



Chapter 1 INTRODUCTION

1.1 Purpose

The purpose of the Land Development Manual is to establish minimum standards for design and construction of site grading and site development projects within the City of Knoxville. The minimum standards for site and land development are intended to protect and promote the general welfare of all citizens by accomplishing these goals:

- Design/construction of safe and durable streets, driveways and parking lots.
- Design/construction of stormwater drainage systems to reduce flooding.
- Complete and accurate plans to ensure grading and property issues are addressed.
- Measures to control erosion and sediment during construction.
- Reduction and control of stormwater pollution through good design features.

The Land Development Manual will assist developers, engineers, contractors, inspectors and property owners in the best practical design for site development and redevelopment activities within the city of Knoxville. This manual contains the minimum requirements applicable to most properties; however, the design engineer (with assistance from other design professionals as needed) must thoroughly investigate field conditions and coordinate all design efforts.

Major objectives for the Land Development Manual, in terms of protecting the general public, are focused on providing good stormwater and street design to satisfy requirements of the City of Knoxville Stormwater Engineering Division (which is part of the Engineering Department). Stormwater design is essential in reducing and controlling erosion, nonpoint source pollution, flooding and other drainage problems. The Stormwater Engineering Division has primary responsibilities for preventing pollution in natural creeks and streams of Knoxville and the adjacent portions of the Tennessee River.

1.2 Scope

The Land Development Manual does not contain the complete requirements for site development design and construction. Two other entities are also involved in the design review process. See Figure 2-1 for the overall review sequence of a typical large site development project.

- ✦ The Metropolitan Planning Commission (MPC) is responsible for conceptual designs, property requirements, zoning regulations, platting issues, street names and addresses, traffic studies, etc. MPC is an independent agency that works with the City of Knoxville government and Knox County government in maintaining zoning ordinances and regulations. A broad description of the zoning powers granted to MPC is included in Section 4.2.
- ✦ The Inspections Bureau (which is part of the Department of Development) addresses other elements of public health and safety (such as structural building codes and fire protection) through building permits, electrical permits, gas permits, mechanical permits, plumbing permits, and sign permits.



The scope of the Land Development Manual is limited to the requirements for submitting site plans and related projects to the City of Knoxville Engineering Department. The Knoxville Engineering Department is only one part of the City of Knoxville review process, as is explained further in Chapter 2 (Plans Review Process). State and federal agencies may have additional requirements other than those listed briefly under Chapter 5 (Permitting Requirements).

The Land Development Manual is not intended as a textbook or a comprehensive engineering design reference. Site plans, details, calculations, construction specifications and other technical documents must be designed and sealed by a professional engineer registered in the state of Tennessee, with sufficient knowledge and experience to accomplish all design elements of the site plan. Most types of engineering calculations are not explained or defined within the Land Development Manual, either due to the very complex nature of the subject matter or the fact that the design equations and methods are well-known to most competent practicing engineers who claim expertise in the area of land development.

In addition to technical design, submitted projects must also meet federal and state standards for health and safety. For instance, trenching and excavations must satisfy OSHA standards in 29 CFR 1926 Subpart P - Excavations. Scaffolding and temporary work platforms must also meet OSHA standards. Traffic signs must be designed to meet FHWA and AASHTO requirements. Consideration for public safety must be emphasized throughout the design process.

1.3 Authorization

The Knoxville Stormwater and Street Ordinance, effective in June 1997 and as further amended, provides the basis for much of the stormwater design criteria contained within this manual. The Knoxville / Knox County Minimum Subdivision Regulations provide most of the street design criteria. Other types of design procedures have been in effect for many years through policy mandates issued by the Engineering Director. City ordinances and regulations also impact project design; the most commonly referenced ordinances are included within Appendix B.

The City of Knoxville, like many other cities across the United States, is required to have a National Pollutant Discharge Elimination System (NPDES) permit to discharge stormwater from the municipal separate storm sewer system (MS4). This requirement comes from the Clean Water Act administered by EPA. Because development activities contribute to the discharge of pollutants, the NPDES permit requires that the City of Knoxville encourage, promote, and require implementation of certain practices and procedures for the purpose of reducing or limiting discharge of pollutants to stormwater channels. City ordinances and standards were developed and adopted specifically to address stormwater quality concerns. The Land Development Manual is an important element in the city's effort to improve residential and commercial design and construction practices. The principal ordinances and standards for the City of Knoxville that affect the selection of stormwater control measures are:

- A. NPDES Stormwater Discharge Permit No. TNS068055 (also called NPDES MS4 Permit), originally issued by TDEC Division of Water Pollution Control for the City of Knoxville and effective on July 1, 1996. This permit is renewable every 5 years by TDEC, and each new permit may contain stricter requirements for pollution control and stormwater monitoring due to changing federal laws, regulations and guidelines.



- B. Stormwater and Street Ordinance (Sections 22.5-1 through 22.5-54), initially issued on June 1997 and as further amended (Chapter 22.5 of the Knoxville City Code).
- C. Knoxville Best Management Practices (BMP) Manual, initially issued on January 2001 and as further amended.

1.4 Design Objectives

The overall intent of the Land Development Manual is to ensure that minimum requirements are met with respect to development and redevelopment activities. These minimum requirements shall be enforced in a fair and impartial manner, based upon sound engineering judgment and concerns for the public safety and welfare. A list of design objectives will include:

1. Safe and functional design of roads, streets, driveways, and parking lots.
2. Safe and functional design of sidewalks, walkways, trails and other pedestrian routes.
3. Safe and functional design of curb and grate inlets, culverts, pipes and open channels.
4. Minimize flooding, interruptions of utility service, traffic inconvenience and potential water damage to residences and businesses within the City of Knoxville.
5. Minimize the amount of public expenditures needed for maintenance of streets and roads, flood control projects, flood relief efforts, and stormwater facility maintenance.
6. Preservation of trees, woods, natural meadows and other green spaces as much as possible (in conjunction with allowable land uses and zoning codes).
7. Protect and enhance streams, wetlands, waterways and rivers for wildlife and plants by reducing stormwater pollution, erosion, and negative stormwater impacts.
8. Promote development of recreational facilities and design aesthetics along streams, waterways, wooded areas and other greenways to benefit local neighborhoods.

1.5 Engineering Design Accountability

The Land Development Manual contains information to assist in the design and layout of most projects. However, this manual does not replace or otherwise excuse the need for professional engineering judgment and knowledge. The user of this manual is hereby cautioned that many aspects of engineering design must be considered, including but not limited to:

- Public health and safety.
- Site-specific conditions or unusual features of project site that warrant special designs.
- Current versions of design texts, manuals, technical documents and research.

Most types of construction plans must be stamped and signed by a professional engineer actively licensed in the state of Tennessee. Site layout and grading plans may be stamped and signed by a professional landscape architect licensed in the state of Tennessee. The design professional must have sufficient education and experience to perform a complete and thorough design of each element shown on the construction plans, and he must also have complete control to change or alter plans during the design phase. The professional's stamp is a public guarantee that his design has the highest regard for health and safety, protects the environment (air, soil, water) to the maximum degree possible, and serves the interests of the general public within Knoxville.



The City of Knoxville requires a certain level of design expertise for stormwater calculations and flooding analyses. Stormwater design criteria are based upon current scientific knowledge and engineering judgment. It should be realized by engineering designers that floods and flooding may occur at any time due to any number of factors beyond the reasonable control of the city, such as: greater amounts of precipitation or different rainfall patterns than used in design storms, wet soil conditions, debris or blockage of key stormwater channels, high groundwater tables, etc.

1.6 Legal Aspects

If any portion of the Land Development Manual is ruled to be invalid or unconstitutional by any court with adequate jurisdiction over the City of Knoxville, then such portion shall be considered to have been selectively removed from this manual without affecting the manual's overall applicability and legal standing to the land development process. The Land Development Manual will be revised on a periodic basis to reflect known changes to laws and regulations.

All local, state and federal laws and regulations shall be considered when interpreting provisions within the Land Development Manual. In each instance, the more restrictive requirement shall govern unless sound engineering judgment can determine and prove that the more restrictive requirement would be otherwise unnecessary. In most instances, laws and regulations that are phrased more explicitly shall apply over those items that are not phrased as precisely.

1.7 Language and Interpretation of Text

The following language rules are applicable to the Land Development Manual:

- A. The imperative case is always mandatory. The words "shall" and "must" are always mandatory. These actions must be performed unless sufficient engineering justification is submitted to city officials within the Stormwater Engineering Division and written approval has been specifically granted.
- B. The word "should" indicates an action that is highly recommended under most conditions. The word "may" indicates an allowable action or choice that is usually beneficial in meeting the minimum city requirements.
- C. Use of the singular or plural case of a noun will not affect the applicability of this manual, or any other law, regulation, or ordinance, unless the context of the sentence specifically indicates that the singular/plural case affects the intended use or function on a scientific or engineering basis. The use of a singular or plural noun does not necessarily indicate whether to design or construct a single unit or multiple units.
- D. Any reference to the Director of Engineering shall also mean the duly authorized representatives, sections or employees under his supervision who have the delegated responsibility. Areas of delegated responsibility may include, but is not limited to: review and approval of plans, review and approval of survey plats, definition of standards or requirements, approval of special conditions, review and issuance of permits, inspections and field investigations, enforcement actions, issuing notices of violation, conduct of public meetings, etc.



- E. Within the Land Development Manual, the term “Knoxville” or “City of Knoxville” shall refer to an official of the Stormwater Engineering Division (in the Engineering Department) with the appropriate responsibility and authority for the particular action or judgment.
- F. The term “development” shall generally include changes or improvements to any property that has already been developed previously. In other words, this manual also applies to redevelopment, structural additions, paving, regrading, etc. The term “redevelopment”, as used in the Knoxville Stormwater & Street Ordinance, specifically refers to the improvement by 50% of the assessed value of the lot, building and/or lot use.
- G. The terms "property", "lot", "parcel" and "plot" are generally used interchangeably to refer to a single undivided portion of land that is either legally recorded in the Knox County property records, or is being proposed in good faith by well-prepared plan drawings for the purpose of being legally recorded. In each instance, it is the responsibility of the property owner (or his agent) to see that property is legally recorded at the Knox County Register of Deeds.
- H. The terms "building" and "structure" are used interchangeably throughout the Land Development Manual, even though there are differences in the definitions listed in the Knoxville Zoning Ordinance and in the Knoxville Flood Damage Prevention and Control Ordinance.

In general, all words in the Land Development Manual shall have the common dictionary meanings and definitions. In addition, Tables 15-1 and 15-2 will assist the reader in locating many technical definitions contained at other locations outside of the Land Development Manual (i.e., commonly used regulations and ordinances for site development).

Common abbreviations and acronyms are listed at the beginning of the Land Development Manual. In some instances, the abbreviation or acronym is only introduced once if in common usage; in other cases, the abbreviation or acronym is spelled out each time it is used.