering's website, www.knoxcounty.org. The map will be updated by Knox County as needed to remain current.

Proposed developments that are located within a buffered area or are located in a watershed that discharges to a buffered stream shown on the Knox County Tennessee Threatened and Endangered Species Buffer Map must submit to review by USFWS. A copy of the results of the USFWS determination must be provided, in writing, with all grading and stormwater management plans submitted to Knox County Engineering. Further, proposed developments that undergo informal consultation by USFWS must also present, in detail, the BMPs that have been accepted by USFWS to mitigate ESA-related impacts. A copy of BMP acceptance by USFWS must also be provided. Grading and stormwater management plans that do not comply with these requirements will not be accepted for review by Knox County Engineering.

4.3.2 Building Permit

The building permit is the final permit that is reviewed and approved by Knox County Engineering. The Knox County Zoning Ordinance designates the activities for which a building permit must be obtained, and activities that are exempt from a building permit. For most new structures in the County, an approved building permit will allow construction to begin on the building. The Knox County Stormwater Management Ordinance requires approval of a stormwater management plan before a building permit can be obtained, unless the development is exempted by the Knox County Stormwater Management Ordinance. The ordinance also requires recording of the portion of the property required for stormwater facilities as a permanent drainage, water quality and/or access easement. More information on Knox County building permit requirements are presented in the Knox County Zoning Ordinance.

4.3.3 Special Pollution Abatement Permit

A Special Pollution Abatement Permit (SPAP) is required for development or redevelopment projects based on the potential for the development to impact stormwater runoff quality, unless a current NPDES discharge permit is in effect for the site. A SPAP application form is presented in Appendix C. SPAP requirements are presented in detail in Volume 2, Chapter 10 of this manual.

4.3.4 Floodplain Development Permit and Elevation Certificate

Knox County participates in the National Flood Insurance Program (NFIP), which is administered by the Federal Emergency Management Agency (FEMA). Participation in the NFIP requires that Knox County manage development within local floodplains using a Floodplain Development Permit and Elevation Certificate, the latter of which is presented in Appendix A. Typically, the permit and certificate are required for insurable structures that are located in the County's Special Flood Hazard Areas that have been designated by FEMA. The Director may require a permit and certificate for developments in TVA flowage easements and other areas as necessary for proper management of local floodplains.

A Floodplain Development Permit is required for any development or alteration to the natural drainage system within the 500-year floodplain in Knox County. The Director shall review said permit based on the requirements stated in the Stormwater Management Ordinance, the Flood Damage Prevention Ordinance, and the required engineering calculations stipulated by the Director and detailed in Volume 2, Chapter 8 of this manual. It is the responsibility of the property owner (or developer) to prepare and submit a Floodplain Development Permit application. Knox County Engineering will issue permits for development and redevelopment sites that are compliant with floodplain development regulations as provided in the Knox County Stormwater Management Ordinance and the Flood Damage Prevention Ordinance.



After construction is complete, a FEMA Elevation Certificate for each building located in the 500-year floodplain must be presented to Knox County Engineering. Failure to submit an elevation certificate shall be cause for Knox County to withhold a certificate of occupancy. The Elevation Certificate, if required, must be completed and sealed by a professional engineer or land surveyor licensed to practice in the State of Tennessee.

4.4 The Stormwater Management Plan

Knox County has established the stormwater management plan as the “umbrella” plan under which all stormwater and roadway related plans are submitted, and grading and building permits are approved. Land disturbing activities not exempted by the Knox County Stormwater Management Ordinance cannot begin before obtaining a grading permit, and a building permit cannot be issued until approval of a stormwater management plan. The contents of the stormwater management plan depend upon the land disturbing or construction activity that is proposed.

The purpose of this section is to present the requirements, contents, and procedure for submittal of stormwater management plans to Knox County prior to beginning land-disturbing activities or making application for a building permit.

4.4.1 General Requirements

In general, the stormwater management plan may include, but is not limited to, written information, calculations, and maps to support the following items:

- an EPSC plan;
- a drainage report and associated maps/plans, including hydrologic and hydraulic calculations for peak discharge, stormwater quantity control, floodplain and sinkhole management, and stormwater quality treatment and water quality volume credit calculations;
- a water quality buffer enhancement plan, if applicable;
- a Special Pollution Abatement Permit and/or Floodplain Development Permit, if applicable; and,
- an Operations and Maintenance plan for stormwater facilities and BMPs located on the property.

While each of the above items is considered a component of the stormwater management plan, items that are not applicable to the development site need not be submitted. For example, a site that is going to disturb more than one acre, but does not include any new impervious surfaces, is not located in a floodplain, and does not have a wetland, lake/pond, or stream that is required to be buffered on-site would be required to submit only an EPSC plan to obtain a grading permit.

In general, stormwater management plans shall be prepared and stamped by an engineer, landscape architect, or architect competent in civil and site design and licensed to practice in the state of Tennessee. However, the elements of a stormwater management plan that are listed below must be prepared and stamped by a professional engineer competent in civil and site design and licensed to practice in the state of Tennessee.

- Any portions of the stormwater management plan that require hydraulic or hydrologic calculations and design, including those temporary best management practices designed for purposes of erosion prevention and sediment control
- Any portions of the erosion prevention and sediment control plan that require hydraulic or hydrologic calculations and design

- All public roads and Joint Permanent Easements

4.4.2 Applicability

The applicability and exemptions for submittal of a stormwater management plan are provided in the Knox County Stormwater Management Ordinance. Exemptions should not be construed as exempting these developments and redevelopments from onsite drainage improvements that may be required in accordance with building and construction codes, nor from compliance with the requirements for a special pollution abatement permit or floodplain development permit.

The requirements for a small lot EPSC plan are discussed in detail in Section 4.6 of this chapter. General technical guidelines and policies for construction site management are discussed in Volume 2, Chapter 9.

4.4.3 Application Instructions and Checklist

Stormwater management plans and any associated plans review fees must be submitted to Knox County Engineering. Knox County Engineering will review the plans for compliance with the Knox County Stormwater Management Ordinance and other applicable local regulations. Only complete plans will be accepted for review.

A stormwater management plan checklist and an EPSC plan checklist are presented in Appendix E. EPSC plans can be submitted separately from a stormwater management plan if a grading permit is desired prior to stormwater management plan approval. In this situation, the grading permit checklist should be utilized alone.

These checklists provide a complete inventory of the required contents of a stormwater management plan and/or grading permit application. Plans submittals shall contain the information listed, as applicable to the proposed land disturbing activity or development.

The Director has the authority to request the submittal of additional information with the stormwater management plan as necessary to allow a thorough review of the site conditions. **Note that the EPSC plan, drainage report and associated plans/maps, and buffer enhancement plan must be on separate plan sheet(s) for clarity.**

Use of the checklists will expedite the plans review process. The applicant must attach a signed copy of the checklist with the stormwater management plan to certify that a complete package is being submitted. Some requirements of the checklists in Appendix E will not be applicable to all projects. These requirements should be checked as "not applicable." Omission of any required items renders the plans incomplete, and they will be returned to the applicant, or their engineer, so that they may be completed.

The checklists indicate that the applicant may also be required to meet State and Federal regulations for construction activities that will have an impact on Waters of the State, wetlands, sinkholes and threatened or endangered species. Wetlands can be defined as such by any agency with authority to make legal wetland determinations (United States Army Corps of Engineers, United States Environmental Protection Agency, Tennessee Department of Environment and Conservation, United States Natural Resources Conservation Service).

It is the responsibility of the developer or permit applicant to thoroughly review, understand and adhere to all applicable local, state and federal laws and regulations with regard to site development and property regulations when submitting the stormwater management plan. Copies of all applicable State and Federal permits must be provided to Knox County Engineering as part of the stormwater management plan.



4.5 Operations and Maintenance Plan

4.5.1 Background

Proper maintenance of stormwater facilities and best management practices is one of the most important factors in the long-term performance and effectiveness of a stormwater management plan. Knox County requires property owners or homeowners associations to properly maintain the stormwater system and BMPs located on private property. In an effort to reduce maintenance requirements for each development, a developer or site designer should consider the maintenance requirements for each stormwater structural or non-structural BMP when designing a development. To this end, Knox County strongly encourages site designers to utilize non-structural BMPs and better site design practices to the maximum degree possible, thereby reducing the degree of stormwater maintenance that will be required for the property after construction. Non-structural controls, which are discussed in detail in Volume 2, Chapter 5, generally require very little (and often no) maintenance and can reduce the size of any structural BMPs needed to treat stormwater runoff quality. The developer and site designer should then choose structural BMPs that have the lowest relative long-term maintenance requirements based upon the site constraints.

Knox County oversees the long-term maintenance of stormwater facilities and best management practices in a three-phased approach, as follows:

- 1) A preliminary Operations and Maintenance (O&M) Plan is submitted and approved as part of the Stormwater Management Plan. The preliminary O&M Plan must include all of the maintenance and inspection information for the stormwater system as designed. The purpose of the preliminary O&M Plan is to ensure that long-term maintenance issues have been considered in the design of the development.
- 2) A final O&M Plan is submitted and approved with the As-Built Certification and must accurately reflect the stormwater system and BMP locations after construction of the site has been completed. The goals of the final O&M Plan are to establish a legal record of the stormwater management system that is located on the property and the property owner's responsibilities with regards to the system; and to provide guidance to the current and any subsequent property owner on the requirements for BMP inspection and maintenance. The final O&M Plan is considered permanent and must be recorded with the deed.
- 3) Knox County Engineering will perform periodic inspections of the stormwater system shown in the final O&M Plan in order to determine if the system is being maintained in proper operating condition. Knox County will order corrective actions for components of the system that are determined to be improperly constructed or not maintained. More information about maintenance requirements after construction is presented in Volume 1, Chapter 5 of this manual.

4.5.2 Requirements

A preliminary O&M Plan shall consist of:

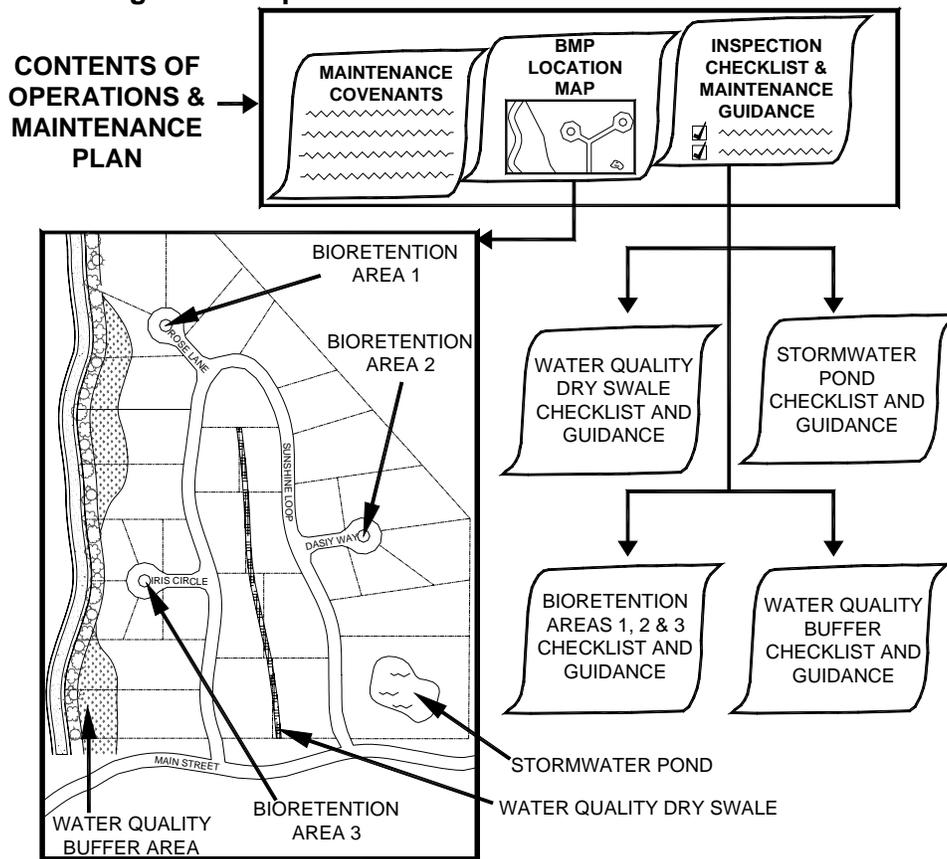
- 1) a map that accurately identifies the stormwater system location and components (e.g., stormwater pond, micropool extended detention pond, pipes, ditches, water quality buffers, etc.) that are located on the property. This map also must show the locations of drainage and access easements. The language used to identify each BMP shall be consistent with the BMP names used in this manual and on any inspection checklists included in the O&M Plan.
- 2) "Inspection Checklist and Maintenance Guidance" sheet(s) for each type of BMP that is located on the property. These sheets are presented in Volume 2, Chapter 4. The sheets provide a general guideline of inspection and maintenance elements. At a minimum, the Inspection

Checklist and Maintenance Guidance provided in Volume 2, Chapter 4 must be utilized for the O&M Plan as appropriate for the BMPs located on a site development. However, site designers may modify the templates to include inspections and maintenance elements as needed and appropriate for the BMPs.

The final O&M Plan includes the components of the preliminary O&M Plan stated above, updated to reflect the stormwater facilities and BMPs as they have been constructed in the field, as well as a completed “Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices” (also called the “Maintenance Covenants”). A blank copy of the Maintenance Covenants is presented in Appendix F of this manual.

An example final O&M plan for a residential subdivision is presented in Figure 4-4.

Figure 4-4. Operations and Maintenance Plan Contents



4.6 Small Lot EPSC Plans

The owner or operator of residential lots that will disturb less than one acre must submit a small lot EPSC plan prior to obtaining a building permit. In some circumstances, a small lot EPSC plan may not provide adequate protection to streams, sinkholes and other stormwater systems from sedimentation. In such situations, the Director can require a more detailed EPSC plan.

The small lot EPSC plan must identify general erosion prevention and sediment control measures that will be employed on the site via one of the template options that is shown on the plan. A blank small lot EPSC plan presented in Appendix G of this manual. In the event that none of the



template options shown on the plan adequately represent site conditions, the owner or operator must create a sketch.

Failure to install and maintain the measures identified in the small lot EPSC plan will be considered a violation of the Knox County Stormwater Management Ordinance. The grading or building permit holder is required to adhere to the small lot EPSC plan and prevent sediment from leaving the building site. The permit holder is also responsible for stabilizing the site prior to the issuance of a Certificate of Occupancy.

4.7 Bonds

Knox County requires that a performance bond be provided for land disturbing activities, and/or the construction of new developments and redevelopments when:

- 1) there is a potential for runoff to adversely impact Knox County rights-of-way, other property, and/or streams, wetlands, ponds or lakes that are located in Knox County; or,
- 2) an erosion prevention and sediment control plan is required; or,
- 3) a stormwater management plan is required; or,
- 4) there is construction of a joint permanent easement or public road; or
- 5) the area of grading or development drains to one or more sinkholes; or,
- 6) the site is used for a borrow pit.

The purpose of the performance bond is to ensure that the person(s) responsible for completing the land disturbing activities and/or construction work that has the potential to impact the public interest if performed improperly is completed in an appropriate manner. The performance bond provides assurance to Knox County that the County will be reimbursed when it must assume the costs of corrective measures and/or work not completed by the responsible person(s) according to the required specifications and approved plans. A performance bond can be used to cover the County's costs for the remediation or demolition of roadways, stormwater management facilities and related appurtenances, the installation and maintenance of EPSC measures and EPSC corrective actions, final soil stabilization of a site, and the establishment, protection, and maintenance of water quality buffers.

Performance bonds are authorized in Section 4.4 of the Knox County Stormwater Management Ordinance and are administered by Knox County Engineering. The dollar amount of the performance bond will be determined by Knox County Engineering, based on the information presented in the approved EPSC and/or stormwater management plan.

General policies regarding release of a performance bond are as follows.

- 1) An accurate as-built certification must be completed for the property, in accordance with the Knox County Stormwater Management Ordinance and this manual.
- 2) Portions of the property that will be used for the stormwater management system must be recorded as a permanent drainage, water quality, preservation, and/or access easement, as appropriate for each system component.
- 3) If found within the boundaries of the development, any one of the following items could keep areas or activities from being released from the performance bond:
 - areas of erosion or unstabilized areas;
 - less than 70% perennial vegetation coverage of non-paved areas. There may be



additional requirements for sites that are considered a priority construction activity or have caused past damages off-site due to sediment discharges;

- potential for discharges of sediment, or construction-related and other wastes;
- engineering or structural deficiencies or maintenance issues associated with constructed roadways, the stormwater system, or stormwater management best management practices;
- unsafe conditions;
- unhealthy, damaged or poorly growing vegetation in a water quality buffer that has been impacted by construction or for which a buffer enhancement plan has been approved;
- Operations and Maintenance Plan not complete.

4.8 As-Built Certifications

Prior to obtaining a Certificate of Occupancy, two (2) complete copies of as-built drawings with the appropriate professional certifications must be provided to Knox County Engineering for approval. The as-built drawings will be compared to the approved stormwater management plan for any irregularities or non-conformance with the approved plans.

The as-built drawings shall reflect the “as-constructed” condition of the development, and shall include sufficient information to demonstrate substantial conformance with the approved stormwater management plan. Significant deviations from the approved plan shall be considered violations of the Knox County Stormwater Management Ordinance and are grounds for the invocation of the injunctions and penalties defined therein, and/or withholding the release of a bond pending the completion of corrective action(s), and/or requiring a submittal of a revised stormwater management plan. In the event that the Director requires submittal of a revised plan, the revision shall include a description of the discrepancies between the site conditions and the prior approved stormwater management plan, along with design calculations that demonstrate that the as-built conditions comply with the Knox County Stormwater Management Ordinance. Should the as-built conditions be shown to have a negative impact with regards to flooding, maintenance, erosion or water quality, the Director has the authority to require other mitigation measures and proposed design plans to mitigate any potential impacts from the development.

Only complete as-built plans will be accepted by Knox County Engineering for review. The As-Built Certification checklist presented in Appendix E shall be included in the as-built plan to indicate that a complete plan is being submitted. As-built plans shall contain the information and certification(s) listed, as applicable to the development. Some requirements of the checklist in Appendix E will not be applicable to all projects. These requirements should be checked as “not applicable”. The Director has the authority to request the submittal of additional information with the as-built plan as necessary to allow a thorough review of the as-constructed conditions. Omission of any required items shall render the plans incomplete, and they will be returned to the applicant, or their engineer, so that they may be completed.

Plats, easements and BMP locations shown in the Operations and Maintenance Plan must be field checked by the property owner or developer prior to submitting the as-built plan to ensure that the field locations are approximately correct. Prior to submittal of the as-built drawings, all easements and survey plats, and the final Operations and Maintenance Plan for the development must be recorded in the Knox County Register of Deeds’ office. Copies of the recorded documents or other verification of the recording shall be included with the as-built drawings.

As-built plans must be prepared and stamped by the appropriate design professional as required to stamp the original stormwater management plan, and/or a registered land surveyor licensed to



maintaining the functionality of each component as well as preventing pollutants from being discharged from the development site.

4.9.2 County Authority and Responsibilities

4.9.2.1 Inspections

The Knox County Stormwater Management Ordinance gives the Director (or his/her designated representative) the authority and right to enter private property to inspect for compliance with approved plans. During the normal course of the property development process, this is a common occurrence. County inspectors will document activities at the site and note any corrective actions needed at the site. The permittee may be required to provide the County inspector with copies of inspection reports and permit documentation to verify that inspections and maintenance are being performed as necessary. In the event that a maintenance need or concern is identified during an inspection by Knox County, the County will require the permittee to perform the maintenance activity and will establish a completion date in writing. Failure to perform the maintenance by the completion date set by Knox County could result in further enforcement action.

Failure of a property owner to allow entry by the Director or his/her designee for purposes of an inspection shall be cause for the issuance of a stop work order, withholding of a certificate of occupancy, and/or civil penalties and/or damage assessments.

4.9.2.2 Corrective Actions

The Director has the authority to order corrective actions to EPSC measures, stormwater management facilities, and/or the stormwater system as necessary to properly maintain the stormwater systems within Knox County. Further, the Director can perform the corrective action. If the property owner(s) fails to perform corrective actions, the Director shall have the authority to order corrective action, to be performed by the County or others. The property owner or permittee is responsible for providing funding for corrective actions that are performed by the County (or designee), either through revocation of the performance bond or reimbursement for double the cost of the corrective action. Knox County has the authority to file a lien for failure to reimburse a corrective action.



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DRAINAGE SYSTEM MAINTENANCE

The purpose of this chapter is to establish general policies for maintenance of stormwater management systems in Knox County, and to define the maintenance responsibilities of Knox County Engineering and private property owners.

5.1 Level of Service

5.1.1 Background

Each local government must make decisions concerning the maintenance of the stormwater infrastructure so maintenance activities can be applied to all components of the stormwater system within their jurisdiction consistently. What defines the public stormwater system versus private stormwater systems? For which parts of the stormwater system should a local government be responsible? What services should a local government provide to various parts of a stormwater system? What responsibilities do private property owners have?

To answer these questions, a local government must define its “extent of service” and “level of service”. When combined, these two concepts provide the framework for regulations and/or policies for the local stormwater system maintenance program. These concepts are defined in italics below:

Extent of Service (EOS): The extent of service is a policy decision that defines the stormwater structures for which a local government provides services. Knox County performs construction, inspection and maintenance of the stormwater system in the public right-of-way along public streets. As a matter of general policy, Knox County does not perform stormwater maintenance on private property.

Level of Service (LOS): The maintenance level of service is defined by the types of services a local government provides to different parts of the drainage system. For example, a local government may perform maintenance for residential drainage systems, but only provide inspection and enforcement of maintenance agreements for systems located on non-residential parcels. Within right-of-way areas that are highly susceptible to flood damages, Knox County’s level of service includes the periodic inspection, priority cleaning and emergency response. Conversely, the level of service for maintenance in right-of-ways that are not susceptible to flooding might consist of inspections and maintenance on an infrequent, or complaint-driven, basis.

5.1.2 Knox County’s Responsibilities

With respect to maintenance of the stormwater management system after its construction, the Knox County Department of Engineering and Public Works has the following responsibilities:

- Maintenance of the stormwater system located in public right-of-ways and on other public lands;
- Administration and enforcement of stormwater management regulations and associated inspections;

- Administration and enforcement of floodplain management regulations and associated inspections, in accordance with the requirements of the National Flood Insurance Program (NFIP) and in order to secure the County's participation in the Community Rating System (CRS) program.
- Administration and enforcement of the "Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices" for stormwater facilities and best management practices (BMPs) located on private property. This responsibility includes periodic or routine inspections by Knox County Engineering staff and may also include issuing Notices of Violations, and ordering or performing corrective actions.

5.1.3 Private Property Owner Responsibilities

The owner(s) of stormwater management facilities and/or BMPs shall ensure the proper operation of the stormwater system. The owner must further maintain all facilities, system components (and related appurtenances), and all BMPs in such a manner as to maintain the full functionality of the facility, component, or BMP. Maintenance of privately-owned facilities and BMPs shall be performed at the sole cost and expense of the owner(s) of such facilities or BMPs.

Stormwater management facilities and BMPs located on private property that have been designed and installed since adoption of this manual must be included in the Operations and Maintenance (O&M) Plan that is recorded with the property's deed. The O&M Plan serves two purposes. First, it is considered a legal statement of responsibility with regards to the stormwater BMPs located on the property and binds the property owner (and subsequent property owners) to the long-term proper operation and maintenance of such BMPs. Second, the plan is intended to provide the property owner with information to accurately locate BMPs on the property, and guidance to adequately inspect and maintain the BMPs. O&M Plan requirements are presented in detail in Volume 1, Chapter 4 of this manual. Included in the O&M Plan are:

1. the "Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices" (also called the "Maintenance Covenants").
2. an "Inspection Checklist and Maintenance Guidance" for each type of stormwater BMP that is located on the property.
3. a map that accurately identifies the location of the stormwater system and the type of each BMP located on the property. This map also clearly identifies drainage and access easements.

Maintenance Covenants bind the property owner(s) to the maintenance of stormwater facilities and BMPs located on the property. It should be noted that the Maintenance Covenants grant Knox County employees right-of-entry to inspect the facilities and BMPs, and/or perform any corrective actions that may be required to ensure the long-term proper operation of the facilities. The Maintenance Covenants also contain provisions for legal repercussions and expense reimbursement for corrective actions that must be performed by Knox County if the BMP owner fails to perform the maintenance or corrective actions.

The inspection and maintenance of stormwater BMPs shall be performed in accordance with the guidance provided in the Inspection Checklist and Maintenance Guidance sheets that are included in the O&M Plan. Property owners are strongly encouraged to document inspection and maintenance activities. The checklists that are provided with the property's O&M Plan (which have been recorded with the property), can be utilized for this purpose.

The Director of Engineering and Public Works (the Director) may require a property owner to document BMP inspections and maintenance activities in order to monitor compliance with applicable rules and regulations, where needed to satisfy local, or State NPDES, TMDL, or other regulatory water quality requirements, or when deemed in the best interest of the County. Where



such documentation is required, it shall be made available for review by the Director immediately upon his/her request.

Revisions to a recorded O&M Plan must be requested in writing by the property owner, and must be approved by the Director. Note that the Director has the authority to require a modification to a recorded O&M Plan in the event that the existing Plan does not function as intended. When revisions of the O&M Plan are required, a new Maintenance Covenants document shall be executed after the Director has approved the O&M Plan. Revisions to an existing O&M Plan must be brought into conformance with the stormwater management regulations, policies, and design standards that are current at the time the revisions are made.



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APPENDIX A - Regulations

This Appendix contains the following local ordinances and permits:

- Appendix A1** - Knox County Stormwater Management Ordinance
- Appendix A2** - Knox County Flood Damage Prevention Ordinance
- Appendix A3** - Knox County Dirty Lot Ordinance
- Appendix A4** - Knox County Grading Permit

ORDINANCE NO. O-07-12-101
AN ORDINANCE FOR STORMWATER MANAGEMENT
KNOX COUNTY, TENNESSEE

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WHEREAS, an ordinance is needed to regulate storm drainage facilities, grading, excavation, clearance, and other alteration of the land in order to limit the dangers of personal injury, property or environmental damage that may be caused by stormwater runoff; and

WHEREAS, an ordinance is needed in order to secure eligibility for flood insurance under Public Law 1016, 84th Congress, and thereby to promote the public health, safety, and general welfare of the citizens of Knox County, Tennessee;

WHEREAS, Knox County is required under the Clean Water Act to implement programs and regulations to protect and restore water quality in water bodies receiving stormwater runoff from the municipal separate storm sewer system.

BE IT ENACTED BY THE COUNTY COMMISSION OF KNOX COUNTY AS FOLLOWS:

SECTION 1. TITLE AND ADMINISTRATION

- (a) This ordinance shall be cited as the Knox County Stormwater Management Ordinance, and shall replace in entirety Chapter 3.5, adopted in April 2005. As of the date of adoption of this ordinance, all references to Chapter 3.5 or to previous stormwater management ordinances cited in other Knox County codes or regulations shall be regarded as a reference to this ordinance.
- (b) This ordinance shall apply to all areas located within the jurisdiction of Knox County.
- (c) The Director of the Knox County Department of Engineering and Public Works (the Director) and the staff under the Director's supervision shall administer the provisions of this ordinance. The Director shall, with the approval of the Knox County Mayor, establish written regulations and technical guidelines as may be necessary to enforce the terms of this ordinance. These regulations and technical guidelines shall be filed in the Department of Engineering and Public Works office, and shall be made available to the public.

SECTION 2. DEFINITIONS

Unless specifically defined in this section, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage, and to give this ordinance the most reasonable application.

1-year Frequency Storm - A storm event defined to be 2.5 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

2-year Frequency Storm - A storm event with a fifty (50) percent chance of being equaled or exceeded in a given year. Defined to be 3.3 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

5-year Frequency Storm - A storm event with a twenty (20) percent chance of being equaled or exceeded in any given year. Defined to be 4.1 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

10-year Frequency Storm - A storm event with a ten (10) percent chance of being equaled or exceeded in any given year. Defined to be 4.8 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

25-year Frequency Storm - A storm event with a four (4) percent chance of being equaled or exceeded in any given year. Defined to be 5.5 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

100-year Frequency Storm - A storm event with a one (1) percent chance of being equaled or exceeded in any given year. Defined to be 6.5 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

500-year Frequency Storm - A storm event with a one-fifth (1/5) of one (1) percent chance of being equaled or exceeded in any given year. Defined to be 7.6 inches in 24 hours or other such magnitude the Director shall establish based upon scientific and engineering information.

100-year Flood Elevation - The elevation of the 100-year flood at any given location.

500-year Flood Elevation - The elevation of the 500-year flood at any given location.

Active Channel – The area of the stream that is most subject to water flow and that includes the portion of the channel below the top-of-bank.

Aquatic Resource Alteration Permit (ARAP) - A permit issued by the Tennessee Department of Environment and Conservation for physically altering Waters (streams and wetlands) of the State.

As-Built Certification - As-built, field-verified plans signed and sealed by a registered professional engineer and/or a registered land surveyor, both licensed to practice in the State of Tennessee, which shows physical information about the development or redevelopment for purposes of verifying adherence to the approved stormwater management plan(s).

Base Flood Elevation (BFE) - The 500-year flood elevation at any given location.

Best Management Practices (BMP or BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls and other management practices designed to prevent or reduce the pollution of waters of the United States. BMPs may include structural devices or non-structural practices.

Blue-Line Stream - Any stream that is shown on a 7.5 minute USGS quadrangle map, unless determined otherwise by the Tennessee Department of Environment and Conservation.

Board of Zoning Appeals (BZA) - A group of nine citizens appointed by the County Commission to hear appeals and decide appeals and variances as authorized in section 6.60 of the Knox County Zoning Ordinance.

CFR - Code of Federal Regulations.

Channel - A natural or man-made watercourse of perceptible extent, with definite bed and banks to confine and conduct continuously or periodically flowing water.

Clearing – In the definition of discharges associated with construction activity, clearing does not refer to clearing of vegetation along roadways, highways or power lines for sight distance or other maintenance and/or safety concerns, or cold planing, milling, and/or removal of concrete and/or bituminous asphalt roadway pavement surfaces. Clearing typically refers to removal of vegetation and/or disturbance of soil prior to grading or excavation in anticipation of construction activities. Clearing may also refer to wide area land disturbance in anticipation of non-construction activities; for instance, cleared forested land in order to convert forest land to pasture for wildlife management purposes.

Commencement of Construction or Commencement of Land Disturbing Activities – The initial disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

Community Waters - Any of the following waterbodies located within the unincorporated areas of Knox County are considered community waters:

- a. Streams, as defined herein;
- b. Wetlands, as defined by the any agency with authority to make legal wetland determinations (United States Army Corps of Engineers, United States Environmental Protection Agency, Tennessee Department of Environment and Conservation, United States Natural Resources Conservation Service);
- c. Ponds that have a direct hydraulic connection to other community waters; and,
- d. Lakes.

Construction – Any placement, assembly, or installation of facilities or equipment (including contractual obligations to purchase such facilities or equipment) at the premises where such equipment will be used, including preparation work at such premises.

Construction Related Wastes - Refuse or unused materials that can result from construction activities. Construction related wastes can include, but are not limited to, unused building and landscaping materials, chemicals, litter, sanitary waste, and concrete truck washout.

Conveyance - The capacity of a channel or a pipe to carry stormwater.

Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices - A legal document executed by the property owner, or a homeowners' association as owner of record, and recorded with the Knox County Register of Deeds which guarantees perpetual and proper maintenance of stormwater facilities and best management practices.

County - Knox County, Tennessee.

Cross Drain - A pipe used to convey stormwater from one side of a Knox County Road to another. A cross drain can also be called a culvert.

Development - Any land change that alters the hydrologic or hydraulic conditions of any property. Often referred to as “site development”. Development includes, but is not limited to, providing access to a site, clearing of vegetation, grading, earth moving, providing utilities, roads and other services such as parking facilities, stormwater management and erosion control systems, potable water and wastewater systems, altering land forms, or construction or demolition of a structure on the land.

Director - The Director of the Knox County Department of Engineering and Public Works or designee.

Discharge - Dispose, deposit, spill, pour, inject, seep, dump, leak or place by any means, or that which is disposed, deposited, spilled, poured, injected, seeped, dumped, leaked, or placed by any means including any direct or indirect entry of any solid or liquid matter into the stormwater system by any means intentional or otherwise.

Disturbed Area - Portion of any site that has been altered from existing conditions, including but not limited to the following: providing access to a site, clearing of vegetation, grading, earth moving, providing utilities and other services such as parking facilities, stormwater management and erosion control systems, potable water and wastewater systems, altering land forms, or construction or demolition of a structure on the land.

Drainage Basin - The area contributing stormwater runoff to a single point.

Drainage System - The system of pipes, channels, culverts, and ditches that convey stormwater from and through public and private land in Knox County.

Erosion - The removal of soil particles by the action of water, wind, ice or other geological agents, whether naturally occurring or acting in conjunction with or promoted by anthropogenic activities or effects.

Excavation - A cavity or hole in the land surface that is caused by the cutting, digging, or scooping and removal of soil, rock, or other materials.

FEMA - The Federal Emergency Management Agency, which administers the National Flood Insurance Program (NFIP).

Filling - Any deposit or stockpiling of dirt, rocks, stumps, or other natural or man-made solid waste material.

Flood - Water from a river, stream, watercourse, lake or other body of standing water that temporarily overflows and inundates adjacent lands and which may affect other lands and activities through increased surface water levels, and/or increased groundwater level.

Flood Fringe - That portion of the Special Flood Hazard Area lying outside the floodway.

Flood Insurance Rate Map (FIRM) - The official map on which the Federal Emergency Management Agency has delineated both the areas of special flood hazard and the risk premium zones.

Flood Insurance Study (FIS) - The official report provided by the Federal Emergency Management Agency. The report contains elevations of the base flood, floodway widths, flood velocities, and flood profiles.

Floodplain - Any land area susceptible to being inundated by water from any source. Floodplains that have been studied for purposes of flood insurance documentation are typically assigned a recurrence interval (i.e., the 100 year floodplain) which defines the magnitude of the flood event that causes the inundation in the floodplain to a specified flood elevation. The 100 year floodplain is the area subject to inundation during the 100 year flood.

Flood Proofing - Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway - The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one foot.

Floodway Encroachment - Any obstruction, fill, construction, improvement or other alteration that changes the hydraulic characteristics of the regulatory floodway.

Grading - Any clearing, excavating, filling or other disturbance of terrain.

Grading Permit - A permit issued by Knox County authorizing the commencement of land disturbing activities.

High Quality Waters - Surface waters of the State of Tennessee that are identified by TDEC as “high quality waters.” Characteristics of high quality waters are listed at Rule 1200-4-3-.06 of the official compilation – rules and regulations of the State of Tennessee. Characteristics include waters designated by the Water Quality Control Board as Outstanding National Resources Waters (ONRW); waters that provide habitat for ecologically significant populations of certain aquatic or semi-aquatic plants or animals; waters that provide specialized recreational opportunities; waters that possess outstanding scenic or geologic values; or waters where existing conditions are better than water quality standards. High quality waters are sometimes referred to as Tier II or Tier III (ONRW) waters.

Hotspot - An area where the land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

Human Occupancy - Any portion of any enclosed structure wherein humans principally live, work, or sleep such as mobile homes, residential activities, basements, health care facilities, restaurants, office buildings, etc.

Illicit Discharge - Any discharge to the stormwater system that is not composed entirely of stormwater and not specifically exempted in section 12 of this ordinance.

Impervious Area - Impermeable surfaces which prevent the percolation of water into the soil including, but not limited to, pavement, parking areas and driveways, packed gravel or soil, or rooftops.

Lake - An inland body of standing water, usually of considerable size.

Land Disturbing Activity - Any activity on a property that results in a change in the existing soil (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to, development, re-development, demolition, construction,

reconstruction, clearing, grading, filling, logging and/or tree chipping operations, haul roads associated with the development, and excavation.

Letter of Map Revision (LOMR) - A letter written by FEMA that officially revises the FIS and FIRM.

Municipal Separate Storm Sewer System (MS4) - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, constructed channels, and storm drains) designed or used for collecting or conveying stormwater. However, sanitary and combined sewers are not included in the definition of the Municipal Separate Storm Sewer System.

National Pollutant Discharge Elimination System (NPDES) - The program administered by the United States Environmental Protection Agency to eliminate or reduce pollutant discharges to the waters of the United States.

Natural Resources Conservation Service (NRCS) - An organization within the U.S. Department of Agriculture that has published standard drainage procedures in the form of Technical Release No. 55. Formerly known as the Soil Conservation Service (SCS).

No Rise - A floodway encroachment that causes no increase to the Base Flood Elevation, and to the 100-year floodway width and water surface elevation.

Outfall - The terminus of a stormwater system where the contents are released into a larger public or private stormwater management system, or into a stream.

Owner or Operator - Any party associated with a construction project that meets either of the following two criteria:

- a. The party has operational control over construction plans and specifications, including the ability to authorize modifications to those plans and specifications (this will typically be the owner or developer); or
- b. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a stormwater pollution prevention plan (SWPPP) for the site or other permit conditions, e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions. (This will typically include the general contractor and would also include erosion control contractors.)

Pond - An inland body of standing water that is usually smaller than a lake.

Priority Construction Activity – Land disturbing activities that are located in a watershed that discharges to waters recognized by the State of Tennessee as impaired for siltation, or high quality waters.

Peak Discharge - The maximum instantaneous rate of flow of water at a particular point resulting from a storm event. Also, the maximum discharge computed for a given design flood event.

Person - Any individual, firm, corporation, partnership, association, organization or entity, including governmental entities, or any combination thereof.

Public Water - Stormwater runoff that originates in whole or part from or is conveyed by publicly owned facilities such as roads.

Redevelopment - The improvement of a lot or lots that have been previously developed.

Riprap - A combination of large stone, cobbles and boulders used to line channels, stabilize stream banks, and reduce runoff velocities.

Runoff - The water resulting from precipitation that is not absorbed by the soil. Also can be referred to as stormwater runoff.

Sanitary Sewer - A system of underground conduits that collects and delivers wastewater from toilets, sinks and other plumbing fixtures to a wastewater treatment plant.

Sediment - Solid material, either inorganic (mineral) or organic, that is in suspension, is being transported, or has been moved from the site of origin by wind, water, gravity, or ice as a product of erosion..

Sewage - Human wastes carried by water from residences, buildings, industrial establishments or other places, together with such industrial wastes, stormwater or other water as may be present; or any substance discharged from a sanitary sewer collection system.

Sinkhole - A depression characterized by closed contours on a topographic map. A sinkhole throat, or opening to the subsurface, may or may not be visible. Field verification may be required in areas where the depth of the depression is below the tolerance of currently available topographic mapping. The extent of the area considered to be a sinkhole is, at a minimum, the limits determined by the sinkhole floodplain elevation, assuming plugged conditions (0 cfs outflow).

Sinkhole Floodplain Elevation - The elevation at the sinkhole lip or the flood elevation expected under extreme flood conditions outlined in section 5.8.

Sinkhole Floodplain Storage Volume – The storage volume below the sinkhole floodplain elevation.

Sinkhole Lip Elevation - The elevation of the highest closed contour around a sinkhole. If the flood elevation is above the sinkhole lip, water will flow away from the sinkhole.

Small Lot - For purposes of a building permit, a small lot is a construction site that results in the disturbance of less than one (1) acre of land and is not part of a larger common plan of development or sale that would disturb one (1) acre or more.

Special Flood Hazard Area (SFHA) - An area having special flood, mudslide (i.e., mudflow) and/or flood-related erosion hazards and shown on a Flood Hazard Boundary Map or Flood Insurance Rate Map as zone A, AO, A1-30, AE, A99 or AH.

Stormwater - Runoff from rain, snow or other forms of precipitation, which results in surface runoff and drainage.

Stormwater Management Facilities - Structures and constructed features designed for the collection, conveyance, storage, treatment and disposal of stormwater runoff into and through the stormwater system. Stormwater management facilities include vegetative or structural measures, or both, to control the increased volume, rate, and quality of stormwater runoff caused by manmade changes to the land.

Stormwater Management Plan - An engineering study for the design of the drainage system for a proposed development that includes a map showing the extent of the land development

activity, an erosion prevention and sediment control plan, stormwater control plan, and may contain as-built certifications and Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices. The stormwater management plan also includes sufficient hydrologic calculations to determine the impact of the development on stormwater discharges.

Stormwater Management Manual – A document prepared and maintained by the Knox County Department of Engineering which contains design standards and criteria, technical specifications and guidelines, maintenance guidelines, methodology for engineering computations, and other supporting documentation to be used as the technical guidance for implementation of the provisions of this ordinance.

Stormwater Master Plan - An engineering and planning study for the drainage system of a watershed that consists of a plan for stormwater management in the watershed. Stormwater master plans can address flooding problems, water quality problems, potential stormwater capital improvements, land use patterns, and regulatory issues for existing and future conditions.

Stormwater System - The system of roadside drainage, roadside curbs and gutters, curb inlets, swales, catch basins, manholes, gutters, ditches, pipes, lakes, ponds, sinkholes, channels, creeks, streams, storm drains, water quality best management practices, and similar conveyances and facilities, both natural and manmade, located within Knox County which are designated or used for collecting, storing, or conveying stormwater, or through which stormwater is collected, treated, stored or conveyed, whether owned or operated by Knox County or other person..

Stream – For the specific purpose of water quality buffers, a stream is defined as a linear surface water conveyance that can be characterized with either perennial or ephemeral base flow and:

- a. has published floodplain elevations that have been computed as part of an approved flood study; or
- b. is identified as a blue line on a 7.5-minute USGS quadrangle, unless otherwise designated by TDEC; or
- c. is identified by the property owner as a stream; or
- d. is or has been identified by Knox County, USACE or TDEC as a stream.

Structure - Anything constructed or erected such that the use of it requires a more or less permanent location on or in the ground. Such construction includes, but is not limited to, objects such as buildings, towers, smokestacks, overhead transmission lines, carports and walls.

TDEC - The Tennessee Department of Environment and Conservation.

Top of Bank - The uppermost limit of the active channel of a stream containing normal flows, usually marked by a break in slope.

Total Maximum Daily Load (TMDL) - A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the source(s) of the pollutant.

Transporting - Any moving of earth materials from one place to another, other than such movement incidental to grading, as authorized on an approved plan.

USACE - United States Army Corps of Engineers.

Utility, public or private - Any agency which under public franchise or ownership, or under certification of convenience and necessity provides the public with electricity, natural gas, steam, communication, rail transportation, water, sewage collection, or other similar service.

Vegetation - Collection of plant life, including trees, shrubs, bushes, and grass.

Wastes, industrial/commercial - Liquid or other wastes resulting from any process of industry, manufacture, trade or business, or from the development of any natural resources.

Wastes, other - Decayed wood; sawdust; shavings; fallen bark; fallen leaves; lawn clippings; animal wastes; used or previously applied lime; garbage; trash; refuse, loose used paper, paper products, plastic containers, or metal containers; ashes, offal, discarded tar; discarded paint; discarded or uncontained solvents; used, discarded, or spilled petroleum products, antifreeze, motor vehicle fluids; used or discarded tires, gas tanks, or chemicals; or any other used, uncontained, or unpackaged, or disposed of materials which may discharge to or otherwise enter the stormwater system.

Waters or Waters of the State - Any and all water, public or private, on or beneath the surface of the ground, which are contained within, flow through or border upon Tennessee or any portion thereof except those bodies of water confined to and retained within the limits of private property in single ownership which do not combine or effect a junction with natural surface or underground waters.

Water Quality Buffer - A use-restricted, vegetated area that is located along the perimeter of community waters, containing natural vegetation and grasses, enhanced or restored vegetation.

Watercourse - A channel, natural depression, gully, stream, creek, pond, reservoir or lake in which stormwater runoff and floodwater flows either regularly or infrequently. This includes major drainageways for carrying urban stormwater runoff.

Watershed - A region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water.

Wetlands - An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetland determination shall be made by the United States Army Corps of Engineers, and/or the Tennessee Department of Environment and Conservation, and/or the Natural Resources Conservation Service.

SECTION 3. AUTHORITY OF THE DIRECTOR

(a) Knox County Department of Engineering and Public Works has the authority to promulgate rules, regulations, and guidance consistent with this ordinance in order to carry-out the meaning and intent of this ordinance in a Stormwater Management Manual. The Stormwater Management Manual, as amended, shall be implemented consistent with other provisions of this ordinance through the approval and enforcement of the stormwater management plan. Stormwater quality or quantity control methods, designs or technologies not provided in the Stormwater Management Manual, as amended, may be submitted for approval if it is proven that such methods, designs or technologies will meet or exceed the water quality and quantity control requirements set forth in the Stormwater Management Manual, as amended, and this ordinance. Knox County Department of Engineering and Public Works will revise and

append the Stormwater Management Manual to satisfy State or Federal regulatory water quality or quantity requirements, or as research and development in the area of stormwater management provides improved knowledge of new or existing stormwater quality or quantity control methods, designs or technologies. This ordinance emphasizes that the Knox County Stormwater Manual is the basis for design for all projects affecting stormwater in Knox County. A role of the Director is to enforce said design. Thus the Knox County Stormwater Manual shall be enforceable consistent with other provisions of this ordinance.

- (b) The Director shall have the authority to prepare, or have prepared, master plans for drainage basins and to establish regulations or direct capital improvements to carry out said master plans.
- (c) In the event that the Director determines that a violation of any provision of this ordinance has occurred, or that work does not have a required plan or permit, or that work does not comply with an approved plan or permit, the Director may issue a Notice of Violation to the permittee or property owner and/or any other person or entity having responsibility for construction work performed at a site development, at which time the penalty provisions of this ordinance shall be implemented.

SECTION 4. STORMWATER MANAGEMENT REQUIREMENTS

4.1 Developments Exempt from a Stormwater Management Plan

It is acknowledged that any exemptions are reviewed by the Director and should not be construed as an opportunity to circumvent the letter and spirit of the Knox County Stormwater Ordinance. It is also not the intent of Knox County Government to place undue and unreasonable hardships on individual business and property owners.

4.1.1 Responsibilities of Exempt Developments

- (a) The exemptions listed in section 4.1.2 shall not be construed as exempting these developments and redevelopments from onsite drainage improvements that may be required in accordance with building and construction codes, nor from compliance with sections 4.6, 4.7 and 12 of this ordinance, nor from providing adequate erosion prevention and sediment control measures to protect adjoining property owners and the public right-of-way.
- (b) Developments and redevelopments that conform to the criteria in section 4.1.2(a) and 4.1.2(b) are exempt from the requirements for a stormwater management plan, but must submit a small lot erosion prevention and sediment control plan, in accordance with section 4.3 of this ordinance, prior to obtaining a building permit.

4.1.2 Exemptions

The following developments and redevelopments are exempt from the requirements for a grading permit and for a stormwater management plan:

- (a) Single to two-family individual residential dwellings in any given area that conform to the following criteria:
 - (1) do not alter a drainage channel; and,
 - (2) disturb less than one (1) acre of land; and,
 - (3) are not part of a larger common plan of development or sale that would disturb one (1) acre or more;

- (4) do not alter the natural ground elevation by more than five (5) feet;
 - (5) are not located in a sinkhole, or are not located on a site where sinkholes are entirely or partially present.
- (b) Commercial or industrial development that conform to the following criteria:
 - (1) disturbs less than one (1) acre of land; and,
 - (2) is not part of a larger common plan of development or sale that would disturb one (1) acre or more; or,
 - (3) adds less than ten-thousand (10,000) square feet of impervious surface; and,
 - (4) does not alter the drainage channel; and,
 - (5) does not alter the natural ground elevation by more than five (5) feet;
 - (6) is not located in a sinkhole, or are not located on a site where sinkholes are entirely or partially present.
 - (c) Minor land disturbing activities such as home gardens and individual home repairs, landscaping, or maintenance work;
 - (d) Individual utility service connections, unless such activity is carried-out in conjunction with the clearing, grading, excavating, transporting, or filling of a lot or lots for which a grading permit would otherwise be required by the regulation;
 - (e) Installation, maintenance or repair of individual septic tank lines or drainage fields, unless such activity is carried out in conjunction with the clearing, grading, excavating, transporting, or filling of a lot or lots for which a grading permit would otherwise be required by the regulation;
 - (f) Installation of posts or poles;
 - (g) Farming activities;
 - (h) Emergency work to protect life or property, and emergency repairs, provided that the land area disturbed shall be shaped and stabilized in accordance with the requirements of this regulation as soon as practicable.

4.2 Stormwater Management Plan Requirements

4.2.1 General Requirements

- (a) The owner or operator of land development activities not exempted under section 4.1 must submit a stormwater management plan.
- (b) No building permit shall be issued until the required stormwater management plan is approved by the Department of Engineering and Public Works.
- (c) The stormwater management plan shall include the specific required elements that are listed and/or described in the Knox County Stormwater Management Manual, as amended. Additional information shall be provided as necessary to allow an adequate review of the site conditions.
- (d) Stormwater management plans, including erosion prevention and sediment control plans shall be prepared and stamped by an engineer, landscape architect, or architect competent in civil and site design and licensed to practice in the state of Tennessee with the following conditions:
 - (1) Portions of the stormwater management plan, including portions of the erosion prevention and sediment control plan, that require hydraulic or hydrology calculations

and design shall be prepared and stamped by a professional engineer competent in civil and site design and licensed to practice in the state of Tennessee.

- (2) All roads and Joint Permanent Easements that are required to be designed and built to Public Road Standards shall be prepared and stamped by a professional engineer competent in civil and site design and licensed to practice in the state of Tennessee.
- (e) The stormwater management plan shall be subject to any additional requirements set forth in the minimum subdivision regulations, zoning ordinance, or other Knox County regulations.
- (f) When existing or documented flooding problems are present, the Director has authority to condition the approval of a grading or building permit upon the compliance with additional requirements, including but not limited to detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

4.2.2 Conformity to Plans

- (a) The approved stormwater management plan, upon which subsequent permits may be issued by Knox County, shall be adhered to during grading and construction activities. Under no circumstance is the owner or operator allowed to deviate from the approved stormwater management plan without prior approval of a plan amendment by the Director. Amendments to the approved plan must comply with this ordinance.
- (b) The Director shall require that an approved stormwater management plan be amended if it is determined that the approved plan is inadequate.

4.2.3 Additional Requirements for Grading Permits

- (a) The owner or operator of land development activities not exempted by section 4.1 of this ordinance must obtain a grading permit prior to commencing land disturbing activities.
- (b) Land disturbing activities performed in accordance with the approved plan shall commence within one year from the issue date of the grading permit, or the grading permit will become null and void and the plan must be resubmitted for approval.
- (c) The grading permit application shall contain an erosion prevention and sediment control plan, prepared as required by this ordinance and the Knox County Stormwater Management Manual, as amended. The plan can be included with the overall stormwater management plan or can be a stand-alone plan.
- (d) The owner or operator must obtain from TDEC a Notice of Coverage (NOC) under the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities, or certification that the land development activity does not require coverage under the State permit, prior to obtaining a grading permit. A copy of the NOC and the associated Stormwater Pollution Prevention Plan (SWPPP), or certification that the site does not require coverage under the State permit must be submitted with the erosion prevention and sediment control plan.
- (e) The erosion prevention and sediment control plan shall include a listing of any legally protected state or federally listed threatened or endangered species and/or critical habitat (if applicable) located in the area of land disturbing activities, and a description of the measures that will be used to protect them during grading.

- (f) The Director may request additional information as deemed necessary to protect streams and adjacent properties from erosion and off-site sedimentation.

4.2.4 Pre-Construction Meeting

- (a) Attendance at a pre-construction meeting with the Knox County Department of Engineering and Public Works prior to issuance of a grading permit is required for owners and operators of developments or redevelopments that are:
 - (1) new subdivisions or condominium developments; or
 - (2) non-residential land developments that require coverage under the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities; or
 - (3) a priority construction activity, as defined in this ordinance.
- (b) Owners and operators of land development activities not listed in section 4.2.4(a) may be required to attend a pre-construction meeting when coordination with adjacent construction activities is needed or when conditions indicate a higher than normal risk for pollutant discharges.

4.3 Building Permit Requirements for Small Lots

- (a) Prior to issuance of a building permit, the owner or operator of small lots that will disturb less than one acre shall prepare and adhere to a small lot erosion prevention and sediment control plan that identifies the erosion prevention and sediment control measures to be employed on the site. Permanent stormwater conveyance measures are not required on this plan.
- (b) The small lot erosion prevention and sediment control plans shall be prepared in accordance with the requirements stated in the Knox County Stormwater Management Manual, as amended.
- (c) The Director has the discretion to require a full stormwater management plan as set forth in section 4 of this ordinance as deemed necessary to protect streams and adjacent properties from erosion and off-site sedimentation.
- (d) Any construction related wastes, such as vehicle wash pads, construction waste materials and concrete truck washout areas, which are located on small lots shall be handled in a manner to preclude contact with stormwater and other water resources.

4.4 Performance Bonds

- (a) Prior to issuance of a grading permit, a performance bond which guarantees satisfactory completion of land disturbing activities shall be provided for construction and/or grading activities related to erosion prevention and sediment control and water quality buffers.
- (b) Prior to plat approval, a performance bond which guarantees satisfactory completion of new development or redevelopment projects shall be provided for construction work related to site roadways and the stormwater management system.
- (c) Performance bonds shall name Knox County as beneficiary and shall be guaranteed in the form of a surety bond, cashier's check, or letter of credit from an approved financial institution or insurance carrier. The surety bond, cashier's check, or letter of credit shall be provided in a form and in an amount to be determined by the Knox County Department of Engineering and Public Works. The actual amount shall be based on submission of plans and estimated construction, installation or potential maintenance and/or remediation expenses.
- (d) The Director may refuse brokers or financial institutions the right to provide a surety bond, letter of credit, or cashier's check based on past performance, ratings of the financial institution, or other appropriate sources of reference information.
- (e) A performance bond is not required for small lots, as defined by this ordinance, except when deemed necessary by the Director based on site conditions and the adverse impact on downstream conditions or other properties.

4.5 Stormwater System Criteria

4.5.1 General

- (a) The provisions set forth in this section are applicable to all developments and redevelopments not exempted from submittal of a stormwater management plan, as defined in section 4.1.
- (b) The provisions set forth in this section are not applicable to developments that have an approved stormwater management plan prior to the date of adoption of this ordinance.

- (c) Where such criteria exist, all stormwater facilities and systems, including those designed and constructed for water quality treatment, channel protection, overbank flood protection, and extreme flood protection, shall be designed and constructed in accordance with the criteria, standards, and specifications presented in this ordinance and in the Knox County Stormwater Management Manual, as amended.
- (d) The portions of the new development or redevelopment on which stormwater management facilities and systems are located shall be shown on the plat and recorded with the deed as permanent drainage or water quality easements.
- (e) Banks of all streams, channels, ditches and other earthen stormwater conveyances shall be left in a stabilized condition upon completion of the project. No actively eroding, bare or unstable vertical banks shall remain. Placement of riprap and other hard armor as the sole bank protection method on blue line streams is only allowed when vegetative bank stabilization alternatives are not technologically feasible.
- (f) The Director has the authority to require additional water quantity standards, including restrictions on peak velocity and/or runoff volumes or less frequent design events, in areas where the Director has determined, through stormwater master plans, engineering studies, and/or other regulatory water quality requirements, a history of existing or documented flooding or erosion problems, or engineering judgment, that additional restrictions are needed to limit adverse impacts of the proposed development downstream or upstream of the site.
- (g) All hydrologic and hydraulic computations utilized in the design of stormwater treatment and control facilities must be performed using the calculation methods presented in the Knox County Stormwater Management Manual, as amended, unless equivalent methods are pre-approved by the Director.
- (h) All hydrologic and hydraulic computations utilized in the design of stormwater facilities must be prepared by a registered engineer proficient in the field of hydrology and hydraulics and licensed to practice engineering in the State of Tennessee.
 - (i) The Director may waive or modify any of the stormwater system criteria provided in this section if adequate water quality treatment, and/or channel protection, and/or overbank flood protection, and/or extreme flood protection is suitably provided by a downstream or shared off-site stormwater facility.

4.5.2 Water Quality Treatment

- (a) Stormwater runoff from the development or redevelopment site must be treated to remove pollutants prior to discharge from the development or redevelopment site in accordance with the stormwater treatment standards and criteria provided in the Knox County Stormwater Management Manual, as amended.
- (b) Stormwater quality treatment must be achieved through the use of one or more structural and/or non-structural best management practices, that are designed and constructed in accordance with the design criteria, guidance, and specifications provided in the Knox County Stormwater Management Manual, as amended.
- (c) Best management practices or technologies that are not included in the Knox County Stormwater Management Manual, as amended, may be approved for the treatment of stormwater quality on a case-by-case basis provided that the following conditions are met:

- (1) The best management practice or technology, as applied to the site, meets the water quality goals published in the Knox County Stormwater Management Manual, as amended. The performance ability of the best management practice must be verified by an independent third party.
 - (2) BMPs that have unacceptably high maintenance requirements may not be installed within public rights-of way or on public property. Such judgments shall be made by the Director after review of applicable information submitted by the designer.
- (d) Additional watershed or site-specific stormwater quality requirements may be required by the Director, in order to satisfy local or State NPDES, TMDL or other regulatory water quality requirements.

4.5.3 Downstream Channel Protection

- (a) The channel protection volume (the runoff volume from the 1-year frequency, 24-hour storm) shall be captured and discharged over no less than a 24-hour period using acceptable hydrologic methods.
- (b) Downstream channel protection can be provided by an alternative approach in lieu of controlling the channel protection volume subject to prior approval by the Director. Sufficient hydrologic and hydraulic analysis that shows that the alternative approach will offer adequate channel protection from erosion must be presented.

4.5.4 Overbank and Extreme Flood Protection

- (a) Overbank flood protection shall be provided such that the calculated peak discharge of stormwater runoff resulting from the 2-year, 10-year, and 25-year return frequency, 24-hour duration storm events shall be no greater after development or redevelopment of the site than that which would result from the same 2-year, 10-year, and 25-year return frequency, 24-hour duration storms on the same site prior to development or redevelopment.
- (b) Extreme flood protection shall be provided such that the calculated peak discharge of stormwater runoff resulting from a 100-year frequency, 24-hour duration storm shall be no greater after development or redevelopment of the site than that which would result from a 100-year frequency, 24-hour duration storm on the same site prior to development or redevelopment.
- (c) A downstream hydrologic analysis shall be performed to determine if the proposed development or redevelopment causes an increase in peak discharge as compared to pre-development runoff rates for the same site, or has the potential to cause downstream channel and streambank erosion. This analysis must be done for the 2-year, 10-year, 25-year and the 100-year return frequency, 24-hour duration storm events, at the outfall(s) of the site, and at each downstream tributary junction and each public or major private downstream stormwater conveyance structure to the point(s) in the stormwater system where the area of the portion of the site draining into the system is less than or equal to 10% of the total drainage area above that point.
- (d) If peak discharge increases are identified in the 10% downstream analysis area, as defined in 4.5.4(c), downstream flood protection shall be provided such that calculated peak discharges for the 2-year, 10-year, 25-year and 100-year return frequency, 24-hour duration storm events after development or redevelopment are no greater after development or

redevelopment of the site than that which would result from the same duration storms in the same downstream analysis area prior to development or redevelopment. These criteria must be applied throughout the 10% downstream analysis area.

- (e) Downstream flood protection can be provided by downstream conveyance improvements and/or purchase of flow easements in lieu of peak discharge controls subject to prior approval by the Director and satisfaction of the following requirements:
 - (1) Sufficient hydrologic and hydraulic analysis must be presented that shows that the alternative approach will offer adequate protection from downstream flooding for all potentially affected downstream property owners.
 - (2) The applicant is responsible for submittal and approval of any necessary CLOMR prior to construction, and a LOMR upon completion of construction.
 - (3) The applicant is responsible for all State and Federal permits that may be applicable to the site including TDEC NPDES and ARAP permits, US Army Corps of Engineers section 404 permits, and TVA section 26A permits.
- (f) Developments and redevelopments that do not cause an increase in peak discharges are not exempt from conformance with water quality treatment and downstream channel protection requirements stated in sections 4.5.2 and 4.5.3, respectively.

4.5.5 Pipes, Channels, and Other Stormwater Components

- (a) The design of the stormwater system, excluding stormwater facilities for water treatment, channel protection, and overbank, extreme and downstream flood protection shall be based on the 25 year frequency storm. This criterion shall be applied to both closed conduit and open channel components. Minor systems that discharge to sinkholes must be designed to safely carry the 100-year frequency storm event.
- (b) All drainage systems shall be designed to insure that no habitable finished floor elevations are flooded for the 500-year frequency storm, and that no structures are located within the vertical projection of the 10-year floodplain line (i.e., located within the 10-year floodplain).
- (c) Pipe material specifications are as follows:
 - 1. Reinforced concrete pipe is required for pass through drainage.
 - 2. Reinforced concrete pipe is required for locations within stormwater detention or retention ponds and their outlet structures.
 - 3. Reinforced concrete pipe is required for location in public rights of way for all streets classified as "minor collectors" and above. For other pipe installations within public rights of way (ie, local, residential streets), reinforced concrete, dual wall high density polyethylene, or aluminized corrugated metal pipe may be used. Other metal pipe materials, including corrugated metal, are not permitted. At no less than thirty (30) days after the time of installation, visual inspection and deflection testing will be performed on all pipes and certified in accordance with TDOT Standard Specifications for Road and Bridge Construction including Supplemental

Specifications - Section 607.09 of the Standard Specifications for Road and Bridge Construction dated March 1, 2006 , to ensure structural integrity. All pipes with deflections greater than 5 percent of the nominal pipe diameter, undue misalignment, or poor joint construction shall be replaced by the contractor at his expense.

- (d) It shall be the responsibility of the property owner to provide all necessary design, date, and installation details for construction to ensure failure of cross drains, pipes, culvers or drainage systems will not occur, and prevent flooding or potential property damage on adjacent properties or right-of-ways.
- (e) Final pipe design specification must be indicated in the Stormwater Management Plan and approved by the Director.

4.6 Special Pollution Abatement Permits

- (a) A Special Pollution Abatement Permit shall be required for the following land uses, which are considered pollutant hotspots:
 - (1) Vehicle, truck or equipment maintenance, fueling, washing or storage areas including but not limited to: automotive dealerships, automotive repair shops, and car wash facilities;
 - (2) Parking lots over 400 spaces or parking areas greater than 120,000 square feet;
 - (3) Recycling and/or salvage yard facilities;
 - (4) Restaurants, grocery stores, and other food service facilities;
 - (5) Commercial facilities with outside animal housing areas including animal shelters, fish hatcheries, kennels, livestock stables, veterinary clinics, or zoos;
 - (6) Other producers of pollutants identified by the Director by information provided to or collected by him/her or his/her representatives, or reasonably deduced or estimated by him/her or his/her representatives from engineering or scientific study.
- (b) The Director has the authority to require a Special Pollution Abatement Permit for land uses or activities that are not identified by this ordinance as hotspot land uses, but are deemed by the Director to have the potential to generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in storm water.
- (c) Technical requirements for the permit shall be based on the provisions and guidelines set forth in the Knox County Stormwater Management Manual, as amended.
- (d) Best management practices specified in the Special Pollution Abatement Permit must be appropriate for the pollutants targeted at the site and approved by the Director for use in Knox County, as set forth in section 4.5.2(b) and 4.5.2(c).
- (e) A Special Pollution Abatement Permit will be valid for a period of five (5) years, at which point it must be renewed. At the time of renewal, any deficiency in the management method must be corrected.

4.7 NPDES Permits

Persons or entities who hold NPDES general, individual and/or multi-sector permits shall provide either a copy of such permit or the permit number assigned to them by the Tennessee

Department of Environment and Conservation to the Director no later than sixty (60) calendar days after issuance of the permit.

SECTION 5. FLOODPLAIN REQUIREMENTS

5.1 General Requirements

- (a) Uses permitted within the flood fringe shall be in accordance with Article 3.70 Flood Fringe Requirements of the Knox County Zoning Ordinance. Uses permitted within the floodway shall be in accordance with Article 5.70 Floodway Zone of the Knox County Zoning Ordinance. The regulations and controls set forth in this section shall be applied to all areas within the 500-year floodplain as designated on the adopted FEMA Flood Insurance Rate Maps (FIRM) in the jurisdiction of Knox County.
- (b) No structure or land shall hereafter be located, extended, converted, or structurally altered without full compliance with the terms of this section and other applicable regulations including the Knox County Zoning Ordinance.
- (c) This section is not intended to repeal, abrogate, or impair any existing easements, covenants, deed restrictions, or existing ordinances and regulations. However, where the provisions of this section and another regulation conflict or overlap, that provision which is more restrictive or imposes higher standards or requirements shall prevail. It is required that the Director be advised of any such regulatory conflicts upon submittal of the Stormwater Management Plan.

5.2 Administration

The Director is responsible for administering and implementing the provisions in this section. The Director shall maintain a copy of the latest Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM) and make these documents available for inspection.

5.3 Floodplain Development Requirements

5.3.1 General Requirements

- (a) A Floodplain Development Permit is required for any development or alteration to the natural drainage system within the 500-year floodplain in Knox County. The Director shall approve said permit based on the requirements herein and the required engineering calculations stipulated by the Director. All activities that take place within the 500-year floodplain must conform to the regulations set forth in the Knox County Flood Damage Prevention Ordinance.
- (b) Persons responsible for property developments that are determined to be in the 500-year floodplain of Knox County shall prepare and submit a Floodplain Development Permit application. A Stormwater Management Plan, as provided for in section 4 of this ordinance, may also be required. As-built elevations of all structures in the floodplain shall be certified on a FEMA elevation certificate. A registered land surveyor or professional engineer in the State of Tennessee shall certify the as-built elevations of all structures in the floodplain.
- (c) The applicant is responsible for all state and Federal permits that may be applicable to the site including State permits for the NPDES and ARAP, US Army Corps of Engineers section 404 permits, and TVA section 26A permits. Proof of permit coverage (if applicable) is a requirement for permit coverage by Knox County.

5.3.2 Flood Fringe Fill Requirements

- (a) Construction fill that alters the conveyance and storage capacity of the natural floodplain is prohibited in the flood fringe one-half the linear distance between the floodway line and the 100-year floodplain line.
- (b) The Director will authorize individual exceptions to section 5.3.2(a) only where:
- (c) a drainage study prepared by a registered professional engineer in the State of Tennessee shows a rise of less than 0.1 feet in flood elevations as a result of the fill within 0.5 miles (upstream and downstream) of the proposed development; or,
- (d) a grading plan prepared for the site shows that alteration in the storage capacity of the natural floodplain is mitigated by removal of an equal, or greater, volume of soil elsewhere in the floodplain located on the site. If this option is used, a drainage study by a registered professional engineer in the State of Tennessee is required to determine if the cut and fill activities will cause a rise in flood elevations greater than 0.1 feet within 0.5 miles (upstream and downstream) of the proposed development.
- (e) The Director has the authority to require which option shall be utilized to obtain a waiver of flood fringe fill requirements.

5.3.3 Structure Requirements

Any new or substantially improved structure proposed to be constructed in the floodplain shall meet the following special conditions:

- (a) The flood protection elevation shall be established as the existing 500-year flood elevation or the future 100-year flood elevation (if available) whichever is higher.
- (b) The minimum finished floor elevation (FFE) intended for human occupancy shall be equal to or higher than one (1) foot above the flood protection elevation. Those portions of such structures not intended for human occupancy shall be either equal to or higher than the flood protection elevation. All other related facilities thereto such as electrical equipment, water service and sanitary sewer connections shall be either equal to or higher than the flood protection elevation or shall be flood proofed to the flood protection elevation.
- (c) The Director will authorize individual exceptions to section 5.3.3(b) only where it can be shown that flood proofing is acceptable from an engineering standpoint.

5.3.4 Post Construction Requirements

The applicant must provide as-built certification for all new or substantially improved structures constructed in the 500-year floodplain. As-built certification will include, at a minimum, the lowest finished floor elevation, the lowest adjacent grade elevation, and the elevation of any electrical equipment. The Director may request more as-built information as needed. The applicant must also provide finished floor elevation certificates for all habitable structures constructed in the floodplain. A registered land surveyor or professional engineer in the State of Tennessee must certify these elevation certificates.

5.4 Flood Proofing Measures.

5.4.1 General Flood Proofing Requirements

Flood proofing measures such as the following shall be designed consistent with the 500-year flood elevation for the particular area, and flood velocities, forces and other factors associated with the 500-year flood elevation. The Director shall require that the applicant submit a plan or document certified by a registered professional engineer or architect in the State of Tennessee that the flood proofing measures are consistent with the flood protection elevation for the particular area. Flood proofing measures include:

- (1) Anchorage to resist flotation and lateral movement.
- (2) Installation of watertight doors, bulkheads and shutters.
- (3) Reinforcement of walls to resist water pressures.
- (4) Use of paints, membranes or mortars to reduce seepage of water through walls.
- (5) Addition of mass or weight to structures to resist flotation.
- (6) Installation of pumps to lower water levels in structures.
- (7) Construction of water supply and waste treatment systems to prevent the entrance of floodwaters.
- (8) Pumping facilities for subsurface drainage systems for buildings to relieve external foundation wall and basement floor pressures.
- (9) Construction to resist rupture or collapse, caused by water pressure or flotation debris.
- (10) Cutoff valves on sewer lines or the elimination of gravity flow basement drains.

5.4.2 Residential Flood Proofing

Flood proofing of new residential structures in Knox County shall be prohibited.

5.5 Developments Within Floodways

Encroachments within the floodways (floodway encroachments) shall be prohibited except where it can be shown by a registered professional engineer in the State of Tennessee that the proposed development will have “no rise” on the existing base flood elevations and floodway elevations. Floodway boundaries can be modified, with approval of the Director, through the Letter of Map Revision (LOMR) process outlined in 44 CFR Part 65.

5.6 Developments in SFHAs Without Base Flood Elevations

5.6.1 Areas Requiring Flood Studies

Persons responsible for property developments that are determined to be in the SFHAs of Knox County, but where no base flood data has been provided or where no floodways have been provided (unnumbered A zones), must prepare and submit a floodplain development permit as outlined in section 5.3. If the project is greater than 40 lots or 10 acres, the applicant shall provide base flood elevation and floodway data in accordance with FEMA Contractor Standards.

5.6.2 Floodway Data Not Available

If floodway data are not prepared, no encroachments, including fill material or structures shall be located within a distance of the stream-bank equal to five times the width of the stream at the top of bank or twenty feet on each side from top of bank, whichever is greater, unless certification by a registered professional engineer in the State of Tennessee is provided demonstrating that such encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

5.6.3 Base Flood Elevations Not Available

If base flood elevations are not prepared, the Director shall provide guidance on minimum FFE requirements.

5.7 Developments in Unstudied Areas

Persons responsible for property developments greater than the lesser of 40 lots or 10 acres that are outside the SFHA, but adjacent to stream channels that have a contributing drainage area of one square mile or greater, shall provide base flood elevation and floodway data according to FEMA Contractor Standards. For areas with a drainage area less than 1 square mile or smaller developments, the provisions in section 5.6.2 and 5.6.3 shall apply.

5.8 Requirements for Developments that Drain to Sinkholes

- (a) Copies of the appropriate permits from TDEC shall be required prior to approval of a stormwater management plan for developments and redevelopments on property that includes a sinkhole. After review of these permits, the Director may require additional information related to structural integrity and flood protection. If the proposed development does not require TDEC approval, a letter from TDEC stating that a TDEC permit is not required shall be submitted prior to the approval of a stormwater management plan.
- (b) For site development or redevelopment projects that must satisfy the flood protection criteria provisions in section 4.5.4 that have sinkholes located entirely within the development boundaries, calculations shall be provided showing that 100-year frequency, 24-hour design storm will not flood any structures assuming plugged conditions (0 cfs outflow) for the sinkhole. If the contributing watershed is less than 50 acres and there is documented evidence that resurgence is not a contributing factor to flood elevations, calculations shall be provided showing that there will not be a rise in the sinkhole floodplain elevation or a decrease in the sinkhole floodplain storage volume between the pre-and post-developed conditions for the 100-year frequency, 4-day duration storm (7.8 inches, over a 4 day period), assuming plugged conditions (0 cfs outflow) for the sinkhole. These calculations must include the entire contributing watershed for the sinkhole. An easement is required around the sinkhole to include an area that is a minimum of five (5) feet horizontally outside the highest closed contour.
- (c) For site development or redevelopment projects that must satisfy the flood protection criteria provisions in section 4.5.4 that have sinkholes located partially on site, calculations shall be provided showing that there will not be a rise in the sinkhole floodplain elevation or a decrease in the sinkhole floodplain storage volume between the pre- and post-developed conditions for the 100-year frequency, 24-hour duration storm, assuming plugged conditions (0 cfs outflow) for the sinkhole. If the contributing watershed is less than 50 acres and there is documented evidence that resurgence is not a contributing factor to flood elevations, calculations shall be provided showing that there will not be a rise in the sinkhole floodplain elevation or a decrease in the sinkhole floodplain storage volume between the pre-and post-developed conditions for the 100-year frequency, 4-day duration storm (7.8 inches, over a 4 day period), assuming plugged conditions (0 cfs outflow) for the sinkhole. These calculations must include the entire contributing watershed for the sinkhole. An easement is required at a minimum of five (5) feet horizontally outside the highest closed contour on the section of the sinkhole located on the developed property. A rise in the 100-year water surface elevation is allowable when no structures will be flooded and all parties with ownership of the sinkhole agree in writing to allow the rise. In this case, an easement is required around the sinkhole to include an area that is a minimum of five (5) feet horizontally outside the highest closed contour.
- (d) Retention of stormwater runoff or satisfaction of the provisions stated in section 5.8.1(c) is required for developments and redevelopments that require approval of a stormwater management plan and are located in one of the following watersheds:
 - (1) Ten Mile Creek;
 - (2) Sinking Creek;
 - (3) Harrell Hills watershed (near Cranberry Dr., Clairmont Dr., and Gaines Rd.);
 - (4) The Dead Horse Lake/Dutchtown Road sinkhole area;

- (5) Any watershed area which will drain exclusively to a sinkhole;
- (6) Any area of known flooding where deemed necessary by the Director.
- (e) Retention facilities shall be designed so that the overflow in the 1-year, 2-year, 5-year, 10-year, 25-year and 100-year design storms meet the pre-developed discharges in addition to retaining the difference in the pre-developed and post-developed 100-year design storm. In basins or sub-basins where there is a documented historical draw down time for the sinkhole or region being drained to, it may be acceptable for a detention pond to be used instead of retention. For detention to be approvable, the draw down time of the detention pond shall be a minimum of one and a half times the draw down time for the region.
- (f) The Director has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to measures to avoid and/or protect the sinkhole throat, detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

5.9 Degree of Flood Protection

The degree of flood protection intended to be provided by this ordinance is considered reasonable for regulatory purposes, and is based on engineering and scientific methods of study. Larger floods may occur on occasions, or the flood height may be increased by man-made or natural causes, such as bridge openings restricted by debris. This ordinance does not imply that areas outside the 500-year floodplain or land uses permitted within such areas will always be totally free from flooding or flood damages. Nor shall this ordinance create a liability on the part of, or a cause of action against Knox County or any officer or employee thereof for any flood damages that may result from implementation of this ordinance.

SECTION 6. WATER QUALITY BUFFERS

6.1 General Requirements

- (a) Water quality buffers shall be established, protected and maintained along all community waters, as set forth herein and in the Knox County Stormwater Management Manual, as amended, in all new developments and redevelopments requiring a stormwater management plan and/or recording of a plat.
- (b) Developments that have received approval of a stormwater management plan, or developments for which a stormwater management plan was not required prior to the effective date of this ordinance shall be exempted from the requirements of this section.
- (c) Water quality buffer areas shall be included in the Operations and Maintenance Plan for the development, and therefore shall be covered by Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices. These documents shall be prepared in accordance with section 10 of this ordinance and the Knox County Stormwater Management Manual, as amended.
- (d) All areas of the water quality buffer, including streambanks, shall be left in a stabilized condition upon completion of construction activities. No actively eroding, bare or unstable areas shall remain, unless approved by the Director.
- (e) The Director may require permanent boundary markers, in the form of signage approved or provided by the Director. Such markers shall be installed prior to recording of the final plat,

and the issuance of a Certificate of Occupancy. The Director has the authority to require replacement of permanent boundary markers that have been removed or destroyed.

- (f) Water quality buffers shall be placed into a permanent water quality easement that is recorded with the deed. For water quality buffer areas that are not publicly owned, the easement shall be held by one of the following non-governmental entities, provided that the entity meets the minimum criteria stated in the Knox County Stormwater Management Manual, as amended:
 - (1) A viable third party such as a land trust, land management company, or utility;
 - (2) A viable homeowners association.
- (g) If neither of the entities identified in section 6.1(f) are able to provide perpetual protection of the water quality buffer, then the property owner shall assume responsibility for maintenance and protection of the buffer area.

6.2 Protection During Construction

- (a) Unless otherwise provided herein, all water quality buffer areas shall remain protected from land disturbance, vegetation removal, construction of impervious surfaces, and discharges of sediment and other construction-related wastes during development activities.
- (b) Water quality buffers shall be clearly identified on all construction drawings, and marked with the statement “Water Quality Buffer. Do not disturb.”
- (c) Water quality buffers cannot be encroached upon or disturbed during project construction, unless they are being established, restored, or enhanced in accordance with an approved Buffer Enhancement Plan.

6.3 Design Criteria

Water quality buffers shall be applied to community waters as stated in this section.

6.3.1 Streams

Water quality buffers shall be applied in the following manner to streams that are identified as community waters:

- (a) A water quality buffer having a minimum width of fifty (50) feet shall be provided along each side of a stream, as measured perpendicular from the top-of-bank of the active channel. For those streams that do not have a defined top-of-bank, the buffer shall be measured perpendicular from the centerline of the stream.
 - (1) The inner zone of the water quality buffer shall have a minimum width of 25-feet, measured perpendicular from the top-of-bank of the active channel and extending landward. For those streams that do not have a defined top-of-bank, the buffer shall be measured perpendicular from the centerline of the stream.
 - (2) The inner zone shall remain undisturbed in accordance with the policies set forth in the Knox County Stormwater Management Manual, as amended.
 - (3) The vegetative target for the inner zone is mature, moderately dense forest (i.e., trees) with woody shrubs and understory vegetation. Where forest vegetation has the potential to impact traffic safety or limit access, areas immediately surrounding approved stream

crossings and utility access areas that are located in the inner zone may be vegetated with dense grasses.

- (4) The outer zone of the water quality buffer shall be measured from the edge of the inner zone and shall extend the perpendicular distance required to obtain a total minimum buffer width of 50-feet, when combined with the width in the inner zone.
 - (5) The minimum vegetative target for the outer zone is mowed, dense grasses that cover the entire zone.
 - (6) The outer zone can be disturbed and graded, but must be revegetated in accordance with the policies set forth in the Knox County Stormwater Management Manual, as amended.
- (b) The width of water quality buffers located on streams may be modified by averaging as set forth herein, and in accordance with policies stated in the Knox County Stormwater Management Manual, as amended, provided that the following conditions are met:
- (1) The average width of the averaged buffer within the boundaries of the property to be developed must be at least fifty (50) feet; and,
 - (2) The width of the buffer shall not be less than twenty-five (25) feet at any location, except where stream crossings have been approved by the Director.
 - (3) Those areas of the buffer having a minimum width of twenty-five (25) feet (or less at approved stream crossings) can comprise no more than fifty (50) percent of the buffer length.
- (c) Buffer averaging is required for water quality buffers that have stream crossings.
- (d) Buffer width averaging is prohibited for any portion of developments that have (or will have) the land uses listed below.
- (1) Slope protection areas, as identified by the Metropolitan Planning Commission, and areas that have slopes greater than 15%, that are located within 50 feet of the stream to be buffered
 - (2) Developments or facilities that include on-site sewage disposal and treatment system drainfields (i.e., septic systems), raised septic systems, subsurface discharges from a wastewater treatment plant, or land application of biosolids or animal waste;
 - (3) Landfills (demolition landfills, permitted landfills, close-in-place landfills);
 - (4) Junkyards;
 - (5) Commercial or industrial facilities that store and/or service motor vehicles;
 - (6) Commercial greenhouses or landscape supply facilities;
 - (7) Developments or facilities that have commercial or public pools;
 - (8) Agricultural facilities, farms, feedlots, and confined animal feed operations; and,
 - (9) Animal care facilities, kennels, and commercial/business developments or facilities that provide short-term or long-term care of animals;
 - (10) Other land uses deemed by the Director to have the potential to generate higher than normal pollutant loadings.

6.3.2 Ponds and Lakes

- (a) Water quality buffers shall be applied in the following manner to ponds and lakes that are identified as community waters:

- (1) For ponds and lakes that are directly connected to other community waters, a minimum buffer of 25-feet shall be provided around the perimeter of ponds and lakes. The buffer shall be measured perpendicular from the topographic contour that defines the normal pool elevation.
 - (2) The minimum vegetative target for the pond or lake buffer is mowed, dense grasses that cover the entire zone.
 - (3) The pond or lake buffer can be disturbed and graded but must be revegetated in accordance with the policies set forth in the Knox County Stormwater Management Manual, as amended.
- (b) Water quality buffers shall not be required around the perimeter of hydraulically disconnected ponds, or ponds that are newly designed and constructed for the purposes of stormwater quality treatment.

6.3.3 Wetlands

- (a) Water quality buffers shall be applied in the following manner to wetlands that are identified as community waters:
- (1) A minimum buffer width of 25-feet shall be provided around the perimeter of a wetland, as measured from the outermost edge of the wetland as determined by USACE, NRCS, TDEC, or other qualified professional.
 - (2) The vegetative target for the wetland buffer is undisturbed, mature, moderately dense forest (i.e., trees) with woody shrubs and understory vegetation.
 - (3) The wetland buffer shall remain undisturbed in accordance with the policies set forth in the Knox County Stormwater Management Manual, as amended.
- (b) Water quality buffers are not required for wetlands designed and constructed for the purposes of stormwater quality treatment.

6.3.4 Steep Slopes

Where slopes greater than 15%, or where Slope Protection Areas as identified by the Metropolitan Planning Commission, are located within 50 feet of the community water, one of the two following conditions shall apply:

- (1) the buffer width in the steep slope areas shall be adjusted to include an additional twenty-five (25) feet, giving a total buffer width of seventy-five (75) feet; or,
- (2) the buffer in steep slope areas shall have a minimum width of fifty (50) feet and shall consist of one-zone, comprised of undisturbed, forested vegetation, as described in section 6.3.1(a)(3).

6.4 Use of Buffer Areas

- (a) The following uses are permitted in the inner zone of stream buffers and the wetland buffer:
- (1) Conservation uses, wildlife sanctuaries, nature preserves, forest preserves, fishing areas, and passive areas of parklands, provided that no impervious surfaces are created;
 - (2) Recreational trails and greenways that are either unpaved or paved with pervious materials;

- (3) Education/scientific research that does not require any of the prohibited activities identified in section 6.4(d);
 - (4) Stream restoration projects, facilities and activities, with prior approval of the Director;
 - (5) Infrastructure features such as roads, bridges, storm drainage, stormwater management facilities that are appropriate for use in a riparian zone (i.e., wetlands, buffers), and utilities, provided that they adhere to the following standards:
 - i. The width of the disturbance for the feature is the minimum required to allow for maintenance and access;
 - ii. The angle of the buffer crossing shall be perpendicular (with up to 15% deviation off perpendicular) to the stream in order to minimize clearing requirements; and,
 - iii. The number of buffer crossings is minimized, with no more than one crossing every one-thousand (1,000) linear feet. The Director has the authority to approve additional crossings if justified by traffic, safety, or access issues.
 - iv. Multiple driveway or private roadway crossings of a stream or a wetland within one development shall be prohibited, unless approved by the Director after the property owner has demonstrated that the development has been planned in such a manner that driveway and private roadway crossings have been minimized to the maximum extent possible.
- (b) Access areas for utilities (e.g., manholes) that are located in the buffer area are allowed in buffer areas. Access areas must be minimized to the maximum extent possible, and shall be located no less than every 300 feet unless warranted by valid safety, access or service issues.
- (c) The following uses are permitted in the outer zone of stream buffers and in buffers surrounding lakes and ponds:
- (1) All activities that are allowable in the inner zone of stream buffers.
 - (2) Yards, trails, greenways, picnic areas, and passive recreation areas as long as they do not have impervious surfaces. Passive recreation areas are defined as recreational activities that do not require hardened, impervious surfaces to be constructed, such as soccer fields without parking and other facilities, walking trails that are either unpaved or paved with permeable materials; bird watching; or hiking. Passive recreation areas do not include golf courses, ball fields that require the construction of impervious surfaces or the maintenance of open soil areas (such as baseball infields), picnic shelters or parking.
- (d) The following activities are prohibited within water quality buffers without prior approval of such activities by the Director:
- (1) Spraying, filling, dumping, and animal grazing;
 - (2) Use, storage, or application of pesticides, herbicides, fertilizers, or household or commercially-generated wastes;
 - (3) Concentrated animal lots or kennels;
 - (4) Use or storage of motorized vehicles, except for maintenance approved by the Director, or emergency use;
 - (5) Creation of impervious surfaces, except for those impervious surfaces that are included in approved stream crossings;
 - (6) Other uses as deemed by the Director to have the potential to generate higher than normal pollutant loadings.

6.5 Allowable Disturbances

- (a) The following disturbances are permitted in the inner zone of stream buffers and the wetland buffer:
 - (1) Limited disturbances to remove and/or plant trees or vegetation, as required to maintain the overall health of vegetation in the buffer area, performed in accordance with the requirements stated in the Knox County Stormwater Management Manual, as amended.
 - (2) Removal of individual trees that are in danger of falling, causing damage to dwellings or other structures, are dead or diseased, or have been heavily damaged by storms. The root wad or stump should be left in place, where feasible, to maintain soil stability.
 - (3) Disturbances necessary for the construction of utility access areas and approved stream crossings.
 - (4) Disturbances as required to establish and/or restore buffer areas in accordance with an approved Buffer Enhancement Plan.
- (b) The following disturbances are allowed in the outer zone of stream buffers and in buffers surrounding lakes and ponds:
 - (1) Clearing, grubbing, grading, and revegetation, performed in accordance with an approved stormwater management plan.
 - (2) Disturbances necessary for the construction of utility access areas and approved stream crossings.
 - (3) Ongoing vegetation maintenance activities such as mowing, bush-hogging, and weed-eating. No chemical applications are allowed in the outer zone.

6.6 Water Quality Buffer Enhancement

- (a) The property owner may restore or enhance vegetation within a water quality buffer with prior approval of a Buffer Enhancement Plan by the Director.
- (b) The Director shall have the authority to require a property owner to restore or enhance water quality buffers that have been disturbed or do not meet, or have the potential to meet through natural vegetative succession, the vegetative targets for buffer areas that are defined herein, and/or in the Knox County Stormwater Management Manual, as amended.
- (c) The required elements of a Buffer Enhancement Plan shall be provided in the Knox County Stormwater Management Manual, as amended.
- (d) One (1) year after completion of the restoration or enhancement activity, the portion of the drainage bond related to the buffer enhancement area can be released provided that the enhancement area has been restored or enhanced as required, that soils within the buffer area are stable and not eroding, and that buffer vegetation is healthy and growing as expected.

SECTION 7. EROSION PREVENTION AND SEDIMENT CONTROL

7.1 Off-Site Sedimentation Prevention

Adequate erosion prevention and sediment control measures shall be employed for all land disturbing activities in conformance with the provisions of this ordinance and guidance materials referenced herein to minimize erosion and prevent off-site sedimentation. Land disturbing or construction activities that do not employ erosion prevention and sediment controls in

conformance with this ordinance and that cause off-site sedimentation or sediment discharges to Waters of the State or onto adjacent properties shall be in violation of this ordinance.

7.2 General Requirements

- (a) Construction site operators shall implement appropriate erosion prevention and sediment control best management practices.
- (b) The design, installation, maintenance and inspection of erosion prevention and sediment control design standards and best management practices shall be performed in accordance with the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities, the TDEC Erosion & Sediment Control Handbook, and the Knox County Stormwater Management Manual, as amended. Where the provisions of this section, the Knox County Stormwater Management Manual, as amended, or another regulation conflict or overlap, that regulation which is more restrictive or imposes higher standards or requirements shall prevail.
- (c) Additional requirements for discharges into impaired or high quality waters that are defined in the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities shall be implemented for all priority construction activities located in Knox County, as defined by this ordinance.
- (d) The Director may require more stringent standards or best management practices than those required by the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities for priority construction activities or where deemed necessary.
- (e) Discharges from sediment basins and traps must be through a pipe or a conveyance lined with rip-rap or other stabilized spillway so that the discharge does not cause erosion.
- (f) Sediment laden water to be pumped from excavation and work areas must be held in settling basins or filtered prior to its discharge into surface waters. Water must be discharged onto a stabilized outlet point so that the discharge does not cause erosion and sedimentation.
- (g) For installation of any waste disposal systems on site, or sanitary sewer or septic system, the plan shall provide for the necessary sediment controls. Owners or operators must also comply with applicable State and/or local waste disposal, sanitary sewer or septic system regulations for such systems, to the extent that these are located within the permitted area.
- (h) Construction site operators shall control other construction related wastes, such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality.
- (i) Construction materials buried onsite shall meet Section 4.8 of the Knox County Zoning Ordinance.
- (j) All discharges from a site shall leave the property at non-erosive velocities and volumes.
- (k) The portion of the performance bond pertaining to erosion prevention and sediment control shall be released only after all soil-disturbing activities at the site have been completed, and perennial vegetation covers seventy (70) percent or more of all unpaved areas.
- (l) The Director shall have the authority to require greater than 70 percent coverage of perennial vegetation for release of the erosion prevention and sediment control portion of the performance bond if site is a priority construction activity, has an elevated potential for erosion or off-site damages, or has caused past damages off-site due to sediment discharges.

SECTION 8. AS-BUILT CERTIFICATIONS

- (a) Prior to the release of a bond, an As-Built Certification shall be provided to the Director, showing that all drainage structures or facilities, facility volumes, size, slopes, locations, elevations, and hydraulic structures have been field verified, represent the as-built field conditions, and comply with the approved stormwater management plan(s). Features such as roadway lines, grades, cross slopes, locations, contours, and elevations shall be provided to verify approved plans as required by the Director. Other contents of the As-Built Certification must be provided, in accordance with the policies stated in the Knox County Stormwater Management Manual, as amended.
- (b) As-Built Certifications shall include sufficient design information to show that stormwater facilities will operate as approved. This shall include the existing (or before site development) peak flow discharges, the after site development peak flow discharges, and/or volumes of stormwater runoff based on the proposed site development, as well as all necessary computations used to determine the reduced peak flow rates for the design storms.
- (c) The As-Built Certification must be stamped by the appropriate design professional required to stamp the original stormwater management plan, as stated in section 4.1, and/or a registered land surveyor licensed to practice in the State of Tennessee.

SECTION 9. MONITORING AND INSPECTIONS

9.1 Right-of-Entry

- (a) The Director may enter upon any property which discharges or contributes, or is believed to discharge or contribute, to stormwater runoff or the stormwater system stream(s), natural drainageway(s) or via any other private or public stormwater management system during all reasonable hours to monitor, remove foreign objects or blockages, and to inspect for compliance with the provisions of this ordinance.
- (b) Failure of a property owner to allow such entry onto a property for the purposes set forth in section 9.1(a) shall be cause for the issuance of a stop work order, withholding of a certificate of occupancy, and/or civil penalties and/or damage assessments in accordance with section 16 of this ordinance.

9.2 During Grading or Construction

During grading or construction, site inspections shall be performed in accordance with following requirements:

- (a) The owner or operator shall conduct site inspections in accordance with the requirements stated in the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities. The Director has the authority to impose more stringent inspection requirements as necessary for purposes of water quality protection and public safety.
- (b) Site inspection documentation shall be maintained on-site during normal working hours by the owner or operator or designee and shall be made available for review by the Director immediately upon request.
- (c) The following areas and items must be inspected as set forth in section 9.2(a):
 - (1) all disturbed areas that are not stabilized;

- (2) any areas used for storage of materials that are exposed to precipitation;
- (3) borrow or waste areas associated with the construction activity;
- (4) temporary and permanent stormwater management facilities;
- (5) locations where vehicles enter and exit the site;
- (6) stormwater outfall locations;
- (7) erosion prevention and sediment control measures; and
- (8) structural and non-structural stormwater management facilities and best management practices.

9.3 After Construction

Once the site has been stabilized and construction has ceased, routine inspections for the stormwater management facilities and best management practices are required, based on the guidance provided in the Operations and Maintenance Plan and “Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices” for the property, as set forth in section 10 of this ordinance. Routine inspections are the responsibility of the property owner, or the owner(s) of the stormwater management facility(s) and best management practice(s).

SECTION 10. MAINTENANCE REQUIREMENTS

10.1 General

- (a) The Director may order corrective actions to erosion prevention and sediment control measures, stormwater management facilities, and/or the stormwater system as are necessary to properly maintain the stormwater systems within Knox County for the purposes of flood prevention, channel protection, water quality treatment and/or public safety. If the property owner(s) fails to perform corrective actions ordered by the Director, the Director shall have the authority to order corrective action, to be performed by the County or others. In such cases where a performance bond exists, the County shall utilize the bond to perform the corrective actions. In such cases where a performance bond does not exist, the property owner shall reimburse Knox County for double its direct and related expenses. If the property owner fails to reimburse Knox County, Knox County is authorized to file a lien for said costs against the property and to enforce the lien by judicial foreclosure proceedings.
- (b) This ordinance does not authorize access to private property by the property owner or site operator. Arrangements concerning removal of sediment on adjoining property must be settled by the owner or operator with the adjoining landowner.

10.2 During Grading or Construction

- (a) The owner or operator shall at all times properly operate and maintain all erosion prevention and sediment control measures, stormwater management facilities, and related appurtenances which are installed or used by the property owner to achieve compliance with this ordinance.
- (b) The owner or operator shall maintain erosion prevention and sediment control and construction site measures in the manner specified by the State of Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activities and the TDEC Erosion & Sediment Control Handbook, as amended, by qualified personnel that are

provided by the owner or operator of the land disturbing activity. Other technical guidance for site environmental controls are provided or referenced in the Stormwater Management Manual, as amended.

- (c) If sediment escapes the construction site, off-site accumulations of sediment that have not reached a stream must be removed at a frequency sufficient to minimize off-site impacts. Fugitive sediment that has escaped the construction site and has collected in a street must be removed so that it is not subsequently washed into storm sewers and streams by the next rain and/or so that it does not pose a safety hazard to users of public streets. Owners and operators shall not initiate remediation/restoration of a stream without consulting TDEC first, and such activities shall be performed in accordance with all Knox County, state, and Federal laws and regulations.

10.3 After Construction

- (a) The owner(s) of stormwater management facilities and/or best management practices shall at all times properly operate and maintain all facilities and systems of stormwater treatment and control (and related appurtenances), and all best management practices in such a manner as to maintain the full function of the facilities or best management practices which are installed or used by the property owner(s) to achieve compliance with this ordinance. Maintenance of privately-owned stormwater management facilities shall be performed at the sole cost and expense of the owner(s) of such facilities.
- (b) Prior to release of the performance bond, the property owner shall provide Knox County with an accurate As-Built Certification, a final Operations and Maintenance Plan, which shall include an executed legal document entitled “Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices”. The property owner shall record the Operations and Maintenance Plan in the Office of the Knox County Register of Deeds. The location of the stormwater facility(s) and best management practices, the recorded location of the Covenants document, and inspection and maintenance guidance that outlines the property owner’s responsibility shall be shown on a plat that is also recorded in the Office of the Knox County Register of Deeds.
- (c) Developments and redevelopments that have received approval of a stormwater management plan after the effective date of this ordinance shall maintain stormwater management facilities and best management practices in accordance with the maintenance guidance provided in the Operations and Maintenance Plan and the Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices.
- (d) The Operations and Maintenance Plan shall specify the minimum inspection and maintenance requirements to be performed at necessary intervals by the property owner(s). The Operations and Maintenance Plan shall be prepared in accordance with the requirements stated in the Knox County Stormwater Management Manual, as amended.
- (e) In order to provide access to stormwater and/or water quality facilities by personnel, vehicles and equipment, the property owner(s) shall provide an unobstructed, traversable twelve (12) foot wide access within a minimum twenty (20) foot wide easement from a public street, driveway, or Joint Permanent Easement in strict accord with the stormwater management plan and any conditions required by the Director.
- (f) The Covenants for Permanent Maintenance of Stormwater Facilities and Best Management Practices shall grant Knox County permission to enter the property to inspect any stormwater

facility or best management practices for proper functioning, maintenance and protection from disturbances (if applicable).

- (g) The removal of sediment and/or other debris from stormwater management facilities and best management practices shall be performed in accordance with all Knox County, state, and federal laws. Requirements for sediment removal and disposal are presented in the Knox County Stormwater Management Manual, as amended. The Director may stipulate additional requirements if deemed necessary for public safety.

SECTION 11. PERMIT CONTROLS AND STORMWATER SYSTEM INTEGRITY

- (a) Any alteration, improvement, or disturbance to existing drainage channels, pipes, or other stormwater systems that convey public water shall be prohibited without authorization from the Director. This does not include alterations that must be made in order to maintain the intended performance of the drainage system.
- (b) Other State and/or Federal permits that may be necessary for construction in and around streams and/or wetlands shall be approved through the appropriate lead regulatory agency prior to submittal of a stormwater management plan to Knox County.
- (c) Any non-permitted drainage system, construction or fill located within a floodplain shall, upon written notice from the Director, be removed at the property owner's expense.

SECTION 12. NON-STORMWATER DISCHARGES

12.1 Illicit Discharges

Except as hereinafter provided, all non-stormwater discharges into the Municipal Separate Storm Sewer System of Knox County are prohibited and are declared to be unlawful.

12.2 Prohibitions

No person shall:

- (a) Connect, or allow to be connected, any sanitary sewer to the stormwater system.
- (b) Cause or allow an illicit discharge to the stormwater system, or any component thereof, or onto driveways, sidewalks, parking lots, sinkholes, creek banks, or other areas draining to the stormwater system. Illicit discharges include, but are not limited to:
 - (1) Sewage discharges or overflows, including Sanitary Sewer Overflows (SSOs);
 - (2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
 - (3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
 - (4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc;
 - (5) Discharges of wash water from the cleaning or hosing of impervious surfaces in industrial and commercial areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards, and outdoor eating or drinking areas, etc.;

- (6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;
- (7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;
- (8) Discharges of sediment, or construction-related wastes, etc.;
- (9) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

12.3 Allowable Discharges

- (a) The following discharges shall not be in violation of this ordinance:
 - (1) Water line flushing;
 - (2) Landscape irrigation;
 - (3) Diverted stream flows or rising groundwater;
 - (4) Infiltration of uncontaminated groundwater [as defined at 40CFR35.2005(20)] to separate storm drains;
 - (5) Pumping of uncontaminated groundwater;
 - (6) Discharges from potable water sources, foundation drains, uncontaminated air conditioning condensation, irrigation waters, springs, water from crawl space pumps, or footing drains;
 - (7) Lawn watering;
 - (8) Individual non-commercial car washing on residential properties; or car washing of less than two (2) consecutive days in duration for a charity, non-profit fund raising, or similar non-commercial purpose;
 - (9) Flows from riparian habitats and wetlands;
 - (10) Dechlorinated swimming pool discharges;
 - (11) Incidental street wash water from street cleaning equipment designed for cleaning paved surfaces and limiting waste discharges;
 - (12) Street deicing for public safety;
 - (13) Any activity authorized by a valid NPDES permit; and
 - (14) Any flows resulting from firefighting.
- (b) Discharge due to water line flushing through a direct connection to the waters of the State of Tennessee is prohibited. Persons responsible for water line flushing activities are required to de-chlorinate discharges before such discharges come in contact with waters of the State of Tennessee.
- (c) If the Director finds that any activity, including but not limited to any of the activities listed in section 12.3, are found to cause or may cause sewage, industrial wastes, other wastes, or other non-stormwater discharges to be discharged into the stormwater system, the Director shall so notify the person performing such activities, and shall order that such activities be stopped or conducted in such a manner as to avoid the discharge of sewage, industrial wastes or other wastes into the stormwater system. The Director may require submittal of a stormwater pollution prevention plan if the activity, or actions taken to cease the activity,

have the potential to cause further releases of pollution or non-stormwater discharges to the stormwater system.

12.4 Notification and Monitoring Requirements

- (a) As soon as any person has knowledge of any illicit spills or discharges to the stormwater system in violation of this ordinance, such person shall immediately notify the Department of Engineering and Public Works of this discharge. If such person is directly or indirectly responsible for such discharge or responsible for the operation of the system or business, then such person shall also take immediate action to ensure the containment and cleanup of such discharge and shall confirm such notification with a written report to the Director within three (3) calendar days. At a minimum, the written report for any illicit discharge shall include:
- (1) Date and time of the discharge
 - (2) Location of the discharge
 - (3) Material or substance discharged
 - (4) Duration and rate of flow
 - (5) Total volume discharged
 - (6) Total volume recovered
 - (7) Cause or reason for the discharge
 - (8) Remediation and containment action taken
 - (9) Material Safety Data Sheets (MSDS) for the discharged material
 - (10) Action taken to prevent further discharges
 - (11) Description of any environmental impact
- (b) The Director may require any person engaging in any activity or owning any property, building or facility (including but not limited to a site of industrial activity) to undertake such reasonable monitoring of any discharge(s) to the stormwater system operated by the County and to furnish periodic detailed reports of such discharges.

12.5 Illegal Dumping

It shall be illegal for any person to intentionally dump liquids or solids that are considered priority pollutants by the U.S. Environmental Protection Agency (EPA) on the ground where there is potential exposure to rain or stormwater and potential for the pollutant to reach the Municipal Separate Storm Sewer System of Knox County.

SECTION 13. SEVERABILITY

- (a) Each separate provision of this ordinance is deemed independent of all other provisions herein so that if any provision or provisions of this ordinance shall be declared invalid, all other provisions thereof shall remain enforceable.
- (b) If any provisions of this ordinance and any other provisions of law impose overlapping or contradictory regulations, or contain any restrictions covering any of the same subject matter, that provision which is more restrictive or imposes higher standards or requirements shall govern.

SECTION 14. RESPONSIBILITY

Conformance with this ordinance is a minimum requirement and does not relieve the property owner, utility, facility operator, lessee, tenant, contractor, permittee, the equipment operator and/or any other person or entity doing work from applying sound judgment and taking measures which go beyond the scope of the requirements of this ordinance where necessary. Nor does this ordinance imply a warranty or the assumption of responsibility on the part of Knox County for the suitability, fitness or safety of any structure with respect to flooding, water quality, or structural integrity. This ordinance is a regulatory instrument only, and is not to be interpreted as an undertaking by Knox County to design any structure or facility.

SECTION 15. VARIANCES

- (a) Variances to the requirements of this ordinance shall be handled by the Knox County Board of Zoning Appeals as defined under section 6.60 of the Knox County Zoning Ordinance, titled Board of Zoning Appeals.
- (b) The Board of Zoning Appeals shall not approve variances that cause Knox County to be in violation of any state or Federal NPDES permit.

SECTION 16. PENALTIES AND APPEALS

- (a) Violations of this ordinance shall be cause for the requirement for corrective action(s), the issuance of a stop work order, withholding of a permit, withholding of permit inspections, withholding of a certificate of occupancy, and/or civil penalties and/or damage assessments as set forth below.
- (b) Any person who violates the provisions of this ordinance shall be subject to a civil penalty of not less than two hundred and fifty dollars (\$250.00) or more than five thousand dollars (\$5,000) per day for each day of each violation. Each day of violation may constitute a separate violation. Knox County shall give the alleged violator reasonable notice of the assessment of any civil penalty. Knox County may also recover all damages proximately caused to the County by such violations.
- (c) In assessing a civil penalty, the following factors may be considered:
 - (1) The harm done to the public health or the environment;
 - (2) Whether the civil penalty imposed will be a substantial economic deterrent to the illegal activity;
 - (3) The economic benefit gained by the violator;
 - (4) The amount of effort put forth by the violator to remedy this violation;
 - (5) Any unusual or extraordinary enforcement costs incurred by the municipality;
 - (6) The amount of penalty established by ordinance or resolution for specific categories of violations; and
 - (7) Any equities of the situation which outweigh the benefit of imposing any penalty or damage assessment.

- (d) In addition to the civil penalty in subsection (b) above, Knox County may also assess damages proximately caused by the violator to the County which may include any reasonable expenses incurred in investigating and enforcing violations of this part, or any other actual damages caused by the violation.
- (e) Notice shall be served upon the alleged violator either by personal service or certified mail. Where such methods are a known, reliable method of communication, notice may be additionally served by fax or regular mail. Upon receipt of notice from Knox County of the assessment of a civil penalty and/or damages, the alleged violator may request a meeting with the Director of Engineering and Public Works. Said request must be made in writing and received by the County within ten (10) business days after the date of the notice. The meeting shall be held within (10) business days of the request for the meeting. Within ten (10) business days after the meeting, the County shall issue a Second Notice to the alleged violator of its decision. If the alleged violator is dissatisfied with the decision of the County, the alleged violator may appeal said civil penalty or damage assessment to the Knox County Board of Zoning Appeals. Said appeal must be received by the Board within thirty (30) days after the date of the Second Notice. The appeal shall be heard by the Board at its next regularly scheduled meeting following receipt of the appeal. If a timely appeal of the Second Notice of damage assessment or civil penalty is not filed with the Board, the violator shall be deemed to have consented to the damage assessment or civil penalty and it shall become final. If the alleged violator files a timely appeal with the Board and the violator is dissatisfied with the decision of the Board, the alleged violator may appeal the decision of the Board pursuant to Tenn. Code Ann. § 27-8-101. Said appeal must be filed within thirty (30) days after the decision of the Board.
- (f) Whenever any damage assessment or civil penalty has become final because of a person's failure to appeal the damage assessment or civil penalty, Knox County may apply to the appropriate chancery court for a judgment and seek execution of such judgment. The court, in such proceedings, shall treat the failure to appeal such damage assessment or civil penalty as a confession of judgment.

AN ORDINANCE OF THE COMMISSION
OF KNOX COUNTY, TENNESSEE TO
APPROVING REGULATIONS FOR
FLOOD DAMAGE PREVENTION.

ORDINANCE NO.: 0-94-3-101

REQUESTED BY: HIGHWAY DIRECTOR

PREPARED BY: KNOX COUNTY LAW
DIRECTOR

APPROVED AS TO FORM
AND CORRECTNESS: _____

APPROVED 1ST READING: _____
Date

APPROVED 2ND READING: _____
Date

APPROVED 3RD READING: _____
Date

APPROVED EMERGENCY: _____
(Yes) (No)

VETOED: _____
Date

VETO OVERRIDE: _____
Date

MINUTE BOOK: _____ PAGE: _____

WHEREAS, TCA § 13-7-101 delegates the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the flood hazard areas of Knox County, Tennessee are subject to periodic inundation which results in health and safety hazards, loss of property, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare; and

WHEREAS, these flood losses are caused by the cumulative effect of obstructions in flood plains causing increases in flood heights and velocities, and by the occupancy in flood hazard areas by uses vulnerable to floods or hazardous to other lands which are inadequately elevated, flood-proofed, or otherwise unprotected from flood damages.

NOW, THEREFORE, BE IT ORDAINED BY THE COMMISSION OF KNOX COUNTY AS FOLLOWS:

The following regulations shall apply for flood damage prevention.

Section 1: Statement of Purpose. It is the purpose of the ordinance to promote the public health, safety and general welfare and to minimize the public and private losses due to flood conditions in specific areas by provisions designed to:

- A. Restrict or prohibit uses which are dangerous to health, safety, and property due to water, erosion, or damaging increases in flood heights or velocities.
- B. Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.
- C. Control the alteration of natural floodplains; stream channels, and natural protective barriers which are involved in the accommodation of flood waters.
- D. Control filling, grading, dredging and other development which may increase erosion or flood damage.
- E. Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.

Section 2: Objectives. The objectives of this Ordinance are:

- A. To protect human life and health.
- B. To minimize the expenditure of public money for costly flood control projects.
- C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.
- D. To minimize prolonged business interruptions.
- E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in flood plains.

- F. To help maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas.
- G. To insure that potential home buyers are notified that property is in a flood area.

Section 3: Definitions. Unless specifically defined below, words or phrases used in this Ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this Ordinance its most reasonable application.

“Addition” (to an existing building) means any walled and roofed expansion to the perimeter of a building in which the addition is connected by a common load-bearing wall other than a fire wall. Any walled and roofed addition which is separated by a fire wall or is separated by independent perimeter load-bearing walls is considered new construction.

“Appeal” means a request for a review of the Supervisor’s interpretation of any provisions of this Ordinance or a request for a variance.

“Area of Special Flood Hazard” is the land in the flood plain within Knox County subject to a two-tenths of one percent or greater chance of flooding in any given year (500-year flood).

“Base Flood” means the flood having a two-tenths of one percent chance of being equaled or exceeded in any given year (500-year flood).

“Development” means any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating or drilling operations, or permanent storage of equipment and materials.

“Existing Manufactured Home Park or Subdivision” means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale for which the construction of facilities for servicing the lot on which the manufactured home is to be affixed (including, at a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) is completed before the effective date of this Resolution.

“Expansion to an Existing Home Park or Subdivision” means the preparation of additional sites by the construction of facilities for servicing lots on which the manufactured homes are to be affixed (including the installation of utilities, either final site grading or pouring of concrete pads, or the construction of streets).

“Flood” or “Flooding” means a general and temporary condition of partial or complete inundation of normally dry land areas from the unusual and rapid accumulation or runoff of surface waters from any source.

“Flood Hazard Boundary Map (FHBM)” means an official map of Knox County, Tennessee, issued by the Federal Emergency Management Agency (F.E.M.A.) where the boundaries of the areas of special flood hazard have been identified as Zone A and B and risk premium zones applicable to Knox County, Tennessee.

“Flood Insurance Rate Map (FIRM)” means an official map of Knox County, Tennessee, on which the F.E.M.A. has delineated both the areas of special flood hazard and the risk premium zones applicable to Knox County, Tennessee.

“Flood Insurance Study” is the official report provided by the F.E.M.A. The report contains flood profiles, as well as the Flood Hazard Boundary-Floodway Map and the water surface elevation of the base flood.

“Flood-proofing” means any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents,

“Floodway” means the channel of a river or other watercourse and the adjacent land areas as shown on the Knox County Zoning Maps that must be reserved in order to discharge the 500-year flood without cumulatively increasing the water surface elevation more than one foot.

“Floor” means the top surface of an enclosed area in a building (including basement), i.e., top of slab in concrete slab construction or top of wood flooring in wood frame construction. The term does not include the floor of a garage used solely for parking vehicles,

“Highest Adjacent Grade” means the highest natural elevation of the ground surface, prior to construction, next to the proposed walls of a structure.

“Historic Structure” means any structure that is:

- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of the Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior nor as contributing to the historical significance of a registered his district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- c. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or

- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
 1. By an approved state program as determined by the Secretary of the Interior, or
 2. Directly by the Secretary of the Interior in states without approved programs.

“Lowest Floor” means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building’s lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of the Ordinance.

“Mean Sea Level” means the average height of the sea for all stages of tide. It is used as a reference for establishing various elevations within the flood plain. For purpose of this Ordinance the term is synonymous with National Geodetic Vertical Datum (NGVD).

“Manufactured Home” means a structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. The term also includes park trailers, travel trailers, and similar transportable structures placed on a site for 180 consecutive days or longer and intended to be improved property.

“New Construction” means structures for which the “start of construction” commenced on or after the effective date of this Ordinance

“New Manufactured Home Park or Subdivision” means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale for which the construction of facilities for servicing the lot on which the manufactured home is to be affixed (including, at a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) is completed on or after the effective date of this Ordinance.

“Start of Construction” includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date. The actual start means the first placement of permanent construction of a structure (including a manufactured home) on a site, such as the pouring of slabs or footings, installation of piles, construction of columns, or any work beyond the stage of excavation or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include

excavation for a basement, floorings, piers or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

“Structure” means a walled and roofed building that is principally above ground, a manufactured home, a gas or liquid storage tank, or other man-made facilities or infrastructures.

“Substantial Damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

“Substantial Improvement” means any reconstruction, rehabilitation, addition or other improvements of a structure, in which the cumulative cost equals or exceeds fifty percent of the market value of the building. The market value of the building should be (1) the appraised value of the building prior to the start of the initial repair or improvement, or (2) in the case of damage, the value of the building prior to the damage occurring. This term includes structures which have incurred “substantial damage”, regardless of the actual repair work performed. For the purposes of this definition, “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the building. The term does not, however, include any project for improvement of a building required to comply with existing health, sanitary, or safety code specifications which have been identified by the Code Enforcement Official and which are solely necessary to assure safe living conditions.

“Substantially Improved Existing Manufactured Home Parks or Subdivisions” is where the repair, reconstruction, rehabilitation or improvement of the streets, utilities and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced.

“Supervisor” means the Supervisor of the Knox County Department of Code Administration and Instruction or his designee.

“Variance” is a grant of relief from the requirements of this Ordinance which permits construction in a manner otherwise prohibited by this Ordinance where specific enforcement would result in unnecessary hardship.

“Violation” means the failure of a structure or other development to be fully compliant with the community’s floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this resolution is presumed to be in violation until such time as that documentation is provided.

Section 4: General Provisions.

A. Application.

This Ordinance shall apply to all areas of special flood hazard within the jurisdiction of Knox County, Tennessee.

B. Basis for Establishing the Areas of Special Flood Hazard.

The areas of special flood hazard identified by the F.E.M.A. in its Flood Hazard Boundary Map dated April 2, 1981, and any revisions thereto are adopted by reference and declared to be a part of this Ordinance.

C. Requirement of a Floodplain Development Permit.

A Floodplain Development Permit shall be required in conformance with the provisions of this Ordinance prior to the commencement of any development activities.

D. Compliance.

No structure or land shall hereafter be located, extended, converted, or structurally altered without full compliance with the terms of this Ordinance and other applicable regulations including the Knox County Zoning Ordinance.

E. Abrogation and Greater Restrictions.

This Ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, deed restrictions, or existing ordinances and regulations. However, where this Ordinance and another conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

F. Interpretation.

In the interpretation and application of this Ordinance all provisions shall be (1) considered as minimum requirements; (2) liberally construed in favor of the governing body; and (3) deemed neither to limit nor repeal any other powers granted under state statutes.

G. Warning and Disclaimer of Liability.

The degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This Ordinance does not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or

flood damages. This Ordinance shall not create liability on the part of Knox County, Tennessee, or by any officer or employee thereof for any flood damages that result from reliance on this Ordinance or any administrative decision lawfully made hereunder.

H. Penalties for Violation.

Violation of the provisions of this Ordinance or failure to comply with any of its requirements, including violation of conditions and safeguards established in connection with grants of variance or special exceptions, shall constitute a misdemeanor. Any person who violates this Ordinance or fails to comply with any of its requirements shall, upon conviction thereof, suffer such penalties as are authorized by law and in addition shall pay all costs and expenses involved in the case. Each day such violation continues shall be considered a separate offense. Nothing herein contained shall prevent Knox County, Tennessee, from taking other lawful action as is necessary to prevent or remedy any violation.

Section 5: Administration.

A. Designation of Supervisor.

The Supervisor is hereby appointed to administer and implement the provisions of this Ordinance.

B. Permit Procedures.

Application for a Floodplain Development Permit shall be made to the Supervisor on forms furnished by him prior to any development activities, and may include, but not be limited to, the following plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage or materials, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

1. Application Stage
 - a. Elevation in relation to mean sea level of the proposed lowest floor (including any basement or other floor) of all structures.
 - b. Elevation in relation to mean sea level to which any non-residential structure will be flood-proofed.
 - c. Certificate from a registered professional engineer or architect that the non-residential flood-proofed structure will meet the flood-proofing criteria established in Section 5, B.2 below.
 - d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

2. Construction Stage

Within unnumbered A zones where flood elevations data are not available, the Supervisor shall record the elevation of the lowest floor on the development permit. The elevation of the lowest floor shall be determined as the measurement of the lowest floor of the building and highest adjacent grade. USGS Quadrangle maps may be utilized when no more detailed reference exists to establish reference elevations.

Within all flood zones where base flood elevations data are utilized, the Supervisor shall require that upon placement of the lowest floor, or flood-proofing by whatever construction means, or upon placement of the horizontal structural members of the lowest floor, whichever is applicable, it shall be the duty of the permit holder to submit to the Supervisor a certification of the elevation of the lowest floor, flood-proofed elevation, or the elevation of the lowest portion of the horizontal structural members of the lowest floor, whichever is applicable as built, in relation to mean sea level. Said certification shall be prepared by or under the direct supervision of a registered land surveyor or professional engineer and certified by same. When flood-proofing is utilized for a particular building, said certification shall be prepared by or under the direct supervision of a professional engineer or architect and certified by same. Any work undertaken prior to submission of the certification shall be at the permit holder's risk. The Supervisor shall review the floor elevation survey data submitted. Deficiencies detected by such review shall be corrected by the permit holder immediately and prior to further progressive work being permitted to proceed. Failure to submit the survey or failure to make said corrections required hereby shall be cause to issue a stop-work order for the project.

C. Duties and Responsibilities of the Supervisor

Duties of the Supervisor shall include, but not be limited to:

1. Review all development permits to assure that the permit requirements of this Resolution have been satisfied.
2. Advise permittee that additional federal or state permits may be required, and if specific federal or state permits are known, require that copies of such permits be provided and maintained on file with the development permit. This shall include Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334.
3. Notify adjacent communities and the Tennessee State Planning Office prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.

4. Assure that maintenance is provided within the altered or relocated portion of said watercourse so that the flood-carrying capacity is not diminished,
5. Verify and record the actual elevation (in relation to mean sea level or highest adjacent grade, whichever is applicable) of the lowest floor (including basement) or all new or substantially improved structures, in accordance with Section 5, B.2.
6. Verify and record the actual elevation (in relation to mean sea level or highest adjacent grade, whichever is applicable) to which the new or substantially improved structures have been flood proofed, in accordance with Section 5, B.2.
7. Where interpretation is needed as to the exact location of boundaries of the areas of special flood hazard (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) the Supervisor shall make the necessary interpretation. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 7.A.
8. When base flood elevation data or floodway data have not been provided in accordance with Section 4.B, then the Supervisor shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source in order to administer the provisions of Section 6. Within unnumbered A zones, where base flood elevations have not been established and where alternative data is not available, the Supervisor shall require the lowest floor of a building to be elevated or flood-proofed to a level or at least two (2) feet above the highest adjacent grade being defined in Section 3 of this Ordinance). All applicable data including the highest adjacent grade elevation and all the elevations of the lowest floor of flood-proofing shall be recorded as set forth in Section 5.B.
9. When flood-proofing is utilized the Supervisor shall obtain certification from a registered professional engineer or architect in accordance with Section 5,B.2.
10. All records pertaining to the provisions of this Ordinance shall be maintained in the office of the Supervisor and shall be open for public inspection.

Section 6: Provisions for Flood Hazard Reduction

A. General Standards

In all areas of special flood hazard the following provisions are required:

1. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.
2. Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable state requirements for resisting wind forces.
3. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
4. All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damage.
5. Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.
6. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.
7. New and replacement sanitary sewer systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.
8. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
9. Any alteration, repair, reconstruction, or improvements to a structure on which the start of construction was begun after the effective date of this Ordinance shall meet the requirements of “new construction” as contained in this Ordinance; and,
10. Any alteration, repair, reconstruction or improvements to a building which is not in compliance with the provision of this Ordinance, shall meet the requirements of “new construction” as contained in the Ordinance and provided said non-conformity is not extended.

B. Specific Standards

In all areas of special flood hazard where base flood elevation data has been provided as set forth in Section 4.B or Section 5.B the following provisions are required:

1. Residential Construction: New construction or substantial improvement of any residential structure shall have the lowest floor, including any basement or other floor, elevated one foot above base flood elevation. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate the unimpeded movements of flood waters shall be provided in accordance with standards of Section 6.B.3.
2. Non-Residential Construction: New construction or substantial improvement of any commercial, industrial, or non-residential structure shall have the lowest floor, including basement, elevated no lower than one foot above the level of the base flood elevation. Structures located in all A-zones may be flood-proofed in lieu of being elevated provided that all areas of the structure below the required elevation are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied. Such certification shall be provided to the official as set forth in Section 5.B.2.
3. Elevated Buildings: New construction or substantial improvements of elevated builds that include fully-enclosed areas formed by foundation and other exterior walls below the base flood elevation shall be designed to preclude finished living space and designed to allow for the entry and exit of floodwaters to automatically equalize hydrostatic flood forces on exterior walls.
 - a. Designs for complying with this requirement must either be certified by a professional engineer or architect or meet the following minimum criteria:
 - i. Provide a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding.
 - ii. The bottom of all openings shall be no higher than one foot above ground.
 - iii. Openings may be equipped with screens, louvers, valves or other coverings or devices provided that permit the automatic flow of floodwaters in both directions.

- b. Electrical, plumbing, and other utility connections are prohibited below the base flood elevation.
 - c. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment used in connection with the premises (standard exterior door) or entry to the living area (stairway or elevator).
 - d. The interior portion of such enclosed area shall not be partitioned or finished into separate rooms in such a way as to impede the movement of floodwaters and all such petitions shall comply with the provisions of Section 6,B. of this Ordinance.
4. Standards for Manufactured Homes
- a. All manufactured homes placed, or substantially improved, on individual lots or parcels, in expansions of existing manufactured home parks or subdivisions, or in substantially improved manufactured home parks or subdivisions, must meet all the requirements of new construction, including elevations and anchoring.
 - b. All manufactured homes shall be anchored to resist flotation, collapse, or lateral movement by providing over-the-top and frame ties to ground anchors. Specific requirements shall be that:
 - i. Over-the-top ties be provided at each end of the manufactured home, with one additional tie per side at an intermediate location on manufactured homes of less than fifty feet and one additional tie per side for manufactured homes of fifty feet or more.
 - ii. Frame ties be provided at each corner of the home with four additional ties per side at intermediate points for manufactured homes less than fifty feet long and one additional tie for manufactured homes of fifty feet or longer.
 - iii. All components of the anchoring system capable of carrying a force of 4,800 pounds.
 - iv. Any additions to the manufactured home similarly anchored.

- c. For new manufactured home parks and subdivisions; for expansions to existing manufactured home parks and subdivisions; for existing manufactured home parks and subdivisions where the repair, reconstruction or improvement of the streets, utilities and pads equals or exceeds fifty percent of the value of the streets, utilities and pads, before the repair, reconstruction or improvement has commenced; and, for manufactured homes not placed in a manufactured home park or subdivisions require:
 - i. Stands or lots elevated on compacted fill or on pilings will be constructed such that the lowest floor of the manufactured home will be at or above one foot above the base flood elevation.
 - ii. Adequate surface drainage and access for a hauler are provided.
 - iii. In the instance of elevation on pilings, lots are large enough to permit steps; piling foundations are placed in stable soil no more than ten feet apart; and lateral reinforcement is provided for pilings more than six feet above the ground level.

5. Floodways

Located within areas of special flood hazard established in Section 4.B are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles and erosion potential, the following provisions shall apply:

- a. Prohibit encroachments, including fill, new construction, substantial improvements and other developments unless certification by a registered professional engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the 500-year flood discharge and no increase in floodway widths.
- b. If Section 6, B.4 is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Section 6.
- c. Prohibit the placement of any manufactured homes, except in an existing manufactured home park or existing manufactured home subdivision.

- d. For additional requirements in the Floodway District refer to the Knox County Zoning Ordinance.

C. Standards for Subdivision Proposals

1. All subdivision proposals shall be consistent with need to minimize flood damage.
2. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards.
3. The location of flood fringe limits and floodways shall be shown on all subdivision proposals regardless of size.

D. Standards for Small Streams

Located within the areas of special flood hazard established in Section 4.B, where small streams exist but where no base flood data has been provided or where no floodways have been provided, the following provisions apply:

1. No encroachments, including fill material or structures shall be located within a distance of the stream-bank equal to five times the width of the stream at the top of bank or twenty feet on each side from top of bank, whichever is greater, unless certification by a registered professional engineer is provided demonstrating that such encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
2. New construction or substantial improvements of structures shall be elevated or flood-proofed in accordance with elevations established in accordance with Section 5.B.

Section 7: Variance Procedures

A. Board of Adjustments and Enforcement

1. The Knox County Board of Adjustments and Enforcement as established by the Knox County Commission shall hear and decide appeals and requests for variances from the requirements of this Ordinance.
2. The Knox County Board of Adjustments and enforcement shall hear and decide when it is alleged there is an error in any requirement, decision, or determination made by the Supervisor in the enforcement or administration of this Ordinance.

3. Any person aggrieved by the decision of the Knox County Board of Adjustments and Enforcement may appeal such decision to Chancery Court.
4. Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places without regard to the procedures set forth in the remainder of this section, except for Section 7.A.5 (a and d), and provided the proposed reconstruction, rehabilitation, or restoration will not result in the structure losing its historical designation.
5. In passing upon such applications, the Knox County Board of Adjustments and Enforcement shall consider all technical elevations, all relevant factors, standards specified in other sections of this Ordinance, and:
 - a. The danger that materials may be swept onto other lands to the injury of others.
 - b. The danger of life and property due to flooding or erosion damage.
 - c. The susceptibility of the proposed facility and its contents to flood damage and the effect of damage on the individual owner.
 - d. The importance of the services provided by the proposed facility to the community.
 - e. The necessity to the facility of a waterfront location, not subject to flooding or erosion damage, for the proposed use.
 - f. The compatibility of the proposed use with existing and anticipated development.
 - g. The relationship of the proposed use to the comprehensive plan and flood plain management program for the area.
 - h. The safety of access to the property in times of flood for ordinary and emergency vehicles,
 - i. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site.

- j. The costs of providing governmental services during and after flood conditions including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, streets, and bridges.
6. Upon consideration of the factors listed above and the purposes of this Ordinance, the Knox County Board of Adjustments and Enforcement may attach such conditions to the granting of variances as it deems necessary to further the purpose of this Ordinance.
7. Variances shall not be issued within any designated floodway district if any increase in flood levels or floodway widths during the 500-year flood discharge would result. The applicant shall have the responsibility to submit technical evaluations supporting this request.

B. Conditions for Variances

1. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief and in the instance of an historical building, a determination that the variance is the minimum necessary so as not to destroy the historic character and design of the building.
2. Variances shall only be issued upon (1) a showing of good and sufficient cause; (2) determination that failure to grant the variance would result in exceptional hardship to the applicant; and (3) a determination that the granting of a variance will not result in increased flood heights or floodway widths, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
3. Any applicant to whom a variance is granted shall be given written notice specifying the difference between the base flood elevation and the elevation to which the structure is to be built and stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.
4. The Supervisor shall maintain the records of all appeal actions and report any variance to F.E.M.A. upon request.

Section 8: This Ordinance shall take effect upon passage, the public welfare requiring it.

_____ Date _____
Presiding Officer of the Commission

_____ Date _____
County Clerk

Approved: _____ Date _____
County Executive

Vetoed: _____ Date _____
County Executive

parts thereof create a substantial, material hazard to the health, safety, and welfare of the citizens and residents of Knox County, and

WHEREAS, the County desires to provide for preservation of the property, health, and safety of the citizens of Knox County by encouraging property owners to maintain their lots in a clean and safe fashion, and

WHEREAS, Knox County wishes to create a system by which dirty, overgrown and/or unsafe properties may be cleaned and restored to a safe condition.

NOW THEREFORE, BE IT ORDAINED BY THE COMMISSION OF KNOX COUNTY AS FOLLOWS:

1. This article may be cited as the Dirty Lot Ordinance.
2. The existence within the limits of the County of Knox of lots and parcels of land overgrown with trees, vines, weeds, and other underbrush or burdened with the accumulation of debris, trash, litter, garbage or refuse or combination of preceding elements, or lots and parcels upon which exist abandoned dwellings or structures, or portions thereof, which are unfit for human habitation, are hereby declared to be a nuisance.
3. (a) Unlawful for any person owning, leasing or having control of property in the County to permit or suffer vines, grass, underbrush, or any other vegetation to grow and/or debris, trash, litter, garbage or refuse to accumulate on such property, or to allow an abandoned structure, or portions thereof, unfit for human habitation, to exist on such property, to such an extent that such a nuisance is created injurious to the health, safety and welfare of the inhabitants of the County. Vines, grass, underbrush, or other vegetation which have attained a height of twelve inches or more shall be presumed to be detrimental to the public health and a public nuisance, which presumption may be rebutted by competent evidence.

(b) It shall also be unlawful for any owner, occupant, lessee or anyone having supervision or control of any lot, tract, parcel of land or portion thereof, occupied or unoccupied, improved or unimproved, within the County to suffer or permit trees, vines, grass, weeds, or any plant that is not cultivated to grow in rank profusion or otherwise, in, along, upon, or across the sidewalk or street adjacent to same in the area between the property line, to a height greater than twelve inches on an average.
4. That in complying with article provisions, it shall be unlawful for any person owning, leasing or having control of property in the County to rake upon, cut up, or pile up said vines, grass, underbrush or other vegetation, dead or broken tree limbs, dead trees or debris, trash, litter, garbage, or rubbish into any ditch or natural drain, or at any place on the property that might obstruct the vision of the operators of vehicles or pedestrians or obstruct the flow of water drainage.

5. That upon failure of any owner of property within the limits of the County of Knox to cut or have cut such growth of trees, vines, grass, underbrush, and/or other obnoxious vegetation or to remove or have removed such accumulation of debris, trash, litter, garbage or refuse as described in Section 3, or to fail to demolish and completely remove any abandoned dwelling or structure unfit for human habitation which may exist upon such lot, it shall be the duty of the County Building Inspector, or such other persons as are designated by the County Executive, to serve a notice on the owner, lessee, occupant or person having control of such property, ordering said person or persons to abate the nuisance within (10) days of the service of such notice.

It shall further be the duty of the County Building Inspector, or such other persons as are designated by the County Executive, to serve a notice on the owner, lessee, occupant or person having control of such property, ordering said person or persons to demolish or have demolished any abandoned dwelling or structure unfit for human habitation which may exist upon the property and to remove or have removed all debris resulting from demolition within thirty (30) days of serving of such notice.

Such notice shall be served: (1) by personally delivering same upon the owner, lessee, occupant, or person having control of such property, or (2) by mailing same to the last know address of such owner, lessee, occupant or person having control of such property by certified United States Mail, or (3) by posting same on the property upon which the illegal conditions exist.

Service of notice by any of the above methods shall be due notice within the meaning of this article, provided, however, that no owner out of possession shall be liable for any penalty or charge imposed under this Ordinance unless there shall be personal service of such notice upon him, or such notice mailed to him by certified mail as aforesaid.

The notice required herein shall state that the owner, lessee, occupant or other person having control of such property is entitled to a hearing. The notice shall be written in plain language and shall also include, but not be limited to, the following elements:

- (a) a brief statement of this law which shall contain the consequences of failing to remedy the noted condition;
- (b) the person, office, address, and telephone number of the department or person giving notice;
- (c) a cost estimate for remedying the noted condition which shall be in conformity with the standards of cost to the community, and

(d) a place wherein the notified party may return a copy of the notice, indicating the desire of a hearing.

6. Any owner, lessee, occupant or person having control of such property aggrieved by the determination and order of an inspector may appeal therefrom to the County Codes Enforcement Director (“the Director”) or such other person or persons as may be designated by the County Executive within ten (10) days from the date of the service of the notice. Such appeal shall be taken by filing with the director a notice of appeal stating in brief and concise form the grounds upon which the appeal is based. The Director shall hear and determine such appeal as promptly as practicable, but in all cases the appeal shall be heard and determined within ten (10) calendar days of the date of the filing of the appeal. The appellant may request in writing an extension of time for the hearing, but no such extension shall be granted unless it shall appear to the Director that the appellant is suffering from some hardship which would make it unreasonable to have the hearing within a ten (10) day period.

The Director shall have the power to affirm, reverse, or modify the order of the inspector. His decision, together with the reasons therefore, shall be in writing, and shall be maintained as a public record. An owner, lessee, occupant or person having control of property who fails, refuses, or neglects to comply with the order of the inspector or, who fails, refuses, or neglects to comply with the Order as modified by the Director, shall be in violation of the provisions of this article. Appeal from the decision of the Administrator shall be by device of common law certiorari.

7. That if the owner or such other person described in paragraph 5 herein shall fail to remedy such condition within the time prescribed therein, unless an appeal is made, the inspector shall certify such failure to the Codes Enforcement Director who shall take such action as necessary to remedy the condition and abate the nuisance.

Wherever possible, labor needed to abate the nuisances described herein shall be obtained from the voluntary services of persons incarcerated within the Knox County Penal Farm. All inmates of the Knox County Penal Farm who so volunteer to perform said labor shall be entitled to all work release credits due them under the provisions of TCA §41-2-101, et seq. The Knox County Highway Department shall provide whatever equipment the Director may deem necessary for the abatement of the aforesaid nuisance.

WHEREAS, the Intergovernmental Committee recommends the requested amendments to the Knox County Code.

NOW THEREFORE BE IT ORDAINED BY THE COMMISSION OF KNOX COUNTY AS FOLLOWS:

Section 1: Knox County Code §38-68(c) is amended by deleting the subsection in its entirety and substituting therefore the following:

In complying with article provisions, it shall be unlawful for any person owning, leasing or having control of property in the County to rake upon, cut up, or pile up said vines, grass, underbrush or other vegetation, dead or broken tree limbs, dead trees or debris, trash, litter, garbage, or rubbish or any other natural or manmade material into any ditch or natural drain or any place on the property that might obstruct the vision of the operators of vehicles or pedestrians or obstruct and/or alter the flow of water drainage or change the water course.

Section 2: Knox County Code §38-69 is amended by deleting any reference to the “county building inspector” and substituting in each instance the phrase “The Department of Codes and Administration”,

Section 3: Knox County Code §38-71(a) is amended by appending the following phrase at the end of the subsection: “including, but limited to, issuance of a citation to General Sessions Court for assessment of civil penalties for violation of this Ordinance.”

Section 4: Knox County Code §38-71(b) is amended by striking the phrase “county highway department” and substituting therefore the phrase “Department of Engineering and Public Works.”

Section 5: Knox County Code §38-71(c) is amended by adding the following sentence after the second sentence in the subsections:

In case where cleanup cannot be performed by the Department of Engineering and Public Works, a citation to General Sessions Court may be issued. A violation of this ordinance may be punished by assessment of a civil penalty of not less than \$100 nor more than \$500 per violation.

Section 6: This Ordinance shall take effect upon passage, the public welfare requiring it.

_____ Date _____
Presiding Officer of the Commission

_____ Date _____
County Clerk

Approved: _____ Date _____
County Executive

Vetoed: _____ Date _____
County Executive

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GRADING PERMIT

(Expires 1 year from date issued)

NON-TRANSFERABLE

Knox County
Department of
Codes/Engineering
Codes: 215-2325
Eng: 215-5825

Grading
Permit # _____

Date: _____

Acreage Disturbed: _____

Job Address: _____

Acreage Total: _____

CLT#: _____ Parcel # _____ Zone: _____

Issued By: _____

Name and Address

Phone #

Owner: _____

Contractor: _____

Architect: _____

Engineer: _____

Flood Plain Development Permit Required? _____ Yes _____ No

Erosion and Drainage Control Plan Approved By The Division Of Engineering? _____ Yes _____ No

Bond Required By The Division Of Engineering? _____ Yes _____ No

Entrance To Site Located On State Highway? _____ Yes _____ No

(All Construction On A State Highway Other Than A Single Family Residential

Will Require a "Right Of-Way" Permit From State D.O.T.)

TDEC Construction? _____ Yes _____ No If yes, provide a copy to Knox County Engineering.

TVA? _____ Yes _____ No If yes, provide a copy to Knox County Engineering

Note: This grading permit issued by Knox County does **NOT** release the applicant from obtaining other required federal, state and local permits (e.g. ARAP, Corps of Engineers, etc.).

Also, **ALL** permits should be posted at job site.

Begin Construction Date: _____ End Construction Date: _____

Describe Work: _____

Future Use Of Site: _____

I, THE UNDERSIGNED OWNER OR AGENT, UNDERSTAND ALL THE REQUIREMENTS STATED ON THIS PERMIT AND ANY ATTACHED SITE PLANS AND/OR LETTERS. I ALSO UNDERSTAND THAT FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL CONSTITUTE A VIOLATION OF THE KNOX COUNTY ZONING REGULATIONS AND SUBSEQUENT LEGAL ACTION BY KNOX COUNTY.

SIGNATURE OF OWNER OR CONTRACTOR

DATE OF SIGNATURE

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