



CITY OF KNOXVILLE

**LAND  
DEVELOPMENT  
MANUAL**

**CITY OF KNOXVILLE  
ENGINEERING DEPARTMENT  
STORMWATER ENGINEERING DIVISION**



## REVISIONS

The Knoxville Land Development Manual (LDM) is published and maintained by the Stormwater Engineering Division. The following timeline shows the list of revision dates:

Date		<b>Development of the Knoxville Land Development Manual</b>
February 2002 ★	Rev. 0	Initial distribution of the Land Development Manual. The local engineering community is notified by letter and in the annual Engineering Development Seminar. <b>The Knoxville Land Development Manual is now ready for use.</b> Please reference the publish date as “ <b>February 2002</b> ”.
August 2002	Rev. 1	Minor corrections and grammar fixes. Revised the plans review and plat review checklists. Revised Policy #17 and added Policy #20.
February 2003	Rev. 2	Revised the plat review checklist. Added a new form for Property Owner Acknowledgement. Revised Policy #17.
June 2003 ★	Rev. 3	<b>Extensive revisions</b> to match the revised Stormwater & Street Ordinance, the reissued NPDES municipal permit, the revised Knoxville BMP Manual, and other state/federal regulations.
December 2003	Rev. 4	Revisions to the Flood Damage Prevention and Control Ordinance (Chapter 12 of City Code) was approved by City Council on 12/09/03. Ordinance reference callouts are corrected at the end of each section for the Stormwater & Street Ordinance, which was revised by City Council on 5/13/03.
May 2004	Rev. 5	Withdrew Policy 13 (Sixty-Day Letter) and Policy 24 (Plat Procedure For Residential Subdivision) as being inconsistent with city ordinances. Revised the table of contents, Chapter 2, Figures 2-2 through 2-4, site development review checklist, plat review checklist, Appendix C flysheet, and Policy 12.
July 2004	Rev. 6	Revised Policy 22 (Stream Buffer Zone) within Appendix C.
May 2005	Rev. 7	Revised the Stormwater and Street Ordinance in Appendix B. Very minor corrections and format change to the other 3 ordinances in Appendix B.
November 2005	Rev. 8	Added new Policy 24 (Appealed Concept Plan) within Appendix C.
March 2006	Rev. 9	Revised Forms A, E, I, K, L and N within Appendix A. Revised Policy 24 (Appealed Concept or Use-on-Review Plan) within Appendix C.
June 2006	Rev. 10	Revised Forms E, F, M1 and M2 within Appendix A. Revised Policies 12 (Sinkhole Development) & 15 (Stormwater Message for Curb Irons and Manhole Lids) within Appendix C.
November 2006	Rev. 11	Revised Chapter 11 (Floodplain Design) and Policy 14 (Stormwater Enforcement Guidelines) within Appendix A.
December 2006	Rev. 12	Revised Policy 7 (Maintenance Responsibility for Stormwater Drainage Systems) within Appendix C.

**REVISIONS (continued)**

The Knoxville Land Development Manual (LDM) is published and maintained by the Stormwater Engineering Division. The following timeline shows the list of revision dates:

<b>Date</b>		<b>Development of the Knoxville Land Development Manual</b>
April 2007	Rev. 13	Revised Forms M2, M3 M4 and M5 within Appendix A.
April 2008	Rev. 14	Revised Forms A, B, E1 and F within Appendix A. Added Form E2 (Site Development Submittal Review Checklist) within Appendix A.
September 2008	Rev. 15	Revised Policy 16 (Stormwater Pipe Materials) within Appendix C.
April 2009	Rev. 16	Revised Policy 8 (Partial Plat Process) and added new Policy 25 (Post-Construction Water Quality Control for Proprietary Flow-Through Best Management Practices (BMP's) within Appendix C.
July 2009	Rev. 17	Revised Form N within Appendix A.
September 2009	Rev. 18	Revised Form E1 (Site Development Review Checklist) within Appendix A and Policy 7 (Maintenance Responsibility for Stormwater Drainage Systems) within Appendix C.
October 2009	Rev. 19	Revised Policy 25 (Post-Construction Water Quality Control for Proprietary Flow-Through Best Management Practices (BMP's) and added new Policy 25 List A - Sizing Guidelines within Appendix C.
December 2009	Rev. 20	Revised Policy 17 (Survey Control System Requirements) within Appendix C.
January 2010	Rev. 21	Revised Form E1 (Site Development Review Checklist) within Appendix A.
March 2010	Rev. 22	Revised Form G (Site Inspection Checklist) and Form H (Development Certification Checklist) within Appendix A and Policy 25 List A (Sizing Guidelines) in Appendix C.
April 2010	Rev. 23	Revised Policy 25 List A (Sizing Guidelines) and added Policy 26 (Utility Maintenance and Construction), both within Appendix C.
June 2010	Rev. 24	Revised Policy 25 List A (Sizing Guidelines) within Appendix C.
April 2011	Rev. 25	Revised Policy 25 List A (Sizing Guidelines) within Appendix C.
July 2011	Rev. 26	Revised Policy 25 List A (Sizing Guidelines) within Appendix C.
December 2011	Rev. 27	Revised Policy 25 List A (Sizing Guidelines) within Appendix C.
March 2012	Rev. 28	Revised Form B within Appendix A and Revised Hyperlinks for Appendix B – Selected City Ordinances for Land Development.
June 2012	Rev. 29	Replaced Policy 14 (Stormwater Enforcement Guidelines) with Policy 14 (Stormwater Enforcement Response Plan) within Appendix C.

**REVISIONS (continued)**

The Knoxville Land Development Manual (LDM) is published and maintained by the Stormwater Engineering Division. The following timeline shows the list of revision dates:

<b>Date</b>		<b>Development of the Knoxville Land Development Manual</b>
July 2012	Rev. 30	Revised Policy 14 (Stormwater Enforcement Guidelines) and Policy 25 List A - Sizing Guidelines within Appendix C.
October 2012	Rev. 31	Revised Policy 21 (No-Fill Line) within Appendix C.
February 2013	Rev. 32	Revised Chapter 11 (Floodplain Design) within the Main Text, Revised Form F (Plat Review Checklist) within Appendix A, Revised Policy 25 List A (Sizing Guidelines) within Appendix C, and Removed Policy 22 (Stream Buffer Zone (Restricted-Use)) in Appendix C.
March 2013	Rev. 33	Added new Policy 27 (Qualified Local Program Construction General Permit) within Appendix C.
April 2013	Rev. 34	Revised Policy 14 (Stormwater Enforcement Guidelines) and Policy 25 List A - Sizing Guidelines within Appendix C.
June 2013	Rev. 35	Revised Policy 17 (Survey Control System Requirements) Policy 25 List A - Sizing Guidelines and Policy 27 (Qualified Local Program Construction General Permit) within Appendix C.
July 2013	Rev. 36	Revised Chapter 5 (Permitting Requirements) within the main text and Form F (Plat Review Checklist), Form Q (NOI/SWPPP Review Checklist) & Policy 5 (Easements for Stormwater Control and Water Quality Facilities within Appendix C.
October 2013	Rev. 37	Revised Form A (Site Development Permit Application), Form B (Property Owner Acknowledgement) and Form F (Plat Review Checklist) within Appendix A.
December 2013	Rev. 38	Revised Form F (Plat Review Checklist) within Appendix A.
January 2014	Rev. 39	Revised Form M2 (SPAP - Food Handling & Processing Facilities), Form M3 (SPAP - Vehicle & Equipment Facilities), Form M4 (SPAP - Vehicle Wash Facilities) and Form M5 (SPAP - Large Parking Lot Facilities) within Appendix A and Revised the Stormwater and Street Ordinance in Appendix B to reflect Ordinance O-112-2013 adopted June 25, 2013.
May 2014	Rev. 40	Revised Policy 16 (Stormwater Pipe Materials) within Appendix C and Abbreviations and Acronyms within the Main Text.
July 2014	Rev. 41	Revised Policy 17 (Survey Control System Requirements) within Appendix C.
July 2014	Rev. 42	Revised Policy 9 (Performance and Indemnity Agreement) within Appendix C.
August 2014	Rev. 42	Revised application in Policy 8 (Partial Plat Process) within Appendix C.
September 2014	Rev. 44	Revised Policy 20 (No-Rise Certification for Floodway Encroachment) within Appendix C.

**REVISIONS (continued)**

The Knoxville Land Development Manual (LDM) is published and maintained by the Stormwater Engineering Division. The following timeline shows the list of revision dates:

<b>Date</b>		<b>Development of the Knoxville Land Development Manual</b>
October 2014	Rev. 45	Revised Policy 25 List A (Sizing Guidelines) within Appendix C.
June 2015	Rev. 46	Revised Policy 7 (Maintenance Responsibility for Stormwater Drainage Systems) within Appendix C.
September 2015	Rev. 47	Revised Policy 16 (Stormwater Pipe Materials) within Appendix C.
July 2016	Rev. 48	Revised Policy 8 (Partial Plat Process) within Appendix C.
September 2016	Rev. 49	Added Policy 28 (Utility Access Driveways) within Appendix C.
January 2017	Rev. 50	Revised Form H (Development Certification Checklist) within Appendix A.
January 2018	Rev. 51	Revised Form M1 (SPAP – General Permit), Form M2 (SPAP - Food Handling & Processing Facilities), Form M3 (SPAP - Vehicle & Equipment Facilities), Form M4 (SPAP - Vehicle Wash Facilities) and Form M5 (SPAP - Large Parking Lot Facilities), Form O (Notice of Intent (NOI)), and Form Q (NOI/SWPPP Review Checklist) within Appendix A; Policy 5 (Easements for Stormwater Control and Water Quality Facilities), Policy 6 (Maintenance Access for Stormwater Management Facilities), Policy 8 (Declaration Document Process), Policy 16 (Stormwater Pipe Materials) and Policy 25-A (Policy 25 List A - Sizing Guidelines) within Appendix C; and the Stormwater and Street Ordinance in Appendix B to reflect Ordinance O-281-2017 effective December 22, 2017.
February 2018	Rev. 52	Revisions to the Flood Damage Prevention and Control Ordinance (Chapter 12 of City Code) in Appendix B to reflect Ordinance O-22-2018 effective February 27, 2018.
April 2018	Rev. 53	Withdrew Form B (Property Owner Acknowledgement), Form D (Information Worksheet for CPMSF (Covenants), Form I (Construction Right-Of-Way Permit), Form J (Construction Right-Of-Way Permit), Form K (Site Development Permit), and Form L (Notice of Violation (NOV) Form) within Appendix A.  Revised Appendix A Index Sheet, Form C (Fee Computation Worksheet), Form N (FEMA Elevation Certificate and Instructions), and Added Form S (Erosion Prevention and Sediment Control (EPSC) Plan for Small-Single Family Lots) within Appendix A and Revised Appendix C Index Sheet within Appendix C.
November 2018	Rev. 54	Revised Form A (Permit Application) within Appendix A.
January 2019	Rev. 55	Revised Policy 17 (Survey Control Requirement) within Appendix C.
April 2019	Rev. 56	Revised Policy 25 (Post-Construction Water Quality Control for Proprietary Flow-Through Best Management Practices (BMPs)) within Appendix C.

**REVISIONS (continued)**

The Knoxville Land Development Manual (LDM) is published and maintained by the Stormwater Engineering Division. The following timeline shows the list of revision dates:

<b>Date</b>		<b>Development of the Knoxville Land Development Manual</b>
July 2019	Rev. 57	Revisions to the Stormwater and Street Ordinance (Chapter 22.5 of City Code) in Appendix B to reflect Ordinance O-83-2019 effective June 4, 2019 and Revisions to the Flood Damage Prevention and Control Ordinance (Chapter 12 of City Code) in Appendix B to reflect Ordinance O-97-2019 effective July 2, 2019.
August 2019	Rev. 58	Revised Policy 5 (Easements for Stormwater Control and Water Quality Facilities) within Appendix C.
March 2020	Rev. 59	Revised Policy 17 (Survey Control Requirement) within Appendix C.
August 2020	Rev. 60	Revised Chapter 5 (Permitting Requirements) within the main text.
November 2020	Rev. 61	Revised Form A (Permit Application) and Form C (Fee Computation Worksheet) within Appendix A and Revisions to the Stormwater and Street Ordinance (Chapter 22.5 of City Code) in Appendix B to reflect Ordinance O-151-2020 effective October 20, 2020.
July 2021	Rev. 62	Revised Form A (Permit Application) within Appendix A and Revisions to the Flood Damage Prevention and Control Ordinance (Chapter 12 of City Code) in Appendix B to reflect Ordinance O-170-2020 effective November 17, 2020.
February 2022	Rev. 63	Revised Policy 10 (Retaining Walls) in Appendix C and the List of Figures and Tables and Chapter 2 (Plan and Plat Review) within the main text.
August 2022	Rev. 64	Revised Form O (Notice of Intent (NOI)) within Appendix A.
October 2022	Rev. 65	Removed Chapter 1 (Introduction), Chapter 2 (Plan and Plat Review), Chapter 3 (Available Resources), Chapter 4 (Property Regulations), Chapter 5 (Permitting Requirements), Chapter 7 (Large Residential and Commercial), Chapter 8 (Overall Stormwater Planning), Chapter 11 (Floodplain Design) and Chapter 15 (Definitions and References) within the main text; replaced Policy 4 (Drainage Easements), Policy 5 (Easements for Stormwater Control and Water Quality Facilities) and Policy 6 (Maintenance Access for Stormwater Management Facilities) with Stormwater Easements policy within Appendix C; removed Policy 15 (Stormwater Message for Curb Irons and Manhole Lids), Policy 23 (List of Studied Streams), and Policy 24 (Appealed Concept or Use-On-Review Plan) within Appendix C, and added policies Permit Application Process, Permits for Utility Construction, Permits for Utility Maintenance, Permit Construction in the Right-of-Way, Temporary Traffic Control Permit, and Street Lighting and Overhead Wiring in the Central Business Improvement District; and removed numbering from all policies within Appendix C.
November 2022	Rev. 66	Removed Form E1 (Site Development Review Checklist) and Form E2 (Site Development Submittal Checklist) and Added Form E (Site Development Permit Checklist) within Appendix A.

**REVISIONS (continued)**

The Knoxville Land Development Manual (LDM) is published and maintained by the Stormwater Engineering Division. The following timeline shows the list of revision dates:

<b>Date</b>		<b>Development of the Knoxville Land Development Manual</b>
July 2023	Rev. 67	Revised Appendix A Index, Fee Computation Worksheet for Site Development Form, Minimum Submission Checklist for Commercial and Large Residential Site Development Permits Form and Added Withdrawn Forms within Appendix A and Revisions to the Flood Damage Prevention and Control Ordinance (Chapter 12 of City Code) in Appendix B to reflect Ordinance O-51-2023 effective March 21, 2023 and Revisions to the Stormwater Ordinance (Chapter 22.5 of City Code) in Appendix B to reflect Ordinance O-101-2023 effective July 11, 2023.
August 2023	Rev. 68	Revised Appendix C Index, removed Stormwater Pipes Materials policy and replaced said policy with Stormwater Pipe Design and Installation policy, and added Attenuation Requirements For Substantial And Additional Development policy within Appendix C.
November 2023	Rev. 69	Revised Site Development Permit Checklist form within Appendix A.



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*The Stormwater Engineering Section Policies (in Appendix C) also contain many tables which are not listed on this page.*



## **LIST OF ABBREVIATIONS AND ACRONYMS**

AASHTO	American Association of State and Highway Transportation Officials
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
AMC	Antecedent Moisture Conditions
ANSI	American National Standards Institute
ARAP	Aquatic Resource Alteration Permit (which is a TDEC permit)
ASTM	American Society for Testing and Materials
BEA	Board of Environmental Appeals
BFE	Base Flood Elevation
BMP	Best Management Practice
BZA	Board of Zoning Appeals
CADD	Computer Aided Drafting & Design
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Register
CLOMA	Conditional Letter of Map Amendment
CLOMR	Conditional Letter of Map Revision
CMP	Corrugated Metal Pipe
CN	Curve Number
COK	City of Knoxville
CPI	Coalescing Plate Interceptor (oil/water separator)
CPMSF	Covenants for Permanent Maintenance of Stormwater Facilities
CRS	Community Rating System
CWA	Clean Water Act
DCIA	Directly Connected Impervious Area
ESCP	Erosion and Sediment Control Plan
FBFM	Flood Boundary and Floodway Map
FEMA	Federal Emergency Management Administration
FFE	Finished Floor Elevation
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information Systems (see KGIS)
H:V	Horizontal to Vertical (ratio that indicates slope steepness)
HDPE	High-Density Polyethylene (pipe)
HDS	Hydraulic Design Series (published by FHWA)
HEC	Hydraulic Engineering Circular (published by FHWA)
HEC	Hydraulic Engineering Center (USACE water research organization)
HEC-HMS	Hydraulic Modeling System (USACE software program, equivalent to HEC-1)
HEC-RAS	River Analysis System (USACE software program, equivalent to HEC-2)

HGL	Hydraulic Grade Line
HHW	Household Hazardous Waste Collection Center (City of Knoxville)
HUC	Hydrologic Unit Code (used by USGS to label river watersheds)
JPE	Joint Permanent Easement
KGIS	Knoxville/Knox County/KUB Geographic Information Systems
KUB	Knoxville Utilities Board
KZO	Knoxville Zoning Ordinance
LDM	Land Development Manual
LHW	Licensed Hazardous Waste Contractor
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LRCD	Large Residential and Commercial Development
MPC	Metropolitan Planning Commission
MRP	Major Road Plan
MSDS	Material Safety Data Sheet
MSR	Minimum Subdivision Regulations of Knoxville and Knox County
MS4	Municipal Separate Storm Sewer System (a designation used by USEPA)
MUTCD	Manual on Uniform Traffic Control Devices
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	National Resources Conservation Service (formerly called SCS)
OSHA	Occupational Safety and Health Administration
PE	Professional Engineer (licensed in the State of Tennessee)
PIA	Performance and Indemnity Agreement (also called construction bond)
RCP	Reinforced Concrete Pipe
RCRA	Resource Conservation and Recovery Act
RLS	Registered Land Surveyor (licensed in the State of Tennessee)
ROW	Right-Of-Way (or also sometimes “R/W”)
RQ	Reportable Quantity
RUSLE	Revised Universal Soil Loss Equation
SARA	Superfund Amendments and Reauthorization Act (Right-to-Know)
SCS	Soil Conservation Service (now called NRCS)
SFHA	Special Flood Hazard Area
SOP	Standards of Practice (state regulations for land surveyors)
SPAP	Special Pollution Abatement Permit
SPCC	Spill Prevention Control and Countermeasures
SSO	Sanitary Sewer Overflow
SSFR	Small Single Family Residential (Development)
SWMF	Solid Waste Management Facility (on Elm Street)
SWPPP	Stormwater Pollution Prevention Plan

TCA	Tennessee Code Annotated
TCP	Traffic Control Plan
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
TMDL	Total Maximum Daily Load
TPO	(Knoxville Regional) Transportation Planning Organization
TR-55	Technical Release 55 (June 1986, SCS - a standard drainage reference)
TTCP	Temporary Traffic Control Permit
TVA	Tennessee Valley Authority
UGST	Underground Storage Tank
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UT	University of Tennessee
WSE	Water Surface Elevation
WZTCP	Work Zone Traffic Control Policy

Abbreviations for units that are commonly used throughout the BMP Manual:

Ac	Acres	Area
Ac-ft	Acre-feet	Volume
Cfs	Cubic feet per second	Flow
Fps	Feet per second	Velocity
Ft	Feet	Length
Gpm	Gallons per minute	Flow
Mg/l	Milligrams per liter	Concentration
Ppm	Parts per million	Concentration
Sf	Square feet	Area
Sq.mi.	Square miles	Area
° F	Degrees Fahrenheit	Temperature



## Chapter 6

### SMALL SINGLE FAMILY RESIDENTIAL DEVELOPMENT

#### 6.1 Overview of SSFR

Small Single Family Residential (SSFR) development is defined as the development of a single recorded residential lot (single-family house or duplex unit) with less than 10,000 square feet of disturbed area. The entire property is assumed to be disturbed until a site plan is submitted to indicate differently. The site plan must be submitted on a topographic map with 2-foot contours (such as the computer-generated maps available from the Technical Services Counter, Chapter 3), but the topographic requirements are not as rigorous as other types of site development.

The site plan is not required to be stamped by a design professional, unless additional information is specifically required due to unusual circumstances, such as complicated stormwater drainage structures or retaining walls over 4' high. A formal erosion and sediment control plan is not needed, although adequate erosion control measures must be used to ensure that no sediment leaves the property. A stormwater detention basin is not required unless there are known drainage problems in the immediate downstream vicinity and it is determined by the Stormwater Engineering Division that a detention basin is the only feasible solution. The presence of a sinkhole or drainage problems may require a drainage study by a professional engineer. In general, residential development does not require a construction bond. However, a construction bond may be required for steep sites with known erosion or drainage problems.

In many cases, the property owner or developer does not want to perform any site grading, utility work, clearing of vegetation, driveway work, or other improvements prior to starting the actual house construction. If this is the case, then a Site Development Permit can be obtained as part of the process of getting a Building Permit from the Inspections Bureau (Suite 505, City County Building). The Inspections Bureau can serve as a "one-stop shop" for the various permits and inspections for Small Single Family Residential projects.

#### 6.2 Plan Submittal Requirements

A typical SSFR site development plan, without unusual grading or drainage problems, will consist of the following steps:

1. Obtain a topographic map at a suitable scale from the Technical Services Counter (4<sup>th</sup> floor City County Building) or from the Engineering Department directly. Carefully draw the location footprint of any proposed structures (house, garage, shed, driveway). Indicate areas where existing trees and vegetation will be cleared. Show areas where utilities will be located, and whether excavation is necessary to construct a basement. Indicate locations on the site where the ground elevation will change (as either cut or fill). This map will serve as the site plan.

2. Fill out the top half of the Site Development Permit Application (Form A). The bottom half of the form is for larger projects; most of these items do not necessarily apply to SSFR development. The principal exception is for floodplains and stream buffer zones, which will be determined by the city plans reviewer based on FEMA maps and profiles during review.
3. Submit topographic map and the permit application to the 4<sup>th</sup> floor of the City County Building. In most cases, the city plans reviewer will check the permit application as you wait. Erosion control measures (silt fence, construction entrance, straw bale) will be added to the topographic map if warranted. The city plans reviewer will conduct a quick check for nearby drainage problems, sinkholes, floodplains and stream buffer zones. A site development permit fee of \$10 will be charged for SSFR development.
4. If the property is located within or next to a floodplain, then the applicant must obtain a Floodplain Development Permit (Form H). This permit is free, and merely gives information about the required minimum floor elevations. The applicant is required to obtain a Flood Elevation Certificate (Form N), with surveyed floor elevations, soon after the structure has been built.
5. If any construction occurs within the public right-of-way, then another permit is also needed. A Construction Right-Of-Way Permit (Form I) can be obtained from the Inspections Bureau (5<sup>th</sup> floor City County Building). The applicant will specify the type of driveway, sidewalk, and utilities involved during construction. A fee will be computed based on any disturbance to public property within the right-of-way.

### 6.3 Typical Concerns

The following items are the most frequently observed problems with SSFR site plans.

- A. Fixed structures may not be constructed within public right-of-way, since these structures may pose a hazard to the driving public. This includes: retaining walls, fences, signs, sign posts, playground equipment, etc.
- B. Brick or masonry mailboxes may not be placed within public right-of-way. Only wooden 4"x4" posts or other "breakaway" designs may be used for mailboxes located within public right-of-way. Brick mailboxes are a safety hazard if located within 10 feet of the street pavement.
- C. The City of Knoxville requires that driveway aprons and driveway connections must be paved within the public right-of-way line. Gravel driveways that "wash out" into the street are unacceptable.
- D. Stormwater drainage channels (such as ditches, swales or ravines) should be stabilized using grass sod or check dams as soon as possible. Filter all stormwater that leaves the project site using silt fence or straw bales.
- E. The City of Knoxville does not allow open burning, unless a special exemption has been obtained in advance from the Knoxville Fire Department. Therefore, trees and vegetation can either be taken to a waste transfer station or landfill, or can be chipped on site to use as mulch.



## Chapter 9 STORMWATER DESIGN

### 9.1 Hydrology Methods

Table 9-1 shows the various hydrologic computation methods that can be used to compute peak flows in the City of Knoxville. The NRCS Unit Hydrograph method is specifically cited for drainage computations in the Knoxville Stormwater and Street Ordinance (Sections 22.5-21 and 22.5-33), using 24-hour Type II rainfall distribution and AMC II soil conditions. The NRCS method is used to compute a peak flow for sizing stormwater conveyances or to generate a hydrograph for the purposes of detention routing.

<b>Table 9-1 Hydrology Design Methods</b>				
<b>Method</b>	<b>Drainage Area</b>	<b>Time of Concentration</b>	<b>Impervious</b>	<b>Design Storms</b>
Rational	< 50 acres	-- any --	0% to 100%	2 to 500 years
<b>NRCS Unit Hydrograph</b>	-- any --	-- any --	CN 40 to 98	1 to 500 years
TVA Regression Equations	> 230 acres	N / A	< 75%	2 to 500 years
USGS Regression Equations	> 135 acres	N / A	< 75%	2 to 100 years

Uses for the various hydrologic computation methods are discussed in the Knoxville BMP Manual. The NRCS Unit Hydrograph method shall be used for all design calculations, but other methods may be consulted for sizing stormwater conveyances (particularly if conservative values and assumptions are used). For equations, consult the Knoxville BMP Manual at these locations:

- NRCS Unit Hydrograph      ST-10, Detention Computations
- NRCS Unit Hydrograph      ST-11, Detention Example for Spreadsheet
- NRCS Unit Hydrograph      ST-12, Detention Example for HEC-1 & HEC-HMS
- Rational, TVA, USGS        ST-13, Other Hydrologic Computations

The NRCS Unit Hydrograph shall be used with average antecedent moisture conditions (AMC II) and Type II rainfall distribution, as specified by the NRCS Technical Release 55 (TR-55) publication from June 1986. The NRCS was formerly called the Soil Conservation Service (SCS), part of the United States Department of Agriculture. The TR-55 publication (Urban Hydrology for Small Watersheds) is the principal technical reference to be downloaded from NRCS: <http://www.wcc.nrcs.usda.gov/hydro/hydro-tools-models-tr55.html>

## 9.2 Functional Design of Stormwater Drainage Systems

In selecting the design frequency storm, the following criteria (listed in the order of being progressively more restrictive) will be used:

- Longitudinal side drains shall be designed for a 10-year frequency flood, providing that no residential or commercial structures are flooded by a 100-year flood.
- Roadway cross-drains for all local streets and collector streets shall be designed for a 25-year frequency flood, providing that no structures are flooded by a 100-year flood.
- Roadway cross-drains for arterial streets or a higher street classification shall be designed for a 50-year flood, provided that no structures are flooded by a 100-year flood.
- All bridges, structures, or embankments in floodways designated as part of the Federal Flood Insurance Study shall be designed to pass a 500-year frequency flood without raising the existing 500-year flood profile.

In instances where the contributing drainage area is 200 acres or greater, the 100-year design storm shall also be computed and analyzed, even though the design storm is a lesser storm event. The 100-year design storm will typically be carried by a combination of the installed stormwater drainage system and some form of overland relief flow, typically streets and roads which can temporarily store or convey excess stormwater runoff. Another form of overland relief flow, commonly used in residential subdivisions, are the drainage swales between houses and through neighborhoods. The 100-year design storm (for areas greater than 200 acres) must be contained within a permanent drainage easement or public right-of-way. State highways and interstates are generally capable of passing 100-year design storm safely with a minimum freeboard of 1 feet.

## 9.3 Design of Open Channels

Manning's equation is the principal means for determining flow capacity and velocity in open channels. Knoxville BMP Manual contains guidance, equations, and coefficients for designing open channels in ES-22 (Channel Linings) and ES-23 (Riprap). Table ES-22-4 lists permissible velocities for various channel lining materials and types of grass. Grass channels are often designed using retardance classifications to determine Manning's roughness coefficient based on the product of hydraulic radius times velocity, an iterative process for which spreadsheets are useful. Grass channels should be analyzed for mowed conditions (when velocity is greatest) and unmowed conditions (when flow depth is greatest) to verify adequacy of design.

A minimum 6" freeboard for the design storm is required for ditches and open channels that are adjacent to streets and roads. This will help to ensure that the pavement subgrade is not repeatedly inundated by smaller design storms, which can eventually lead to damage or failure of the pavement subgrade. When two open channels join together, some form of riprap or other armored surface may be provided. Consult ES-25 (Outlet Protection) in the Knoxville BMP Manual for typical energy dissipators and stilling basins.

## 9.4 Design of Curb and Grate Inlets

Use of City of Knoxville standard inlets or TDOT standard inlets is required within all public rights-of-way or drainage easements. This allows easy repair or replacement of any damaged grates and curbs using standard off-the-shelf items. Use of standard inlets on private property is encouraged for reasons of structural reliability, ease of maintenance, common availability and standardized installation methods. See City of Knoxville standard details COK-10 and COK-11 (on the City Engineering Division webpage) for frames/grates/inlets at locations with 24" wide concrete gutter, with the required "No Dumping - Drains to River" stormwater message.

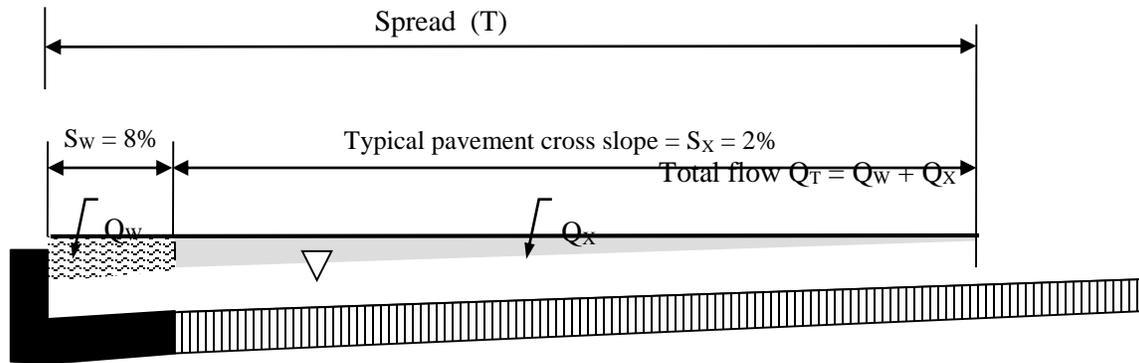
The designer must locate street inlets to quickly drain stormwater from paved surfaces, keeping streets passable and safe for vehicular traffic. Street inlets must be spaced and located in a manner to carefully balance vehicle safety, drainage system capacity, economics and efficiency. Maximum inlet spacing is generally 300 feet unless proven otherwise by computations. Inlets should be located at uphill corners of each street intersection to prevent sheetflow of stormwater. The basic geometry of stormwater flow along curbs is a thin shallow triangular cross-sectional area. If the section contains curb and gutter, then the stormwater flow is a composite shape formed by both concrete and asphalt surfaces, for which Manning's equation is still applicable. See Figure 9-1 for basic geometric considerations in computing gutter flow depth and velocity.

Based upon the longitudinal slope of the gutter and the cross slope of the street, the gutter flow will spread across the street. The spread impacts vehicular traffic in a negative way, causing vehicles to hydroplane or to pull in one direction. Basic references for computing spreads, inlet capacities, and interception rates for curb and grate inlets are FHWA Hydraulic Engineering Circular No. 12, *Drainage of Highway Pavements* (March 1984), or FHWA Hydraulic Engineering Circular No. 22, *Urban Drainage Design Manual* (November 1996). Both references can be downloaded in Acrobat format at the FHWA website:

<http://www.fhwa.dot.gov/bridge/hydpub.htm>

Detailed inlet computations are usually not required for local residential streets and alleys, except at sag locations where potentially inadequate inlets could flood nearby houses and buildings. Slow design speeds on local streets usually minimize the impact of spread and hydroplaning, although local streets do tend to have steeper approach slopes for intersections. Typical considerations for inlet design include:

1. Place inlets at all sag locations and other depressed areas to ensure positive drainage. Compute flow capacity of the inlet by ponding stormwater to a depth not higher than top of curb. Use orifice equation (with actual open area of grate) and weir equation (open perimeter of grate) to determine flow capacity of inlet. Ensure that ponded water does not flood nearby structures, buildings, or houses. Flanking inlets, at an offset distance of 25' or 50', are desirable in sag locations with large flow rates. A combination inlet (curb + grate opening) is less likely to clog at sag locations.



Curb and Gutter Section (composite flow)

**Figure 9-1**  
**Street Pavement Drainage Section**

2. Place inlets at street intersections to prevent stormwater from flowing across a street or entrance. This is particularly important wherever a local street intersects a larger street, such as a collector or arterial. Valley gutters across street intersections are not allowed, unless specifically requested for very short dead-end streets or cul-de-sacs.
3. Select standard grates and avoid using grates with unusual shapes or configurations, such as beehive or raised designs. Install standard sizes of manholes and inlet tops. Grate openings should be oriented to allow for safe bicycle traffic.
4. Curb and grate inlets have a much higher interception rate for streets with relatively flat grades. Therefore, all other considerations being equal, inlets along steep sections of roadway are not as effective in intercepting stormwater.
5. Maintain a minimum curb and gutter longitudinal slope of 0.5% if possible to keep positive drainage. When designing a flat stretch of street, the street designer may incorporate a gently rolling vertical profile to maintain positive drainage (along with placement of additional inlets).

## 9.5 Design of Storm Drainage Systems

Manning's equation is typically used to compute non-pressurized flow in pipes and storm drainage systems where inlets and headwalls are closely spaced to allow atmospheric pressure throughout the entire system. Computations for each pipe should be performed systematically (such as in a table) and include the drainage area, design flow, velocity, capacity, diameter or size, slope, length, construction material, upstream and downstream inlets, etc. Computations should also include one or more maps and drawings to show drainage areas, impervious surfaces, slopes, land cover, paths for computing time of concentration, and any offsite areas that contribute flow. Minimum size diameter of storm drainage pipes is 15 inches. For allowable types of pipe see Policy 16 (Stormwater Pipe Materials) in Appendix A.

Computation of the hydraulic grade line (HGL) may be required by the Engineering Department, particularly if pipes are designed without excess capacity, pipes are placed at steep slopes with high velocities, or if there are excessive deflection angles in the stormwater drainage system. Excessive velocities should be avoided to prevent HGL problems and the potential for erosion. Minimum design velocities should be at least 3 feet per second to ensure that a storm drainage system has some capability for self-cleaning (typical target slope is 1% or greater).

## 9.6 Design of Culverts

A culvert is a single drainage pipe, not part of an enclosed system, which has a pipe or box opening as the inlet condition. Allowable flow within culverts are subject to inlet control, outlet control, or some combination of the two controls. Culvert design is performed using FHWA Hydraulic Design Series No. 5, *Hydraulic Design of Highway Culverts* (September 1985), which can be downloaded at <http://www.fhwa.dot.gov/bridge/hydpub.htm> as an Adobe Acrobat document. The flow equations for a culvert are complex, such that design nomographs and procedures in Hydraulic Design Series No. 5 are the most common method of solution.

Considerations in culvert design include analysis of open channels at both ends of the culvert, potential for storage or channel routing, and design of energy dissipators and outlet protection. Head loss can be reduced by using headwalls, wingwalls, mitered slopes, and tapered inlets; refer to Hydraulic Design Series No. 5 for more details concerning culvert design. In general, reinforced concrete pipe (RCP) is more hydraulically efficient than corrugated metal pipe (CMP). Considerations for determining the allowable headwater are potential for upstream property damage, road overtopping, erosion potential, human safety, and whether wingwalls and headwalls are designed as part of the culvert. Minimum size diameter for culverts is 15 inches. See Policy 16 (Stormwater Pipe Materials) in Appendix A for allowable culvert materials.

## 9.7 Hydraulic Grade Line Computations

Due to short pipe lengths of typical drainage systems, normal pipe flow from Manning's equation only occurs in the middle section of the various pipes. Minor energy losses (directional changes, bend losses, inlet expansion and contraction effects) may cause the hydraulic grade line to be higher than the crown of pipe or the top of inlet. This can occur even if velocities and flows from Manning's equation appear to be acceptable and seem to indicate adequate pipe capacity.

If the hydraulic grade line is above the top of inlet, then stormwater escapes from the inlet and flows down the street. This may lead to unsafe road conditions, local flooding, displaced grates or manhole lids, etc. Hydraulic grade line computations are usually not necessary in instances where the drainage designer chooses the next larger size of pipe than necessary to convey design flows. Where the hydraulic grade line is deemed to be critical by the Engineering Director or his representative, the HGL shall be computed using the form in Table 9-2 or equivalent method.

HGL computations must be performed by a registered engineer using principles of hydrology and hydraulics, and basic formulas such as conservation of momentum and energy, continuity of flow, and types of flow classification. Open channel flow is preferred, since pressure flow allows less margin of safety and also creates more stress on pipe joints. Start at the outlet for the entire drainage system and compute the HGL at the next upstream junction(s), by repeating the procedure in columns 1 through 22 for each incoming pipe to determine the next HGL point.

Column 2	For the HGL table, the principal categories are manhole or drop inlet. Also note whether the invert of the structure is shaped with a round half-section at the proper invert elevations, in order to efficiently convey water and reduce energy losses. This information affects the total head loss adjustment in column 19.
Column 3	For the most downstream junction (i.e., the drainage system outfall), find the outlet WSE from backwater computations, outlet channel flow depth, or by assuming 0.8 times the pipe diameter/height. Determine outlet WSE for other inlets by using inlet WSE (column 21) for the downstream inlet.
Columns 7-8	The friction slope $S_F$ is computed from the equation shown at the bottom of Table 9-2. Manning's roughness coefficient (n), the cross-sectional flow area (A), and the hydraulic radius (R) should be already known from stormwater drainage computations to size the pipes and culverts.
Columns 9-10	The loss $H_O$ is equal to contraction loss from flow entering the outlet pipe.
Columns 11-18 **	For a given inlet, there may be more than one incoming pipe. List all the incoming pipes using one row each. Do not compute $H_i$ or $H_\Delta$ using lateral pipes carrying less than 10% of peak flow of largest incoming pipe.
Columns 11-14	** Compute the value of $Q_i V_i$ for each pipe. The pipe with the largest value of $Q_i V_i$ is used to compute the head loss assigned to the inlet ( $H_i$ ), which is equivalent to expansion losses of flow leaving the pipe.
Columns 15-17	** Enter deflection angle for each incoming pipe, when compared to the outlet pipe. A value of $0^\circ$ means that there is no bend between the incoming pipe and the outlet pipe. Then compute K for each angle, by interpolating from values at the bottom of Table 9-2. The largest value of $H_\Delta$ will be used to determine $H_L$ in column 19.
Columns 18-19	Add the values for the individual components of junction loss ( $H_O$ , $H_i$ , $H_\Delta$ ) to compute the total junction loss, $H_L$ . Adjust the value of $H_L$ in column 18 based on either one or both conditions. Multiply by 1.3 if the junction is a drop inlet that receives more than 10% of its total flow from the surface. And/or multiply by 0.5 if the junction has a shaped invert with a smooth half-diameter channel formed into the bottom for each incoming pipe to the outlet. The embedded channel must be durable and continuous.
Columns 20-21	Column 20 = column 8 + column 19. (H <sub>T</sub> : Total head loss) Column 21 = column 3 + column 20. (Inlet HGL or WSE)  Compare column 21 to column 22 to see if the drainage system overflows the top of manhole or the catch basin lip. Use the answer in column 21 as the outlet HGL (column 3) for the next upstream junction.

## 9.8 Analysis of Downstream System

The Knoxville Stormwater and Street Ordinance requires that discharge from a developed site (typically a stormwater detention basin) must be routed to an existing natural or manmade stormwater channel with adequate capacity. Calculations must be submitted that show the capacity of the receiving stormwater channel to handle the 2-year and 10-year design storms. The routing calculations must extend at least as far as the second downstream street crossing or to a blue-line stream. Routing calculations must be extended even further downstream, if the Engineering Director or his representative has reasonable concern about the capacity of a downstream stormwater channel based on scientific or engineering evidence.

The first reason for analysis of the downstream system is to ensure that known flooding problems are not exacerbated. Stormwater detention basins are always designed so that the peak flow discharge is not increased. This means that the immediate downstream receiving channel, if it currently has adequate capacity, will continue to be adequate. However, if the stormwater detention basin causes a longer duration for peak or near-peak flows (as shown in Figure 10-1), then flooding could occur in locations where it did not occur before.

The second reason for analysis of the downstream system is to determine any backwater effects on the detention outlet structure and embankment. In most situations, the design engineer assumes inlet control conditions for the detention basin control structure, which must be verified to ensure that the detention basin operates as designed.

Analysis of the downstream system will usually include flow capacity and velocity for existing and proposed flow conditions, using Manning's equation at a minimum, but could potentially include backwater routing effects with a computer program.





## Chapter 10 STORMWATER DETENTION AND QUALITY

### 10.1 Detention Requirements

The requirements for stormwater detention are described in the Knoxville Stormwater and Street Ordinance (Chapter 22.5 of the city code) included within Appendix B. All site development projects exceeding the thresholds listed in Section 22.5-23 must incorporate stormwater detention and first flush treatment as part of the design. Additional information on the design of stormwater detention and first flush treatment is included in the Knoxville BMP Manual (ST-10 through ST-12). Stormwater detention is not required in the following two situations:

- The project site discharges stormwater runoff directly into the Tennessee River, Holston River or French Broad River without flowing through a named creek/stream, through a public drainage system, or across a downstream property boundary.
- Stormwater detention for a project site is either unwarranted or impractical. The developer must submit complete hydrologic and hydraulic computations to support this conclusion. Typically this might occur in the very lowest downstream reaches of a major watershed, if it can be proved that undetained stormwater should be discharged quickly to avoid the peak discharge timing for the entire watershed. The hydrologic analysis should include more than one representative downstream location for comparing hydrographs.

Even if stormwater detention is waived for the above two situations (as described in Section 22.5-23), the site development must still provide first flush treatment or an acceptable alternative in order to protect stormwater quality.

Typical detention BMPs are dry detention basins, wet detention basins, retention basins and constructed wetlands. Detention computations and methods are discussed in ST-10 of the Knoxville BMP Manual. As specified by ordinance, all detention computations must use NRCS design methods with Type II 24-hr storm and average antecedent moisture conditions (AMC II).

Underground detention structures are not allowed within the City of Knoxville (as explained in ST-08 of the Knoxville BMP Manual). In contrast, underground stormwater quality structures (oil/water separator or sand filtration unit) are encouraged and even required for some land uses. The difference is that stormwater quality structures do not attempt to control or store tremendous volumes of stormwater runoff, with the attendant problems of flooding, hydrostatic pressures, settlement, washout, etc. Stormwater quality structures are scientifically designed with overflow or bypass capabilities to prevent large volumes of stormwater from flowing through the structure.

### 10.2 Design Criteria for Detention Structures

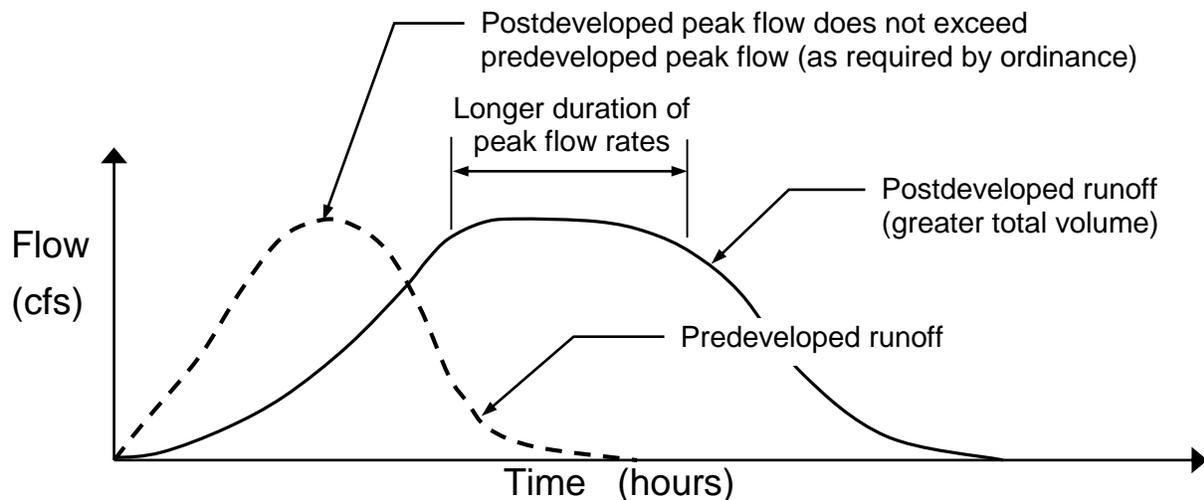
All stormwater detention structures must attenuate the postdevelopment peak flow rates from the 1-year, 2-year, 5-year, 10-year and 100-year NRCS 24-hour design storms to discharge at or below predevelopment peak flow rates. See ST-10 in the Knoxville BMP Manual for design

computations and methods, including downloadable documents from NRCS and FHWA. Physical design criteria is listed within Section 22.5-31 of the Knoxville Stormwater and Street Ordinance (see Appendix B).

The purpose for detention structures is to slow or attenuate the peak flows downstream by controlling the release rate. The typical predevelopment and postdevelopment outflow hydrographs for a detention basin are shown in Figure 10-1. The postdevelopment peak outflow rate is limited to the predevelopment peak outflow rate as the basis of detention design. However, the postdevelopment condition is likely to discharge at or near the peak outflow rate for a few hours. It should be noted that the conglomerate effect of dozens of detention basins in a watershed may or may not reduce peak flows at a downstream location. This uncertainty is caused by factors such as the infinite types and variety of actual rainfall distributions, spacing and sizes of the detention basins, discharge characteristics for the detention basins, maintenance and conveyance of major drainage channels. Two examples of detention basin computations are given in ST-11 and ST-12 of the Knoxville BMP Manual.

The first detention example, ST-11, uses a very complex "home-made" spreadsheet (in Microsoft® Excel 97), created to compute and route hydrographs through a detention basin structure. The spreadsheet has been tested and verified; however, it tends to be very slow and cumbersome except for fairly new computers. The main purpose of the spreadsheet method is to demonstrate the types of input that are necessary for all detention computations, typical computational procedures that are used in stormwater routing, and a basis for calibrating or comparing other methods.

Worksheet #2 (*Excel file ST11-EST.xls*) is probably the most useful spreadsheet from ST-11 of the Knoxville BMP Manual, and serves as the basis of an initial volume estimate. Worksheet #2 is easy to use and faithfully reproduces the detention volume estimates generated by NRCS Technical Release 55 publication. However, TR-55 detention volume estimates and Worksheet #2 volume estimates do not take into account the first flush volume and thus need to be adjusted upwards. This is because the first flush volume is not merely briefly detained as part of the peak flow reduction, but must be fully captured and then released over a minimum 24-hour time period.



**Figure 10-1**

**Typical Detention Hydrograph**

The second example of detention basin computations (ST-12 of the Knoxville BMP Manual) are HEC-1 and HEC-HMS computer runs for a simple detention basin. The HEC-1 computer program

(or the successor windows-based computer program HEC-HMS) is a nationally recognized and trusted free software, developed by the U.S. Army Corps of Engineers, for the purpose of computing and routing hydrographs. The following guidelines should be followed for using HEC-1 (or HEC-HMS) for detention computations:

- Enter the NRCS Type II rainfall distribution, preferably using increments of 0.1 hours as in the Knoxville BMP Manual ST-11 example, using either incremental (PI cards) or cumulative values (PC cards).
- To increase computational precision by a decimal point, multiply basin area (BA card), the pond areas or volumes (SA or SV cards), and the pond outflow rating (SQ cards) by a factor of 10. After the computation is finished, divide the peak inflow rates and peak outflow rates by a factor of 10. The computations should clearly document that this method is being used to increase precision, so that engineers who might review this computation in the future would understand the rationale.
- The pond outflow rating and volume (SQ and SV cards) must be computed at regular intervals, either by hand or preferably by a computer program or spreadsheet, before entering the SQ and SV values into the HEC-1 program.

The Stormwater Engineering Division currently uses Haestad Methods PondPack™ for regulatory review of proposed detention basins and also for checking the as-built conditions. PondPack™ is a very flexible and user-friendly software, and it allows many types of outlet structures with almost any combination of weirs, orifices or culverts. It is understood that the PondPack™ program is relatively expensive, represents a sizable investment in software and training for any potential user, and is therefore not required by the Engineering Department.

### 10.3 Stormwater Quality Considerations

The stormwater ordinance also requires that the first flush volume for any stormwater detention structure must be contained and then slowly released over a minimum time period of 24 hours and maximum time period of 72 hours. First flush treatment must be provided at locations that would normally provide stormwater detention, even if detention requirements are exempted because the project site flows directly into Fort Loudoun Lake or one of its tributary rivers.

The first flush volume is described in ST-10 of the Knoxville BMP Manual. The purpose is to allow settling and filtering for the first 1/2" of stormwater runoff, which typically contains dust, deicing sands and salt, oils and automotive fluids from leaking vehicles, tire particles, brake pad particles, trash, debris, leaves and small sticks, etc. Preventing the first flush volume from entering the natural streams and creeks has greatly benefited water quality of streams, fish and other aquatic life, city parks, greenways, and residents who live near natural streams and creeks.

The first flush volume for a typical dry detention basin is shown in ST-01 of the Knoxville BMP Manual. The first flush volume is slowly released over a 24-hour period by an underground sand filter, aboveground sand filter, or small discharge orifices. Methods for capturing floatable debris, sediments and other debris can be incorporated into a detention outlet structure at no cost.

The project designer may also consider alternative means of providing stormwater quality such as oil/water separators, grit chambers, long expanses of stormwater filter swales, or constructed wetlands. For some land uses, these stormwater quality structures may be used in place of the first

flush volume. For critical land uses such as large parking lots and gasoline stations, these structures are required in addition to first flush treatment volume (as part of a Special Pollution Abatement Permit - see Chapter 7 of the Knoxville BMP Manual). A project designer may wish to contact the Stormwater Engineering Division for unusual methods of stormwater treatment prior to submittal. See Chapter 4 of the Knoxville BMP Manual (Figure 4-2 in particular) for stormwater treatment removal goals, typical pollutants, and approximate removal rates for urban BMP designed structures.

#### 10.4 Permanent Maintenance Agreements

If there is a stormwater detention or stormwater quality structure shown on the design plans, the Stormwater Engineering Division requires that the current property owner (as well as any future owners of this property) enter into a permanent maintenance agreement with the City of Knoxville. This legal document, called *Covenants for Permanent Maintenance of Stormwater Facilities* (CPMSF), is recorded in the permanent land records with the Knox County Register of Deeds, in addition to being fully described on the final plat. The CPMSF document is prepared by the Stormwater Engineering Division using information supplied by the property owner, and must be signed and executed prior to the issuance of a site development permit. The CPMSF is further described as an engineering policy in Appendix C and shown in the Chapter 2 flowcharts.

A list of engineering policies that describe the CPMSF document, reporting requirements, and maintenance responsibilities of the project owner includes:

- Policy 02 - Covenants for Permanent Maintenance of Stormwater Facilities (CPMSF)
- Policy 06 - Maintenance Access for Stormwater Management Facilities
- Policy 07 - Maintenance Responsibility for Stormwater Drainage Systems
- Policy 11 - Sediment Disposal for Detention Basins
- Policy 14 - Stormwater Enforcement Guidelines
- Policy 18 - Underground Stormwater Facility Maintenance
- Policy 19 - Underground Stormwater Facility Recordkeeping and Reporting

#### 10.5 Facility and Access Easements

Stormwater detention easements are described in Policy 05 (included in Appendix C). There are two types of easements for stormwater detention basins and stormwater quality structures:

- Facility easements: Encompasses the entire stormwater detention basin or stormwater quality structure. Minimum size 20' x 20'.
- Access easements: Provides access to the facility easement, if the easement is not immediately adjacent to the public right-of-way. Minimum 20' wide.

A facility easement is always required. The facility easement is not allowed to encroach upon any other existing or proposed easements. The preferred name for showing the facility easement for a stormwater detention basin on plans or plats is *Stormwater Detention Basin Easement*. The

preferred name for showing the facility easement for a stormwater quality structure on plans or plats is *Water Quality Facility Easement*. A facility easement allows city engineering personnel (stormwater inspectors, grading equipment operators, stormwater monitoring personnel) to investigate and inspect the detention basin or stormwater quality structure as needed to determine proper functioning, need for maintenance, etc. In addition, minor repairwork and maintenance may be performed if there is an emergency or urgent condition, or if the property owner is negligent to perform maintenance as directed.

The preferred name for showing the second type of easement on plans or plats is *Stormwater Detention Basin 20' Access Easement* or *Water Quality Structure 20' Access Easement*. This access easement is not necessary at locations where the facility easement abuts the public right-of-way for at least 20 feet and is easily traversable by potential grading equipment such a dozer or backhoe. Otherwise, an access easement will be required.

The detention basin access easement must be shown on the plat, but does not require a recorded written legal document to be in effect. It is not necessary to build an actual road to the detention basin as part of the easement agreement (although the property owner should generally have some means of vehicle access to the detention basin for his maintenance needs). An access easement must not contain any buildings or structures, large trees or heavy shrubbery, utility poles or manholes, overhead utility lines without adequate clearance, deep ditches or channels, etc. If the property owner wishes, the access easement may contain:

- small shrubs of little or no value that can be easily removed or cleared.
- fences that can be easily removed (or ideally a gate through the fence)
- portable structures that can be quickly moved
- vehicles or equipment

The City of Knoxville is not responsible for damage to any structures, utilities or vegetation located within a facility access easement, whenever such access is deemed necessary by city inspection personnel. The City of Knoxville is not responsible for repair or replacement of structures, utilities and vegetation. A facility access easement is normally intended for heavy equipment access rather than ordinary passenger vehicle access. A city stormwater inspector will normally gain access to a detention basin or water quality facility by parking nearby.



## Chapter 12 STREET DESIGN CRITERIA

### 12.1 Overall Design Guidelines

The minimum design standards for streets and roads in the City of Knoxville are contained in the Minimum Subdivision Regulations (MSR), which are maintained by MPC as a joint set of standards for Knoxville and Knox County. Public streets and highways must be designed in accordance with the most current version of the book "A Policy on Geometric Design of Streets and Highways", published by the American Association of State and Highway Transportation Officials (AASHTO) and the geometric design standards contained in Tennessee Department of Transportation (TDOT) standard drawings and details.

Public streets and roads are grouped into seven functional classifications as specified by MSR Section 62. The Major Road Plan, maintained by MPC, shows the functional classification of all existing streets and roads. In addition, MPC also keeps a list of proposed transportation improvements as a guide for laying out new streets and roads. New streets and roads will be analyzed by MPC to determine functional classification, necessary width for right-of-way, and additional design requirements based on traffic volumes and patterns, future growth projections, or scenic/aesthetic considerations. The seven types of public streets and roads are:

- |                    |             |                    |             |
|--------------------|-------------|--------------------|-------------|
| 1. Expressway      | (MSR 62-31) | 5. Minor Collector | (MSR 62-35) |
| 2. Major Arterial  | (MSR 62-32) | 6. Local Street    | (MSR 62-36) |
| 3. Minor Arterial  | (MSR 62-33) | 7. Alley           | (MSR 62-37) |
| 4. Major Collector | (MSR 62-34) |                    |             |

In general, most new streets and roads that are constructed as part of a development project are either collector or local streets. On occasion, a developer may be required to improve or extend a portion of an arterial street. Arterial streets and expressways are usually state routes and must be designed according to TDOT standards. Therefore, this chapter will focus mainly on the design of collector and local streets for subdivisions, using the MSR as the principal reference.

Alleys, designed on a case-by-case basis as either one-way or two-way, are considered to be a secondary means of access to the back or side of a property that has principal access elsewhere. A typical use of an alley is to provide access to the back of a building for delivery trucks, or as a route to install or maintain public utility infrastructure. Alleys are not intended for use in new subdivisions, but are most commonly found in older historic neighborhoods. Section 17-243 of the City Code recommends that one-way alleys should run east-to-west or north-to-south, unless the Engineering Department rules that a different direction is more appropriate or safer.

In addition to the seven types of public streets, the developer may choose to construct a joint permanent easement (JPE) which functions as a private street. If it serves or is adjacent to more than 5 lots, then the JPE actually receives an official street name and must satisfy most of the design requirements for a public street. However, the City of Knoxville will not accept the JPE

for public ownership, and a homeowners association or other legal entity must accept responsibility to maintain and repair a JPE to the satisfaction of MPC and the City of Knoxville.

## 12.2 Acceptance as Public Streets

The City of Knoxville will only accept streets into the public street system that are constructed to city standards for the actual functional classification (as specified in Section 12.1). Private roads must be designed and constructed to JPE standards as specified in the Minimum Subdivision Regulations. Even if a private road is constructed to JPE standards, however, it will be very difficult for the private road to be accepted as a public street at a later time.

When a public street is accepted, it is then maintained by the City of Knoxville. Private roads must be maintained by the property owners served by the private road, or another legal entity which has been assigned responsibility at the time of design and construction. The city government is often asked to take over and maintain private roads. However, the type of problems and considerable expenses involved for the property owners to process these requests usually makes it impractical for a private road to be upgraded to the standards of a city public street. Consequently, most requests for the City Engineering Department to accept a private road are usually dropped and not pursued further. The following three basic requirements are necessary to approve a private road as a public street.

### 1. Right-of-Way Dedication

The right-of-way to be dedicated must comply with the Major Road Plan as maintained by MPC. Within the City of Knoxville, the minimum right-of-way width for local streets is 50 feet. Private roads almost always have right-of-way widths less than 50 feet. In many of these cases, additional right-of-way cannot be dedicated without encroaching on buildings, sheds, trees, utilities, drainage structures or other improvements.

### 2. Acceptable Roadway Construction

The property owners must submit proof to the City Engineering Department that the current pavement section is constructed to public road standards. Even if the existing private road meets the pavement thickness standards, additional construction will usually be necessary to increase the pavement width. The pavement investigation and proposed roadway improvements must be analyzed and designed by a qualified professional engineer registered in the state of Tennessee, with adequate education and experience to conduct this type of work.

### 3. New Survey Plat

A new property survey reflecting the new public right-of-way, and all changes to the affected properties, must be approved by the Metropolitan Planning Commission and recorded with the Knox County Register of Deeds. The new survey plat must be prepared by a registered land surveyor currently licensed to practice in the state of Tennessee. Within subdivisions, the entire subdivision unit must be included on the plat. When the right-of-way to be dedicated must be widened to 50 feet, property boundaries and lot areas are affected. New easements are generally required. New variances may be needed for minimum lot areas, setbacks, zoning, etc. Each property owner must sign a "Certificate of

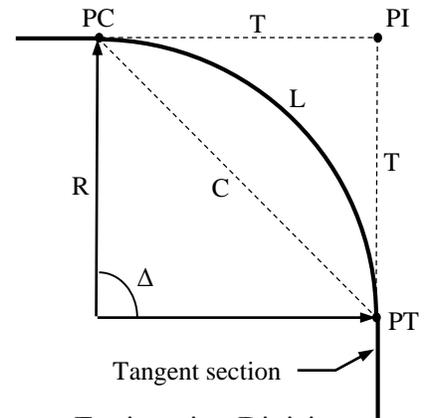
Ownership and General Dedication" statement and have his signature notarized on the survey plat.

### 12.3 Horizontal Geometry

Horizontal geometry requirements for city streets and roads are described in MSR Section 62 and summarized in Table 12-1 for the seven functional classifications. In addition, MSR Section 62 contains criteria for designing cul-de-sacs, intersection spacing, vertical grades, etc. For Table 12-1, the minimum allowable horizontal radius for local streets depends on whether the local street has a total length of 1000 feet or greater. The minimum design speed for local streets in residential subdivisions is 30 miles per hour or as designated by the Engineering Director (see Section 22.5-35 of the Knoxville Stormwater and Street Ordinance).

Minimum right-of-way widths are specified in order to accommodate future road improvements, sidewalks, utility installation, streetlights, bicycle trails, greenways, etc. As a brief summary of horizontal curve design, the following equations are listed:

- $\Delta$  = Deflection angle (degrees)
- $R$  = Centerline radius, or radius of curvature (feet)
- $L$  = Length of curve (feet) =  $\Delta (R) (2\pi / 360^\circ)$
- $D$  = Degree of curve (degrees) =  $5729.58 / R$
- $T$  = Tangent of curve (feet) =  $R \tan (\Delta)$
- $C$  = Chord, or long chord (feet) =  $2 R \sin (\Delta/2)$



Horizontal curve information is required in order for the Stormwater Engineering Division to review and approve site development plans. For new public streets and roads, separate roadway drawings must be submitted in a standardized format that can be easily reproduced in various formats for city and county records. In many cases, it is customary to measure the length of centerline in units of 100 feet, called stations. Also, the following points are usually represented and labeled on roadway drawings:

- PC = point of curvature (the beginning of a curve)
- PI = point of intersection (where two tangent sections would meet, if extended)
- PT = point of tangency (the end of a curve)

Additional requirements for horizontal design include:

- (MSR 62-81) Streets within a subdivision shall usually have 90° intersections whenever possible. The minimum intersection angle is 60° for cases where topography imposes a severe restraint, and very few traffic movements are expected in the direction of the acute angle turn.
- (MSR 62-84) Minimum radius for a curb or the edge of pavement, at the corner of a property with residential or agricultural zoning, shall be 25 feet for angles of 90° or less. Minimum radius of a curb shall be 75 feet for angles greater than 90°.

- (MSR 62-85) Minimum radius for a curb or the edge of pavement, at the corner of a property with office, commercial or industrial zoning, shall be 75 feet for all angles between 60° and 120°.

Table 12-1 Horizontal Geometry for Streets							
Functional Classification	Minimum ROW width	Minimum pavement width	Minimum centerline radius	Minimum length for tangents - reverse curve	Minimum length for tangents - broken back curve	Minimum intersection spacing	
<i>Section from MSR:</i>							
	62-40	62-50	62-70	62-73	62-74		
Expressway	*	*	*	*	*	*	
Major Arterial	*	*	920'	150'	*	400'	
Minor Arterial	*	*	920'	150'	*	400'	
Major Collector	*	*	560'	100'	175'	300'	
Minor Collector	70'	32'	400'	75'	175'	300'	
Local Street	L >	50'	26'	250'	50'	150'	125'
	L <	50'	26'	100'	50'	150'	125'
Alley	**	**	**	**	**	---	

\* - Consult Major Road Plan, MPC growth planning studies, City Engineering Dept and TDOT.

\*\* - Designed on a case-by-case basis.

## 12.4 Vertical Geometry

Vertical geometry requirements for city streets and roads are described in MSR Section 62 and summarized in Table 12-2 for the seven functional classifications. The major concerns for vertical geometry are ensuring adequate sight distance, reasonable grades for accelerating and decelerating, and relatively flat grades at intersections for stopping and turning. Vertical geometry is based on parabolic curves rather than circular curves. The following equations are listed as a brief summary of vertical geometry.

LVC = Length of vertical curve (stations)

$G_1$  = Approach grade (percent)

$G_2$  = Exit grade (percent)

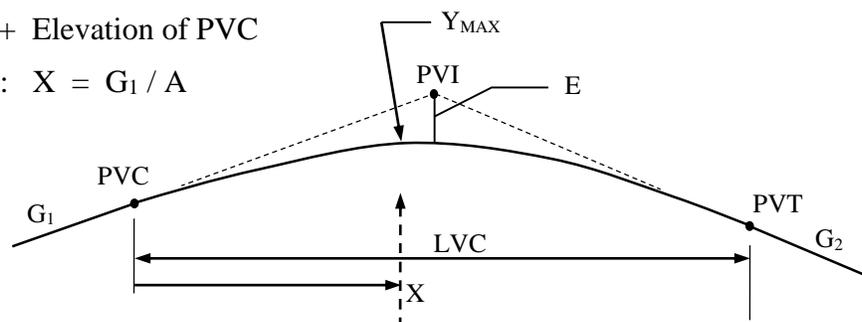
$A$  = Rate of change (percent per station) =  $(G_2 - G_1) / LVC$

$E$  = External of vertical curve =  $0.125 (LVC) (G_2 - G_1)$

$Y$  =  $(A/2) X^2 + G_1 X + \text{Elevation of PVC}$

$Y_{MAX}$  or  $Y_{MIN}$  occurs when:  $X = G_1 / A$

$K$  =  $(100 LVC) / A$



<b>Table 12-2 Vertical Geometry for Streets</b>				
<b>Functional Classification</b>	<b>Maximum grade</b>	<b>Minimum grade</b>	<b>Minimum K for vertical curves</b>	<b>Typical cross slopes</b>
<i>Section from MSR:</i>	62-60	-----	62-72	-----
Expressway	5%	1%	*	*
Major Arterial	6%	1%	50	*
Minor Arterial	6%	1%	50	*
Major Collector	8%	1%	50	2%
Minor Collector	10%	1%	50	2%
Local Street	12% #	1%	25 #	2%
Alley	**	**	**	**

\* - Consult Major Road Plan, MPC studies, City Engineering Dept and TDOT.

\*\* - Designed on a case-by-case basis.

# - MPC and Stormwater Engineering Division may recommend approval for variance up to 15% on local streets.

Collector streets and local streets should be designed with a crown section of 2% cross slope. In other words, each half of the street should drain towards the curb and gutter without crossing the centerline of the street. This necessitates that a storm drainage system must be designed to drain both sides of the street, with careful attention to street intersections.

Superelevation of a minor collector street or a local street for a subdivision is seldom necessary. The tradeoff of achieving higher design speeds (through the use of superelevation) is usually not worth the design problems of ensuring adequate drainage on each side of the street, particularly if there are many entrances and driveways along the street. In addition, the use of superelevation on local streets may encourage faster driving through residential neighborhoods. However, the design engineer should be prepared to properly design any street superelevations when requested by MPC or Stormwater Engineering Division. Superelevation standards can be found in both the AASHTO design policy ("Green Book") and on TDOT standard detail drawings.

A local street must have a minimum tangent grade of 50' length when tying into another street. The tangent grade should preferably be 1% with a maximum value up to 2%. The minimum tangent grade is measured from the closest edge of travelway of the intersected road. Vertical street geometry must be coordinated with horizontal street geometry in order to ensure adequate sight distances as described in Section 12.5. Broken-back vertical curves and compound vertical curves should be avoided.

## 12.5 Sight Distance

Sight distance is an essential safety element in the design of streets, roads, driveways and entrances. The entire process of driving relies on a combination of adequate vision and lighting, driver reactions, easily recognizable situations, and standard traffic signs and signals. While there are equations and formulas for computing both horizontal and vertical sight distances, it is usually difficult to quantify and measure these values if a horizontal roadway curve and vertical roadway

curve occur at the same location. Horizontal curves and vertical curves should be separated whenever possible. An example of bad street design is if a horizontal curve begins or ends near the crest of a vertical curve (so that the driver does not see the change in alignment).

Each driveway, entrance, and intersecting street must be checked by the design engineer to ensure that the driver of the stopped vehicle (typically several feet from the front or back bumper) can adequately see both ways. Each check can be done by formulas and equations, by drawing horizontal sight distances on the plan drawings, or by carefully visualizing a driveway or entrance. The use of 3-dimensional CADD software for street design is now commonplace; this will also assist the design engineer in verifying sight distances.

Horizontal sight distance for street design is usually satisfied by the minimum centerline radius for each functional street classification (shown in Table 12-1), provided that standard building setbacks and right-of-way clearances are followed. However, there are many other things that may interfere with horizontal sight distance such as: cut slopes, trees, tall grass, signs, billboards, parked cars, retaining walls, fences, or bridge overpasses.

Vertical sight distance is usually satisfied by the minimum K values found in Table 12-2 for each functional street classification. Vertical sight distance is actually two categories: stopping sight distance and passing sight distance. Passing sight distance, which is the distance needed to overtake and pass a vehicle headed in the same direction, is usually not applicable on urban streets since:

- Most vehicles do not achieve "highway speeds" on city streets.
- Alternate routes are more commonly available within the city for impatient drivers.
- Within the city limits, a slower vehicle may turn left at almost any driveway or street.

Stopping sight distance is shown in Table 12-3 for various travel speeds and assuming wet pavement conditions. Stopping distance is shorter when traveling uphill and longer when traveling downhill. The design engineer must coordinate all elements of street and roadway design during design, and conduct a thorough review after design is completed. Geometric design must be coordinated with grading and earthwork. Drainage design must be compatible with the geometric design. Some basic rules for coordinating geometric design include:

- Avoid a horizontal curve at the crest of a vertical curve.
- Avoid a horizontal curve at the bottom of a long vertical grade.
- Do not make an uncomfortable vertical profile by using a series of up-and-down curves.
- Do not use compound vertical curves or short tangent sections between vertical curves.
- Avoid a vertical curve at the beginning or end of a horizontal curve.

**Table 12-3**  
**Stopping Sight Distance**  
(*f* = wet pavement friction value)  
*Taken from "A Policy on Geometric Design of Highways and Streets" (AASHTO)*

Actual Travel Speed	Reaction Distance *	F	Braking Distance on Level Ground **	Stopping Sight Distance on Level Ground		Stopping Sight Distance for Uphill Grades		Stopping Sight Distance for Downhill Grades	
				Computed	Typical Rounded Values	Computed		Computed	
						+5%	+10%	-5%	-10%
mph	feet	---	feet	feet	feet	feet	feet	feet	feet
20	73	0.	33	107	125	103	100	112	118
25	92	0.	55	147	150	140	135	155	166
30	110	0.	86	196	200	185	177	210	230
35	128	0.	120	248	250	233	221	269	299
40	147	0.	167	313	325	291	274	345	389
45	165	0.	218	383	400	353	330	425	487
50	183	0.	278	461	475	422	392	517	600
55	202	0.	336	538	550	490	454	605	706
60	220	0.	414	634	650	573	528	721	852
70	257	0.	584	840	850	752	687	967	1165

\* - Reaction distance is based on 2.5 seconds to recognize and react to a stopping situation.

\*\* - Braking distance is based on the equation  $D = V^2 / 30 (F \pm G)$

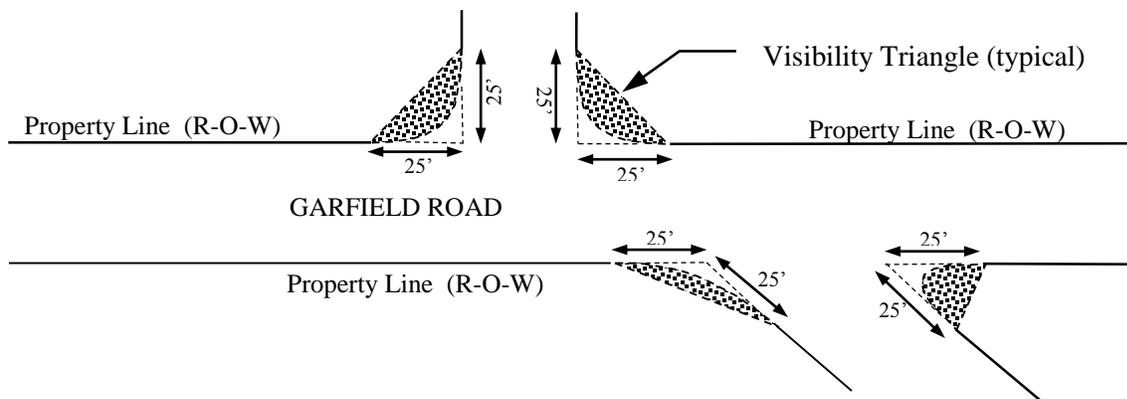
D = braking distance (feet)

V = travel speed (mph)

F = coefficient of friction

G = longitudinal grade of roadway (feet/foot)

The following diagram illustrates the “Visibility Triangle”, a further requirement for sight distance that is in the City of Knoxville Zoning Ordinance, Article V, Section 6(C). On any corner lot where front and side yards are required, there shall be no wall, fence, sign, structure, plant growth or any object, whether movable or stationary, which obstructs the vision at elevations between 2 ½ feet and 10 feet above the crown of the adjacent roadway within the “Visibility Triangle”.



On any property which is required to have a front yard (except for the corner lot as described with the Visibility Triangle), there shall be no fence, wall, hedge or yard ornament that materially impedes vision across the front yard above the height of 3 ½ feet, in accordance with in the City of Knoxville Zoning Ordinance, Article V, Section 6(C).

## 12.6 Pavement Sections

Concrete curb shall generally be 6" high, with or without integral concrete gutters. In most cases, integral curb and gutter sections shall have a total width of 30" consisting of a 24" gutter, unless a different type of curb has been used in the immediate vicinity of the project. Traversable curb and gutter may be appropriate in some locations such as residential subdivisions. New residential subdivision streets may be constructed with standard extruded curbing with the approval of the Engineering Department. The aggregate base must extend at least 2 feet beyond the back of curb, in order to ensure an adequate foundation for the curb and gutter.

### Asphalt Pavement

	Aggr. base	Binder	Leveling	Surface
Local street	8"	2.5"	----	1.5"
Collector street	10"	3"	----	2"
Arterial street	12"	3"	1.5"	1.5"
Industrial / Commercial	14"	3.5"	2"	1.5"

### Concrete Pavement

	Aggr. base	Surface
Local street	4"	5"
Collector street	4"	6"
Arterial street	4"	8"
Industrial / commercial	4"	9"

Asphalt and concrete pavement materials must be tested to ensure adequate strength properties and proper density (as specified in the Knoxville Technical Specifications).

Material	Gradation	Knoxville Technical Specifications
Mineral aggregate base	Class A Grade D crushed stone	TS-05 (TDOT 903.05)
Binder asphalt course	Grading B asphalt	TS-09
Leveling asphalt course	Grading C asphalt	TS-09
Surface asphalt course	Grading D asphalt	TS-10
Surface concrete pavement	3500 psi 28-day compr. strength	TS-11
Prime coat and tack coat	Emulsified or cut-back asphalt	TS-06 and TS-07

## 12.7 Traffic Considerations

MPC maintains the Major Road Plan to ensure that traffic and street improvements will benefit the overall community. MPC coordinates review of conceptual and preliminary plans with many agencies, such as the Knoxville Police and Fire Departments, so that changes to traffic or street patterns will not adversely affect emergency response services. As part of the regional program called "Nine Counties - One Vision", MPC is also involved in conceptual planning for alternative forms of transportation (bus, transit, bicycles, pedestrians). The Knoxville Regional Transportation Planning Organization (TPO) serves the areas covered by Knox County and Blount County to analyze regional transportation planning. See the following websites for additional information:

- <http://www.knoxmpc.org/> Metropolitan Planning Commission (MPC)  
<http://www.knoxtrans.org/> Knoxville Transportation Planning Organization (TPO)  
<http://www.ninecountiesonevision.org/> Nine Counties - One Vision  
<http://www.knoxmpc.org/locldata/stats.htm> Traffic counts, travel analyses, commuter patterns

The Knoxville Zoning Ordinance defines a major traffic generator as a facility that is required to have 400 or more parking spaces. The number and type of parking spaces are described in Article V, Section 7 (Minimum offstreet parking, access and driveway requirements). Any development projects which qualify as a major traffic generator shall submit a traffic study report as described in Policy 01 in Appendix C. Driveways and entrances shall meet the requirements of Policy 01 (Access Control for Traffic and Driveways).

## 12.8 Traffic Signs

The developer/contractor is required to correctly install all traffic signs necessary for the safe and effective control of traffic. The site development plans must include the types and locations of each sign, standard detail or reference, mounting height, and orientation. The primary reference for traffic signs and markings is the Manual on Uniform Traffic Control Devices (MUTCD), with a particular emphasis on regulatory signs (such as Stop signs, R1-1, and One-Way signs, R6-1) and warning signs (such as No Outlet signs, W14-1). See the City of Knoxville Technical Specification TS-63 (on the Civil Engineering Division webpage) for traffic sign installation and materials, or consult TDOT Standard Specifications Section 916 for installation and materials.

The developer/contractor may contact the City Sign Shop (Traffic Engineering Division) in order to purchase traffic signs and installation hardware. Or alternatively, the developer/contractor may arrange for the City Sign Shop to install traffic signs at a reasonable cost.

Temporary traffic signs and temporary pavement markings, if necessary during construction, must meet the requirements that are listed in City of Knoxville Technical Specification TS-34. A Construction ROW Permit and a Temporary Traffic Control Permit must be obtained from the Civil Engineering Division for work that occurs within the street right-of-way.

## 12.9 Coordination With Utilities

Installation of utilities must be carefully coordinated with all aspects of site construction, and especially street construction. New streets and rights-of-way are required to have a utility strip outside of the pavement section, so that routine utility installation and repair does not impact the pavement structure and traffic. Utilities should be installed underground whenever possible (such as telephone and electric). Requirements for utility plans are described in MSR Section 43-75. MSR Section 69-10 requires that the interior and exterior lot lines of a subdivided property shall have a standard 10' wide utility/drainage easement. Interior easements shall be centered on interior property lines, so that the width will be 5' on each side of the property line.

The locations, sizes, and capacities of utility lines and appurtenances must be shown on the plan drawings in order to minimize utility conflicts, coordinate construction work, arrange for the proper easements, and to ensure adequate materials. Appurtenances such as valves, fire hydrants, manholes, cleanouts, and pump stations must be located in areas that are easily accessible and identifiable. Utility easements must be labeled with accurate dimensions and locations. Sanitary sewer lines must include a profile showing invert elevations and connections. All excavations should be coordinated with "Tennessee One Call" (1-800-351-1111) at least 2 working days prior to digging.

The design engineer should carefully examine the proposed layout of utilities to avoid interferences. Electrical and water connections may be needed for outdoor applications. Electrical connections are required for streetlights, traffic signals, signs or security lights. Water may be needed for lawn irrigation sprinklers, fountains, or landscaped waterfalls/ponds. KUB looks at utility plans as part of the building permit review and not during grading permit review.

Any excavation, tree trimming, construction or installation within public right-of-way must follow the Utility Maintenance & Construction Policy, which is available on the Civil Engineering Division webpage. A Construction ROW Permit must be obtained at least 48 hours in advance of the construction activity; a Temporary Traffic Control Permit may also be needed. A copy of the ROW Construction Permit is included in Appendix A.

## 12.10 Streetlights

Streetlights are necessary to improve public safety for pedestrians and vehicles. The City of Knoxville pays for the installation and maintenance of streetlights, but the developer is required to show approximate locations and type of streetlight on the site development plans for city approval. Maximum streetlight spacing on local streets and within subdivisions is typically 200 feet, with a typical height in residential areas of 14 to 35 feet. Streetlights should be located at intersections in such a manner to illuminate intersections, stop signs and curves.

Design and installation of streetlights is performed by KUB (or another utility district if appropriate) and must be coordinated with the Stormwater Engineering Division. Streetlights are often specified with underground electric connections for subdivisions, and a developer has several choices of decorative fixtures and poles that can be selected. Or streetlights may be mounted on existing electrical poles. High-pressure sodium lights are required on city streets due to energy efficiency and ease of maintenance.

Pictures and designs of decorative streetlights can be viewed at the KUB offices or the Stormwater Engineering Division offices. Other streetlight types may be selected if any additional installation/construction costs are borne by the developer. Typical information for streetlight design includes:

1. Horizontal and vertical geometry of the street centerline, including curve data.
2. Typical cross section of the street that shows the proposed streetlight (pole and luminaire) with respect to the edge of pavement, curb and sidewalk.
3. Character and spacing of existing streetlights on nearby streets and throughout the neighborhood.
4. Locations of the proposed streetlights, with average spacing computations.
5. Mounting height, foundation/base, and type of pole.
6. Luminaire size, ASA type, and initial lumen rating (with photometric design data).
7. Average horizontal footcandle level (with minimum and maximum values also noted).

Streetlight poles shall not be located closer than 2 feet to the face of curb, or closer than 4 feet to the edge of pavement. Do not locate streetlight poles at locations with a high potential for collisions. Typically streetlight poles may be metal, fiberglass, concrete or wood poles with a luminaire mounting height between 10 feet and 18 feet. Poles will have a handhole for access to wiring. Poles may be direct burial (4 ft butt) or designed with a flange base for mounting on a concrete foundation.

All installations shall conform to the requirements of the latest edition of the National Electrical Code (NEC), the Illuminating Engineering Society standards, and the rules of the Knoxville Utilities Board (KUB). Customers shall notify "Tennessee One Call" (1-800-351-1111) prior to any excavation for the proposed streetlight installation.

### **12.11 Standard Details and Technical Specifications**

The use of standard details and specifications is encouraged in order to promote a safe level of performance for all structures and roadways. The Civil Engineering Division maintains standard details to be used for construction projects within the City of Knoxville; see the Civil Engineering Division webpage. An excellent source of standard details are the TDOT Standard Roadway and Structure Drawings, which can be purchased from TDOT headquarters in Nashville (approximate cost \$100) or downloaded from the TDOT website described in Chapter 3.

The minimum properties and methods of street construction must match the latest version of the City of Knoxville technical specifications. The Civil Engineering Division maintains the Knoxville standard specifications for use with all city construction projects, which can be downloaded from the Civil Engineering Division webpage. The City of Knoxville technical specifications are not meant to cover every situation or design need, but they address general requirements for which additional drawings, specifications, details, plans and cross sections must be prepared and stamped by a design professional engineer registered in the state of Tennessee.



## Chapter 13 CONSTRUCTION ADMINISTRATION

### 13.1 Preconstruction Assistance Conference

A preconstruction assistance conference is required, prior to the issuance of a Site Development Permit, for all projects for which a construction bond has been collected by the Stormwater Engineering Division during the design review process. The construction bond (also called a Performance and Indemnity Agreement) certifies that the specified portion of the project will be constructed in agreement with city standards and regulations. In addition, a preconstruction assistance conference may be requested by Stormwater Engineering Division personnel for projects with unusual requirements or conditions that may require extra care or some measure of environmental sensitivity.

The preconstruction assistance conference may take place either in the Stormwater Engineering Division offices (4<sup>th</sup> floor of the City County Building) or in the field, depending on the type of construction and the nature of the project site. The Stormwater Engineering Division will coordinate the time and location of the preconstruction assistance conference with the developer and contractor. A typical meeting will include: review of erosion and drainage concerns, as-built requirements, procedure for renewing construction bonds, inspection schedules, etc.

### 13.2 Required Submittals and Notifications

In general, the contractor/developer is not required to make regular submittals or progress reports to the Stormwater Engineering Division inspectors. However, the contractor is encouraged to notify the inspector of significant changes to the construction schedule. A construction schedule is recommended as part of the erosion and sediment control plan (ESCP) narrative as described in Section 7.3. A construction schedule, for the purposes of the ESCP narrative, should indicate the duration of activities such as initial placement of erosion controls, clearing and grubbing, earthwork, trenching, drainage installation, and seeding/sodding.

Certain types of construction activities will require submittals and field inspections by Stormwater Engineering Division personnel. Submittals and field inspections help to ensure that streets, sidewalks, graded slopes, streetlights, detention basins and drainage systems will meet city standards for safety and durability. Inspection activities for a typical project are listed below (assuming that the project will have asphalt pavement for any proposed public streets):

#### Pavement Subgrade and Aggregate Base

- Submit aggregate gradation report (in TDOT format) at least 2 days prior to placement.
- Notify city inspector at least 2 days prior to construction.

#### Asphalt Binder and Asphalt Surface Coat

- Submit an asphalt job mix formula (in TDOT format) from approved asphalt plant at least 2 days prior to placement.
- Notify city inspector at least 2 days prior to construction.
- Submit density and gradation reports from materials analysis laboratory as required.

#### Curbs and Sidewalks

- Notify city inspector at least 2 days prior to placement for inspection of lines and grades. Methods, materials and locations for construction and expansion joints, and steel reinforcement where shown on plans, should also be reviewed.

#### Retaining Wall Footers

- Notify city inspector at least 2 days prior to pouring concrete for inspection of lines and grades. Other review items include adequate foundation conditions, joints, and correct amount of steel reinforcement.

#### Storm Drain Pipes Within the Right-of-Way

- Notify city inspector at least 2 days prior to backfilling. Manufacturer's certificates may be required by the city inspector for materials which appear to be substandard.

#### Water Quality Structures

- Submit manufacturer's specifications for the structure at least 7 days prior to backfilling for final approval. Specifications must agree with approved construction plans and any other documents (such as a Special Pollution Abatement Permit or a NDPEs application).
- Notify city inspector at least 2 days prior to installation.

Other types of construction, located on private property and not affecting the public interest, may be spotchecked by the Stormwater Engineering Division personnel for general conformance with the plans. However, it is not the Stormwater Engineering Division's responsibility to inspect constructed project work on private property.

Retaining walls will not be allowed on public right-of-way as part of a site development project, and any retaining walls inadvertently built on public right-of-way must be completely removed. See Policy 10 in Appendix C for more information concerning retaining walls.

### **13.3 Erosion and Sediment Control**

Proper sequencing of construction activities is essential to maximize the effectiveness of erosion and sediment control measures. A construction schedule is recommended as part of the erosion and sediment control plan (see Section 7.3), with typical schedule formats described in AM-02 of the Knoxville BMP Manual. The following erosion control activities provide a simplified outline that applies to the initial phase of most site developments:

1. Install a stabilized construction entrance and exit.
2. Flag and mark the project boundaries. Flag the construction buffer zones, sediment traps or basins, construction storage areas, and equipment travel lanes.

3. Clear a path for the installation of perimeter erosion and sediment controls.
4. Install perimeter erosion and sediment controls. Evaluate effectiveness and adjust as needed.
5. Excavate any temporary sediment traps or sediment basins. For most small project sites, the proposed detention basin will also function as a temporary sediment basin with slight modifications.
6. Install outlet structures and channel stabilization measures for temporary sediment traps or sediment basins. Install slope stabilization measures such as grass sod or turf reinforcement mats.
7. Proceed with site grading and construction work. Establish either temporary or permanent vegetation on all disturbed areas within 14 days of completion of grading at the disturbed area. Provide temporary seeding on temporary soil stockpiles.
8. The Stormwater Engineering Division will conduct routine inspections for erosion and sediment control throughout the construction phase. The Stormwater Engineering Division will also respond to complaints of erosion or sediment. In addition, TDEC may investigate complaints of erosion or sediment anywhere within the City of Knoxville.

A final as-built inspection and review will be performed at the project site prior to release or reduction of a construction bond. See Appendix A for the Final Site Inspection Checklist and for the Development Certification Checklist. All disturbed areas must support a thick and healthy stand of vegetation, with no evidence of erosion or slope instability.

Throughout the construction phase of a project, erosion and sediment control measures are required to be inspected at least weekly and also after any significant rainfall event. During periods of prolonged rainfall, the erosion and sediment control measures should be inspected daily. It is recommended that an inspection checklist, either generic or project-specific, should be used to perform the inspections and to record any needed maintenance tasks. See Appendix A for a generic erosion control inspection checklist.

Failure to install or maintain the required erosion and sediment control measures will result in enforcement action from the Stormwater Engineering Division inspectors. Authority for the enforcement of erosion and sediment controls is provided by Section 22.5-8 of the Knoxville Stormwater and Street Ordinance. Any person violating the provisions of the ordinance may be assessed a civil penalty of not less than \$50 per day and not more than \$5000 per day for each day of violation, in addition to any damages or expenses incurred by the City of Knoxville in controlling or investigating violations.

### **13.4 Development Certification**

An approved development certification is one of the items required prior to the release of any bond (also called Performance and Indemnity Agreement) that has been collected by the Stormwater Engineering Division. The development certification is issued by the Stormwater Engineering Division after all construction has been completed in accordance with the design plans and requirements of the Knoxville Stormwater and Street Ordinance. An accurate as-built drawing must be submitted and sealed by the design engineer.

Appendix A contains a site review checklist for final approval of a constructed site development project and the associated as-built drawing. Plats, maintenance covenants, and easements are field-checked to ensure that the locations are approximately correct. Sizes and configurations for detention basins, oil/water separators or other water quality structures are inspected. Adequate vegetation cover is required for all areas disturbed by construction activity. Due to the difficulty of establishing vegetation on sloped surfaces and grades (such as detention basins), it is highly recommended that grass sod or turf reinforcement mats should be used for these areas.

Every as-built drawing must be properly certified by the appropriate design professional engineer and the registered land surveyor. The land surveyor must provide certification as shown to the right, in addition to the surveyor's seal with an original signature and date across the seal

I hereby certify that I have surveyed the land boundaries and easements shown hereon in accordance with the accuracy requirements for a Category I survey and that the ratio of precision of the unadjusted survey is not less than 1:10,000.

I further certify that I have located all natural and manmade features shown hereon in accordance with the current Standards of Practice as adopted by the Tennessee State Board of Examiners for Land Surveyors. I certify the location, elevation, and description of these features.

---

Printed Name

Date

RLS No.

### 13.5 Bond Release

Minimum requirements for release of the performance bonds include:

1. Development Certification Approval -- Follow checklist in Appendix A for submittal of as-built drawings to the Stormwater Engineering Division by the design engineer as required by the Knoxville Stormwater and Street Ordinance in Section 22.5-28(e).
2. Recorded Documents -- All necessary survey plats, maintenance covenants (CPMSF), and easements must be recorded at the Knox County Register of Deeds by following official procedures. It is the responsibility of the property owner to see that all necessary documents are properly recorded, including easements for detention basins, oil/water separators and all other stormwater facilities.
3. Good Cover of Vegetation -- All areas disturbed by construction activity must be stabilized for the purpose of erosion control. Due to the difficulty in establishing vegetation on sloped surfaces, it is highly recommended that detention basins should have grass sod or turf reinforcement mats on all slopes.

Basic timetables for bond extension/reduction/release are shown in Figure 2-4. The contractor or developer should contact the Stormwater Engineering Division at least 30 days prior to the bond expiration date in order to arrange a site inspection and to discuss requirements for bond release. As a courtesy, the Stormwater Engineering Division may send a notice letter to both the Principal and Guarantor 60 days prior to bond expiration. The Stormwater Engineering Division may send a second courtesy letter 21 days prior to bond expiration, with a more urgent warning. The Principal is required to notify the Stormwater Engineering Division of his intentions at least 14 days prior to the bond expiration with regard to the specific form of surety and the proposed Guarantor. Original signed documents must be submitted to the Stormwater Engineering Division at least 10 days prior to the bond expiration, in order to forestall the initiation of collection procedures by the Stormwater Engineering Division.



## Chapter 14

### SITE CONSTRUCTION ACTIVITIES

#### 14.1 Construction Schedules and Phases

A construction schedule should generally be prepared as part of the erosion and sediment control plan (ESCP) as described in Section 7.3. The construction schedule allows the engineering plans reviewer and the construction inspector to understand the sequence of construction. Typical tasks may include:

- Site mobilization and traffic control
- Installing erosion and sediment controls
- Clearing and grubbing
- Cut and fill operations
- Installing underground utilities and stormwater system
- Seeding, sodding, planting trees, and other landscaping activities
- Street and parking lot construction
- Installing pavement surface
- Installing sidewalks and curbs
- Installing streetlights and signs
- Excavating for building foundations

The construction schedule should indicate how many days are required for each task. Estimate the duration of each task by using realistic number of workdays with allowance for the weather. Computerized scheduling software is often beneficial in terms of revising and adapting schedules to delays caused by weather, broken equipment, subcontractors, material shortages, difficult construction, etc. Advanced scheduling methods usually keep track of available manpower and resources for maximum efficiency. Typical methods may include:

- CPM (Critical Path Method)
- PERT (Planning Evaluation and Review Technique)
- Milestone charts

The construction contractor should notify the city inspector of any major changes or delays to the construction schedule, thus allowing the required construction inspections in Chapter 13 to proceed in a timely fashion.

Construction phases are highly recommended for larger projects such as residential subdivisions, commercial business parks, shopping malls, office complexes, etc. The goal of construction phasing is to minimize the amount of disturbed area at any given time. Construction phases often allow a contractor to make more efficient use of resources and manpower. See Chapter 5 of the Knoxville BMP Manual for additional discussion of construction phases and the effective use of erosion and sediment controls. See AM-02 of the Knoxville BMP Manual for further discussion of construction scheduling and a very brief example of the PERT method.

## 14.2 Good Housekeeping and Other BMPs

The construction contractor must prevent pollution in all forms on the project site. Potential problems may include excessive noise, construction traffic, dust and other forms of air pollution, leaks and spills, trash, debris, etc. Many departments within the City of Knoxville are specifically instructed to be responsive to citizen complaints in such matters as codes enforcement, zoning violations, stormwater quality and illegal dumping. In addition to City of Knoxville personnel, TDEC also has a large office inside the city limits with many regulatory inspectors who are instructed to respond to complaints from any Tennessee citizen.

Therefore, it is in the best interests of the contractor to prevent or reduce pollution and other nuisance conditions. The first step is to institute good housekeeping measures on the construction site. These measures (which are often called best management practices or BMPs) will help to maintain safe working conditions, orderly traffic at the site, efficient use of limited space, and protection of materials and equipment. Basic rules for good housekeeping include:

- Maintain well-defined paths for vehicle traffic and pedestrian traffic. Ensure adequate visibility and sight distance for safety reasons.
- Store materials and equipment in an orderly manner to prevent waste or damage.
- Supply electricity, lighting, heating, fans, etc, to various locations on the construction site, as needed, in an orderly manner using equipment designed for the particular purpose.
- Provide labeled containers in convenient locations for all types of waste and excess materials. Encourage recycling of materials when possible.
- Adequate supervision and guidance should be provided for all personnel on the construction site.
- Security measures should be taken to prevent or discourage visitors, trespassers or neighborhood children from entering the site.

Liquid materials must be stored in sturdy non-leaking containers that are chemically inert. Equipment fueling and maintenance should not take place at the construction site to minimize the potential for spills and leaks. The Knoxville BMP Manual contains many other recommendations for construction contractors under the AM category (Activities & Methods).

## 14.3 Waste Management

A major part of the effort to maintain good housekeeping practices is to effectively manage materials and resources at the project site. Waste management, and material storage in general, is often neglected, which actually costs the contractor both time and money because waste handling is a fact of life. In addition, incorrect waste management may cause pollution or other violations for which the contractor can be fined or even shut down. Therefore, plan to manage waste materials in accordance with state and local regulations to avoid problems.

Table 14-1 provides a list of information sources on locating waste management guidance. The Office of Solid Waste has waste inspectors to locate and prevent illegal dumping and trash disposal. The Stormwater Engineering Division has stormwater inspectors to locate and prevent illegal discharges to the stormwater system and natural creeks.

<b>Table 14-1</b>		
<b>Sources for Waste Management Guidance</b>		
<b>Document</b>	<b>Subject</b>	
<b>Knoxville BMP Manual</b>	AM-01	Employee Training (Quick Reference for Disposal Alternatives) -- Table AM-01-1
	AM-06	Material Delivery and Storage
	AM-07	Spill Prevention and Control (Emergency and Regulatory Contacts) -- Table AM-07-1
	AM-08	Waste Management and Recycling
	AM-09	Sanitary and Septic Waste Management
	AM-10	Contaminated Soil Management
	AM-18	Concrete Waste Management
Policy 11	Sediment Disposal for Detention Basin Maintenance	
Office of Solid Waste -- on the city website at <a href="http://www.cityofknoxville.org/solidwaste/">www.cityofknoxville.org/solidwaste/</a> Telephone: 865-215-2921 (information on waste collection, recycling, illegal dumping, etc.)		

#### 14.4 Maintenance of Stormwater Facilities During Construction

The construction of stormwater facilities must occur early during the construction process for a number of reasons:

- Underground features that involve trenching and excavations must be coordinated with the grading operations.
- Detention basins also involve substantial grading efforts and must be considered during cut/fill volumes analysis.
- The construction site needs to be well-drained in order to allow operations to continue smoothly and on time.

A cleared site is usually as impervious as the final graded site. Therefore, the cleared site is likely to contribute to increased stormwater runoff volume and even potential flooding if sufficient measures are not in place to detain stormwater, slow runoff velocities, prevent sediment, etc. A proposed detention basin should usually be constructed during initial construction grading, with suitable modifications to serve as a temporary sediment basin also.

Common methods to protect and maintain stormwater facilities during construction (along with the matching reference to the Knoxville BMP Manual) include:

- Preservation of existing vegetation (AM-03)
- Maintenance of existing drainage systems (AM-04)
- Construction road stabilization (ES-03)
- Diversions and downdrains (ES-21)
- Temporary inlet protection (ES-24)
- Temporary sediment trap (ES-18)
- Construction entrance (ES-01)
- Seeding (ES-08) / Sodding (ES-09)
- Check dams (ES-13)
- Silt fence (ES-14)
- Straw bales (ES-15)

In many cases, the developer may choose to use a permanent detention basin as a temporary sediment basin. The approved construction plans should clearly indicate if the detention basin will be used in this manner. The basin outlet structure must be suitably modified during construction

to prevent sediment and silt from leaving the project site. In most cases, the computed detention basin volume is also adequate for sediment settling during construction.

Stormwater facilities (underground pipes and culverts, detention basins, other types of stormwater quality structures) must be periodically cleaned and maintained during construction. At a minimum, stormwater facilities must be cleaned as part of the final construction effort prior to the contractor leaving the construction project. An erosion control inspection must be conducted at least once a week to ensure that all erosion control systems and drainage systems are working correctly. See Policy 11 (in Appendix C) for guidance on sediment disposal from detention basins and other stormwater treatment BMPs.

#### 14.5 Notification of Spills and Other Releases

Knoxville Water Quality Hotline (865-215-4147) is intended to receive anonymous reporting of water quality concerns and illegal discharges 24 hours per day. In an actual emergency or for HAZMAT responders, call the 911 emergency number. In response to calling the Water Quality Hotline, Engineering Department staff will then investigate, coordinate, and enforce illegal dumping, illicit discharges, and spills to the storm drainage system, river, or creeks within the city of Knoxville. Staff are on hand to only assist, not replace, your emergency response contractor or the City HAZMAT team. See the Knoxville BMP Manual under AM-07, Spill Prevention and Control, for a general list of hazardous materials contractors known to provide services in the Knoxville area. According to the Stormwater and Street Ordinance (22.5-53, Notification of Spills and Illicit Discharges):

*“As soon as any person has knowledge of any illicit spills or discharges to the stormwater system in violation of the City of Knoxville Stormwater and Street Ordinance, such person shall immediately notify the Engineering Director by telephone [i.e. the Water Quality Hotline 215-4147] 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 telephone notification with a written report to the Engineering Director within three (3) calendar days. At a minimum, the written report for any illicit discharge shall include:*

- i. Date and time of the discharge*
- ii. Location of the discharge*
- iii. Material or substance discharged*
- iv. Duration and rate of flow*
- v. Total volume discharged*
- vi. Total volume recovered*
- vii. Cause or reason for the discharge*
- viii. Remediation and containment action taken*
- ix. Material Safety Data Sheets (MSDS) for the discharged material*
- x. Action taken to prevent further discharges*
- xi. Description of any environmental impact”*

The Knoxville Stormwater and Street Ordinance (Section 22.5-52) contains a list of the allowable stormwater discharges to the city storm drainage system, ditches, swales, natural channels, streams, creeks, or sinkholes. Any other material or substance is not an allowable discharge, and

therefore is in direct violation of the city ordinance. The list of allowable stormwater discharges is also included in the Knoxville BMP Manual under AM-01 (Employee Training) and IC-01 (Non-Stormwater Discharges to Storm Drains).

In the event of a leak or spill that presents a serious hazard to life, property or the environment, the first phone call shall be made to the E911 emergency dispatching center. The second phone call should preferably be made to a hazardous materials contractor for which an arrangement has been previously established. The next phone calls shall be made to the Knoxville Water Quality Hotline and to TDEC Water Pollution Control.

The recommended course of action is listed in the Knoxville BMP Manual under AM-07, Spill Prevention and Control. A spill or leak, unless extremely minor in nature, should also be reported to the Tennessee Department of Environment and Conservation (TDEC). A minor spill typically involves a small amount of material that can be completely removed with shovels, buckets or absorbent materials. The Knoxville BMP Manual has emergency and non-emergency numbers for the municipal hazmat response team (see Table AM-07-1).

#### **14.6 Notice of Violation (NOV)**

The Stormwater Engineering Department can issue a notice of violation (NOV) for many types of illegal discharges, sediment, erosion, grading without a permit, etc. A copy of the NOV form is included in Appendix A. The NOV shall include the recommended course of action and a timetable to accomplish the corrective action. The NOV may include penalties and fines. Performing site grading or construction without a valid site development permit may result in an NOV, which will serve as a stop-work order until corrective actions are taken.

The Knoxville Stormwater and Street Ordinance (Section 22.5-6) allows the Engineering Director or his designated representatives to enter any property which is believed to discharge or contribute to the stormwater system, stream, natural drainage channel. The purposes for this right of entry are to remove foreign objects or blockages, monitor and inspect stormwater runoff quality, and to enforce any of the provisions of this ordinance. The Knoxville Stormwater and Street Ordinance (Section 22.5-54) may also require any person engaging in any activity (or owning the property in question) to undertake a reasonable monitoring effort for discharges to the stormwater system operated by the City of Knoxville. The monitoring shall be reported periodically in a report to the City of Knoxville.



## **Appendix A FORMS**

### **Application Forms**

- Site Development Permit Application
- Fee Computation Worksheet for Site Development

### **Checklists**

- Site Development Permit Checklist
- Minimum Submission Checklist for Commercial and Large Residential Site Development Permits
- NOI/SWPPP Review Checklist
- Site Inspection Checklist
- Development Certification Checklist

### **Miscellaneous Forms**

- Special Pollution Abatement Permit (SPAP)
- SPAP for Restaurant, Grocery Store or Food Handling Facilities
- SPAP for Vehicle and Equipment Facilities
- SPAP for Vehicle Wash Facilities
- SPAP for Large Parking Lot Facilities
- FEMA Elevation Certificate & Instructions
- Notice of Intent (NOI) Form
- Notice of Termination (NOT) Form
- Stormwater Monitoring Report Form
- Erosion Prevention and Sediment Control (EPSC) Plan for Small-Single Family Lots



City of Knoxville, Tennessee  
Stormwater Engineering Division  
[www.knoxvilletn.gov/engineering/](http://www.knoxvilletn.gov/engineering/)

Land Development Manual  
July 2023

## PERMIT APPLICATION PROCESS

Site development permits are issued in conjunction with the Plans Review and Inspections Department. The permits are applied via an online portal found at [permits.knoxvilletn.gov](http://permits.knoxvilletn.gov). For any questions, please contact the City of Knoxville Development Services desk at (865) 215-3669 or email [bldginspections@knoxvilletn.gov](mailto:bldginspections@knoxvilletn.gov).



CITY OF KNOXVILLE

City of Knoxville, Tennessee  
Manual Stormwater Engineering Division  
www.knoxvilletn.gov/engineering

Land Development  
July 2023

## FEE COMPUTATION WORKSHEET FOR SITE DEVELOPMENT

Disturbed acreage should be rounded down to the nearest tenth and used for acreage calculations

Review Fees <i>(due with the initial site plan submittal)</i>	Computation	Amount
1. Choose A, B, or C		
A. Small Single Family Residential – Less than 10,000ft <sup>2</sup> (0.23ac)	\$0.00 <i>(no charge)</i>	
B. Large Residential and Commercial Development <i>(choose 1)</i>		
Less than 1 acre	\$150.00	
1 to 5 acres	\$150.00 + \$20.00 per acre	
More than 5 acres	\$200.00 + \$10.00 per acre	
2. Each review beginning with the 4 <sup>th</sup> submittal.	\$100.00 each submittal	
3. Special Pollution Abatement Permit	\$200.00	

Subtotal: \_\_\_\_\_

Permit Fees <i>(due before site permit is issued)</i>	Computation	Amount
1. Choose A, B, or C		
A. Site Development Plans with no Performance and Indemnity Agreement <i>(choose 1)</i>		
Small Single Family Residential – Less than 10,000ft <sup>2</sup>	\$10.00	
Large Residential and Commercial Development – Any size	\$50.00	
B. Site Development Plans with a Performance and Indemnity Agreement <i>(choose 1)</i>		
Less than 1 acre	\$375.00	
1 acre or more	\$375.00 + \$15.00 per acre	
2. If site development begins before the permit is obtained.	Multiply fee by 10	
3. Right of Way permit	Computed by Engr. Dept.	
4. Permits for utilities	Computed by Engr. Dept.	
5. Floodplain development permit	\$0.00 <i>(no charge)</i>	
6. Permit renewal before permit expiration date.	\$0.00 <i>(no charge)</i>	
7. Permit renewal after permit expiration date.	Full permit fee	

Subtotal: \_\_\_\_\_

<b>Construction General Permit (CGP)</b>	<b>Computation</b>	<b>Amount</b>
1. CGP – New ( <i>choose 1</i> ) - ( <i>due before site permit is issued or reissued</i> )		
A. 1 acre or more but less than 5 acres	\$250.00	
B. 5 acre or more but less than 20 acres	\$1,000.00	
C. 20 acres or more but less than 50 acres	\$3,000.00	
D. 50 acres or more but less than 150 acres	\$6,000.00	
E. 150 acres or more	\$10,000.00	
2. CGP – Permit maintenance fee ( <i>choose 1</i> ) - ( <i>due prior to permit renewal</i> )		
A. 1 acre or more but less than 5 acres	\$125.00	
B. 5 acre or more but less than 20 acres	\$500.00	
C. 20 acres or more but less than 50 acres	\$1,000.00	
D. 50 acres or more but less than 150 acres	\$2,000.00	
E. 150 acres or more	\$3,750.00	

Subtotal: \_\_\_\_\_

<b>Engineering Plat Review</b> ( <i>due before approval of Plat</i> )	<b>Computation</b>	<b>Amount</b>
1. Administrative Plat	\$80.00	
2. Exempt subdivision and corrected plats	\$70.00	
3. All other plats ( <i>choose 1</i> )		
1 to 50 lots	\$100.00 + \$10.00 per lot	
More than 50 lots	\$300.00 + \$6.00 per lot	
4. Each plat review with a misclosure beginning with the third submittal	\$100.00 each submittal	
5. Declaration Document	\$150.00	

Subtotal: \_\_\_\_\_

Total: \_\_\_\_\_



## MINIMUM SUBMISSION CHECKLIST FOR COMMERCIAL AND LARGE RESIDENTIAL SITE DEVELOPMENT PERMITS

The following items must be submitted in order to receive a full review of a project's site development plan. If the appropriate items are not submitted, the project may be disapproved immediately, and no comments will be made regarding the site development plans.

Though other plans, calculations, or supplementary documentation may be required, the following are the minimum requirements for site development permits. For a more in-depth guide to site development permit requirements please see the "Site Development Permit Checklist" (Form E of the *Land Development Manual*).

### Design Plans

- Site Layout
- Grading
- Drainage
- Erosion Prevention and Sediment Controls
- FEMA (*Flood Damage Prevention and Control Ordinance*)
- Riparian Buffer Zone (*Stormwater and Street Ordinance Sec. 22.5-40*)
- Details

### Design Calculations

- Pipe and Storm System Calculations
- Detention Calculations (*Stormwater and Street Ordinance Sec. 22.5-31*)
- Downstream Study (*Stormwater and Street Ordinance Sec. 22.5-23 and 22.5-31*)
- Retaining Wall Calculations (*Retaining Walls Policy*)

### Supplementary Documentation

- Construction General Permit (*Qualified Local Program Construction General Permit Policy*)
- Roadway Design Information including Geometric Layout (*Subdivision Regulations*)



## SITE DEVELOPMENT PERMIT CHECKLIST

This list is not for small single-family residences and duplex developments. Please note, this list is not intended to be an exhaustive list of comments that could be made during a review but, rather, an extensive list of common requirements to facilitate in the creation and design of plans.

### STANDARD COMMENTS

#### Project Thresholds

- Once a site has been improved to a value equal to or greater than 50% of the site's assessed appraised or recent sale value (whichever is greater) over a rolling five-year duration, it has met Substantial Investment (SI), and the site must be brought into compliance with the City of Knoxville Code of Ordinances Chapter 22.5 (*Stormwater Ordinance*).
- When a building permit is not being applied for, a maximum of 25% of trees can be removed from the property within a 5-year period.
- If one acre or more of area is to be disturbed, a SWPPP and completed City of Knoxville NOI form must be submitted. See the "Qualified Local Program Construction General Permit" in the *Land Development Manual* for SWPPP requirements.
- A TDOT entrance permit must be obtained for all state routes.
- A Traffic Impact Study is required for developments with 400 or more parking spaces or as specified Knoxville Knox County Planning.
- Traffic safety hazards should be eased or eliminated. Engineering can take changes into consideration to mitigate any 'domino' effects.
- Ensure attenuation/detention requirements are met per the *Stormwater Ordinance*.
- Provide a downstream study if a site will have 0.5 acres or more of impervious and meets "Substantial Investment." A study is also required when a site is required to provide attenuation.
- Ensure the site meets the first flush requirements specified in the Stormwater Ordinance. See the Land Development Manual for prescribed treatment methods (e.g., stormwater basin, proprietary water quality devices, infiltration systems).
- A Special Pollution Abatement Permit (SPAP) shall be required for the following land hot spots:
  1. Vehicle, truck, or equipment maintenance, fueling, washing, or storage areas, e.g. automotive dealerships, automotive repair shops, and car wash facilities;
  2. Any development (or common development) containing more than four hundred (400) surface parking spaces or one hundred twenty thousand (120,000) square feet or more of surface parking area;
  3. Recycling and salvage yard facilities;
  4. Restaurants, grocery stores, and other food service facilities;

5. Commercial facilities with outside animal housing areas, e.g. animal shelters, fish hatcheries, kennels, livestock stables, veterinary clinics, and zoos; and
  6. Other producers of pollutants identified by the Director.
- If a new structure is being constructed in the floodplain, the structure's finished floor elevation must be raised to a minimum of one foot above the base flood elevation (500-year), or the structure must be floodproofed to an elevation equal to or greater than one foot above the base flood elevation in accordance with Chapter 12 of the City of Knoxville Code of Ordinance. Please note, single-family residential structures may not be floodproofed. Exception: Structures in floodplains for along any TVA dam-controlled river (Tennessee, French Broad, Holston) must be elevated or floodproofed to no lower than three feet above the 100-year flood elevation.
  - If an existing structure meets FEMA substantial improvement criteria. The structure must be properly elevated and/or floodproofed. If the applicant believes the improvements do not meet the substantial improvement criteria, an appraisal of the existing building may be submitted.
  - If the applicant believes the existing building is sufficiently elevated, submit a FEMA Elevation Certificate.
  - If a project in the floodplain proposes work in the "No-Fill" area or Floodway, a No-Rise may be required. See the "No-Rise Certification for Floodway Encroachment" and "No-Rise Certification for Fill Line Area Encroachment" policies of the LDM for more information.

### Information

- Indicate the city block # on the site development plan.
- Indicate the Parcel ID # on the site development plan.
- Show the names, phone numbers, and addresses of all interested parties (Owner, Developer, and Design Professional) on the site development plan.
- Show and label a vicinity map with all adjacent streets on the plans.
- Ensure that all plans have a graphical scale.
- Ensure that all plans have a north arrow.
- Ensure that all plans are stamped & signed by professional engineer, landscape architect, or architect registered in TN.
- Calculate the total site acreage, total disturbed area, total existing impervious area, total vehicular use area, and total post developed impervious area (including any pervious pavers) and show the values on the drawings.
- Prior to plan approval, any stamps saying, "Not for Construction", "Preliminary", etc. should be removed from the plans.
- Ensure proposed structures, retaining walls, detention ponds, and infiltration areas do not conflict with existing utility and drainage easements.
- If creating a subdivision of 6 or more lots, it is required to provide three permanent monuments. Identify the monuments on the plans.
- Provide a site plan showing the routing of all proposed utilities.

- On the layout plan, identify all ROW repairs due to utility work. Repairs should be in accordance with detail COK-12; provide detail with plans.

### Existing Conditions

- Clearly label all existing features to either remain or to be removed.
- Clearly show and label all property lines.
- Show and label any existing easements.
- Show all existing drainage features and label them correctly with inverts.
- Show the no-fill line, riparian buffer zone, floodway, 500-year floodplain, and 100-year floodplain on the site plans.
- Identify closed depressions on the site plan, and ensure compliance with Chapter 22.5 of the City Code.
- Identify any blue-line streams or wetlands on the plans. If streams or wetlands are modified, an ARAP must be issued by TDEC.
- If a storm pipe exists under an existing building, the storm system must be rerouted, and the existing pipe must be abandoned per City of Knoxville specifications.
- Grading
- Ensure contours are legible and are labeled, at a minimum, every 10 elevation feet (existing and proposed).
- Show all existing and proposed contours at 2' intervals (maximum).
- Ensure that all proposed contour lines tie back in properly.
- Obtain adjacent property owners' written permission for any grading on their property.
- The maximum allowable slope is 2H:1V. Proposed permanent soil stabilization measures may be considered if provided and designed by an appropriate design professional.
- Ensure proposed retaining walls meet the requirements of the retaining wall policy in the Land Development Manual.

## TRANSPORTATION

### Streets and ROW

- Provide a roadway section showing the width of the base under curb, prime coat, and tack coat in accordance with the Land Development Manual.
- Include a note on the plans to contact the City Sign & Marking Division at 865-215-6720 prior to installation of any ROW signs/or markings for in-field verification.
- Encroachments into the ROW are not permissible.
- Specify on the site plans whether proposed roads will be public or private right-of-way per the Knoxville-Knox County Planning Subdivision Regulations.
- Provide horizontal curve information for each proposed street; ensure compliance with AASHTO standards.

- Provide vertical curve information for each proposed street; ensure compliance with AASHTO standards.
- ROW curbing is required to meet the requirements of TDOT detail RP-VC-10. Include a detail with the drawings.
- Steep slopes are not allowed in the road's clear zone, provide a 10 ft clear zone from edge of street (max grade 4%).
- Submit a Street Signage Plan with locations and details for all subdivisions.
- Prior to performing work in the ROW, obtain a traffic control permit from the City of Knoxville Division of Traffic Engineering (roadclosures@knoxvilletn.gov).
- Provide a note on the site plan stating contractor is responsible for repairing ROW elements damaged during construction per City of Knoxville standards.
- Clarify on the site plans if any utility poles are being removed or relocated. Clearly show on the plans where utilities are being relocated. Coordinate relocation with the appropriate utility providers.
- Clarify on the site plans if any existing streetlights are to be removed. Coordinate replacement of the lights with the City of Knoxville Streetlight Coordinator (streetlighting@knoxvilletn.gov).
- The minimum allowable width for a drive through lane is 10 feet.

### Driveways

- A stamped drawing showing the appropriate sight distance triangles for all driveways and street intersections may be required. The sight distance submittal shall specify the required sight distance per AASHTO (Green Book 7th Edition), the posted speed limit, the grades of the roadways, and all assumptions. Utilize AASHTO stopping sight distance for driveways sight triangles. Ensure there are no vertical (e.g. plants or utilities) or horizontal obstructions; provide sight line profiles when appropriate.
- The maximum allowed driveway slope is 15%.
- The number of driveways provided must be less than or equal to the maximum allowed in Article 11 Table 11-5 of the Zoning Ordinance.
- The minimum driveway spacing from an intersection must comply with Article 11 Table 11-6 of the Zoning Ordinance.
- Driveways in a development must be separated by a minimum distance equal to the width of the wider driveway.
- Provide written consent from neighboring property owner for curb cuts encroaching on the frontage of an adjacent property.
- Entrances need to meet the requirements of TDOT detail RP-D-15 or RP-D-16. Include a detail with the plans. When proposing a RP-D-16 Type-C driveway, provide a flat panel of sidewalk on either side of the driveway prior to providing a ramp.
- The driveway radius should not be depicted as extending through the sidewalk.
- Right-in and right-out driveways must be oriented at an angle which ensures compliance (e.g. 30 degrees). TDOT lowered curb must continue through the driveway. Sidewalk must continue through the driveway, and all joints must be perpendicular to sidewalk edges. Right-in and right-

out island curbing must be angled back or rounded to prevent tire damage (e.g. RP-SC-1). Where curb heights transition, the curb should be tapered.

- The driveway and curb cut widths must comply with Article 11 Table 11-7 of the Zoning Ordinance. Provide appropriate dimensions on the site plans.
- Remove unused driveways and curb cuts. Right-of-way curbing, gutter, sidewalk and landscaping are to be reinstalled per City standards at these locations.

### **Parking Lots**

- Identify the proposed location of the dumpster. Depending on the dumpster location, a turning template may be required to verify that it can be properly serviced. If a dumpster is not proposed, clarify this fact on the submittal. The City of Knoxville Solid Waste Department can issue (with a subscription fee) a maximum of one push cart to a commercial site.
- If dumpster pad is proposed show on plans for pad to be raised approximately two (2) to four (4) inches above grade to prevent stormwater flow across pad. Show spot elevations for dumpster pad(s). Catch basins should not be located under or directly adjacent to dumpster pads. When possible direct flow from pad into grass or vegetated area this should not cause the runoff to bypass any required attenuation or water quality device.
- Ensure the site does not cause queuing into the right-of-way.
- Parking lots must be setback from the ROW property line at least 25 feet if it shares frontage (in the same block) with a residentially zoned property on a street with less than 4 lanes. This does not apply to multi-family dwelling.
- The minimum parking lot setback from the ROW for parking lots 20,000 ft<sup>2</sup> or larger is 10 feet.
- The minimum parking lot setback from the ROW for parking lots less than 20,000 ft<sup>2</sup> is 6 feet.
- Minimum parking lot setback for Industrial zones abutting Agricultural or Residential zones is 20 feet
- Minimum parking lot setback for Office or Commercial zones abutting Agricultural or Residential zones is 20 feet
- Minimum parking lot setback for Multi-dwelling structures/developments abutting Agricultural or SFR zones is 10 feet
- Minimum parking lot setback for Non-residential uses in Agricultural or Residential zones is 10 feet
- All parking spaces must comply with the minimums and maximums in Article 11.5 Table 11-4 of the Zoning Ordinance.
- All drive aisles must comply with the minimums and maximums in Article 11.5 Table 11-4 of the Zoning Ordinance.
- The number of compact vehicle spaces must be 20% or less than the total provided spaces.
- Compact spaces should be clustered together.
- Compact spaces must be marked with signs restricting their use.
- Ensure all compact spaces meet the minimum requirements of Article 11.5 of the Zoning Ordinance.

- For parking modules with parking on one side, the maximum protrusion into the modules (space depth) is 1 foot.
  - For parking modules with parking on two sides, the maximum protrusion (space depth) 2 feet (1' for each parking row).
  - Protrusions into parking modules may not affect more than 25% of the parking spaces.
  - All parking spaces must be designed so that drivers are not required to back into a public street.
  - When vehicles are required to back into an alley, the alley plus the on-site parking aisle must meet the minimum aisle width.
  - The maximum grade allowed in parking spaces and drive aisles is 10%.
  - Surface drainage from the 10-year 24-hour storm is required to be collected so as to preclude uncontrolled drainage onto the paved portion of street rights-of-way.
  - A divider median is required at a minimum interval of one median per every 6 parking rows.
  - Parking rows must be terminated at both ends with terminal islands with a minimum area of 120 ft<sup>2</sup>.
  - Interior islands must have a minimum area of 120 ft<sup>2</sup> for each parking row that they interrupt.
  - All areas devoted to permanent off-street parking surfaced as to control dust, rutting, erosion as a result of continuous use, and migration of surface materials.
  - All parking spaces must be clearly delineated
- Gravel parking lots must be designed to prevent migration and rutting and must control dust.
- Provide a border (e.g. curbing, fencing, or landscape timbers) to control migration.
  - Provide an appropriate grid system (e.g. flush curbs, flush landscape timbers, or manufactured grid system) to prevent rutting.
  - Gravel lots should only use clean stone to control dust.
- All vehicular and pedestrian signs must be MUTCD compliant

### **Sidewalks**

- Sidewalks must meet the requirements of City of Knoxville details COK-6 and COK-13.
- If proposed curbing or sidewalk eliminates a roadside ditch, provide an adequate drainage system.
- Provide spot elevations at the four corners of all ROW sidewalk ramps and turning panels to ensure ADA compliance.
- Provide a 4-foot minimum accessible path (exclusive of curb width) around all obstacles in the sidewalk area.
- Provide details for crosswalk repair. Crosswalk shall be composed of 10 ft long bars, 12 in wide bars, 2 ft gaps, parallel with traffic, thermoplastic, and retroreflective.

### **Bicycles**

- Provide the number of bicycle spaces equal to or greater than the minimums shown in Article 11 Table 11-8 of the Zoning Ordinance.

- The required bicycle parking spaces are required to be located in a convenient and visible area within fifty (50) feet of a principal entrance.
- Bicycle parking facilities must be sufficiently separated from motor vehicle parking areas (e.g. grade separation, distance or physical barrier, such as curbs, wheel stops, poles, or other similar features)
- Users must not be required to climb or descend stairs in order to access the bicycle parking facility unless there is a bicycle wheel through parallel to the stairs
- Bicycle parking must not impede pedestrian or accessible routes.
- Bicycle parking spaces must include a rack which permits the locking of the bicycle frame and one wheel to the rack or fixture and support bicycles in a stable position without damage to the wheels, frame, or components.
- Bicycle racks must be spaced 3.0' from the side of the rack to any obstruction, including edge of pavement. Clearly demonstrate this on plans/details.
- Bicycle racks must be spaced 3.0' forwards or backwards from the centerline of the rack to any obstruction, including edge of pavement. Clearly demonstrate this on plans/details.
- Bicycle racks must be spaced 4.0' from the side of the rack to another bike rack. Clearly demonstrate this on plans/details.
- Bicycle racks must be spaced 10.0' feet forwards or backwards from the centerline of the rack to the centerline of another bike rack. Clearly demonstrate this on plans/details.
- Bicycle parking and access to bicycle parking must be surfaced as to control dust, rutting, erosion resulting from continuous use, and migration of surface materials.

## DRAINAGE AND STORMWATER

### General

- If removing or abandoning any stormwater pipes, add a note to the plans to contact the City of Knoxville Department of Engineering 865-215-2148 prior to removing or abandoning any stormwater pipes. Pipes structures must be either completely removed or abandoned in place; Indicate which method will be used, as well as the associated requirement on the plans.
  - If removed, any remaining structures that were tied to the pipe must be repaired per City or TDOT standards. A formal inspection by City Engineering staff (or 3rd party PE) of the repair is required before covering up.
  - If the pipe will be abandoned in place, the ends of the pipe must be blocked off per City or TDOT standards. The entire volume of the pipe must then be filled with flowable fill or concrete. A City Engineering inspector (or 3rd party PE) must be present for this work.
- Ensure all required stormwater easements (e.g. detention, retention, access, water quality facility, drainage, etc.) are provided. See the *Stormwater Ordinance* and the *Land Development Manual* for further guidance.
- Detention and Retention easements must be 5 feet outside the top of the cut slope and 5 feet outside the toe of the fill slope.

If the top of cut cannot be located, the easement shall be 5 feet outside of the top of berm elevation. If the toe of a fill slope cannot be located, the distance of the easement's extent shall be

determined by including the following distances: 5 feet for the berm width plus 5 feet for the outside of the toe width plus the top of berm elevation minus the bottom of pond elevation (this creates a theoretical 1:1 slope distance).

- Water quality easements fully encompass the treatment device and must be a minimum of 20' by 20' square.
- "Access Easements" are required for all detention facilities and water quality devices on the plan. The access easement must be traversable from the right-of-way and a minimum of 20 feet wide. A "Blanket Access Easement" may be granted in lieu of a specific access easement.
- Stormwater systems must discharge to a natural or manmade stormwater facility, or be discharged in a manner that does not create an erosive or safety condition.
- Provide drainage easements for through-water pipe systems crossing property lines.
- Downstream studies must include calculations showing the capability of the receiving stormwater facility to convey the 2-year and 10-year frequency storms. The calculations must be routed through the second existing street crossing, a blue-line stream, interstate right-of-way, railroad right-of-way, or off-site stormwater detention, whichever is closest. Failure of the downstream study may result in detention or alternate mitigation being required. Provide the following:
  - Narrative summary including a tabular summary of results,
  - Detailed pre- and post- delineated drainage maps that include contours.
  - Map and/or detailed description of the downstream system.
  - Pre- and post- developed acreage, curve numbers, and time of concentration.
  - A statement ensuring that the downstream system's existence, location, and functionality have been verified and any known problems have been identified.
- Riparian buffer zones are either 30 or 60 feet wide measured horizontally from the top of a stream bank or the width of the floodway whichever is greater. Typically, riparian buffers should be planted with 3 tiers (height) of plants that are clustered in a way seen in natural buffers. These tiers include trees, shrubs, and grasses. Plants in the buffer must be native and non-invasive to east Tennessee.

### General Calculations

- Stormwater calculations should be prepared and stamped by a professional engineer.
- Stormwater calculations must include all required storm events per the *Stormwater Ordinance*. Calculations must include a report from the modeling software. The report should include drainage area information, curve numbers, times of concentration, and all other required input data. The report from the modeling software must specify the output flows and volumes (for sites requiring retention) at all outfall points for all design storms.
- CN 98 should be used for the pond's 100-year water surface elevation.
- The city standard design storms are as follows: 1-year - 2.5in; 2-year - 3.0in; 5- year - 3.7in; 10- year - 4.3in; 25- year - 5.0in; 50- year - 5.7in; and 100- year - 6.3in
- Required hydrologic and hydraulic computation shall be in accordance with NRCS unit hydrograph procedures using AMC II curve numbers and type II rainfall distribution.
- When using the rational method for pipe calculations, the flows must be verified using an NRCS method. This can be done by running the NRCS method for a pipe system's entire drainage area

and comparing that flow the Rational flow. If the flow from the Rational method is lower, the intensity should be increased so that the rational flow is equal to or greater than the NRCS flow.

- Provide pre- and post-developed drainage maps.
- Provide a breakdown of the CN calculations including the TR-55 category for each component CN.
- Provide the  $t_c$  calculation for any time of concentration greater than the minimum. Include the 3 component time-of-concentration parts: Sheet Flow, Shallow Concentrated, and Open Channel.
- Indicate, on the drainage maps, the critical path used for calculating all times of concentration greater than the minimum.
- Ensure off-site run-on is adequately addressed.

### Pipes and Storm System

- Show all pipe sizes, lengths, slopes, inverts, and construction material on the plans.
- Provide details for all drainage structures (catch basins, manholes, etc.)
- Drainage pipes only collecting on-site runoff must be constructed of RCP, HDPE, DWPVC, or PPP.
- Steep pipes require anti-seep collars. Pipes with slopes between 12% and 35% require anti-seep collars or junction boxes every 35'. Pipes with slopes between 35% and 50% require anti-seep collars or junction boxes every 25'. The anti-seep collars should be placed against the downgrade side of the pipe bell. Provide a detail for anti-seep collar.
- Catch basins or junction boxes are required at all changes in grade, direction, pipe material, and pipe size.
- All catch basins in the ROW require a penta-headed bolt type locking system. (See a current revision of City of Knoxville standard detail COK-10).
- All storm pipes must have a minimum slope of 0.5%.
- Grass lined ditches must have a minimum slope of 2%.
- All catch basins, area drain grates, and manhole covers require a permanently cast environmental message or stamped medallion, i.e. "no dumping drains to river". Indicate this on a detail.
- Provide a detail for storm pipe trenches that are within the right-of-way; see City of Knoxville standard detail COK-5. Storm trenches under pavement or in the right-of-way require crush-and-run backfill from the spring line. 57 stone backfill is not allowed. Additionally, the minimum clearance from the top of pipe to the bottom of the subgrade is 1 foot.
- Ensure the top of catch basin elevations align with adjacent topographic information.
- Submit pipe, ditch, HGL, and catch basin inlet calculations.
- All through-water storm systems must be constructed with RCP (Exemptions may apply to common developments)
- All storm systems in the ROW must be constructed with RCP.
- All stormwater pipes, other than roof drains, must have a minimum diameter of 15".
- Provide a backfill detail for stormwater pipes.

## Water Quality

- Include necessary calculations and specifications with the Special Pollution Abatement Permit (SPAP) submittal.
- Attach the following to SPAP applications: a site plan showing all proposed water quality facilities, their details, and operation and maintenance information.
- Proprietary Stormwater Control Measures (SCMs) that are acceptable to use for water quality treatment may be found on the list of approved stormwater manufactured treatment devices published by the New Jersey Department of Environmental Protection (NJDEP) at the following website: <http://www.nj.gov/dep/stormwater/treatment.html>.
- Water quality units must match the orientation in which they are certified by NJDEP (e.g. one inlet pipe and no grate inlet).
- Provide a site-specific detail for the proposed water quality unit including the units top elevation inverts.
- When proposing a flow-through-water quality device, provide calculations showing that floatable pollutants will not be released in the lesser of the upstream pipe capacity or the 100-year storm.
- When proposing a flow-through-water quality device in the 100-year floodplain, provide documentation showing the unit will not release floatables in the 100-year flood.

## Attenuation

- Stormwater retention is required for areas draining to sinkholes if the site is required to provide a stormwater basin per the *Stormwater Ordinance*.
- Stormwater retention is required for projects located in a critical watershed if the site is required to provide a stormwater basin per the *Stormwater Ordinance*. See the *Stormwater Ordinance* for a list of critical watersheds.
- No woody vegetation may be placed within the storage area of the stormwater basin.
- Trees may not be planted in a stormwater basin or on its berm.
- Provide a removable and lockable trash rack on the riser.
- The outlet control structure and culvert should be made from RCP, concrete, or sturdy masonry.
- Detention Basins with low flow orifices (less than 15 inches) must have a filter box at the outlet structure's lowest orifice that is easily constructed and maintained. The filter box should be minimum 18" all directions, with hinged lid, and 2"-3" stone D50. The box may not allow the stone to escape.
- The minimum slope in the bottom of stormwater basins is 2% towards the outlet control structure.
- All inlet pipes should be located as far as possible from the outlet control structure.
- Stormwater basins must have a traversable 20 ft wide path between the access easement and the bottom of the pond. Maximum allowable slope is 3:1.
- If sumping a stormwater basin the following comments apply:
  - The sumped area cannot be used in detention calculations
  - The basin must be aerated (i.e. fountain)
  - A significant portion of the sumped area must be a minimum 5 ft deep.

- Ensure all areas drain to the stormwater basin as designed in the calculations during a 100-yr storm event.
- Provide an elevation/volume relationship table for stormwater basins
- Stormwater basins' design volume (volume used in calculations) should be 15% less than the volume to be constructed. This should be clearly indicated on an elevation-volume table. The 15% additional volume should be added by adjusting the surface area each two-foot contour (or each stage of the elevation-volume table).
- A minimum of 1 foot of freeboard from the 100-year storm elevation to the top of the berm is required for stormwater basins.

### Green Infrastructure

- Sites with pervious surface infiltration systems must add the following note to the site plan: Development certification is required for underground stone media storage systems. Verification will need to be certified by a Registered Land Surveyor or a Professional Engineer. Verification should include the following items:
  - Elevation of the bottom of the pit (to be shot before fill is placed)
  - Length and width of the pit
  - Elevation of the top of the pit (when gravel fill is complete)
  - Geotextile is installed at bottom and sides of the pit
  - Use of clean stone
  - Additional items may need to be certified. Contact City of Knoxville Engineering Development Services, 865-215-2148, for additional information.
- Sites with underground detention vaults must add the following note to the site plan: Development certification is required for underground stone media storage systems. Verification will need to be certified by a Registered Land Surveyor or a Professional Engineer. Verification should include the following items:
  - Elevation of bottom of gravel pit (to be shot before fill is placed)
  - Certify fabric and installation in gravel pit per the approved plans
  - Stone depth and type
  - Entire length of all chambers are installed at the same elevation (shoot surface of gravel before installation of chambers, include spot shots of chamber rows at ends and every 50 feet at a minimum)

This information is also used to verify the depth of stone under the chambers

- Length, size, and number of chambers
- Fabric installed per the approved plans in the isolator rows
- Any invert elevations indicated on the approved plans
- Outlet structure information, elevations, etc.
- Manifold elevations, diameter of pipe used, etc. for each tie in
- Verify use of spacers (size and number) between each row

- Verify pit was backfilled correctly
- Standard storm details, e.g. joints are tight, structures/tie-ins are grouted appropriately or fabric wrapped appropriately.

## **EROSION PREVENTION AND SEDIMENT CONTROLS**

### **General**

- Show a construction entrance on the plans and in a detail. The minimum dimensions are 50' long, 16' wide, and 6" deep.
- Specify perimeter erosion prevention and sediment controls on the plans and details.
- To ensure proper alignment of the silt fence, show an arrow indicating the flow direction on the detail.
- Temporary seeding is required when grading operations are temporarily halted for over 14 days and on soil stockpiles.
- Permanent seeding is required when grading operations are completed and when construction operations will not impact the disturbed area. Seed areas that show signs of excessive erosion.
- Provide temporary inlet protection for all catch basins, inlets, and culvert entrances.
- Provide permanent outlet protection at all outlets. Riprap aprons should be sized per standards set forth in ES-25 (Knoxville BMP Manual), or their size should be verified with calculations. Classify the size of riprap, and indicate their minimum grading, i.e., D50.
- If infiltration systems are proposed, specify EPSC measures on the plans to prevent sediment from entering the stone media during construction.
- A double row and/or reinforced silt fence should be used along creeks.
- A note should be included on the plans saying, "Excavate the permanent stormwater basin as the first act of grading. Provide a dewatering device and use as a sediment basin during construction. Remove accumulated sediment and landscape the pond when the upstream drainage area is stabilized."

### **Sediment Basins**

- Show the construction of any sediment basins on the phase 1 EPSC plan with all required diversion swales and berms.
- Specify for a cleanout marker to be installed in all sediment basins indicating the cleanout elevation. The recommended cleanout volume is 1/4 to 1/3 of the total storage volume of the basin
- A forebay is required at the primary inlet of all sediment basins. The forebay volume shall be at least 25% of the dry sediment storage volume; the forebay volume can count toward the basin's required dry storage volume.
- Provide sediment basin calculations specifying the required and provided amount of wet and dry storage.
- Provide means to ensure the sediment pond skimmer does not rest in the mud.
- Sediment basin outlet pipes must have an anti-seep collar.

- Sediment basin dewatering devices must be attached to the riser above the wet storage elevation.
- Provide a plan to convert the sediment basin to a dry detention basin post-construction.
- A sediment basin must not exceed a 4:1 length to width ratio. Non-porous baffles may be used to achieve the ratio.
- Sediment basins must be able to pass the peak runoff from a 25-year, 24-hour storm. The storm may be passed, in part, by principal or emergency spillways.

## FLOODPLAIN DEVELOPMENT

### General

- When proposing structures, walls, fences, dumpsters, etc. provide hydrodynamic, hydrostatic, buoyancy, and debris impact calculations for the structures located in the floodplain. See FEMA Technical Bulletin 3-93 - Non-Residential Floodproofing — Requirements Certification for guidance.
- Show dumpster and enclosure will not float and can withstand debris impact.

### Elevation Certificate

The following items refer to common mistakes on Elevation Certificates. This list is not comprehensive as elevation certificates are governed by FEMA.

- Place an "N/A" for all blank spaces.
- All numerical values should be rounded to the tenths place.
- Specify 475434 as the community number.
- The format for the panel number is ##### (letter) #####.
- Block B10 must be "FIS Profile"
- Block B11 must be "NAVD 1988"
- Provide the lowest elevation of any mechanical equipment and also the 500-year floodplain elevation in the notes section.
- The firm zone should be one of the following: Shaded X Zone, AE Zone, or A Zone.
- If a building will be floodproofed, submit the FEMA form titled, "Floodproofing Certificate for Non-Residential Structures."

### Floodproofing

The following items refer to common mistakes on a Floodproofing Certificate. This list is not comprehensive as Floodproofing certificates are governed by FEMA.

- Place an "N/A" for all blank spaces.
- All numerical values should be rounded to the tenths place.
- Specify 475434 as the community number.
- The format for the panel number is ##### (letter) #####.
- The elevation datum must be NAVD 1988.

- Floodproofing gates/doors must be automatic and cannot require manual intervention.
- Identify the required floodproofing elevation on architectural elevation drawings.
- Sign and seal the “Non-Residential Floodproofed Elevation Information Certification,” as is.
- Supply a comprehensive "Maintenance Plan" for the entire structure with the Floodproofing Certificate.
- An as-built floodproofing certificate will be required.
- For Section III, you may cross out “and constructed” and then sign and seal the statement for the design Floodproofing Certificate
- Specify the manufacturer model on the drawings for any waterproofing membrane, if applicable.
- Specify the manufacturer model on the drawings for any floodgates, if applicable.
- Provide the lowest elevation of any mechanical equipment and also the 500-year floodplain elevation in the notes section
- All proposed external mechanical and electrical (e.g. HVAC, outlets, control panels, lights, speakers, dispensers, etc.) must be adequately floodproofed or elevated one foot above the base flood elevation.



# Site Inspection Checklist

Inspection # \_\_\_\_\_ Final? – Yes / No

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Weather: \_\_\_\_\_

Construction inspector: \_\_\_\_\_

Project Name/Address: \_\_\_\_\_

## Erosion and Sediment Control:

1. Is there a good stand of grass on all areas disturbed by construction?
2. Is there a good stand of grass within all ditches and swales?
3. Is there a good stand of grass within the detention basin?
4. Are erosion and sediment control devices properly installed at the correct locations?
5. Is there any evidence of erosion or sedimentation downstream from the project site?
6. Are all slopes less than 2:1?

Yes	No	N/A

## Storm Drainage Structures:

(catch basins, inlets, manholes, junction boxes)

1. Are all drainage structures installed at the proper location per approved plans?
2. Are all drainage structures installed at the proper grade and cross slope?
3. Are curb irons and manhole lids installed correctly? Proper size?
4. Do curb irons and manhole lids have anti-pollution message per COK standard details?
5. Are structure inverts shaped to prevent ponding water? Free from silt and debris?
6. Are pipes properly grouted and fitted into each drainage structure?

Yes	No	N/A

## Storm Drainage Pipes:

1. Has the proper aggregate backfill been used (Class A Grade D)? Adequately compacted?
2. Does pipe size and pipe material agree with the approved plans?
3. Does the location and grade of storm drainage pipes agree with the approved plans?
4. Are pipe sections joined correctly (coupling bands for CMP, joints, gaskets, etc.)
5. Are pipes in good condition and undamaged?
6. Has proper outlet protection been installed? Headwalls, riprap with filter fabric, or other erosion control measures.

Yes	No	N/A

## Ditches and Swales:

1. Are the ditches and swales located per the approved plans?
2. Does the constructed cross section (width, depth) agree with the approved plans?
3. Are erosion control measures in place? Riprap with filter fabric.

Yes	No	N/A

## Stormwater Quality Structures:

(O/W separator, catch basin inserts, etc.)

1. Is the correct brand, size, and model installed as per approved plans?
2. Is the structure installed at correct location, grade and elevation as per approved plans?
3. Is the structure located within the designated easement? Is access easement free from obstructions and traversable?
4. Are lift holes plugged and all joints sealed to prevent leakage?
5. Has buffer zone been maintained throughout construction, or as required by approved plans and the Stormwater and Street Ordinance?

Yes	No	N/A

**Stormwater Detention Basin:**

1. Was Detention Basin installed as first item of construction, to prevent erosion/sediment?
2. Does the basin size and location agree with the approved plans & detention calculations?
3. Is the basin located within the detention basin easement, including fill and cut slopes?
4. Is the bottom of the detention basin graded to the outlet structure to prevent ponding?
5. Is there a good cover of vegetation on the slopes and bottom (to prevent erosion)?
6. Is the outlet structure constructed to agree with approved plans & detention calculations?
7. Are the detention basin slopes at the approved grades (no steeper than 2:1 H:V)?
8. Is the detention basin berm graded at the proper elevation and width, all the way around?
9. Is the first flush volume adequate? With a controlled release over 24 hours?
10. Is there any evidence of utility lines or pipes within the detention basin easement?
11. Has the traversable access easement been constructed per approved plan?

Yes	No	N/A

**Streets:**

1. Are streets in good condition and free from damage? (no cracks, upheaval or settlement)
2. Are the streets located correctly as per approved plans? Curves (PC, PT, tangents)?
3. Are the street widths adequate?
4. Does the street cross section (pavement and base depths) meet the approved plans?
5. Are streets crowned and gutters graded properly to prevent ponding?
6. Has the curb been backfilled?
7. Is there a good stand of grass within the street right-of-way?
8. Are street signs in compliance with City and FHWA standards and installed properly?
9. Are pavement markings, lines and symbols correct?
10. Have streetlights been installed correctly with adequate setbacks?
11. Have property pins been set and protected?
12. Are entrance signs and other structures located outside of the street right-of-way?

Yes	No	N/A

**Curbs and Sidewalks in Right of Way:**

1. Are curbs and sidewalks in good condition and free from damage?
2. Does the location, type, and height of curb and gutter agree with the approved plans?
3. Are the curb and sidewalk radii and curves correct for all entrances and cross streets?
4. Are curb contraction joints installed with 5 ft maximum spacing?
5. Are curb expansion joints installed with 25 ft maximum spacing and at fixed objects?
6. Is the sidewalk width and location adequate?
7. Are sidewalk cross sections adequate, with proper finishing and joints?
8. Do sidewalk ramps and cuts installed meet ADA and City of Knoxville requirements?

Yes	No	N/A

**Entrances and Driveways:**

1. Do the entrance and driveway widths match the approved plans?
2. Are the entrance and driveway radii adequate for each property?
3. Are the entrance and driveway cross sections adequate, with proper finishing and joints?
4. Are sight distances adequate, with no obstacles such as trees, fences or signs?

Yes	No	N/A

**Retaining Walls:**

1. Has the contractor been notified of 3<sup>rd</sup> party inspection requirements for MSE walls?
2. Are retaining walls located as per approved plans?
3. Do the retaining walls footer size and steel reinforcement match design plans?
4. Do the retaining walls agree with the approved height, length, and construction material?

Yes	No	N/A



# Development Certification Checklist

Date: \_\_\_\_\_ Property Owner: \_\_\_\_\_  
 Certifying Engineer: \_\_\_\_\_ Certifying Surveyor (as-built): \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Address: \_\_\_\_\_

The Development Certification process is necessary in order for a construction bond or performance bond to be released, as described in the City of Knoxville Stormwater Ordinance (Chapter 22.5 of the City Code) in Section 22.5-27(k). Also see Section 13.5 of the Land Development Manual for a list of construction bond release requirements.

<b>Certification Requirements:</b>	Date
<b>A. Submit as-built drawings which meet the minimum requirements of this checklist.</b>	
<b>B. Submit complete detention calculations (signed &amp; stamped by professional engineer) showing that the as-built conditions meet the minimum design criteria in the City of Knoxville Stormwater and Street Ordinance. Include all inputs and methods.</b>	
<b>C. Submit roadway material inspection reports by a qualified geotechnical firm (if not inspected directly by Knoxville Engineering Department).</b>	
<b>D. Conduct the final site inspection using the Site Inspection Checklist in Appendix A.</b>	
<b>E. Ensure that all roadway, drainage, detention basin, and water quality structure easements are properly delineated on a recorded plat. Check to see if CPMSF (maintenance agreement) is recorded at Knox County Register of Deeds and also denoted on the recorded plat.</b>	
<b>F. Submit retaining wall inspections/certifications for walls that affect right-of-way, dwelling structures, and/or stormwater facilities.</b>	

**As-Built Drawings – General Information:**

1. Does title block have same project name, address, and contact persons as original plans?
2. Are seal and signature for the certifying Engineer & Surveyor shown on as-built drawings?
3. Does each as-built drawing contain survey benchmarks or other reference points?
4. Does each as-built drawing contain a north arrow and bar scale?
5. Does each as-built drawing contain the Engineer's & Surveyor's Certification Statements? Are the statements filled out?
6. Are slopes greater than 2:1 certified by an engineer?
7. Has a Notice of Termination (NOT) been submitted for projects that received a Notice of Coverage?

Yes	No	N/A

**As-Built Drawings - Storm Drainage Structures:**

1. Are all drainage pipes and structures located correctly on the drawings?
2. Is each drainage pipe labeled with slope, length, size or diameter, material, inverts?
3. Is each drainage structure labeled with top and invert elevations, size, material, detail #, and coordinates based on a known control system?

Yes	No	N/A

**As-Built Drawings - Water Quality Structures:**

1. Is the structure located correctly on plan view, with labeled facility & access easements?
2. Are the manufacturer's identification number, make, model, and size shown on plans?
3. Are specification sheets, operation instructions, and maintenance guidelines provided?

Yes	No	N/A

**As-Built Drawings - Detention Basins:**

1. Do all plan views correctly show detention basin at a readable scale, with 1-foot contours?
2. Are locations and invert elevations for all pipe/ditch outfalls into detention basin shown?
3. Are detention basin and access easements shown and labeled? Are all conflicts avoided?
4. Does the plan include accurate details of outlet structures, including all orifices and weirs, such as size, diameter, invert elevation, means of anchoring, underdrain systems, etc?
5. Does the model show pre developed and post developed soil types, CN, Tc, drainage areas, etc...? Is a map included showing the pre developed and post developed drainage areas?
6. Does the model use the reduced as-built volume per the ordinance? Is the as-built volume and reduced volume shown in a table?
7. Does the model compare pre developed peak flows to as-built peak flows?
8. Are First Flush calculations included? Is First Flush volume and 24-72 hour draw down time provided?
8. Does detention basin adequately attenuate the 1, 2, 5, 10, 25, and 100-year storm events?
9. Has minimum freeboard of 1 foot been provided between 100-year storm and top of berm?

Yes	No	N/A

**As-Built Drawings - Public Streets and Joint Permanent Easements:**

1. Are street right-of-way, easement boundaries, and street centerlines shown and labeled?
2. Are all structures within the public right-of-way or public easement shown and labeled? (such as: pavement, curb, gutter, inlet, catch basin, manhole, pipe, streetlight, retaining wall, pole, sidewalk, large tree, utility structure, structural sign, or ornamental structure)
3. Is a street profile provided (to scale) with the as-built elevations at 50' increments, or as necessary, to ensure a smooth profile? Are street grades, horizontal curvature, and K values provided?
4. Is the typical street cross-section shown with widths and all pavement depths?
5. Is all striping installed per plan?
6. Are all Pedestrian Crossings (buttons, ramps, etc.) ADA compliant?

Yes	No	N/A

**As-Built Drawings – Retaining Walls:**

1. Are walls located on the as-built drawings with top and bottom wall elevations shown?
2. Has a certification/inspection letter, geotechnical reports, calculations, and drawing been provided for as-built walls that affect right-of-way, dwelling structures, and/or stormwater facilities?
3. Do the as-built calculations show a factor of safety of 3.0 for field tested bearing capacity, 2.0 for overturning, and 1.5 for sliding?
4. Do the as-built drawings for the wall show a typical detail, profile view, footing size/type, material used to construct wall, steel layout, geo-grid type, geo-grid embedment depth, backfill material, drain locations, dimensions of wall, etc...?

Yes	No	N/A

**As-Built Drawings – Parking & Access:**

1. Are all new parking areas shown with dimensions and space counts?

Yes	No	N/A

**As-Built Drawings – FEMA/Floodplains:**

1. Are all FEMA boundaries shown (floodway, 100-yr & 500-yr floodplains, no-fill, etc.)?
2. Was an Elevation Certification required and has it been provided?
3. Is an as-built No-Rise required? LOMR required?

Yes	No	N/A

**As-Built Drawings – 3<sup>rd</sup> Party Inspections**

1. Have all necessary 3<sup>rd</sup> Party Inspections been provided?
  - Storm Installations
  - Roadways/Road Patch
  - Underground Detention (vaults, pavers, etc.)
  - Sidewalks
  - Retaining Walls

Yes	No	N/A



**Stormwater Management  
Special Pollution Abatement Permit  
General Permit**



[www.knoxvilletn.gov/engineering/](http://www.knoxvilletn.gov/engineering/)

(Chapter 22.5 of the Knoxville City Code)

**SWM USE ONLY (Engineering Department)**

<b>Date Received:</b>	<b>Fee: \$200 Paid on:</b>	<b>Reviewer:</b>
<b>Date of Coverage:</b>	<b>Expiration Date:</b>	<b>Permit Number:</b>
<b>Watershed:</b>	<b>City Block#:</b>	<b>CLT:</b>

If completing form by hand, please use black ink only. Submit information for application of a Knoxville Special Pollution Abatement Permit to comply with the following:

- A. Enter the legal or official name of the facility. Do not use colloquial name. Give the mailing address and physical location of facility.
- B. Name of contact person for permit compliance, including job title, address, and phone numbers. The contact person shall be responsible for keeping records of incidents such as significant spills of toxic pollutants or other discharges which may affect stormwater runoff quality. The contact person shall document and record all inspections and maintenance activities.
- C. For sections 1-9, include the supporting information in the box provided or attach an exhibit labeling which section it is in reference to. Provide complete data in a legible and clearly organized format.
- D. Verify that the certification on this permit is read, thoroughly understood, and signed by the appropriate persons.

<b>A)</b>	<b>Name of facility:</b>	
	Mailing Address of Facility:	Street _____ City _____ State _____ Zip _____
	Physical Address of Facility:	Street _____ City _____ State _____ Zip _____

<b>B)</b>	<b>Contact Information</b>	Name: _____ Title: _____
	Address:	Street _____ City _____ State _____ Zip _____
	Phone: _____	Fax: _____ E-mail: _____

**C) Supporting Information**

1. Description of facility, nature of work performed, and type of facility.

2. Site map of facility with buildings, parking, drives, materials loading and access areas, dumpsters, type of each impervious surface, ditches, pipes, catch basins, drainage basin limits, area of facility, acreage of offsite water draining onto facility, discharge points to "Waters of the State" or "Community Waters" with name of the water or channel. This map will be a minimum scale of 1"=50'.

3. Submit a plan of instruction provided to employees at all levels within the company in methods to prevent stormwater runoff pollution. The plan shall identify periodic dates for such training and methods used. Submit a site-specific spill protection plan that deals with actual hazardous materials and emergency response equipment at the site.

4. A narrative description of significant materials (as defined by 40 CFR 122.26) that are currently or in the past have been treated, stored or disposed outside; method of onsite storage or disposal; material management practices used to minimize contact of these materials with stormwater runoff for the past three years; material loading and access area; material disposal areas, location and description of existing structural and non-structural control measures to reduce pollutants in stormwater runoff; and a description of any treatment the stormwater receives.

5. Include a record of available sampling data describing pollutants in stormwater discharges. Carefully research using historical data from previous owner/operator, government records, and investigation reports.

6. Include a preventive maintenance program that includes regular inspection and maintenance of all stormwater management devices (such as cleaning grit chambers and catch basins). Maintenance program shall also include inspecting and testing plant equipment and systems to uncover conditions that could potentially cause breakdowns or failures resulting in discharges of pollutants to surface waters or to groundwater.

7. Submit a maintenance schedule of sweeping or vacuuming of facility to prevent washout from deposited emissions laden with hydrocarbons, oxides, salts, metals, worn pavement particulates, hydrocarbons for leaks and spills, trash, debris, garbage, metal, tire particles, brake lining particles and various chemicals from the wear and deterioration of vehicles. In the event of remedial work or action, submit a cleanup schedule for debris or material storage areas.

8. Description of other ways the facility plans to implement programs to reduce the discharge of pollutants into stormwater runoff. Provide estimated quantity of stormwater flow, direction of flow, and an estimate of the types of pollutants which are likely to be present in stormwater discharges associated with industrial activity for each area of the facility. Designate each area of the facility as having high, medium or low potential for stormwater pollution and explain rationale.

9. Include plans, details and specifications that show construction of new structures to protect discharge outfalls into "Waters of the State" or into "Community Waters". Common examples include an appropriately-sized grit chamber, oil skimmer, oil/water separator, media filtration inserts, etc. Vegetative measures such as grassed swales, constructed wetlands, existing woods or a detention basin are commonly used to supplement structural measures.

**D) Certification and signatures:**

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and attached exhibits. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine or imprisonment."

Name: \_\_\_\_\_  
(President, Owner, or Ranking Official)

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

.....

Name: \_\_\_\_\_  
(Contact Person)

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

If any information changes or is subsequently found to be in error, please resubmit necessary pages of the Special Pollution Abatement Permit application along with new signatures and dates.

- (a) Some facilities which are not yet constructed may not have selected a permanent contact person who will ultimately be responsible for permit compliance. In these instances, the contact person may be a technical person within the company who is generally responsible for environmental compliance issues.
- (b) The president, owner, or other ranking official who certifies this document is responsible for keeping the City of Knoxville up-to-date concerning the name of the contact person. The president, owner, or other ranking official who certifies this document is also responsible for notifying the City of Knoxville if he is no longer an official with the company.

Permit expires five years from the date of issuance, or as noted on the first page of this permit

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Submit this permit application promptly to the following address:

City of Knoxville  
Engineering Department  
Stormwater Management  
Suite 317A, City County Building  
P.O. Box 1631  
Knoxville, TN 37901

Telephone: (865) 215-2890  
Fax: (865) 215-2631



CITY OF KNOXVILLE

SWM USE ONLY (Engineering Department)

Stormwater Management
Special Pollution Abatement Permit
Food Handling and Processing Facilities

http://www.knoxvilletn.gov/engineering/

(Chapter 22.5 of the Knoxville City Code)



Table with 3 columns: Date Received, Fee: \$200 Paid on, Reviewer; Date of Coverage, Expiration Date, Permit Number; Watershed, City Block#, CLT.

Please complete form using black ink only.

I. Type of facility: [ ] Restaurant [ ] Cafeteria [ ] Grocery Store [ ] Food Processing Facility [ ] Other

Table for facility information: Name of facility, Mailing Address of Facility (Street, City, State, Zip), Physical Address of Facility (Street, City, State, Zip).

Table for contact information: Contact Information (Name, Title), Address (Street, City, State, Zip), Phone, Fax, E-mail, General Corporate E-mail for Compliance Notices.

A map of the facility is attached with all stormwater facilities noted: [ ] Yes [ ] No

Please check each box to indicate that you understand, agree to, and will enforce the corresponding control at the facility. Please attach a detailed justification for any unchecked box.

IV. Dumpsters/Grease Bins

BMP's: AM-01, AM-07, IC-01, IC-07, IC-10

Structural Controls

- A. Dumpster pads will be constructed at least 2" - 3" above the surrounding paved area to prevent run-on.
B. No storm drain grates or inlets shall be constructed within the dumpster pad.
C. Water Spigot or supply will not be installed unless a sanitary waste line is also installed. The sewer utility must approve all waste connections in the dumpster pad area.

Management Controls

- D. Dumpster lids and doors shall be kept closed when not in use and drain plugs shall be in place at all times.
E. Only dry material shall be disposed in dumpsters.
F. Dumpster pads shall be inspected at least weekly and any potential illicit discharges or spills shall be cleaned immediately to prevent non-stormwater discharges to the storm drain system.
G. Grease bins shall be placed away from storm drain grates or inlets and inspected daily for spills, drippings, or potential illicit discharges to the storm drain system. Any spilled material shall be cleaned immediately in such a way that prevents non-stormwater discharges to the storm drain system.



**VIII. Certification and signatures:**

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and attached exhibits. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine or imprisonment.”

Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(President, Owner, or Ranking Official)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

.....  
Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(Contact Person)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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Stormwater Management  
Suite 317A, City County Building  
P.O. Box 1631  
Knoxville, TN 37901

Telephone: (865) 215-2890  
Fax: (865) 215-2631



CITY OF KNOXVILLE

Stormwater Management
Special Pollution Abatement Permit
Vehicle & Equipment Facilities

http://www.knoxvilletn.gov/engineering/
(Chapter 22.5 of the Knoxville City Code)



SWM USE ONLY (Engineering Department)

Table with 3 columns: Date Received, Fee: \$200 Paid on, Reviewer; Date of Coverage, Expiration Date, Permit Number; Watershed, City Block#, CLT.

Please complete form using black ink only.

I. Type of facility: [ ] Vehicle/Equipment Dealership/Storage [ ] Fueling Station [ ] Repair Shop [ ] Other

Table for facility information: II. Name of facility; Mailing Address of Facility; Physical Address of Facility.

Table for contact information: III. Contact Information; Name; Title; Address; Phone; Fax; E-mail; General Corporate E-mail for Compliance Notices.

A map of the facility is attached with all stormwater facilities noted: [ ] Yes [ ] No

Please check each box to indicate that you understand, agree to, and will enforce the corresponding control at the facility. Please attach a detailed justification for any unchecked box.

IV. Parking Area & Loading Dock

BMP's: AM-01, AM-07, IC-01, IC-03, IC-04, & IC-8

Structural Controls

- A. Stormwater treatment facilities... will be installed to treat runoff from all drainage basins.
B. List Brand, Model, & Location of Units:
C. List flow rates for site or sub-basin: 1 yr/24 hour storm = Site specific bypass capacity =
D. Verified treatment flow of the unit = Bypass flow (Y/N), if Y, total bypass flow rate =

Management Controls

- E. Stormwater treatment facilities with low storage capacity (e.g. inserts, sumps, skimmers, etc.) will be inspected at least monthly and cleaned out at least quarterly. Documented maintenance records will be stored on site and made available to inspectors.



**VIII. Certification and signatures:**

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Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(President, Owner, or Ranking Official)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

.....  
Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(Contact Person)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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Stormwater Management  
Suite 317A, City County Building  
P.O. Box 1631  
Knoxville, TN 37901

Telephone: (865) 215-2890  
Fax: (865) 215-2631



CITY OF KNOXVILLE

Stormwater Management  
Special Pollution Abatement Permit  
Vehicle Wash Facilities

<http://www.knoxvilletn.gov/engineering/>

(Chapter 22.5 of the Knoxville City Code)



SWM USE ONLY (Engineering Department)

Date Received:	Fee: <b>\$200</b> Paid on:	Reviewer:
Date of Coverage:	Expiration Date:	Permit Number:
Watershed:	City Block#:	CLT:

Please complete form using black ink only.

<b>I.</b>	<b>Name of facility:</b>				
Mailing Address of Facility:	Street	City	State	Zip	
Physical Address of Facility:	Street	City	State	Zip	

<b>II.</b>	<b>Contact Information</b>	Name:	Title:		
Address:	Street	City	State	Zip	
Phone:	Fax:	E-mail:			
General Corporate E-mail for Compliance Notices:					

A map of the facility is attached with all stormwater facilities noted: [ ] Yes [ ] No

Please check each box to indicate that you understand, agree to, and will enforce the corresponding control at the facility. **Please provide a detailed justification for any unchecked box.**

**III. Parking Area & Loading Dock**

**BMP's: AM-01, AM-07, IC-01, IC-03, IC-04, & IC-8**

*Structural Controls*

- A. Stormwater treatment facilities (e.g., catch basin inserts, vault separation device, etc.), will be installed to treat runoff from all drainage basins.
- B. List Brand, Model, & Location of Units: \_\_\_\_\_
- C. List flow rates for site or sub-basin: 1 yr/24 hour storm = \_\_\_\_\_  
Site specific bypass capacity = \_\_\_\_\_
- D. Verified treatment flow of the unit = \_\_\_\_\_  
Bypass flow (Y/N), if Y, total bypass flow rate = \_\_\_\_\_





CITY OF KNOXVILLE

Stormwater Management  
Special Pollution Abatement Permit  
Vehicle Wash Facilities

<http://www.knoxvilletn.gov/engineering/>

(Chapter 22.5 of the Knoxville City Code)



SWM USE ONLY (Engineering Department)

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Watershed:	City Block#:	CLT:

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Mailing Address of Facility:	Street	City	State	Zip	
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*Structural Controls*

- A. Stormwater treatment facilities (e.g., catch basin inserts, vault separation device, etc.), will be installed to treat runoff from all drainage basins.
- B. List Brand, Model, & Location of Units: \_\_\_\_\_
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- D. Verified treatment flow of the unit = \_\_\_\_\_  
Bypass flow (Y/N), if Y, total bypass flow rate = \_\_\_\_\_



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(Contact Person)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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Permit expires five years from the date of issuance, or as noted on the first page of this permit

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City of Knoxville  
Engineering Department  
Stormwater Management  
Suite 317A, City County Building  
P.O. Box 1631  
Knoxville, TN 37901

Telephone: (865) 215-2890  
Fax: (865) 215-2631

**V. Certification and signatures:**

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Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(President, Owner, or Ranking Official)

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CITY OF KNOXVILLE

Stormwater Management  
Special Pollution Abatement Permit  
**Large Parking Lot Facilities**  
<http://www.knoxvilletn.gov/engineering/>  
(Chapter 22.5 of the Knoxville City Code)



**SWM USE ONLY (Engineering Department)**

Date Received:	Fee: <u>\$200</u> Paid on:	Reviewer:
Date of Coverage:	Expiration Date:	Permit Number:
Watershed:	City Block#:	CLT:

Please complete form using black ink only.

**I. Type of facility:** [ ] Large Parking Lot [ ] Warehouse [ ] Other

<b>II. Name of facility:</b>				
Mailing Address of Facility:	Street	City	State	Zip
Physical Address of Facility:	Street	City	State	Zip

<b>III. Contact Information</b>	Name:	Title:		
Address:	Street	City	State	Zip
Phone:	Fax:	E-mail:		
General Corporate E-mail for Compliance Notices:				

A map of the facility is attached with all stormwater facilities noted: [ ] Yes [ ] No

Please check each box to indicate that you understand, agree to, and will enforce the corresponding control at the facility. **Please provide a detailed justification for any unchecked box.**

**IV. Parking Area & Loading Dock**

**BMP's: AM-01, AM-07, IC-01, IC-03, IC-04, & IC-8**

*Structural Controls*

- A. Stormwater treatment facilities (e.g., catch basin inserts, vault separation device, etc.), will be installed to treat runoff from all drainage basins.
- B. List Brand, Model, & Location of Units: \_\_\_\_\_
- C. List flow rates for site or sub-basin: 1 yr/24 hour storm = \_\_\_\_\_  
Site specific bypass capacity = \_\_\_\_\_
- D. Verified treatment flow of the unit = \_\_\_\_\_  
Bypass flow (Y/N), if Y, total bypass flow rate = \_\_\_\_\_

*Management Controls*

- E. Stormwater treatment facilities with low storage capacity (e.g. inserts, sumps, skimmers, etc.) will be inspected at least monthly and cleaned out at least quarterly. Documented maintenance records will be stored on site and made available to inspectors.



**VII. Certification and signatures:**

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and attached exhibits. Based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine or imprisonment.”

Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(President, Owner, or Ranking Official)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

.....  
Name: \_\_\_\_\_ Title: \_\_\_\_\_  
(Contact Person)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If any information changes or is subsequently found to be in error, please resubmit necessary pages of the Special Pollution Abatement Permit application along with new signatures and dates.

- (a) Some facilities which are not yet constructed may not have selected a permanent contact person who will ultimately be responsible for permit compliance. In these instances, the contact person may be a technical person within the company who is generally responsible for environmental compliance issues.
- (b) The president, owner, or other ranking official who certifies this document is responsible for keeping the City of Knoxville up-to-date concerning the name of the contact person. The president, owner, or other ranking official who certifies this document is also responsible for notifying the City of Knoxville if he is no longer an official with the company.

Permit expires five years from the date of issuance, or as noted on the first page of this permit

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Submit this permit application promptly to the following address:

City of Knoxville  
Engineering Department  
Stormwater Management  
Suite 317A, City County Building  
P.O. Box 1631  
Knoxville, TN 37901

Telephone: (865) 215-2890  
Fax: (865) 215-2631

## **FEMA Elevation Certificate and Instructions**

Follow the link below to access the FEMA Elevation Certificate and Instructions

<https://www.fema.gov/media-library/assets/documents/160>



# Notice of Intent – NOI

General NPDES Permit for Stormwater Discharges  
from Construction Activities (TNR100000)  
Located within a Qualifying Local Program (QLP)



**Purpose of this Form:** The State of Tennessee General NPDES Permit for Stormwater Discharges from Construction Activities (TNCGP) allows for construction activities within the jurisdiction of a Qualifying Local Program (QLP) to only have to apply and obtain coverage for both the TNCGP and the local program from the QLP itself. By signing this Notice of Intent (NOI), the permittee agrees to be responsible for compliance under the requirements of the TNCGP. The permittee will not be required to submit an NOI, a Stormwater Pollution Prevention Plan (SWPPP), a Notice of Termination (NOT), or a permit fee to the local TDEC Environmental Field Office. For additional information, please see Section 1.4.5 of the TNCGP or the state's QLP webpage at <http://tn.gov/environment/wpc/stormh2o/qlp.shtml>.

## Construction General Permit – Notice of Intent - Instructions

A completed NOI must be submitted to obtain coverage under the CGP. **Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to be in compliance with permit terms and conditions.** CGP coverage is required for stormwater discharge(s) from construction activities including clearing, grading, filling and excavating (including borrow pits) of one or more acres of land.

**Who must submit the NOI form to the QLP?** All site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of stormwater associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria: (1) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g., subsequent builder), or the person that is the current land owner of the construction site, and is considered the primary permittee; or (2) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

Owners, developers and all contractors that meet the definition of the operator in subsection 2.2 of the permit shall apply for permit coverage on the same NOI, insofar as possible. After permit coverage has been granted to the initial site-wide primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The comprehensive site-specific SWPPP shall be prepared in accordance with the requirements of part 3 of the permit and must be submitted with the NOI unless the NOI being submitted is to add a subsequent permittee to an existing coverage. Artificial entities (e.g., corporations or partnerships) must submit the correct Tennessee Secretary of State, Division of Business Services, control number. **The NOI will be considered incomplete without a correct control number, and the division reserves the right to deny coverage to artificial entities that are not properly registered and in good standing with the Tennessee Secretary of State.**

**Notice of Coverage.** The QLP will review the NOI for completeness and accuracy and prepare a notice of coverage (NOC). Stormwater discharge from the construction site is authorized as of the effective date of the NOC.

**Complete the form.** Type or print clearly, using ink and not markers or pencil. Answer each item or enter "NA," for not applicable, if a particular item does not fit the circumstances or characteristics of your construction site or activity. If you need additional space, attach a separate piece of paper to the NOI form. **The NOI will be considered incomplete without a map and comprehensive site-specific SWPPP**

**Describe and locate the project.** Use the legal or official name of the construction site. If a construction site lacks street name or route number, give the most accurate geographic information available to describe the location (reference to adjacent highways, roads and structures; e.g. intersection of state highways 70 and 100). Latitude and longitude (expressed in decimal degrees) can be located at numerous web sites. Attach a copy of a portion of a 7.5 minute USGS quadrangle map, showing location of site, with boundaries at least one mile outside the site boundaries. Provide estimated starting date of clearing activities, completion date of the project, and an estimate of the number of acres of the site on which soil will be disturbed, including, but not limited to, borrow areas, fill areas, stockpiles, and the total acres. For linear projects, give location at each end of the construction area.

**Give name of the receiving waters** Trace the route of stormwater runoff from the construction site and determine the name of the river(s), stream(s), creek(s), wetland(s), lake(s) or any other water course(s) into which the stormwater runoff drains. Note that the receiving water course may or may not be located on the construction site. If the first water body receiving construction site runoff is unnamed ("unnamed tributary"), determine the name of the water body which the unnamed tributary enters.

**ARAP permit may be required** **If your work will disturb or cause alterations of a stream or wetland, you must obtain an appropriate Aquatic Resource Alteration Permit (ARAP).** If you have a question about the ARAP program or permits, contact your local Environmental Field Office (EFO).

**Submitting the form and obtaining more information** Note that this form must be signed by the company President, Vice-President, for details see permit subpart 2.5. For more information, contact QLP or the City of Knoxville at 865-215-2148

**Notice of Coverage:** The division will review NOIs for completeness and accuracy and issue an NOC to site-wide primary operators, authorizing stormwater discharge from the construction site as of the effective date of the NOC. New subsequent operators will not receive an NOC, but are considered covered under the permit when their permit record is published on TDEC's dataviewer as "active" and with an effective date. TDEC Permit Dataviewer can be found at: [http://environment-online.tn.gov:8080/pls/enf\\_reports/f?p=9034:34001:0](http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34001:0)

General Information			
Site or Project Name:		QLP Tracking Number: <b>TNQ</b>	
Street Address or Location:		Construction Start Date:	
		Estimated End Date:	
Site Description:		Latitude (dd.dddd):	
		Longitude (-dd.dddd):	
County(ies): <b>Knox</b>	QLP/MS4 <b>Knoxville</b>	Acres Disturbed:	
	Jurisdiction:	Total Acres:	
Check the appropriate box(s) if there are streams and/or wetlands on or adjacent to the construction site:		<b>Streams</b> <input type="checkbox"/>	<b>Wetlands</b> <input type="checkbox"/>
If wetlands are located on-site and may be impacted, attach wetlands delineation report.		<b>Wetlands Delineation Report Attached</b> <input type="checkbox"/>	
If an Aquatic Resource Alteration Permit (ARAP) has been obtained for this site, what is the permit number?			
Check the box if a jurisdictional determination has been made by the USACE or EPA identifying water of the United States.		<input type="checkbox"/>	
Note: If yes, Attach the jurisdictional determination			
Receiving Waters			
Attach the SWPPP with the NOI	<b>SWPPP Attached</b> <input type="checkbox"/>	Attach a Site Location Map	<b>Map Attached</b> <input type="checkbox"/>
Site Owner / Developer: (Primary Permittee)			
Person, company, or entity that has operational or design control over construction plans and specifications:			
For corporate entities only, provide correct Tennessee Secretary of State (SOS) Control Number: <small>(an incorrect SOS control number may delay NOI processing)</small>			
Site Owner or Developer Contact Name: <small>(Individual Responsible for Site)</small>		Title or Position (The party who signs the certification below):	
Mailing Address:		City:	State: ZIP Code:
Phone:	E-mail:	Fax:	
Optional Contact:		Title or Position:	
Mailing Address:		City:	State: ZIP Code:
Phone:	E-mail:	Fax:	
Is the project site within the vicinity of any Threatened or Endangered aquatic species? <input type="checkbox"/> no <input type="checkbox"/> yes, please attach a list of all species affected			
Threatened and Endangered Species Certification: (must be Owner/Developer)			
I certify that my SWPPP, stormwater discharges, and stormwater discharge-related activities are protective of legally protected listed and proposed threatened or endangered aquatic fauna or flora in the receiving stream(s); or discharges or activities that would not result in a "take" of a state or federal listed endangered or threatened aquatic or wildlife species deemed in need of management or special concerned species, or such species' habitat. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.			
Owner/Developer Name: (print/type)		Signature:	Date:
Owner/Developer Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Primary Permittee)			
I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.			
Owner/Developer Name: (print/type)		Signature:	Date:
Contractor(s) Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Secondary Permittee)			
I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations and for failure to comply with these permit requirements. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.			
Primary contractor name, address, and SOS control number (if applicable):		Signature:	Date:
Other contractor name, address:		Signature:	Date:



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)**

Division of Water Resources  
6<sup>th</sup> Floor Annex, L&C Tower, 401 Church Street, Nashville, Tennessee 37243  
1-888-891-TDEC (8332)



**Notice of Termination (NOT) for General NPDES Permit  
for Stormwater Discharges from Construction Activities (CGP)  
Located within a Qualifying Local Program (QLP)**

This form is required to be submitted to the local QLP when requesting termination of coverage from the CGP. The purpose of this form is to notify the QLP that either all stormwater discharges associated with construction activity from the portion of the identified facility where you, as an operator, have ceased or have been eliminated; or you are no longer an operator at the construction site. Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the local QLP from which you received your coverage. For additional information, please contact the QLP or the state's QLP webpage at <http://tn.gov/environment/wpc/stormh2o/qlp.shtml> or contact your local EFO at the numbers identified below.

**Type or print clearly, using ink and not markers or pencil.**

<b>Site or Project Name:</b>		<b>QLP Tracking Number: TNQ</b>	
Street Address or Location:		County(ies):	
<b>Name of Permittee Requesting Termination of Coverage:</b>			
Permittee Contact Name:		Title or Position:	
Mailing Address:		City:	State:      Zip:
Phone:		E-mail:	

**Check the reason(s) for termination of permit coverage:**

<input type="checkbox"/>	Stormwater discharge associated with construction activity is no longer occurring and the permitted area has a uniform 70% permanent vegetative cover OR has equivalent measures such as rip rap or geotextiles, in areas not covered with impervious surfaces.
<input type="checkbox"/>	You are no longer the operator at the construction site (i.e., termination of site-wide, primary or secondary permittee coverage).

**Certification and Signature:** (must be signed by president, vice-president or equivalent ranking elected official)

I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

For the purposes of this certification, elimination of stormwater discharges associated with construction activity means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized, the temporary erosion and sediment control measures have been removed, and/or the site or portions of the site have obtained permit coverage by subsequent operators or that all stormwater discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated from the portion of the construction site where the operator had control.

Permittee name (print or type):	Signature:	Date:
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### QLP NOI/SWPPP Checklist - Version 1.4

Date Received: \_\_\_\_\_ QLP Tracking Number: TNQ \_\_\_\_\_

QLP: \_\_\_\_\_ Reviewer: \_\_\_\_\_

Project Name: \_\_\_\_\_

\*Impaired receiving waters: \_\_\_ Yes \_\_\_ No    \*\*Exceptional Tennessee Waters: \_\_\_ Yes \_\_\_ No Why?: \_\_\_\_\_



Notice of Intent					
YES	NO		YES	NO	
		Correct site-wide permittee (Owner/Developer) entity name included			Start/End Dates listed
		Proper signature for the owner/developer provided			Disturbed acreage given
		Receiving waters listed: _____			Latitude/Longitude given and is correct
		ARAP Required: _____ ARAP #(s): _____			Has NOI certified the presence of threatened and endangered species
		***Indicators of possible unidentified streams or wetlands.			Secretary of State Control #:
		2.6.2- USGS topo map provided showing the boundaries of the construction site			

SWPPP			
YES	NO	N/A	Comments
			3.1.1 - Plans and specs for structural control measures prepared and stamped by professional engineer or landscape architect
			3.1.2 - Quality Assurance Site Assessment described
			3.3.1 - The SWPPP is signed by the operator(s) in accordance with subpart 7.7
			3.3.3 - Location of on-site SWPPP identified
			3.5.1.a - A description of all construction activities at the site (not just grading and street construction) has been included
			3.5.1.b - The sequence of major activities which disturb soils for major portions of the site (excavation, grading and infrastructure installation, etc.) is explained
			3.5.1.c - Estimates of the total area of the site and the total area that is expected to be disturbed by grading, filling, or other construction activities is given
			3.5.1.d - Estimation of the percent slope based off of a drainage area serving each outfall
			3.5.1.g - Identification on the site plan of outfall points
			3.5.1.i - A description of any proposed stream alterations and associated ARAP number has been given
			3.5.1.j - The approximate size and location of affected wetland acreage at the site is noted (if applicable)
			3.5.1.m - For projects of more than 50 acres, the construction phases must be described
			3.5.1.n - Limits of disturbance shall be clearly marked in the SWPPP
			3.5.2 - EPSC plans have been included with the SWPPP: <5 acres = 2 phases of EPSC sheets.; ≥5 acres - 3 phases of EPSC sheets
			3.5.3.1.e - Discusses when sediment will be removed from sediment controls (as necessary but at least when design capacity has been reduced by 50%)
			3.5.3.1.n - Construction access described to reduce off-site vehicle tracking of sediment
			3.5.3.2 - Stabilization completed within 15 days (7 days for ≥35% slopes) on portions of site where construction activities have temporarily or permanently ceased
			3.5.3.3 - The SWPPP contains a description/list of structural practices
			3.5.3.3 - Acreage of drainage areas and basin volumes have been provided
			3.5.4 - At discharge locations and along the length of any outfall channel velocity dissipation devices identified to control pollution
			3.5.8.2 - Identifies that inspections of outfall points and all EPSCs shall be performed at least twice a week and at least 72 hours apart
			5.4.1.a - The SWPPP must certify that EPSCs used at the site are designed to control storm runoff generated by a 5-year, 24-hour storm event
			5.4.1.f - For an outfall in a drainage area of a total of 5 or more acres, a temporary sediment basin has been provided
			5.4.2 - A 60-foot buffer zone has been provided and shown on plans along all streams, lakes, and wetlands on or adjacent to the construction site
			[4.1.2] [5.4.2] - A 15' natural riparian buffer zone adjacent to wet weather conveyances identified as WOTUS by the USACE or EPA

\*Current Impaired Waters: <http://tnmap.tn.gov/wpc/default.aspx?resetSession=true>    \*\*Current Exceptional Waters: [http://environment-online.state.tn.us:8080/pls/enf\\_reports/f?p=9034:34304:438790041100476](http://environment-online.state.tn.us:8080/pls/enf_reports/f?p=9034:34304:438790041100476)

\*\*\*Identify indicators of possible streams or wetlands utilizing site information and resources such as: 1) Contour and stream indicators on USGS TOPO maps, 2) Drainage to a defined conveyance (20 acres east TN/40 middle TN/ 75 west TN), 3) Aerial photography identifying a sinuous tree line or grouping of remaining forest in an agricultural setting, 4) Springhouse/box, 5) Comparable nearby drainage that has previously been determined to have a stream, 6) Onsite or adjacent ponds or impoundments, 7) Check EFO HD GIS for previous determinations, 8) NRCS soil maps or Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>), 9) Wetlands on National Wetlands Inventory: (<http://107.20.228.18/Wetlands/WetlandsMapper.html#>)

If sufficient indicators exist, a stream determination may need to be performed. Stream determinations must be performed by a QHP.



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)

Division of Water Resources  
 6<sup>th</sup> Floor Annex, L&C Tower, 401 Church Street, Nashville, Tennessee 37243  
 1-888-891-8332 (TDEC)



General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

**Construction Stormwater Inspection Certification (Twice-Weekly Inspections)**

<b>Site or Project Name:</b>		<b>NPDES Tracking Number: TNR</b>	
Primary Permittee Name:		Date of Inspection:	
Current approximate disturbed acreage:	Has rainfall been checked/documented daily? <input type="checkbox"/> Yes <input type="checkbox"/> No	Name of Inspector:	
Current weather conditions:		Inspector's TNEPSC Certification Number:	

**Please check the box if the following items are on-site:**

- Notice of Coverage (NOC)     
  Stormwater Pollution Prevention Plan (SWPPP)     
  Twice-weekly inspection documentation  
 Site contact information     
  Rain Gage     
  Off-site Reference Rain Gage Location: \_\_\_\_\_

**Best Management Practices (BMPs):**

<b>Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly: If "No," describe below in Comment Section</b>		
1. Are all applicable EPSCs installed and maintained per the SWPPP?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are EPSCs functioning correctly at all disturbed areas/material storage areas per section 4.1.5?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Are EPSCs functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the receiving stream, and no other water quality impacts per section 5.3.2?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Are EPSCs functioning correctly at ingress/egress points such that there is no evidence of track out?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. If applicable, have discharges from dewatering activities been managed by appropriate controls per section 4.1.4? If "No," describe below the measures to be implemented to address deficiencies.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. If construction activity at any location on-site has temporarily/permanently ceased, was the area stabilized within 14 days per section 3.5.3.2? If "No," describe below each location and measures taken to stabilize the area(s).	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters per section 4.1.5? If "No," describe below the measures to be implemented to address deficiencies.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8. If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No," describe below the measures to be implemented to address deficiencies.	<input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
9. Have all previous deficiencies been addressed? If "No," describe the remaining deficiencies in the Comments section. <input type="checkbox"/> Check if deficiencies/corrective measures have been reported on a previous form.	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Comment Section. If the answer is "No" for any of the above, please describe the problem and corrective actions to be taken. Otherwise, describe any pertinent observations:

**Certification and Signature** (must be signed by the certified inspector and the permittee per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Inspector Name and Title:	Signature:	Date:
Primary Permittee Name and Title:	Signature:	Date:

# Construction Stormwater Inspection Certification Form (Twice-Weekly Inspections)

## **Purpose of this form/ Instructions**

An inspection, as described in section 3.5.8.2. of the General Permit for Stormwater Discharges from Construction Activities (“Permit”), shall be performed at least twice every calendar week and documented on this form. Inspections shall be performed at least 72 hours apart. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g., site covered with snow or ice), such inspection only has to be conducted once per month until thawing results in runoff or construction activity resumes.

Inspectors performing the required twice weekly inspections must have an active certification by completing the “Fundamentals of Erosion Prevention and Sediment Control Level I” course. (<http://www.tnepsc.org/>). A copy of the certification or training record for inspector certification should be kept on site.

Qualified personnel, as defined in section 3.5.8.1 of the Permit (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site’s drainage system. Erosion prevention and sediment control measures shall be observed to ensure that they are operating correctly.

Outfall points (where discharges leave the site and/or enter waters of the state) shall be inspected to determine whether erosion prevention and sediment control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event if possible, but in no case more than 7 days after the need is identified.

Based on the results of the inspection, the site description identified in the SWPPP in accordance with section 3.5.1 of the Permit and pollution prevention measures identified in the SWPPP in accordance with section 3.5.2 of the Permit, shall be revised as appropriate, but in no case later than 7 days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.

All inspections shall be documented on this Construction Stormwater Inspection Certification form. Alternative inspection forms may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the division’s form and the permittee has obtained a written approval from the division to use the alternative form. Inspection documentation will be maintained on site and made available to the division upon request. Inspection reports must be submitted to the division within 10 days of the request.

Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records or other documentation or failure to complete inspection documentation shall result in a violation of this permit and any other applicable acts or rules.



# EROSION PREVENTION & SEDIMENT CONTROL (EPSC) PLAN FOR SMALL-SINGLE FAMILY LOTS

Site Development Permit Number \_\_\_\_\_

For small single-family residential sites affecting <10,000 sqft, circle one of the options below for the EPSC schematic that best describes the measures that will be used on this property during construction. If options A through F do not adequately reflect site conditions, add flow lines and EPSC measures to Option G, as appropriate. The EPSC details can be found on page 2 of this Form.

Option A

Option B

Option C

Option D

Option E

Option F

Option G

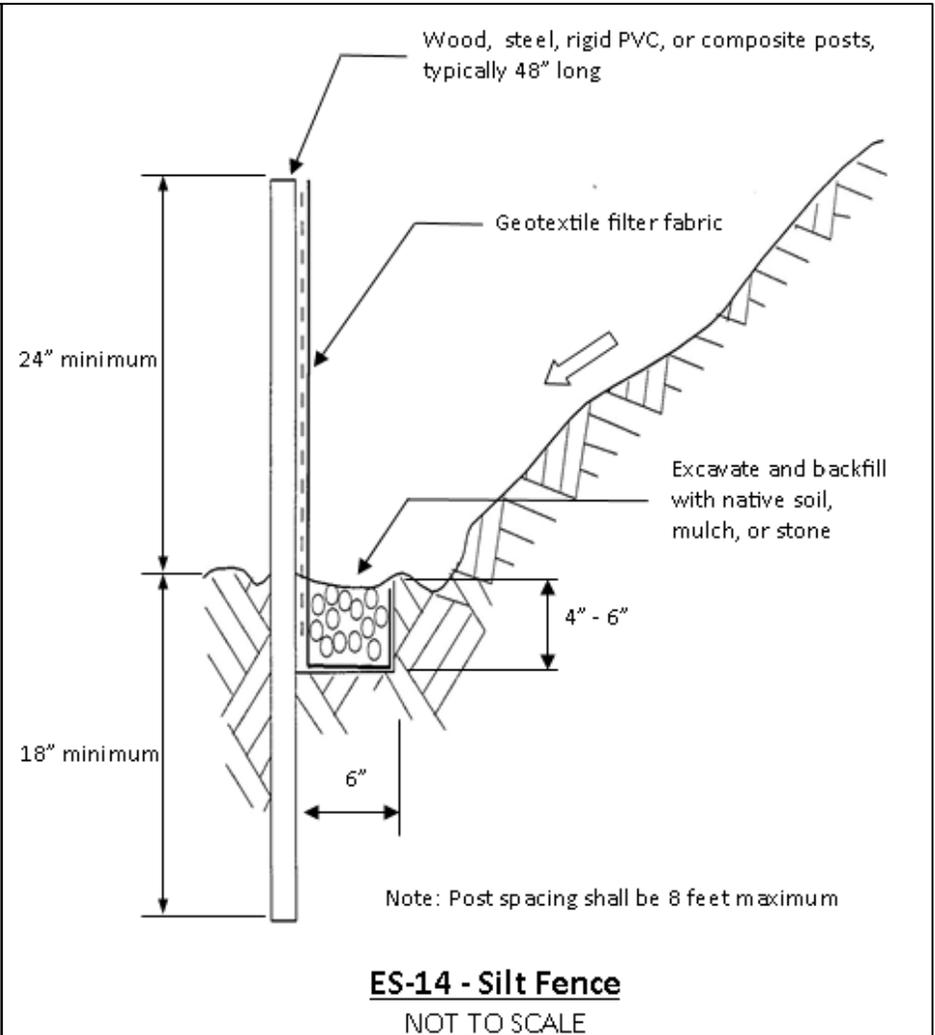
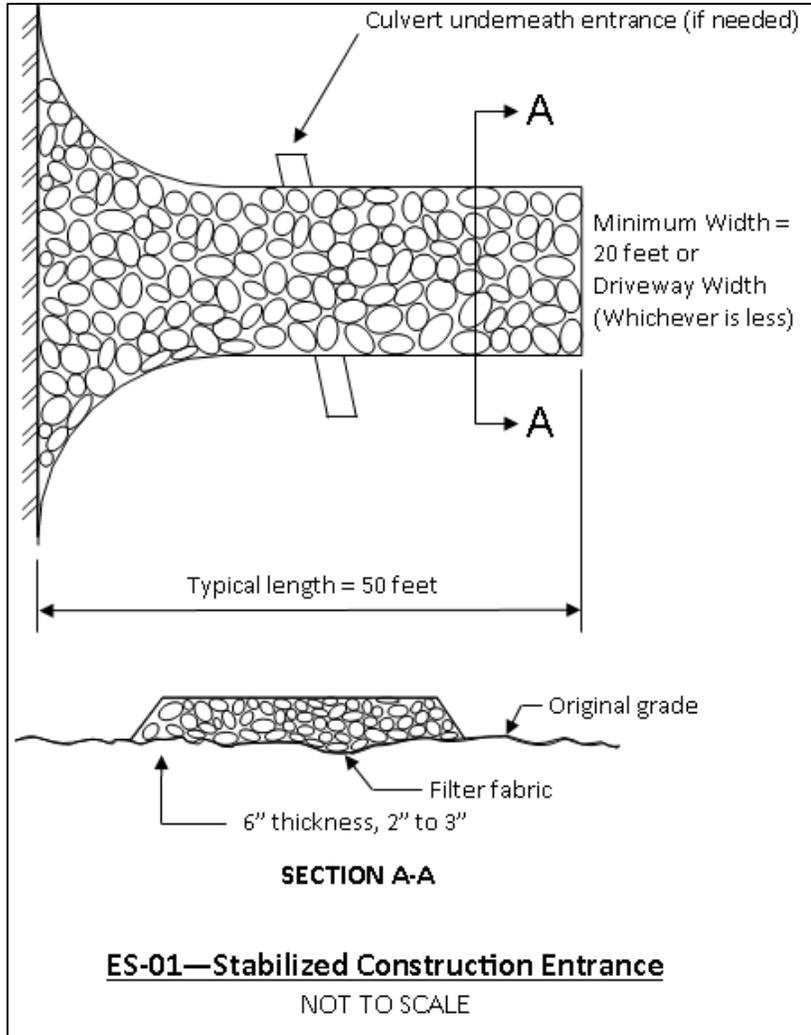
**LEGEND**

	Silt Fence (ES-14)
	Stabilized Construction Entrance (ES-01)
	Direction of Flow (Points Downhill)

Image used and modified with permission from Knox County Department of Engineering and Public Works

In addition to the installation of the proper EPSCs, temporary seeding is required when grading operations are temporarily halted for over 14 days and on soil stockpiles. Permanent seeding is required when grading operations are completed and/or construction operations will not impact the disturbed area. Seed areas that show signs of excessive erosion.

Prior to digging, call 811 to verify utility locations. For more information on the following details see the City of Knoxville [BMP Manual](http://knoxvilletn.gov/government/city_departments_offices/engineering/stormwater_engineering_division/bmp_manual/) at [http://knoxvilletn.gov/government/city\\_departments\\_offices/engineering/stormwater\\_engineering\\_division/bmp\\_manual/](http://knoxvilletn.gov/government/city_departments_offices/engineering/stormwater_engineering_division/bmp_manual/)





## WITHDRAWN FORMS

<b>Application Forms</b>	<b>Date Withdrawn</b>
Property Owner Acknowledgement	April 2018
Information Worksheet for CPMSF (Covenants)	April 2018
<b>Checklists</b>	
Site Development Review Checklist	November 2022
Site Development Submittal Checklist	November 2022
Plat Review Checklist	April 2018
<b>Permits</b>	
Construction Right-of-Way Permit	April 2018
Floodplain Development Permit	April 2018
Site Development Permit	April 2018
<b>Miscellaneous Forms</b>	
Notice of Violation (NOV) Form	April 2018



## ***Appendix B***

### ***Selected City Ordinances for Land Development***

Please click the links associated with each ordinance to open either a PDF document of the ordinance or at *municode.com*

- Chapter 12** - **Flood Damage Prevention and Control**  
[\[PDF\]](#) [\[Online at municode.com\]](#)
- Chapter 14** - **Forestry**  
[\[PDF\]](#) [\[Online at municode.com\]](#)
- Chapter 22.5** - **Stormwater**  
[\[PDF\]](#) [\[Online at municode.com\]](#)
- Chapter 23** - **Streets and Sidewalks**  
[\[PDF\]](#) [\[Online at municode.com\]](#)

Contact the Engineering Development Services Division if there is reason to believe that one of these four ordinances has been changed or is not otherwise current.

The municipal charter and codes are also maintained online by Municode which can be accessed through the pulldown menus on most city webpages. Select "City Ordinances & Charter" from the pulldown menu. The Municode posting is updated at a pace that is generally a few months or more behind the current actions of



## Chapter 12

### FLOOD DAMAGE PREVENTION AND CONTROL

#### **ARTICLE I. Findings of Fact, Purpose and Objectives**

Section 12-1.	Findings of fact.
Section 12-2.	Statement of purpose.
Section 12-3.	Objectives.
Section 12-3.1.	Definitions.
Section 12-4.	Application.
Section 12-5.	Basis for establishing the of special flood hazard areas and shaded X zones.
Section 12-6.	Requirement for development permit.
Section 12-7.	Compliance.
Section 12-8.	Abrogation and greater restrictions.
Section 12-9.	Interpretation.
Section 12-10.	Warning and disclaimer of liability.
Section 12-11.	Penalties for violation.
Sections 12-12-30.	Reserved.

#### **ARTICLE II. Administration**

Section 12-31.	Designation of the ordinance administrator.
Section 12-32.	Permit procedures.
Section 12-33.	Duties and responsibilities of the ordinance administrator.
Section 12-34.	Variance procedure.
Sections 12-35-50.	Reserved.

#### **ARTICLE III. Provisions for Flood Hazard Reduction**

Section 12-51.	General standards.
Section 12-52.	Specific standards.
Section 12-53.	Standards for special flood hazard areas, zones AE with established base flood elevation but without floodways designated.
Section 12-54.	Standards for areas of shallow flooding (AO and AH zones).
Section 12-55.	Reserved.
Section 12-56.	Standards for special flood hazard areas (Zone AE) with established base flood elevations and with floodways designated.
Section 12-57.	Standards for streams without established base flood elevations and floodways (A zones).

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*Flood protection and control was initially established in Chapter 17A of the 1962 City Code. Participation in the National Flood Insurance Program and building/structure requirements was confirmed in June 1978 (Ordinance O-83-78). The first flood hazard boundary maps for Knoxville were issued February 18, 1981. The flood damage prevention and control ordinance was revised substantially in November 1990 (Ordinance O-347-90), December 2003 (Ordinance O-428-03), April 2007 (Ordinance O-70-07), June 2013 (Ordinance O-*

112-2013) and February 2018 (Ordinance O-22-2018. This version now dates as July 2019 (Ordinance O-97-2019).

## **ARTICLE I. FINDINGS OF FACT, PURPOSE AND OBJECTIVES**

### **Section 12-1. Findings of fact.**

- (a) The city mayor and council wish to maintain eligibility in the National Flood Insurance Program and in order to do so must meet the requirements of 60.3(d) of the Federal Insurance Administration Regulations found at 44 CFR Ch. 1 (10-1-04 Edition) and subsequent amendments.
- (b) Areas of the city are subject to periodic inundation which could result in loss of life and property, health and safety hazards, 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.
- (c) These flood losses are caused by the cumulative effect of obstructions in floodplains, causing increases in flood heights and velocities; and by uses in flood hazard areas which are vulnerable to floods; or construction which is inadequately elevated, floodproofed, or otherwise unprotected from flood damages.

*(Ord. No. O-112-2013, § 1, 6-25-13)*

### **Section 12-2. Statement of purpose.**

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas. This chapter is designed to:

- (1) Restrict or prohibit uses which are vulnerable to flooding or erosion hazards, or which result in damaging increases in erosion, flood heights or velocities;
- (2) Require that uses vulnerable to floods, including community facilities, be protected against flood damage at the time of initial construction;
- (3) Control the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of floodwaters;
- (4) Control filling, grading, dredging and other development which may increase flood damage or erosion; and
- (5) Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

*(Ord. No. O-112-2013, § 1, 6-25-13)*

### **Section 12-3. Objectives.**

The objectives of this chapter are:

- (1) To protect human life, health and property;
- (2) To minimize expenditure of public funds for costly flood control projects;
- (3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (4) To minimize prolonged business interruptions;
- (5) 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-prone areas;
- (6) 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 blight in flood areas;

- (7) To ensure that potential buyers are notified that property is in a flood-prone area; and
- (8) To maintain eligibility for participation in the National Flood Insurance Program.

(Ord. No. O-112-2013, § 1, 6-25-13)

**Section 12-3.1. Definitions.**

Unless specifically defined below, words or phrases used in this chapter shall be interpreted as to give them the meaning they have in common usage and to give this chapter its most reasonable application given its stated purpose and objectives.

*1% Annual Chance Flood* means the flood having a one percent chance of being equaled or exceeded in any given year.

*Accessory structure* shall represent a subordinate structure to the principal structure on the same lot and, for the purpose of this section, shall conform to the following:

- (1) Accessory structures shall only be used for parking of vehicles and/or storage.
- (2) Accessory structures shall be designed to have low flood damage potential.
- (3) Accessory structures shall be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters.
- (4) Accessory structures shall be firmly anchored to prevent flotation, collapse and lateral movement which otherwise may result in damage to other structures
- (5) Utilities and service facilities such as electrical and heating equipment shall be elevated to one (1) foot above the base flood elevation or otherwise protected from intrusion of flood waters.

*Act* means the statutes authorizing the National Flood Insurance Program that are incorporated in 42 U.S.C. 4001-4128.

*Addition (to an existing building)* means any walled and roofed expansion to the perimeter or height 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 connected by a fire wall or is separated by independent perimeter load-bearing walls shall be considered "new construction."

*Appeal* means a request for a review of the building official's interpretation of any provision of this chapter or a request for a variance.

*Area of shallow flooding* means a designated AO or AH zone on a community's flood insurance rate map (FIRM) with one (1) percent or greater annual chance of flooding to an average depth of one (1) to three (3) feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. (Such flooding is characterized by ponding or sheet flow).

*Base flood* means the flood having a two-tenths of one percent chance of being equaled or exceeded in any given year.

*Basement* means any portion of a building having its floor subgrade (below ground level) on all sides.

*Building* means any structure built for support, shelter, or enclosure for any occupancy or storage (see "structure").

*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, excavation, drilling operations, or storage of equipment or materials.

*Elevated building* means a non-basement building built to have the lowest floor of the lowest enclosed area elevated above the ground level by means of fill, solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of floodwater, pilings, columns

piers, or shear walls adequately anchored so as not to impair the structural integrity of the building during a base flood event.

*Emergency flood insurance program or emergency program* means the program as implemented on an emergency basis in accordance with section 1336 of the Act. It is intended as a program to provide a first layer amount of insurance on all insurable structures before the effective date of the initial FIRM.

*Erosion* means the process of the gradual wearing away of land masses. This peril is not per se covered under the program.

*Exception* means a waiver from the provisions of this chapter which relieves the applicant from the requirements of a rule, regulation, order or other determination made or issued pursuant to this chapter.

*Existing construction* means any structure for which the "start of construction" commenced before the effective date of the first floodplain management code or ordinance adopted by the community as a basis for that community's participation in the National Flood Insurance Program (NFIP).

*Existing manufactured home park or subdivision* means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, final site grading or the pouring of concrete pads) is completed before the effective date of the first floodplain management code or ordinance adopted by the community as a basis for that community's participation in the National Flood Insurance Program (NFIP).

*Existing structures.* See "existing construction."

*Expansion to an existing manufactured home park or subdivision* means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

*500-year flood.* See "base flood."

*Flood or flooding* means

- (1) A general and temporary condition of partial or complete inundation of normally dry land areas from:
  - a. The overflow of inland or tidal waters.
  - b. The unusual and rapid accumulation or runoff of surface waters from any source.
  - c. Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in paragraph (1)b of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.
- (2) The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (1)a of this definition.

*Flood elevation determination* means a determination by the Federal Emergency Management Agency or the city's ordinance administrator, of the water surface elevations of the base flood, which is the flood level that has a two-tenths of one percent or greater chance of occurrence in any given year.

*Flood elevation study* means an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

*Flood insurance rate map (FIRM)* means an official map of a community, issued by the Federal Emergency Management Agency, delineating the areas of special flood hazard or the risk premium zones applicable to the community.

*Flood insurance study* is the official report provided by the Federal Emergency Management Agency, evaluating flood hazards and containing flood profiles and water surface elevation of the base flood.

*Flood protection system* means those physical structural works for which funds have been authorized, appropriated and expended and which have been constructed specifically to modify flooding in order to reduce the extent of the area within a community subject to a "special flood hazard" and the extent of the depths of associated flooding. Such a system typically includes hurricane tidal barriers, dams, reservoirs, levees or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards.

*Floodplain or flood-prone area* means any land area susceptible to being inundated by water from any source (see definition of "flooding").

*Floodplain management* means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and floodplain management regulations.

*Floodproofing* 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, without the use of human intervention.

*Flood-related erosion* means the collapse or subsidence of land along the shore of a lake or other body of water as a result of undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood, or by some similarly unusual and unforeseeable event which results in flooding.

*Flood-related erosion area or flood-related erosion-prone area* means a land area adjoining the shore of a lake or other body of water, which due to the composition of the shoreline or bank and high water levels or wind-driven currents, is likely to suffer flood-related erosion damage.

*Flood-related erosion area management* means the operation of an overall program of corrective and preventive measures for reducing flood-related erosion damage, including but not limited to, emergency preparedness plans, flood-related erosion control works and floodplain management regulations.

*Floodway* means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the one (1) percent annual chance flood without cumulatively increasing the water surface elevation more than the designated height.

*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.

*Freeboard* means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, blockage of bridge or culvert openings and the hydrological effect of urbanization of the watershed.

*Functionally dependent use* means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

*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:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the U.S. Department of the Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- (3) Individually listed on a state inventory of historic places; or
- (4) Individually listed on a local inventory of historic places or within an existing H1 zone.

*Levee* means a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

*Levee system* means a flood protection system which consists of a levee or levees, and associated structures such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

*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 this chapter.

*Manufactured home* means a structure, transportable in one or more sections, which is built on a permanent chassis and designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."

*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.

*Map* means the flood hazard boundary map (FHBM) or the flood insurance rate map (FIRM) for a community issued by the Federal Emergency Management Agency

*Mean sea level* means the average height of the sea for all stages of the tide. It is used as a reference for establishing various elevations within the floodplain. For purposes of this chapter, the term is synonymous with, the North American Vertical Datum (NAVD) of 1988, or other datum, to which base flood elevations shown on a community's flood insurance rate map are referenced.

*New construction* means any structure for which the "start of construction" commenced on or after the effective date of the first floodplain management ordinance and includes any subsequent improvements to such structure.

*New manufactured home park or subdivision* means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date

of the first floodplain management ordinance and includes any subsequent improvements to such structure.

*North American Vertical Datum (NAVD)* as corrected in the 1988, is a vertical control used as a reference for establishing varying elevations within a floodplain.

*Person* includes any individual or group of individuals, corporation, partnership, association, or any other entity, including state and local governments and agencies.

*Reasonably safe from flooding* means base flood waters will not inundate the land or damage structures to be removed from the Special Flood Hazard Area and that any subsurface waters related to the base flood will not damage existing or proposed structures.

*Recreational vehicle* means a vehicle which is:

- (1) Built on a single chassis;
- (2) Four hundred (400) square feet or less when measured at the largest horizontal projection;
- (3) Designed to be self-propelled or permanently towable by a light duty truck; and
- (4) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

*Regulatory floodway* means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the one hundred-year flood without cumulatively increasing the water surface elevation more than a designated height.

*Riparian buffer zone (RBZ)*. A naturally undisturbed, vegetated, and pervious zone adjacent to regulated waters that is protected from clearing, grading, filling, paving, building, or other destruction of the naturally vegetated state. The RBZ is measured horizontally from the top of bank, extending perpendicular from each bank for the length of the water body. The top of bank is the uppermost limit of the active channel, typically indicated by a change in bank slope from steep to gentle slope. The width of the RBZ will vary, depending on all of the following criteria:

- (1) If a floodway profile, as part of the flood insurance study, has been adopted for the waters, the RBZ width must be equal to or greater than the width of the floodway at all points.
- (2) Waters with a drainage area of less than one (1) square mile will require a minimum RBZ width of thirty (30) feet.
- (3) Waters with a drainage area of one (1) square mile or more will require a minimum RBZ width of sixty (60) feet.
- (4) The Engineering Director may approve alternate RBZ widths for special circumstances (e.g., existing land uses or existing physical conditions).

*Riverine* means relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

*Special flood hazard area* means the floodplain within a community subject to a one percent or greater chance of flooding in a given year. The area may be designated as zone A on the FIRM. Zone A is usually refined into zones A, AO, AH, A1-30, AE or A99.

*Special hazard area* means an area having special flood, mudslide (i.e., mudflow) and/or flood-related erosion hazards and shown on an FHBM or FIRM as zone A, AO, A1-30, AE, A99 or AH.

*Start of construction* includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure (including a manufactured home) on a site, such as the pouring of slabs or footings, the installation of piles, the 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 the installation of streets and/or walkways; nor does it include excavation for a basement, footings, 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. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

*State coordinating agency* means the Tennessee Emergency Management Agency, State NFIP Office as designated by the governor of the state at the request of FEMA, to assist in the implementation of the National Flood Insurance Program for the state.

*Structure* for purposes of this chapter, 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 fifty (50) percent of the market value of the structure before the damage occurred.

*Substantial improvement* means any repairs, reconstruction, rehabilitation, addition, alteration or other improvement to a structure, taking place during a five-year period, in which the cumulative cost of which equals or exceeds fifty (50) percent of the market value of the structure before the "start of construction" of the initial improvement. The market value of the structure is determined by:

- (1) The appraised value of the structure prior to the start of the initial repair or improvement, or
- (2) In the case of damage, the value of the structure prior to the damage occurring.

This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either:

- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions and not solely triggered by an improvement or repair project; or
- (2) Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.

*Substantially improved existing manufactured home parks or subdivision* is where the repair, reconstruction, rehabilitation or improvement of the streets, utilities and pads equals or exceeds fifty (50) percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced.

*Variance* is a grant of relief from the requirements of this chapter which permits construction in a manner otherwise prohibited by this chapter 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 certification, or other evidence of compliance required in this chapter is presumed to be in violation until such time as that documentation is provided.

*Water surface elevation* means the height, in relation to the North American Vertical Datum (NAVD) of 1988 (or other datum where specified), of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19; Ord. No. O-170-2020, § 1, 11-17-20; Ord. No. O-51-2023, § 3, 3-21-23)

**Section 12-4. Application.**

This chapter shall apply to all areas within the incorporated area of the city.  
(*Ord. No. O-112-2013, § 1, 6-25-13*)

**Section 12-5. Basis for establishing the special flood hazard areas and shaded X zones.**

The areas of special flood hazard identified on the city Federal Emergency Management Agency flood insurance study (FIS), dated August 5, 2013, and flood insurance rate maps (FIRM), Community 475434, Panel Numbers: 47093C0120F, 47093C0134F, 47093C0136F, 47093C0137F, 47093C0142F, 47093C0144F, 47093C0162F, 47093C0169F, 47093C0170F, 47093C0188F, 47093C0189F, 47093C0254F, 47093C0256F, 47093C0258F, 47093C0262F, 47093C0263F, 47093C0264F, 47093C0266F, 47093C0268F, 47093C0269F, 47093C0282F, 47093C0284F, 47093C0287F, 47093C0288F, 47093C0289F, 47093C0291F, 47093C0292F, 47093C0301F, 47093C0302F, 47093C0303F, 47093C0304F, 47093C0306F, 47093C0307F, 47093C0310F, 47093C0311F, 47093C0312F, 47093C0313F, 47093C0327F, 47093C0330F, 47093C0380F, 47093C0385F, 47093C0405F, dated May 2, 2007 and 47093C0133G, 47093C0138G, 47093C0139G, 47093C0141G, 47093C0143G, 47093C0161G, 47093C0163G, 47093C0164G, 47093C0242G, 47093C0243G, 47093C0244G, 47093C0257G, 47093C0259G, 47093C0267G, 47093C0276G, 47093C0277G, 47093C0278G, 47093C0279G, 47093C0281G, 47093C0283G and 47093C0286G, together also dated August 5, 2013, along with all supporting technical data and any subsequent amendments or revisions, are adopted by reference and declared to be a part of this chapter.  
(*Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-22-2018, § 1, 2-27-18; Ord. No. O-97-2019, § 1, 7-02-19*)

**Section 12-6. Requirement for development permit.**

A development permit shall be required in conformity with this chapter prior to the commencement of any development activity.  
(*Ord. No. O-112-2013, § 1, 6-25-13*)

**Section 12-7. Compliance.**

No land, structure or use shall hereafter be located, extended, converted, or structurally altered without full compliance with the terms of this chapter and other applicable regulations.  
(*Ord. No. O-112-2013, § 1, 6-25-13*)

**Section 12-8. Abrogation and greater restrictions.**

This chapter is not intended to repeal, abrogate, or impair any existing easement, covenant, or deed restriction, existing ordinances and regulations. However, where this chapter conflicts or overlaps with another, whichever imposes the more stringent restrictions shall prevail.  
(*Ord. No. O-112-2013, § 1, 6-25-13*)

**Section 12-9. Interpretation.**

In the interpretation and application of this chapter, 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.

(*Ord. No. O-112-2013, § 1, 6-25-13*)

**Section 12-10. Warning and disclaimer of liability.**

The degree of flood protection required by this chapter 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 chapter 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 chapter shall not create liability on the part of the city or by any officer or employee thereof for any flood damages that result from reliance on this chapter or any administrative decision lawfully made hereunder.

*(Ord. No. O-112-2013, § 1, 6-25-13)*

**Section 12-11. Penalties for violation.**

Violation of the provisions of this chapter 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 violation. Any person who violates this chapter or fails to comply with any of its requirements shall, upon adjudication thereof, be assessed civil penalties and fines as provided by Tennessee law and in addition shall pay all costs and expenses involved in the case. Each day such violation continues shall be considered a separate violation. Nothing herein contained shall prevent the city from taking such other lawful actions to prevent or remedy any violation.

*(Ord. No. O-112-2013, § 1, 6-25-13)*

**Sections 12-12—12-30. Reserved.**

**ARTICLE II. ADMINISTRATION**

**Section 12-31. Designation of the ordinance administrator.**

The engineering director, or designee, is hereby appointed to administer and implement the provisions of this chapter.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No O-170-2020, § 2, 11-17-20)*

**Section 12-32. Permit procedures.**

Application for a development permit shall be made to the ordinance administrator on forms furnished by the department prior to any development activity. The development permit may include, but is not 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, earthen fill placement, storage of materials or equipment, and drainage facilities. Specifically, the following information is required:

- (1) Application stage.
  - a. Elevation in relation to mean sea level of the proposed lowest floor, including basement, of all buildings where base flood elevations are available, or to the required height above the highest adjacent grade when applicable under this chapter.
  - b. Elevation in relation to mean sea level to which any non-residential building will be floodproofed, where base flood elevations are available, or to the required height above the highest adjacent grade when applicable under this chapter.
  - c. A FEMA floodproofing certificate from a Tennessee-registered professional engineer or architect that the proposed nonresidential floodproofed building will meet the floodproofing criteria in article II, section 12-32(2).
  - d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.
  - e. In order to determine if improvements or damage meet the substantial improvement or substantial damage criteria, the applicant shall provide to the ordinance administrator a detailed cost to repair all damages and/or cost of improvements which includes the

complete costs associated with all types of work necessary to repair or improve a building. These include the costs of all materials, labor, and other items necessary to perform the proposed work. These must be in the form of:

1. An itemized costs of materials, and labor, or estimates of materials and labor that are prepared by licensed contractors or professional construction cost estimators;
  2. Building valuation tables published by building code organizations and cost-estimating manuals and tools available from professional building cost-estimating services;
  3. A qualified estimate of costs that is prepared by the local official using professional judgement and knowledge of local and regional construction costs; or
  4. A detailed cost estimate provided and prepared by the building owner. This must include as much supporting documentation as possible (such as pricing information from lumber companies, plumbing and electrical suppliers, etc.). In addition, the estimate must include the value of labor, including the value of the owner's labor.
- (2) Construction stage. Within AE and shaded X zones, where base flood elevation data is available, any lowest floor certification made relative to mean sea level shall be prepared by, or under the direct supervision of, a Tennessee-registered land surveyor and certified by same. The ordinance administrator 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 relative to the highest adjacent grade. When floodproofing is utilized for a non-residential building, said certification shall be prepared by, or under the direct supervision of, a Tennessee-registered professional engineer or architect and certified by same.

For all new construction and substantial improvements, the permit holder shall provide to the ordinance administrator an as-built certification of the lowest floor elevation or floodproofing level upon the completion of the lowest floor or floodproofing.

Within approximate A zones, where flood elevation data is not available, the elevation of the lowest floor shall be determined as the measurement of the lowest floor of the building relative to the highest adjacent grade. The ordinance administrator shall record the elevation of the lowest floor on the development permit. Any lowest floor certification made relative to mean sea level shall be prepared by, or under the direct supervision of a Tennessee-registered land surveyor and certified by same. When floodproofing is utilized for a non-residential building, said certification shall be prepared by, or under the direct supervision of, a Tennessee-registered 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 ordinance administrator shall review the above-referenced certification data.

Deficiencies detected by such review shall be corrected by the permit holder immediately and prior to further work being allowed to proceed. Failure to submit the certification or failure to make said corrections required hereby, shall be cause to issue a stop-work order for the project.

- (3) Finished construction. Upon completion of construction, a FEMA elevation certificate which depicts all finished construction elevations is required to be submitted to the ordinance administrator. If the project includes a floodproofing measure, a FEMA floodproofing certificate is required to be submitted by the permit holder to the ordinance administrator. An operation and maintenance plan must be provided along with the floodproofing certificate.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-170-2020, § 3, 11-17-20)*

**Section 12-33. Duties and responsibilities of the ordinance administrator.**

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

- (1) Review of all development permits to assure that the requirements of this chapter have been satisfied, and that proposed building sites will be reasonably safe from flooding.
- (2) Advice to permittee that additional federal or state permits may be required, and if specific federal or state permit requirements 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) Notification to adjacent communities and the Tennessee Emergency Management Agency and state NFIP office prior to any alteration or relocation of a watercourse, and submission of evidence of such notification to the Federal Emergency Management Agency.
- (4) For any altered or relocated watercourse, submit engineering data/analysis within six (6) months to the Federal Emergency Management Agency to ensure accuracy of community flood maps through the letter of map revision process. Assure that the flood carrying capacity within an altered or relocated portion of any watercourse is maintained.
- (5) Record the actual elevation (in relation to mean sea level or highest adjacent grade, whichever is applicable) of the lowest floor (including basement) of all new or substantially improved buildings, in accordance with article II, section 12-32(2).
- (6) Record the actual elevation (in relation to mean sea level or highest adjacent grade, whichever is applicable) to which the new or substantially improved buildings have been floodproofed, in accordance with article II, section 12-32(2).
- (7) When floodproofing is utilized for a non-residential structure, the ordinance administrator shall obtain certification of design criteria from a Tennessee-registered professional engineer or architect, in accordance with article II, section 12-32(2).
- (8) 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 ordinance administrator 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 12-34.
- (9) When base flood elevation data and floodway data have not been provided by the Federal Emergency Management Agency, then the ordinance administrator shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state or other source, including data developed as a result of these regulations, as criteria for requiring that new construction, substantial improvements, or other development in zone A on the community FIRM meet the requirements of this chapter.
- (10) All records pertaining to the provisions of this chapter shall be maintained in the office of the ordinance administrator and shall be open for public inspection. Permits issued under the provisions of this chapter shall be maintained in a separate file or marked for expedited retrieval within combined files.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-170-2020, § 4, 11-17-20)*

**Section 12-34. Variance procedure.**

- (a) The city board of zoning appeals, as established by the city council, shall hear and decide appeals and requests for variances from the requirements of this chapter. Notice requirements shall be as established by the board for appeals of the zoning ordinance.
- (b) The city board of zoning appeals shall hear and decide when it is alleged there is an error in any requirement, decision, or determination made by the engineering director in the enforcement or administration of this chapter.

- (c) Any person aggrieved by the decision of the city board of zoning appeals may appeal such decision by petition to the court of record, as provided in the state enabling legislation.
- (d) 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 subsections (h)(1) and (h)(2), provided the proposed reconstruction, rehabilitation, or restoration will not result in the structure losing its historical designation.
- (e) In passing upon such application, the city board of zoning appeals shall consider all technical evaluations, all relevant factors, and standards specified in other sections of this chapter and:
  - (1) The danger that materials may be swept onto other lands to the injury of others.
  - (2) The danger of life and property due to flooding or erosion damage.
  - (3) The susceptibility of the proposed facility and its contents to flood damage and the effect of damage on the individual owner.
  - (4) The importance of the services provided by the proposed facility to the community.
  - (5) The necessity to the facility of a waterfront location, where applicable.
  - (6) The availability of alternate locations, not subject to flooding or erosion damage, for the proposed use.
  - (7) The compatibility of the proposed use existing and anticipated development.
  - (8) The relationship of the proposed use to the comprehensive plan and floodplain management program for that area.
  - (9) The safety of access to the property in times of flood for ordinary and emergency vehicles.
  - (10) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site.
  - (11) 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, and streets and bridges.
- (f) Upon consideration of the factors listed above and the purposes of this chapter, the city board of zoning appeals may attach such conditions to the granting of variances as it deems necessary to further the purposes of this chapter.
- (g) Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
- (h) Conditions for variances are as follows:
  - (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 a showing of good and sufficient cause, determination that failure to grant the variance would result in exceptional hardship to the applicant, and 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.
- (i) 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 the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

- (j) The engineering director shall maintain the records of all appeal actions and report any variances to the Federal Emergency Management Agency upon request.

*(Ord. No. O-112-2013, § 1, 6-25-13)*

**Sections. 12-35—12-50. Reserved.**

### **ARTICLE III. PROVISIONS FOR FLOOD HAZARD REDUCTION**

#### **Section 12-51. General standards.**

In all special flood hazard areas and shaded X zones, the following provisions are required:

- (1) New construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.
- (2) Manufactured homes must be installed using methods and practices that minimize flood damage. They shall be elevated and 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) New construction and substantial improvements to existing buildings shall be constructed with materials and utility equipment resistant to flood damage.
- (4) New construction or substantial improvements to existing buildings shall be constructed by methods and practices that minimize flood damage.
- (5) All electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities shall be floodproofed and/or elevated one (1) foot above the BFE, or three (3) feet above the 1% annual chance flood along TVA dam-controlled rivers, 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 floodwaters into the system.
- (7) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters.
- (8) On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
- (9) Any alteration, repair, reconstruction or improvements to a building which is in compliance with the provisions of this chapter shall meet the requirements of "new construction" as contained in this chapter.
- (10) Any alteration, repair, reconstruction or improvements to a building which is not in compliance with the provisions of this chapter shall be undertaken only if said nonconformity is not extended or replaced.
- (11) All new construction and substantial improvement proposals shall provide copies of all necessary federal and state permits, including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334.
- (12) All subdivision proposals and other proposed new development proposals shall meet the standards of section 12-52.

- (13) When proposed new construction or substantial improvements are partially located a special flood hazard area or shaded x zone, the entire structure shall meet the standards for new construction.
- (14) When proposed new construction or substantial improvements are located in multiple flood hazard risk zones or in a flood hazard risk zone with multiple base flood elevations, the entire structure shall meet the standards for the most hazardous flood hazard risk zone and the highest base flood elevation.

(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19; Ord. No. O-51-2023, § 3, 3-21-23)

### **Section 12-52. Specific standards.**

In all special flood hazard areas, the following provisions, in addition to those set forth in section 12-5, are required:

- (1) *Residential construction.* In AE and shaded x zones where base flood elevation data is available, new construction or substantial improvement of any residential building (or manufactured home) shall have all utilities (including electrical (utility meters not included), heating, ductwork, ventilating, plumbing, and air conditioning equipment) and the lowest floor, including basement, elevated to no lower than one (1) foot above the base flood elevation. Along any TVA dam-controlled river (Tennessee, French Broad, Holston), new construction and/or substantial improvement of any commercial, industrial, or nonresidential building in AE and/or shaded X zones when base flood elevation data is available, shall have all utilities (including electrical (utility meters not included), heating, ductwork, ventilating, plumbing, and air conditioning equipment) and the lowest floor, including basement, elevated to no lower than three (3) feet above the 1% annual chance flood. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate equalization of flood hydrostatic forces on both sides of exterior walls and to ensure the unimpeded movement of floodwaters shall be provided in accordance with standards of article III, section 12-52(3).

Within approximate A zones, where baseflood elevations have not been established and where alternative data is not available, the ordinance administrator shall require the lowest floor of a building to be elevated to a level of at least three (3) feet above the highest adjacent grade (lowest floor and highest adjacent grade being defined in section 12-3.1 of this chapter). All applicable data including elevations or flood proofing certifications shall be recorded as set forth in article II, section 12-32. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate equalization of flood hydrostatic forces on both sides of exterior walls shall be provided in accordance with the standards of subsection (2).

- (2) *Nonresidential construction.* In AE and shaded x zones, new construction and / or substantial improvement of any commercial, industrial, or nonresidential building, when base flood elevation data is available, shall have aU utilities (including electrical (utility meters not included), heating, ductwork, ventilating, plumbing, and air conditioning equipment) and the lowest floor, including basement, elevated or floodproofed to no lower than one (1) foot above the level of the base flood elevation. Along any TVA dam-controlled river (Tennessee, French Broad, Holston), new construction and/or substantial improvement of any commercial, industrial, or nonresidential building in AE and/or shaded X zones when base flood elevation data is available, shall have all utilities (including electrical (utility meters not included), heating, ductwork, ventilating, plumbing, and air conditioning equipment) and the lowest floor, including basement, elevated or floodproofed to no lower than three (3) feet above the 1% annual chance flood. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate equalization of flood hydrostatic forces on

both sides of exterior walls shall be provided in accordance with the standards of subsection (2).

Within approximate A zones, where base flood elevations have not been established and where alternative data is not available, new construction and substantial improvement of any commercial, industrial, or non-residential building shall have the lowest floor of a building, including the basement, to be elevated or floodproofed to a level of at least three (3) feet above the highest adjacent grade (lowest floor and highest adjacent grade being defined in section 12-3.1 of this chapter). Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate equalization of flood hydrostatic forces on both sides of exterior walls shall be provided in accordance with the standards of subsection (2). Non-residential buildings located in all A zones may be floodproofed in lieu of being elevated, provided that all areas of the building below the required elevation are watertight with walls substantially impermeable to the passage of water, and are built with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. A registered professional engineer or architect shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions above and shall provide such certification to the Ordinance Administrator as set forth in article II, section 12-32(2).

(3) *Standards for manufactured homes and recreational vehicles.*

- a. All manufactured homes placed, or substantially improved, on:
  1. Individual lots or parcels;
  2. In expansions to existing manufactured home parks or subdivisions; or
  3. In new or substantially improved manufactured home parks or subdivisions; must meet all the requirements of new construction, including elevations and anchoring.
- b. All manufactured homes placed or substantially improved in an existing manufactured home park or subdivision must be elevated so that either:
  1. In AE and shaded x zones with base flood elevations, the lowest floor of the manufactured home is elevated on a permanent foundation no lower than one (1) foot above the level of the base flood elevation; or
  2. Along any TVA dam-controlled river (Tennessee, French Broad, Holston) in AE and shaded X zones with base flood elevations, the lowest floor of the manufactured home is elevated on a permanent foundation no lower than three (3) feet above the 1% annual chance flood; or
  3. In approximate A zones without base flood elevations, the manufactured home chassis is elevated and supported by reinforced piers (or other foundation elements of equivalent or greater strength) at least three (3) feet in height above the highest adjacent grade.

(4) *Standards for subdivisions and other proposed new development proposals.*

Subdivisions and other proposed new development, including manufactured home parks, shall be reviewed to determine whether such proposals will be reasonably safe from flooding.

- a. All subdivisions and other proposed new development proposals shall be consistent with the need to minimize flood damage.
- b. All subdivisions and other proposed new development proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage.
- c. All subdivisions and other proposed new development proposals shall have adequate drainage provided to reduce exposure to flood hazards.
- d. In all approximate A zones, base flood elevation data shall be provided by the project engineer for subdivision proposals and other proposed development (including

manufactured home parks and subdivisions), which are greater than fifty (50) lots or five (5) acres in area.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 3, 7-02-19; Ord. No. O-170-2020, § 7, 11-17-20; Ord. No. O-51-2023, § 3, 3-21-23)*

**Section 12-53. Standards for special flood hazard areas, zones AE with established base flood elevation but without floodways designated.**

Located within the special flood hazard areas established in article III section 12-5, where streams exist with base flood data but where no floodways have been designated (zones AE), the following provisions apply:

- (1) No encroachments, including fill material, new construction or substantial improvements shall be located within special flood hazard areas, unless certification by a Tennessee-registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community. The engineering certification should be supported by technical data that conforms to standard hydraulic engineering principles.
- (2) New construction or substantial improvements of buildings, where permitted, shall comply with all applicable flood hazard reduction provisions in article III, section 12-52.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19)*

**Section 12-54. Standards for areas of shallow flooding (AO and AH zones).**

(a) Located within the special flood hazard areas established in article I, section 12-5 may be areas designated as shallow flooding areas (AO Zones.) These areas have special flood hazards associated with base flood depths of one (1) to three (3) feet where a clearly defined channel does not exist and where the path of flooding is unpredictable and indeterminate. Therefore, the following provisions apply:

- (1) All new construction and substantial improvements of non-residential and residential buildings shall have the lowest floor, including basement, elevated to at least one (1) foot above as many feet as the depth number specified on the flood insurance rate map, in feet, above the highest adjacent grade. If no flood depth number is specified on the FIRM, the lowest floor, including basement, shall be elevated at least three (3) feet above the highest adjacent grade. Openings sufficient to facilitate automatic equalization of hydrostatic flood forces on exterior walls shall be provided in accordance with standards of article III, section 12-52, and "enclosures."
- (2) All new construction and substantial improvements of non-residential buildings may be flood- proofed in lieu of elevation. The structure together with attendant utility and sanitary facilities must be flood proofed and designed watertight to be completely flood-proofed to at least one (1) foot above the flood depth number specified on the FIRM, with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. If no depth number is specified, on the FIRM, the structure shall be flood proofed to at least three (3) feet above the highest adjacent grade. A Tennessee-registered professional engineer or architect shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this ordinance and shall provide such certification to the engineering department as set forth above and as required in article II, section 12-32.
- (3) Adequate drainage paths shall be provided around slopes to guide floodwaters around and away from proposed structures.

- (b) Located within the special flood hazard areas established in article I, section 12-5, are areas designated as shallow flooding areas (AH zones). These areas are subject to inundation by one-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are one (1) to three (3) feet. Base flood elevations are derived from detailed hydraulic analyses are shown in this zone. In addition to sections 12-51 and 12-52, all new construction and substantial improvements shall meet the following requirement: adequate drainage paths shall be provided around structures on slopes, to guide floodwaters around and away from proposed structures.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19; Ord. No. O-170-2020, § 8, 11-17-20)*

**Section 12-55. Reserved.**

**Section 12-56. Standards for special flood hazard areas (Zone AE) with established base flood elevations and with floodways designated.**

Located within the special flood hazard areas established in article I, section 12-5 are areas designated as floodways. A floodway may be extremely hazardous area due to the velocity of floodwaters, debris or erosion potential. In addition, the area must remain free of encroachment in order to allow for the discharge of base flood without increased flood heights and velocities. Therefore, the following provisions apply:

- (1) The community shall select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one (1) foot at any point;
- (2) Encroachments, including fill material, new construction, substantial improvements or other developments are prohibited within the regulatory floodway. Development may be permitted however, provided it is demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practiced that the cumulative effect of the proposed encroachments or new development, when combined with all other existing and anticipated development, shall not result in any increase the water surface elevation of the base flood level, velocities or floodway widths during the occurrence of a base flood discharge at any point within the community. A Tennessee registered professional engineer must provide supporting technical data and certification thereof, using the same methodologies as in the effective flood insurance study for the city and certification thereof.
- (3) A community may permit encroachments within the adopted regulatory floodway that would result in an increase in the water surface elevation of the base flood level, velocities or floodway widths provided that the community first applies for a conditional letter of map revision (CLOMR) and floodway revision, fulfills the requirements for such revisions as established under the provisions of 44 CFR 65.12, and receives the approval of FEMA.
- (4) Only if section 12-56, provisions (1) through (3) are satisfied, then any new construction or substantial improvements of buildings shall comply with all applicable flood hazard reduction provisions of article III.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19; Ord. No. O-170-2020, § 9, 11-17-20)*

**Section 12-57. Standards for streams without established base flood elevations and floodways (A zones).**

In areas located within the special flood hazard areas established in article I, where streams exist, but no base flood data has been provided and where a floodway has not been delineated, the following shall apply:

- (1) The ordinance administrator shall obtain, review and reasonably utilize any base flood elevation, scientific or historic base flood elevation and floodway data available from federal, state or other sources, including data developed as a result of these regulations (see subsection (2), below) as criteria for requiring that new construction, substantial improvements, or other development in approximate A zones meet the requirements of this chapter.
- (2) Require that all new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than fifty (50) lots or five (5) acres, whichever is the lesser, include within such proposals base flood elevation data.
- (3) Within approximate A zones, where base flood elevations have not been established and where such data is not available from other sources, require the lowest floor of a building to be elevated or floodproofed to a level of at least three (3) feet above the highest adjacent grade. All applicable data, including elevations or floodproofing certifications, shall be recorded as set forth in this chapter. Openings sufficient to facilitate automatic equalization of hydrostatic flood forces on exterior walls shall be provided in accordance with the standards of section 12-52.
- (4) Within approximate A zones, where base flood elevations have not been established and where such data is not available from other sources, no encroachments, including structures or fill material, shall be located within an area equal to the width of the stream or twenty (20) feet, whichever is the greater, measured from the top of the stream bank, unless certification by a Tennessee-registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community. The engineering certification should be supported by technical data that conforms to standard hydraulic engineering principles.
- (5) New construction or substantial improvements of existing buildings, where permitted, shall comply with all applicable flood hazard reduction provisions of sections 12-51 and 12-52. Within approximate A zones, require that these sections dealing with the alteration and relocation of a watercourse, assuring watercourse carrying capacities are maintained and manufactured home provisions are complied with as required.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19; Ord. No. O-170-2020, § 10, 11-17-20)*

#### **Section 12-58. Standards for unmapped streams.**

Located within the city are unmapped streams along which special flood hazard areas are neither indicated nor identified. Adjacent to such streams, the following provisions shall apply:

- (1) No encroachments including fill material or other development including structures shall be located within the riparian buffer zone as defined in the stormwater and street ordinance.
- (2) When a new flood hazard risk zone, and base flood elevation and floodway data is available, new construction and substantial improvements shall meet the standards established in accordance with this chapter.

*(Ord. No. O-112-2013, § 1, 6-25-13; Ord. No. O-97-2019, § 1, 7-02-19; Ord. No. O-170-2020, § 10, 11-17-20)*



## Chapter 14

### FORESTRY

- ❖ Cross reference— Animals, Ch. 5; buildings and building regulations, Ch. 6; garbage, trash and refuse, Ch. 13; parks and recreation, Ch. 20; streets and sidewalks, Ch. 23; waterways, Ch. 27; subdivision regulations, App. A.
  - ❖ State Law reference— Authority to acquire lands for forestry purposes, T.C.A. § 11-23-101.
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#### **ARTICLE I. In General**

- Section 14-1. Definitions
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#### **ARTICLE II. Tree Protection**

- Section 14-26. Title of article.
- Section 14-27. Purpose and intent of article.
- Section 14-28. Definition.
- Section 14-29. Applicability of article.
- Section 14-30. Waiver of requirements during emergencies.
- Section 14-31. Penalty for violation of article.
- Section 14-32. Appeals.
- Section 14-33. Site plan.
- Section 14-34. Destruction or removal of trees.
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#### **ARTICLE III. Trees on Public Property**

- Section 14-51. Short title.
- Section 14-52. Purpose and intent.
- Section 14-53. Definitions.
- Section 14-54. Severability.
- Section 14-55. Creation and duties of the tree board.
- Section 14-56. Establishment of the position of urban forester.
- Section 14-57. Appropriate species list.
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- Section 14-59. Obstruction, spacing, and location of trees.
- Section 14-60. Topping and removal of trees.
- Section 14-61. Municipal tree care.
- Section 14-62. Tree mitigation.
- Section 14-63. Emergencies.
- Section 14-64. Penalty.

**ARTICLE I.                      In General**

**Sections 14-1                      Definitions**

The following words shall have the meanings assigned to them wherever such words appear in this chapter.

*American National Standards Institute (ANSI).* These are generally accepted industry standards, and for this article arboriculture standards for tree care are defined in the current edition of American National Standards Institute ANSI A300 series and ANSI Z133.

*Arbor Day Foundation Standards.* Standards for becoming a Tree City USA, Tree Campus USA, or Tree Line USA.

*Caliper.* This is a size measurement for newly planted and nursery stock trees. This measurement is made at six (6) inches above ground.

*Champion tree.* Designated tree in the State of Tennessee that is identified as the largest tree of its species across the State.

*City.* The City of Knoxville, Tennessee.

*City of Knoxville Species List.* List of approved tree species that can be planted within the city.

*City property.* All real property which is owned or leased by the city or which is maintained by it or any part of any improved public right-of-way.

*Critical root zone.* The soil area below ground and the space above ground defined by measuring one (1) foot radius away from the trunk of the tree for every inch diameter at breast height (DBH).

*Diameter at breast height (DBH).* This is a diameter measurement for existing or established trees. This standard of measure is made at four and one-half (4.5) feet above the ground.

*Historic tree.* A tree that has been a direct witness to a historic event or cultural movement significant nationally, regionally, or within the state and confirmed to date to that time.

*Landmark tree.* Recognized as an established and familiar feature of the community, confirmed as a significant part of the community's heritage, or planted to commemorate special events or community leaders more than 50 years ago.

*Property owner.* The person owning property or the owner as shown by the county property assessor's records.

*Public service department.* The designated unit of the city under whose jurisdiction a public tree falls.

*Public tree.* All trees now and hereafter that have been planted or maintained by the city, and/or grow on any city property.

*Right-of-way.* Property located within and adjoining the alleys, streets, roads, highways, and public easements within the city for which the city has the right to improve or maintain.

*Site.* Area of land being impacted, altered, graded, or developed. A site may consist within a parcel of land or overlap multiple parcels of land.

*Topping.* The severe and/or indiscriminate cutting back of limbs or trunks within the canopy of a tree so as to remove the normal canopy and disfigure the tree. The practice of not pruning back to lateral branches.

*Tree.* For purposes of this chapter only, trees shall be considered to be plants, woody in structure with an anticipated mature height of at least 15 feet.

*Tree canopy.* The area that is made up of leaves, branches, and other living parts of a tree above ground.

*Tree mitigation.* The process of replacing trees and tree benefits that have been or will be lost through tree removal or pruning based on the species, size, health, and location of the tree.

*Treelawn.* An area of maintained property not covered by sidewalk or other paving, located between a public sidewalk and edge of pavement within the right-of-way that can grow vegetation.

*Urban forester.* The City of Knoxville Urban Forester or other designated official of the city, assigned to carry out the enforcement of this article.

*Urban forestry division.* A proactive program for managing trees within the public service department as a public resource.  
(Ord. No. O-161-2021, § 2, 12-14-21)

**Sections 14-2-25. Reserved.**

**ARTICLE II. Tree Protection**

**Section 14-26. Title of article.**

This article may be known as the Tree Protection Ordinance of the City of Knoxville.  
(Code 1962, § 22-1)

**Section 14-27. Purpose and intent of article.**

The purpose and intent of this article is to encourage the preservation and protection of trees and tree canopy within the city because of the unique social, economic, and environmental benefits they provide the community such as assisting the natural control of solar heat, improving water quality, soil conservation, assisting with stormwater control, air pollution and noise abatement, providing a haven for community wildlife; and in providing citizens with psychological relief from the increasing complexities of the manmade urban environment. It is not intended to be punitive nor to cause hardships on those individuals and concerns exercising reasonable care and diligence to protect trees.  
(Code 1962, § 22-2; Ord. No. O-161-2021, § 3, 12-14-21))

**Section 14-28. Reserved.**

Ord. No. O-161-2021, § 5, adopted December 14, 2021, amended the Code by repealing former § 14-28 in its entirety. Former § 14-28 defined the word "tree," and derived from the Code of 1962, § 22-3.

**Section 14-29. Applicability of article.**

- (a) This article shall apply to all real property within the city, including all commercial, industrial, business or multifamily and subdivision property, with the following exceptions:
- (1) It shall not apply to any parcel of land currently being used for a single-family dwelling or two-family dwelling. If the use of the parcel changes to any other classification, the other requirements of this article apply.
  - (2) It shall not apply to the approaches (clear zones) to any airports located in the city limits, to the easements or rights-of-way of utility companies, or to federal, state or local governments.
  - (3) It shall not apply to containerized trees or nursery stock trees for resale in commercial nurseries or garden centers.
- (b) Trees being provided on the site in compliance with other regulations may be used for compliance with this article where minimum size and species standards are maintained.
- (c) This article shall apply to all trees two (2) inches in diameter at breast height.  
(Code 1962, § 22-4; Ord. No. O-161-2021, §§ 4, 6, 12-14-21)

**Section 14-30. Waiver of requirements during emergencies.**

In case of emergencies such as windstorms, ice storms or other disasters, the requirements of this article may be waived by the urban forester during emergency periods so as not to hamper private and public work to restore order in the city.  
(Code 1962, § 22-9; Ord. No. O-161-2021, § 7, 12-14-21)

**Section 14-31. Penalty for violation of article.**

Any person violating any provisions of this article shall be punished as provided in section 1-9.  
(Code 1962, § 22-10)

**Section 14-32. Appeals.**

Except as otherwise provided, appeals from decisions of the urban forester under this article shall be to the courts of record by petition setting forth that such decision is illegal in whole or in part and specifying the grounds of the illegality. Such petition shall be filed within sixty (60) days after the receipt of the urban forester's decision.

(Code 1962, § 22-11)

**Section 14-33. Site plan.**

- (a) Where no building permit or subdivision approval is required for activities regulated under this article, the developer shall submit a site plan to the urban forester or other designated official. The plan shall generally locate individual trees and groups of trees on the parcel and estimate the number of trees that will remain and the proposed number of trees to be removed.
- (b) Where application for a building permit or preliminary subdivision plat is required by the city, a site plan locating trees to be removed, retained, or provided, their species, and size shall be submitted with such application for review by the urban forester, or other designated official. Such plan shall be approved unless notice to the contrary is given within ten (10) working days of the application. In the event of disapproval, the reasons for such disapproval shall be reported in writing to the applicant. The submitted plan must meet the purpose and intent of this article.

(Code 1962, § 22-8; Ord. No. O-161-2021, § 9, 12-14-21)

**Section 14-34. Destruction or removal of trees.**

- (a) *Clearing or grading work.* Where a building permit or subdivision approval has not been issued, the destruction of more than twenty-five (25) percent of the trees on any one (1) parcel of nonexempt land, without the prior approval of the urban forester, shall be prohibited.
- (b) *Land development and new construction.* Where a building permit for new construction or subdivision approval is required, a minimum of six (6) trees per acre shall be retained on the site unless because of cut or fill work such trees cannot be saved. If trees cannot be salvaged, mitigation trees should be included as per section 14-36.

(Code 1962, § 22-5(a), (b); Ord. No. O-161-2021, § 10, 12-14-21)

**Section 14-35. Protection of trees of historical or botanical importance.**

- (a) No living tree within the city designated on the State of Tennessee Champion Tree list or designated as a landmark, or historic tree by the State of Tennessee or designated organization, shall be removed or otherwise substantially altered by pruning, trimming, or otherwise cutting more than twenty (20) percent of the woody area of such tree without first obtaining a permit from the urban forester.
- (b) Permits as noted in subsection (a) of this section shall be issued only upon a satisfactory showing that the tree in question is a public safety concern or is not of such historical or botanical importance that the public interest would be served through the preservation of such trees such as invasive species or a tree in declining health.
- (c) If the urban forester fails to issue a permit as provided in this section within thirty (30) days of the application for the permit, such permit shall be considered to be denied. Any person denied such permit may appeal the denial directly to city council by filing a notice of such appeal with the city recorder within fifteen (15) days of the denial, and the appeal shall be placed upon council's agenda for consideration at the next regularly scheduled council meeting. The council shall consider the matter de novo and may uphold denial of the permit, order the permit to be issued, or order a permit under such terms and conditions as council deems appropriate considering the totality of the circumstances.

(Code 1962, § 22-5(c); Ord. No. O-161-2021, § 11, 12-14-21)

**Section 14-36. Planting of trees.**

Where trees cannot be retained pursuant to this article, or do not exist on the site, they shall be provided on the site, within twelve (12) months of construction completion, at the rate of eight (8) trees per acre, with at least one-half of the required number being species capable of attaining a height of fifty (50) feet or more at maturity. Such trees shall have a minimum trunk diameter of two (2) inches at six (6) inches above ground at planting. Trees shall be planted and spaced accordingly to meet the purpose and intent of this article.

*(Code 1962, § 22-6; Ord. No. O-161-2021, § 12, 12-14-21)*

**Section 14-37. Maintenance and replacement of trees.**

All trees retained or provided to meet the requirements of this article shall be properly preserved, planted, and mitigated to ensure their survival to meet the purpose and intent of this article. Any tree which fails to survive or dies through maturation shall be replaced by the owner within twelve (12) months of loss.

*(Code 1962, § 22-7; Ord. No. O-161-2021, § 13, 12-14-21)*

**Sections. 14-38. Tree mitigation bank.**

The tree mitigation bank is established as a more creative, alternative means to meet the spirit and intent of requirements concerning the planting and maintaining of trees and landscaping as specified in the Knoxville City Code.

- (1) *Application.* To participate in the tree mitigation bank, a written request must be approved by the city urban forester.
- (2) *Comparable trees.* Upon approval of a request to participate in the tree mitigation bank, the urban forester will determine what trees to be planted on public grounds or rights-of-way would be comparable to the trees or landscaping otherwise required on-site by the City Code. The approved participant will then pay a one-time, flat cost estimate for the planting and maintenance of such comparable trees. The urban forester will maintain a list of a variety of appropriate trees, along with costs. The flat cost estimate for planting and initial maintenance of comparable trees is three times the base price for the city to purchase the comparable tree.
- (3) *Tree mitigation bank administration.* Funds paid into the tree mitigation bank will be used for the sole purpose of planting and maintaining trees on public grounds and rights-of-way at the direction of the urban forester. As essential infrastructure, the urban forester will endeavor to ensure that trees planted pursuant to the tree mitigation bank are located in the nearby vicinity or twelve-digit hydraulic unit code (HUC) watershed of the land development with which they are associated. Upon request, the urban forester will provide an annual advisory report to the city tree board regarding the operation of the tree mitigation bank.

*(Ord. No. O-1-2021, § 1, 1-12-20)*

**Section 14-39. Tree maintenance and registry.**

All individuals or companies intending to do tree work for hire on any tree over twelve (12) inches in diameter at one (1) foot off the ground within the city, must register with the city public service department urban forester.

Each said individual or company must sign an acknowledgement that they understand this article and all other codes that pertain to tree work and the proper disposal of wood waste. It is the responsibility of the tree company to remove the wood waste from the property and properly dispose of the material. Disposal of wood material by placing it at the street/city right-of-way for collection will be considered illegal dumping/litter per article VI of the solid waste ordinance (chapter 13). Individuals or companies in violation of this registry or improperly disposing of wood waste are subject to a stop work order (SWO) and prohibited from doing any work in the city until registration is completed

and/or wood waste is removed. The company/individual responsible for failing to properly remove wood waste will be given a notice to correct violations. Failure to correct the violation within the time allotted will result in fines to the company (not the property owner) as outlined in sections 13-145, 13-146, and 13-147 of the solid waste ordinance.

*(Ord. No. O-161-2021, § 14, 12-14-21)*

**Sections. 14-38—14-50. Reserved.**

### **ARTICLE III. TREES ON PUBLIC PROPERTY**

#### **Section 14-51. Short title.**

This article may be cited as the "trees on public property" ordinance.

*(Ord. No. O-447-91, § 1, 10-29-91)*

#### **Section 14-52. Purpose and intent.**

The purpose and intent of this article is to increase public safety while encouraging the conservation, protection, and management of trees on public property within the city because of the unique benefits they provide the community in assisting the natural control of solar heat, soil conservation, flood control, air pollution, water quality, stormwater mitigation, and noise; in providing a haven for community birds and wildlife; in providing citizens with relief from aesthetic degradation of the manmade environment and in helping increase the economic appeal of a community. In furtherance of this purpose, this article also creates a city tree board and establishes an urban forester to achieve the objectives of this article.

*(Ord. No. O-447-91, § 2, 10-29-91; Ord. No. O-88-2014, § 1, 5-13-14; Ord. No. O-161-2021, § 15, 12-14-21)*

#### **Section 14-53. Definitions.**

*Ord. No. O-161-2021, § 16, adopted December 14, 2021, amended the Code by repealing former § 14-53, which pertained to definitions, and derived from Ord. No. O-447-91, adopted October 29, 1991; and Ord. No. O-88-2014, adopted May 13, 2014.*

#### **Section 14-54. Severability.**

Should any part or provision of this article be declared by a court of competent jurisdiction to be invalid, the same shall not affect the validity of the article as a whole or any part thereof other than the part held to be invalid.

*(Ord. No. O-88-2014, § 3, 5-13-14)*

- ❖ Editor's note— Ord. No. O-88-2014, § 3, adopted May 13, 2014, amended the Code by repealing former § 14-54, and adding a new § 14-54. Former § 14-54 pertained to creation and duties of the tree board, and derived from Ord. No. O-447-91, adopted October 29, 1991; and Ord. No. O-423-03, adopted November 25, 2003. Similar provisions can be found in § 14-55.

#### **Section 14-55. Creation and duties of the tree board.**

- (a) There is hereby created and established a city tree board to be known and designated as the "Knoxville Tree Board." The city tree board shall consist of eleven (11) members, seven (7) of which must be citizens and residents of the city. The four (4) remaining members may reside outside the city, but within the county. All members are to be nominated by the mayor and approved by city council. At least five (5) of the members shall be professionals, including a landscape architect, a horticulturist or forester, and an educator. One (1) member shall be a representative of Knoxville Utilities Board. The members should include broad representation from community groups, neighborhood associations, environmental groups, builders, developers, and other civic organizations. The urban forester, a representative from the city engineering

#### **Appendix B**

#### **Chapter 14 – Code of Ordinances**

department, a representative from city parks and recreation department, and a representative from the Knoxville-Knox County planning commission shall attend meetings of the board and shall render information and advice to the board members; however, they shall have no vote in the processes thereof. Persons appointed to the board shall serve a term of four (4) years or until their successors are duly nominated and approved, with three (3) terms expiring each year. Vacancies caused by death, resignation, or otherwise, shall be filled for the unexpired term in the same manner as original appointments are made. The members shall serve without pay.

- (b) The duties of the city tree board shall be as follows:
- (1) To study the problems and determine the needs of the city in connection with its urban forestry program in order to maintain Tree City USA status through the Arbor Day Foundation and to report from time to time to the governing body of the city as to desirable legislation concerning the urban forestry program and related activities for the city. The city tree board shall recommend for approval by the city council such rules and regulations as the board shall deem advisable and necessary in order to perform its duties as set forth herein.
  - (2) To assist the properly constituted officials, as well as city council and the citizens of the city, in the dissemination of news and information regarding the selection, planting, establishment, protection, and maintenance of trees within the corporate limits of the city and to make recommendations from time to time to the city council relative to desirable legislation concerning the tree program and tree related activities on city property.
  - (3) To provide regular and special meetings at which the subject of trees, insofar as it relates to the city, may be discussed by members of the tree board and, when requested by the tree board, officers and personnel of the city, and all other persons interested in the tree program. The board shall also adopt procedures as it may deem necessary for holding and conducting its regular and special meetings.

*(Ord. No. O-88-2014, § 4, 5-13-14; Ord. No. O-161-2021, § 17, 12-14-21)*

- ❖ Editor's note— Ord. No. O-88-2014, § 4, adopted May 13, 2014, amended the Code by repealing former § 14-55, and adding a new § 14-55. Former § 14-55 pertained to the appropriate species list, and derived from Ord. No. O-447-91, adopted October 29, 1991. Similar provisions can be found in § 14-57.

#### **Section 14-56. Establishment of the position of urban forester.**

- (a) An urban forester shall be employed by the governing body of the city after a competitive examination and interview given by the public service department. He or she shall be a person skilled and trained in the arts and sciences of municipal arboriculture, and shall hold a college degree in urban forestry, arboriculture, ornamental or landscape horticulture, or other closely related fields and is charged with overseeing the urban forestry division. He or she shall have had at least five (5) years' experience in municipal urban forestry work or its equivalent. He or she shall be a certified arborist through the International Society of Arboriculture prior to employment. The office of the urban forester shall be an administrative unit of the public service department. Should the office of urban forester be vacant, the authority of that office shall be transferred to the director of public service or another designated official until such time as the urban forester position is filled.
- (b) The urban forester shall receive a salary to commensurate with his or her training and experience as full compensation for all services rendered and in lieu of all fees.
- (c) The duties of the urban forester shall be as follows:
  - (1) The urban forester shall have the authority and jurisdiction of regulating the planting, maintenance, protection, and removal of public trees to ensure safety and preserve and enhance the aesthetics of city property. The urban forester shall promulgate the rules and regulations of the urban forestry program and this chapter and work with the tree board on education of proper arboriculture practices for both public and private trees. He or she shall cause the provisions of this chapter to be enforced. All city departments shall coordinate with

the urban forester on projects concerning the planting, maintenance, protection and removal of public trees.

- (2) The urban forester shall have the authority to approve or deny permits for planting, maintenance, and/or removal of public trees. It shall also be his or her duty to supervise or inspect all work done under a permit issued in accordance with the terms of this article.
- (3) The urban forester shall have the authority to formulate and amend the urban forestry management plan(s) as needed, perform and maintain a tree inventory, and create other relevant documents for the urban forestry program with the advice and assistance of the tree board.
- (4) The urban forester shall be a municipal enforcement officer, as set forth in chapter 2 of the Knoxville City Code.

*(Ord. No. O-88-2014, § 5, 5-13-14; Ord. No. O-161-2021, §§ 18, 19, 12-14-21)*

- ❖ Editor's note— Ord. No. O-88-2014, § 5, adopted May 13, 2014, amended the Code by repealing former § 14-56, and adding a new § 14-56. Former § 14-56 pertained to the spacing and location of trees on municipal property, and derived from Ord. No. O-447-91, adopted October 29, 1991. Similar provisions can be found in § 14-59.

#### **Section 14-57. Appropriate species list.**

The urban forester shall formulate a species list of trees acceptable for planting on all city property. That list shall consist of small trees under thirty (30) feet tall, medium trees thirty (30) to fifty (50) feet tall, and large trees over fifty (50) feet in height. No species other than those included in this list may be planted on city property without application to and written permission received from the urban forester. That species list shall be made available for reference and be called the "City of Knoxville Species List."

*(Ord. No. O-88-2014, § 6, 5-13-14)*

- ❖ Editor's note— Ord. No. O-88-2014, § 6, adopted May 13, 2014, amended the Code by repealing former § 14-57, and adding a new § 14-57. Former § 14-57 pertained to municipal tree care, and derived from Ord. No. O-447-91, adopted October 29, 1991. Similar provisions can be found in § 14-61.

#### **Section 14-58. Jurisdiction.**

The city shall have the right to plant, care for, maintain, remove, and replace all public trees, shrubs and other plantings as may be necessary to ensure public safety or to preserve or enhance the symmetry and beauty of such public property or within the right-of-way.

*(Ord. No. O-88-2014, § 7, 5-13-14; Ord. No. O-161-2021, § 20, 12-14-21)*

- ❖ Editor's note— Ord. No. O-88-2014, § 7, adopted May 13, 2014, amended the Code by repealing former § 14-58, and adding a new § 14-58. Former § 14-58 pertained to emergencies, and derived from Ord. No. O-447-91, adopted October 29, 1991. Similar provisions can be found in § 14-63.

#### **Section 14-59. Obstruction, spacing, and location of trees.**

- (a) It shall be the duty of any person or persons owning or occupying real property bordering on any street upon which property there may be trees, to prune or plant trees in such manner that they will not obstruct or shade street lights, will not obstruct the passage of pedestrians on sidewalks, will not obstruct vision of traffic signs, will not obstruct the use of any street or alley, will not obstruct a public sidewalk, will not interfere with utility equipment and/or facilities or their safety clearances, or otherwise endanger the public. Property owners shall remove all dead, diseased or dangerous trees, or broken or decayed limbs which constitute a menace to the safety of the public. The minimum clearance of any overhanging portion thereof should be eight (8) feet over

sidewalks, and twelve (12) feet over all streets and vehicular use areas except truck thoroughfares which shall have a minimum clearance of fourteen (14) feet.

- (b) No trees shall be planted closer than ten (10) feet to any fire equipment including water meters, fire hydrants, and post indicator valves. No tree shall be planted within thirty (30) feet of a street intersection. Public tree planting that will affect utility operations or maintenance of their safety clearances shall be approved by the affected utility owner. A treelawn should be at least four (4) feet in width to plant a medium tree, and at least five (5) feet in width to plant a large tree.
- (c) The urban forester shall determine where such restrictions may be relaxed or modified based on site-specific, physical, and biological factors.

*(Ord. No. O-88-2014, § 8, 5-13-14; Ord. No. O-161-2021, § 21, 12-14-21)*

- ❖ Editor's note— Ord. No. O-88-2014, § 8, adopted May 13, 2014, amended the Code by repealing former § 14-59, and adding a new § 14-59. Former § 14-59 pertained to exemptions, and derived from Ord. No. O-447-91, adopted October 29, 1991.

#### **Section 14-60. Topping and removal of trees.**

It shall be unlawful for any person, or city employee or contractor to remove any tree on city property without written approval by the urban forester. Topping of trees located on city property or within the right-of-way is prohibited. Trees severely damaged by storms or other causes, or certain trees causing obstructions where other pruning practices are impractical are exempted from this provision.

*(Ord. No. O-88-2014, § 9, 5-13-14)*

- ❖ Editor's note— Ord. No. O-88-2014, § 9, adopted May 13, 2014, amended the Code by repealing former § 14-60, and adding a new § 14-60. Former § 14-60 pertained to penalties, and derived from Ord. No. O-447-91, adopted October 29, 1991. Similar provisions may be found in § 14-64.

#### **Section 14-61. Municipal tree care.**

- (a) It shall be unlawful, without authorization from the urban forester or the director of the public service department, to plant, spray, fertilize, prune, top, or remove any tree on city property. Attachment of any foreign materials such as ropes, wire, nails, posters or any other contrivance to any public tree is prohibited. Requirements for species, spacing, location, and maintenance should be made available to the public at the application filing place which may include an online application process. Maintenance of trees threatening public health, safety, or welfare, structures or underground or overhead utilities may be exempted from this provision through a general permit issued by the urban forester.
- (b) Any pruning, planting, or other tree maintenance practices on a public tree shall conform to the current edition of American National Standards Institute ANSI A300 and ANSI Z133.
- (c) Mulch or soil shall not be placed within the critical root zone of a tree on city property or within the right-of-way in a manner that is harmful to a tree. Mulch and soil shall not touch the trunk of the tree. Mulch shall not be greater than three (3) inches in depth.
- (d) The critical root zone of a public tree shall not be disturbed without obtaining a written permit from the urban forester. The written permit shall state what best management practices must be in place before work within, near, or adjacent to the critical root zone commences, and what best management practices must be in place throughout the duration of the project. Disruption of roots includes the grading, removal, or grubbing of soil; any excavating or trenching of soil; the use of equipment and vehicles within the critical root zone, compaction of the root zone from vehicles or equipment, and any depositing of material such as stone, brick, sand, or concrete within the critical root zone. Upon good cause shown, the urban forester may alter or waive the foregoing requirements at their discretion. Construction, operations and maintenance in compliance with Arbor Day Foundation or ANSI standards, unless no practical alternative exists, may be approved under an annual general permit issued by the urban forester.

- (e) A person, firm, or contractor receiving a permit must abide by any standards and practices adopted by the urban forester and by other reasonable conditions imposed in the permit by the urban forester. Permits are on file at the city public service department.
- (f) Applications for permits are on file at the city public service department. The permit must be approved and signed by the urban forester not less than seventy-two (72) hours in advance of the time the work is to be done and the urban forester shall have forty-eight (48) hours to review all applications. Any permit filed will have a definite date of expiration and work shall be completed in the time allowed on the permit and in the manner as therein described. Any permit shall be void if its terms are violated.
- (g) Unless stated otherwise in the permit, notice of completion shall be given within five (5) days to the urban forester for his or her inspection. The urban forester will inspect work based on conditions imposed in the permit and this article. Inadequate or improper work completed with a permit is subject to the section 14-64, if not remediated within fourteen (14) days of notification from the urban forester.

*(Ord. No. O-88-2014, § 10, 5-13-14; Ord. No. O-161-2021, § 22, 12-14-21)*

**Section 14-62. Tree mitigation.**

- (a) As determined by the urban forester, healthy public trees removed or with more than twenty-five (25) percent of the critical root zone or tree canopy disrupted or injured during construction, development, or road expansion shall require tree mitigation. The person or firm responsible for such work shall be required to mitigate for loss of tree benefits by replacing removed, disrupted or injured trees with 2-inch caliper replacement trees. The total caliper inches of replacement trees should equal or be greater than the DBH of the tree removed, disrupted, or injured. Upon good cause shown, the urban forester may alter or waive the foregoing requirements at his/her discretion. This requirement shall not apply to construction, operations, and maintenance in compliance with Arbor Day Foundation or ANSI standards where an annual general permit has been issued by the urban forester.
- (b) All replacement trees must meet the latest version of American Standard for Nursery Stock ANSI Z60 and be planted according to the latest version of American National Standard ANSI A300 planting and transplanting best management practices. Urban forester shall be given five (5) days notice when planting is complete, and may inspect planted trees and refuse any stock or plantings that do not meet requirements. All planting shall be completed between November and March of each year. Inadequate or improper planting is subject to the "penalty" section of this article if not remediated within fourteen (14) days of notification from the urban forester.
- (c) The urban forester shall determine type of trees and locations for mitigation planting.

*(Ord. No. O-88-2014, § 11, 5-13-14)*

**Section 14-63. Emergencies.**

In case of emergency such as windstorm, ice storm, natural disaster or such other events that jeopardize public safety, the requirements of this article may be waived by the urban forester pursuant to rules and regulations issued hereunder so as not to hamper private and public work to abate the emergency conditions within the city.

*(Ord. No. O-88-2014, § 12, 5-13-14)*

**Section 14-64. Penalty.**

- (a) Any violation of this article shall be punished as set forth in section 1-9 of the Knoxville City Code. Each subsequent day that any violation continues unabated shall constitute a separate offense. In addition, any person found to be in violation of this article shall be responsible for any incurred maintenance and actual cost by the city for mitigating any violations.
- (b) In addition to other violations, any person found to be in violation of this article through the action of damaging, removing, or topping a tree either willfully or accidentally, or significantly

disturbing the critical root zone of a tree on public property beyond repair shall be responsible for the reimbursement to the city for the value of the tree described in the latest edition of the Guide for Plant Appraisal by the Council of Tree and Landscape Appraisers.  
*(Ord. No. O-88-2014, § 13, 5-13-14)*



## Chapter 22.5 STORMWATER ORDINANCE

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- Section 22.5-32. Requirements for developments draining to a sinkhole.
- Section 22.5-33. Hydrologic and hydraulic computations.
- Section 22.5-34. Covenant requirements for stormwater facilities.
- Section 22.5-35. Acceptance of streets and stormwater systems within public rights-of-way.
- Section 22.5-36. First flush requirements for stormwater basins.
- Section 22.5-37. Requirements for special pollution abatement permits.
- Section 22.5-38. Additional permits required.
- Section 22.5-39. National Pollutant Discharge Elimination System permits.
- Section 22.5-40. Riparian buffer zone.
- Sections 22.5-41-49. Reserved.

**ARTICLE III. Illicit Connections and Illegal Dumping**

- Section 22.5-50. Findings of fact.
- Section 22.5-51. Objectives.
- Section 22.5-52. Prohibitions.
- Section 22.5-53. Notification of spills and illicit discharges.
- Section 22.5-54. Requirements for monitoring.
- Sections 22.5-55-60. Reserved.

**ARTICLE IV. Property owner maintenance requirements for the stormwater system**

- Section 22.5-61. Title of article.
- Section 22.5-62. Declaration of a nuisance.
- Section 22.5-63. Prohibition.
- Section 22.5-64. Notice to correct conditions.
- Section 22.5-65. Appeals.
- Section 22.5-66. Failure to correct conditions; abatement by city; cost recovery.
- Section 22.5-67. Special conditions.
- Sections 22.5-68-70. Reserved.

**ARTICLE I. IN GENERAL**

**Sec. 22.5-1. Title of chapter.**

This chapter shall be known and may be cited as the "Stormwater and Street Ordinance of the City of Knoxville."

**Sec. 22.5-2. Purpose.**

The purpose of this chapter is to consolidate all regulations pertaining to the stormwater system and the local street system and to accomplish the following:

- (1) Improve stormwater management;
- (2) Control the discharge of pollutants to the stormwater system;
- (3) Improve public safety;
- (4) To comply with the city's National Pollution Discharge Elimination System (NPDES) permit;
- (5) Establish procedures to accomplish the above purposes.

**Sec. 22.5-3. Administration of chapter.**

The director and the engineering staff under the director's supervision shall administer the provisions of this chapter.

**Sec. 22.5-4. 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 chapter its most appropriate application.

*1-year frequency storm.* A storm event defined to be two and one-half (2.5) inches in twenty-four (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 three (3.0) inches in twenty-four (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 three and seven-tenths (3.7) inches in twenty-four (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 four and three-tenths (4.3) inches in twenty-four (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 five (5.0) inches in twenty-four (24) hours or other such magnitude the director shall establish based upon scientific and engineering information.

*50-year frequency storm.* A storm event with a two (2) percent chance of being equaled or exceeded in any given year. Defined to be five and seven-tenths (5.7) inches in twenty-four (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 six and three-tenths (6.3) inches in twenty-four (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 eight (8.0) inches in twenty-four (24) hours or other such magnitude the director shall establish based upon scientific and engineering information.

*Administrative plat.* A plat prepared and certified by a registered land surveyor licensed to practice in the State of Tennessee and approved or denied for recording by Knoxville-Knox County Planning through staff administrative procedures. A plat shall be classified as an administrative plat when no variance from the Knoxville-Knox County Subdivision Regulations, or as amended, is requested and it meets one (1) or more of the following criteria:

- (1) It divides one (1) tract into no more than two (2) lots;
- (2) It combines existing lots into no more than two (2) lots;
- (3) It adjusts the common lot line(s) between two (2) existing recorded lots;
- (4) It is for the purpose of recording an easement or other new information and no subdivision of land is involved; or
- (5) It qualifies as an exempt or corrected plat as defined by the Knoxville-Knox County Subdivision Regulations, or as amended.

*Best management practices manual (BMP manual).* A manual produced by the city containing best management practices for use on site development plans and construction projects.

*Blue-line stream.* Any stream shown on the 7.5 minute USGS quad maps.

*Board of environmental appeals.* Appointed by the mayor and confirmed by council to hear appeals filed by any person incurring a civil penalty or damage assessment imposed pursuant to section 22.5-8 of this chapter.

*Covenants by lessee for maintenance of stormwater facilities on leased property.* A legal document executed by a lessee and recorded with the county register of deeds guaranteeing proper maintenance of stormwater facilities during the term of the lessee's lease and the proper removal of the water quality facilities at the end of the term of the lessee's lease.

*Covenants by property owner for permanent maintenance of stormwater facilities.* A legal document executed by the property owner and recorded with the county register of deeds guaranteeing perpetual and proper maintenance of stormwater facilities.

*Declaration document.* A legal deed document, prepared by a surveyor licensed in the State of Tennessee, that grants or releases easements or other property rights.

*Detention.* A practice to store stormwater runoff by collection as a temporary pool of water and provide for its gradual (attenuated) release and thereby control peak discharge rates.

*Development certification.* A post-development certification performed by an appropriate design professional validating that the project was constructed per the approved design.

*Development, large residential and commercial.* Any development, commercial, office, industrial, multiple single-family lots, any nonresidential use, or any development of a single residential lot with a disturbed area of ten thousand (10,000) square feet or more.

*Development, small single-family residential.* Development of a single recorded residential lot with less than ten thousand (10,000) square feet of disturbed area.

*Development, utilities.* Physical alteration of any location for the purpose of installing utilities. This includes, but is not limited to, providing access to a site, clearing of vegetation, grading, earth moving, providing utilities, other services such as parking, altering land forms, and installing erosion prevention and sediment control systems.

*Director.* Director of the city department of engineering or an authorized representative.

*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, altering land forms, construction, demolition of a structure on the land, providing utilities, or other related work, e.g. parking facilities, stormwater systems, erosion prevention and sediment control measures, potable water systems, and wastewater systems.

*Driveway pipe.* A stormwater pipe, typically in the right-of-way of residential development, installed in a roadside ditch to allow access to a property via a driveway.

*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.

*Exempt plat.* A survey plat or map that divides property in manner that is consistent with exemption from the requirements of the Knoxville-Knox County Subdivision Regulations, or as amended, based on the provisions of TCA §§ 13-3-401 and 13-4-301, or as amended. Divisions on exempt plats may be eligible for inclusion on the ward map if reviewed and approved by the department of engineering.

*First flush.* The initial or early stages of stormwater runoff from a storm event which commonly delivers a disproportionately large amount of previously accumulated pollutants due to the rapid rate of runoff. The first flush is defined as the first one-half (½) inch of direct runoff from the contributing drainage basin.

*Floodplain.* For a given flood event, that area of land temporarily covered by water which adjoins a watercourse.

*Hot spot.* An area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. Examples might include operations producing concrete or asphalt, auto repair shops, auto supply shops, large commercial parking areas, and restaurants.

- Hydraulic.* Pertaining to, involving, moved, or operated by a fluid, especially water under pressure or under a gravity-driving force.
- Hydrologic.* Pertaining to the scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.
- Illicit discharge.* Any discharge to the stormwater system that is not composed entirely of stormwater and not specifically exempted in article III.
- Impervious area.* Impermeable surfaces, such as pavement or rooftops, which prevent the percolation of water into the soil.
- Infiltration.* A method used to promote the recharge of groundwater by containment and concentration of stormwater in porous soils.
- Infiltration basin.* An impoundment made by excavation or embankment construction to contain and infiltrate runoff into the soil layer.
- Land development manual (LDM).* Manual produced by the city that provides additional information about the specifics of this chapter.
- Large residential development.* See "development, large residential and commercial."
- Lessee.* A lessee occupying real property pursuant to a lease agreement entered into prior to February 4, 1987, which contains no contractual provisions requiring the landlord to execute property owner's covenants, whose site development plan is five (5) acres or less, and whose use of the real property will not create environmental hazards.
- Lot of record.* A lot which has been platted and recorded with the Knox County Register of Deeds.
- Main stream.* The Tennessee River, Holston River, or French Broad River.
- Mitigation.* The creation, restoration, enhancement, or preservation of a stream, riparian buffer zone, adjacent land, or other stormwater facility which offsets expected adverse impacts of development.
- 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-fill line.* A line one-half (0.5) the linear distance between the floodway line and the 100-year floodplain line.
- Parking area.* The off-street facility including parking spaces along with adequate provision for drivers and aisles for maneuvering and giving access, and for entrance and exit, designed to be usable for the parking of vehicles.
- Peak flow.* The maximum instantaneous rate of flow of water at a particular point resulting from a storm event.
- Peak flow attenuation.* The reduction of the peak discharge of stormwater from a development.

*Performance and indemnity agreement.* A contract between the property owner, lessee, or developer and the city that assures construction and compliance as per site development plans approved by the department of engineering and in the case of a lessee, assures the lessee's proper maintenance of stormwater facilities during the term of its lease, and the proper removal of water quality facilities by the lessee at the end of the term of its lease.

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

*Plat.* A map meeting requirements of the Knoxville-Knox County Subdivision Regulations, or as amended, prepared and certified by a registered land surveyor licensed to practice in the State of Tennessee, approved for recording by Knoxville-Knox County Planning, and recorded in the Knox County Register of Deeds Office.

*Regulated waters.* Any stream, wetland, or other waterbody specified by the director, where protections are imposed for adjacent land use, development, or vegetative cover.

*Restaurant.* An establishment or facility where food is prepared and sold.

*Retention.* A practice designed to store stormwater runoff by collection as a permanent pool of water without release except by means of evaporation, infiltration, or attenuated release when runoff volume exceeds storage capacity of the permanent pool.

*Riparian buffer zone.* A naturally undisturbed, vegetated, and pervious zone adjacent to regulated waters that is protected from clearing, grading, filling, paving, building, or other destruction of the naturally vegetated state.

*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.

*Sanitary sewer.* A system of underground conduits that collect and deliver wastewater to a wastewater treatment plant.

*Sinkhole.*

- (1) A naturally occurring depression where drainage collects in the earth's surface that is a minimum of two (2) feet deep. These depressions are typically denoted as closed contours and are shown as hachured contours on the city's geographic information system, or
- (2) A hole, fissure, or other opening in the ground, often underlain with limestone, dolomite, or other rock formation that provides for and is being designated as a natural conduit for the passage of stormwater.

For both (1) and (2), the extent of the area considered to be a sinkhole is at a minimum the limits determined by the water surface elevation, assuming plugged conditions (zero (0) cfs outflow).

*Site development.* To physically change land (land disturbance). Including, but not limited to, providing access to a site, clearing of vegetation, grading, filling, earth moving, providing utilities and other services such as parking facilities, stormwater management, erosion prevention and sediment control systems, potable water and wastewater systems, altering land forms, and construction or demolition of a structure on the land.

*Site plan survey.* A map prepared and certified by a registered land surveyor licensed to practice in the state of Tennessee, approved by the Department of Engineering for the purpose of recognizing property lines, building setbacks, easements, and other encumbrances, deemed applicable and associated with applications for single and two family dwellings, where a lot of record does not exist.

*Small residential development.* See "development, small single-family residential."

*Stormwater.* Runoff from rain, snow, or other forms of precipitation, resulting in surface runoff and drainage.

*Stormwater basin.* An area used for stormwater detention, retention, or infiltration.

*Stormwater facility.* A specific regulated component of the stormwater system.

*Stormwater system.* The system of roadside drainage, roadside curbs and gutters, curb inlets, swales, catch basins, manholes, gutters, ditches, pipes, lakes, sinkholes, channels, creeks, streams, storm drains, detention basins, retention basins, stormwater quality treatment devices, and similar natural or manmade conveyances and facilities located within the city, which, whether owned or operated by the city or other person, are designated or used for collecting, storing, treating, or conveying stormwater or through which stormwater is collected, stored, treated or conveyed.

*Stream.* Includes any linear surface water conveyance recognized by TDEC as waters of the state, any blue-line shown on the 7.5 min USGS quad map, or any waterbody determined to be a stream by a Tennessee qualified hydraulic professional (TN-QHP).

*Substantial investment.* The investment of fifty (50) percent or more of the market value (licensed professional appraisal) or tax appraised value of the real property and improvements where the investment totals more than \$500,000 over a rolling five-year duration.

*Swale.* A natural or manmade depression or wide shallow ditch used to route or filter runoff.

*Utilities development.* See "development, utilities."

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

*Ward map.* The official map of the city adopted under Emergency Ordinance No. 499, January 6, 1933 depicting the wards, blocks, lots (including Lots of Record), tracts, and rights-of-way within the corporate limits of the city. Eligibility for inclusion on this map is determined by the director.

*Wastes, industrial/commercial.* Liquid or other wastes resulting from any process of industry, manufacture, trade, or business or resulting 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, or motor vehicle fluids; used or discarded tires, gas tanks, or chemicals; or any other used, uncontained, unpackaged, or disposed of materials which may discharge to or otherwise enter the stormwater system.

**Sec. 22.5-5. Performance and indemnity agreement.**

In order to ensure that any site development complies with the requirements of this chapter, the director shall have the authority to require a performance and indemnity agreement, together with a letter of credit, a cashier's check, or a surety bond from an approved financial institution or insurance carrier which guarantees satisfactory completion of the project and names the city as beneficiary, and in the case of a lessee, assures the lessee's proper maintenance of stormwater facilities during the term of its lease and the proper removal of water quality facilities by the lessee at the end of the term of its lease. The security shall be provided by the property owner, lessee, or developer in a form and in an amount to be determined by the department of engineering based on submission of plans and actual construction or potential remediation expenses. In addition, a lessee shall pay the city an amount determined by the director, that in no event shall be less than \$5,000.00, to compensate the city for any perpetual maintenance that may be required after the expiration of the lessee's lease.

**Sec. 22.5-6. Right of entry.**

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 during all reasonable hours to monitor, remove foreign objects or blockages, and to inspect for compliance with the provisions of this chapter.

**Sec. 22.5-7. Notice of violation.**

Whenever the director determines that a violation of any provision of this chapter has occurred, 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 property owner, utility, facility operator, lessee, tenant, contractor, permittee, the equipment operator, any other person or entity doing work on the site, or any combination thereof. The notice of violation shall:

- (1) Be in writing;
- (2) Include a description of the property sufficient for identification of where violation has occurred;
- (3) List the violation;
- (4) State the action required; and
- (5) Provide a deadline for compliance or to stop work.

**Sec. 22.5-8. Penalties (articles I, II, and III).**

- (a) Any person violating the provisions of this chapter may be assessed a civil penalty by the city of not less than fifty dollars (\$50.00) or more than five thousand dollars (\$5,000.00) per violation, per site, per day for each day of violation. A person may be deemed guilty of a separate violation for each day during any continuing violation of any provision of this chapter, of any regulation, or of any permit issued hereunder. All penalties collected under the provisions of this section shall inure exclusively to the use and benefit of the department of engineering for remediation projects and educational endeavors associated with stormwater activities.

- (b) In assessing a civil penalty, the city considers the following:
  - (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 city;
  - (6) The amount of penalty established by ordinance or resolution for specific categories of violations;
  - (7) Any equities of the situation that outweigh the benefit of imposing any penalty or damage assessment;
  - (8) Willingness and cooperation of the violator to remedy this violation and remediate any damage;
  - (9) Whether the violation was intentional, negligent, or accidental;
  - (10) Costs incurred by the city for any administrative or remediation costs, including the investigative and monitoring activities. This is often computed in terms of number of man-hours necessary to deal with the problem; and
  - (11) Prior violations for this violator or at this location.
- (c) In addition to the civil penalty, the city may recover all damages proximately caused by the violator to the city, which may include any expenses and attorney's fees incurred in investigating, enforcing, and correcting violations of this chapter.
- (d) An expedited order for partial civil penalty assessment may be issued at the time of violation. The amount of the expedited order shall be set by ordinance for specific categories of violations as mentioned in section 22.5-8(b)(6).
- (e) The director has the authority to allow a reduction in civil penalty assessments for penalties paid within thirty (30) days of issuance. Reductions shall not be considered for violations that have been repeated within twelve (12) months of the subject violation.
- (f) The city may bring legal action to enjoin the continuing violation of this chapter, and the existence of any other remedy, at law or in equity, shall be no defense to any such actions.
- (g) The remedies set forth in this section shall be cumulative, not exclusive, and it shall not be a defense to any action, civil or criminal, that one (1) or more of the remedies set forth herein has been sought or granted.

**Sec. 22.5-9. Board of environmental appeals (articles I, II, and III).**

- (a) There is created a board of environmental appeals (BEA) to hear appeals filed by any person incurring a civil penalty or damage assessment imposed pursuant to this chapter.
- (b) The BEA may issue subpoenas requiring attendance of witnesses and production of evidence, administer oaths, and take testimony as the BEA deems necessary to fulfill its purpose.

- (c) The BEA shall be composed of five (5) members appointed by the mayor and confirmed by council.
  - (1) The mayor shall select appointees so that the BEA will consist of individuals with an expertise as follows:
    - a. One (1) registered professional engineer licensed to practice in the state of Tennessee with at least three (3) years of engineering experience as a professional engineer;
    - b. One (1) registered architect, engineer, landscape architect, or surveyor licensed to practice in the State of Tennessee with at least three (3) years of experience;
    - c. One (1) representative of the development or industrial community;
    - d. One (1) neighborhood representative; and
    - e. One (1) member at large.
  - (2) In addition to qualifications a. through e. of section 22.5-9.c.1., one (1) of the five (5) members must have at least three (3) years civil engineering experience, and a second member must have at least three (3) years civil or environmental engineering experience.
  - (3) BEA members shall serve for a term of five (5) years. A BEA member shall continue to serve, however, until a successor has been appointed or until the BEA member has been reappointed, as the case may be. The terms of the original BEA members shall be staggered so that the term of one (1) member shall expire each year.
  - (4) An appointment to succeed a BEA member who is unable to serve said member's full term shall be for the remainder of said member's term.
  - (5) BEA members may be reappointed, but they do not succeed themselves automatically.
  - (6) BEA members shall serve without compensation.
- (d) The BEA shall annually select one (1) of its members to serve as chair and another member to serve as vice-chair of the BEA by a majority vote of all members.
- (e) The BEA shall keep complete and accurate records of the proceedings of all their meetings. The department of engineering shall designate a person to serve as secretary to the BEA.
- (f) No BEA member shall participate in the appeal of any matter in which the member has a direct personal or financial interest.
- (g) Three (3) members of the BEA shall constitute a quorum, and the concurrence of a majority of the BEA present and voting in any matter shall be required for a determination of any matter within its jurisdiction.

**Sec. 22.5-10. Appeals (articles I, II, and III).**

Any person aggrieved by the imposition of a civil penalty or damage assessment as provided by this chapter may appeal said civil penalty or damage assessment to the board of environmental appeals (BEA).

- (1) The appeal shall be in writing and filed with the law department within thirty (30) days after the civil penalty or damage assessment is served in any manner authorized by law.

- (2) Upon receipt of an appeal, the BEA shall hold a public hearing within sixty (60) days or a later date mutually agreed upon by the parties, not to exceed one hundred eighty (180) days. After the one hundred eighty (180) days, if a mutually agreed upon date has not been determined, then the appeal will be heard at the next available public hearing where there is a quorum. Ten (10) days' prior notice of the time, date, and location of said hearing shall be published in a daily paper of general circulation. Ten (10) days' notice shall be provided to the aggrieved party at the address provided at the time of appeal.
- (3) Any alleged violator may appeal a decision of the BEA pursuant to the provisions of T.C.A. title 27, chapter 8.
- (4) If a petition for review of such civil penalty or damage assessment is not filed within thirty (30) days after the civil penalty or damage assessment is served in any manner authorized by law, the violator shall be deemed to have consented to the civil penalty or damage assessment, and it shall become final and is due immediately.

**Sec. 22.5-11. Severability.**

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

**Secs. 22.5-12-17. Reserved.**

**ARTICLE II. STORMWATER REQUIREMENTS**

**Sec. 22.5-18. Purpose.**

This article is adopted to improve public safety, to control the rate of flow of stormwater, to minimize increases in the peak flow rates of stormwater runoff caused by site development within the city, to control new site development, and to minimize any detrimental effect on water quality during construction or by the completed facility.

**Sec. 22.5-19. Declaration document (deed document).**

- (a) A declaration document may be used to grant certain easements, on property that is recognized as a lot of record, including but not limited to stormwater facilities, access, and sidewalks.
- (b) A declaration document facilitates the process whereby (1) a property owner grants easements, (2) a lessee grants easements running through the term of its lease, and (3) a property owner or lessee relocates or abandons previous easements, when the city is the easement holder, due to changes in the site development or certification.
- (c) The declaration document process is completed by recording an approved written legal document, in which the easements are declared, described, and shown on an attached survey map exhibit. All exhibits shall be prepared on letter or legal-sized paper, certified by a licensed land surveyor, and recorded in the county register of deeds office. At the discretion of the law director, the written document may be a form document provided by the law department or may be a document prepared by the property owner's or lessee's attorney and approved by the law department. Survey map exhibits shall be approved by the department of engineering.

- (d) A declaration document may not be used when the director determines, in unforeseen or unusual circumstances, that this process shall not be an option.

**Sec. 22.5-20. Plat/easement requirements for the issuance of a building permit.**

- (a) No building permit shall be issued unless the property shown on the approved site development plan is a lot of record, except as provided in section 22.5-20(c) or 22.5-20(e).
- (b) No certificate of occupancy shall be issued until the required easements for the stormwater facilities and access to the stormwater facilities, identified on the approved site development plan, are dedicated as permanent easements. Easement dedications can be done by declaration document per section 22.5-19 or on a recorded subdivision plat.
- (c) In limited situations, extenuating circumstances may exist that prevent the timely recording of a declaration document or a plat. After evaluating these circumstances, the department of engineering may approve a building permit based on the approval of a promissory letter from the owner, developer, or surveyor stating their commitment to record the declaration document or plat within a forty-five-day grace period. A fee will be required prior to the approval of the promissory letter. One (1) fifteen-day extension may be granted for an additional fee. The terms for the promissory letter and extension shall be at the director's discretion. The department of engineering is in no way obligated to accept promissory letters or extensions. On the expiration of the promissory letter or extension, the department of engineering may issue a stop work order to suspend all work on the property until the final declaration document or plat is recorded.
- (d) Before a promissory letter is approved, the following minimum requirements must be considered:
  - (1) A site development plan must be approvable by the department of engineering;
  - (2) A final plat must be submitted to the Knoxville-Knox County Planning or a declaration document submitted to the department of engineering for recording;
  - (3) The department of engineering must have reviewed the plan and either a declaration document or plat;
  - (4) The plan and the declaration document or plat must be consistent; and
  - (5) The property as platted must not be subject to any unapproved variances.
- (e) For an addition, an alteration or the construction of a new single family or two family dwelling, including accessory structures where allowed, where a lot of record does not exist by way of a recorded plat, but the property configuration was created (including parcel consolidation) by deed prior to July 8, 1971 (date of original adoption of subdivision regulations), and has remained intact with the same boundary configuration since the recorded date, then the Director of Engineering, or designated staff, may waive the requirement for the property to be a lot of record and therefore may approve the building permit. In these situations, where a waiver is not an option, then a building permit may be issued subject to the review and approval of a Site Plan Survey.

**Sec. 22.5-21. General design criteria.**

- (a) The director has the authority to adopt site development design criteria.
- (b) The standard method of drainage computation shall be as set forth in section 22.5-33.

- (c) The stormwater system, excluding stormwater basins, water quality control facilities, systems required to carry stormwater to stormwater basins or water quality control facilities, and sinkholes, shall be designed to accommodate a ten-year frequency storm. For facilities which would flood public roads, a twenty-five-year frequency storm shall be used in the design to prevent flooding of local roads and collectors, and a fifty-year frequency storm shall be used in the design to prevent flooding of arterial streets. A one hundred-year frequency storm shall be used in the design to prevent flooding of all new structures and ensure no additional adverse impact on existing structures. For site development located within the limits of the flood insurance study, the flood damage prevention and control ordinance O-347-90 (chapter 12 of the Knoxville City Code) shall also apply. All stormwater systems shall be designed to have no additional adverse impact on upstream or adjacent property in the fifty-year frequency storm, unless an adequate permanent drainage easement is obtained.
- (d) For drainage generated by areas greater than two hundred (200) acres, the flow for a one hundred-year frequency storm shall be computed. Such flow may exceed the capacity of facilities designed to comply with the requirements of lesser floods as noted in subsection 22.5-21(c) and shall be contained in the public right-of-way or a permanent drainage easement on the property being improved or developed.
- (e) Material for pipes used for conveyance of stormwater within the city shall be in accordance with the following:
  - (1) Stormwater pipes installed under city streets, private rights-of-way, joint permanent easements (JPEs), or within the roadway prism of city streets and JPEs shall be reinforced concrete pipe (RCP).
  - (2) Driveway pipes shall be RCP. However, high-density polyethylene pipe (HDPE), corrugated dual-walled polyvinyl chloride pipe (DWPVC), dual-walled polypropylene pipe (PPP), or corrugated metal pipe (CMP) may be used for single family and duplex development where:
    - a. A pipe only conveys water under non-heavily traveled driveways;
    - b. A pipe is located outside of the roadway prism; and
    - c. The installation would not cause flooding of adjacent properties or rights-of-way in the event of pipe failure.
  - (3) RCP is required for all stormwater systems located within new residential developments (includes residential condominium developments).
  - (4) RCP, HDPE, DWPVC, and PPP may be used to convey stormwater generated on the particular property (on-site drainage), i.e. parking lots, buildings, etc.
  - (5) Any pipe, culvert, or drainage system dedicated to the city, or installed with the intent of dedication to the city, whether inside or outside the right-of-way, shall be constructed of RCP.
  - (6) RCP is required for all stormwater pipes and culverts that carry water generated on adjacent properties or areas (off-site water). In the case of common non-residential developments, alternate pipe materials listed in 22.5-21(e)(4) may be used.
  - (7) RCP is required if the failure of the pipe would cause flooding or potential property damage on adjacent properties.

- (8) RCP is required for all stormwater basin outlet structures and for all stormwater outlet pipes that drain through the berm of a stormwater basin continuing to its terminus or the connection to a downstream system. Underground detention facilities that do not have a berm associated with their construction may use HDPE for the pipe material downstream of the outlet structure provided that in the event of a failure of the pipe, no offsite properties will be adversely affected.
  - (9) Ductile iron (DI) is an acceptable alternative pipe material for RCP.
  - (10) For all pipe installations, the pipe shall be designed for the proposed loading conditions.
  - (11) The director may approve the use of alternative pipe materials in overlapping rights of way or easements when necessary to accommodate special conditions presented by railroads, pipelines, utilities, unique facilities, or other sensitive areas.
- (f) Construction fill that alters the conveyance or storage capacity of the regulated floodplain is prohibited in the flood fringe in an area bounded by the floodway line and the no-fill line. This requirement may be waived if a development occurs on a lake/river regulated by Tennessee Valley Authority (TVA) and where a TVA flowage easement exists or if a drainage study prepared by a registered professional engineer licensed to practice in the State of Tennessee shows a rise of less than one-tenth (0.1) foot on existing properties within one-half (0.5) mile (upstream or downstream) of the proposed development using a method widely accepted among engineering professionals.
- (g) When existing or documented flooding problems are present, the director has authority to condition the approval of a 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 public right-of-way, other properties, or on the subject development.

**Sec. 22.5-22. Site development design manuals.**

The department of engineering is authorized to adopt additional policies, criteria, specifications, and standards for the proper implementation of the requirements of this chapter in a land development manual (LDM) and a best management practices manual (BMP manual). The policy, criteria, and requirements of the LDM and the BMP manual, both as amended by the city's department of engineering, shall be enforceable consistent with other provisions of this chapter.

The department of engineering is specifically authorized to adopt and update the city qualified local program construction general permit policy.

**Sec. 22.5-23. Stormwater basins.**

- (a) The requirement for stormwater basins shall apply to the following:
- (1) All road construction exceeding one-half (½) acre of impervious area;
  - (2) All developments of one acre or more of disturbed area;
  - (3) Developments of five (5) lots or more;
  - (4) Any site development which contains one-half (½) acre or more of additional impervious area since June 1997.
  - (5) Any areas of substantial investment which contains one-half (½) acre or more impervious area.

- (b) For areas of substantial investment, if the downstream system (routed through the second existing street or alley crossing, a blue-line stream, interstate right-of-way, railroad right-of-way, Tennessee Department of Transportation roadway project, City of Knoxville roadway or drainage project, or existing stormwater basin, whichever is closest) is examined and found to be adequate to carry the two-year and ten-year frequency storms, the requirement for detention for areas of substantial investment may be waived. However, if the examination finds inadequate conveyance for the two-year and ten-year frequency storms, the director has authority to condition the approval of a permit upon 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 the public right-of-way, other properties, or on the subject development. The engineer is charged with determining the predeveloped (before any site development had occurred) conditions, including the curve number. If the engineer cannot determine the predeveloped conditions, then a maximum predeveloped curve number of seventy (70) may be used to compute the predeveloped flow and satisfy the requirement. In areas of substantial investment, detention or retention is required for the entire developed site, not just the portion of the site being redeveloped.
- (c) If in the developer's judgment, stormwater detention is unwarranted or impractical, hydrologic and hydraulic computations to support such a conclusion and to demonstrate that stormwater runoff peak rates shall not be increased for storm events identified in the design standards for detention basins in this chapter shall be furnished to the department of engineering for review.
- (d) Where the development's stormwater discharges directly into a main stream, detention for peak flow attenuations is not required unless deemed necessary by the department of engineering.
- (e) Exclusions from detention do not exempt the developer from providing water quality requirements.
- (f) When existing or documented flooding problems are present, the director has authority to condition the approval of a 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 the public right-of-way, other properties, or on the subject development.
- (g) Stormwater basins located in residential subdivisions must be located on two (2) or more buildable lots or in a common area with a legally established property owners' organization with responsibility for maintenance and repair of the stormwater basin.
- (h) Stormwater basins located in non-residential subdivisions must be located on one (1) or more buildable lots or in a common area with a legally established property owners' organization with responsibility for maintenance and repair of the stormwater basin.

**Sec. 22.5-24. Erosion prevention and sediment control.**

- (a) In order to protect, maintain, and enhance the immediate and long-term health, safety, and general welfare of the citizens of the city, this article has the following objectives:
  - (1) Prevent erosion and sedimentation to limit deposition in streams and other water bodies; and
  - (2) Facilitate the removal of pollutants in stormwater runoff to perpetuate the natural functions of streams.

- (b) To comply with state, federal, and local regulations, erosion prevention and sediment control shall be regulated by this article because of the following water quality impacts:
  - (1) Stormwater runoff can carry pollutants into receiving water bodies, thereby degrading water quality;
  - (2) The increase in nutrients in stormwater runoff such as phosphorus and nitrogen accelerates eutrophication of receiving waters;
  - (3) Construction requiring land clearing and the alteration of natural topography tend to increase erosion;
  - (4) Siltation of water bodies resulting from increased erosion decreases their capacity to hold and transport water, interferes with navigation, harms flora and fauna, destroys habitat, and reduces populations of aquatic species; or
  - (5) Substantial economic losses can result from these adverse impacts on community waters.
- (c) When site development occurs, the following actions are required:
  - (1) Install, inspect, repair, and maintain all erosion prevention and sediment controls for any site development;
  - (2) Install, inspect, repair, and maintain all erosion prevention and sediment controls per the requirements of the approved permits and plans.

**Sec. 22.5-25. Reserved.**

**Sec. 22.5-26. Site development permit.**

- (a) A site development permit from the department of engineering is required to:
  - (1) Grade, dump, alter natural or existing topography, move or place fill material, excavate, remove any vegetation not exempted by the tree protection ordinance, or begin any land disturbance activities;
  - (2) Alter any natural or manmade drainage system so as to divert, constrict, increase, or change in any manner the natural or existing flow of any stream, natural drainage, or existing drainage of any area;
  - (3) Commence site development or construction of any building or structure; or
  - (4) Clear any site by means that causes disturbance of soil.
- (b) No person shall:
  - (1) Perform site development equal to or greater than one (1) acre without first obtaining a city qualified local program construction general permit; or
  - (2) Perform site development work beyond the scope of the approved site development plan.

**Sec. 22.5-27. Site development plan.**

- (a) A site development plan shall be required for any site development except when:
  - (1) The developed area is used for gardening or agricultural purposes;
  - (2) The proposed work does not, in the opinion of the department of engineering, affect the drainage on the site or the quality of stormwater runoff from the site.
- (b) A site development plan shall contain the following:
  - (1) The name, address, and telephone number of all persons having a legal interest in the property;
  - (2) The tax map number, group, and parcel number of the property or properties affected; and
  - (3) Information that complies with the requirements of the tree protection ordinance.
- (c) A registered professional engineer licensed to practice in the state must prepare and stamp portions of the site development plan that require hydraulic or hydrology calculations and design, as well as, all roads, private rights-of-way, and joint permanent easements that are required to be designed and built to public road standards.
- (d) Additional information is required for site development plans based on the type of development.
  - (1) Small single-family residential development.
    - a. A topographic map showing and identifying:
      - 1. The proposed area of land disturbance;
      - 2. The layout of the structure(s);
      - 3. Location of all depressed areas;
      - 4. Blue-line streams and any related lines, e.g. no fill line, riparian buffer zone, floodway, 500-year floodplain, 100-year floodplain, and F-1 zone;
      - 5. Any proposed or existing easements, e.g. stormwater facility easements, access easements, drainage easements, and TVA easements;
      - 6. All existing and proposed components of the stormwater system; and
      - 7. Erosion prevention and sediment control measures.
    - b. Other information as required by the director.
  - (2) Large residential and commercial development.
    - a. Plans showing and identifying:
      - 1. Existing and proposed two-foot contours;
      - 2. Parking lot;
      - 3. Drainage facilities;
      - 4. Cut and fill slopes;
      - 5. All stormwater pipe size, material, slope, and location;
      - 6. Location of all depressed areas;

7. Blue-line streams and any related lines, e.g. no fill line, riparian buffer zone, floodway, 500-year floodplain, 100-year floodplain, and F-1 zone;
  8. Any proposed or existing easements, e.g. stormwater facility easements, access easements, drainage easements, and TVA easements;
  9. Erosion prevention and sediment control measures;
  10. Stormwater basin data, e.g. size, location, slope of bottom, outlet, invert, top elevations, spillway size, and elevation;
  11. Catch basin locations and elevations, e.g. top of casting, sump, and invert;
  12. Swales, ditches, and their stabilization treatment;
  13. Building pad contours and building pad elevations; and
  14. Dumpster pad elevations and location.
- b. When the site development plan includes a street to be dedicated to the city, a complete set of roadway plans must be submitted including:
1. Profiles, grades, and K-values;
  2. Horizontal curvature;
  3. Cross sections showing cross slope, limits of construction, clear zones, utility strips, and sidewalks (greenway/pedestrian facilities);
  4. Signage plan;
  5. Street-lighting fixture types; and
  6. Any above-ground fixed objects in the right-of-way.
- c. Large residential and commercial development plans that are submitted to the department of engineering and that do not include the following items will be rejected and will not be reviewed further until submission standards are met:
1. A stamp and signature from appropriate design professional;
  2. Plans, sheets and supplemental material such as calculations that are legible (for scanning and reproducing);
  3. Constructible designs;
  4. All required hydraulic and hydrologic calculations with assumptions;
  5. Pre- and post- developed contours;
  6. An erosion prevention and sediment control plan;
  7. Required retaining wall calculations;
  8. The owner's and, if applicable, lessee's name, address, and phone number;
  9. A vicinity map;
  10. The city block number;
  11. The parcel ID; and

12. A certified address from Knoxville-Knox County Planning.
- (3) Utilities development.
- a. Utilities development requires plans showing the following:
    1. The names and addresses of all property owners;
    2. The name, address, and contact person of the utility;
    3. The name, address, and contact person of the engineering firm;
    4. A vicinity map;
    5. A graphical scale;
    6. The stamp and signature of a registered professional engineer licensed to practice in the state;
    7. Total project length in feet;
    8. All property lines;
    9. Existing easements;
    10. Pre- and post- development contours;
    11. All water features;
    12. All topographic features such as sinkholes;
    13. Appropriate delineations, e.g. no-fill line, riparian buffer zone, floodway, and F-1 zone;
    14. Appropriate construction details; and
    15. An effective erosion prevention and sediment control plan with details adequate for installation and inspection that complies with the TDEC "Erosion and Sediment Control Handbook," Fourth Edition dated August 2012, or the city's BMP manual, current as of the date of the submission of the plans.
  - b. The site development permit requirements for any utility entity currently subject to a court order or decree shall be determined by the department of engineering.
- (e) When existing or documented flooding problems are present, the director has authority to condition the approval of a 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 the public right-of-way, other properties, or on the subject development.

- (f) An erosion prevention and sediment control plan must be provided as follows:
  - (1) Small single-family residential development—Requires no erosion prevention and sediment control plan except if the residential development, exclusive of agricultural, gardening, farming, and similar areas of activity, results in disturbance of more than ten thousand (10,000) square feet or as deemed necessary by the director. When a plan is deemed necessary, the erosion prevention and sediment controls must comply with the TDEC Erosion and Sediment Control Handbook, Fourth Edition, dated August 2012, or the city's BMP manual, current as of the date of the submission of the plans.
  - (2) Large residential and commercial development—Requires an erosion prevention and sediment control plan that is stamped by a registered professional engineer, architect, or landscape architect licensed to practice in the state of Tennessee and complies with the TDEC Erosion and Sediment Control Handbook, Fourth Edition, dated August 2012, or the city's BMP manual, current as of the date of the submission of the plans.
  - (3) Portions of the erosion prevention and sediment control plan that require hydrology or hydraulic calculations and design shall be prepared and stamped by a registered professional engineer licensed to practice in the state.
- (g) When the department of engineering has determined the site development plan is approvable, it will send written notification authorizing the installation of the erosion prevention and sediment control measures. When the erosion prevention and sediment control plan has been implemented on site, the appropriate design professional required to stamp the erosion prevention and sediment control portion of the site development permit will provide written notification to the department of engineering stating that they have inspected the site and the erosion prevention and sediment controls have been implemented as shown on the approved erosion prevention and sediment control plan. This written notification must be signed and sealed by the appropriate design professional.
- (h) Stormwater facilities documentation.
  - (1) An easement is required for proposed stormwater facilities. The easements can be dedicated by declaration document, by plat or other means approved by the director. The declaration document or plat shall locate, establish, and define an easement around each facility. The covenants shall be referenced on the declaration document or plat.
  - (2) In order to provide access to stormwater facilities for personnel, vehicles, and equipment, the property owner or lessee will provide traversable access from a public street to the stormwater facility. Access rights may be granted by declaration document, by plat or other means approved by the director in accordance with the plan and any conditions required by the department of engineering.
  - (3) A stormwater facility required to comply with an SPAP may not require an easement. Maintenance of SPAP facilities is required as outlined in the SPAP application.

- (i) Before any residential lot(s) in a platted subdivision may be transferred, the engineer of record must sign and seal a letter stating that all supporting stormwater and street infrastructure and grading has been completed for the subject lot(s), or the development certification may be submitted to and approved by the department of engineering. Failure to comply with this requirement may result in any combination the following:
  - (1) Revocation of the surety bond, cashier's check, or letter of credit thereby revoking the ability to obtain permits;
  - (2) Cancellation of permits on properties; and
  - (3) Implementation of all available legal remedies.
- (j) A surety bond, cashier's check, or letter of credit must be provided as follows:
  - (1) A performance and indemnity agreement is required prior to the issuance of a site development permit for rough grading or site development when there is a potential for runoff to adversely impact public rights-of-way or other property, when sites drain into sinkholes, or when the site is used for a borrow pit. The performance and indemnity agreement shall be guaranteed in the form of a cashier's check, a letter of credit, or a surety bond.
  - (2) A performance and indemnity agreement is required for large residential development when there is a potential for runoff to adversely impact public rights-of-way or other property, when sites drain into sinkholes, when the site is used for a borrow pit, a stormwater basin is required, or there is construction of a joint permanent easement, private right-of-way, or public road. The performance and indemnity agreement shall be guaranteed in the form of a cashier's check, a letter of credit, or a surety bond. The actual amount is based on a remediation and completion estimate as determined by the department of engineering, with a minimum amount of fifty thousand dollars (\$50,000.00).
  - (3) A performance and indemnity agreement is required for commercial development when there is a potential for runoff to adversely impact public rights-of-way or other property, when sites drain into sinkholes, when the site is used for a borrow pit, a stormwater basin is required, or there is construction of a joint permanent easement, private right-of-way, or public road. The amount is based on the project cost estimate that includes roadway facilities, drainage facilities, and erosion prevention and sediment control remediation. The performance and indemnity agreement shall be guaranteed in the form of a cashier's check, a letter of credit, or a surety bond. The actual amount is based on a remediation and completion estimate as determined by the department of engineering, with a minimum amount of ten thousand dollars (\$10,000.00).
  - (4) A surety bond, cashier's check, or letter of credit is not required for small single-family residential development except when deemed necessary by the director based on site conditions and the adverse impact on downstream conditions or other properties.
  - (5) The director may refuse brokers or financial institutions the right to provide a surety bond, cashier's check, or letter of credit based on past performance, ratings of the financial institution, or other appropriate sources of reference information.

- (k) Prior to the release or reduction of a bond, a development certification must be completed.
  - (1) The development certification shall show that the as-built field conditions have been field verified and comply with the approved plans.
  - (2) The development certification must be stamped by the appropriate design professional required to stamp the original site development permit as stated in subsection 22.5-27(c). A registered land surveyor licensed to practice in the state of Tennessee must also stamp certifications that include a survey drawing.

**Sec. 22.5-28. Temporary emergency exemption.**

In extreme circumstances, when a delay in construction may cause significant property damage or loss of life, the director may grant a temporary exemption from a site development permit. Specific instances may include a sinkhole opening up which threatens homes or personal safety or a failure of a storm system where the flooding could cause property damage or loss of life. This exemption is limited to work specific to resolving the dangerous situation(s). Any approval for work granted under this emergency exemption must be issued in writing and approved by the director. After the emergency has been resolved, a site development permit must be obtained for the emergency work and any additional proposed work. This should be accomplished through the standard review process. This temporary emergency exemption does not provide immunity from any of the design criteria of this chapter.

**Sec. 22.5-29. Fees.**

- (a) When a site development plan review is required, the following fee schedule applies and will be required upon the submittal of the plans.
  - (1) Site development plans review fees (based on disturbed area):

Small single-family residential	\$ 0.00
Less than one (1) acre:	\$ 150.00
One (1) acre to five (5) acres, plus twenty dollars (\$20.00) per acre:	\$ 150.00
More than five (5) acres, plus ten dollars (\$10.00) per acre:	\$ 250.00

The plans review fee for site development plans includes the initial submittal and two (2) resubmittals. Beginning with the fourth submittal, an additional plans review fee of one hundred dollars (\$100.00) is due for each resubmittal.
- (b) When a site development permit is required, the following fee schedule applies and will be required before the issuance of the permit.
  - (1) Site development permits without a bond:
    - a. Small single-family residential: \$ 10.00
    - b. All other projects: \$ 50.00
  - (2) Site development permits with a bond (based on disturbed area):
    - a. Less than one (1) acre: \$ 375.00
    - b. One (1) acre or more, plus fifteen dollars (\$15.00) per acre: \$ 375.00

- (3) Site development permits for utilities (except for utility entities currently subject to a court order or decree, the fees for which shall be determined by the department of engineering):
  - a. Maintenance: fifteen dollars (\$15.00) per twenty (20) square yards plus fifty cents (\$0.50) per each additional square yard.
  - b. Construction: one dollar (\$1.00) per linear foot of conduit (e.g., pipe, cable, wire, fiber optics) with a two hundred dollar (\$200.00) minimum.
- (c) The fee for a site development permit issued after site development has begun without a permit shall be ten (10) times the standard fee.
- (d) A site development permit is valid for one (1) year. A permit may be renewed before it expires at no additional cost. Once a permit expires, the appropriate permitting fee shall be charged for the renewal.
- (e) If separate permits for any combination of grading, erosion prevention and sediment control, and/or drainage are requested, the appropriate permitting and review fee will be charged for each permit.
- (f) The cost to review each special pollution abatement permit (SPAP) application shall be two hundred dollars (\$200.00). Reapplication prior to the expiration date of the permit may be eligible for a fifty (50) percent review fee reduction.
- (g) When a final plat review is required, the following fee schedule applies and will be required before approval:
  - (1) Administrative plat: \$ 80.00
  - (2) Exempt subdivision and corrected plats: \$ 70.00
  - (3) All other plats:
    - a. One (1) to fifty (50) lots, plus ten dollars (\$10.00) per lot: \$ 100.00
    - b. Fifty-one (51) or more lots, plus six dollars (\$6.00) per lot (lots over fifty): \$ 600.00
    - c. Declaration document: \$ 150.00
- (h) Mathematical closure checks of property and easement boundaries are performed for all subdivision plat submittals, Exempt plats requiring inclusion on the ward map, and declaration documents that are submitted for review within the city. A one hundred dollar (\$100.00) fee will be assessed on the third submittal and all subsequent submittals, thereafter, for which a misclosure is noted.
- (i) The fee for the approval of a promissory letter committing to record a plat or declaration document within forty-five (45) days shall be five hundred dollars (\$500.00). A fifteen-day extension of this time frame to record a plat shall be an additional two-hundred dollar (\$200.00) fee.
- (j) A fee of five hundred dollars (\$500.00) will be required prior to the acceptance of the promissory letter committing to execute the covenants within a forty-five-day grace period. A fee of two hundred dollars (\$200.00) will be required for the consideration of a fifteen-day extension.

- (k) Whenever a construction general permit is required, the following fee schedules apply:
- (1) The following fees shall be charged for general construction application and will be required before the issuance of the permit:
    - a. Equal to or greater than one (1) acre but less than five (5) acres, two hundred fifty dollars (\$250.00).
    - b. Equal to or greater than five (5) acres but less than twenty (20) acres, one thousand dollars (\$1,000.00).
    - c. Equal to or greater than twenty (20) acres but less than fifty (50) acres, three thousand dollars (\$3,000.00).
    - d. Equal to or greater than fifty (50) acres but less than one hundred fifty (150) acres, six thousand dollars (\$6,000.00).
    - e. Equal to or greater than one hundred fifty (150) acres, ten thousand dollars (\$10,000.00).
  - (2) For all construction general permits issued on or after January 1, 2018, the following permit maintenance fees shall be charged on an annual basis for all construction activities that exceed one (1) year under general permit coverage and shall be collected prior to the renewal of the site development permit
    - a. Fee schedule:
      1. Equal to or greater than one (1) acre but less than five (5) acres, one hundred twenty-five dollars (\$125.00).
      2. Equal to or greater than five (5) acres but less than twenty (20) acres, five hundred dollars (\$500.00).
      3. Equal to or greater than twenty (20) acres but less than fifty (50) acres, one thousand dollars (\$1,000.00).
      4. Equal to or greater than fifty (50) acres but less than one hundred fifty (150) acres, two thousand dollars (\$2,000.00).
      5. Equal to or greater than one hundred fifty (150) acres, three thousand seven hundred fifty dollars (\$3,750.00).
    - b. If the permit maintenance fees are not paid on an annual basis, as required, they may be collected, in full, prior to the approval of the development certification or collected from the bond prior to its release.
- (l) All fees and charges collected under the provisions of this section shall inure exclusively to the use and benefit of the Department of Engineering for operations associated with stormwater related activities. The excess of revenues less operating costs may be transferred to the general fund for general operations.

**Sec. 22.5-30. Reserved.**

**Sec. 22.5-31. Design standards for detention and/or retention basins.**

- (a) The calculated peak flow rate of stormwater runoff resulting from a one-year, two-year, five-year, ten-year, twenty-five-year, and one hundred-year frequency storm shall be no greater after site development of the site than that which would result from a one-year, two-year, five-year, ten-year, twenty-five-year, and one hundred-year frequency storm on the same site prior to site development.
- (b) Adequate attention must be given to safety and sanitation in the design of any detention or retention facility. This includes, but is not limited to, a minimum of two (2) percent slope in the bottom of all stormwater basins, a 3:1 (H:V) or flatter side slope used for traversable access to the basin's bottom for maintenance, proposed contours should reflect fifteen (15) percent additional area for each two-foot contour of the stormwater basin based on the appropriately sized basin for the one-year, two-year, five-year, ten-year, twenty-five-year, and one hundred-year frequency storms, a minimum of four thousand five hundred (4,500) cubic feet of storage volume, and a minimum of one (1) foot of freeboard from the highest water surface elevation for the largest required design storm to the top of the berm before the fifteen (15) percent additional volume is added. An exception can be made to the minimum slope requirement in the bottom of the basin if the first flush requirement is not managed in the quantity detention basin and the basin invert is finished in concrete.
- (c) When stormwater pretreatment is utilized to treat the first flush prior to discharging water into a stormwater basin, the basin is not required to have fifteen (15) percent additional volume as required by section 22.5-31(b).
- (d) The plans shall include sufficient design information to show that the facility will operate as required. This design shall include the predevelopment and postdevelopment peak flow discharges, 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. The capacity of the facility shall be sufficient to control the volume of stormwater runoff resulting from one-year, two-year, five-year, ten-year, twenty-five-year, and one hundred-year frequency storms within the peak flow requirements stated in this subsection.
- (e) Discharge from the stormwater basins shall be routed to a ditch, channel, or stormwater facility of adequate capacity. Calculations showing the capacity of the receiving stormwater facility and its capability to convey a ten-year frequency storm shall be provided. If the receiving stormwater facility is incapable of conveying a ten-year frequency storm, calculations showing the capacity of the receiving stormwater facility and its capability to convey a two-year frequency storm shall also be provided. These calculations will show how the flow is routed through the second existing street or alley crossing, a blue-line stream, interstate right-of-way, railroad right-of-way, state or local government project where drainage improvements were made from 1985 to present, or existing stormwater basin, whichever is closest. The director has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to correctly sizing and installing offsite conveyance facilities or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or the development.

**Sec. 22.5-32. Requirements for developments draining to a sinkhole.**

- (a) Site development on property that includes a sinkhole will require copies of the appropriate permits from the Tennessee Department of Environment and Conservation (TDEC) prior to site development approval. After review of the state permit, 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 shall be submitted prior to the issuing of a site development permit, stating that a TDEC permit is not required.
- (b) For site development or areas of substantial investment requiring attenuation or retention of the one-year, two-year, five-year, ten-year, twenty-five-year, and a one hundred-year frequency storms with sinkholes entirely on site, calculations shall be provided showing that one hundred-year frequency storm will not flood any structures assuming plugged conditions (zero (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 extending to the greater of five (5) feet horizontally outside the one hundred-year water surface elevation or one (1) foot above the one hundred-year water surface elevation.
- (c) For site development or areas of substantial investment requiring attenuation or retention of the one-year, two-year, five-year, ten-year, twenty-five-year, and one hundred-year frequency storms with sinkholes partially on site, calculations must be provided showing that there will not be a rise in water surface elevations between the one hundred-year predeveloped and the one hundred-year postdeveloped frequency storm assuming plugged conditions (zero (0) cfs outflow) for the sinkhole. An easement is required at a minimum of five (5) feet horizontally outside the one hundred-year water surface elevation on the section of the sinkhole located on the developed property. A rise in the one hundred-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 extending to the greater of five (5) feet horizontally outside the one hundred-year water surface elevation or one (1) foot above the one hundred-year water surface elevation.
- (d) Stormwater retention is required for site developments that meet the requirements for stormwater attenuation and are located in one of the following critical watersheds:
  - (1) Ten Mile Creek;
  - (2) Harrell Hills watershed (near Cranberry Dr., Clairmont Dr., and Gaines Rd.);
  - (3) Prosser Road area;
  - (4) Pamela Ln.;
  - (5) All areas draining to a sinkhole;
  - (6) Any area of known flooding where deemed necessary by the director.

The retention basin shall be designed so that the overflow in the one-year, two-year, five-year, ten-year, twenty-five-year, and one hundred-year frequency storms must meet the predeveloped discharges in addition to retaining the difference in the predeveloped and postdeveloped one hundred-year frequency 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 basin to be used instead of retention. For detention to be approvable, the draw down time of the detention basin must be a minimum of six (6) days.

- (e) When existing or documented flooding problems are present, the director has authority to condition the approval of a 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 the public right-of-way, other properties, or on the subject development.

**Sec. 22.5-33. Hydrologic and hydraulic computations.**

- (a) All hydrologic and hydraulic computations utilized in the design of stormwater detention facilities must be prepared by a registered professional engineer licensed to practice in the state.
- (b) The required hydrologic and hydraulic computations shall be in accordance with NRCS (formerly known as the SCS) unit hydrograph procedures using AMC II curve numbers and type II rainfall distribution. All post-developed conditions must be routed at appropriately small time intervals through the stormwater basin using computer models that are widely accepted among engineering professionals. The Rational Method may be used in the design of stormwater inlets and small pipe systems.

**Sec. 22.5-34. Covenant requirements for stormwater facilities.**

- (a) Property owners and lessees are responsible for maintaining stormwater facilities located on their property.
- (b) Prior to the issuance of a site development permit, the property owner shall execute a legal document entitled "Covenants for Permanent Maintenance of Stormwater Facilities," or the lessee shall execute a legal document entitled "Covenants for Maintenance of Stormwater Facilities on Leased Property" ("the covenants"). The property owner or the lessee, as the case may be, shall record the covenants in the office of the county register of deeds. The location of the facility, the recorded location of the covenants document, and a note stating the property owner's or lessee's responsibility shall be shown on a plat, or in the case of a lessee, as an exhibit attached to the lessee's covenants, that is also recorded in the office of the county register of deeds.
- (c) The covenants shall specify minimum maintenance requirements to be performed at necessary intervals by the property owner or lessee, as the case may be.
- (d) The covenants shall grant the city permission to enter the property to inspect any stormwater facility for proper functioning and maintenance.
- (e) In limited situations, extenuating circumstances may exist that prevent the timely execution of the covenants by the proper party. After evaluating these circumstances, the department of engineering may approve a site development or building permit based on the acceptance of a promissory letter from the owner, prospective buyer, or developer stating their commitment to execute the covenants within a forty-five-day grace period. A fee will be required prior to the acceptance of the promissory letter. One fifteen-day extension may be granted for an additional fee. The fees authorized herein shall be the same as the fees for a promissory letter and an extension request in the plat requirement. The terms for the promissory letter and extension shall be at the director's discretion. The department of engineering is in no way obligated to accept promissory letters or extensions. On the expiration of the promissory letter or extension, the department of engineering may issue a stop work order to suspend all work on the property until the executed covenants document is recorded.

- (f) Sediment removal and disposal shall be performed in accordance with all local, state, and federal laws. Guidelines for sediment removal and disposal are given in the city's LDM. The director may stipulate additional guidelines if deemed necessary for public safety.

**Sec. 22.5-35. Acceptance of streets and stormwater systems within public rights-of-way.**

- (a) No street or stormwater system shall be dedicated to the city for public use or maintained by the city as a public street until said street and stormwater facilities have been accepted through completion of the development certification process.
- (b) The director shall only approve streets designed by a registered professional engineer licensed to practice in the state. Streets shall be designed according to publications by the American Association of State Highway and Transportation Officials (AASHTO). The design speed for local streets in residential subdivisions shall be twenty-five (25) miles per hour, unless the director deems a different design speed appropriate. Additionally, stormwater systems and streets, including pedestrian facilities, must conform to the city standard specifications and the city construction standards.

**Sec. 22.5-36. First flush requirements for stormwater basins.**

- (a) The requirements of this section shall not apply to those developments built or approved before June 20, 1997.
- (b) All stormwater basins that are required under section 22.5-23. shall be built to manage first flush water quality. The standard management method shall be to collect the first flush or the first four thousand five hundred (4,500) cubic feet, whichever is greater, of stormwater runoff in a vegetated basin and release that runoff over a minimum twenty-four-hour and a maximum of a seventy-two-hour period. The director may approve other methods of managing first flush water quality including:
  - (1) Proprietary BMPs may be considered based on full-scale testing, maintenance protocols, etc.
  - (2) Other designed BMPs based on their merit.

**Sec. 22.5-37. Requirements for special pollution abatement permits.**

- (a) Specific land uses, hot spots, are known to produce pollutants that are detrimental to water quality and would not be corrected by the standard first flush requirement. A special pollution abatement permit (SPAP) is required to ensure that structural and management best management practices are used to control water quality for these hot spots. Before the approval of structural stormwater treatment devices, the director may require valid documentation from full-scale testing by an independent third party to verify that the pollutants of concern will be properly controlled. A SPAP will be valid for a period of five (5) years, and must be renewed before expiration. At the time of renewal, any deficiency in the pollution control methods must be corrected. Any development that occurs without a required permit shall be a violation of this chapter of the code.
- (b) A SPAP shall be required for the following land hot spots:
  - (1) Vehicle, truck, or equipment maintenance, fueling, washing, or storage areas, e.g. automotive dealerships, automotive repair shops, and car wash facilities;
  - (2) Any development containing more than four hundred (400) surface parking spaces or one hundred twenty thousand (120,000) square feet or more of surface parking area;

- (3) Recycling and salvage yard facilities;
  - (4) Restaurants, grocery stores, and other food service facilities;
  - (5) Commercial facilities with outside animal housing areas, e.g. animal shelters, fish hatcheries, kennels, livestock stables, veterinary clinics, and zoos; and
  - (6) Other producers of pollutants identified by the director.
- (c) A SPAP may be required for a specific site due to operational failure, spills, or illicit discharges.
- (d) Technical requirements for the SPAP shall be based on the current BMP manual subject to the approval of the department of engineering.

**Sec. 22.5-38. Additional permits required.**

Additional permits may be required from various state and federal agencies before a site development permit will be issued by the city.

**Sec. 22.5-39. National Pollutant Discharge Elimination System permits.**

- (a) Any person who holds an individual National Pollutant Discharge Elimination System (NPDES) permit shall provide a copy of such permit to the director no later than sixty (60) calendar days after issuance or renewal of the permit. The permit holder shall also provide copies of all discharge monitoring reports required by the permit for any discharge to the stormwater system upon request.
- (b) Any person who holds an NPDES general permit or multi-sector permit (as distinct and different from an individual permit) shall provide either a copy of such permit or the permit number assigned to them by TDEC to the director no later than sixty (60) calendar days after issuance of the permit.

**Sec. 22.5-40. Riparian buffer zone.**

Riparian buffer zones (RBZ) exist within and adjacent to regulated waters (waters). The city regulates the RBZ to comply with federal mandates, protect stream water quality, and to reduce flood insurance rates.

- (1) The RBZ is measured horizontally from the top of bank, extending perpendicular from each bank for the length of the water body. The top of bank is the uppermost limit of the active channel, typically indicated by a change in bank slope from steep to gentle slope. If the top of bank cannot be determined from the change of slope or if there is a dispute in the determination, the top of bank can be determined by submitting approved engineering calculations that determine the width of the stream resulting from the 2-year frequency storm. The width of the RBZ will vary, depending on all of the following criteria:
  - a. If a floodway profile, as part of the flood insurance study, has been adopted for the waters, the RBZ width must be equal to or greater than the width of the floodway at all points.
  - b. Waters with a drainage area of less than one (1) square mile will require a minimum RBZ width of thirty (30) feet.
  - c. Waters with a drainage area of one (1) square mile or more will require a minimum RBZ width of sixty (60) feet. The sixty-foot width of the RBZ can be established on an average width basis for a project, as long as the minimum width of the RBZ is at least thirty (30) feet at any measured location. If RBZ averaging is used, a plat must be recorded showing the limits of the RBZ.

- d. Waters that are contained within a culvert do not require an RBZ. This exception does not apply to proposed roadway or proposed driveway crossing waters.
  - e. RBZ widths apply where culverts are removed from waters.
  - f. The director may approve alternate RBZ widths for special circumstances (e.g., existing land uses or existing physical conditions) that conflict with the requirements in sections 22.5-40.a.1. through 5.
  - g. Mitigation must be shown on a recorded plat.
- (2) Use of RBZs.
- a. Acceptable uses of the RBZ may include: yards, picnic areas, walking trails, greenways, landscaped areas, wildlife habitat, primitive areas, roadway and sidewalk stream crossings, or other similar uses approved by the director.
  - b. Specifically prohibited new uses include, but are not limited to, parking lots, dumpster storage, material storage, grease-bin storage, vehicle storage or maintenance, animal lots or kennels, or other uses known to contribute pollutants to waterways.
- (3) Protection of RBZs.
- a. It is prohibited to disturb an RBZ except when restoring the stream or stream banks, creating or restoring the RBZ, removing/eradicating invasive vegetation, replanting with native vegetation, or when constructing a permitted allowable disturbance.
  - b. All slopes adjacent to waters shall be left in a stabilized condition. No actively eroding, bare, or unstable banks shall remain unless TDEC has determined there is no better alternative (i.e. detrimental to endangered species). Placement of riprap and other hard armor is only allowed when bioengineering alternatives are not technologically feasible.
- (4) Allowable disturbances of RBZs.
- a. The director may allow new driveways, road crossings, or foundations and columns across or through an RBZ on a case-by-case basis. It must be demonstrated that the encroachment is necessary and that the RBZ will not be impacted excessively. In these cases, the driveway, road crossing, or foundation and columns shall be constructed with careful attention to protecting trees and vegetation and minimizing site grading.
  - b. Approved mitigation is required for removal, encroachment, or disturbances to the RBZ.
  - c. Utility crossings.
    - 1. Utilities within the RBZ are not exempt from RBZ requirements or mitigation.
    - 2. All utilities within the RBZ must be subsurface or overhead.
    - 3. Planting plans must be consistent with guidelines in the *LDM*.

- d. Installing a new or replacing an existing culvert, pipe, or bridge across waters.
  1. Maintain a natural stream bottom to the maximum extent practicable.
  2. Culverts, pipes, and bridges must span the baseflow channel.
  3. Minimize the length of culverts, pipes, and bridges.
  4. All crossings must be as close to perpendicular to the flow path as possible.
- (5) RBZ enhancement, including RBZ creation, may be required if an RBZ does not exist, when an RBZ has excessive invasive vegetation, or if the RBZ contains significant areas of unhealthy, diseased, or dead vegetation. Information on RBZ enhancements can be found in the LDM.

**Secs. 22.5-41-49. Reserved.**

### **ARTICLE III. ILLICIT CONNECTIONS AND ILLEGAL DUMPING**

#### **Sec. 22.5-50. Findings of fact.**

The city council finds that the uncontrolled discharge of pollutants to the stormwater system has an adverse impact upon the water quality of the receiving waters.

- (1) The 1987 amendments to the Federal Water Pollution Control Act, commonly known as the Clean Water Act, established the National Pollutant Discharge Elimination System (NPDES) program, which requires permits for discharges from stormwater systems into waters of the United States. The Environmental Protection Agency (EPA) has promulgated regulations implementing the NPDES program.
- (2) The NPDES regulations for stormwater discharges require certain municipalities, including the city, to:
  - a. Control through ordinance, permit, contract, order, or similar means the contribution of pollutants to municipal stormwater systems by stormwater discharges associated with industrial activity and the quality of stormwater discharged from sites of industrial activity;
  - b. Prohibit through ordinance, order, or similar means illicit discharges to the stormwater system;
  - c. Control through ordinance, order, or similar means discharges to the stormwater system of spills, dumping or disposal of materials other than stormwater;
  - d. Require compliance with conditions in ordinances, permits, contracts, or orders; and
  - e. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions, including the prohibition of illicit discharges to the stormwater system.

**Sec. 22.5-51. Objectives.**

This chapter is adopted as part of the city's stormwater management program in order to prevent certain non-stormwater discharges to and improper disposal of substances in the stormwater system, as to reduce, to the maximum extent practicable, pollutants that may be present in discharges from the stormwater system.

**Sec. 22.5-52. Prohibitions.**

(a) No person shall:

- (1) Connect, or allow to be connected, any sanitary sewer to the stormwater system, including any sanitary sewer connected to the stormwater system as of the date of adoption of this chapter.
- (2) 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:
  - a. Sewage discharges or overflows, including sanitary sewer overflows (SSOs);
  - b. Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive service facilities;
  - c. Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, concrete-related equipment, and portable toilet servicing;
  - d. Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, carpet cleaning;
  - e. 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, outdoor eating or drinking areas;
  - f. Discharges from material storage areas of runoff containing chemicals, fuels, grease, oil, or other hazardous materials;
  - g. Discharges of pool or fountain water containing chlorine, biocide, salt, or other chemicals or discharges of pool or fountain filter backwash water;
  - h. Discharges of sediment or construction-related wastes;
  - i. Discharges of food-related wastes, e.g., grease, fish processing, restaurant kitchen mat and trash bin wash water; and
  - j. Discharge of liquid or solid waste from dumpsters, trash bins, oil or grease holding tanks, or other refuse and recycling enclosures.
- (3) Connect, or allow to be connected, any interior floor drain to the stormwater system, including drains in parking garages (except for the upper garage level exposed to open air), basements, etc.

- (b) Subject to the provisions of section 22.5-52.c., the following discharges shall not be in violation of this chapter:
- (1) Water line flushing;
  - (2) Landscape irrigation;
  - (3) Diverted stream flows;
  - (4) Rising groundwater;
  - (5) Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm drains;
  - (6) Uncontaminated pumped ground water;
  - (7) Discharges from potable water sources;
  - (8) Air conditioning condensation;
  - (9) Irrigation waters;
  - (10) Springs;
  - (11) Uncontaminated water from crawl space pumps;
  - (12) Footing drains;
  - (13) Lawn watering;
  - (14) Individual residential car washing;
  - (15) Flows from riparian habitats and wetlands;
  - (16) Dechlorinated or desalinated swimming pool discharges;
  - (17) Incidental street wash water from street cleaning equipment designed for cleaning paved surfaces and limiting waste discharges;
  - (18) Discharges or flows from firefighting activities;
  - (19) Street deicing for public safety; or
  - (20) Any activity authorized by a valid NPDES permit.
- (c) If the director finds that any activity, including but not limited to any of the activities listed in section 22.5-52(b), are found to cause or may cause sewage, industrial wastes, or other wastes to be discharged into the stormwater system, the director shall 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 a stormwater pollution prevention plan to ensure that the activity can be conducted without causing further discharge of pollution to the stormwater system.

**Sec. 22.5-53. Notification of spills and illicit discharges.**

As soon as any person has knowledge of any spills or illicit discharges to the stormwater system in violation of this chapter, such person shall immediately notify the director 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 spill or illicit discharge and shall confirm such notification with a written report to the director within three (3) calendar days. At a minimum, the written report 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) or safety data sheets (SDS) for the discharged material;
- (10) Action taken to prevent further discharges; and
- (11) Description of any environmental impact.

**Sec. 22.5-54. Requirements for monitoring.**

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 city and to furnish periodic detailed reports of such discharges.

**Secs. 22.5-55-60. Reserved.**

**ARTICLE IV. PROPERTY OWNER MAINTENANCE REQUIREMENTS FOR THE STORMWATER SYSTEM**

**Sec. 22.5-61. Title of article.**

This article may be known as the "stormwater system maintenance ordinance" (SSMO).

**Sec. 22.5-62. Declaration of a nuisance.**

- (a) To cause or allow a reduction in flow, capacity, storage, or other critical function of any component of the stormwater system due to damage, deterioration, blockage, etc., when the reduction causes or may cause a flooding hazard in the public right-of-way or require right-of-way closure for public safety, is hereby declared to be a nuisance.
- (b) To cause or allow a reduction of the designed flow attenuation, storage capacity, performance, or inlet/outlet control of any detention, retention, infiltration, treatment, or other stormwater facility is hereby declared to be a nuisance.

**Sec. 22.5-63. Prohibition.**

Property owners and lessees are responsible for maintaining stormwater facilities located on their property. It shall be unlawful for any property owner to cause or allow a nuisance for any component of the stormwater system located on private property.

**Sec. 22.5-64. Notice to correct conditions.**

- (a) Upon the failure of any property owner to maintain the stormwater system to prevent the nuisance as described in this article, the director may serve notice to the property owner ordering the person to remediate the nuisance.
- (b) Notice may be served by any of the following methods and is effective as noted:
  - (1) Personally delivered to the owner, lessee, occupant, or person having control of such property. Notice occurs on the date such delivery is made;
  - (2) Mailed to the last known address of such owner, lessee, occupant, or person having control of such property by first class, United States mail. Notice occurs three (3) days after the notice is deposited in the mail, properly addressed, and with sufficient postage to carry it to its destination; or
  - (3) Posting the notice on the property on which such conditions described in section 22.5-62 exist. Notice occurs on the date the notice is posted.
- (c) Service of notice by any of the methods set out in subsection 22.5-64(b) shall be due notice within the meaning of this article, provided, however, that no owner out of possession shall be liable to the penalty imposed by section 22.5-8 of this chapter unless there shall be personal service of such notice upon such owner or such notice mailed to such owner by first class, United States mail, as provided in this section.
- (d) The notice required under this section shall state that the property owner is entitled to a hearing. The notice shall be written in plain language and shall also include, at a minimum, the following elements:
  - (1) A brief statement of this article, which shall contain the consequences of failing to remedy the noted condition;
  - (2) The person, office, address, and telephone number of the department or person giving notice;
  - (3) A description of the violation, including the minimum measures required to remedy the violation, and the deadline(s) to complete; and
  - (4) A place wherein the notified party may return a copy of the notice, indicating the desire for a hearing. Failure to make the request within the time specified in this article shall, without exception, constitute a waiver of the right to a hearing.

**Sec. 22.5-65. Appeals.**

- (a) Appeals for violations of article IV are not heard by the board of environmental appeals and are covered under the process outlined under this section.

- (b) Any property owner having control of the property aggrieved by the determination and order under this article may appeal administratively to the department of engineering within thirty (30) days from the date of service of the notice. Such appeal shall be taken by filing with the department of engineering a notice of appeal stating in brief and concise form the grounds therefore. The department of engineering shall hear and determine such appeal as promptly as practicable, but within thirty (30) calendar days of the filing of the appeal, except upon written application for an extension of time by the appellant, who shall recite reasons satisfactory to the department of engineering before such extension may be granted. The department of engineering shall have the power to affirm, reverse, or modify the order of the inspector. The department of engineering's decision, together with the reasons therefore, shall be in writing and maintained as a public record. Any property owner, having control of property who fails, refuses, or neglects to comply with the order of the inspector, as modified by the department of engineering, shall be in violation of the provisions of this article. Appeals of the decision of the department of engineering shall be provided by law in cases of certiorari.

**Sec. 22.5-66. Failure to correct conditions; abatement by city; cost recovery.**

- (a) If the property owner fails to remedy such conditions within the prescribed time, unless an appeal is made, the department of engineering may take such action as is necessary to remedy the conditions and abate the nuisance. If city resources, employees or equipment are used to abate the nuisance, the city shall determine the reasonable cost of the required inspections, recorded examinations, notifications, complaint response, and movement of employees and equipment to and from the site in establishing a base charge, to which additional charges for equipment and employee operating time shall be added to establish the total cost to be billed to the owner. Upon failure of the owner to remit to the city the amount of such charge within sixty (60) days from the date of such notice, a ten (10) percent penalty shall be added, and the total amount of the bill and the penalty shall be certified by the city and shall constitute a lien upon the property for which the expenditure is made.
- (b) The director of finance shall:
- (1) Certify the cost to the city tax collector, who shall place the cost upon the tax rolls as a lien upon the affected property, which cost shall then be collected in the same manner as the city's taxes are collected; and
  - (2) Note the lien in favor of the city and against the affected property by filing a lien against the property in the office of the register of deeds for the county in the same manner as other liens are required to be filed.
- (c) The lien granted by this section may be enforced at the same time and in the same manner as delinquent property taxes are collected and shall be subject to the same penalty and interest as delinquent property taxes.
- (d) No collection of costs may proceed against the owner of an owner-occupied residential property, including the filing of the liens referenced in section 22.5-66(b), until cumulative charges for remediation equal or exceed five hundred dollars (\$500.00).
- (e) In addition to the foregoing provisions, any person violating any of the provisions of this article shall be liable for a civil penalty not to exceed fifty dollars (\$50.00) and the repayment of administrative costs incident to the correction of the municipal violation up to four hundred dollars (\$400.00). Each day any violation of this Code or of any ordinance shall constitute a separate offense for which the person in violation shall be liable.

- (f) The lien granted by this section shall be extinguished upon the payment to the city of all amounts owing hereunder, upon a finding that the lien was placed in error, or by operation of law.

**Sec. 22.5-67. Special conditions.**

For any nuisance that may impede emergency response or causes an immediate threat to the health and safety of the general public, the director may shorten the owner abatement period set forth in this article which may include immediate action by the city or their designated representative, with the owner being charged for the abatement per section 22.5-66.



## Chapter 23 Streets and Sidewalks

- ❖ *Charter reference— Authority to lay out, open, etc., streets and other improvements, § 206.*
- ❖ *Cross reference— Aircraft and airports, Ch. 3; animals, Ch. 5; buildings and building regulations, Ch. 6; cable television regulations, Ch. 7; civil emergencies, Ch. 9; flood damage prevention and control, Ch. 12; horticulture, Ch. 14; ambulance service, § 16-61 et seq.; markets and pedestrian vendors, § 16-316 et seq.; motor vehicles and traffic, Ch. 17; offenses, Ch. 19; parks and recreation, Ch. 20; public transportation, Ch. 21; railroads, Ch. 22.*
- ❖ *State Law reference— Streets and other public improvements, T.C.A. § 7-31-101 et seq.*

### **ARTICLE I. In General**

- Section 23-1. Definitions.
- Section 23-2. Obstructions—Prohibited; exceptions.
- Section 23-3. Same—Removal of unlawful obstructions.
- Section 23-4. Same—Public safety; lights.
- Section 23-5. Sale of merchandise on street or sidewalk.
- Section 23-6. Storage or display of goods.
- Section 23-7. Cleaning of sidewalks.
- Section 23-8. Removal of ice, snow, mud, etc., from sidewalks.
- Section 23-9. Discharge of roof water on sidewalk.
- Section 23-10. Making fire on street.
- Section 23-11. Slaking or burning lime, cement or similar material on street.
- Section 23-12. Construction of cellar doors.
- Section 23-13. Leaving cellar doors open or out of repair.
- Section 23-14. Obstruction of streetlights by shade trees.
- Section 23-15. Walking or driving on grass plot or park strip.
- Section 23-16. Curb stops.
- Section 23-17. Failure to obtain franchise for use of streets.
- Sections. 23-18—23-40. Reserved.

### **ARTICLE II. Construction and Repair of Sidewalks and Driveways**

- Section 23-41. Responsibility for construction.
- Section 23-42. Responsibility for repairs.
- Section 23-43. Permit; lines and grades.
- Section 23-44. Bond.
- Section 23-45. Storage of materials and equipment; public safety.
- Section 23-46. Special construction.
- Section 23-47. Specifications for sidewalks.
- Section 23-48. Specifications for driveways.
- Section 23-49. Specifications for curbs.
- Section 23-50. Specifications for gutters.
- Sections. 23-51—23-70. Reserved.

**ARTICLE III. Construction Within or Interfering With Right-Of-Way**

- Section 23-71. Permit required; emergency exception.
- Section 23-72. Permit cancellation.
- Section 23-73. Revocation of permit.
- Section 23-74. Bond; certificate of insurance.
- Section 23-75. Inspection fees.
- Section 23-76. Responsibility for repair of street, sidewalk, or right-of-way.
- Section 23-77. Supervision of work.
- Section 23-78. Public safety and traffic control.
- Section 23-79. Use of sheeting and braces.
- Section 23-80. Work in public right-of-way.
- Section 23-81. Utility connections to be installed prior to paving the street.
- Section 23-82. Protective barriers for work in sidewalks or right-of-way.
- Section 23-83. Annual maintenance permit.
- Sections. 23-84—23-105. Reserved.

**ARTICLE IV. Street Naming and Addressing**

- Section 23-106. Assignment of street names, property addresses.
- Section 23-107. Sections established.
- Section 23-108. Street designation.
- Section 23-109. House and building address procedure.
- Section 23-110. Buildings required to have number.
- Section 23-111. Street names.
- Section 23-112. Street signs.
- Section 23-113. Appeals.
- Section 23-114. Enforcement.

**ARTICLE I. IN GENERAL**

**Section 23-1. Definitions.**

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Curb means that construction parallel to and adjoining the edge of the paving or roadway surface of the street definitely marking the limits of that portion of the street to be used by vehicular traffic.

Director means the person holding the position of director of public service in the government of the city, or his duly authorized representative.

Driveway means that portion of the street lying between the curbline of the street and the property line of the street used for ingress and egress to property adjoining a street, by vehicles.

Gutter means that construction adjoining the curb and forming a part of the street surface used by vehicles and whose primary function is to provide surface drainage along the street.

Sidewalk means that portion of the street generally reserved for pedestrians' use. Unless otherwise permitted, it shall be laid so that the property side of the walk shall be parallel to and identical with the property line of the street.

Specification means the standard specifications and plans for construction procedures and materials on file in the office of the city engineer, and their subsequent revisions.

Street means all public thoroughfares within the corporate limits of the city, such as alleys, avenues, highways, boulevards, streets and the like, and shall include all that portion of the public way from property line to property line dedicated to the public use, and includes sidewalks, driveways, grass plots, curbs and that portion of the street used by vehicles.

(Code 1962, § 36-1)

**Section 23-2. Obstructions—Prohibited; exceptions.**

If any person shall place upon any public street of the city, or cause to be placed thereon, any rocks, lumber, wood, rubbish or other encumbrance, or other obstruction whatever, he shall be guilty of a misdemeanor; provided that, for the purpose of erecting, finishing or repairing any building within the city, a contractor, upon obtaining a permit therefor from the director of public service, shall have the privilege of depositing on the squares, streets, lanes or alleys opposite or adjacent to the building any lumber, brick or other material necessary to be used in erecting, finishing or repairing the building. Such materials shall not hinder or impede the necessary passage of pedestrians and vehicles, nor the free passage of water in the gutters of the streets; the materials shall not remain longer than is absolutely necessary for the completion of the work being done; and all rubbish from the building shall be removed as soon as possible. This section shall not apply to any obstruction permitted by law.

(Code 1962, § 36-55)

**Section 23-3. Same—Removal of unlawful obstructions.**

Should any rocks, wood, lumber or other obstruction whatever be found upon any of the pavements, sidewalks, squares or streets of the city, where such obstruction is not permitted by the provisions of section 23-2, the director of public service shall request the person allowing, making or suffering such obstruction to remove the obstruction without delay, and if the obstruction is not removed by the offender it shall be the duty of the director to remove the obstruction, and the person offending shall be liable, in addition to the penalties fixed in section 1-9, to pay to the city double the expense of removing the obstruction.

(Code 1962, § 36-56)

**Section 23-4. Same—Public safety; lights.**

When any person shall place or cause to be placed any kind of building material or other obstruction in or upon any street of the city, he shall see to it that such material is not left in condition to endanger any person passing along the street, and shall put up, at or near the obstruction, a red signal light during the darkness of each and every night the obstruction continues. If such obstruction is more than fifty (50) feet in length there shall be an additional light for every fifty (50) feet or fraction thereof.

*(Code 1962, § 36-57)*

**Section 23-5. Sale of merchandise on street or sidewalk.**

It shall be unlawful for any person to sell or offer for sale on the streets and sidewalks, or in doorways or entrances to vacant buildings when the occupancy of the doorway or entrance interferes with travel upon the sidewalk adjacent thereto, any merchandise of any kind or character; provided that the provisions of this section shall not apply to sales regulated by chapter 16, article X of this Code.

*(Code 1962, § 36-58)*

**Section 23-6. Storage or display of goods.**

It shall be unlawful to use any part of any public street between the curblin and property line or between the curblin and outermost street line for the storage of goods, merchandise or other material, or for the purpose of displaying goods or articles for sale or barter, except as provided in chapter 16, article X.

*(Code 1962, § 36-59)*

**Section 23-7. Cleaning of sidewalks.**

All owners or occupants of property in front of which paved sidewalks have been laid or abutting upon paved sidewalks are hereby required to keep such sidewalks clean. All persons and others required to keep sidewalks clean where such sidewalks are within the first fire district of the city and are swept or otherwise cleaned and the sweepings placed in the street shall sweep and clean the sidewalks between the hours of 6:00 p.m. and midnight and at no other time. If any person within the first fire district of the city who is required by this section to keep sidewalks clean desires to and does sweep or clean the sidewalk between the hours of midnight and 6:00 p.m., all sweepings shall be gathered and placed in a garbage can and disposed of as other garbage.

*(Code 1962, § 36-60)*

**Section 23-8. Removal of ice, snow, mud, etc., from sidewalks.**

It shall be the duty of every person occupying any dwelling house or other house upon any street of the city, or owner thereof if the house is unoccupied, to remove or cause to be removed from the sidewalks in front of or upon the sides of his premises all ice, snow or mud, grass, weeds and other foreign substances which may accumulate thereon, and it shall be the duty of every police officer to enforce this section.

*(Code 1962, § 36-62)*

**Section 23-9. Discharge of roof water on sidewalk.**

It shall be unlawful for any owner or occupant of a house situated upon any of the streets to have any water spout or gutter attached to such building which shall be so constructed as to empty its contents upon the public sidewalk, and all such water spouts emptying their contents on the alleys shall not be of greater height than four (4) inches from the ground, and all such as are of greater height from the ground are hereby declared to be public nuisances. It shall be the duty of all persons owning property within the city, whose buildings are provided with water spouts emptying their contents upon the

public sidewalks, to abate such nuisance by the construction of drainpipes beneath the surface of the sidewalks, which shall make connection with all such water spouts for the purpose of conveying the water into the gutter.

*(Code 1962, § 36-63)*

**Section 23-10. Making fire on street.**

(a) It is hereby declared to be a misdemeanor for any person to make any fire or burn any trash, leaves, wood, coal, oil, gasoline or similar combustible material upon any of the paved streets or other public thoroughfares of the city; provided, however, that contractors and other workmen may construct necessary fires for melting tar or similar material where the surface of the street under such fires is first amply protected by depositing a sufficient thickness of earth on the surface so as to prevent injury to the street. Such workmen or contractors shall first obtain a written permit for the construction of such fire from the director of public service.

(b) As used in this section, "paved streets of the city" means any of the streets paved with brick, asphalt, bitulithic, concrete, wood block, stone block, tar macadam, granitoid or other similar improved paving material in common use in paving the city's streets.

*(Code 1962, § 36-64)*

**Section 23-11. Slaking or burning lime, cement or similar material on street.**

It shall be unlawful and a misdemeanor for any person to slake or burn any lime, cement or similar material which thereby generates heat upon any of the unprotected paved streets of the city in such way or manner as to be calculated to damage or injure the street by the application of heat thereto.

*(Code 1962, § 36-65)*

**Section 23-12. Construction of cellar doors.**

All cellar doors upon any of the streets, parks or squares of the city shall be built of strong material and be uniform and flush with the pavement or sidewalk, and shall not project from the wall of the building more than five (5) feet. Within the first fire district, all such doors shall be of noncombustible material.

*(Code 1962, § 36-66)*

**Section 23-13. Leaving cellar doors open or out of repair.**

If any owner of a house in the city shall permit his cellar door, on any square, lane, alley, pavement or sidewalk of the city, to remain open, except when in actual use, or shall have it so insecure or weak or out of repair as to render walking thereon or over the door unsafe or dangerous, such person so offending shall be punished as provided in section 1-9. In case the owner or occupant of any house does not, on notice, attend to the repairs of any cellar door, the door may be repaired by the director of public service, at the expense of the owner, which may be recovered before any court having jurisdiction, with costs.

*(Code 1962, § 36-67)*

**Section 23-14. Obstruction of streetlights by shade trees.**

(a) Prohibited. It shall be unlawful for the owner of any property abutting upon any of the streets within the corporate limits of the city to permit the branches of any shade trees upon his property, or the sidewalk in front thereof, to so extend across the street as to obstruct the shining of any electric light in the street placed there by the corporate authorities or under their direction.

(b) Notice to trim trees. If any person shall permit branches of his shade trees to extend on the street and obstruct the electric lights on the street, it shall be the duty of the director of public service to cause to be served upon such property owner a ten-day notice requiring him to trim his trees so that the light may freely shine without obstruction upon the thoroughfare in front of his property.

- (c) Failure to comply with notice. If the person owning trees shall fail or refuse so to trim his trees by the time fixed in the notice prescribed by subsection (b) of this section, he shall be guilty of a violation of subsections (a) and (b) of this section.

*(Code 1962, §§ 36-68—36-70)*

**Section 23-15. Walking or driving on grass plot or park strip.**

- (a) The term "grass plot or park strip," as used in this section, means:

- (1) Where there is a sidewalk pavement on the side of a street or public way, the space between such sidewalk pavement and the property line, and the space between such sidewalk pavement and the curb pavement, or, if there is no curb pavement, the space between the sidewalk pavement and the improved or traveled portion of the street or public way, all such references being to the side of the street or public way upon which the sidewalk pavement is located.
- (2) Where there is no sidewalk pavement on the side of a street or public way, the space between the property line and the improved or generally traveled portion of such street or public way of the side upon which there is no sidewalk pavement.

- (b) It shall be unlawful to walk or drive on, over or across any grass plot or park strip except where landings have been provided in front of property or other improved crossings have been provided over such grass plot or park strip.

*(Code 1962, §§ 36-71, 36-72)*

**Section 23-16. Curb stops.**

Whenever a parking lot is ten (10) feet or closer to any property line, a physical barrier or curb stop shall be provided to prevent encroachment of any portion of a parked vehicle over the property line.

*(Code 1962, § 36-73)*

**Section 23-17. Failure to obtain franchise for use of streets.**

It shall be unlawful for any person to operate and conduct any kind of business within the corporate limits of the city which requires a franchise, grant or easement over its streets, without first obtaining such franchise, grant or easement. Any person engaged in operating or conducting such a business without having first obtained a franchise, grant or easement shall be guilty of a misdemeanor.

*(Code 1962, § 28-1002)*

**Section 23-18. Authority to establish regulations for mobile food vending establishments.**

The mayor or the mayor's designated representative is hereby authorized to make and promulgate rules and regulations for the operation of mobile food vending establishments, including rules and regulations regarding licensing, fees and the use of city rights-of-way.

*(Ord. No. O-223-2013, § 1, 11-26-13)*

**Section 23-19. Complete streets policy.**

The city, through its mayor's office and in collaboration with other applicable departments, shall adopt a complete streets policy committing the city, to the maximum extent practical, plan for, design, construct, maintain, and operate all streets to reflect complete streets principles and provide for a comprehensive and integrated street network that accommodates all users and modes. The complete streets policy may be updated from time to time, as needed, in the discretion of the mayor's office or other applicable designated departments, provided that such changes are subject to public hearing and that the public is allowed to submit comments before proposed changes are finalized.

*(Ord. No. O-204-2014, § 1, 10-28-14)*

**Sections. 23-20—23-40. - Reserved.**

**ARTICLE II. CONSTRUCTION AND REPAIR OF SIDEWALKS AND DRIVEWAYS**

**Section 23-41. Responsibility for construction.**

- (a) It shall be the duty of the abutting property owner, or his agent, of any house or property, to construct sidewalks or driveways adjoining his property, and if the abutting property owner or his agent fails to construct sidewalks or driveways adjoining his property, the director of public service shall cause written notice to be given such property owner or agent requiring him to construct such sidewalks or driveways, after the council has, by proper resolution, determined that the construction of the sidewalks or driveways is necessary for the public convenience and safety.
- (b) If such property owner or agent shall fail or refuse to construct the sidewalk or driveway within fifteen (15) days from the giving of such written notice, the director shall construct such sidewalk or driveway, and the cost of such construction shall be paid by the city and the amount so paid shall be a lien against the abutting property and may be enforced in the chancery court of the county or any other court of competent jurisdiction.

*(Code 1962, § 36-5)*

**Section 23-42. Responsibility for repairs.**

It shall be the duty of the abutting property owner, or his agent, of any house or property, to maintain and repair sidewalks or driveways adjoining his property, and if an abutting property owner or his agent fails to repair or maintain the sidewalk or driveway adjoining his property the director shall notify the owner, and if the repairs are not completed within ten (10) days the director shall cause the necessary repairs to be made and the cost of such repairs shall be a lien against the abutting property and may be enforced in the chancery court of the county or any other court of competent jurisdiction.

*(Code 1962, § 36-6)*

**Section 23-43. Permit; lines and grades.**

- (a) No person shall construct any sidewalk, driveway, curb or gutter, or change or repair any sidewalk, driveway, curb or gutter on the streets of the city without having first received a permit from the director of public service for the work, authorizing such construction, and received the necessary lines and grades from the office of the city engineer.
- (b) Such permits shall be issued by the director of public service at charges set out under section 23-75 in order to provide for inspectors on the work.

*(Code 1962, § 36-7)*

*Cross reference— Licenses and miscellaneous business regulations, Ch. 16.*

**Section 23-44. Bond.**

No person shall be granted a permit for the construction of any sidewalk, driveway, curb or gutter, or repairs to any sidewalk, driveway, curb or gutter without first having on file with the recorder of the city, in a form prescribed by the director of law, an indemnity bond in the amount of two thousand five hundred dollars (\$2,500.00) protecting the city from any and all claims for damages to person or property arising out of or incident to the prosecution of the work, whether caused from negligence or otherwise.

*(Code 1962, § 36-8)*

**Section 23-45. Storage of materials and equipment; public safety.**

- (a) Generally. The director of public service shall specify the portion of the street that may be used for storage of materials and equipment, necessary safety precautions to be observed and other precautions to be taken in prosecuting the work of construction or repair of any sidewalk, driveway, curb or gutter. All materials, equipment, barricades and the like shall be properly marked by red lanterns or flares from sunset to sunrise, and properly marked with suitable

markers clearly distinguishable by the public during daylight hours. When so directed, the person obtaining the permit shall add additional lights or markers. He shall also carry out the work in a safe and workmanlike manner with due caution for the safety of the public at all times, and shall be subject to the instructions of the director to attain this safety.

- (b) Use of street. No materials or equipment shall be piled or placed in gutters, over sewer inlets, in front of crosswalks, or within ten (10) feet of any fireplug, and no more than one-half of the street shall be occupied in the prosecution of the work of constructing or repairing any sidewalk, driveway, curb or gutter. Sufficient and safe walkways for ingress and egress to the premises in front of which the work is being carried on shall be provided at all times.
- (c) Use of gutter or sidewalk. No construction, barricades, temporary driveways, etc., shall be placed in the gutter or on the sidewalk, except as may be permitted by the building code of the city and authorized by the director of public service.

*(Code 1962, §§ 36-9—36-11)*

**Section 23-46. Special construction.**

- (a) Approval. Wherever any special construction is required in the sidewalk space, such as chute covers, openings, special vault lights or any other construction, either in or under the sidewalk space, the construction shall be approved by the director of public service both as to material and method of construction, the approval to be written on the permit for the work.
- (b) Bond. Whenever such special construction referred to in subsection (a) of this section is authorized, the property owner for whom such construction is authorized shall furnish a surety bond in suitable amount and form as directed by the director of law of the city, protecting the city against any and all damages incident to or arising out of the special construction authorized under subsection (a) of this section.

*(Code 1962, §§ 36-12, 36-13)*

**Section 23-47. Specifications for sidewalks.**

All sidewalks laid within the corporate limits of the city shall be composed of standard portland cement, sand and stone in the proportion prescribed by the standard specifications on file in the office of the director of public service or city engineer. All materials and methods of mixing and placing shall conform to the standard specifications and plans for concrete sidewalks on file in the office of the director of public service or city engineer. Sidewalks shall be laid on a cinder base of two-inch thickness, when compacted, shall be four (4) inches in thickness and five (5) feet wide, unless otherwise prescribed by the director, and shall be laid to the lines and grades established by the director of public service and subject to his inspection and approval.

*(Code 1962, § 36-14)*

**Section 23-48. Specifications for driveways.**

Driveways laid within the corporate limits of the city shall be composed of standard portland cement, sand and stone, in the proportion prescribed by the standard specifications on file in the office of the director of public service or city engineer. All materials and methods of mixing and placing shall conform to the standard specifications and plans for concrete driveways on file in the office of the director of public service or city engineer. Driveways shall be six (6) inches thick and of a width prescribed by the director of public service, who shall determine the necessary width and have full authority to set the maximum width required. Driveways shall be laid to the lines and grades established by the director and subject to his inspection and approval.

*(Code 1962, § 36-15)*

**Section 23-49. Specifications for curbs.**

All curbs laid in the corporate limits of the city shall be composed of standard portland cement, sand and stone in the proportion prescribed by the standard specifications on file in the office of the

director of public service or city engineer. All materials, methods of mixing and placing shall conform to the standard specifications and plans for concrete curbs or granite curbs on file in the office of the director of public service or city engineer. Curbs shall be either standard six-inch by fourteen-inch curb or six-inch by eighteen-inch curb, as determined by conditions, and the size shall be prescribed by the director of public service. They shall be laid to the lines and grades as established by the director and subject to his approval and inspection.

(Code 1962, § 36-16)

**Section 23-50. Specifications for gutters.**

All gutters shall be composed of standard portland cement, sand and stone, in the proportion prescribed by the standard specifications on file in the office of the city engineer. All materials and methods of mixing and placing shall conform to the standard specifications and plans for concrete gutters on file in the office of the city engineer. Gutters shall be six (6) inches thick and either eighteen (18) inches, twenty-four (24) inches, thirty (30) inches or thirty-six (36) inches in width as prescribed by the director of public service. They shall be laid to the lines and grades as established by the director and subject to his inspection and approval.

(Code 1962, § 36-17)

**Sections. 23-51—23-70. Reserved.**

**ARTICLE III. CONSTRUCTION WITHIN OR INTERFERING WITH RIGHT-OF-WAY**

*Editor's note— Ord. No. O-15-00, § 1, adopted January 25, 2000, has been treated by the editor as amending the Code by repealing former art. III, §§ 23-71—23-83, and adding a new art. III, §§ 23-71—23-83, to read as herein set out. Former art. III pertained to excavations, and derived from the Code of 1962, §§ 36-25—36-37; Ord. No. O-419-91, adopted October 1, 1991; Ord. No. O-420-91, adopted October 1, 1991; and Ord. No. O-396-99, adopted September 21, 1999.*

**Section 23-71. Permit required; emergency exception.**

- (a) It shall be unlawful for any person to make an opening in any street, to disturb in any way the surface or subsurface of any street, or to perform any construction within the right-of-way, or to perform any work so closely adjacent as to create a hazardous roadway condition, or to restrict pedestrian or vehicle flow within the right-of-way without having first received a right-of-way permit and/or temporary traffic control permit therefor from the department of engineering.
- (b) All applications for mains, conduits, manholes and other subsurface structures shall be accompanied by a construction plan and typical cross sections showing as nearly as possible the existing underground structures and the location of the proposed structure.
- (c) A copy of the permit and the approved traffic control plan must be maintained at the work site at all times during construction. Upon request, it shall be available for inspection by the city.
- (d) Where, because of a leak, break, failure or other hazardous condition in a utility distribution or collection system, or other emergency, the public safety requires immediate action, the work may proceed without a permit. In such a situation, the permit shall be obtained as soon as possible thereafter.
- (e) A person who begins work within the right-of-way or performs any work so closely adjacent as to create a hazardous roadway condition, or to restrict pedestrian or vehicle flow within the right-of-way without having first received a right-of-way permit and/or temporary traffic control permit, shall be charged a double fee for said permits. This shall not apply to emergency situations.

(Ord. No. O-15-00, § 1, 1-25-00)

*Cross reference— Licenses and miscellaneous business regulations, Ch. 16.*

**Section 23-72. Permit cancellation.**

If a permit has been issued and the work has not been started or has not been completed within the time allowed by the permit, the work cannot proceed until the permit is extended or a new permit is secured. If an extension or new permit is not obtained, the department of engineering may cancel the permit.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-73. Revocation of permit.**

The issuance of a permit will be based upon the approved plans, and no work which changes the alignment or methods of construction from the approved plans shall be performed unless and until revised plans have been submitted to and approved by the department of engineering. The department of engineering may revoke a permit for failure to comply with the terms of the approved traffic control plan or construction plan or for any violation of this article.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-74. Bond; certificate of insurance.**

When permits are requested to disturb, excavate, obstruct, or perform any construction within or interfering with the right-of-way, the department of engineering may require such applicant to provide a bond or certificate of insurance with good and sufficient sureties, conditioned to secure the city and third parties against all loss, damage or injury of any kind which may result by reason of such work.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-75. Inspection fees.**

(a) Where the contractor or other governmental agency makes its own restoration, or the operation is of unusual size or difficulty, the department of engineering may assign an inspector to ensure that street openings or street restoration comply with city, department of engineering standards and specifications. In such cases, the permittee shall deposit with the city the estimated amount of such inspection charges in advance and in accordance with the following fee schedule:

Classification	Minimum 20 Sq. Yds. Or Less	Exceeding 20 Sq. Yds. Minimum Plus Following Rate per Square Yard
Pavement or sidewalks	\$ 15.00	\$ 0.50
Earth or gravel	5.00	0.15

(b) The minimum charge for the issuance of any permit shall be five dollars (\$5.00).

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-76. Responsibility for repair of street, sidewalk, or right-of-way.**

- (a) Where any street, sidewalk or right-of-way is damaged or disturbed by any person, said person shall restore the street, sidewalk, or right-of-way to the condition that existed before the excavation began.
- (b) In all cases where work is done in and upon the streets, sidewalks, or right-of-way, the person doing the work and the person for whom it is done will be held responsible for any subsequent settling of the ground or other disrepair.
- (c) Whenever notified by the department of engineering that such street, sidewalk, or right-of-way where an area was excavated or on account of the work done, is hazardous to the public and requires emergency repair, the person responsible therefor shall immediately cause said area to be repaired. In all other situations, the repair work must be commenced within ten (10) days or within a longer time as approved by the department of engineering.
- (d) If after said notification above, the person responsible fails to make the necessary repairs within the time specified by the department of engineering, said person shall be guilty of a separate

offense and violation of this section, and shall be punished as provided in section 1-9. The department of engineering may further make such necessary and proper repairs at the cost and expense of the person doing such work or having such work done, or for whose benefit such work is done, or at the cost and expense of each of such persons or all of such persons, jointly and severally.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-77. Supervision of work.**

All excavation and construction within the right-of-way, for any purpose shall be done under the regulation, review and approval of the department of engineering.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-78. Public safety and traffic control.**

- (a) A permittee under this article shall carry on the work authorized by the permit in such manner as to cause a minimum of interference with traffic.
- (b) A permittee shall provide adequate signs and devices to warn and guide traffic, and shall place the signs and devices in a position of maximum effectiveness. The most recent edition of the Manual on Uniform Traffic Control Devices shall be used for the design, installation and maintenance of any traffic control devices. The permittee shall provide and deploy all traffic control devices as prescribed in the approved traffic control plan.
- (c) Where difficult or potentially hazardous conditions exist, the permittee shall provide a competent flagger in compliance with the most recent edition of the Manual on Uniform Traffic Control Devices to effect the safe and orderly movement of traffic. Where insufficient traffic lanes exist because of street opening, adequate bridging shall be supplied by the permittee.
- (d) When traffic congestion occurs in spite of all precautions and when the permittee or his agent or employee has notice of the congestion, either actual notice or notice from the department of engineering or the police department, the permittee shall request police department assistance immediately. Failure of the permittee to request such assistance will constitute a violation of this article and will be grounds for revocation of the permit. The permittee shall be responsible for such police assistance at rates determined by the city.
- (e) When construction is required that will block one (1) or more lanes of a principal collector or arterial roadway, the hours of work shall be limited on weekdays to avoid conflict with peak traffic movement. Work on weekdays is permitted only during the following times: 1) before 6:00 a.m., 2) from 9:00 a.m. to 3:00 p.m., and 3) after 6:30 p.m. Additional work hours may be permitted on a case by case basis. Work is permitted on weekends except for unusual circumstances, such as parades and University of Tennessee football games, etc., as determined by the department of engineering.
- (f) When proposed construction will block one (1) or more lanes of a secondary collector or a local roadway, the department of engineering will review the temporary traffic control plans on a case-by-case basis to determine when work is permitted.
- (g) In case of an emergency occurring in any roadway, the permittee must notify the police and the fire departments immediately.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-79. Use of sheeting and braces.**

Whenever the sides of trenches dug in the streets will not stand perpendicularly, sheeting and braces must be used to prevent unnecessary caving.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-80. Work in public right-of-way.**

All work within the right-of-way shall comply with the utility maintenance and construction policy, standard detail for trench cut repair, and policy on work zone traffic control prepared by the department of engineering.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-81. Utility connections to be installed prior to paving the street.**

Where utility connections have not been made in any improvement district, under the abutting property law, utility connections shall be laid to the property line of the abutting owner before the paving on the street is done by the paving contractor. The department of engineering, through the proper officer, shall notify the owner to have such connections made where necessary and at the time necessary. Upon failure of the owner to have such connections made to the property line as provided in this section, it shall be done by the department of engineering at the expense of the abutting owner in order that such street paving may not be torn up unnecessarily after the street has been paved.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-82. Protective barriers for work in sidewalks or right-of-way.**

Any person leaving a hole or excavation in the sidewalk or right-of-way unprotected by a barrier, guard or other reasonable protection against the dangers thereof, whether caused by the taking out or putting in of a grating, tree, pole, or from any other cause which leaves the sidewalk or right-of-way in an unsafe condition for pedestrians, shall be guilty of a misdemeanor.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Section 23-83. Annual maintenance permit.**

The director of engineering is authorized to create an annual permit for the repair and maintenance of existing utility facilities located in the right-of-way and to develop the necessary regulations to administer such permit.

*(Ord. No. O-15-00, § 1, 1-25-00)*

**Sections. 23-84—23-105. Reserved.**

**ARTICLE IV. STREET NAMING AND ADDRESSING**

**Section 23-106. Assignment of street names, property addresses.**

The Knoxville/Knox County Metropolitan Planning Commission shall develop and maintain street names and property addressing. This agency shall maintain a file of existing public and private street names and be responsible for ensuring that proposed street names and addresses are in conformance with this article and do not create duplications. Street names and addresses shall be adopted by the city, provided, however, that the city may modify such names and addresses as it, in its wisdom, deems appropriate.

*(Code 1962, § 36-48; Ord. No. O-280-90, § 2, 9-18-90)*

**Section 23-107. Sections established.**

The city and county shall be divided into four (4) sections by the following streets and rights-of-way:

- (1) North/south line formed by Heiskell Road, Central Avenue Pike, Gay Street, Blount Avenue and Chapman Highway;
- (2) East/west line formed by Asheville Highway, Martin Luther King Avenue, Jackson Avenue, Gay Street, Southern Railway and Kingston Pike.

The system shall start at the intersection of Central Street and Jackson Avenue going to the four (4) general points of the compass, north, south, east and west. Continuous street names which

cross over these designated lines shall carry the appropriate directional prefix, in addition to the proper street name. All official street names shall include the geographic quadrant suffix.  
(Code 1962, § 36-45; Ord. No. O-280-90, § 3, 9-18-90)

**Section 23-108. Street designation.**

The following street designation guidelines shall apply to street names, street signs and addresses:

- (1) All public streets generally extending easterly/westerly shall be designated drives or avenues.
- (2) All public streets generally extending northerly/southerly shall be designated streets or roads.
- (3) Deadend public streets which cannot be extended shall be designated lanes.
- (4) Private easements serving six (6) or more dwelling units shall be designated ways.
- (5) Other designations such as boulevard, pike, circle, etc., may be requested for consideration by application to the metropolitan planning commission (MPC). The MPC shall consider such request in their monthly public meetings and approve or deny the request after consideration of the public interest.

(Code 1962, § 36-46; Ord. No. O-280-90, § 4, 9-18-90)

**Section 23-109. House and building address procedure.**

- (a) The MPC addressing department shall designate the number of each lot or building within the city.
- (b) Buildings on the south and east sides of streets or easements shall receive even numbers. Buildings on the north and west sides of streets or easements shall receive odd numbers. Numbers shall be assigned every twenty-five (25) feet progressively outward from the base lines of the community. Except as otherwise provided by special ordinance of the city council, the numbering in all cases shall begin with the figures "100" and progress consecutively for the first block, and the second block shall begin with the figures "200," the third block shall begin with the figures "300," and so on until the limits of the city are reached.
- (c) Multiple principal structures on a lot shall receive a unique number or letter for each structure. Multiple occupants of a principal structure may be assigned multiple numbers across the linear frontage of structures or a unique number or letter for each occupant in addition to and distinct from the structure's designation.

(Code 1962, §§ 36-46, 36-47; Ord. No. O-280-90, § 5, 9-18-90; Ord. No. O-458-92, § 1, 10-27-92)

**Section 23-110. Buildings required to have number.**

It shall be the duty of the owners, occupants or lessees of all dwellings, apartment houses, hotels, commercial establishments and other buildings to number such buildings with numerals not less than three and one-half (3½) inches in height and/or of such contrasting color and so located as to be readily visible from the street in daylight or when a light is shined upon them at night. Where such buildings have access to an alley, the numbers shall also be posted on the rear of the building, subject to the same requirements, so as to be easily seen from the alley. The owners, occupants or lessees shall number such dwellings, apartment houses, hotels, commercial establishments and other buildings in accordance with the provisions of this article within sixty (60) days from September 18, 1990.

(Code 1962, § 36-49; Ord. No. O-280-90, § 6, 9-18-90)

**Section 23-111. Street names.**

- (a) All proposed names for public streets and private easements shall be reviewed and approved by the MPC addressing department. Approved street names may be reserved for a maximum of eighteen (18) months before being formally recorded.
- (b) Extensions of existing streets, including extensions across intersecting streets, shall use the same name as the existing street, provided, however, that local streets which cross major collector or arterial streets may change names if approved after formal consideration by the MPC.

(c) Street name duplications, including phonetic duplications within Knoxville/Knox County, are prohibited. Existing duplications shall be identified and a procedure initiated for changing the name of the street duplications which is less disruptive to the community.

(d) All initiated street name changes shall be formally acted upon and become effective, if approved, within eighteen (18) months of September 18, 1990.

*(Ord. No. O-280-90, § 7, 9-18-90)*

**Section 23-112. Street signs.**

(a) All public streets and private easements serving six (6) or more dwelling units shall be signed at intersections. Signs shall be built in compliance with the latest edition of "The Manual on Uniform Traffic Control Devices for Streets and Highways."

(b) Street signs shall be provided within three (3) months of public access to the facility. Any repair or replacement of street signs on publicly dedicated right-of-way shall be the responsibility of the city.

(c) All street and road signs in the city shall display street names, any required prefix letter designations, the 100 block number and geographic quadrant letter designation.

*(Ord. No. O-280-90, § 8, 9-18-90)*

**Section 23-113. Appeals.**

(a) Anyone aggrieved by the enforcement of this article may appeal the decision of the MPC staff to the MPC.

(b) Any person, firm or corporation aggrieved by any decision of the MPC may appeal to the city council to consider the same. All appeals shall be filed at the MPC office within fifteen (15) days of the date of the decision being appealed.

*(Ord. No. O-280-90, § 9, 9-18-90; Ord. No. O-211-00, § 1, 5-30-00)*

**Section 23-114. Enforcement.**

(a) Enforcement of this article shall be accomplished through the MPC subdivision regulations and city and county administrative departments. A proper address shall be required for any permit issuance.

(b) Any person, firm, association or corporation who violates, disobeys, omits, neglects or refuses to comply with this article shall be guilty of a misdemeanor and subject to the penalties provided for such an offense.

*(Ord. No. O-280-90, § 10, 9-18-90)*



## **Appendix C POLICIES**

### **Administrative**

- Index Sheet for Appendix C
- Appealed Concept or Use-On-Review Plan
- Covenants – CPMSF (Permanent Maintenance Agreement)
- Declaration Document Process
- Performance and Indemnity Agreements (Bonds)
- Permit Application Process
- Stormwater Easements
- Survey Control System Requirements

### **Grading and Erosion Controls**

- Qualified Local Program Construction General Permit
- Retaining Walls

### **Maintenance (Post Construction)**

- Creek Restoration and Channel Maintenance
- Maintenance Responsibility for Stormwater Drainage Systems
- Sediment Disposal for Detention Basin Maintenance
- Underground Stormwater Facility Maintenance
- Underground Stormwater Facility Recordkeeping / Reporting

### **Stormwater**

- Attenuation Requirements for Substantial and Additional Development
- List of Studied Streams
- No-Rise Certification for Fill Line Area Encroachment
- No-Rise Certification for Floodway Encroachment
- Sinkhole Development
- Stormwater Enforcement Response Plan
- Stormwater Message for Curb Irons and Manhole Lids
- Stormwater Pipe Materials

### **Transportation and Utilities**

- Access Control for Traffic and Driveways
- Permits for Utility Construction
- Permits for Utility Maintenance
- Sidewalk Construction and Maintenance
- Street Lighting and Overhead Wiring in the Central Business Improvement District (CBID)
- Temporary Traffic Control Permit
- Utility Access Driveways
- Utility Construction in the Right-of-Way



## **Policy 24**

### **APPEALED CONCEPT OR USE-ON-REVIEW PLAN**

In order to address issues arising when concept or use-on-review plans approved by the Metropolitan Planning Commission are appealed to the City Council and the appeal is upheld by City Council, the engineering department will not issue site development permits until the final plat is approved and the appeal period has expired, or if appealed, until the appeals process (including any litigation) has been resolved.

Furthermore, as contemplated by the Metropolitan Planning Commission's minimum subdivision regulations, as adopted by the City, no resubmittal of the appealed concept or use-on-review plan to the Metropolitan Planning Commission will be required prior to design plan submittal. The applicant will move forward to the design plan review process correcting the deficiencies in the concept plan or use-on-review plan as designated by City Council. After the design plan has been approved by the appropriate reviewing agencies and upon application for final plat approval, the Metropolitan Planning Commission will consider the concept / use-on-review plan and final plat simultaneously, thus, fulfilling the Metropolitan Planning Commission's minimum subdivision regulations' final plat requirements of an approved concept / use-on-review plan and an approved design plan.



## Policy 02

### COVENANTS FOR PERMANENT MAINTENANCE OF STORMWATER FACILITIES (CPMSF)

Covenants for Permanent Maintenance of Stormwater Facilities (CPMSF) is a permanent maintenance agreement that is recorded (and attached to the deed by reference) as a permanent contract in the official records of the Knox County Register of Deeds. The purpose of this document is to ensure perpetual and proper maintenance, repair and/or replacement of a stormwater facility by the current property owner as well as any future owners. The requirement for a permanent maintenance agreement for stormwater facilities is contained in the Knoxville Stormwater and Street Ordinance (Section 22.5-34). Maintenance of stormwater facilities on private property is the responsibility of the property owner rather than the City of Knoxville. The term "*covenants*" refers to multiple promises from the property owner to the City of Knoxville.

The Stormwater Engineering Division requires that the CPMSF must be properly signed and officially recorded before issuing a site development permit or a building permit. The plans reviewer in the Stormwater Engineering Division will notify the person submitting a site development plan if a CPMSF is required. The completed CPMSF Worksheet (Appendix A) is either mailed or faxed to the Stormwater Engineering Division. The CPMSF document is then prepared and forwarded to the property owner for execution. The property owner is responsible for signing the document and having it notarized. The attached basic CPMSF template is for a typical stormwater detention facility with first flush treatment. Additional requirements may be necessary, based upon the type of detention and/or stormwater quality treatment provided.

When the property owner has signed the document and had it notarized, return (1) the original document and (2) a check in the dollar amount specified and made payable to the Knox County Register of Deeds to:

Construction Bond Coordinator  
City of Knoxville, Engineering Department  
City County Building, Suite 480  
400 Main Street  
Knoxville, TN 37902

The Engineering Department records the document with the Register of Deeds for Knox County. The property owner will be sent a copy of the recorded CPMSF document along with a receipt.

The property owner is also responsible for the preparation and recording of a survey plat\* that shows the stormwater facility and easement. A survey plat must be prepared by a Registered Land Surveyor (RLS) actively registered in the State of Tennessee. The Instrument Number assigned to the CPMSF by the Knox County Register of Deeds must be placed on the new survey plat, so that future property owners and others will have notice of the obligations that run with ownership of the property. The plat must show an easement boundary around each stormwater or water quality facility, complete with bearings and distances, and a tie line from each easement to a property corner. If the facility easement is not directly accessible from an adjoining public street or right-of-way, then a 20-foot traversable access easement must be shown for the stormwater facility.

---

\* NOTE: See the Minimum Subdivision Regulations for platting requirements. Consult the plat review form in Appendix A and the plat review flowcharts in Chapter 2 for additional information, or call the Stormwater Engineering Division (telephone 215-2148) as necessary.

CONTRACT NUMBER:

Form 5/10/2000  
This instrument prepared by:  
Sharon E. Boyce  
Senior Attorney  
City of Knoxville

THIS DOCUMENT IS A  
BLANK TEMPLATE USED  
BY STORMWATER  
ENGINEERING DIVISION IN  
PREPARING A CPMSF.

**COVENANTS FOR PERMANENT MAINTENANCE OF  
STORMWATER FACILITIES**

**THE TERM "STORMWATER FACILITIES" MAY REFER TO WATER QUALITY AND/OR WATER QUANTITY FACILITIES (i.e. detention basins, retention basins, swales, pipes, oil/water separators, sand filtering devices, etc.)**

\_\_\_\_\_, (an individual/ a Tennessee or other state corporation/partnership), with its (office/residence) located at \_\_\_\_\_, (hereinafter "Property Owner") grants these Covenants for Maintenance of Stormwater and/or Water Quality Facilities (hereinafter "Covenants") on this the \_\_ day of \_\_\_\_\_ 2003.

**WITNESSETH:**

**TEMPLATE ONLY !  
Do not use this form to  
execute CPMSF.**

**WHEREAS**, City of Knoxville Ordinance No. 0-155-03, \_\_\_\_\_ is amended, requires property owners to enter into permanent maintenance agreements for stormwater and/or water quality facilities before the property is developed.

**NOW THEREFORE**, as a condition of the Department of Engineering's issuance of a Site Development Permit, the Property Owner warrants, covenants and grants as follows:

1. The Property Owner warrants that it is the owner of property located within the City of Knoxville at \_\_\_\_\_ (address); **CLT Number:** Map\_\_\_ Insert\_\_\_ Group\_\_\_Parcel\_\_\_; **City Block Number:** \_\_\_ ; and more specifically of record by deed dated \_\_\_ in (**Warranty Book** \_\_\_ **Page** \_\_\_ or as **Instrument Number** \_\_\_) with the Knox County Register of Deeds, (hereinafter referred to as the "Property") and that it has the right to grant said Covenants.

2. The Property Owner desires to develop all or a portion of the above described Property according to the Site Development Permit to be issued by the City Engineering Department based on the Property Owner's site/subdivision plan entitled \_\_\_\_\_, dated \_\_\_\_\_ and prepared by \_\_\_\_\_ (hereinafter "Plan").

3. The Property Owner will construct and maintain the stormwater and/or water quality facilities in strict accord with the Plan, specifications, calculations, and conditions required by the Department of Engineering.

4. The Property Owner will provide a surety bond, letter of credit or cash bond acceptable to the City and in an amount to be determined by the Department of Engineering to guarantee that the stormwater and/or water quality facilities are constructed in accordance with the Plan.

5. To ensure that subsequent property owners have notice of these Covenants and the obligations therein, the Property Owner will include in all instruments conveying any or all of the above described Property on which the stormwater and/or water quality facilities are located, the specific instrument numbers referencing these Covenants and the recorded subdivision plat indicated in paragraph 12 herein.

6. The Property Owner will maintain the approved stormwater and/or water quality facilities in good working order acceptable to the City Department of Engineering. Minimum maintenance of the said facilities, shall include sediment, debris, oil, hydrocarbons, and foreign materials removal; cutting and removal of woody vegetation on an annual basis; and keeping emergency spillways functional and clear of woody vegetation and debris so that the operation and capacity of the stormwater and/or water quality facilities continue to meet the standards in said Plan.

7. In order to provide access to stormwater and/or water quality facilities by personnel, vehicles and equipment, the Property Owner will provide a twenty (20) foot wide access within an easement from a public street in strict accord with the Plan and any conditions required by the Department of Engineering. The Property Owner further covenants that no structure or building will be erected on the access easement; that no woody vegetation shall be allowed to grow on the easement; and that no use will be made which will interfere with the use of said easement for access to the facilities. If access to the facilities is obstructed and the City is required to remove the obstruction, the City will follow the notice procedure, double lien, and collection process as set forth in Paragraph 9 herein.

8. Property Owner grants permission to the City, its agents and employees, to enter upon the property to inspect and monitor said facilities whenever the City deems necessary and further for the City or its agents to repair, replace, maintain and reconstruct said facilities as permitted herein.

9. (a) If the City determines that the stormwater detention and/or water quality facilities are not being maintained in good working order and gives written notice to the current property owner to repair, replace, reconstruct or maintain said facilities within a reasonable time, and the property owner fails to comply with the City's notice within the time specified, Property Owner authorizes the City or its agents to enter upon the Property to repair, reconstruct, replace or perform maintenance on said facilities at the Property Owner's expense.

(b) Property Owner further authorizes the City to place a lien for double the amount of said expenses of repair, maintenance or reconstruction against the property.

(c) If the Property Owner fails to pay the City for the above expenses after forty-five (45) days written notice, the Property Owner authorizes the City to collect said expenses from the Property Owner

through the appropriate legal action, with the Property Owner to be liable for the reasonable expenses of collection, court costs, and attorney fees.

(d) Property Owner recognizes, however, that this remedy does not obligate the City to maintain or repair any stormwater facilities and/or water quality facilities or restrict the City from pursuing other or additional legal remedies against the Property Owner.

10. These Covenants shall be binding upon the Property Owner's heirs, administrators, executors, successors and assigns, and any and all subsequent property owners. Upon conveyance of the Property, these Covenants shall transfer to and be binding upon the new property owner, and the original Property Owner shall be released from any and all responsibilities and obligations under these Covenants.

11. These Covenants are permanent and shall run with the land.

12. Property Owner will record a plat showing and accurately defining the easements for stormwater and/or water quality facilities and an access easement to these facilities on a survey plat of record. The plat must reference the Instrument Number where these Covenants are recorded and contain a note that the property owner is responsible for maintaining the facility.

13. Property Owner will record these Covenants with the Knox County Register of Deeds and return the original to the Department of Engineering before the final plat is signed by the Department of Engineering, and before all or any portion of the property is transferred or conveyed.

**APPROVED BY DEPARTMENT OF ENGINEERING:**

**By:** \_\_\_\_\_  
**Title:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

THIS DOCUMENT IS A BLANK TEMPLATE  
USED BY STORMWATER ENGINEERING  
DIVISION IN PREPARING A CPMSF.

**PROPERTY OWNER:**

\_\_\_\_\_  
**BY:** \_\_\_\_\_  
**TITLE:** \_\_\_\_\_

THIS DOCUMENT IS A BLANK  
TEMPLATE USED BY  
STORMWATER ENGINEERING  
DIVISION IN PREPARING A  
NOTARY WITNESS FORM.

STATE OF TENNESSEE  
COUNTY OF KNOX

Before me, \_\_\_\_\_, a Notary Public in and for the County and State aforesaid, personally appeared \_\_\_\_\_, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged himself to be the \_\_\_\_\_ (Title) of \_\_\_\_\_, the within named bargainor, a corporation, and that he/she being authorized so to do, executed the foregoing instrument for the purpose therein contained, by signing the name of the corporation by himself/herself as \_\_\_\_\_

WITNESS, my hand and official seal at office this \_\_\_\_\_ day of \_\_\_\_\_, 2003.

MY COMMISSION EXPIRES:

\_\_\_\_\_

\_\_\_\_\_

NOTARY PUBLIC



## DECLARATION DOCUMENT PROCESS

A Declaration Document may be used to grant certain easements, on property that is recognized as a Lot of Record

- Easements are established by a written legal form document, similar to a property deed, with attached survey map and written description exhibits that describe the location and boundaries of the easements. The survey map and written description exhibits must be prepared and certified by a Tennessee Registered Land Surveyor.
- Typically, the Law Department provides the Declaration Document legal form portion of the document, to which the survey exhibits are attached. However, if determined that an attorney representing the owner or developer shall prepare it, then it must be approved by the Law Department before being recorded.
- The combined Declaration Document, which also includes the surveying map exhibits, shall be recorded in the Office of the Knox County Register of Deeds and in the Technical Services/City Engineering Records.
- Only the part of the property covering the proposed easement area must be surveyed and included on the survey map exhibit.
- The map shall show the proposed easements relative to existing property boundaries, and depending upon review requirements, other existing easements, roads, buildings, utilities, drainage ways, streams, and any other natural features or man-made structures that could affect the proposed easements may need to be shown.
- Declaration Document survey exhibits must be based on actual field surveys that have been conducted in accordance with the Tennessee State Board of Examiners for Land Surveyors Standards of Practice
- Survey exhibits must meet the review requirements of the Engineering Department.
- Composite surveys are not acceptable. However, it can be noted that the map exhibit is not intended to be a General Property Survey as defined by rule 0820-03-.07 and does not require all mapping items contained under said rule to be shown on the map exhibit. The surveyor is encouraged to add a note to the exhibit stating this.
- Declaration Document survey map exhibits should be referenced to the same north meridian as the pre-existing recorded plat of the property.
- To establish easements by the Declaration Document Process:
  1. Contact the Technical Services Offices to verify that it is an option.
  2. Submit a completed application form (attached) and the applicable fee.

- Below are common certificates and notes that are typically required on Declaration Document surveying map exhibits.
  - Property owners are responsible for maintaining stormwater facilities on this property. See Covenants Document recorded as Instrument No. \_\_\_\_\_.
  - This survey does not subdivide any property.
  - The following note may be added at the surveyor's discretion:  
This Survey is not a general property survey as defined by rule 0820-03-.07.
  - City of Knoxville Engineering Department  
The Knoxville Engineering Department hereby approves this plat on this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
  
\_\_\_\_\_  
Engineering Director
- When the Declaration Document and survey exhibits have been approved for recording, the Engineering Department will determine the Register of Deeds' recording fee and inform the surveyor. The Engineering Department shall record the final Declaration Document and provide notice to the surveyor of the recorded document referencing information.

For more information, call the Technical Services Department at (865) 215-2103.

City of Knoxville  
DECLARATION DOCUMENT APPLICATION

Date: \_\_\_\_\_  
To: Director  
City of Knoxville Department of Engineering  
P.O. Box 1631  
Knoxville, TN 37901-1631

<i>For office use only</i> Application#: _____ City Block: _____ Date \$150 fee page: _____ <b>(CC or Check)</b>
--

From: Undersigned Registered Land Surveyor or Property Owner

RE: Declaration Document Process Request

Plat Recording Reference and Lot Number: \_\_\_\_\_

Property Address and/or Tax Map Parcel Info: \_\_\_\_\_

I have read and understand Section 22.5-20 of the City's Stormwater and Street Ordinance and Policy 08 (Declaration Document Process) in the Engineering Department's current Land Development Manual.

Surveyor

Name: \_\_\_\_\_  
Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, Street, Zip: \_\_\_\_\_  
Telephone No: \_\_\_\_\_  
Email: \_\_\_\_\_

\_\_\_\_\_  
Surveyor's Signature\*

\_\_\_\_\_  
RLS No.

Property Owner

Name: \_\_\_\_\_  
Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, Street, Zip: \_\_\_\_\_  
Telephone No: \_\_\_\_\_  
Email: \_\_\_\_\_

\_\_\_\_\_  
Property Owner's Signature\*

\* Either the registered land surveyor or the property owner may sign the application



## **Policy 09**

### **PERFORMANCE AND INDEMNITY AGREEMENT** **(or "Performance Bond")**

The Performance and Indemnity Agreement (also commonly known as a performance bond or a construction bond) is a contract between the Principal and the City of Knoxville. The purpose of the agreement is to ensure that the Principal guaranteeing that the construction work affecting the public interest (streets and drainage) is performed in an appropriate manner. Performance bonds are authorized in the Knoxville Stormwater and Street Ordinance in Sections 22.5-5 and 22.5-27 (see Appendix B).

The three parties included in the agreement are:

1. **Principal:** The party responsible for completing the requirements of the contract according to the design plan approved by the Engineering Department. This person must be the property owner.
2. **Guarantor:** The party providing the collateral in the form of a Letter of Credit, a Surety Bond, or a Cashier's Check.
3. **Beneficiary:** The party receiving the benefits should the Principal not comply with the requirements of the Agreement. The beneficiary is always the City of Knoxville, who would receive the full amount of money in a timely manner.

The Performance and Indemnity Agreement is the City's assurance that it will be reimbursed for assuming the costs of uncompleted work not completed by the Principal according to the required specifications and approved plans. The city plans reviewer will determine the dollar amount of the bond based on the actual construction or potential remediation expenses, using guidelines in the Knoxville Stormwater Ordinance.

When the reviewing engineer determines that a Performance and Indemnity Agreement is required for a project, the party submitting the plans will be notified. It is that party's responsibility (and/or the Principal's responsibility) to provide the Stormwater Engineering Division with the following information by mail or fax:

1. Name, address, phone and fax numbers and the contact person for the Principal.
2. The form of guarantee (Cashier's Check, Letter of Credit, Surety Bond).
3. Name, address, phone and fax numbers and the contact person for the Guarantor.

Upon receipt of this information, the Stormwater Engineering Division will then prepare the bond document for execution. A typical blank template is included as part of this policy. It is the Principal's responsibility to obtain all signatures and notarizations. When the document has been fully executed, it is to be returned to the Stormwater Engineering Division with the original signatures and notary seals.

The initial Performance and Indemnity Agreement covers a one-year time period, which is sufficient for most types of site development projects. If the project is not completed according to the approved site plans and the city's standards within that year, the agreement must be extended.

Approximately 60 days before the expiration date, the Principal and Guarantor will be notified by a courtesy letter concerning the bond agreement. It is the Principal's responsibility to contact the Stormwater

Engineering Division to request that the bond be released or extended. The letter contains the names of contact persons within the Stormwater Engineering Division to request either an extension or a release. A second letter is issued approximately 21 days before the expiration date; this timeframe generally requires immediate action by the Principal.

If the Principal feels that the project is complete, a city construction inspector will visit the site to determine if all requirements have been met. Basic general requirements for the release of a performance bond are:

1. Development certification for constructed items being bonded (i.e., accurate as-builts)
2. No erosion problems, structural deficiencies, unsafe conditions or maintenance issues
3. A good stand of grass within required areas

There may be other specific requirements for each project. The city construction inspector will notify the Principal whether all requirements have been met and whether the bond can be considered for release or must be extended. Occasionally, the city construction inspector will decide that the dollar amount of the bond may be reduced but still needs to be extended. At that time the inspector will notify both the Principal and the Stormwater Engineering Division secretary.

If an extension is required, the Principal must notify the Stormwater Engineering Division secretary of his intention. The secretary will prepare the document for execution and then either mail or fax it to the Principal. It is the Principal's responsibility to submit the executed document, along with either an amended Letter of Credit (extending the expiration date) or an extension of the Surety Bond. If the extension agreement has not been received in the Stormwater Engineering Division within ten days of expiration, the initial stages of the collection procedures will be implemented.

### **PERFORMANCE BONDS - STEP BY STEP INSTRUCTIONS**

- I. The person submitting site development plans is notified by the city plans reviewer that a Performance and Indemnity Agreement is required. The city plans reviewer determines the dollar amount of the bond using standard estimates.
- II. The person submitting the plans (such as the contractor, developer, property owner, project manager, or design engineer) provides written information to the Stormwater Engineering Division listing the Principal, the Guarantor, and form of guarantee (including all contact information such as address and phone numbers).
- III. The Stormwater Engineering Division then prepares the bond document for execution and forwards it to the Principal/Guarantor.
- IV. The signed and notarized document must be returned with the original signatures and notary seals to the Stormwater Engineering Division secretary.
- V. The Principal notifies their financial institution that a letter of credit or cashier's check is required and that the original should be mailed to the Stormwater Engineering Division at the following address: City of Knoxville Engineering Department, 400 Main Street, Suite 480, Knoxville, TN 37902. Alternatively, the Principal may obtain a surety letter from his insurance company, which must be signed by the Principal and an authorized representative of the insurance company. The Principal shall mail the document with original signatures to the same address above (Suite 480), along with proper notarization by a licensed notary public.
- VI. Approximately 60 days prior to the expiration date of the Performance & Indemnity Agreement, the Principal and Guarantor are notified by letter that the agreement needs to be extended. A second notification letter is sent approximately 21 days prior to the expiration date, which is more urgent in nature. These letters are sent as a courtesy, and in no way is the City of Knoxville responsible for reminding the Principal of any expiration dates connected with bonds, site development permits, or the construction process in general.
- VII. It is the Principal's responsibility to notify the Stormwater Engineering Division secretary whether an extension agreement is requested, or that the project is complete and needs to be inspected. It is the Principal's responsibility to contact the city construction inspector in preparing for final inspections and punchlist items.
- VIII. If the city construction inspector determines that the project is complete and that all necessary documentation has been approved by the Stormwater Engineering Division, a Release Document will be prepared and signed by the City Engineering Department with executed copies to be mailed to the Principal and the Guarantor. At this time the Principal has no further responsibility for administering project construction for items that affect the general public and welfare (as far as the Stormwater Engineering Division is concerned).
- IX. If the city construction inspector determines that an extended agreement is required, the Principal must contact the Stormwater Engineering Division to prepare the Extension agreement document and forward it to the Principal for execution. The bond amount shall be unchanged if a bond reduction has not been approved by the Stormwater Engineering Division. The Principal must also notify his bank or insurance institution to provide an amended Letter of Credit or Surety Bond, extending the expiration date to agree with the Extension Agreement.

THIS DOCUMENT IS A  
BLANK TEMPLATE  
USED BY STORMWATER  
ENGINEERING DIVISION  
IN PREPARING A BOND.

## PERFORMANCE AND INDEMNITY AGREEMENT

**KNOW ALL MEN BY THESE PRESENTS:** That **PRINCIPAL**, **PRINCIPAL**, **streetaddress**, Knoxville, Tennessee 37\_\_\_\_, is held and firmly bound unto the CITY OF KNOXVILLE in the sum of **AMOUNT** DOLLARS AND NO/100 (\$**AMOUNT**), guaranteed in the form of Letter of Credit Number \_\_\_\_\_ issued by \_\_\_\_\_, **SURETY**, to ensure proper grading, construction, drainage and payment of any unpaid and due penalties issued either to the property owner or site contractor at **PROJECTNAME**, located at **PROJECTADDRESS**, CLT Number \_\_\_\_\_, Parcel \_\_\_\_\_. The construction allowed by the issuance of Site Development Permit Number. (“Permit”) includes site grading; construction of roads, sidewalks and retaining walls per approved plans; construction of drainage infrastructure (including pipes, ditches, catch basins and/or junction boxes, detention basins, headwalls, and installation of water quality devices) per approved plans; control of erosion and sediment from the site during construction; stabilization of disturbed areas after construction; street lighting; work within the city right-of-way; the development certification (including as-built plans); and “Covenants for Permanent Maintenance of Stormwater Facilities” referenced on the final plat.

As a condition of the issuance of this Permit, **PRINCIPAL**, hereby covenants and agrees that all work being performed on the above described property shall be performed in a workmanlike manner, shall be completed on or before \_\_\_\_\_, and shall conform with the site and drainage plans reviewed and approved by the Department of Engineering, all applicable provisions of the Knoxville City Code, and adopted regulations of the Engineering Department.

**PRINCIPAL**, further agrees to maintain all public streets, sidewalks, and rights-of-way and downstream drainage facilities in the condition that existed prior to construction.

If the work required in the permit is not completed in accordance with the approved plans to the satisfaction of the Engineering Department, or if the street, rights-of-way and downstream drainage facilities are not maintained to their pre-construction condition, or if the work is not completed by \_\_\_\_\_, or within a written extension thereof granted by the Engineering Department the Letter of Credit in the amount of \$**AMOUNT** described herein shall be forfeited to the City of Knoxville to ensure both the satisfactory completion of the work required by the Permit and the satisfactory repair and/or maintenance of the streets, sidewalks, rights-of-way and downstream facilities to pre-construction conditions.

The Department of Engineering will call in the Letter of Credit ten (10) days prior to its expiration date, unless the Department has determined that it will release the Letter of Credit and no extension is required.

Upon completion of the requirements in this Permit and this Agreement to the satisfaction of the Engineering Department, the City will release the Principal's guarantee and relieve the Principal of further responsibility.

**PRINCIPAL**, agrees that this Performance and Indemnity Agreement shall be governed by the laws of the State of Tennessee.

This the \_\_\_\_ day of \_\_\_\_\_ 20\_\_.

PRINCIPAL:

**PRINCIPAL**

BY: \_\_\_\_\_  
Signature

NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

CITY OF KNOXVILLE

\_\_\_\_\_  
BRENTLY J. JOHNSON  
ENGINEERING PLANNING CHIEF

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

Before me, \_\_\_\_\_, of the state and county mentioned, personally  
Name of the Notary Public  
appeared \_\_\_\_\_, with whom I am personally acquainted (or proved to me  
Name of Person Representing the Principal  
on the basis of satisfactory evidence), and who, upon oath, acknowledged himself/herself to be  
\_\_\_\_\_  
Title of Person Representing the Principal (or other officer authorized to execute the instrument) of  
\_\_\_\_\_, the within named bargainor, a \_\_\_\_\_,  
Principal Company Name Type of organization  
and that such \_\_\_\_\_ or officer as such \_\_\_\_\_,  
Title of Person Representing the Principal Title of Person Representing the Principal  
executed the foregoing instrument for the purpose therein contained, by personally signing the  
name of the \_\_\_\_\_ as \_\_\_\_\_.  
Type of organization Title of Person Representing the Principal

WITNESS, my hand and seal, at office, this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_.

\_\_\_\_\_  
NOTARY PUBLIC (Signature)

MY COMMISSION EXPIRES:  
\_\_\_\_\_



City of Knoxville, Tennessee  
Stormwater Engineering Division  
[www.knoxvilletn.gov/engineering/](http://www.knoxvilletn.gov/engineering/)

Land Development Manual  
October 2022

## PERMIT APPLICATION PROCESS

Site development permits are issued in conjunction with the Plans Review and Inspections Department. The permits are applied via an online portal found at [permits.knoxvilletn.gov](http://permits.knoxvilletn.gov). For any questions, please contact the City of Knoxville Development Services desk at 865-215-3669.

## STORMWATER EASEMENTS

### Detention/Retention Easement

#### *Stormwater Basins*

- All stormwater basins, must have a minimum 5 foot wide flat area on all fill berms; the area must be a minimum of 1 foot above the 100-year water surface elevation.
- If the basin slope is in cut:
  - The easement shall extend 5 feet outside the freeboard elevation (1 foot above the 100-year water surface elevation) (Figures 1 & 2).

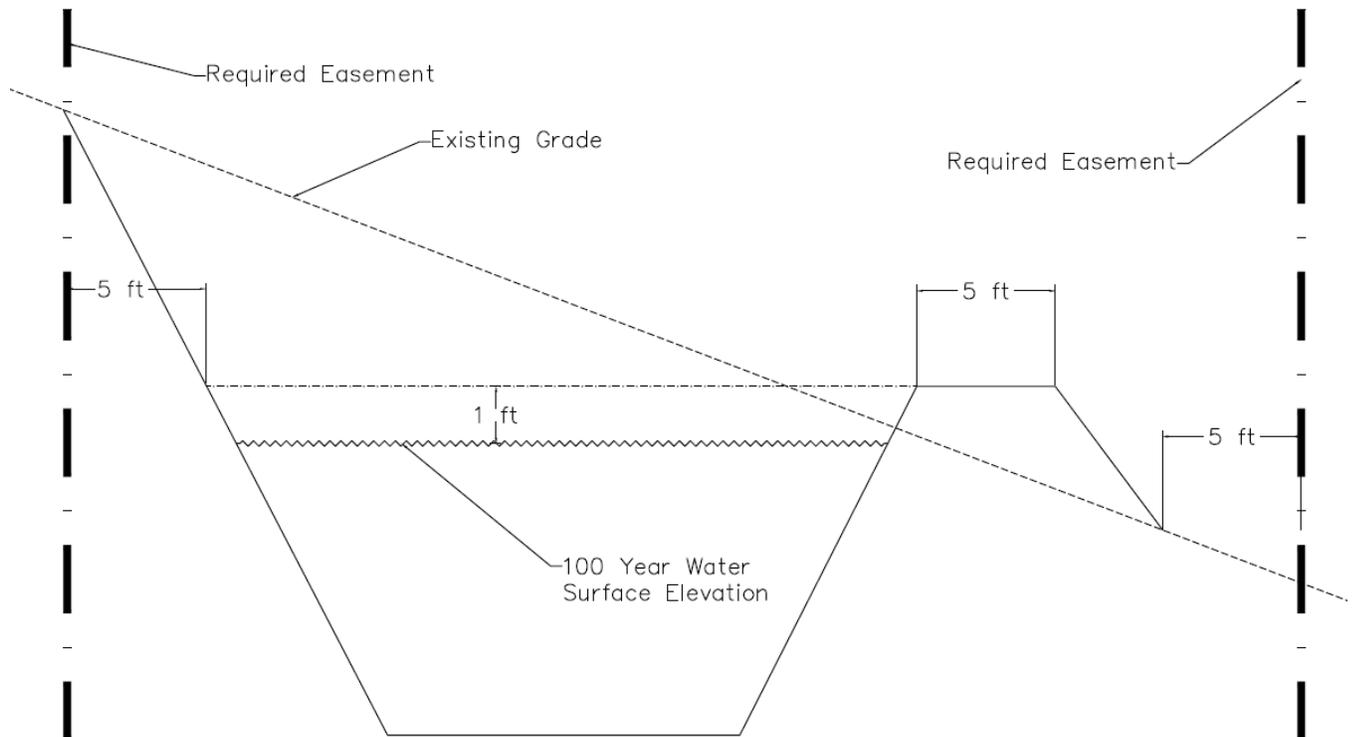


Figure 1

- If the basin slope is in fill:
  - The easement must extend 5 feet beyond the basin's toe of fill slope (Figure 1).

- The easement must extend a length equal to the elevation difference between the top of the berm and the bottom of the basin, plus an additional 10 feet (Figure 2).

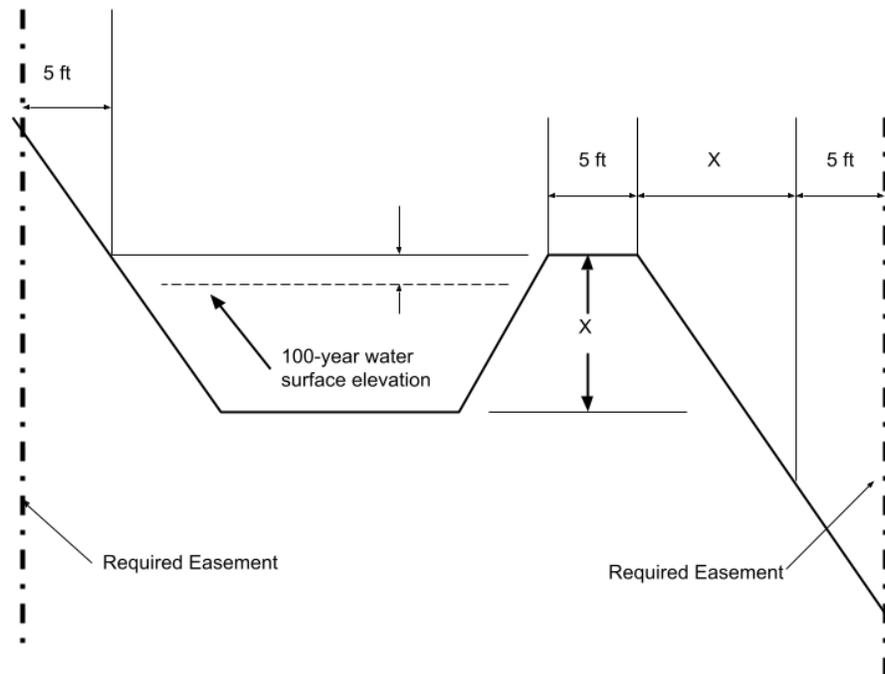


Figure 2

### *Sinkholes*

- If an existing sinkhole is utilized to provide attenuation or retention, the easement shall extend a minimum of 5 feet horizontally from the edge of the 100-year water surface elevation.

### *Underground*

- Easements for infiltration and underground chamber systems must encompass the footprint of the device plus its depth.

### Water Quality Facility Easement (WQFE)

- A WQFE is required for all facilities that provide first flush treatment or Large Parking Lot Special Pollution Abatement Permit treatment. The easement must be large enough to encompass and maintain the facility. The minimum easement size is 20 feet by 20 feet.
- If a device described in the Detention/Retention section is utilized to provide water quality, the easement sizing requirements shall also apply to WQFE.

Drainage Easement

*Pipes*

Pipe Size (diameter or span, inches)	Drainage Easement Width (Feet)		
	(based on maximum depth from top of ground to pipe invert)		
	6 feet or less	6 feet - 12 feet	more than 12 feet
15 - 24	10	20	30
27 - 48	15	20	30
54 - 60	20	20	30

Table 1

*Swales and ditches*

- Must be the width required to convey their design storm plus 5 feet with a minimum width of 10 feet.

Access Easement

- Required to provide traversable access from the public right-of-way to detention/retention easements and WQFE.
- Must be a minimum of 20 feet wide and must have a maximum slope of 3H:1V.
- Must not contain obstructions, *e.g.*, trees or fences without gates.
- If the length, slope, or terrain cause vehicle movements to be dangerous, additional turnaround or maneuvering areas may be required.
- Shall not generally cross the emergency spillway.
- A “Blanket Access Easement” may be recorded in place of specific access easement, but a path meeting the access easement requirements must be provided and maintained.



## SURVEY CONTROL SYSTEM REQUIREMENTS

The purpose of this policy is to clarify plat requirements relative to the *Knoxville-Knox County Planning Subdivision Regulations* and the use of the City of Knoxville's Survey Control System.

The information required by the Standards of Practice and the Subdivision Regulations must be included on all survey plats. When a survey is tied to the City of Knoxville's survey control system, the following information is also required:

1. The survey shall be tied to an approved survey control point and rotated to the grid bearing between that point and a nearby, second, approved, survey control point. The grid bearing shall be the bearing computed between the published coordinates of the two selected points. The points become the base control points for the survey.
2. A tie line from a property corner to the closest base control point shall be shown. The tie line shall include the grid bearing and measured ground distance of the line. Ground distance is defined as the horizontal distance between two points as measured at ground datum. When grid distances are shown on the survey plat the corresponding ground distance shall also be shown.
3. The survey shall include a reference to the horizontal datum that the published coordinates are based on. On June 17, 2013 the most recent coordinate system "NAD83 (NSRS2007)" was replaced with adjusted data. The adjusted data is based on the NAD83 (2011) adjustment and shall be the required reference datum for all plat ties.
4. The point identification number, horizontal datum, and the latest published north and east coordinate of the base control point at the end of the tie line shall be labeled on the plat verbatim as published, including all digits after the decimal point.
5. The grid north meridian shall be identified. When labeling the north arrow, use "GRID NORTH" or "GRID NORTH/NAD83 (2011)". Do not label the North arrow as "KGIS" or any variation thereof.
6. The following note shall be shown on the plat.

GRID NORTH is based on a bearing of  X Deg° Min' Sec" Y from City  
Control Point # \_\_\_\_\_ to # \_\_\_\_\_. Distances have not been reduced to grid.

7. If a published elevation for an approved control point is labeled on the plat, the proper vertical reference datum must also be labeled (NGVD29 or NAVD88). Both elevations are included in the published data. Label elevations verbatim as published, including all digits after the decimal point.

When selecting the base control points for a survey, confirm their integrity by measuring and comparing the ground distance between them to the grid distance computed from the published coordinates. Ground distances should be longer than grid distances by a factor of approximately 1.0001 (about 0.10 feet longer per 1,000 feet). Please report any missing, disturbed, or otherwise unusable control points to the City Surveyor by calling (865) 215-6100.

Survey control data for the City of Knoxville Survey Control System is available on the [Survey Control Points](#) web page and through the Technical Services Department (865-215-2103) located in the City-County Building at 400 Main Street, Knoxville, Tennessee 37901.



**Policy 27**  
**QUALIFIED LOCAL PROGRAM**  
**CONSTRUCTION GENERAL PERMIT**

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**LDM APPENDIX A, FORM R – Twice-Weekly Inspection Report Form**

## SECTION 1 COVERAGE UNDER THIS GENERAL POLICY

### 1.1 POLICY AREA

This construction general permit (CGP) covers all areas of the City of Knoxville.

### 1.2 DISCHARGES COVERED BY THIS POLICY

#### 1.2.1 Stormwater discharges associated with construction activities

This policy authorizes point source discharges of stormwater from construction activities that result in soil disturbances of one or more acres. Soil disturbances of less than one acre are required to obtain authorization under this policy if construction activities are part of a larger common plan of development or sale that comprises at least one acre of cumulative land disturbance. Construction activities include clearing, grading, filling and excavating. One or more site operators must maintain coverage under this policy for all portions of a site that have not been permanently stabilized.

Projects of less than one acre of total land disturbance may also be required to obtain authorization under this policy if:

- a) the director has determined that the stormwater discharge from a site is causing, contributing to, or is likely to contribute to a violation of a state water quality standard;
- b) the director has determined that the stormwater discharge is, or is likely to be, a significant contributor of pollutants to waters of the state, or
- c) changes in state or federal rules require sites of less than one acre that are not part of a larger common plan of development or sale to obtain a stormwater permit.

Any discharge of stormwater, or other fluid, to an improved sinkhole or injection well must be authorized by policy or rule as a Class V underground injection well under the provisions of Tennessee Rules, Chapter 0400-45-06.

#### 1.2.2 Stormwater discharges associated with construction support activities

This policy also authorizes stormwater discharges from support activities associated with a permitted construction site (Support activities may include concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas). Support activities are authorized provided all of the following are met:

- a) The support activity is related to a construction site that is covered under this general permit.
- b) The operator of the support activity is the same as the operator of the construction site.
- c) The support activity is not a commercial operation serving multiple unrelated construction projects by different operators.
- d) The support activity does not operate beyond the completion of the construction activity of the last construction project it supports.

- e) Support activities are identified in the Notice of Intent (NOI) and the Stormwater Pollution Prevention Plan (SWPPP). The appropriate erosion prevention and sediment controls and measures applicable to the support activity shall be described in a comprehensive SWPPP covering the discharges from the support activity areas.

Stormwater discharges associated with support activities that have been issued a separate individual permit or an alternative general permit are not authorized by this general permit. This policy does not authorize any process wastewater discharges from support activities. Process wastewater discharges from support activities must be authorized by an individual permit or other appropriate general permit.

#### 1.2.3 Non-stormwater discharges authorized by this policy

The following non-stormwater discharges from active construction sites are authorized by this policy provided the non-stormwater component of the discharge is in compliance with Subsection 3.5.9 (*Pollution prevention measures for non-stormwater discharges*):

- a) Dewatering of collected stormwater and ground water.
- b) Waters used to wash dust and soil from vehicles where detergents are not used and detention and/or filtering is provided before the water leaves site. Wash removal of process materials such as oil, asphalt or concrete is not authorized.
- c) Water used to control dust in accordance with Subsection 3.5.5 (*Other items needing control*).
- d) Potable water sources including waterline flushings, from which chlorine has been removed to the maximum extent practicable.
- e) Routine external building washdown that does not use detergents or other chemicals.
- f) Uncontaminated groundwater or spring water.
- g) Foundation or footing drains where flows are not contaminated with pollutants (process materials such as solvents, heavy metals, etc.).

All non-stormwater discharges authorized by this policy must be free of sediment and other solids, must not cause erosion of soils, and must not result in sediment impacts to the receiving streams.

#### 1.2.4 Other NPDES-permitted discharges

Discharges of stormwater or wastewater authorized by and in compliance with a different National Pollutant Discharge Elimination System (NPDES) permit may be mixed with discharges authorized by this permit.

### 1.3. LIMITATIONS ON COVERAGE

Except for discharges from support activities, as described in Subsection 1.2.2 (*Stormwater discharges associated with construction support activities*) and non-stormwater discharges listed in Subsection 1.2.3 (*Non-stormwater discharges authorized by this policy*), all discharges covered by this policy shall be composed entirely of stormwater. This policy does not authorize the following discharges:

- a) Post-construction discharges (Permanent Stormwater Management) -Stormwater discharges associated permanent stormwater management structures after construction activities have been completed, the site has undergone final stabilization and the coverage under this permit has been terminated.
- b) Discharges mixed with non-stormwater - Discharges that are mixed with sources of non-stormwater, other than discharges which are identified in Subsection 1.2.4 (*Other NPDES-permitted discharges*), and in compliance with Subsection 3.5.9 (*Pollution prevention measures for non-stormwater discharges*) of this permit.
- c) Discharges covered by another permit - Discharges associated with construction activities that have been issued an individual permit in accordance with Subsection 7.12 (*Individual Permit*).
- d) Discharges threatening water quality - Discharges from construction sites, that the director determines will cause, or has the reasonable potential to cause, or contribute to, violations of water quality standards. Where such a determination has been made, the department will notify discharger in writing that an individual permit application is necessary as described in Subsection 7.12 (*Individual Permit*). The department may authorize coverage under this policy after appropriate controls and implementation procedures have been included in the SWPPP that are designed to bring the discharge into compliance with water quality standards.
- e) Discharges into waters with unavailable parameters (impaired) streams – Discharges to waters with unavailable parameters that would cause measurable degradation of water quality for the parameter that is unavailable; or that would cause additional loadings of unavailable parameters that are bioaccumulative or that have criteria below method detection levels. Waters with unavailable parameters means any segment of surface waters that has been identified by the department as failing to support its designated classified uses. A discharge that complies with the additional requirements set forth in Subsection 5.4 is not considered to cause measurable degradation of waters with unavailable parameters, unless the department determines upon review of the SWPPP that there is a reason to limit coverage as set forth in Subsection 1.3(d) and the SWPPP cannot be modified to bring the site into compliance.
- f) Discharges into Outstanding National Resource Waters – Discharges into waters that designated by the Water Quality Control Board Outstanding National Resource Waters (ONRWs) pursuant to Tennessee Rules, Chapter 0400-40-03-.06(5).
- g) Discharges into Exceptional Tennessee Waters - Discharges that would cause more than de minimis degradation of water quality for any available parameter in waters designated by TDEC as Exceptional Tennessee. A discharge that complies with the additional requirements set forth in Subsection 5.4 is not considered to cause more than *de minimis* degradation of available parameters unless the department determines upon review of the SWPPP that there is a reason to limit coverage as set forth in Subsection 1.3(d) and the SWPPP cannot be modified to bring the site into compliance.
- h) Discharges not protective of aquatic threatened and endangered, species deemed in need of management or special concern species - Discharges or discharge-related activities that are likely to jeopardize the continued existence of listed or proposed threatened or endangered aquatic species, or their critical habitat, under the Endangered Species Act (ESA), or other applicable state law or rule. Discharges or conducting discharge related activities that will cause a prohibited take of federally listed aquatic species (as defined under Section 3 of the ESA and 50 CFR §17.3),

unless such take is authorized under Sections 7 or 10 of the ESA. Discharges or conducting discharge-related activities that will cause a prohibited “take” of state listed aquatic species (as defined in the Tennessee Wildlife Resources Commission Proclamation, Endangered or Threatened Aquatic Species, and in the Tennessee Wildlife Resources Commission Proclamation, Wildlife in Need of Management), unless such take is authorized under the provisions of T.C.A. § 70-8-106(e).

- i) Discharges from a new or proposed mining operation - Discharges from a new or proposed mining operation are not authorized.
- j) Discharges negatively affecting a property on the National Historic Register – Discharges that would negatively affect a property that is listed or is eligible for listing in the National Historic Register maintained by the Secretary of Interior.
- k) Discharges into waters with approved Total Maximum Daily Load - Discharges a pollutant to waters for which there is an EPA-approved or established total maximum daily load (TMDL) for that pollutant, unless the SWPPP incorporates measures or controls consistent with the assumptions and requirements of the TMDL. If a specific wasteload allocation has been established, that would apply to the discharge, that allocation must be incorporated into the SWPPP and steps necessary to meet that allocation must be implemented. If an EPA-approved or established TMDL has specified a general wasteload allocation applicable to construction stormwater discharges, but no specific requirements for construction sites have been identified, the permittee should consult with the department to confirm that adherence to a SWPPP that meets the requirements of this permit will be consistent with the approved TMDL. Where an EPA approved or established TMDL has not specified a wasteload allocation applicable to construction stormwater discharges, but has not specifically excluded these discharges, adherence to a SWPPP that meets the requirements of the CGP will be assumed to be consistent with the approved TMDL. If the EPA-approved or established TMDL specifically precludes construction stormwater discharges, the operator is not eligible for coverage under the CGP.

#### 1.4 OBTAINING POLICY COVERAGE

A complete NOI, SWPPP and application fee are required to obtain coverage under this general permit. Requesting coverage under this permit means that an applicant has examined a copy of this permit and thereby acknowledged the applicant’s claim of ability to comply with permit terms and conditions. Upon completing NOI/SWPPP review, the department will:

- a) issue a NOC to the operator identified as the initial site-wide primary permittee on the NOI form (see Subsection 1.5 (*Effective Date of Coverage*)),
- b) notify the applicant of needed changes to their NOI submittal (see Subsection 2.6.3 (*Application completeness*)), or
- c) deny coverage under this general permit (see Subsection 7.12 (*Individual Permit*)).

##### 1.4.1 Notice of Intent

Operators wishing to obtain coverage under this policy must submit a complete NOI in accordance with Section 2, using the NOI form provided in Appendix A of this policy. The department will review NOIs for completeness and accuracy and, when deemed necessary, investigate the proposed project for potential impacts to the waters of the state.

#### 1.4.2 Stormwater Pollution Prevention Plan (SWPPP)

Operators wishing to obtain coverage under this policy must submit a site-specific SWPPP with the NOI. The SWPPP, developed and submitted by the site-wide permittee (typically the owner/developer who applies for coverage prior to project commencement), should address all construction-related activities from the date construction commences to the date of termination of permit coverage, to the maximum extent practicable. The SWPPP must address the total acreage planned to be disturbed (see definition for “disturbed area” in Section 10), including any associated construction support activities (see Subsection 1.2.2). The SWPPP must be developed, implemented and updated according to the requirements in Section 3 (*SWPPP Requirements*) and Subsection 2.3 (*Responsibilities of Operators*). The SWPPP must be implemented prior to commencement of construction activities.

If the initial SWPPP does not address all activities until final stabilization of the site, an updated SWPPP or addendums to the plan addressing all aspects of current site disturbance must be prepared. An active, updated SWPPP must be in place for all disturbed portions of a site until each portion has been completed and permanently stabilized.

Preparation and implementation of the SWPPP may be a cooperative effort with all operators at a site. New operators with design and operational control of their portion of the construction site are expected to adopt, modify, update and implement the comprehensive SWPPP. Primary permittees at the site may develop a SWPPP addressing only their portion of the project, as long as the proposed Best Management Practices (BMPs) are compatible with the comprehensive SWPPP and complying with conditions of this general permit.

#### 1.4.3 Permit application fee

The permit application fee should accompany the applicant’s NOI form. The fee is based on the total acreage planned to be disturbed (see definition of “disturbed area” in Section 10) by an entire construction project for which the applicant is requesting coverage, including any associated construction support activities (see Subsection 1.2.2). The applicant may present documentation of common areas in the project that will not be subject to disturbance at any time during the life of the project and have these areas excluded from the fee calculation.

The application fees shall be as specified in the *Stormwater and Street Ordinance*. The application will be deemed incomplete until the appropriate application fee is paid in full. Checks for the appropriate fee should be made payable to “City of Knoxville.” There is no additional fee for subsequent owner/operator to obtain permit coverage (see Subsection 2.4.3), as long as the site-wide primary permittee has active permit coverage at the time of receipt of the subsequent operator’s application, because the site-wide primary permittee paid the appropriate fee for the entire area of site disturbance. If a project was previously permitted, but permit coverage was terminated (see Subsection 8.1.1 (*Termination process for primary permittees*)), and subsequent site disturbance or re-development occurs, the new operator must obtain coverage and pay the appropriate fee for the disturbed acreage.

## 1.5 EFFECTIVE DATE OF COVERAGE

### 1.5.1 Notice of Coverage

The NOC is a notice from the department to the initial site-wide primary permittee informing the applicant that the NOI, the SWPPP, and the application fee were received and accepted, and stormwater discharges from a specified area of a construction activity have been approved under this general permit. The initial site-wide primary permittee is authorized to discharge stormwater associated with construction activity as of the effective date listed on the NOC.

Assigning a permit tracking number by the department to a proposed discharge from a construction site does not confirm or imply an authorization to discharge under this permit. The department reserves the right to deny coverage to artificial entities (e.g., corporations or partnerships, excluding entities not required to register with the Tennessee Secretary of State) that are not properly registered and in good standing (i.e., listed with an entity status of “active”) with the Tennessee Secretary of State, Division of Business Services. The department also reserves the right to issue permit coverage in the correct legal name of the individual or entity seeking coverage, including each general partner of a general partnership in addition to the general partnership.

Correspondence with the permittee is maintained through the Site Owner or Developer listed in the NOI: not the optional contact or the secondary permittee.

If an Aquatic Resource Alteration Permit (ARAP) is required for a site proposed for active construction, the NOC will not be issued until an ARAP application is submitted and deemed by the City of Knoxville to be complete. The treatment and disposal of wastewater (e.g., sanitary wastewater) generated during and after the construction must be also addressed prior to the issuance of the NOC. The NOC may be delayed until adequate wastewater treatment and accompanying permits are issued.

### 1.5.2 Permit tracking numbers

Construction sites covered under this permit will be assigned permit tracking numbers in the sequence TNQ030001, TNQ030002, etc. An operator presently permitted under a previous construction general permit shall be granted coverage under this new general permit. Permit tracking numbers assigned under a previous construction general permit will be retained (see Subsection 2.4.1 (*Existing site*)). An operator receiving new permit coverage will be assigned a new permit tracking number (see Subsection 2.4.2 (*New site or new phases of existing sites*)).

## SECTION 2 NOTICES OF INTENT (NOI) REQUIREMENTS

### 2.1 WHO MUST SUBMIT AN NOI?

All site operators must submit an NOI form. “Operator” for the purpose of this policy and in the context of stormwater associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria:

- a) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g. subsequent builder), or the person who is the current owner of the construction site. This person is considered the primary permittee
- b) The person has day-to-day operational control of the activities necessary to ensure compliance with the SWPPP or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

The site-wide permittee is the first primary permittee to apply for coverage at the site. There may be other primary permittees for a project, but there is only one site-wide permittee. Where there are multiple operators associated with the same project, all operators are required to obtain permit coverage. Once covered by a permit, all such operators are to be considered as co-permittees if their involvement in the construction activities affects the same project site, and are held jointly and severally responsible for complying with the permit.

### 2.2 CONSTRUCTION SITE OPERATORS

#### 2.2.1 Owner/Developer

An owner or developer of a project is a primary permittee. This person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person may include, but is not limited to, a developer, landowner, realtor, commercial builder, homebuilder, etc. and may be an individual, a corporate entity, or a governmental entity. An owner’s or developer’s responsibility to comply with requirements of this policy extends until permit coverage is terminated in accordance with requirements of Section 8 (*Requirements for Termination of Coverage*).

#### 2.2.2 Commercial builders

A commercial builder can be a primary or secondary permittee at a construction site.

A commercial builder who purchases one or more lots from a site-wide permittee for the purpose of constructing and selling a structure (e.g., residential house, non-residential structure, commercial building, industrial facility); and has design or operational control over construction plans and specifications is a primary permittee for that portion of the site. A commercial builder may also be hired by an end user such as a lot owner who may not be a permittee. In either case, the commercial builder is considered a new operator and must submit a new NOI following requirements in Subsection 2.4.3 (*New operator*).

The commercial builder may also be hired by the primary permittee or a lot owner to build a structure. In this case, the commercial builder signs the primary permittee’s NOI and SWPPP as a contractor (see Subsection 2.2.3 (*Contractors*)) and is considered a secondary permittee.

### 2.2.3 Contractors

A contractor is considered a secondary permittee. This person has day-to-day operational control of the activities necessary to ensure compliance with the SWPPP or other permit conditions (e.g., the contractor is authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

A contractor may be: a general contractor, a grading contractor, an erosion control contractor, a sub-contractor responsible for land disturbing activities or EPSC implementation and maintenance, or a commercial builder hired by the primary permittee. The contractor may need to include in their contract with the party that hired them specific details for the contractor's responsibilities concerning EPSC measures. This includes the ability of the contractor to make EPSC modifications. The contractor should sign the NOI and SWPPP associated with the construction project at which they will be an operator.

## 2.3 RESPONSIBILITIES OF OPERATORS

A permittee may meet one or more of the operational control components in the definition of "operator" found in Subsection 2.1 (*Who must submit an NOI?*). Either Subsection 2.3.1 (*Permittee(s) with design control (owner/developer)*) or 2.3.2 (*Permittee(s) with day-to-day operational control (contractor – secondary permittee)*), or both, will apply depending on the type of operational control exerted by an individual permittee.

### 2.3.1 Permittees with design control

Permittees with design control (i.e., operational control over construction plans and specifications) at the construction site, including the ability to make modifications to those plans and specifications must:

- a) ensure the project specifications they develop meet the minimum requirements of Section 3 (*Stormwater Pollution Prevention Plan (SWPPP) Requirements*) and all other applicable conditions;
- b) ensure the SWPPP indicates the areas of the project where they have design control, and ensure all other permittees implementing and maintaining portions of the SWPPP impacted by any changes they make to the plan are notified of such modifications in a timely manner;
- c) ensure that all common BMPs (i.e., sediment treatment basin and drainage structures) necessary for the prevention of erosion and control of sediment are maintained and effective until all construction is complete and all disturbed areas in the entire project are stabilized, unless permit coverage has been obtained and responsibility has been taken over by a new primary permittee; and
- d) ensure that all operators on the site have permit coverage, if required, and are complying with the SWPPP.

If parties with day-to-day operational control of the construction site have not been identified at the time the comprehensive SWPPP is initially developed, the permittee with design control shall be considered to be the responsible person until a supplemental NOI is submitted identifying the new operators (see Subsection 2.4.3). These new operators (e.g., general contractor, utilities contractors, sub-contractors, erosion control contractors, hired commercial builders) are considered secondary permittees. The SWPPP must be updated to reflect the addition of new operators.

### 2.3.2 Permittees with day-to-day operational control (contractor – secondary permittee)

Permittees with day-to-day operational control of the activities necessary to ensure compliance with the SWPPP or other permit conditions must:

- a) ensure the SWPPP for portions of the project where they are operators meets the minimum requirements of Section 3 (*SWPPP Requirements*) and identifies the parties responsible for implementing the of control measures identified in the plan;
- b) ensure the SWPPP indicates areas of the project where they have operational control over day- to-day activities; and
- c) ensure that measures in the SWPPP are adequate to prevent erosion and control any sediment that may result from their earth disturbing activity.

Permittees with operational control over only a portion of a larger construction project are responsible for compliance with all applicable terms and conditions of this policy as it relates to their activities on their portion of the construction site. This includes, but is not limited to, implementation of Best Management Practices (BMPs) and other controls required by the SWPPP. Permittees shall ensure either directly or through coordination with other permittees, that their activities do not render another person's pollution control ineffective. All permittees must implement their portions of a comprehensive SWPPP.

## 2.4 NOI SUBMITTAL

### 2.4.1 Existing site

An operator presently permitted under the 2011 construction general permit shall be granted coverage under this new general permit.<sup>1</sup> There will be no additional fees associated with an extension of coverage for existing sites under the new permit. The department may, at its discretion, require permittees to confirm their intent to be covered under this new general permit following its effective date through submission of an updated NOI. If the confirmation is required but not received by the department, coverage under the new general permit will be terminated. If a site with terminated coverage is unstable or if construction continues, a new NOI, SWPPP and application fee must be submitted.

### 2.4.2 New site or New Phases of Existing Sites

Except as provided in Subsection 2.4.3 (*New operators*), operators must submit a complete NOI, SWPPP and an application fee in accordance with the requirements described in Subsection 1.4 (*Obtaining Policy Coverage*). The complete application should be submitted at least 30 days prior to commencement of construction activities. The permittee is authorized to discharge stormwater associated with construction activity as of the effective date listed on the NOC. The land disturbing activities shall not start until a NOC is prepared and written approval by the department staff is obtained according to Subsection 1.5 (*Effective Date of Coverage*).

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<sup>1</sup> If the existing permittee is an artificial person (e.g., a partnership or corporation, excluding entities not required to register with the Tennessee Secretary of State), the department reserves the right to deny coverage under this new general permit if the permittee is not registered and in good standing (i.e., listed with an entity status of “active”) with the Tennessee Secretary of State, Division of Business Services. The department further reserves the right to convert permit coverage to the correct legal name of the permittee and to name each general partner of a general partnership in addition to the general partnership.

### 2.4.3 New operators

A supplemental NOI should be submitted as soon as practicable, before a new operator commences work at the site. The supplemental NOI must reference the project name and tracking number assigned to the primary permittee's NOI.

If the site under the control of the new owner is inactive and all areas disturbed are completely stabilized, the NOI may not need to be submitted immediately upon assuming operational control. However, the department should be notified if a new operator obtains operational control at a site, but commencement of construction under the direction of the operator at the site is going to be delayed.

If the primary permittee's company name has changed (but not the site ownership or authorized signatories), an updated NOI should be submitted to the department within 30 days of the name change, along with documentation that the name change has been properly registered with the Tennessee Secretary of State, Division of Business Services. If the new operator agrees to comply with an existing comprehensive SWPPP already implemented at the site, a copy of the supplemental or modified SWPPP does not have to be submitted with the NOI.

If the transfer of ownership is due to foreclosure or a permittee filing for bankruptcy proceedings, the new owner (e.g., a lending institution) must obtain permit coverage if the property is inactive, but is not stabilized sufficiently. If the property is sufficiently stabilized, permit coverage may not be necessary unless, and until, construction activity at the site resumes.

### 2.4.4 Late NOIs

Dischargers are not prohibited from submitting late NOIs. When a late NOI is submitted, and if the department authorizes coverage under this permit, such authorization is only for future discharges. Any prior, unpermitted, discharges or policy noncompliance are subject to penalties as described in Subsection 7.1.2 (*Penalties*).

## 2.5 WHO MUST SIGN THE NOI?

All construction site operators as defined in Subsection 2.2 (*Construction Site Operators*) must sign the NOI form. Signatory requirements for a NOI are described in Subsection 7.7.1 (*Signatory requirements for an NOI*). All signatures must be original. An NOI that does not bear an original signature will be deemed incomplete. The department recommends that signatures be in blue ink.

## 2.6 NOI FORM

### 2.6.1 Contents of the NOI form

The NOI for construction projects shall be submitted on the form provided in Appendix A of this policy. This form and its instructions set forth the required content of the NOI. The NOI form must be filled in completely. If sections of the NOI are left blank, a narrative explaining the omission must be provided as an attachment.

Owners, developers and contractors that meet the definition of the operator in Subsection 2.2 (*Construction Site Operators*) shall apply for permit coverage on the same NOI, if possible. The department may accept separate NOI forms from different operators for the same construction site when warranted.

After permit coverage has been granted to the primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The SWPPP shall be prepared in accordance Section 3 (*SWPPP Requirements*), and must be submitted with the NOI unless the NOI is only being submitted to add a secondary permittee to an existing coverage.

#### 2.6.2 Construction site map

An excerpt (8 ½" by 11" or 11" by 17") from the appropriate 7.5 minute United States Geological Survey (USGS) topographic map, with the proposed construction site centered, must be included with the NOI. The entire proposed construction area must be outlined in red on the map. The total acreage to be disturbed should be included on the map. All outfalls discharging runoff from the property should be identified. Streams receiving the discharge, and storm sewer systems conveying the discharge from outfalls should be clearly identified and marked on the map. The map should also list and indicate the location of EPSCs that will be used at the construction site. NOIs for linear projects must specify the location of each end of the construction area and all areas to be disturbed. Commercial builders that develop separate SWPPPs that cover only their portion of the project shall also submit a site or plat map that clearly indicates the lots for which they are applying for permit coverage and the location of EPSCs that will be used at each lot.

#### 2.6.3 Application completeness

The department recommends that all applicants use the Notice of Intent (NOI) & Stormwater Pollution Prevention Plan (SWPPP) Checklist (see Land Development Manual – Appendix A) to check the completeness of their submittal.

Based on a review of the NOI and other available information, the department shall:

- a) issue a NOC to the initial site-wide primary operator for the construction site (see Subsection 1.5),
- b) prepare a deficiency letter stating additional information must be provided before the NOC can be issued, or
- c) deny coverage under this general permit.

#### 2.7 WHERE TO SUBMIT THE NOI, SWPPP AND APPLICATION FEE

The applicant shall submit the NOI, SWPPP and APPLICATION fee to the City of Knoxville Department of Engineering. The TDEC's Nashville Central Office will serve as a processing office for NOIs submitted by federal or state agencies (including, but not limited to the Tennessee Department of Transportation (TDOT), Tennessee Valley Authority (TVA) and the local Municipal Separate Storm Sewer System (MS4) programs).

The City of Knoxville Department of Engineering may be reached by telephone at (865) 215-2148.

## SECTION 3 SWPPP REQUIREMENTS

### 3.1. THE GENERAL PURPOSE OF THE SWPPP

A SWPPP must be prepared and submitted along with the NOI as required in Subsection 1.4.2 (*SWPPP*). The primary permittee must implement the SWPPP as written from commencement of construction activity until final stabilization is complete or until the permittee does not have design or operational control of any portion of the construction site. Requirements for termination of site coverage are provided in Section 8 (*Requirements for Termination of Coverage*).

A site-specific SWPPP must be developed for each construction project or site covered by this permit. The design, inspection and maintenance of Best Management Practices (BMPs) described in the SWPPP must be prepared in accordance with good engineering practices. At a minimum, BMPs shall be consistent with the requirements and recommendations contained in the current edition of the *Tennessee Erosion and Sediment Control Handbook* (handbook). The handbook is designed to provide information to planners, developers, engineers, and contractors on the proper selection, installation, and maintenance of BMPs. This policy allows the use of innovative or alternative BMPs, whose performance has been documented to be equivalent or superior to conventional BMPs as certified by the SWPPP designer.

Once a definable area has been finally stabilized, the permittee may identify this area on the SWPPP. No further SWPPP or inspection requirements apply to that portion of the site (e.g., earth-disturbing activities around one of three buildings in a complex are done and the area is finally stabilized, one mile of a roadway or pipeline project is done and finally stabilized, etc.).

For more effective coordination of BMPs, a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWPPP is expected. Primary permittees at a site may develop separate SWPPPs that cover only their portion of the project. In instances where there is more than one SWPPP for a site, the permittees must ensure the stormwater discharge controls and other measures are compatible with one another and do not prevent another operator from complying with permit conditions. The comprehensive SWPPP developed and submitted by the primary permittee must assign responsibilities to secondary permittees and coordinate all BMPs at the construction site. Assignment and coordination can be done by name or by job title.

#### 3.1.1 Registered engineer requirement

The narrative portion of the SWPPP shall be prepared by an individual who has a working knowledge of erosion prevention and sediment controls, such as (but not limited to) a Certified Professional in Erosion and Sediment Control (CPESC) or a person that successfully completed the “Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites” course. Plans and specifications for any building or structure, including the design of sediment basins or other sediment controls involving structural, hydraulic, hydrologic or other engineering calculations shall be prepared by a licensed professional engineer and stamped and certified in accordance with the Tennessee Code Annotated, Title 62, Chapter 2 (see Section 10 (*Definitions*)) and the rules of the Tennessee Board of Architectural and Engineering Examiners. Engineering design of sediment basins must be included in SWPPPs for construction sites involving drainage to an outfall totaling 5 or more acres with unavailable parameters of Exceptional Tennessee Waters (see Subsection 5.4.1).

#### 3.1.2 Site assessment

Quality assurance of erosion prevention and sediment controls (EPSCs) shall be done by performing site assessments. The site assessment shall be conducted at each outfall draining 5 or more acres within 30

days of construction commencing at each portion of the site that drains the qualifying. The site assessment shall be performed by individuals with one or more of following qualifications:

- a) A licensed professional engineer or landscape architect.
- b) A Certified Professional in Erosion and Sediment Control (CPESC).
- c) A person that successfully completed the “Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites” course.

At a minimum, site assessments should be performed to verify the installation, functionality and performance of the EPSC measures described in the SWPPP. IF structural BMPs (or equivalent EPSC measures) are not constructed or construction is in progress at the time of the site assessment, a follow-up monthly assessment(s) are required until the BMPs are constructed per the SWPPP. The site assessment should be performed with the inspector (as defined in Section 10), and should include a review and update (if applicable) of the SWPPP. Modifications of plans and specifications for any building or structure, including the design of sediment basins or other sediment controls involving structural, hydraulic, hydrologic or other engineering calculations shall be prepared by a licensed professional engineer and stamped and certified in accordance with the Tennessee Code Annotated, Title 62, Chapter 2 (see Section 10 (*Definitions*)) and the rules of the Tennessee Board of Architectural and Engineering Examiners.

The site assessment findings shall be documented and the documentation kept with the field SWPPP at the site. At a minimum, the documentation shall include information required in the inspection form provided in Appendix C (*Inspection Report Form*) of this permit, an assessment of any failing or unmaintained EPSCs, causes of failure and any action necessary to bring the site into compliance with this permit. The documented quality assurance assessments shall also indicate if all EPSCs have been installed as designed in the submitted SWPPP and EPSC plans; and, if not, measures that need to be taken so those EPSCs meet the design specifications in the field and EPSC plans. The documentation must contain the printed name and signature of the individual performing the site assessment and the following certification:

*“I certify under penalty of law that this report and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations as specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.”*

The site assessment can take the place of one of the twice weekly inspections requirement from Subsection 3.5.8.2 (*Schedule of inspections*) if the entire site is inspected during the assessment.

The department may require additional site assessments to be performed if site inspection by department’s personnel reveals site conditions that have the potential of causing pollution to the waters of the state.

### 3.2 SWPPP PREPARATION AND COMPLIANCE

#### 3.2.1 Existing site

Operators of an existing site currently covered under a previous TDEC or City of Knoxville CGP shall maintain full compliance with their existing SWPPP. If the director deems it necessary, the existing SWPPP must be modified to meet requirements of the new CGP, and changes to the SWPPP must be implemented no later than 12 months following the SWPPP modification. The permittee shall make the updated SWPPP available for the department's review upon request.

#### 3.2.2 New sites or new phases of existing sites

For construction stormwater discharges not authorized under an NPDES permit as of the effective date of this permit, a SWPPP that meets the requirements of Subsection 3.5 (*Components of the SWPPP*) of this policy shall be prepared and submitted along with the NOI and an appropriate fee for coverage under this permit.

### 3.3 SIGNATURE REQUIREMENTS, SWPPP REVIEW AND MAKING PLANS AVAILABLE

#### 3.3.1 Signature requirements

The SWPPP shall be signed by the operators in accordance with Subsection 7.7 (*Signatory Requirements*), and if applicable, certified according to requirements in Subsection 3.1.1 (*Registered engineer requirement*). All signatures must be original. Electronic signatures are deemed equivalent to original signatures. A SWPPP that does not bear an original signature or an electronic signature will be deemed incomplete.

#### 3.3.2 SWPPP Review

The permittee shall make updated plans and inspection reports available upon request to the director; the local agency approving erosion prevention and sediment control plans, grading plans, land disturbance plans; or stormwater management plans, or the operator of an MS4.

#### 3.3.3 Making plans available

A copy of current version of the SWPPP shall be retained on-site at the location which generates the stormwater discharge in accordance with Section 6 of this policy. If the site is inactive or does not have an onsite location adequate to store the SWPPP, the location of the SWPPP, along with a contact phone number, shall be posted on-site. If the SWPPP is located offsite, reasonable local access to the plan, during normal working hours, must be provided.

### 3.4 KEEPING PLANS CURRENT

#### 3.4.1 SWPPP modifications

The permittee must modify and update the SWPPP if any of the following conditions apply:

- a) Whenever there is a change in the scope of the project that would be expected to have a significant effect on the discharge of pollutants to the waters of the state and which has not otherwise been addressed in the SWPPP. If applicable, the SWPPP must be modified or updated whenever there

is a change in chemical treatment methods, including the use of different treatment chemical, different dosage or application rate or different area of application.

- b) Whenever inspections or investigations by site operators; or local, state or federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under Subsection 3.5.2 (*Description of stormwater runoff controls*), or is otherwise not achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity. Where local, state or federal officials determine that the SWPPP is ineffective in eliminating or significantly minimizing pollutant sources, a copy of any correspondence to that effect must be retained in the SWPPP.
- c) Whenever any new operator (typically a secondary permittee) who will implement a measure of the SWPPP must be identified (see Subsections 2.1 and 2.2 (*Who Must Submit an NOI?* and *Construction Site Operators*, respectively) for further description of which operators must be identified).
- d) Whenever it is necessary to include measures intended to prevent a negative impact to legally protected state or federally listed fauna or flora (or species proposed for such protection – see Subsection 1.3 (*Limitations on Coverage*)). Amendments to the SWPPP may be reviewed by the department, a local MS4, the EPA, or an authorized regulatory agency.
- e) Whenever a TMDL is developed for the receiving waters for a pollutant of concern (e.g. siltation and habitat alteration due to in-channel erosion).

### 3.5 COMPONENTS OF THE SWPPP

The SWPPP shall include the following items, as described in Subsections 3.5.1 to 3.5.10: a site description; a description of stormwater runoff controls, erosion prevention and sediment control measures, stormwater management measures, and a description of any other items needing control; approved local government sediment and erosion control requirements; maintenance and inspection requirements; pollution prevention measures for non-stormwater discharges, and documentation of permit eligibility related to Total Maximum Daily Loads (TMDL). The SWPPP must:

- a) identify all potential sources of pollutions likely to affect the quality of stormwater discharges from the construction site;
- b) describe practices to be used to reduce pollutants in stormwater discharges from the construction site; and
- c) assure compliance with the terms and conditions of this permit.

#### 3.5.1 Site description

Each SWPPP shall provide a description of pollutant sources and other information as indicated below:

- a) A description of all construction activities at the site (not just grading and street construction).
- b) The intended sequence of activities which disturb soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation).

- c) Estimates of the total area of the site and the total area that is expected to be disturbed by excavation, grading, filling or other construction activities.
- d) A description of the topography of the site including an estimation of the percent slope and the variation in percent slope found on the site. The estimate should be on a basis of a drainage area serving each outfall, rather than an entire project.
- e) An estimate of drainage area (acres) serving each outfall
- f) Data describing the soil, how the soil type will dictate the needed control measures and how the soil may affect the expected quality of runoff from the site. The data may be references or summarized.
- g) An estimate of the runoff coefficient of the site after construction activities are completed and how the runoff will be handled to prevent erosion at the permanent outfall and receiving stream. The estimate of the percentage of impervious area before and after construction must also be provided.
- h) An erosion prevention and sediment control plan with the proposed construction area clearly outlined. The plan should indicate the boundaries of the permitted area, drainage patterns, approximate slopes anticipated after major grading activities, areas of soil disturbance, an outline of areas which are not to be disturbed, the location of major structural and nonstructural controls identified in the SWPPP, the location of areas where stabilization practices are expected to occur, surface waters including wetlands, and sinkholes, and identification on the erosion control plan of outfall points intended for coverage. The erosion control plan must meet requirements stated in Subsection 3.5.2.
- i) A description of any discharge associated with industrial activity other than construction stormwater that originates on site and the location of that activity and its permit number.
- j) Identification of any stream or wetland on or adjacent to the project, a description of any anticipated alteration of these waters and the permit number or the tracking number of the Aquatic Resources Alteration Permit (ARAP) or Section 401 Certification issued for the alteration.
- k) The name of the receiving waters and the identification if those receiving waters have unavailable parameters for siltation and habitat alterations due to in-channel erosion of are Exceptional Tennessee Waters.
- l) If applicable, clearly identify and outline the construction riparian buffer zones established to protect waters of the state located within the boundaries of the project.
- m) Some construction projects, such as residential or commercial subdivisions and/or developments or industrial parks are subdivided. Subdivided lots are sometimes sold to new owners prior to completion of construction. The site-wide developer/owner must describe EPSC measures implemented at those lots. Once the property is sold, the new operator must obtain coverage under this permit.
- n) A description of the construction phasing for projects of more than 50 acres, the construction (see Subsection 3.5.3.1 (*General criteria and requirements*)).
- o) A description of the protections (e.g. caution fencing or construction riparian buffer zones) employed to limit the disturbance if only a portion of the total acreage of the construction site is to be disturbed.

The limits of disturbance shall be clearly identified in the SWPPP and the areas to be undisturbed clearly marked in the field before construction activities begin.

### 3.5.2 Description of stormwater runoff controls

The SWPPP shall include a description of appropriate erosion prevention and sediment controls and other Best Management Practices (BMPs) that will be implemented at the construction site. The SWPPP must clearly describe each activity which disturbs soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation). The SWPPP must also describe:

- a) Appropriate control measures and the general timing for the measures to be implemented during construction activities.
- b) Which permittee is responsible for implementation of which controls.

The SWPPP must include EPSC plans showing the approximate location of each control measure and description of when the measure will be implemented during the construction (e.g., prior to the start of earth disturbance, as the slopes are altered and after major grading is finished). The different stages of construction and the EPSC measures that will be utilized during each stage should be depicted on multiple plan sheets. Half sheets are acceptable. One sheet showing all EPSCs that will be used during the life of the multi-phase project implementing different EPSC controls at each stage will not be considered complete.

At least two separate EPSC plan sheets shall be developed for site disturbances less than 5 acres. The first plan sheet will address the EPSC measures necessary to manage stormwater runoff, erosion and sediment during the initial land disturbance, or grading, stage. The second plan sheet will address the EPSC measures necessary to manage stormwater runoff, erosion and sediment during the final grading stage.

At least 3 separate EPSC plan sheets shall be developed for site disturbances of 5 acres or more. In addition to the two plan sheets described, a third plan sheet will address the EPSC measures necessary to manage stormwater runoff, erosion and sediment during any interim grading stages.

The description and implementation of controls shall address the following minimum components, as described in Subsections 3.5.3, 3.5.4, and 3.5.5. Additional controls may be necessary to comply with Subsection 5.3.2.

### 3.5.3 Erosion prevention and sediment control

#### 3.5.3.1 General criteria and requirements

- a) The construction-phase erosion prevention controls shall be designed to eliminate (or minimize if complete elimination is not possible) the dislodging and suspension of soil in water. Sediment controls shall be designed to retain mobilized sediment on site to the maximum extent practicable.
- b) The design, inspection and maintenance of Best Management Practices (BMPs) described in the SWPPP must be prepared in accordance with good engineering practices and, at a minimum, shall be consistent with the requirements and recommendations contained in the current edition of the *Tennessee Erosion and Sediment Control Handbook*. In addition, all control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications (where applicable). All control measures selected must be able to slow runoff so that rill and gully

formation is prevented. When steep slopes or fine particle soils are present at the site, additional physical or chemical treatment of stormwater runoff may be required. Proposed physical or chemical treatment must be researched and applied according to the manufacturer's guidelines and fully described in the SWPPP. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control. Chemicals used for treating stormwater runoff must be shown to be non-toxic to sensitive aquatic species through a 48-hour or 96-hour acute toxicity test as reported in the product's Material Safety Data Sheets. The chemical feed rate shall be such that the effluent concentration of the product is lower than the LC50 toxicity value for sensitive aquatic species as reported in the products Material Safety Data Sheets. Calculations used to determine the chemical feed rate so that runoff or effluent is not toxic to sensitive aquatic species shall also be included in the SWPPP. Chemicals used for treating stormwater runoff shall be applied in accordance with manufacturer specifications and securely stored on-site in the contractor's staging and storage area if not stored off-site or provided by others. Chemicals shall not be applied directly to any stream.

- c) The timing of the planting of the vegetation cover must be discussed in the SWPPP if permanent or temporary vegetation is to be used as a control measure. Planting cover vegetation during winter months or dry months should be avoided.
- d) If sediment escapes the permitted area, off-site accumulations that have not reached a stream must be removed at a frequency sufficient to minimize off-site impacts (e.g., sediment that has escaped a construction site and collected in a street must be removed so that it does not subsequently wash into storm sewers and streams during the next rain or so that it does not pose a safety hazard to users of public streets). Permittees shall not initiate remediation or restoration of a stream without consulting the department first. This permit does not authorize access to private property. Arrangements concerning the removal of sediment on adjoining property must be settled by the permittee and the adjoining landowner's.
- e) Sediment should be removed from sediment traps, silt fences, sedimentation basins and other sediment controls as recommended in the *Tennessee Erosion and Sediment Control Handbook*. Sediment must be removed when design capacity has been reduced by 50%.
- f) Litter, construction debris and construction chemicals exposed to stormwater shall be picked up prior to anticipate storm events or before being carried off of the site by wind so that they do not become a pollutant source for stormwater discharges. Erosion prevention and sediment control materials (e.g. silt fence) should be removed or otherwise prevented from becoming a pollutant source for stormwater discharges.
- g) Erodible material storage areas (e.g., overburden and stockpiles of soil) and borrow pits that are used primarily for the permitted project and which are contiguous to the site are considered a part of the site and shall be identified on the NOI, addressed in the SWPPP and included in the fee calculation. TDOT projects shall be addressed in the Waste and Borrow Manual per the Statewide Stormwater Management Plan (SSWMP).
- h) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 14 days prior to grading or earth moving activities unless the area is subsequently temporarily or permanently stabilized.
- i) Clearing and grubbing must be held to the minimum necessary for grading and equipment operation. Existing vegetation at the site should be preserved to the maximum extent practicable.

- j) Construction must be sequenced to minimize the exposure time of graded or denuded areas.
- k) Construction phasing is recommended on all projects regardless of size as an effective practice for minimizing erosion and limiting sedimentation. Construction must be phased to keep the total disturbed area less than 50 acres at any one time. Areas of the completed phase must be stabilized within 14 days (see Subsection 3.5.3.2). No more than 50 acres of active soil disturbance is allowed at any time during the construction project. This includes off-site borrow or disposal areas that meet the conditions of Subsection 1.2.2. The 50 acre limitation does not apply to linear construction projects (e.g., roadway, pipeline and other infrastructure construction activities) if the following conditions are met:
  - i. Where no one area of active soil disturbance is greater than 50 acres and the various areas of disturbance have distinct receiving waters.
  - ii. Where contiguous disturbances amount to greater than 50 acres, but no one distinct water is receiving run off from more than 50 disturbed acres.
  - iii. With the department's written concurrence, where more than 50 acres of disturbance is to occur and where a single water body will receive run-off from more than 50 acres.
  - iv. Where no one area of active soil disturbance is greater than 50 acres and the various areas of disturbance are more than 5 miles apart.

In order for a linear project to take advantage of the 50 acre rule exemption outlined in this paragraph, the contractor shall conduct monthly site assessments as described in Subsection 3.1.2 (*Site assessment*) until the site is permanently stabilized.

- l) EPSC measures must be in place and functional before earth moving operations begin, and must be constructed and maintained throughout the construction period. Temporary measures may be removed at the beginning of the workday, but must be replaced at the end of the workday.
- m) The following records shall be maintained on or near the site: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; the dates when stabilization measures are initiated; inspection records and rainfall records.
- n) Off-site vehicle tracking of sediment and the generation of dust shall be minimized. A stabilized construction access shall be described and implemented, as needed, to reduce the tracking of mud and dirt onto public roads by construction vehicles.
- o) Permittees shall maintain a rain gauge and daily rainfall records at the site, or use a reference site for a record of daily precipitation.

### 3.5.3.2 Stabilization practices

The SWPPP shall include a description of temporary and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved when possible. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees and the preservation of mature vegetation. Use of impervious surfaces for final stabilization in lieu of a permanent vegetative cover should be avoided where practicable. No stabilization control measures or EPSC measures are to be installed in a stream without obtaining a Section 404 permit and an Aquatic

Resources Alteration Permit (ARAP). Stabilization measures shall be initiated as soon as possible in portions of the site where construction activities have temporarily or permanently ceased. Temporary or permanent soil stabilization at the construction site must be completed no later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. In the following situations, temporary stabilization measures are not required:

- a) Where the initiation of stabilization measures is precluded by snow cover or frozen ground conditions or adverse soggy ground conditions, stabilization measures shall be initiated as soon as practicable.
- b) Where construction activity on a portion of the site is temporarily ceased, but soil disturbing activities will be resumed within 14 days.

Steep slopes shall be stabilized no later than seven days after construction activity on the slope has temporarily or permanently ceased.

Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable. Unpacked gravel containing fines (silt and clay sized particles) or crusher runs will not be considered a non-eroding surface.

#### 3.5.3.3 Structural practices

The SWPPP shall include a description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and discharge of pollutants from exposed areas of the site. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural controls shall not be placed in streams or wetlands except as authorized by a section 404 permit and/or Aquatic Resources Alteration Permit (ARAP).

EPSC measures must be prepared in accordance with good engineering practices and the latest edition of the *Tennessee Erosion and Sediment Control Handbook*. In addition, EPSC measures shall be designed to minimize erosion and maximize sediment removal resulting from a 5-year, 24-hour storm (the design storm – see Section 10: “5-year frequency storm”), as a minimum, either from total rainfall in the designated period or the equivalent intensity as specified on the following website [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn_pfds.html). Chemical treatment of the stormwater runoff may be necessary to minimize the amount of sediment being discharged when clay and other fine particle soils or highly erodible soils are present at the construction site.

For an on-site outfall that receives drainage from 5 or more acres, a minimum sediment basin volume that will provide treatment for a calculated volume of runoff from a 5-year, 24-hour storm and runoff from each acre drained, or equivalent control measures as specified in the *Tennessee Erosion and Sediment Control Handbook*, shall be provided until final stabilization of the site. A drainage area of 5 or more acres includes disturbed and undisturbed portions of the site and areas adjacent to the site, all draining through the common outfall. Where an equivalent control measure is substituted for a sediment retention basin, the equivalency must be justified to the department. Runoff from any undisturbed acreage should be diverted around the disturbed area and the sediment basin. Diverted runoff can be omitted from the volume calculation. Sediment storage expected from the disturbed areas must be included. All calculations of drainage areas, runoff coefficients and basin volumes must be provided in the SWPPP. The discharge structure from a sediment basin must be designed to retain sediment during the lower flows. Muddy water to be pumped from excavation and work areas must be held in settling basins, filtered or

chemically treated prior to its discharge into surface waters. Water must be discharged through a pipe; grassed or lined channel or other equivalent means so that the discharge does not cause erosion and sedimentation. Discharged water must not cause an objectionable color contrast with the receiving stream.

#### 3.5.4 Stormwater management

The SWPPP shall include a description of any measures that will be installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed, including a brief description of applicable State or local erosion and sediment control requirements.

For projects discharging to waters with Unavailable Parameters for sediment and habitat alterations due to in-channel erosion, the SWPPP shall include a description of measures that will be installed during the construction process to control pollutants and the increase impervious area after the construction addressed in the permit application is completed, the nature of fill material and existing data describing the soil or quality of the discharge. The SWPPP shall also include a description of measures that will be installed to dissipate the volume and energy of the stormwater runoff to pre-development levels.

This policy only addresses the installation of stormwater management measures and not the ultimate operation and maintenance of such structures after the construction activities have been completed, the site has undergone final stabilization and the permit coverage has been terminated. Permittees are only responsible for the operation and maintenance of stormwater management measures prior to final stabilization of the site and permit coverage being terminated. Permittees are not responsible for maintenance after permitted stormwater discharges associated with construction activity have been eliminated from the site. All permittees are encouraged to limit the amount of post construction runoff voluntarily, if not required by local building regulations or local MS4 program requirements, to minimize in-stream channel erosion in the receiving stream.

Construction stormwater runoff management practices may include: stormwater detention structures including ponds with a permanent pool; stormwater retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems which combine several practices.

Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide a non-erosive velocity flow from the structure to the receiving stream so that the natural physical and biological characteristics and functions of the stream are maintained and protected (i.e., there should be no significant changes in the hydrological regime of the receiving water). The SWPPP shall include an explanation of the technical basis used to select the velocity dissipation devices to control pollution where flows exceed pre-development levels. The *Tennessee Erosion and Sediment Control Handbook* provides measures that can be incorporated into the design or implemented on site to decrease erosive velocities. An Aquatic Resources Alteration Permit (ARAP) from TDEC may be required if such velocity dissipation devices installed would alter the receiving stream or its banks.

#### 3.5.5 Other items needing control

- a) No solid materials, including building materials, shall be placed in waters of the state, except as authorized by a section 404 permit and/or Aquatic Resources Alteration Permit (ARAP) (see Section 9 (*Aquatic Resource Alteration Permits (ARAP)*)).

- b) The SWPPP shall identify and provide the necessary EPSC measures for the installation of any waste disposal system, sanitary sewer or septic system. Permittees must also comply with applicable state and/or local waste disposal, sanitary sewer or septic system regulations as necessary.
- c) The SWPPP shall include a description of construction and waste materials expected to be stored on-site. The SWPPP shall also include a description of controls used to reduce pollutant from materials stored on site. Controls may include storage practices to minimize exposure of the materials to stormwater or spill prevention and response.
- d) A description of stormwater sources from areas other than construction and a description of controls and measures that will be implemented at those sites.
- e) A description of measures necessary to prevent “taking” of legally protected state or federal listed threatened or endangered aquatic fauna or critical habitat, if applicable. The permittee must describe and implement such measures to maintain eligibility for coverage under this permit.

#### 3.5.6 Approved local government sediment and erosion control requirements

Permittees must comply with any additional erosion prevention, sediment control and stormwater management measures required by a local municipality or permitted MS4 program.

#### 3.5.7 Maintenance

The SWPPP shall describe procedures to ensure that vegetation, erosion prevention and sediment control measures, buffer zones, and other protective measures are kept in good and effective operating condition. Maintenance needs identified in inspections or by other means shall be accomplished before the next storm event, but in no case more than seven days after the need is identified.

#### 3.5.8 Inspections

##### 3.5.8.1 Inspector training and certification

Twice weekly inspections can be performed by:

- a) a person with a valid certification from the “Fundamentals of Erosion Prevention and Sediment Control Level I” course,
- b) a licensed professional engineer or landscape architect,
- c) a Certified Professional in Erosion and Sediment Control (CPESC), or
- d) a person who has successfully completed the “Level II Design Principles for Erosion Prevention and Sediment Control for Construction Site” course.

A copy of the certification, or training record for inspector certification, should be kept on site.

##### 3.5.8.2 Schedule of inspections

- a) Inspections described in paragraphs b, c, and d shall be performed at least twice every calendar week. Inspections shall be performed at least 72 hours apart. Where sites, or portions of construction sites, have been temporarily stabilized, inspections only have to be conducted once per month until

construction activity resume. Inspection requirements do not apply to definable areas that have been finally stabilized, as described in Subsection 3.1 (*The General Purpose of the SWPPP*). Written notification of the intent to change the inspection frequency and the justification for such request must be submitted to the department, or TDEC's Nashville Central Office for projects of the Tennessee Department of Transportation (TDOT) and the Tennessee Valley Authority (TVA). Should the department discover that monthly inspections of the site are not appropriate due to insufficient stabilization measures or otherwise, twice weekly inspections shall resume. The department may inspect the site to confirm or deny the notification to conduct monthly inspections.

- b) Qualified personnel, as defined in 3.5.8.1 (Inspector training and certification) (provided by the permittee or cooperatively by multiple permittees), shall inspect disturbed areas of the construction site that have not been permanently stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.
- c) Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site's drainage system. EPSC measures shall be observed to ensure that they are operating correctly.
- d) Outfall points shall be inspected to determine whether EPSC measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.
- e) Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced, modified, or repaired as necessary, before the next rain event, but in no case more than seven days after the need is identified.
- f) Based on the results of the inspection, the site description identified in the SWPPP in accordance with Subsection 3.5.1 (*Site description*) and pollution prevention measures identified in the SWPPP in accordance with Subsection 3.5.2 (*Description of stormwater runoff controls*) shall be revised as appropriate, but in no case later than seven days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.
- g) All inspections shall be documented on the Construction Stormwater Inspection Certification form provided in Appendix C of this policy for all construction sites. An alternative inspection form may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the department's form and the permittee has obtained a written approval from the department to use the alternative form. The form must contain the printed name and signature of the inspector and the certification must be executed by a person who meets the signatory requirements of Subsection 7.7.2. Inspection documentation will be maintained on site and made available to the department upon request. Inspection reports must be submitted to the department within 10 days of the request. If the department requests the Construction Stormwater Inspection Certification form to be submitted, a copy of the signed original must be submitted.
- h) Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records, or other documentation; or failure to complete inspection documentation shall result in a violation of this policy and any other applicable acts or rules.
- i) Subsequent primary permittees who have obtained coverage under this policy should conduct

twice weekly inspections, unless their portions of the site has been temporarily stabilized, runoff is unlikely due to winter conditions or due to extreme drought as stated in Subsection 3.5.8.2.a. The primary permittee (such as a developer) is no longer required to conduct inspections of the site that are covered by a subsequent primary permittee (such as a home builder).

### 3.5.9 Pollution prevention measures for non-stormwater discharges

The SWPPP must identify the source of any non-stormwater discharge listed in Subsection 1.2.3 (*Non-stormwater discharges authorized by this policy*) if it is to be combined with stormwater discharges associated with construction activity. The SWPPP shall identify and ensure the implementation of appropriate pollution prevention measures for the non-stormwater components of the discharge. Any non-stormwater runoff must be discharged through stable discharge structures. Estimated volume of the non-stormwater components of the discharge must be included in the design of all impacted control measures.

### 3.5.10 Documentation of permit eligibility related to Total Maximum Daily Loads (TMDL)

The SWPPP must include documentation supporting a determination of permit eligibility with regard to waters that have an approved TMDL for a pollutant of concern, including:

- a) whether the discharge is identified, either specifically or generally, in an approved TMDL and any associated wasteload allocations, site-specific requirements, and assumptions identified for the construction stormwater discharge;
- b) summaries of consultations with the department on consistency of SWPPP conditions with the approved TMDL, and
- c) measures taken to ensure that the discharge of TMDL identified pollutants from the site is consistent with the assumptions and requirements of the approved TMDL, including any specific wasteload allocation that has been established that would apply to the construction stormwater discharge.

## SECTION 4 CONSTRUCTION AND DEVELOPMENT EFFLUENT GUIDELINES

### 4.1 NON-NUMERIC EFFLUENT LIMITATIONS

Any point source authorized by this general permit must achieve, at a minimum, the effluent limitations representing the degree of effluent reduction attainable by application of best practicable control technology (BPT) currently available and is described in Subsections 4.1.1 through 4.1.7.

#### 4.1.1 Erosion prevention and sediment controls

Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

- 1) Control stormwater volume and velocity to minimize soil erosion in order to minimize pollutant discharges;
- 2) Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize channel and stream-bank erosion and scour in the immediate vicinity of discharge points;
- 3) Minimize the amount of soil exposed during construction activity
- 4) Minimize the disturbance of steep slopes;
- 5) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
- 6) Provide and maintain natural buffers as described in Subsection 4.1.2, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges, unless infeasible;
- 7) Minimize soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted; and
- 8) Unless infeasible, preserve topsoil. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.

#### 4.1.2 Construction riparian buffer zone requirements

Construction riparian buffer zone (CRBZ) requirements in this section apply to all streams adjacent to construction sites except for streams with unavailable parameters or Exceptional Tennessee Waters (see Subsection 5.4.2). A 30-foot natural CRBZ adjacent to all streams at a construction site shall be preserved, to the maximum extent practicable, during construction activities. The CRBZ is required to protect waters of the state that are not wet weather conveyances (e.g., perennial and intermittent streams, rivers, lakes, wetlands) located within or immediately adjacent to the boundaries of the project, as identified using Tennessee's standard operating procedures for hydrologic determinations set forth in Rule 0400-40-03-.05(9). Because of heavy sediment load associated with construction site runoff, CRBZs are not primary sediment control measures and should not be relied on as such. However, the

primary purpose of CRBZ is additional pollutant removal. Stormwater discharges must enter the CRBZ as sheet flow, not as concentrated flow, where site conditions allow. Rehabilitation and enhancement of a natural buffer zone is allowed, if necessary, to improve its effectiveness in protecting waters of the state.

The CRBZ should be preserved between the top of stream bank and the disturbed construction area. The 30-foot criterion for the width of the buffer zone can be established on an average width basis at a project, as long as the minimum width of the buffer zone is more than 15 feet at any measured location. If the construction site encompasses both sides of a stream, buffer averaging can be applied to both sides, but must be applied independently.

Every attempt should be made for construction activities to not take place within the CRBZ and for existing forested areas to be preserved. Where it is not practicable to maintain a full CRBZ, BMPs providing equivalent protection to a receiving stream as a natural riparian buffer must be used at a construction site. Equivalent BMPs shall be designed to be as effective in protecting the receiving stream from the impacts of construction stormwater runoff as a natural riparian buffer. A justification for use and a design of equivalent BMPs shall be included in the SWPPP. Such equivalent BMPs are expected to be routinely used at construction projects typically located adjacent to surface waters. These projects may include sewer line construction, roadway construction, utility line or equipment installation, greenway construction, construction of a permanent outfall or a velocity dissipating structure.

This requirement does not apply to any valid Aquatic Resources Alteration Permit (ARAP), or equivalent permits issued by federal authorities. Additional buffer zone requirements may be established by the local MS4 program.

#### 4.1.2.1 Construction riparian buffer zone exemption based on existing uses

CRBZs as described in Subsection 4.1.2 shall not be required in portions of the buffer where certain land uses exist and are to remain in place according to the following:

- a) A use shall be considered existing if it was present within the buffer zone as of the date of the Notice of Intent for coverage under the CGP. Existing uses may buffer include buildings, parking lots, roadways, utility lines and on-site sanitary sewage systems. Only the portion of the buffer zone that contains the footprint of the existing land use is exempt from buffer zones. Activities necessary to maintain uses are allowed provided that no additional vegetation is removed from the buffer zone.
- b) If an area with an existing land use is proposed to be converted to another use or the impervious surfaces located within the buffer area are being removed, CRBZ requirements shall apply.

#### 4.1.2.2 Pre-approved Sites

Construction activities at sites that have been pre-approved prior to February 1, 2010, are exempt from the CRBZ requirements of Subsection 4.1.2. Evidence of pre- approval for highway projects shall be a final right-of-way plan and for other construction projects, the final design drawings with attached written and dated approval by the local, state or federal agency with authority to approve such design drawings for construction.

#### 4.1.3 Soil stabilization

Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have temporarily or permanently ceased on any

portion of the site, and will not resume for a period exceeding 14 calendar days. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures such as, properly anchored mulch, soil binders, matting) must be employed.

#### 4.1.4 Dewatering

Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. Appropriate controls include weir tanks, dewatering tanks, gravity bag filters, sand media particulate filter, pressurized bag filter, cartridge filter or other control units providing the level of treatment necessary to comply with permit requirements.

#### 4.1.5 Pollution prevention measures

The permittee must design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

- a) minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
- b) minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
- c) minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

Soil analysis shall be performed prior to the application of fertilizer to any portion of the site. Soil analysis shall include parameters included in the Basic Test by the UT Agriculture Extension for developing and maintaining fertilizer programs (e.g., soil pH, buffer value, phosphorus, potassium, calcium, magnesium). Soil samples should be representative of the area for which fertilizer will be applied. Sample type should be composite and should be collected in accordance with the guidance provided in the University of Tennessee Extension "Soil Testing" brochure PB1061, available at: <http://utextension.tennessee.edu/publications/Documents/PB1061.pdf>. Soil analysis results shall be used to determine correct fertilizer application rates to prevent the over application of fertilizer to the site. Documentation of required soil analysis is maintained onsite with the SWPPP.

#### 4.1.6 Prohibited discharges

The following discharges are prohibited:

- a) Wastewater from washout of concrete, unless managed by an appropriate control;
- b) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

- c) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
- d) Soaps or solvents used in vehicle and equipment washing.

4.1.7 Surface outlets

Discharges from basins and impoundments shall utilize outlet structures that only withdraw water from near the surface of the basin or impoundment, unless infeasible.

## SECTION 5 SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER NON-NUMERIC EFFLUENT LIMITATIONS

### 5.1 RELEASES IN EXCESS OF REPORTABLE QUANTITIES

The discharge of hazardous substances or oil in the stormwater discharges from a facility shall be prevented or minimized in accordance with the applicable stormwater pollution prevention plan for the facility. This policy does not relieve the permittee of the reporting requirements of 40 CFR 117 and 40 CFR 302. Where a release containing a hazardous substance in an amount equal to or in excess of a reportable quantity established under either 40 CFR 117 or 40 CFR 302 occurs during a 24 hour period:

- a) The permittee is required to notify the National Response Center (NRC) (800-424-8802), the Tennessee Emergency Management Agency (emergencies: 800-262-3300; non-emergencies: 800-262-3400) and the Knoxville-Knox County Emergency Management Agency (865-215-1177) in accordance with the requirements of 40 CFR 117 or 40 CFR 302 as soon as he or she has knowledge of the discharge;
- b) As soon as any person has knowledge of any illicit spills or discharges to the stormwater system in violation of this section, such person shall immediately notify the Director 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:
  - i. Date and time of the discharge;
  - ii. Location of the discharge;
  - iii. Material or substance discharged;
  - iv. Duration and rate of flow;
  - v. Total volume discharged;
  - vi. Total volume recovered
  - vii. Cause or reason for the discharge;
  - viii. Remediation and containment action taken;
  - ix. Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS) for the discharged material;
  - x. Action taken to prevent further discharges; and
  - xi. Description of any environmental impact.

- c) The SWPPP required under Section 3 of this policy must be updated within 7 days of knowledge of the release: to provide a description of the release, the circumstances leading to the release, and the date of the release. This can be accomplished by including a copy of a written description of the release as described in the Subsection 5.1.b. In addition, the SWPPP must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

## 5.2 SPILLS

This policy does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

## 5.3 DISCHARGE COMPLIANCE WITH STATE WATER QUALITY STANDARDS

### 5.3.1 Violation of water quality standards

This policy does not authorize stormwater or other discharges that would cause or contribute to a violation of a state water quality standard (Tennessee Rules, Chapters 0400-40-03, 0400-40-04). Such discharges constitute a violation of this permit.

Where a discharge is already authorized under this policy and the department determines the discharge to cause or contribute to the violation of applicable state water quality standards, the department will notify the operator of such violation. The permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and shall document these actions in the SWPPP.

### 5.3.2 Discharge quality

- a) The construction activity shall be carried out in such a manner that will prevent violations of water quality criteria as stated in the Tennessee Rules, Chapter 0400-40-03-.03. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits or turbidity impair the usefulness of waters of the state for any of the uses designated for that water body by Tennessee Rules, Chapter 0400-40-04. Construction activity carried out in the manner required by this policy shall be considered in compliance with the Tennessee Rules, Chapter 0400-40-03-.03
- b) There shall be no distinctly visible floating scum, oil or other matter contained in the stormwater discharge.
- c) The stormwater discharge must not cause an objectionable color contrast in the receiving stream.
- d) The stormwater discharge must result in no materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream. This provision includes species covered under Subsection 1.3.

#### 5.4. DISCHARGES INTO WATERS WITH UNAVAILABLE PARAMETERS OR EXCEPTIONAL TENNESSEE WATERS

##### 5.4.1 SWPPP/BMP Requirements

Discharges that would cause measurable degradation of waters with unavailable parameters or that would cause more than de minimis degradation of Exceptional Tennessee Waters are not authorized by this policy (see Subsection 1.3). To be eligible to obtain and maintain coverage under this permit, the operator must satisfy, at a minimum, the following additional requirements for discharges into waters with unavailable parameters for siltation and habitat alterations due to in-channel erosion (or discharges upstream of such waters and because of the proximity to the segment with unavailable parameters and the nature of the discharge is likely to contribute sediment in amounts measurable in the waters with unavailable parameters) and for discharges to Exceptional Tennessee Waters (or discharges upstream of such waters and because of the proximity to the exceptional segment and the nature of the discharge is likely to cause more than de minimis degradation in the exceptional segment):

- a) The SWPPP must certify that EPSC measures used at the site are designed to control stormwater runoff generated by a 5-year, 24-hour storm event (as defined in this document), at a minimum, either from total rainfall in the designated period or the equivalent intensity as specified on the following website [http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/orb/tn_pfds.html). Additional physical or chemical treatment of stormwater runoff, such as use of treatment chemicals, may be necessary to minimize the amount of sediment being discharges when clay and other fine particle soils are found on sites.
- b) The SWPPP must be prepared by individuals with one or more of the following qualifications:
  - A licensed professional engineer or landscape architect.
  - A Certified Professional in Erosion and Sediment Control (CPESC).
  - A person who has successfully completed the Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites course.
- c) A copy of the certification or training record for inspector certification should be included with the field SWPPP.
- d) The permittee shall perform inspections described in Subsection 3.5.8 at least twice every calendar week. Inspections shall be performed at least 72 hours apart.
- e) The permittee must certify on the form provided in Appendix C of this policy whether or not all planned and designed EPSC measures are installed and in working order. The form must contain the printed name and signature of the inspector and the certification must be executed by a person who meets the signatory requirements of Subsection 7.7.2. The record of inspections must be kept at the construction site with a copy of the SWPPP. For record retention requirements, see Section 6.
- f) If the department finds that an operator is contributing to the impairment of a receiving stream despite complying with the SWPPP, The operator will be notified by the director in writing that the discharge is no longer eligible for coverage under the general permit. The operator may update the SWPPP and implement the necessary changes designed to eliminate further impairment of the receiving stream. If the permittee does not implement the SWPPP changes within seven days of receipt of notification, the permittee will be notified in writing that continued discharges must be

covered by an individual permit (see Subsection 7.12). To obtain the individual permit, the operator must file an individual permit application (U.S. EPA NPDES Forms 1 and 2F). The project must be stabilized immediately and remain stable until the SWPPP is updated and the individual permit is issued. Only discharges from earth disturbing activities necessary for stabilization are authorized to continue until the individual permit is issued.

- g) For an on-site outfall in a drainage area totaling five or more acres, a minimum sediment basin volume that will provide treatment for a calculated volume of runoff from a 5-year, 24-hour storm and runoff from each acre drained; or equivalent control measures as specified in the *Tennessee Erosion and Sediment Control Handbook*, shall be provided until final stabilization of the site. The drainage area includes both disturbed and undisturbed portions of the site and areas adjacent to the site, all draining through a common outfall. Where an equivalent control measure is substituted for a sediment retention basin, the equivalency must be justified in the SWPPP narrative. Runoff from any undisturbed acreage should be diverted around the disturbed area and the sediment basin. Diverted runoff can be omitted from the volume calculation. Sediment storage expected from the disturbed areas must be included and a marker installed signifying when sediment accumulation has reduced the wet storage volume by 50%. In a case that a sediment marker is damaged by the volume of water or sediment, a best professional judgment should be used in evaluating sediment basin capacity.
- h) For an on-site outfall in a drainage area totaling 3.5 - 4.9 acres, a minimum sediment trap volume that will provide treatment for a calculated volume of runoff from a 5-year, 24-hour storm and runoff from each acre drained, is recommended until final stabilization of the site. A drainage area of 3.5 - 4.9 acres includes both disturbed and undisturbed portions of the site or areas adjacent to the site, all draining through the common outfall. Runoff from any undisturbed acreage should be diverted around the disturbed area and the sediment trap. Diverted runoff can be omitted from the volume calculation. Sediment storage expected from the disturbed areas must be included and a marker installed signifying when sediment accumulation has reduced the wet storage volume by 50%.
- i) The director may require revisions to the SWPPP necessary to prevent a negative impact to legally protected state or federally listed aquatic fauna, their habitat, or the receiving waters.

#### 5.4.2 Construction riparian buffer zone requirements

Sites that contain, or are adjacent to, receiving waters with unavailable parameters or Exceptional Tennessee Waters shall preserve a 60-foot natural construction riparian buffer zone (CRBZ) adjacent to the receiving stream. The buffer zone shall be preserved to the maximum extent practicable during construction activities at the site. The CRBZ is required to protect waters of the state, as identified using Tennessee's standard operating procedures for hydrologic determinations set forth in Rule 0400-40-03-.05(9), located within, or immediately adjacent to, The boundaries of the project. Because of heavy sediment load associated with construction site runoff, CRBZs are not primary sediment control measures and should not be relied on as such. The primary purpose of a CRBZ is additional pollutant removal. Stormwater discharges must enter the CRBZ as sheet flow, not as concentrated flow, where site conditions allow. Rehabilitation and enhancement of a natural riparian buffer zone is allowed, if necessary, to improve its effectiveness in protecting waters of the state.

The natural riparian buffer zone should be preserved between the top of stream bank and the disturbed construction area. The 60-foot criterion for the width of the CRBZ can be established on an average width basis at a project, as long as the minimum width of the buffer is more than 30 feet at any measured

location. If the construction site encompasses both sides of a stream, buffer averaging can be applied to both sides, but must be applied independently.

Every attempt should be made for construction activities not to take place within the CRBZ and for existing forested areas to be preserved. Where it is not practicable to maintain a full CRBZ, or if the construction site is located in an MS4 jurisdiction and would qualify for a smaller permanent riparian buffer due to the size of the drainage area, then BMPs providing equivalent protection to a receiving stream as a natural riparian zone may be used at a construction site. Equivalent BMPs shall be designed to be as effective in protecting the receiving stream from the impacts of stormwater runoff as a natural riparian buffer zone. A justification for use and a design of equivalent BMPs shall be included in the SWPPP. Such equivalent BMPs are expected to be routinely used at construction projects typically located adjacent to surface waters. These projects may include: sewer line construction, roadway construction, utility line or equipment installation, greenway construction, construction of a permanent outfall or a velocity dissipating structure.

This requirement does not apply to an area that is being altered under the authorization of a valid Aquatic Resources Alteration Permit (ARAP), or equivalent permits issued by federal authorities. Additional riparian buffer zone requirements have been established by the City of Knoxville in the *Stormwater and Street Ordinance*.

#### 5.4.2.1 Construction riparian buffer zone exemption based on existing uses

CRBZs as described in Subsection 5.4.2 shall not be required in portions of the buffer where certain land uses exist and are to remain in place according to the following:

- a) A use shall be considered existing if it was present within the buffer zone as of the date of the Notice of Intent for coverage under the CGP. Existing uses may include buildings, parking lots, roadways, utility lines and on-site sanitary sewage systems. Only the portion of the buffer zone that contains the footprint of the existing land use is exempt from buffer zones. Activities necessary to maintain uses are allowed provided that no additional vegetation is removed from the buffer zone.
- b) If an area with an existing land use is proposed to be converted to another use or the impervious surfaces located within the buffer area are being removed, CRBZ requirements shall apply.

#### 5.4.3 Pre-approved sites

Construction activities at sites that have been approved before February 1, 2010, are exempt from the buffer requirements of Subsection 5.4.2. Evidence of approval for highway projects shall be a final right-of-way plan and for other construction projects, the final design drawings with attached dated, written approval by the local, state or federal agency with authority to approve such design drawings for construction.

## SECTION 6 RETENTION, ACCESSIBILITY AND SUBMISSION OF RECORDS

### 6.1 DOCUMENTS

The permittee shall retain copies of SWPPPs, reports required by this permit, records of all data used to complete the NOI and the NOT for a period of at least three years from the date the NOT is submitted. This period may be extended by written request of the director.

### 6.2 ACCESSIBILITY AND RETENTION OF RECORDS

The permittee shall retain a copy of the SWPPP and a copy of the permit at the construction site (or other local location accessible to the director and the public) from the date construction commences to the date of termination of permit coverage. Permittees with day-to-day operational control over SWPPP implementation shall have a copy of the SWPPP available at a central location onsite for the use of all operators and those identified as having responsibilities under the plan whenever they are on the construction site. The permittee shall maintain a copy of all records for a period of three years once coverage is terminated.

#### 6.2.1 Posting information at the construction site

The initial site-wide permittee shall post a notice near the main entrance of the construction site accessible to the public with the following information:

- a) A copy of the NOC with the NPDES permit tracking number for the construction project.
- b) A name or company name; E-mail address (if available); telephone number and address of the project site owner/operator or a local contact person.
- c) A brief description of the project.
- d) The location of the SWPPP (see Subsection 3.3.3).

The notice must be maintained in a legible condition. The notice shall be posted in a local public building if posting this information near a main entrance is infeasible due to safety concerns or not accessible to the public. If the construction project is a linear construction project (e.g., pipeline or highway), the notice must be placed in a publicly accessible location near where construction is actively underway and moved as necessary. This permit does not provide the public with any right to trespass on a construction site for any reason, including inspection of a site. This permit does not require permittees to allow members of the public access to a construction site.

The permittee shall also retain the following items in an appropriate location on-site:

- a) A rain gauge (or use a reference site for a record of daily precipitation),
- b) A copy of twice weekly inspection reports,
- c) Documentation of quality assurance site assessments, if applicable (see Subsection 3.1.2).
- d) A copy of the site inspector's certification (e.g. Fundamentals of Erosion Prevention and Sediment Control Level 1 or level 2, P.E., P.L.A, CPESC).

### 6.3 ELECTRONIC SUBMISSION OF DOCUMENTS

If the department notifies dischargers by mail, E-mail, public notice or by making information available on the world wide web of electronic forms or other report options that become available at a later date (e.g., electronic submission of forms), the operators may take advantage of those options to satisfy the NOI, NOT and other report notification requirements.

## SECTION 7 STANDARD POLICY CONDITIONS

### 7.1 DUTY TO COMPLY

#### 7.1.1 Duty to comply

The permittee must comply with all conditions of this permit. Any policy noncompliance constitutes a violation of the Tennessee Water Quality Control Act (TWQCA) and is grounds for an enforcement action, permit termination, revocation and reissuance modification; or for denial of a permit renewal application.

#### 7.1.2 Penalties

Please refer to the City of Knoxville *Stormwater and Street Ordinance*.

In some cases enforcement will revert back to TDEC, e.g. Subsections 7.1.3, 7.1.4, 7.8, and 7.9.

#### 7.1.3 Civil and criminal liability

Nothing in this policy shall be construed to relieve the discharger from civil or criminal penalties for noncompliance. Notwithstanding this permit, the discharger shall remain liable for any damages sustained by the State of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge to any surface or subsurface waters. Additionally, notwithstanding this permit, it shall be the responsibility of the discharger to conduct stormwater discharge activities in a manner such that public or private nuisances or health hazards will not be created. Furthermore, nothing in this policy shall be construed to preclude the State of Tennessee from any legal action or relieve the discharger from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or the Federal Water Pollution Control Act.

#### 7.1.4 Liability under state law

Nothing in this policy shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable local, state or federal law.

### 7.2 CONTINUATION OF THE EXPIRED GENERAL PERMIT

Permittees shall maintain coverage under this general permit until a new general permit is issued. Permittees who choose not to maintain coverage under the expired general permit, or are required to obtain an individual permit, must submit an application (U.S. EPA NPDES Forms 1 and 2F and any other applicable forms) at least 180 days prior to expiration of this general permit.

Permittees who are eligible and choose to be covered by the new general permit must submit an NOI by the date specified in that permit. Facilities that have not obtained coverage under this policy by the permit expiration date cannot become authorized to discharge under the continued permit.

Operator(s) of an existing site permitted under the TDEC's 2011 construction general permit shall maintain full compliance with the existing SWPPP. The existing SWPPP should be modified, if necessary, to meet requirements of this new general permit, and the SWPPP changes implemented no later than 12 months following the new permit effective date. The permittee shall make the updated SWPPP available for the department's review upon request.

### 7.3 NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

### 7.4 DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this policy that has a reasonable likelihood of adversely affecting human health or the environment.

### 7.5 DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the department or an authorized representative of the department, within a time specified by the department, any information that the department may request to determine compliance with this policy or other information relevant to the protection of the waters of the state. The permittee shall also furnish to the department, upon request, copies of records required to be kept by this permit.

### 7.6 OTHER INFORMATION

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the director, he or she shall promptly submit such facts or information.

### 7.7 SIGNATORY REQUIREMENTS

All NOIs, SWPPPs, requests for NOTs, Construction Stormwater Inspection Certifications, Construction Stormwater Monitoring Report forms, reports, certifications or information either submitted to the director or the operator of a large or medium municipal separate storm sewer system shall be signed as described in Subsections 7.7.1 and 7.7.2 (*Signatory requirements for an NOI* and *Signatory requirements for reports and other items*) and dated.

#### 7.7.1 Signatory requirements for an NOI<sup>2</sup>

The NOI shall be signed as follows:

- a) For a corporation, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
  - i. a president, secretary, treasurer, or vice-president of the corporation in charge of a

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<sup>2</sup> As specified in 40 CFR 122.22(a)(1)-(3) [48 FR 14153, Apr. 1, 1983, as amended at 48 FR 39619, Sept. 1, 1983; 49 FR 38047, Sept. 29, 1984; 50 FR 6941, Feb. 19, 1985; 55 FR 48063, Nov. 16, 1990; 65 FR 30907, May 15, 2000]

principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or

- ii. the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated site including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- b) For a general partnership, by each general partner in the general partnership,
  - c) For a sole proprietorship, by the proprietor,
  - d) For a municipality, state, federal, or other public agency, by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
    - i. the chief executive officer of the agency, or
    - ii. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

NOTE: The department does not require specific assignments or delegations of authority to responsible corporate officers. The department will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions rather than to specific individuals.

#### 7.7.2 Signatory requirements for reports and other items

SWPPPs, Construction Stormwater Inspection Certification forms, reports, certifications or other information submittals required by the policy and other information requested by the department, including but not limited to Notice of Violation responses, shall be signed by a person described in Subsection 7.7.1, or by a duly authorized representative of that person.

#### 7.7.3 Duly authorized representative

For a purpose of satisfying signatory requirements for reports (see Subsection 7.7.2), a person is a duly authorized representative only if:

- a) the authorization is made in writing by a person described in Subsection 7.7.1;
- b) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated site or activity such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company; a duly authorized representative may thus be either a named individual or any individual occupying a named position and,

- c) the written authorization is submitted to the director or an appropriate city official. The written authorization shall be a written document including the name of the newly authorized person and the contact information (title, mailing address, phone number, fax number and E-mail address) for the authorized person. The written authorization shall be signed by the newly authorized person accepting responsibility and by the person described in Subsection 7.7.1 delegating the authority.

#### 7.7.4 Changes to authorization

If an authorization under Subsections 7.7.1 or 7.7.3 (*Duly authorized representative*) is no longer accurate because a different individual or position has responsibility as the primary or secondary permittee, but the company name (permittee name) remains the same, a new NOI and SWPPP certification shall be submitted to the City of Knoxville Stormwater Engineering Division and signed by the new party who meets signatory authority satisfying the requirements of Subsections 7.7.1 or 7.7.3. The NOI shall include the new individual's information (title, mailing address, phone number, fax number and E-mail address), the existing tracking number and the project name.

#### 7.7.5 Signatory requirements for primary permittees

Primary permittees required to sign an NOI and SWPPP because they meet the definition of an operator (see Subsection 2.2) shall sign the following certification statement on the NOI and on the SWPPP:

*"I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury."*

#### 7.7.6 Signatory requirements for secondary permittees

Secondary permittees required to sign an NOI and SWPPP because they meet the definition of an operator but who are not primarily responsible for preparing an NOI and SWPPP, shall sign the following certification statement on the NOI and on the SWPPP:

*"I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations and for failure to comply with these permit requirements. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury"*

### 7.8 PENALTIES FOR FALSIFICATION OF REPORTS

Knowingly making any false statement on any report or form required by this policy may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and in T.C.A. §69-3-115 of the Tennessee Water Quality Control Act.

## 7.9. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this policy shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to Section 311 of the Clean Water Act or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

## 7.10 PROPERTY RIGHTS

The issuance of this policy does not convey any property rights of any sort, nor any exclusive privileges, or does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. The issuance of this policy does not authorize trespassing or discharges of stormwater or non-stormwater across private property.

## 7.11 SEVERABILITY

The provisions of this policy are severable, and if any provision of this permit, or the application of any provision of this policy to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this policy shall not be affected thereby.

## 7.12 INDIVIDUAL PERMIT

### 7.12.1. Required coverage

The director may require any operator/developer covered by this permit to apply for and obtain an individual NPDES permit (from TDEC) to ensure adequate protection of designated uses of a receiving stream. Any interested person may petition the director in writing to take action under this paragraph, but must include in their petition the justification for such an action. Where the director requires a discharger authorized to discharge under this permit to apply for an individual NPDES permit, the director shall notify the discharger in writing that an individual permit application is required. This notification will include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application and a statement that coverage under this general permit shall terminate upon the effective date of an individual NPDES permit; or denial of coverage under an individual permit. The notification may require stabilization of the site and suspend coverage under this general permit until the individual permit is issued. Individual permit applications shall be submitted to TDEC. The director may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual NPDES permit application as required by the director under this paragraph, then the applicability of this permit to the discharger will be terminated at the end of the day specified by the director for application submittal.

If the decision to require an individual NPDES permit precedes the issuance of coverage under this general permit, earth disturbing activities cannot begin until the individual permit is issued.

### 7.12.2 Permittee coverage

Any discharger authorized by this policy may request to be excluded from the coverage of this policy by applying for an individual permit. Any discharger that knowingly cannot abide by the terms and conditions of this policy must apply for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the appropriate TDEC's Environmental Field Office. The request may be granted by issuance

of an individual permit, or alternative general permit, if the reasons cited by the permittee are adequate to support the request.

### 7.12.3 General permit termination

When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this policy to the discharger is terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an owner or operator otherwise subject to this permit, or the owner or operator is denied for coverage under an alternative NPDES general permit, the applicability of this policy to the individual NPDES permittee is terminated on the date of such denial, unless otherwise specified by the director. Coverage under the Tennessee Multi-Sector General Permit for the Discharge of Stormwater from an Industrial Activity (TMSP) will not be considered as an alternative general permit under this section without being specified by the director.

## 7.13 OTHER, NON-STORMWATER, PROGRAM REQUIREMENTS

No condition of this policy shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

## 7.14 PROPER OPERATION AND MAINTENANCE

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related equipment) which are installed or used by the permittee to achieve compliance with the conditions of this policy and with the requirements of stormwater pollution prevention plans.

Proper operation and maintenance also includes adequate laboratory quality assurance and quality control procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee, when determined by the permittee or the department to be necessary to achieve compliance with the conditions of the permit.

## 7.15 INSPECTION AND ENTRY

The permittee shall allow authorized representatives of the Environmental Protection Agency, the director or an authorized representative of the commissioner of TDEC, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the MS4 receiving the discharge, upon the presentation of credentials and other documents as may be required by law:

- a) to enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
- b) to have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and
- c) to inspect any facilities or equipment (including monitoring and control equipment).

## 7.16 POLICY ACTIONS

This policy may be issued, modified, revoked, reissued or terminated for cause in accordance with this policy and the applicable requirements of T.C.A. § 69-3-108. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

## SECTION 8 REQUIREMENTS FOR TERMINATION OF COVERAGE

### 8.1 TERMINATION OF DEVELOPER AND BUILDER COVERAGE

#### 8.1.1 Termination process for primary permittees

Primary permittees wishing to terminate coverage under this permit must submit a completed NOT form provided in Appendix B of this policy. Primary permittees who abandon a site and fail to submit the NOT will be in violation of this policy. The department can terminate coverage under the CGP if the NOT is not submitted within five years of the “estimated end date” (as identified on the NOI). Signs notifying the public of the construction activity shall be in place until the NOT form has been submitted. Primary permittees may terminate permit coverage only if the conditions described below occur at the site:

- a) All earth-disturbing activities and, if applicable, construction support activities permitted under Subsection 1.2.2 at the site are complete and the following requirements are met:
  - i. For any areas that were disturbed during construction, are not covered by permanent structures and over which the permittee had control during the construction activities; the requirements for final vegetation or non-vegetative stabilization described in 3.5.3.2 are met.
  - ii. The permittee has removed and properly disposed of all construction materials; and, waste and waste handling devices. The permittee has removed all equipment and vehicles that were used during construction, unless they are intended for long-term use following termination of permit coverage.
  - iii. The permittee has removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following termination of permit coverage.
  - iv. The permittee has identified who is responsible for ongoing maintenance of any stormwater controls left on the site for long-term use following termination of permit coverage.
- b) The permittee has transferred control of all areas of the site for which he is responsible (including, but not limited to, infrastructure, common areas, stormwater drainage structures, sediment control basin) under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit.
- c) The permittee obtains coverage under an individual or alternative general NPDES permit.

#### 8.1.2 NOT review

The department may review NOTs for completeness and accuracy and, when necessary, investigate the proposed site for which the NOT was submitted. Coverage under this CGP is terminated when the owner/operator is notified by the department that coverage is terminated.

The department retains the right to deny termination of coverage under this general permit upon receipt of the NOT. If the department has information indicating that the permit coverage is not eligible for termination, written notification will be provided that permit coverage has not been terminated. The

notification will include a summary of existing deficiencies. When the site meets the termination criteria, the NOT should be re-submitted.

If any permittee files for bankruptcy or the site is foreclosed on by the lender, the permittee should notify the department of the situation so that the department may assess the site to determine if permit coverage should be obtained by any other person or whether other action is needed.

## 8.2 TERMINATION OF BUILDER AND CONTRACTOR COVERAGE

### 8.2.1 Termination process for secondary permittees

Secondary permittees must request termination of coverage under this policy by submitting an NOT when they are no longer an operator at the construction site. Secondary permittees receive coverage under this permit, but are not normally mailed a NOC. Consequently, the department may, but is not required to, notify secondary permittees that their notice of termination has been received. If the department has reason to believe that the secondary permittees' NOT should not have been submitted, the department will deny the secondary permittees' NOT in writing, with specific reasons as to why the NOT should not have been submitted.

## 8.3 NOT CERTIFICATION

The NOT and the following certification must be signed in accordance with Subsection 7.7 of this permit:

*"I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act. As specified in Tennessee Code Annotated Section 39-16-702(a) (4), this declaration is made under penalty of perjury."*

## 8.4 WHERE TO SUBMIT AN NOT

The NOT shall be submitted to the City of Knoxville Stormwater Engineering Division or Environmental Field Office (EFO) which issued the NOC to the primary permittee. The appropriate permit tracking number must be clearly printed on the form.

## SECTION 9 AQUATIC RESOURCE ALTERATION PERMITS (ARAP)

Alterations to channels or waterbodies (streams, wetlands and/or other waters of the state) that are contained on, traverse through or are adjacent to the construction site, may require an Aquatic Resources Alteration Permit (ARAP) (<http://www.tn.gov/environment/article/permit-wateraquatic-resource-alteration-permit>). It is the responsibility of the developer to provide a determination of the water's status<sup>3</sup>. This determination must be conducted in accordance with Tennessee's standard operating procedures for hydrologic determinations set forth at Rule 0400-0-03.05(9). The permittee can make an assumption that streams/wetlands are present at the site in order to expedite the permit process. In some cases, issuance of coverage under the CGP may be delayed or withheld if the appropriate ARAP has not been obtained. At a minimum, any delay in obtaining an ARAP for water body alteration associated with the proposed project must be adequately addressed in the SWPPP prior to issuance of an NOC. Failure to obtain an ARAP prior to any actual alteration may result in enforcement action for the unauthorized alteration.

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<sup>3</sup> The EPA considers inventorying a site's natural features is a technique called fingerprinting. More info can be found in EPA's document - EPA's Developing Your SWPPP – A Guide for Construction Sites (EPA-833-R-06-004 May 2007).

## SECTION 10 DEFINITIONS

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 three and seven-tenths (3.7) inches in twenty-four (24) hours or other such magnitude the Director shall establish based upon scientific and engineering information.

BEST MANAGEMENT PRACTICES (BMP) – Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

BORROW PIT – An excavation from which erodible material (typically soil) is removed to be fill for another site. There is no processing or separation of erodible material conducted at the site. Given the nature of activity and pollutants present at such excavation, a borrow pit is considered a construction activity for the purpose of this permit.

BUFFER ZONE – See “Construction Riparian Buffer Zone” or “Riparian Buffer Zone”

CLEARING – In the definition of discharges associated with construction activity, typically refers to removal of vegetation and 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, clearing forested land in order to convert forestland to pasture for wildlife management purposes. Clearing, grading and excavation do not refer to clearing of vegetation along existing or new roadways, highways, dams or power lines for sight distance or other maintenance and/or safety concerns, or cold planning, milling, and/or removal of concrete and/or bituminous asphalt roadway pavement surfaces. The clearing of land for agricultural purposes is exempt from federal stormwater NPDES permitting in accordance with Section 401(1)(1) of the 1987 Water Quality Act and state stormwater NPDES permitting in accordance with the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.).

COMMENCEMENT OF CONSTRUCTION – The initial disturbance of soils associated with clearing, grading, excavating or other construction activities.

COMMON PLAN OF DEVELOPMENT OR SALE – Any announcement or documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot. A common plan of development or sale identifies a situation in which multiple areas of disturbance are occurring on contiguous areas. This applies because the activities may take place at different times, on different schedules, by different operators.

CONSTRUCTION RIPARIAN BUFFER ZONE (CRBZ) – A temporary BMP that is defined as a strip of dense undisturbed perennial native vegetation, either original or re-established, that borders streams and rivers, ponds and lakes, wetlands, and seeps. CRBZs are established for the purposes of slowing water runoff, enhancing water infiltration, and minimizing the risk of any potential nutrients or pollutants from leaving the upland area and reaching surface waters. CRBZs are most effective when stormwater runoff is flowing into and through the buffer zone as shallow sheet flow, rather than in concentrated form such as in channels, gullies, or wet weather conveyances. Therefore, it is critical that the design of any development include management practices, to the maximum extent practical, that will result in stormwater runoff flowing into and through the buffer zone as shallow sheet flow. CRBZs are established for the primary purpose of protecting water quality and maintaining a healthy aquatic ecosystem in receiving waters.

CONTROL MEASURE – As used in this permit, refers to any Best Management Practice (BMP) or other method used to prevent or reduce the discharge of pollutants to waters of the state.

CWA – Clean Water Act of 1977 or the Federal Water Pollution Control Act (33 U.S.C. 1251, et seq.)

DEPARTMENT – The City of Knoxville Stormwater Engineering Division

DIRECTOR – The director, or authorized representative, of the City of Knoxville Department of Engineering.

DISCHARGE OF STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY – As used in this permit, refers to stormwater point source discharges from areas where soil disturbing activities (e.g., clearing, grading, excavation, etc.), or construction materials or equipment storage or maintenance (e.g., earth fill piles, fueling, waste material etc.) are located.

DISTURBED AREA – Any portion of a 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.

FINAL STABILIZATION – All soil disturbing activities at the site have been completed and one of the three following criteria is met:

- a. A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a uniform density of at least 70 percent of the (preferably) native vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, and all slopes and channels have been permanently stabilized against erosion, or
- b. Equivalent permanent stabilization measures (such as the use of riprap; permanent geotextiles, hardened surface materials including concrete, asphalt, gabion baskets, or Reno mattresses) have been employed, or
- c. For construction projects on land used for agricultural or silvicultural purposes, final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural or silvicultural use.

ELECTRONIC SIGNATURE – symbols or other data in digital form attached to an electronically transmitted document as verification of the sender's intent to sign the document.

EXCEPTIONAL TENNESSEE WATERS – Surface waters of the State of Tennessee that satisfy characteristics of exceptional Tennessee waters as listed Chapter 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 Resource 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.

IMPAIRED WATERS – See “Waters with Unavailable Parameters”

IMPROVED SINKHOLE – A natural surface depression that has been altered in order to direct fluids into the hole opening. Improved sinkhole is a type of injection well regulated under the Underground Injection Control (UIC) program. Underground injection constitutes an intentional disposal of waste waters in natural depressions, open fractures, and crevices (such as those commonly associated with weathering of limestone).

INSPECTOR – A person with following qualifications:

- a) a valid certification from the “Fundamentals of Erosion Prevention and Sediment Control Level I” course,
- b) a licensed professional engineer or landscape architect, c) a Certified Professional in Erosion and Sediment Control (CPESC), or
- d) successfully completed the “Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites” course

An inspector performs and documents the required inspections, paying particular attention to time-sensitive permit requirements such as stabilization and maintenance activities. An inspector may also have the following responsibilities:

- a) oversee the requirements of other construction-related permits, such as an Aquatic Resources Alteration Permit (ARAP) or Corps of Engineers permit for construction activities in or around waters of the state.
- b) update field SWPPPs.
- c) conduct pre-construction inspection to verify that undisturbed areas have been properly marked and initial measures have been installed.
- d) inform the permit holder of activities that may be necessary to gain or remain in compliance with the CGP and other environmental permits.

LINEAR PROJECT – A land disturbing activity as conducted by an underground/overhead utility or highway department, including but not limited to any cable line or wire for the transmission of electrical energy; any conveyance pipeline for transportation of gaseous or liquid substance; any cable line or wire for communications; or any other energy resource transmission ROW or utility infrastructure, e.g., roads and highways. Activities include the construction and installation of these utilities within a corridor. Linear project activities also include the construction of access roads, staging areas, and borrow/spoil sites associated with the linear project. Land disturbance specific to the development of a residential and/or commercial subdivision or high-rise structures is not considered a linear project.

MONTHLY – Refers to calendar months.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) – Is defined at 40 CFR §122.26(b)(8) to mean a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

- a) owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a

sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

- b) designed or used for collecting or conveying stormwater;
- c) not a combined sewer; and
- d) not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2

NOTICE OF INTENT (NOI) – Formal notice provided to the department by the operator/developer to be covered by this policy (see Section 2 of this policy.)

NOTICE OF TERMINATION (NOT) – Formal notice provided to the department by the operator/developer requesting termination of coverage by this policy (see Section 8 of this policy).

OPERATOR – For the purpose of this policy and in the context of stormwater associated with construction activity, means any person associated with a construction project that meets either of the following two criteria:

- a) this person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project, and is considered the primary permittee; or
- b) this person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

It is anticipated that at different phases of a construction project, different types of parties may satisfy the definition of “operator.”

POINT SOURCE – Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include introduction of pollutants from non-point-source agricultural and silvicultural activities, including stormwater runoff from orchards, cultivated crops, pastures, range lands, and forest lands or return flows from irrigated agriculture or agricultural stormwater runoff.

QUALIFYING LOCAL PROGRAM (QLP) – Is one that includes, as defined in 40 CFR 122.44(s):

- a) requirements for construction site operators to implement appropriate erosion and sediment control best management practices;
- b) requirements for construction site operators to control waste 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;
- c) requirements for construction site operators to develop and implement a stormwater pollution

prevention plan. (A stormwater pollution prevention plan includes site descriptions, descriptions of appropriate control measures, copies of approved State, Tribal or local requirements, maintenance procedures, inspection procedures, and identification of non-stormwater discharges); and

- d) requirements to submit a site plan for review that incorporates consideration of potential water quality impacts

QUALITY ASSURANCE SITE ASSESSMENT – A documented site inspection to verify the functionality and performance of the SWPPP and for determining if construction, operation and maintenance accurately comply with policy requirements, as presented in the narrative, engineering specifications; maps, plans and drawings; and details for erosion prevention, sediment control and stormwater management.

REGISTERED ENGINEER OR LANDSCAPE ARCHITECT – An engineer or landscape architect certified and registered by the State Board of Architectural and Engineer Examiners pursuant to Section 62-202, Tennessee Code Annotated, to practice in Tennessee.

RIPARIAN BUFFER ZONE (RBZ) – A permanent BMP that is defined as a strip of dense undisturbed perennial native vegetation, either original or re-established, that borders streams and rivers, ponds and lakes, wetlands, and seeps. RBZs are established for the purposes of slowing water runoff, enhancing water infiltration, and minimizing the risk of any potential nutrients or pollutants from leaving the upland area and reaching surface waters. RBZs are most effective when stormwater runoff is flowing into and through the buffer zone as shallow sheet flow, rather than in concentrated form such as in channels, gullies, or wet weather conveyances. Therefore, it is critical that the design of any development include management practices, to the maximum extent practical, that will result in stormwater runoff flowing into and through the buffer zone as shallow sheet flow. RBZs are established for the primary purpose of protecting water quality and maintaining a healthy aquatic ecosystem in receiving waters.

RUNOFF COEFFICIENT – The fraction of total rainfall that will appear at the conveyance as runoff. Runoff coefficient is also defined as the ratio of the amount of water that is NOT absorbed by the surface to the total amount of water that falls during a rainstorm.

SEDIMENT – Solid material, both inorganic (mineral) and 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.

SEDIMENT BASIN – A temporary basin consisting of an embankment constructed across a wet weather conveyance or an excavation that creates a basin or by a combination of both. A sediment basin typically consists of a forebay cell, dam, impoundment, permanent pool, primary spillway, secondary or emergency spillway, and surface dewatering device. The size and shape of the basin depends on the location, size of drainage area, incoming runoff volume and peak flow, soil type and particle size, land cover, and receiving stream classification (Waters with Unavailable Parameters (impaired) or Exceptional TN Waters).

SEDIMENTATION – the action or process of forming or depositing sediment.

SIGNIFICANT CONTRIBUTOR OF POLLUTANTS TO WATERS OF THE STATE – Any discharge containing pollutants that are reasonably expected to cause or contribute to an impairment of receiving stream water quality or designated uses.

SOIL – The unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of plants.

STEEP SLOPE – A natural (or created) slope of 35% grade or greater. Designers of sites with steep slopes

must pay attention to stormwater management in the SWPPP to engineer runoff non-erosively around or over a steep slope. In addition, site managers should focus on erosion prevention on the slope(s) and stabilize the slope(s) as soon as practicable to prevent slope failure and/or sediment discharges from the project.

STORMWATER – rainfall runoff, snow melt runoff, and surface runoff and drainage.

STORMWATER ASSOCIATED WITH INDUSTRIAL ACTIVITY – Is defined at 40 CFR 122.26(b)(14) and incorporated here by reference. Most relevant to this policy is 40 CFR 122.26(b)(14)(x), which relates to construction activity including clearing, grading, filling and excavation activities (including borrow pits containing erodible material). Disturbance of soil for the purpose of crop production is exempted from permit requirements, but stormwater discharges from agriculture-related activities which involve construction of structures (e.g., barn construction, road construction, pond construction, etc.) are considered associated with industrial activity. Maintenance performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility, e.g. re-clearing, minor excavation performed around an existing structure necessary for maintenance or repair, and repaving of an existing road, is not considered a construction activity for the purpose of this permit.

STORMWATER DISCHARGE-RELATED ACTIVITIES – Activities which cause, contribute to, or result in point source stormwater pollutant discharges, including but not limited to: excavation, site development, grading and other surface disturbance activities; and measures to control stormwater including the siting, construction and operation of best management practices (BMPs) to control, reduce or prevent stormwater pollution.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) – A written plan required by this policy that includes site map(s), an identification of construction/contractor activities that could cause pollutants in the stormwater, and a description of measures or practices to control these pollutants. It must be prepared and approved before construction begins. In order to effectively reduce erosion and sedimentation impacts, Best Management Practices (BMPs) must be designed, installed, and maintained during land disturbing activities. The SWPPP should be prepared in accordance with the *Tennessee Erosion and Sediment Control Handbook*. The handbook is designed to provide information to planners, developers, engineers, and contractors on the proper selection, installation, and maintenance of BMPs. The handbook is intended for use during the design and construction of projects that require erosion and sediment controls to protect waters of the state. It also aids in the development of SWPPPs and other reports, plans, or specifications required when participating in Tennessee's water quality regulations.

STREAM – Surface waters that are not considered a wet weather conveyance. Therefore, as used in this permit, “stream” includes lakes, wetlands and other non-linear surface waters.

TAKE OF AN ENDANGERED SPECIES – To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct with an endangered species.

TEMPORARY STABILIZATION – When vegetation and/or a non-erodible surface have been established on the area of disturbance and construction activity has temporarily ceased. Under certain conditions, temporary stabilization is required when construction activities temporarily cease. However, if future construction activity is planned, permit coverage continues

TOTAL MAXIMUM DAILY LOAD (TMDL) – The sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background (40 CFR 130.2(I)). TMDL is a study that: quantifies the amount of a pollutant in a stream, identifies the sources of the pollutant, and recommends regulatory or other actions that may need to be taken in order for the stream to cease being

polluted. Some of the actions that might be taken are:

- 1) Re-allocation of limits on the sources of pollutants documented as impacting streams. It might be necessary to lower the amount of pollutants being discharged under NPDES permits or to require the installation of other control measures, if necessary, to ensure that water quality standards will be met.
- 2) For sources over which the department does not have regulatory authority, such as ordinary agricultural or forestry activities, provide information and technical assistance to other state and federal agencies that work directly with these groups to install appropriate Best Management Practices (BMPs).

Even for impacted streams, TMDL development is not considered appropriate for all bodies of water: if enforcement has already been taken and a compliance schedule has been developed; or if best management practices have already been installed for non-regulated activities, the TMDL is considered not applicable. In cases involving pollution sources in other states, the recommendation may be that another state or EPA perform the TMDL. TMDLs can also be described by the following equation:

$TMDL = \text{sum of non-point sources (LA)} + \text{sum of point sources (WLA)} + \text{margin of safety}$

A list of completed TMDLs that have been approved by EPA can be found at this web site: <http://tn.gov/environment/article/wr-ws-tennessees-total-maximum-daily-load-tmdl-program>.

TREATMENT CHEMICALS – Polymers, flocculants or other chemicals used to reduce turbidity in stormwater discharges by chemically bonding to suspended silts and other soil materials and causing them to bind together and settle out. Common examples of anionic treatment chemicals are chitosan and anionic PAM.

TURBIDITY – The cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye, similar to smoke in air.

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.

WASTE SITE – An area where material from a construction site is disposed of. When the material is erodible, such as soil, the site must be treated as a construction site.

WATERS WITH UNAVAILABLE PARAMETERS (IMPAIRED) – (unavailable conditions waters) Any segment of surface waters that has been identified by the TDEC as failing to support one or more classified uses. For the purpose of this permit, pollutants of concern include, but are not limited to: siltation (silt/sediment) and habitat alterations. Based on the most recent assessment information available to staff, the department will notify applicants and permittees if their discharge is into, or is affecting, Waters with Unavailable Parameters (impaired) waters. Resources to be used in making this determination include biennial compilations of Waters with Unavailable Parameters (impaired) waters, databases of assessment information, updated GIS coverages (<http://tnmap.tn.gov/wpc/>), and the results of recent field surveys. GIS coverages of the streams and lakes not meeting water quality standards, plus the biennial list of Waters with Unavailable Parameters (impaired) waters, can be found at <http://tn.gov/environment/topic/wr-wq-water-quality>.

WET WEATHER CONVEYANCES – Man-made or natural watercourses, including natural watercourses that have been modified by channelization, that meet the following:

- a) the conveyance carries flow only in direct response to precipitation runoff in its immediate locality.
- b) the conveyance's channels are at all times above the ground water table.
- c) the flow carried by the conveyance is not suitable for drinking water supplies.
- d) hydrological and biological analyses indicate that, due to naturally occurring ephemeral or low flow under normal weather conditions, there is not sufficient water to support fish or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months. (Tennessee Rules, Chapter 0400-40-3-.04(3))

**SECTION 11 LIST OF ACRONYMS**

ARAP	Aquatic Resource Alteration Permit
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CGP	Construction General Permit
COK	City of Knoxville
CRBZ	Construction Riparian Buffer Zone
CWA	Clean Water Act
EFO	Environmental Field Office
EPA	(U.S.) Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
MS4	Municipal Separate Storm Sewer System
NOC	Notice of Coverage
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
ONRW	Outstanding National Resource Waters
POTW	Publicly Owned Treatment Works
QLP	Qualifying Local Program
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
TMDL	Total Maximum Daily Load
TMSP	Tennessee Multi-Sector General Permit for the Discharge of Stormwater from an Industrial Activity
TVA	Tennessee Valley Authority
TWQCA	Tennessee Water Quality Control Act
UIC	Underground Injection Control
USGS	United States Geological Survey

(End of body of policy.)



## Policy 10 RETAINING WALLS

All construction, modification, and repair of retaining walls require a permit. Retaining walls that are monolithically placed and structurally tied to a house or building foundation will be permitted and approved under the building permit. Retaining walls located on private property are the responsibility of the property owner. The City of Knoxville Department of Engineering classifies retaining walls as critical walls or non-critical walls.

The Director of the Department of Engineering has authority to modify the requirements of this policy on a case by case basis.

### Critical Walls

Critical walls are walls where the distance between the face of the retaining wall (regardless of height) and a critical feature is less than the wall's height, thus having the potential to affect the critical feature during the wall's failure. Critical features are public right-of-way, stormwater infrastructure, structures where people reside, or adjacent property. A wall's height is defined as the maximum difference between grade elevations on either side of the wall.

### Non-Critical Walls

Non-critical walls are walls that do not meet the critical wall definition.

### Permitting Requirements

Type of Wall	Site Plan	Typical Section	PE Stamp	Section Design	Calculations	Development Certification
Non-Critical Wall Max Height 5 ft	X					
Non-Critical Wall Max Height 10 ft	X	X	X	X		
Non-Critical Wall Height Greater than 10 ft	X	X	X	X	X	
Critical Wall	X	X	X	X	X	X

### Site Plan

Show the wall's location in reference to all property lines, structures, and all other critical features. It must include existing and proposed contours (2 ft minimum), easements, parking facilities, drainage features, existing or proposed site features, and the wall's maximum height.

### Typical Section

Show wall and footing dimensions, backfill slopes and material, finished grade elevations, steel reinforcements details, weephole locations, subsurface drainage system, and all other critical features to the wall's design.

### Calculations

Must note all assumptions such as concrete and steel reinforcements strengths, soil parameters, surcharges, bearing pressures, safety factors for bearing capacity, overturning, and sliding. The minimum required factors of safety are as follows:

Bearing Capacity = 3.0

Overturning = 2.0

Sliding = 1.5

A reasonable allowable bearing capacity should be used.

### Development Certification

A geotechnical report, stamped by a Professional Engineer, must be included with the retaining wall design and calculations submittal or with the Development Certification Submittal. The geotechnical report must verify the assumed bearing capacity is acceptable. If the bearing capacity is not acceptable the wall must be addressed by the appropriate design professional, which may include redesign, modification, or reconstruction. Wall elements must be inspected by a 3rd party engineer, the 3rd party certification must be submitted as part of the Development Certification. The 3rd party certification must confirm construction meets or exceeds the original design. City of Knoxville inspectors may certify poured in place walls in place of a 3rd party engineer.

### Large Segmental Block Walls

Walls that are 5 feet tall or less (which are not associated with a water impoundment feature) and are constructed of manufactured solid masonry blocks that are at least 2 feet wide (as measured from face of wall to back of wall) do not require calculations, development certification, PE Stamp, or closure of peripheral utility and drainage easements. The walls must be constructed per the manufacturer's specifications.

### Terraced Walls

If at any point the distance between the faces of terraced walls is less than the height of the tallest wall, the walls must be designed with consideration of the interdependent nature of the walls. In this case, the difference between the bottom grade of the lower wall and the top grade of the upper wall should be considered in the analysis.

### Utility and Drainage Easements

The majority of lots have dedicated utility and drainage easements along their perimeter. If a non-critical wall is to be located in the perimeter utility and drainage easement and a utility or drainage facility is located in the easement, the applicant must obtain written permission from the utility provider before the wall can be permitted. If a critical wall is to be placed in a perimeter utility and drainage easement the easement must be addressed (typically by closure of the utility and drainage easement).

If a wall is proposed in another type of easement the applicant must obtain written permission from the entities who have rights to the easements.

### Engineered Slopes

Slopes that exceed 2 horizontal : 1 vertical must be designed by a Professional Engineer. If the slope also meets the requirements of a critical wall the slope must be certified through the Development Certification process. A slope is deemed critical when the height of the slope, that is steeper than 2 horizontal : 1 vertical, is greater than the distance between any part of the slope and a critical feature.



## Policy 03

### CREEK RESTORATION AND CHANNEL MAINTENANCE

The City of Knoxville offers a public service to assist property owners with a limited amount of maintenance for creeks and drainage channels. The City of Knoxville has a dedicated full-time field crew (Creek Cleanup Crew) to help maintain and restore the major creeks and other urban drainage channels.

The ultimate responsibility for all maintenance of creeks and drainage channels will remain with the property owner. If there is a drainage easement, the maintenance responsibility still remains with the property owner, even if the City of Knoxville has historically maintained the drainage channel for the clearly defined general public welfare. Drainage channels shall include (but are not limited to) natural drainage ditches, manmade drainage ditches, swales, creeks, streams, dry creek beds and open culverts.

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The Creek Cleanup Crew is usually dedicated to inspecting the creeks and drainage channels on a regular basis. Routine maintenance, such as litter and debris removal, is performed as the crew progresses. Although most of the work is done by hand, larger items may need to be removed with special equipment. Blockages will be removed, and very minor grading can be performed as needed to restore channel conveyance.

The Creek Cleanup Crew will also try to maintain or improve the amount of shade provided by large trees along stream reaches. Natural snags and other obstructions that cause pool areas are generally not removed if channel conveyance is not affected. Special problem sites are noted, with recommendations for work orders outside of the routine schedule. In general, the crew does not perform clearing or mowing of streambank areas and other riparian zones. This practice is highly discouraged by the Tennessee Department of Environment and Conservation (TDEC) to prevent grass and leaves from entering the creeks.

The Creek Cleanup Crew is instructed to report incidences of illicit discharges and improper disposal to the Stormwater Quality Hotline for further investigation. This may include: trash and debris, discharge of liquids through culverts or pipes, grass and leaves in the creek, food and organic nutrients in the creek, etc. See AM-01 and IC-01 of the Knoxville BMP Manual for more guidance on non-stormwater discharges and a quick-reference table for disposal alternatives.

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The City of Knoxville helps to support the “Adopt-A-Stream” program, which is now coordinated by the Water Quality Forum ([www.waterqualityforum.org](http://www.waterqualityforum.org)). A group of volunteers can adopt a section (typical unit = ¼ mile but varies widely) to periodically pickup trash and debris along stream and creek reaches. The volunteers sign up through the Water Quality Forum, receive training and supplies, and are recognized by posted Adopt-A-Stream signs. Each group of volunteers will be supported by the local government with jurisdiction over the particular stream reach, and the local government (Knox County, City of Knoxville, Town of Farragut) will provide trash bags, trash pickup and other supplies as needed. The volunteers are encouraged to note field conditions and stream quality, and to also report locations of large debris for future removal by the Creek Cleanup Crew. Volunteers may also support other types of community projects such as streambank stabilization, storm drain stenciling, or habitat enhancements by contacting the Water Quality Forum or the Knoxville Stormwater Engineering Division.



## Policy 07

# MAINTENANCE RESPONSIBILITY FOR STORMWATER DRAINAGE SYSTEMS

### 1. Purpose

The purpose of this policy is to provide guidelines for City of Knoxville Engineering Department employees to identify, evaluate, and resolve existing drainage problems; this policy also defines maintenance responsibilities for stormwater drainage systems. The guidelines in this policy are intended to apply to existing stormwater drainage systems only; new stormwater drainage systems shall be designed as specified in other portions of this manual and in the Knoxville Stormwater and Street Ordinance.

### 2. Drainage Channels

For the purpose of this policy, drainage channels shall include, but are not limited to: natural or man-made drainage ditches, swales, creeks and wet or dry open culverts.

The City of Knoxville assumes responsibility for the construction, improvement and maintenance of drainage channels within the public right-of-way when it is for the clearly defined general public welfare. The City assumes no responsibility for maintenance or improvement of drainage channels on private property. Where a drainage easement exists, the City may maintain or improve drainage channels at its option when it is for the clearly defined general public welfare. Engineers and technicians of the Engineering Department are authorized to act on behalf of the City within these guidelines.

### 3. Storm Drains

The City of Knoxville assumes responsibility for the installation, improvement and maintenance of storm systems on the right-of-way when same is for clearly defined general public welfare. The minimum diameter of pipes installed by the City of Knoxville will be no less than fifteen inches, unless an abnormal condition exists. The City does not assume responsibility for the installation or improvement of storm systems on the right-of-way as follows:

- Storm drains desired by the adjacent property owner for aesthetics.
- Storm drains desired by a property owner or required by the City to allow street access or to aid development.
- Storm drains desired by an adjacent property owner as an alternative to a properly functioning existing ditch or proposed ditch.

The City of Knoxville assumes no responsibility for the maintenance, installation or improvement of pipes or stormwater systems on private property. Where a drainage easement exists, the City may maintain, install or improve a stormwater system at its option for the clearly defined general public welfare. Any installation on private property must be approved by the Engineering Director or the Public Service Director. An easement or right-of-entry must be obtained before an approved project shall commence.

Any project that requires the installation or replacement of pipes in excess of one hundred feet or requires pipes with an equivalent diameter greater than thirty six inches may be considered beyond the scope of the Public Service Department. These projects will be recommended for either the Neighborhood Drainage Program or a Capital Improvements Project (see section 9).

#### **4. Curbing**

The City of Knoxville can install asphalt curbing and asphalt rollover curbs to help correct structure flooding drainage issues. Asphalt curbing will not be installed in, but not limited to, the following situations:

- Where a drainage channel, as described in Section 2, can be installed or re-established to provide the same amount of flooding relief.
- Where the curbing will cause a safety hazard.
- Where the curbing will cause flooding issues to other properties.

Asphalt rollover curbs will not be installed in, but not limited to, the following situations:

- Along concrete or gravel driveways.
- Along gravel, dirt or grass pulloffs.
- Where the addition of the curb may cause damage to vehicles passing over it.

#### **5. Priority of Stormwater Maintenance Activities**

The order in which stormwater projects will be prioritized will be based on the date the work order was submitted to the Public Service Department as well as the type of flooding that is occurring. The four types of flooding complaints are prioritized as follows:

1. Structural flooding (of finished floor)
2. Structural flooding (other structures)
3. Roadway flooding or safety hazards
4. Non-structural flooding

The time period for completion of each work order is dependent upon many factors; including the scope of each project, availability of resources, and the total number of work orders written by the inspectors to the Public Service Department during any given period.

#### **6. Stormwater Facilities**

Stormwater facilities refer to any device designed to reduce stormwater flows or to reduce the pollutant loads in stormwater. Stormwater facilities include, but are not limited to: detention basins, retention basins, infiltration ponds, oil/water separators and grit chambers. The City of Knoxville assumes no responsibility for the maintenance, installation or improvement of stormwater facilities located on private property. Stormwater facilities located on private property are the responsibility of the property owner(s). In some cases, a neighborhood association may have legally accepted the responsibilities of the stormwater facility.

#### **7. Storm Drainage Material Selection**

Please see Policy 16, of Appendix C of this manual.

## 8. Design Criteria for Stormwater Improvements

Determination of stormwater flow rates within the City of Knoxville shall be in accordance with the NRCS method described in Technical Release 55 (TR-55). The use of standard well-known software programs, such as HEC-1 or HEC-HMS from the U.S. Army Corps of Engineers, is typically beneficial for most computations. Average antecedent moisture conditions (AMC II) shall be used for the calculations. NRCS methods must use 24-hour duration storm with NRCS Type II rainfall distribution for the design frequency. These rainfalls apply to the Knoxville area:

Frequency	1-year	2-year	5-year	10-year	25-year	50-year	100-year	500-year
NRCS rainfall	2.5"	3.3"	4.1"	4.8"	5.5"	6.1"	6.5"	7.6"

In selecting the design frequency storm, the following criteria will be used (listed in order as being progressively more restrictive):

- Longitudinal side drains shall be designed for a 10-year frequency flood, provided that no residential or commercial structures are flooded by a 100-year flood, except as noted below.
- Roadway cross-drains for all but arterial streets shall be designed for a 25-year frequency flood, providing that no residential or commercial structures are flooded by a 100-year flood, except as noted below.
- Roadway cross-drains for arterial streets or a higher street classification shall be designed for a 50-year flood, provided that no structures are flooded by a 100-year flood, except as noted below.
- All bridges, structures, or embankments in floodways designated as part of the Federal Flood Insurance Study shall be designed to pass a 500-year frequency flood without raising the existing 500-year flood profile.

These guidelines have been set up to provide a uniform basis for design projects; however, many retrofit projects have limitations as to the benefits that are produced by the project. Therefore, the City of Knoxville will endeavor to follow the guidelines to the maximum extent practical, both economically and physically.

## 9. Programs for Funding Special Drainage Projects

The City of Knoxville has two programs which may be used to fund special or large drainage projects throughout the City. Projects funded through either of these programs may include work on private property, when it is for the clearly defined general public welfare.

The first program is the Capital Improvements Projects (CIP) Program. This program is a prioritized, multi-year schedule of public infrastructure improvements, which may include drainage projects. During the fall of each year, the Engineering Department recommends projects for inclusion in the CIP Program. Projects accepted for the program will then be eligible for funding at the beginning of the next fiscal year (i.e. the following July 1).

The second program is the Neighborhood Drainage Program, which was proposed by the Mayor and approved by City Council to address pressing drainage concerns. The program currently provides \$250,000 annually for the funding of drainage improvements throughout the City of Knoxville. Consideration for project inclusion in this program is based on, but is not limited to, one or more of the following:

- Total projected cost of the project
- Number of residential or commercial structures that have had floodwater damage
- Frequency of the occurrences

- Impact to adjacent and downstream properties
- Degree of flooding on adjacent streets.

Additional consideration may be given to projects when partial funding can be provided by other sources, such as federal agencies or neighborhood groups.



## Policy 11

### SEDIMENT DISPOSAL FOR DETENTION BASIN MAINTENANCE

When properly designed, stormwater detention basins will accumulate significant quantities of sediment over time. Sediment gradually reduces the available stormwater storage capacity of the basin. A rule of thumb is that approximately 1% of the storage volume capacity associated with the 2-year design storm can be lost annually. Therefore, approximately 20% of a pond's total storage capacity can be lost within 20 years.

However, the actual sediment accumulation rate is dependent upon a number of factors including watershed size, facility sizing, upstream construction, nearby industrial activities and land uses, numbers of leaking vehicles, use of sand and salt during winter, etc. Thick grass and vegetation will retain sediment and silt at a faster rate.

In addition to long-term maintenance, sediment disposal is usually necessary during the construction process. Erosion control practices and devices are not totally effective at reducing and eliminating all sediment. The developer must ensure that the designed detention volume has been restored and that all graded surfaces have been completely stabilized at the end of construction.

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The sediment basin shall be inspected on a regular basis to determine the impact of existing sedimentation on the capacity of the basin. Inspections should occur during dry weather and wet weather conditions. In general, remove sediment prior to significant accumulations using a combination of equipment methods and hand shoveling. Typical intervals for sediment removal will be every 5 to 7 years. Typical intervals for sediment removal for a sediment forebay or other pretreatment settling basin will be once a year.

#### Assessment and Disposal:

1. If the detention basin meets any of the following criteria, then contact the Tennessee Department of Environment and Conservation (TDEC) for further regulations and recommended disposal guidelines.
  - a. Known contaminants are contained in the stormwater runoff or the sediment.
  - b. The detention basin receives stormwater runoff from an industrial site.
  - c. The detention basin receives stormwater runoff from a fueling center.
  - d. The detention basin receives stormwater runoff from one or more commercial businesses with a total parking area of at least 120,000 square feet or 400 parking spaces.
  - e. The Engineering Director has reason to believe that contaminants are present based upon scientific or engineering information.

In all cases, treat sediment from detention basins as potentially hazardous soil until proven otherwise. Sediments should be sampled and identified before removal and disposal operations proceed. Contact the local office of TDEC - Division of Water Pollution Control (865-594-6035) to discuss special disposal procedures.

2. If the detention basin does not meet any of the above criteria, or if the sediment has been tested and is determined to be free of contamination, then the following disposal practices are allowed.
  - a. Disposal at a Class III or Class IV landfill.
  - b. Use for fill material, cover material or land spreading on the project site.
  - c. Other disposal materials as approved by the Engineering Director.

All sediment which is disposed onsite must be prevented from entering the sediment basin, any drainage channel or culvert, natural creeks or streams, or any other component of the stormwater drainage system.

The following table is a list of local landfills that may accept sediment. Contact each landfill for costs and regulations associated with sediment disposal. This list is not intended to be complete or inclusive.

<b>Landfill</b>	<b>Location</b>	<b>Phone</b>	<b>Type</b>
Burnett-Armstrong Demolition Landfill	3330 Delrose Avenue Knoxville, Tennessee	865-525-6645	Demolition
Poplar View Class III/IV Landfill	7826 Rutledge Pike Knoxville, Tennessee	865-525-7720	Demolition
Ridgeview Demolition Landfill	8723 Oak Ridge Highway Knoxville, Tennessee	865-690-9436	Demolition
Yarnell Demolition Landfill, LLC	1550 Lamon Quarry Road Knoxville, Tennessee	865-470-0023	Demolition
Chestnut Ridge Landfill & Recycling Center	240 Fleenor Mill Road Heiskell, Tennessee (in Anderson County)	865-457-7810	Sanitary



## Policy 18

### UNDERGROUND STORMWATER FACILITY MAINTENANCE

This policy is for the purpose of generally specifying the types of maintenance for underground stormwater facilities. The most common types of underground stormwater facilities are oil/water separators, sand filtration units, water quality inlets, and modified catch basins. Many types of underground stormwater facilities are proprietary in nature, for which the unit manufacturer will have a recommended maintenance procedure and schedule. In general, underground stormwater detention is not allowed (per ST-08 of the *Knoxville BMP Manual*).

Underground stormwater facilities are typically constructed for new development or redevelopment projects with a potential for causing stormwater pollution, for which the developer is must obtain a Special Pollution Abatement Permit (see Chapter 7 of Knoxville BMP Manual) during the site development process. Or alternatively, the developer may be exempt from stormwater detention but is required to provide "first flush" treatment or similar stormwater quality treatment. Types of projects requiring a Special Pollution Abatement Permit are listed in Section 22.5-37 of the Knoxville Stormwater and Street Ordinance (see Appendix B).

A Special Pollution Abatement Permit typically requires a maintenance schedule, preventive maintenance program, spill protection program and other emergency measures, and any additional information needed for operation and maintenance of the underground stormwater facility. Owners of underground stormwater facilities must follow all requirements of the applicable document "Covenants for Permanent Maintenance of Stormwater Facilities" (CPMSF), to be recorded at the Knox County Register of Deeds during the plat review process.

#### MINIMUM MAINTENANCE REQUIREMENTS

The property owner will maintain the approved stormwater and/or water quality facilities in good working order acceptable to the City Engineering Department. Minimum maintenance of the stormwater facilities shall include the routine removal of sediment, debris, oil, hydrocarbons, and foreign materials so that the operation and capacity of the stormwater quality facility continues to function properly. The stormwater quality facility must have an ongoing inspection, maintenance, and reporting schedule. Routine inspection and maintenance must be performed on a schedule recommended by the manufacturer, required by the City Engineering Department, agreed to as part of the Site Development Permit, or as actually needed, whichever is most restrictive.

#### INSPECTION OF THE STORMWATER QUALITY FACILITY

Large vault-type treatment systems are typically designed to have a much greater storage capacity than the smaller catch basin inserts or filter units. Therefore the large systems may require less frequent inspections since they may be less susceptible to clogging, overflows, and flow bypasses.

In the first year of operation of a large vault system, the City of Knoxville recommends inspections at least once each quarter during spring, summer and early fall. Monthly inspections should be conducted from November through March to determine how leaf litter will impact the flow capacity of the structure.

Thereafter, the inspection schedule can be modified according to experience or to meet specific stormwater permit requirements. The City of Knoxville requires a minimum of quarterly visual inspections for large systems and more frequent inspections for smaller systems, filtration devices, and/or absorbent systems.

During routine inspections, sediment accumulation is measured with a stadia rod, trash and floating solids can be visually inspected and dipped out, and floating oil and hydrocarbons are measured with a Teflon bailer. Filters and absorbent systems may vary but most should allow some type of visual inspection. Some popular hydrocarbon absorbents will turn from white when new to black as they reach full capacity. All systems must be cleaned when any of the indicator pollutant level criteria are met or when the regular inspection schedule interval expires.

#### CLEANING THE STORMWATER QUALITY FACILITIES

The stormwater quality facility should be cleaned shortly after the project is complete and erosion control and vegetation has been placed. Generally, a sump-vacuum truck is the best and most convenient method of removing the captured sediment and floatables from the larger stormwater quality facilities and catch basin sumps. Floatables and oil should be removed in a separate procedure prior to the removal of the sediment. After the floatables and oil have been removed, the vacuum hose may be lowered down to remove the accumulated sediments from the bottom of the collection chamber. For systems with large storage volume, this maintenance must be done at least annually, although more frequent maintenance may be required to keep the system operating properly in areas with substantial pollution or sediment.

Filter and adsorbent systems may be maintained by manually removing the accumulated trash and sediments from the unit and replacing the filter/absorbent media. Some of this maintenance must be done at least quarterly. Filter/absorbent life will depend on the type and amount of media and the pollutant load from the contributing drainage area. Heavy use areas, such as fuel islands, may need daily maintenance to remove cigarette butts, cups, and other litter from the small storage area. The filters may require frequent replacement in high spill/drip areas. Large sand filters may only need to have the top layer of media scraped to restore capacity rather than replace the entire volume.

All manhole covers and grates shall be securely replaced following cleaning activities. All trash, sediment, oil and contaminated water must be properly disposed at an approved waste facility.

#### RECORDKEEPING AND REPORTING

Policy 19 in the Land Development Manual (Appendix C) further describes the requirements for recordkeeping and reporting of underground stormwater facilities. Inspections must be conducted at least quarterly, with all pertinent information recorded into an inspection log that must be kept on the site. Annually, the property owner must certify in writing that the stormwater quality facility has been inspected and the system is functioning properly. The property owner must submit the certification by January 15 of the following year. Certification will generally include a list of inspections, repairs, and maintenance conducted with any receipts and signatures.



## Policy 19

### UNDERGROUND STORMWATER FACILITY RECORDKEEPING AND REPORTING

This policy is authorized by the Knoxville Stormwater Ordinance (§22.5-54) and is essential to ensure that stormwater quality is not allowed to degrade over time. Therefore, the City of Knoxville requires that underground stormwater facilities must be periodically inspected and maintained in an organized fashion at least once every three months. Minimum requirements are:

- Inspection logs and records will be kept at the property site, in an organized fashion, and must be made quickly available when asked by a representative of the City Engineering Department or by a representative of TDEC.
- Inspection logs will include the name and title of the inspector, the date of inspection, quantity and types of pollution or sediment observed, recommendations for maintenance and cleaning, and overall soundness of the underground stormwater facility.
- The property owner must certify, in writing, on an annual basis that the stormwater facility has been periodically inspected and is currently functioning properly. The certification will generally cover the calendar year (January to December) and must be submitted by the 15<sup>th</sup> of January immediately following the inspection calendar year.
- The property owner must also report annually: all maintenance and cleaning activities, dates of inspection and maintenance, list of repairs or replacement parts, name of person and company that performs maintenance, and any other relevant information, details or photographs.

Submit annual certifications for underground stormwater facilities to:

City of Knoxville Engineering Department  
Stormwater Quality Section  
P.O. Box 1631  
Knoxville, TN 37901

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New underground stormwater facilities should be designed and constructed in accordance with the Knoxville BMP Manual and the manufacturer's recommendations (when applicable). Follow the instructions in Chapters 6 and 7 as needed if preparing a Stormwater Pollution Prevention Plan (SWPPP) or a Stormwater Pollution Abatement Permit (SPAP). Common types of underground stormwater facilities requiring inspection and recordkeeping may include (with a reference to the Knoxville BMP Manual in parentheses):

- Infiltration systems (ST-03) Such as an infiltration trench or drywell.
- Media filtration inlet (ST-06)
- Water quality inlet (ST-06)
- Oil/water separator (ST-07)
- Underground detention facility (ST-08) Not allowed by Stormwater Engineering Div.
- Any other structures which have difficult access or any nonstandard means of entry.



## ATTENUATION REQUIREMENTS FOR SUBSTANTIAL AND ADDITIONAL DEVELOPMENT

- *Substantial investment (SI)*. The investment of 50% or more of the market value (licensed professional appraisal) or tax appraised value of the real property and improvements where the investment totals more than \$500,000 over a rolling five-year duration.
- These requirements only apply to sites that do not currently have detention. Any new impervious on site's with previously provided detention requires detention to today's standards.
- Retention, sinkhole, and SPAP requirements may apply as determined by site use or other conditions.

Project Characteristics			Stormwater Requirements		
Post Development Impervious (ac)	Added* Impervious (ac) °	Substantial Investment	Downstream Study	Attenuation	First Flush
< 0.5	< 0.5	X			
≥ 0.5	≥ 0.5	X	X	X	X
≥ 0.5	< 0.5	X	X	X <sup>+</sup>	X
< 0.5	< 0.5				
≥ 0.5	≥ 0.5		X	X	X
≥ 0.5	< 0.5				

\* As compared to 1997 values

<sup>+</sup> Director will review on a case by case basis for detention requirements, pending results of the downstream study and any historical flooding problems

<sup>°</sup> < 0.5 includes no increase and decreases in impervious area.



## Policy 23

### LIST OF STUDIED STREAMS

A list of studied streams is desirable for the purpose of easily identifying creeks, streams and rivers with computed floodway and floodplain information. This information is necessary to determine minimum floor elevations, no-fill lines (Policy 21), stream buffer zones (Policy 22), and other information for site development projects in the vicinity of a studied stream. Minimum floor elevations for new buildings and structures are required to be at least 1 foot above the computed 500-year water surface elevation according to Section 12-52(5) of the Knoxville Flood Damage Prevention and Control Ordinance (see Appendix B).

#### Table 23-1

This table shows every studied creek and stream for which any portion falls within the Knoxville city limits. The maximum extent of the studied flood profile is listed without regard to the city limits. Stream mile 0.00 indicates the mouth of the creek or stream, so that the miles then measure the upstream distance. A physical description of the upstream limit is given in Table 23-1. In addition, each creek or stream which mostly falls outside the city limits is denoted by \*\*.

The sources of information for each stream are “checked” in the appropriate boxes. The most recent information shall generally be used to determine floodplain and floodway widths, computed water surface elevations, and other hydraulic parameters. In some cases, the most recent information is TVA unpublished studies, which can be viewed during normal business hours at the Engineering Department offices located on the 4<sup>th</sup> Floor of the City County Building. Call the Engineering Department at 215-2148 for assistance in determining whether individual properties are in a floodplain, flood zone, etc.

These information sources can be viewed at the Engineering Department offices (located on the 4<sup>th</sup> Floor of the City County Building). FEMA Flood Insurance Studies and maps can be viewed and purchased inexpensively online at the FEMA Map Service Center website.

- #1 - The Flood Insurance Study for Knox County (FEMA Community 475433), published November 1982, and the associated Flood Insurance Rate Maps (FIRMs), last updated in May 1983.
- #2 - The Flood Insurance Study for the City of Knoxville (FEMA Community 475434), last updated January 1991, and the associated Flood Insurance Rate Maps (FIRMs), last updated in January 1991.
- #3 - Knox County reports for Beaver Creek Watershed (February 2000) and for Ten Mile Creek Watershed (February 2000), prepared by Ogden Environment and Energy Services (now called AMEC).
- #4 - TVA flood restudy and remapping efforts (not yet published, draft version January 2003), prepared by TVA for the purpose of revising the official Flood Insurance Study for the City of Knoxville and Knox County. FEMA is analyzing TVA results in a formal review.

The Engineering Department has HEC-2 and HEC-RAS computer models that provide the specific flood profiles, cross sections, and modeling assumptions for each of these reports. The City of Knoxville Engineering Department reserves the right to refer to the underlying computer model to specifically interpret the published flood profiles and maps.

<b>Table 23-1</b>  <b>STREAM NAME</b>	<b>Maximum Extent for Studied Flood Profile of the particular stream</b>	<b>Physical Description of the Upper Limit for Studied Flood Profile</b>	Flood Study (FIS)		Reports for & Ten Mile		(for eventual inclusion into official FIS)
	(whether within City of Knoxville limits or outside)	(whether within City of Knoxville limits or outside)	#1 (1983)	#2 (1991)	#3 (2001)	#4 (2003)	
	(Stream miles)	(-----)	Flood Knox	Flood City	Knox Bea	TVA	
Beaver Creek **	0.00 to 44.33	Border with Union County	✓		✓		
First Creek	0.00 to 7.13	Knox Road bridge		✓		✓	
First Creek – Trib #1	0.00 to 0.76	Montrose Road bridge				✓	
First Creek – Trib #2	0.00 to 0.46	Bend along Parkway Drive				✓	
Fourth Creek	0.00 to 3.84	Above Middlebrook Pike	✓	✓			✓
Fourth Creek – Trib #1	0.00 to 2.14	2 <sup>nd</sup> x-ing with Lawford Road		✓			✓
Fourth Creek – Trib #2	0.00 to 1.17	Wellington Drive		✓			
Fourth Creek – Trib #3	0.00 to 0.81	Kinzalow Dr (near Stockton)		✓			✓
French Broad River **	0.00 to 19.20	Border with Sevier County	✓				✓
Goose Creek	0.00 to 1.20	Candora Road		✓			
Goose Creek – Trib #1	0.00 to 0.24	Bikepath bridge		✓			
Grassy Creek **	0.00 to 2.17	Municipal Golf Course	✓		✓		
Hines Branch **	0.00 to 2.22	Mynatt Road			✓		
Holston River **	0.00 to 23.10	Border with Grainger County	✓	✓			
Knob Fork **	0.00 to 4.20	Dry Gap Pike	✓		✓		
Love Creek	0.00 to 4.32	Mill Road & Southern RR	✓	✓			
Love Creek – Tributary	0.00 to 0.88	Carta Road					✓
Murphy Creek **	0.00 to 1.13	Murphy Road	✓				
Second Creek	0.00 to 5.83	Charlene Lane near I-75		✓			
Sinking Creek **	0.00 to 1.88	Middlebrook Pike	✓		✓		
Stock Creek **	2.47 to 6.17	McCammon Road	✓				✓
Swanpond Creek **	0.00 to 6.06	Huckleberry Springs Road	✓				
Ten Mile Creek **	0.00 to 5.64	East of Robinson Road	✓	✓	✓		
Ten Mile Creek – Trib #1	0.00 to 1.07	Corteland Drive	✓	✓	✓		
Ten Mile Creek – Trib #2	0.00 to 0.44	Echo Valley Road	✓		✓		
Tennessee River **	610.4 to 652.0	Splits into two rivers at 652.0	✓				✓
Third Creek	0.00 to 7.97	Vienna Dr and Mondale Rd		✓			
Third Creek – East Fork	0.00 to 1.77	Tennessee Avenue		✓			
Turkey Creek **	0.00 to 6.20	Simmons Road	✓				✓
Turkey Creek – Trib #1	0.00 to 0.30	Gilbert Drive	✓				✓
Whites Creek **	0.00 to 3.24	McC Campbell Road	✓	✓			✓
Williams Creek	0.00 to 2.04	Wilson Avenue					✓

The Water Quality Forum website (<http://www.waterqualityforum.org/>) has a very useful tool – an interactive mapping page to determine the locations and watershed boundaries for various Knox County creeks and streams. The information available at this website will increase gradually, with the intended

\*\* Most of this studied stream is outside of the Knoxville city limits.

goal of providing floodplains, water surface profiles and other highly technical information in a user-friendly format.

Table 23-2

This table lists the various tributaries and their approximate locations. Since tributaries are not usually labeled on street maps or county maps, this table helps to identify studied streams for which a floodway profile has been computed. Tributaries were originally numbered for the Flood Insurance Studies, but are not numbered on the USGS 7.5-minute quadrangle maps.

<b><u>Table 23-2</u></b>		
<b>Tributary Name</b>	<b><u>Maximum Extent for Studied Profile</u></b> (Stream miles)	<b><u>Street Crossings</u></b>  (from downstream to upstream)
First Creek – Trib #1	0.00 to 0.76	Rockcrest Road, Montrose Road (between Maple & Fair Dr)
First Creek – Trib #2	0.00 to 0.46	Meadow Road (north of Fair Drive)
Fourth Creek – Trib #1	0.00 to 2.14	Westland Drive, Lawford Road (twice)
Fourth Creek – Trib #2	0.00 to 1.17	Westfield Road, Kinston Pike, Wellington Drive
Fourth Creek – Trib #3	0.00 to 0.81	Wesley Road, Picadilly Road, driveways along Kinzalow Dr
Goose Creek – Tributary	0.00 to 0.24	Maryville Pike, footbridge, bikepath bridge, Chappell Road
Love Creek – Tributary	0.00 to 0.88	Tulane Road, S. Chilhowee Drive, Chilhowee Court
Ten Mile Creek – Trib #1	0.00 to 1.07	Walker Springs Road, Corteland Drive
Ten Mile Creek – Trib #2	0.00 to 0.44	Ebenezer Road, Echo Valley Road
Turkey Creek – Trib #1	0.00 to 0.30	Outlet Drive, Gilbert Drive

**Assistance**

Please call the Engineering Department at 215-2148 for assistance in determining whether individual properties are in a floodplain or flood zone, computing minimum finished floor elevations, whether flood insurance is required, etc. The Engineering Department can answer floodplain questions; however, questions of a technical nature need to be researched. Immediate answers are not always available if Engineering Department personnel have to check maps, plans, profiles, or cross sections to fully answer a question.

The Engineering Director serves as the floodplain administrator according to Section 12-31 of the Flood Damage Prevention and Control Ordinance, with substantial responsibility to protect the public welfare and satisfy FEMA requirements. The Engineering Director’s responsibilities are listed in Section 12-32.

Common FEMA	FEMA Map Service Center	1-800-358-9616
telephone numbers	Flood insurance questions	1-888-FLOOD29
	FEMA map technical specialists	1-877-FEMA-MAP



## **NO-RISE CERTIFICATION FOR NO-FILL AREA ENCROACHMENT**

The No-Fill Line is defined for studied streams where a floodway profile has been computed; it is a continuous line halfway between the 100-year floodway and the 100-year floodplain boundaries. Any type of fill which alters the conveyance or the flood storage capacity of the regulated floodplain is prohibited within the no-fill line. This includes buildings, structures, construction fill, soil, riprap, pavement, concrete, signs, other materials, etc. that reduce the stream cross-section anywhere within the no-fill line.

The requirement for a No-Fill Line may be waived if a No-Rise Certification shows a rise of less than 0.1 feet on all existing properties within 0.5 miles (upstream and downstream) of the proposed site development. This no-rise certification uses the 100-year flood model (without the floodway) to demonstrate no impacts on the 100-year water surface elevation.

Prior to issuing any building, grading, or development permits involving activities in the No-Fill Area, the City of Knoxville must obtain a certification stating the proposed development will not impact the pre-project base flood elevations, floodway elevations, or floodway data widths. The certification should be obtained from the permittee and signed and sealed by a professional engineer.

### **PROCEDURE**

The “no-rise” certification must be based upon the standard step-backwater computer model shown on the community’s effective Flood Insurance Rate Map (FIRM), and the results must be tabulated in the community’s Flood Insurance Study (FIS). To support a “no-rise” certification for proposed developments encroaching into the regulatory floodway, the following procedures shall be followed:

#### **Currently Effective Model**

1. Obtain the step-backwater computer model for the specified stream, identifying the limits of the requested data. The engineering “no-rise” certification and supporting technical data must stipulate NO IMPACT on the 500-year flood elevation, floodway elevations, or floodway widths at all new and existing cross-sections anywhere in the model. Therefore, the model limits should be chosen for a sufficient distance (typically 1 mile, depending on the hydraulic slope of the stream) upstream and downstream of the development site.

#### **Duplicate Effective Model**

2. Upon receipt of the step-backwater computer model, run the original step-backwater model to duplicate the data in the effective FIS.

#### **Existing Conditions Model**

3. Revise the original step-backwater model to reflect site-specific existing conditions by adding new cross-sections (two or more) in the vicinity of the proposed development, without the proposed development in place. Floodway limits should be manually set at the new cross-section locations by measuring from the effective FIRM. The cumulative reach lengths of the stream should also remain unchanged. The results of these analyses will indicate the 500-year elevations for revised existing conditions at the proposed project site.

#### **Proposed Conditions Model**

4. Modify the revised existing conditions model to reflect the proposed development at the new cross-sections while retaining the currently adopted floodway widths. The over-bank roughness coefficients should remain the same unless a reasonable explanation of how the proposed development will affect Manning’s “n” values is included with the supporting data. The results of this floodway run will indicate the 500-year elevations for proposed

conditions at the project site. These results must indicate NO impact on the 500-year flood elevations, floodway elevations, or floodway widths shown in the Duplicate Effective Model or in the Existing Conditions Model.

## SUPPORTING DATA

The “no-rise” supporting data and a copy of the engineering certification must be submitted to and reviewed by the appropriate community official prior to issuing a permit. The “no-rise” supporting data should include, but may not be limited to:

1. Duplicate Effective Model
2. Existing Conditions Model
3. Proposed Conditions Model
4. FIRM and topographic map, showing the following:
  - a. The floodplain and floodway
  - b. The additional cross-sections
  - c. The site location with the proposed topographic modification superimposed onto the maps
5. A copy of the effective FIRM showing the current regulatory floodway.
6. Documentation clearly stating analysis procedures:
  - a. All modifications made to the original FIS model to create the Existing Conditions Model
  - b. Modifications to the Existing Conditions Model to create the Proposed Conditions Model should be well documented and submitted.
7. Statement defining source of additional cross-section topographic data and supporting information.
8. Cross-section plots, of the added cross sections, for revised existing and proposed conditions.
9. Plan information indicating the location of structures on the property.
10. Copy of the microfiche, or other applicable source, from which input for original FIS HEC-2 model was taken.
11. Digital copy of all input files.
12. Printout and Digital copy of output files from EDIT runs for all three floodway models.

A “no-rise” certification. Attached is a sample “no-rise” certification form that can be completed by a registered professional engineer and supplied to the community along with the supporting technical data when applying for a development permit.

**ENGINEERING “NO-RISE” CERTIFICATION  
FOR NO-FILL AREA ENCROACHMENT**

This is to certify that I am a duly qualified engineer licensed to practice in the state of Tennessee.

It is to further certify that the attached technical data supports the fact that proposed

\_\_\_\_\_ will not impact  
*(Name of Development)*

the Base Flood Elevations (100-year flood), floodway elevations, and the floodway widths on

\_\_\_\_\_ at published sections in the Flood Insurance Study for  
*(Name of Stream)*

\_\_\_\_\_, dated \_\_\_\_\_  
*(Name of Community & Community ID Number)*

and will not impact the Base Flood Elevations (100-year flood), floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Signature \_\_\_\_\_

Phone Number \_\_\_\_\_ Email \_\_\_\_\_

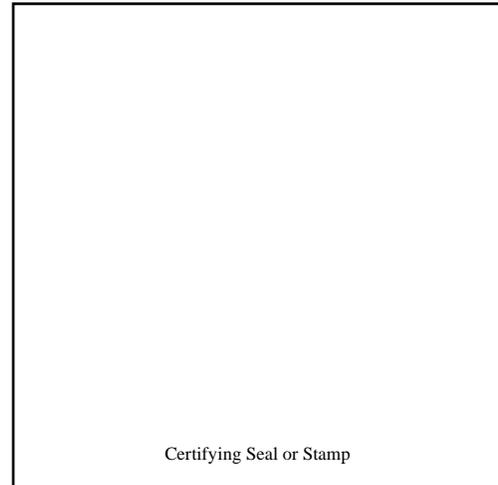
Representing \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

Date \_\_\_\_\_



Certifying Seal or Stamp

**FOR CITY OF KNOXVILLE ENGINEERING DEPARTMENT USE ONLY: FOR CITY OF KNOXVILLE  
ENGINEERING DEPARTMENT USE ONLY:**

No-Rise Certification is:

Approved

Disapproved

\_\_\_\_\_  
Official's Name

\_\_\_\_\_  
Official's Signature

\_\_\_\_\_  
Title

\* Based upon R4-MT Form - Revised 06/03



## **NO-RISE CERTIFICATION FOR FLOODWAY ENCROACHMENT**

The City of Knoxville Flood Damage Prevention and Control Ordinance defines the base flood as the 0.2% chance flood for the purposes of flood protection. Any encroachment within the floodway is prohibited unless a no-rise certification demonstrates that there is no increase in flood levels during the occurrence of the 0.2% chance flood.

### **PROCEDURE**

The “no-rise” certification must be based upon the standard step-backwater computer model shown on the community’s effective Flood Insurance Rate Map (FIRM), and the results must be tabulated in the community’s Flood Insurance Study (FIS). To support a “no-rise” certification for proposed developments encroaching into the regulatory floodway, the following procedures shall be followed:

#### **Currently Effective Model**

1. Obtain the step-backwater computer model for the specified stream, identifying the limits of the requested data. The engineering “no-rise” certification and supporting technical data must stipulate NO IMPACT on the 500-year flood elevation, floodway elevations, or floodway widths at all new and existing cross-sections anywhere in the model. Therefore, the model limits should be chosen for a sufficient distance (typically 1 mile, depending on the hydraulic slope of the stream) upstream and downstream of the development site.

#### **Duplicate Effective Model**

2. Upon receipt of the step-backwater computer model, run the original step-backwater model to duplicate the data in the effective FIS.

#### **Existing Conditions Model**

3. Revise the original step-backwater model to reflect site-specific existing conditions by adding new cross-sections (two or more) in the vicinity of the proposed development, without the proposed development in place. Floodway limits should be manually set at the new cross-section locations by measuring from the effective FIRM. The cumulative reach lengths of the stream should also remain unchanged. The results of these analyses will indicate the 500-year elevations for revised existing conditions at the proposed project site.

#### **Proposed Conditions Model**

4. Modify the revised existing conditions model to reflect the proposed development at the new cross-sections while retaining the currently adopted floodway widths. The over-bank roughness coefficients should remain the same unless a reasonable explanation of how the proposed development will affect Manning’s “n” values is included with the supporting data. The results of this floodway run will indicate the 500-year elevations for proposed conditions at the project site. These results must indicate NO impact on the 500-year flood elevations, floodway elevations, or floodway widths shown in the Duplicate Effective Model or in the Existing Conditions Model.

## SUPPORTING DATA

The “no-rise” supporting data and a copy of the engineering certification must be submitted to and reviewed by the appropriate community official prior to issuing a permit. The “no-rise” supporting data should include, but may not be limited to:

1. Duplicate Effective Model
2. Existing Conditions Model
3. Proposed Conditions Model
4. FIRM and topographic map, showing the following:
  - a. The floodplain and floodway
  - b. The additional cross-sections
  - c. The site location with the proposed topographic modification superimposed onto the maps
5. A copy of the effective FIRM showing the current regulatory floodway.
6. Documentation clearly stating analysis procedures:
  - a. All modifications made to the original FIS model to create the Existing Conditions Model
  - b. Modifications to the Existing Conditions Model to create the Proposed Conditions Model should be well documented and submitted.
7. Copy of effective Floodway Data Table copied from the FIS report
8. Statement defining source of additional cross-section topographic data and supporting information
9. Cross-section plots of the added cross sections for revised existing and proposed conditions.
10. Plan information indicating the location of structures on the property
11. Copy of the microfiche, or other applicable source, from which input for original FIS HEC-2 model was taken.
12. Digital copy of all input files
13. Printout and digital copy of output files from EDIT runs for all three floodway models
14. A “no-rise” certification. Attached is a sample “no-rise” certification form that can be completed by a registered professional engineer and supplied to the community along with the supporting technical data when applying for a development permit.

**ENGINEERING “NO-RISE” CERTIFICATION  
FOR FLOODWAY ENCROACHMENT**

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It is to further certify that the attached technical data supports the fact that proposed

\_\_\_\_\_ will not impact  
*(Name of Development)*

the Base Flood Elevations (500-year flood), floodway elevations and the floodway widths on

\_\_\_\_\_ at published sections in the Flood Insurance Study for  
*(Name of Stream)*

\_\_\_\_\_, dated \_\_\_\_\_  
*(Name of Community & Community ID Number)*

and will not impact the Base Flood Elevations (500-year flood), floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Signature \_\_\_\_\_

Phone Number \_\_\_\_\_ Email \_\_\_\_\_

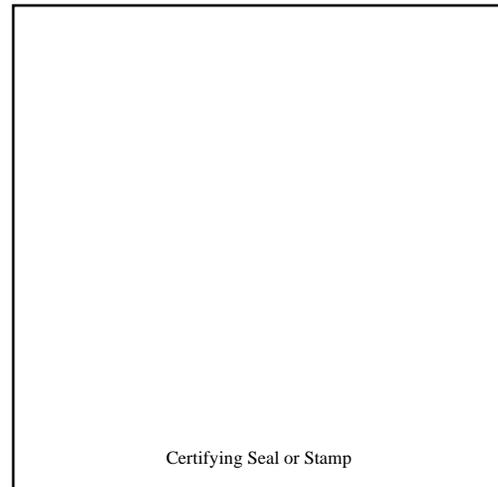
Representing \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

Date \_\_\_\_\_



Certifying Seal or Stamp

**FOR CITY OF KNOXVILLE ENGINEERING DEPARTMENT USE ONLY:FOR CITY OF KNOXVILLE  
ENGINEERING DEPARTMENT USE ONLY:**

No-Rise Certification is:

Approved

Disapproved

\_\_\_\_\_  
Official's Name

\_\_\_\_\_  
Official's Signature

\_\_\_\_\_  
Title

\* Based upon R4-MT Form - Revised 06/03



## Policy 25

# POST-CONSTRUCTION WATER QUALITY CONTROL STANDARDS FOR PROPRIETARY FLOW-THROUGH BEST MANAGEMENT PRACTICES (BMPs)

### 1. Introduction

The City of Knoxville requires two types of water quality treatment in certain situations: First flush treatment and Special Pollution Abatement Permit (SPAP) treatment. This policy primarily addresses water quality treatment by means of proprietary flow-through BMPs. However, green infrastructure with supporting documentation can also be used to address the water quality standards. Proprietary BMPs that are acceptable to use for water quality treatment and their maximum treatment flow rates may be found on the list of approved stormwater manufactured treatment devices published by the New Jersey Department of Environmental Protection (NJDEP) at the following website:

<http://www.nj.gov/dep/stormwater/treatment.html>.

### 2. First Flush Pollutant Reduction

All stormwater basins that are required under Section 22.5-23 of the Stormwater and Street Ordinance shall be built to manage first flush water quality. When the requirement for detention or retention is waived, first flush treatment is still required.

Sites requiring first flush treatment with a proprietary flow through BMP must be designed to remove 80% of the suspended solids from the post-construction runoff resulting from Knoxville's ninety-fifth percentile storm (1.5 inches of rainfall in a 24-hour period). Flows must be determined by methods approved in the Stormwater and Street Ordinance. Each of the following methodologies can be used to meet the first flush requirement:

- Green infrastructure may be used to satisfy the first flush requirement
- Green infrastructure combined with a unit certified (NJDEP) can be used to achieve 80% TSS removal rate
- The approved flow for a BMP certified (NJDEP) for 80% TSS removal rate
- The approved flow for a BMP certified (NJDEP) for 50% TSS removal rate multiplied by a factor of 0.6

### 3. Special Pollution Abatement Permit (SPAP) Pollutant Reduction

Some land uses (aka Hot Spots) are known to produce pollutants that are detrimental to water quality that would not be corrected by the standard first flush treatment. These sites will require a Special Pollution Abatement Permit and may need additional structural and management BMPs to address the pollutants of concern. See Section 22.5-37 in the Stormwater and Street Ordinance for more information regarding SPAPs.

All proprietary devices used for SPAP pollutant reduction must treat the runoff resulting from Knoxville's 1-year 24-hour storm. The BMP must remove 50% of the suspended solids from the post-

construction runoff resulting from Knoxville’s 1-year 24-hour storm (2.5 inches of rainfall in a 24-hour period). Flows must be determined by methods approved in the Stormwater and Street Ordinance. Each of the following methodologies can be used to meet the SPAP requirement:

- Green infrastructure may be used to satisfy the SPAP requirement
- The approved flow for a unit certified (NJDEP) for 50% TSS removal
- The approved flow for a unit certified (NJDEP) for 80% TSS removal multiplied by a factor of 1.7

Additionally, the BMP must be able to treat all pollutants of concern for the given use (See Table 1). The pollutants of concern for special land uses that are not specifically listed in Table 1 will be determined on a case by case basis.

SPAP Land Use (Hot Spot)	Pollutants of Concern		
	Hydrocarbons	Nutrients / Bacteria	Gross Pollutants
Property with more than 400 parking spaces	X		X
Property with more than 120,000 ft <sup>2</sup> of pavement area	X		X
Food Handling and Facilities	X		X
Vehicle and Equipment Facilities	X		X
Vehicle Wash Facilities	X		X
Recycling or Salvage Yard Facilities	X		X
Facilities with Animal Housing Areas		X	X

#### 4. Dual Treatment

When a site requires both first flush and SPAP treatment, the same BMP may be used to satisfy both criteria.

#### 5. Bypass and Maximum Flow Rates

When using a proprietary device, stormwater bypass for large storms must be provided to prevent the re-suspension/discharge of captured pollutants.

There are two methods that can be used for the bypass.

- A diversion structure can be used upstream and be designed to convey the treatment flow to the water quality device.
- Stormwater diversion can occur within the proprietary device where the bypass method separates the bypass flow path from the treatment flow path, preventing mixing.

The bypass must be sized to handle the lesser of the incoming pipe capacity or the 100-year design storm.

#### 6. Treatment Devices Not Approved By NJDEP

For a majority of cases, proprietary BMPs not approved by NJDEP will not be allowed. However, in situations where there is a change of use that creates the requirement for a SPAP and/or for projects that include new construction but do not meet redevelopment requirements, e.g. parking lot layout changes, certain non-NJDEP approved devices may be considered on a case-by-case basis, e.g. catch basin inserts, flume filters, trench drain filters, and snouts. The approval of such devices does not remove the possibility of a requirement to upgrade the site’s water quality treatment to green infrastructure or NJDEP approved BMPs in future improvements.

Proprietary BMPs that were previously listed and accepted for use in the City of Knoxville will continue to be accepted with new permit submissions until October 1, 2019.



## Policy 12

### SINKHOLE DEVELOPMENT

#### **Introduction and Overview -**

A sinkhole is a naturally occurring surface depression which occurs primarily in limestone regions and is usually denoted with hachured lines on a contour map, or is otherwise part of a closed watershed system. A sinkhole typically receives surface stormwater runoff, and may be directly or indirectly linked to an underground cavern system or groundwater table. For the purposes of regulating site development, a sinkhole is a minimum of 2' deep when measured from the lowest part of the depression to the overflow lip.

Sinkholes are a common feature in Knoxville and throughout east Tennessee. The predominant geology in Knoxville is a system of parallel ridges and valleys that run in a southwest-northeast direction. The ridges typically are a combination of folded shales, sandstones and limestones. The valleys contain soft shales, limestones and clay soils.

It is not possible to determine the condition of a sinkhole by visual inspection. Even if a sinkhole appears to be well-drained based on repeated observations and measurements, it may still close tomorrow for no apparent reason. It is suspected that many sinkholes become nonfunctioning due to construction activities. Construction heavy equipment and/or dynamite may have changed drainage characteristics for many sinkholes along I-40 and I-640 in previous decades. Excess silt and sediment can also clog sinkholes and make them nonfunctioning.

Historically in decades past, some sinkholes have been used to dump trash, liquid wastes, etc. This is particularly harmful to the environment due to the direct connection to groundwater tables and subsurface drainage. Trash, debris and sediment will clog the sinkhole throat and eventually reduce the drainage capability of the sinkhole. Most water entering a sinkhole will eventually reappear in a nearby creek or stream.

Sinkholes are typically not reliable as a primary drainage system. Every sinkhole behaves differently under changing conditions. Saturated ground conditions and high groundwater tables will cause a sinkhole to drain very poorly. It is even possible for groundwater to flow upwards and fill a sinkhole. Sinkholes are prone to settlement and generally do not have suitable soil foundations.

#### **Sinkhole Requirements -**

1. *(For site development on a property that contains a sinkhole or partially contains a sinkhole) --* Engineering Department will require a copy of a Class V Injection Well Permit and/or an Aquatic Resource Alteration Permit (ARAP) prior to approving a site development permit. These permits are issued by the Tennessee Department of Environment and Conservation (TDEC) to protect Waters of the State. After reviewing the TDEC permit, the Engineering Department may require additional information relating to the structural integrity and flood protection. When existing or documented flooding problems are present, the Engineering Director may require additional measures such as detention, conveyance facilities, or other stormwater management solutions to reduce adverse impacts to the subject development or to other properties.

Requirements #2 through #6 apply to site development projects that must provide stormwater detention for the 1-year, 2-year, 5-year, 10-year, 25-year and 100-year NRCS storms as required by Section 22.5-23 of the Stormwater and Street Ordinance:

- A. *Road construction containing one-half acre or more of impervious surface.*
- B. *Commercial, industrial, educational, institutional, or recreational developments containing one acre or more of disturbed area.*
- C. *Single-family or duplex residential development containing at least five acres of disturbed area or at least five lots.*
- D. *Any development containing one-half acre or more of additional impervious area.*
- E. *Any redevelopment that causes the improvement of 50% of the assessed value of the lot, building, or lot use.*

Requirements #2 through #6 must include calculations to demonstrate that the requirement is met. Volume computations must be performed using regular intervals, preferably using the conic volume formula shown on page ST-11-13 of the Knoxville BMP Manual. All hydrologic and hydraulic computations 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. Detention and routing computations shall meet the general requirements contained in ST-10, ST-11 and ST-12 of the Knoxville BMP Manual.

- 
2. *(For site development on a property that contains a sinkhole, partially contains a sinkhole or ultimately drains to a sinkhole) -- Provide calculations that show that the 100-year, 24-hour NRCS design storm will not flood any structures assuming plugged conditions for the sinkhole (0 cfs outflow). These calculations must include the entire contributing watershed area for the sinkhole. A sinkhole easement, similar to a detention easement as defined in Policy 05, must be dedicated at least 5' horizontally outside the highest closed contour defined by the sinkhole lip.*
  3. *(For site development on a property that partially contains a sinkhole) -- Provide calculations that show no rise in water surface elevations between the predeveloped and postdeveloped 100-year, 24-hour NRCS design storm, assuming plugged conditions for the sinkhole (0 cfs outflow). These calculations must include the entire contributing watershed area for the sinkhole. A sinkhole easement, similar to a detention easement as defined in Policy 05, must be dedicated on the property being developed at least 5' horizontally outside the highest closed contour defined by the sinkhole lip. In some cases, a rise in the 100-year water surface elevation is allowable if all parties with ownership of the sinkhole agree to allow the rise with written documentation.*
  4. *(For site development on a property within a Critical Sinkhole Watershed) -- Provide calculations that show total retention of the difference between the predeveloped and postdeveloped 100-year, 24-hour NRCS design storms. These calculations must include the entire contributing watershed area for all designed retention basins and sinkholes.*
  5. *(For site development on a property within a Critical Sinkhole Watershed) -- Provide calculations that show that the postdeveloped 100-year, 24-hour NRCS peak flow rate does not exceed the predeveloped 100-year, 24-hour NRCS peak flow rate. In basins or subbasins with a documented historical drawdown time, it may be acceptable to assume drawdown if the documented value is at least 1.5 times larger than the drawdown time for the region. In general, advanced subsurface testing must be performed and certified by a professional engineer registered in the state of Tennessee with a demonstrated expertise in hydrogeology. Subsurface testing shall reasonably determine the range of outflows under a variety of design conditions.*

6. (For any site development that drains to any sinkhole or retention basin within a Critical Sinkhole Watershed) -- Subsurface testing shall reasonably determine the range of outflows under a variety of design conditions. In general, advanced subsurface testing must be performed and certified by a professional engineer registered in the state of Tennessee with a demonstrated expertise in hydrogeology. If it is proven by geotechnical testing that the soil does not percolate, then a drawdown orifice may be used. This is evaluated by a case-by-case basis. The drawdown rate will be 0.05 cfs for drainage areas 2.5 acres and less, or 0.02 cfs per acre for larger drainage areas.

### **Critical Sinkhole Watersheds -**

The following areas contain sinkholes and are labeled as critical watersheds. These areas can be viewed on maps at the Engineering Department, 4<sup>th</sup> Floor City County Building, during normal working hours.

- (1) The entire watershed for Ten Mile Creek (since the entire creek drains into a huge sinkhole near the intersection of Ebenezer Road and Southern RR crossing)
- (2) Sinking Creek
- (3) Emily Avenue and Timothy Avenue
- (4) Harrell Hills subdivision (near Cranberry Drive, Clairmont Drive, and Gaines Road) Prosser Road #1 (between Cherry Street and immediately north of the railroad crossing)
- (5) Prosser Road #2 (approximately halfway between Knoxville Zoo Drive and Magnolia Avenue)
- (6) Pamela Lane
- (7) All areas draining to a sinkhole
- (8) Any area of known flooding where deemed necessary by the Engineering Director

### **Definitions -**

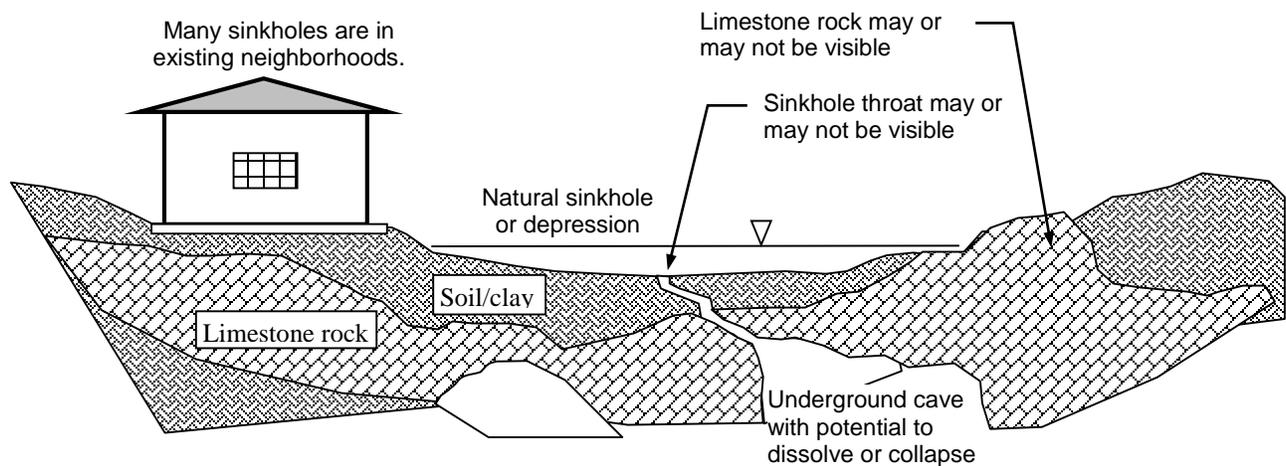
<u>Baseflow</u>	The quantity of water in a stream or creek that is contributed by groundwater and is not directly associated with surface stormwater runoff.
<u>Closed</u>	A sinkhole that no longer drains is said to be closed. An open sinkhole can become closed for any number of reasons: sediment and debris; nearby construction activity with heavy equipment or dynamite; changing subsurface conditions; underground collapse; high groundwater tables; etc.
<u>Dolomite</u>	A soluble rock consisting mainly of magnesium carbonate and calcium carbonate. Classified as sedimentary rock; common throughout Knoxville.
<u>Interflow</u>	Movement of groundwater from one location to another; often accounting for springs and stream baseflow.
<u>Karst</u>	A region with porous limestone that may also contain other soluble rocks and minerals such as carbonates. A karst region may contain sinkholes, underground caves, springs, disappearing streams, subsurface cavities or voids, and natural streams with high baseflow characteristics.
<u>Limestone</u>	A soluble rock consisting mainly of calcium carbonate. Classified as sedimentary rock; common throughout Knoxville in both ridges and valleys.

Open A sinkhole that drains well is said to be open. It is possible for a closed sinkhole to become open for any number of reasons: dissolution of limestone or other soluble rock, underground collapse, settlement, etc.

Resurgence Groundwater that flows out of a sinkhole, due to high groundwater tables or perched springs. A sinkhole may or may not experience resurgence at different times for different storm events.

Sinkhole Lip The portion of the sinkhole perimeter where stormwater first begins to overflow. This elevation is likely to be flooded for large storms and high-intensity rainfalls.

Throat The area of a sinkhole where surface stormwater drains into the ground to become subsurface water. Normally located at the lowest part of the depression, but not necessarily.



Increasing stormwater runoff to a natural depression may increase sinkhole formation by further dissolving limestone. Even if the amount of stormwater runoff has not been increased, stormwater quality treatment is necessary to prevent pollutants from entering groundwater and to reduce potential pH changes and chemicals within stormwater runoff.

NOT TO SCALE

**Figure 1 -- Typical Concerns of Sinkholes in Residential Areas**



## Policy 14

### STORMWATER ENFORCEMENT RESPONSE PLAN

In compliance with the National Pollution Discharge Elimination System Permit # TNS068055, the City of Knoxville is required to prohibit and enforce non-stormwater discharges to the municipal separate storm drain system. This was initially accomplished by the Knoxville Stormwater and Street Ordinance in 1997. To fulfill the remainder of the NPDES requirements with regards to enforcement, these guidelines have been adopted by the Water Quality Section and other personnel within the Stormwater Engineering Division.

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Upon discovery of a violation of Chapter §22.5 of the City Code, the Engineering Director or his representative may employ any combination of the enforcement actions below, and to escalate enforcement responses where necessary to address persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm.

- A) Verbal Warnings – The site inspector may issue verbal warnings that specify the nature of the violation, any required corrective action, and a time to comply with verbal warning.
- B) Written Notices - The Engineering Director or his representative may issue a Notice of Violation (NOV) to the responsible party and/or property owner where the violation has occurred. The NOV shall typically include:
  - 1. The description and nature of the violations to the City Code.
  - 2. The location of where the violations have occurred.
  - 3. A description of the ordered repair or remediation work which is necessary to comply with the Knoxville Stormwater and Street Ordinance (Chapter 22.5 of the City Code).
  - 4. The latest date that the repair or remediation work must be completed. This becomes the expiration date of the NOV.
  - 5. Signature of the person issuing the NOV.

The NOV shall require that any violation of the City Code must stop immediately, unless doing so would otherwise endanger the public safety or welfare. The Engineering Director will not allow an extension of time for NOVs that substantially harm natural streams and the environment.

The Engineering Director may review a written request for an extension of time, if there is sufficient evidence of hardship. Considerations which could allow for an extension of time may include:

- Structural modifications or any repair work (such as sanitary sewer laterals) for which new design plans are usually not necessary. The Engineering Director may typically allow a maximum of 14 days for these projects to occur.
- New structures or major structural modifications which require a coordinated effort for design planning. The Engineering Director may typically allow a maximum of 60 days for large projects to occur.

- New structures or any structural modifications that require state or federal permits to complete the project. The Engineering Director may allow a maximum of 180 days for large projects with substantial elements of design work.

C) Citations with Administrative Penalties - Any person violating the provisions of the City of Knoxville Stormwater and Street Ordinance may be assessed a civil penalty by the City of Knoxville of not less than \$50 per day and not more than \$5,000 per day for each day of violation. Each day of violation shall constitute a separate violation. After the NOV has been issued, the property owner, developer and/or responsible party will be notified by mail of the violations and the ordered repairs.

The NOV typically does not include the amount of any fines or penalties. All fines and penalties will be determined by the Engineering Director, and are generally assessed after the NOV expires. The Director will consider the following criteria when assessing penalties:

1. The amount of damage to the public health and the environment.
2. The amount of effort put forth by the violator to remedy this violation.
3. The economic benefit gained by the violator for not obeying the law.
4. Whether the civil penalty imposed will be a substantial economic deterrent to the illegal activity.
5. The amount of penalty established by ordinance or resolution for specific categories of violations.
6. Any unusual or extraordinary enforcement costs incurred by the city.
7. Any equities of the situation that outweigh the benefit of imposing any penalty or damage assessment.

The Director may also consider these additional criteria for determining penalties of violations:

8. Willingness and cooperation of the violator to remedy this violation and remediate any damage.
9. Whether the violation was intentional, negligent, or accidental.
10. Costs incurred by the City of Knoxville for any administrative or remediation costs, including the investigative and monitoring activities. This is often computed in terms of number of man-hours necessary to deal with the problem.
11. Prior violations for this violator or at this location.

In addition to the civil penalty above, the City of Knoxville may recover all damages proximately caused by the violator to the city, which may include any reasonable expenses and attorney's fees incurred with investigating, enforcing or correcting violations. The City may bring legal action to enjoin any continuing violation, and the existence of any other remedy, at law or in equity, shall be no defense to any such actions. The remedies set forth in this policy shall be cumulative, not exclusive, and it shall not be a defense to any action, civil or criminal, that one or more of the remedies set forth herein has been sought or granted.

Any person aggrieved by the imposition of a civil penalty or damage assessment, as provided by the Knoxville Stormwater and Street Ordinance (Chapter 22.5), may appeal said penalty or damage assessment to the Board of Environmental Appeals. The appeal shall be in writing and filed with the City of Knoxville Law Department within 30 days after the damage assessment or civil penalty is served in any manner authorized by law.

Upon receipt of an appeal, the Board shall hold a public hearing within 60 days, or a later date mutually agreed upon by all parties. At least 10 days prior to the hearing, the Board shall publish time, date and location of the public hearing in a daily paper of general publication. At least 10 days prior to the hearing, notice shall be provided to the aggrieved party at the address provided at the time of appeal. Any alleged violator may appeal a decision of the Board of Environmental Appeals pursuant to the provisions of Title 27, Chapter 8 of the Tennessee Code Annotated.

In the event that an assessed civil penalty is due and unpaid, the City of Knoxville may collect the monies due from the surety bond, cashier's check, letter of credit or other security supplied to ensure the proper completion of the project.

- D) Stop Work Orders - The Engineering Director or his representative may issue a Notice of Violation (NOV) for ceasing all activities on site (Stop Work Order, SWO) to the responsible party and/or property owner where the violation has occurred and the violation is egregious or where the above means have failed to bring the site into compliance.
- E) Withholding of Plan Approvals or Other Authorizations - When violations are known to exist, the Engineering Director or his representative may withhold the approval of all plans the responsible party or property owner submits.
- F) Additional Measures - The City of Knoxville may also use other escalated measures provided under local legal authorities. The City may perform work necessary to improve erosion control measures and collect the funds from the responsible party in an appropriate manner, such as collecting against the project's bond or directly billing the responsible party to pay for work and materials. The City may also increase permitting fees for any future developments.

## Policy 15

### STORMWATER MESSAGE FOR CURB IRONS AND MANHOLE LIDS

The City of Knoxville required that developers follow this policy beginning January 2001. The policy is also reflected in the following City of Knoxville standard details:

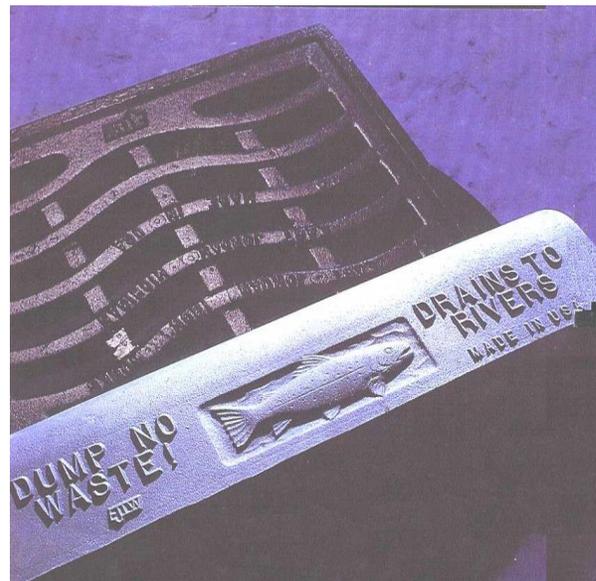
COK-01	Area Drain
COK-02	Traffic-Bearing Manhole Frames and Covers
COK-10	Type "B" Cast Iron Frame, Grate and Inlet
COK-11	Type "B" Cast Iron Frame, Grate and Inlet for Mountable Curbs

All new curb irons, grate inlets, yard inlets and solid stormwater manhole covers must have an educational message permanently attached or cast directly into the structure. This message must be specified on the site development plans for all standard catch basins and stormwater manhole covers. Acceptable messages include any combination of the following, or an approved equivalent message:

1. NO DUMPING <icon> DRAINS TO RIVER (or STREAM)
2. DUMP NO WASTE <icon> DRAINS TO RIVER (or STREAM)
3. DO NOT POLLUTE <icon> DRAINS TO RIVER (or STREAM)

An environmental icon (typically a fish) is preferred but not mandatory. Lettering should be of sufficient size to be easily readable. Each of the following major foundries were notified of this new regulation in 2000: Acheson, Deeter, East Jordan Iron Works, John Bouchard & Sons, NEENAH, and Vulcan. Additional manufacturers were notified in November 2001, to include the commonly used stormwater treatment devices in the Knoxville area. Grates for catch basins and yard inlets must also have the environmental message cast directly into the metal.

Stormwater stenciling of the environmental message (commonly known as the "Blue Thumb" program) is only for existing catch basins in areas with likely dumping. Having the environmental message cast directly into curb irons and manhole lids will reduce maintenance effort, paint costs, and possible paint spillage associated with the Blue Thumb program.





## Policy 16

### STORMWATER PIPE MATERIALS

In order to reduce flooding, promote adequate drainage, and reduce maintenance, the City of Knoxville requires certain pipe materials depending upon usage and location of the pipes. Material for pipe used for conveyance of stormwater within the City of Knoxville shall be in accordance with the following:

- Stormwater pipes installed under City streets, private rights-of-way, joint permanent easements (JPEs), or within the roadway prism of City streets and JPEs shall be reinforced concrete pipe (RCP).
- Driveway pipes shall be RCP. However, High-density polyethylene pipe (HDPE), corrugated double-walled polyvinyl chloride pipe (PVC), or corrugated metal pipe (CMP) may be used for single family and duplex development where:
  - A pipe only conveys water under non-heavily traveled driveways,
  - A pipe is located outside of the roadway prism, and
  - The installation would not cause flooding of adjacent properties or rights-of-way in the event of pipe failure.
- RCP is required for all stormwater systems located within new residential developments (includes residential condominium developments).
- RCP, HDPE, PVC, and CMP may be used to convey stormwater generated on the particular property (on-site drainage), i.e. parking lots, buildings, etc.
- Any pipe, culvert, or drainage system dedicated to the City, or installed with the intent of dedication to the City, whether inside or outside the right-of-way, shall be constructed of RCP.
- RCP is required for all stormwater pipes and culverts that carry water generated on adjacent properties or areas (off-site water).
- RCP is required if the failure of the pipe would cause flooding or potential property damage on adjacent properties.
- RCP is required for all stormwater basin outlet structures and for all stormwater outlet pipes that drain through the berm of a stormwater basin continuing to its terminus or the connection to a downstream system. Underground detention facilities that do not have a berm associated with their construction may use HDPE for the pipe material downstream of the outlet structure provided that in the event of a failure of the pipe, no offsite properties will be adversely affected.
- Ductile Iron (DI) is an acceptable alternative pipe material for RCP.
- The Director may approve the use of alternative pipe materials in overlapping rights of way or easements when necessary to accommodate special conditions presented by railroads, pipelines, utilities, unique facilities, or other sensitive areas.

### **Installation Standards**

All stormwater pipes must be installed correctly with adequate pipe bedding, backfill and stormwater joint techniques. See the following for proper installation practices:

Reinforced Concrete Pipe (RCP) – ASTM C 1479-01

Double Walled High-Density Polyethylene (HDPE) – ASTM D 2321

Corrugated Double Walled Polyvinyl Chloride (PVC) – ASTM D 2321

Corrugated Metal Pipe (CMP) – ASTM A 798

Non-Reinforced Concrete Pipe (NRCP) – ASTM C-14

All installations must be per ASTM standard or the manufacturers specifications, whichever is more stringent. At a minimum, all pipe installations must have soil tight gasketed joints.

The following documents are additional references available from the Civil Engineering Division website:

- City of Knoxville Standard Detail COK-5 (Storm Pipe Bedding and Backfill)
- City of Knoxville Technical Specifications TS-05 (Mineral Aggregate Base)
- City of Knoxville Technical Specifications TS-20 (Storm Sewers and Pipe Culverts)

## Policy 01

### ACCESS CONTROL FOR TRAFFIC AND DRIVEWAYS

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  - 1.1 Purpose of Policy
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  - 2.2 Application for permit
  - 2.3 Driveway agreement
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  - 3.4 Miscellaneous driveway requirements
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#### SECTION 1 INTRODUCTION

##### 1.1 PURPOSE OF POLICY

The efficiency and safety of a street or highway depends largely upon the amount and character of any interference with vehicles moving along the street. This interference may come from vehicle movements in opposing directions or the same direction, but normally the major interferences are that of vehicles entering, leaving, or crossing the street.

Commercial developments, industrial facilities, and multi-family residential developments are major traffic generators which significantly affect the efficiency and safety of a street or highway. In order to protect the traveling public and fully utilize the potential of streets and highways, it is necessary to regulate vehicle movements entering and leaving roadside developments, thus reducing interference with the traffic stream. In contrast to the necessity by local government to regulate access, the landowner has a legal right to adequate ingress and egress to the land.

The Director of Engineering and his representatives (i.e., the Engineering Department) have the responsibility to make the movement and handling of traffic more effective and efficient. Part of that responsibility involves resolving the conflicting interests of both landowners and road users in the critical area of driveway locations and operations. In many cases the Inspections Bureau reviews and approves driveway locations and design parameters on behalf of the Engineering Department. Therefore, this policy has been established to meet the following objectives:

- To provide maximum protection and safety to the general public through the orderly control of traffic entering and leaving the street or roadway
- To provide a uniform policy for the design and review of driveways throughout the city of Knoxville.
- To ensure that construction methods and field decisions will be acceptable to the city of Knoxville.

Through the uniform enforcement of this policy, the needs and rights of both landowners and the traveling public will be satisfied with respect to the critical area of driveway location, design, and operation. The extent to which this policy is enforced on existing property uses will be based on the relative values of the existing and proposed improvements. Existing lots of record prior to the original publication of this policy (January 1980) may be reviewed on an individual basis, when compliance with this policy represents an unusual hardship. Lots recorded after publication of this policy are expected to comply fully with all provisions of this policy.

## 1.2 DEFINITIONS

<u>Apron</u>	That portion of the driveway extending from the edge of pavement to the sidewalk section, or right-of-way line if no sidewalk exists, and lying between the side slopes of the driveway.
<u>Corner Clearance</u>	The distance measured along the street right-of-way line from the intersection of street right-of-way lines to the nearest edge of driveway.
<u>Curb Return</u>	The curved portion of a curb at street intersections, or the curved portion of a curb in the side slopes of a driveway.
<u>Curb Transition</u>	A change in the vertical dimension of a curb over a distance as required to develop a full curb from a drop curb.
<u>Driveway</u>	The improved area between a public street and private property intended to provide ingress and egress of vehicular traffic from the public street or thoroughfare to a definite area of private property. Driveways are typically categorized into three types (radius, ramp, street) and three types of properties (multi-family, nonresidential, single-family).
<u>Driveway Angle</u>	The acute angle between the driveway centerline and the centerline of the street. Shown as dimension Y on Figures 1 through 5.

<u>Drop Curb</u>	A curb section with a reduced vertical dimension to allow vehicular ingress and egress, obtained by cutting a section of existing curb or by new construction of a standard ramp driveway.
<u>Easement</u>	The right to use another person's property for a limited and specifically named purpose, as recorded in legal documents and property records. The landowner continues to control the property in all other respects.
<u>Edge Clearance</u>	The distance measured along the street right-of-way line from an interior property line to the nearest edge of driveway. Shown as dimension E on Figures 1 through 5.
<u>Right-Of-Way</u>	The lands conveyed or dedicated to the public to be used for a street, alley, walkway, drainage facility, or other public purpose.
<u>Sidewalk</u>	The area on public or private property where pedestrians walk or stand, generally parallel to the edge of the street, roadway or curb. Sidewalks are generally paved.
<u>Sidewalk Section</u>	The portion of the driveway apron which is an extension of the adjacent sidewalks.
<u>Street</u>	Any public thoroughfare, primarily used by motor vehicles, with a designed section that is not classified as an alley.
<u>Traffic Control Devices</u>	All signs, signals, markings and structures that are placed on, over, or adjacent to a traveled way to regulate, warn or guide traffic. Traffic control devices must conform to the Manual on Uniform Traffic Control Devices and supplement regulations issued by the Tennessee Department of Transportation.

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***Driveway Properties:***

<u>Driveway, Multi-Family</u>	A driveway providing vehicular ingress and egress for property that is used for multi-family residential purposes.
<u>Driveway, Nonresidential</u>	A driveway providing vehicular ingress and egress to property that is used for commercial, industrial, educational or other non-residential purposes.
<u>Driveway, Single-Family</u>	A driveway providing vehicular ingress and egress for property used for single-family residential purposes (usually a single lot of record).

***Driveway Types (see Figure 8 for examples):***

<u>Driveway, Radius</u>	A driveway constructed with a tapered radius curb transition and a fully developed pavement section from the tangent section of the driveway to the tangent section of the street.
<u>Driveway, Ramp</u>	A driveway constructed with a drop curb transition and paved with concrete from the back of sidewalk (or the property line where no sidewalk exists) to the edge of pavement along the street.
<u>Driveway, Street</u>	A driveway constructed similar in appearance to a street intersection, with fully developed curb returns and pavement sections, lane use markings, channelized lane usage, queue storage for waiting vehicles, etc.

### 1.3 PROPERTY ACCESS LIMITED TO DRIVEWAY

In order to restrict ingress and egress to the approved driveway, an appropriate curb section or curb and gutter section will be required along the edge of public roadways on a line and grade that must be approved by the Engineering Department. The general requirements are:

- 1) Curb and gutter
  - (a) All roadways classified as arterials on the Major Road Plan
  - (b) All roadways classified as collectors on the Major Road Plan
- 2) Curb and gutter, or detached curb
  - (a) All roadways classified as local and that serve land uses other than single-family residential development (RD, CD, OD)
- 3) Curb and gutter, or detached curb, or extruded curb
  - (a) All roadways classified as local and that serve single-family residential development (SFR)

Additional requirements or exceptions to the stated policy may be necessary to ensure that new curbs, gutters, sidewalks and grass areas are consistent with adjacent development or plans for future development. All parking areas shall be constructed and properly curbed so that traffic movements to park and unpark will take place within the property lines.

## SECTION 2 RIGHT-OF-WAY CONSTRUCTION PERMIT

### 2.1 PERMIT REQUIRED

No driveway shall be constructed, nor shall any existing driveway be relocated, altered, or reconstructed on any public right-of-way, except under a permit issued by the appropriate authority. Tennessee Department of Transportation (TDOT) can issue permits for a right-of-way under state jurisdiction, such as a federal or state route. The Knoxville Engineering Department can issue permits for any other right-of-way, which is considered to be under city jurisdiction. All improvements constructed on public right-of-way within the city limits must conform to this policy.

All driveways to be constructed or reconstructed on city right-of-way shall be reviewed and approved by the Engineering Department prior to issuance of a right-of-way permit. In general, a right-of-way permit will not be issued prior to a site development permit or a building permit. A right-of-way permit will not be issued for a vacant parcel of property without a proposed development plan. The Engineering Department may require reasonable proof that a proposed development plan will be implemented, prior to consideration and review of a right-of-way permit for a vacant parcel of property. A right-of-way permit will not be considered or issued for a parcel of property which is not constructable due to topography, building and zoning restrictions, unusual size or shape of property, or other factors which would not allow parking and/or internal traffic circulation on the property.

### 2.2 APPLICATION FOR PERMIT

An application form for a right-of-way construction permit is included in Appendix A of the Land Development Manual. Include a brief explanation of the proposed usage of property with the application. Submit three copies of a prepared site plan drawing on standard 24" x 36" size paper, unless the right-of-way permit is for a single driveway for a residential development (RD) project, for which a 8 1/2" x 11" sketch will be sufficient.

The site plan drawing must show parking layout, buildings, vertical and horizontal alignment of driveway, sight distances if applicable, drainage and typical driveway cross-section. Include exact location and dimensions of the proposed driveway with reference to the property boundary. Additional requirements typically include property lines, nearest intersecting streets and alleys, utility poles, fire hydrants, traffic signs, traffic signals, pavement markings, parking meters, and bus stops. A site plan drawing shall be at a minimum scale of 1" = 30' in order to clearly show all features. If the plan drawing would exceed 24" x 36" at this scale, the developer may either use multiple drawings or could potentially use 1" = 50' supplemented with detailed drawings of critical areas.

The Stormwater Engineering Division (or in some cases the Inspections Bureau) will review the application in order to determine acceptability of design and the conformance with regulations and design standards. In addition, copies of the right-of-way application will be circulated to other city agencies as necessary to ensure that all driveways are shown correctly on other site development drawings. The Stormwater Engineering Division will notify the permit contact whether permit approval has been granted and any deficiencies noted, which may also include suggested improvements or alternatives based upon knowledge of local standards, neighborhood preferences, physical factors or other conditions.

Approval of the proposed driveway locations and geometric design shall be secured from the Stormwater Engineering Division prior to the issuance of a site development permit or a building permit, except for residential property (single-family houses or duplexes) fronting on local or collector streets. A permit for reconstruction or replacement of any existing driveway, in its current location, may be requested by submitting a right-of-way application to the Civil Engineering Division.

### 2.3 DRIVEWAY AGREEMENT

A driveway agreement may be necessary in rare cases involving large or complex projects with multi-family housing or commercial developments. The driveway agreement will include the approved right-of-way drawings of the proposed driveways, all exceptions and restrictions imposed on the driveways, methods of construction, maintenance responsibilities, and other conditions as necessary. If the right-of-way permit includes the alteration of through traffic lanes or the addition of a traffic lane, the driveway agreement shall also include a construction plan for the alteration, amount and method of payment for the construction, bond provisions, and a further description of safety and maintenance responsibilities.

A driveway agreement shall be signed by the owner, developer, other interested parties and a representative of the Engineering Department. The driveway agreement shall be binding upon the owner and developer, their successors, any renter or leasee, and upon the City of Knoxville. The driveway agreement also becomes part of the right-of-way permit.

### 2.4 APPROVAL AND DISPLAY OF RIGHT-OF-WAY CONSTRUCTION PERMIT

When an approved right-of-way permit is granted by the Stormwater Engineering Division or the Inspections Bureau, the supervisor at the construction site shall keep the permit available for inspection at the worksite. The right-of-way construction permit shall be made immediately available to city inspectors upon request. If work is not performed to the requirements of the authorized permit standards, the City of Knoxville may immediately issue a notice to stop work. The site supervisor is also required to produce any TDOT right-of-way permit upon request, so that a city inspector may also review driveway plans and construction of a driveway that connects to state right-of-way.

SECTION 3 SPECIFICATIONS

3.1 NUMBER AND LOCATION OF DRIVEWAYS

In order to provide ease and convenience of ingress and egress to private property, the number and location of driveways shall be regulated relative to the development density of the property being served and the amount of lot frontage. The number and location of driveways is regulated in order to provide the maximum safety with the least interference to the traffic flow on public streets. The maximum number of driveways is shown in Table 3-1 based upon lot frontage:

Table 3-1 Maximum Number of Driveways	
Lot Frontage	Maximum Number of Driveways
< 75 feet	1
75 feet to 149 feet	1 A, B
150 feet to 299 feet	2 B
300 feet to 599 feet	3 B
(each additional 300 feet)	( + 1 more ) B
(A) Single-family houses, gasoline service stations, or drivethrough Establishments may have two driveways if separated by a Distance equal to the width of the widest driveway.	
(B) Or as determined by the Knoxville Engineering Department.	

All driveways shall be subject to the following controls, unless appeal is made to the Stormwater Engineering Division upon sound engineering judgment:

- No driveway shall be constructed within the radius return of a street intersection.
- No driveway shall be constructed with a corner clearance of less than 25 feet.
- No driveway shall be constructed in a manner which results in the encroachment of a curb return or curb radius beyond the extension of an adjacent property line or lease line, except where joint use with the adjacent property is established.
- Property adjoining more than one street with adequate frontage for a driveway entrance shall be encouraged to locate primary access on the street with lower traffic volumes.
- The minimum length of tangent curbs between curb cuts on the same property must equal or exceed 20% of the widest adjacent curb cut.
- Except for R-1 zoning districts, no driveway may be constructed opposite the non-continuous leg of a "T" intersection for a distance equal to the width of the non-continuous leg right-of-way plus 25 feet in each direction.

### 3.2 WIDTH OF DRIVEWAYS

The width of all driveways shall be within minimum and maximum limits specified in Table 3-2:

Table 3-2 Driveway Widths		
Location	Minimum	Maximum
Residential (single-family or duplex)	10 feet	25 feet
One-way, all other uses (A)	15 feet	20 feet
Two-way, all other uses (B)	25 feet	30 feet
(A) All one-way driveways shall be signed to denote "entrance only" and "exit only". A driveway agreement must be accepted in order to ensure proper maintenance of traffic signs (see sections 2.3 and 3.3).		
(B) Gasoline service stations and developments which serve a substantial volume of trucks (more than 5 per day or 25 per week) of large trucks with at least 3 axles may choose to have driveways up to 40 feet wide.		

For all ramp-type driveways, the curb transition shall extend at least 3 feet beyond the side of each apron when measured at the curb line or the edge of pavement, but not more than 5 feet. In addition, length of ramp-type driveways shall be at least equal to the curb transition length. Minimum length of curb cuts for radius-type and ramp-type driveways is shown in Table 3-3, based upon the functional classification of the street and the property use.

The width of street-type driveways for major traffic generation sites are often required to be wider than 40 feet to accommodate traffic patterns, in which case a waiver by the Knoxville Engineering Department will be necessary. The curb radius for street-type driveways shall not be less than 25 feet and not greater than 40 feet, unless a waiver is granted.

### 3.3 NONCONFORMANCE OF DRIVEWAYS

On occasion, the use of a land parcel or development project is changed so that the driveway is no longer in conformance with this policy. In this case, the owner or developer, at his expense, shall replace or modify all curbs, gutters, sidewalks and grassed areas to restore the driveway and lot frontage to a condition that is consistent with the land use and the neighborhood character. Curb/driveway replacement shall occur either during the site redevelopment project or, if no sitework is being performed, within six months of the land use change.

In locations where driveways are not permitted or are substandard, the Knoxville Engineering Department may request the property owner to either remove or modify the driveway as necessary within 180 days, or a lesser time if appropriate, by means of written notification. If the property owner shall fail to remove, modify or complete work upon the driveway within the allotted time, then the Knoxville Engineering Department may remove or modify such driveway, with the cost of construction being paid by the property owner or a lien attached to the property. The lien shall be twice the amount of the construction cost, with recovery of liens being enforced in Knox County Chancery Court or any other court of competent jurisdiction.

Table 3-3 Minimum Length of Curb Cut for Driveways (Radius-Type and Street-Type)				
		Minimum length of curb cut for driveway (based on street classification)		
	Driveway width	Arterial	Collector	Local
SINGLE FAMILY RESIDENTIAL	10'	25'	20'	20'
	12'	27'	22'	22'
	15'	30'	25'	25'
	20'	35'	30'	30'
	25'	40'	35'	35'
HIGH TRUCK VOLUME TRAFFIC	20'	60'	55'	50'
	25'	65'	60'	55'
	30'	70'	65'	60'
	35'	80'	70'	65'
	40'	90'	75'	70'
GASOLINE SERVICE STATION	20'	50'	40'	30'
	25'	55'	45'	35'
	30'	60'	50'	40'
	35'	60'	55'	45'
	40'	60'	60'	50'
ALL OTHER USES	15'	45'	35'	25'
	20'	50'	40'	30'
	25'	55'	45'	35'
	30'	60'	50'	40'
Minimum turning radius into curb cuts		Arterial	Collector	Local
<i>Single Family Residential</i>		7.5'	5'	5'
<i>High Truck Volume Traffic</i>		20'	17.5'	15'
<i>Gasoline Service Station</i>		15'	10'	5'
<i>All Other Uses</i>		15'	10'	5'

### 3.4 MISCELLANEOUS DESIGN CRITERIA

Driveways shall be designed to meet the following conditions:

- Driveways shall constructed to conform to the existing paved street grade, unless a different grade is approved by the Stormwater Engineering Division.
- Driveways shall cross the sidewalk area (if any) to allow for a smooth and continuous sidewalk (either existing or proposed) along city rights-of-way.
- In general, an existing driveway shall not be incorporated into the construction of a new driveway unless it can be demonstrated that the sidewalk is in good condition consisting of a minimum 6" thick reinforced concrete slab meeting the city standards.
- Driveways are not allowed to contain any municipal facilities, such as traffic signal standards, fire hydrants, crosswalks, loading zones, utility poles, guy wires, fire alarm boxes, meter boxes, or

sewer cleanouts. The owner or developer may be authorized to relocate the municipal structures or appurtenances as necessary. The owner or developer may also request the city to relocate minor structures or appurtenances as necessary, with the cost to be borne by the owner or developer.

- If special pedestrian or vehicle hazards are created by two-way traffic, then a driveway may be restricted to one-way traffic. Proper signs and/or markings shall be erected and maintained. A one-way driveway, due to the necessity of providing one-way signs, will require an approved driveway agreement (as described in Sections 2.3 and 3.2) in order to ensure proper maintenance of traffic signs. Failure to adequately erect and maintain standard one-way signs is a violation of this policy.
- Driveways shall be constructed at an angle not less than 75° to the street or roadway unless exempted by the Knoxville Engineering Department. This safety requirement is to allow clear sight distance in each direction. Exemptions may be considered for single driveways serving single-family residences.
- Driveways shall be located and constructed to provide adequate stopping sight distance for drivers entering and exiting the property.
- Driveways should generally be the standard ramp-type driveway at locations where sidewalks exist or are included in the construction. Either radius-type, ramp-type or street-type driveways may be constructed at locations where sidewalks do not exist. In general, a new driveway should be constructed to match the predominant type of driveway in existing use along that street or road.

### 3.5 CONSTRUCTION SPECIFICATIONS

All work performed in the construction of driveways and entrances shall conform to the current specifications established by the Tennessee Department of Transportation or the City of Knoxville. Use high-quality materials and standard paving methods to ensure a safe and durable finished project. The construction plans shall completely describe the pavement thickness and materials used. Materials shall generally be described using standard TDOT terminology.

### 3.6 MAJOR TRAFFIC GENERATORS

The Knoxville Zoning Ordinance defines a major traffic generator as a facility that is required to provide 400 or more parking spaces. The number and types of parking spaces are described in Article V, Section 7 (Minimum offstreet parking, access and driveway requirements). Any development projects which qualify as a major traffic generator shall submit a complete report to the Metropolitan Planning Commission, along with conceptual plans, that provides the following information:

- Projection of traffic generation for the development.
- Directional distribution of traffic and the assignment of projected traffic to the available access routes.
- Anticipated queue length and available vehicle storage of access routes.
- Impact of the development and proposed access routes on the operation of existing streets and neighborhoods.

### 3.7 HIGH VOLUME DRIVE-THROUGH FACILITIES

Any property that provides drive-through services (such as carwashes, cleaners, banks or fast food restaurants) is required to provide adequate storage areas for waiting vehicles. Storage area lengths, expected volumes, and queue times shall be submitted to the Knoxville Engineering Department for review. Factors that affect the review may include:

- Size and type of street that provides access to the property
- Potential for interference with traffic on collector and arterial roads
- Sight distances at the driveway entrance and exit
- Available parking to conduct business in a manner other than by drive-through

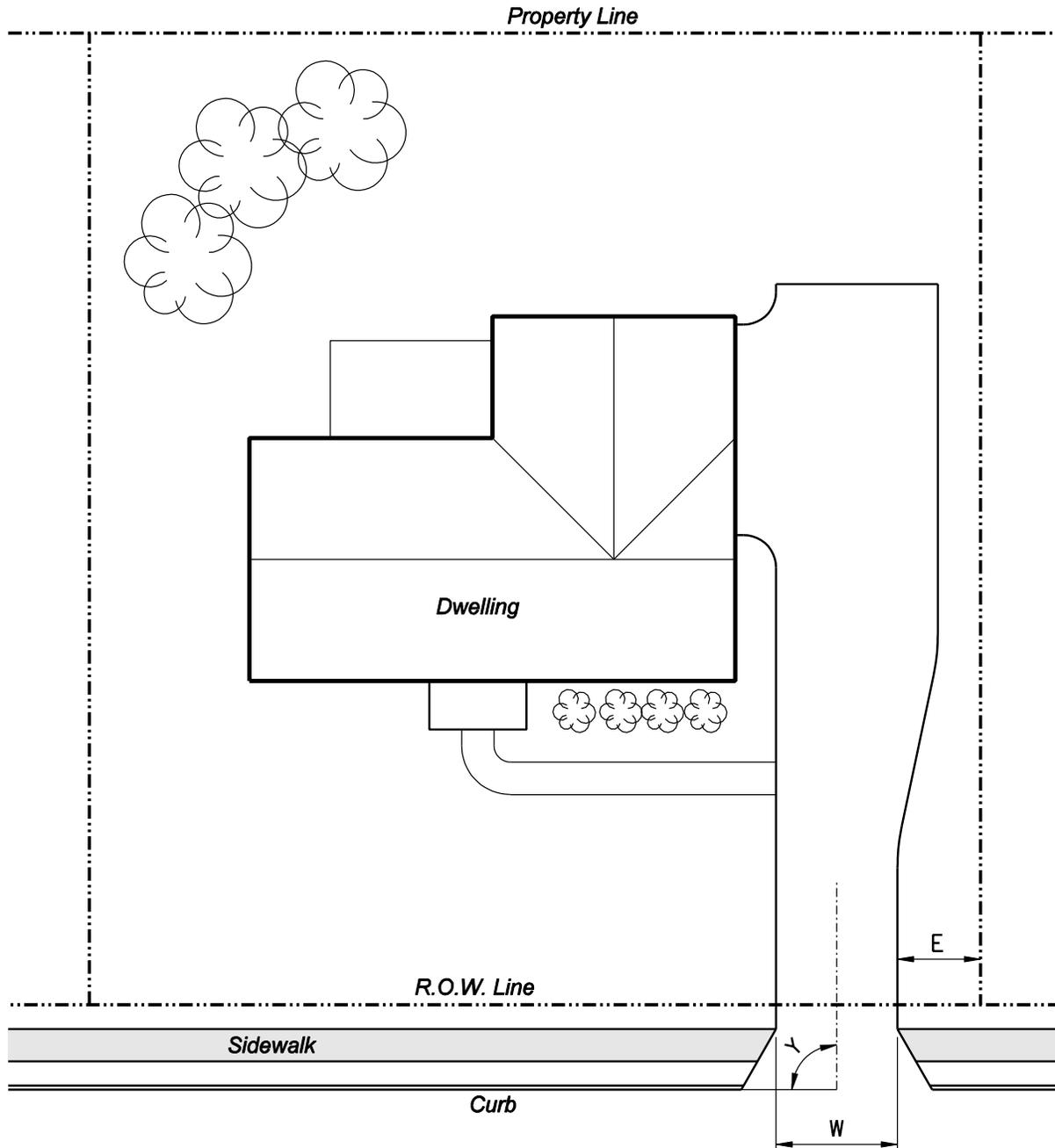
## SECTION 4 DESIGN SCHEMATICS

The following design schematics show examples of common driveway layouts. Figure 8 shows the 3 types of driveways (radius-type, ramp-type, and street-type). As stated previously in Section 3.4, driveways and entrances must be aesthetically compatible with neighborhood standards and other driveways in the immediate vicinity. In addition, the presence of existing or proposed sidewalks is a major factor in selecting the driveway type.

When designing driveways and entrances, the engineer must consult the appropriate sections of the Knoxville Zoning Ordinance for property setback requirements, parking requirements and building limitations. In addition, a clear sight triangle is defined by Article V, Section 6-C, of the Knoxville Zoning Ordinance. This minimum level of sight distance is considered adequate for very infrequent use on low-volume local streets. Higher standards for sight distance should be considered for driveways and entrances with high volumes of traffic or that connect to roads with higher design speeds.

## Example of Single Family Residential Driveway Schematic

Not to scale



W = 10' MIN - 25' MAX

E = MIN/MAX VARIES WITH STREET CLASSIFICATION

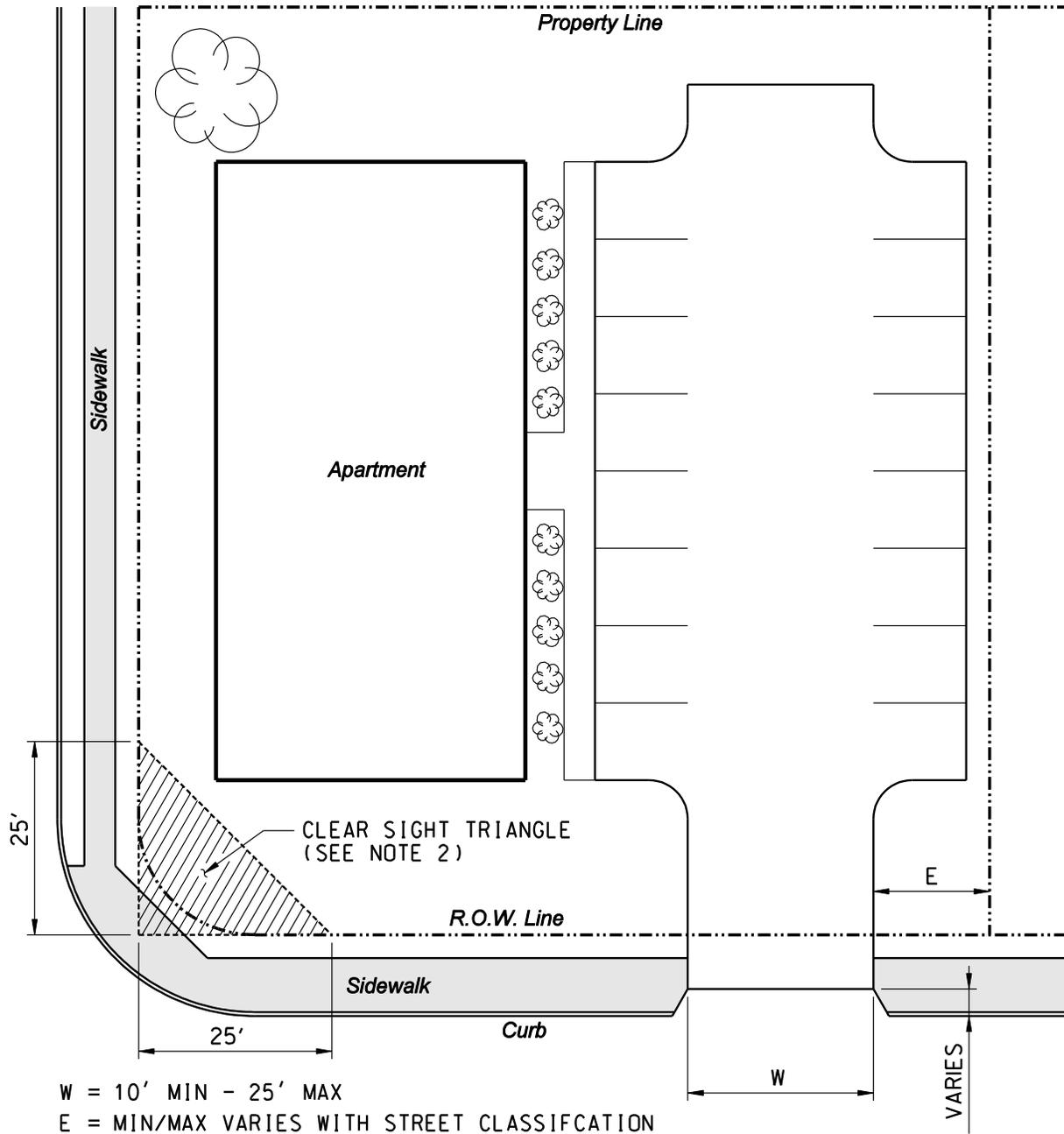
Y = 75° TO 90°

NOTE: SEE APPROPRIATE ZONING ORDINANCE FOR BUILDING AND PARKING LOT SET BACK REQUIREMENTS.

Figure 1

## Example of Multi-Family Residential Driveway Schematic

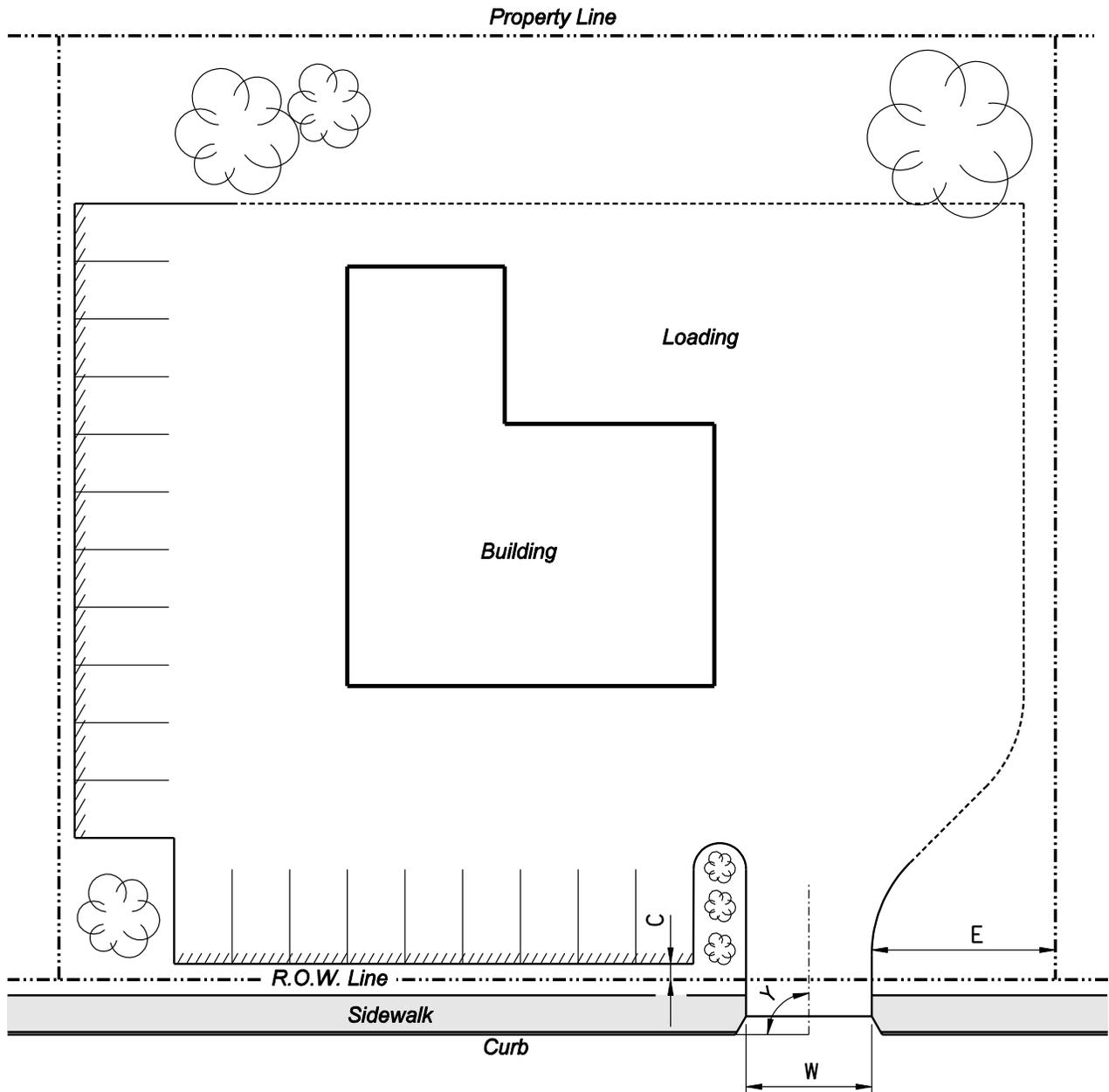
Not to scale



- NOTES: 1. SEE APPROPRIATE ZONING ORDINANCE FOR BUILDING AND PARKING LOT SET BACK REQUIREMENTS.
2. SEE ARTICLE V. SECTION 6-C OF THE ZONING ORDINANCE FOR THE CITY OF KNOXVILLE FOR CLEAR SIGHT TRIANGLE.

Figure 2

**Example of Single Driveway Schematic**  
Not to scale



W = 20' MIN - 30' MAX

C = 3' MIN

E = MIN/MAX VARIES WITH STREET CLASSIFICATION

Y = 75° TO 90°

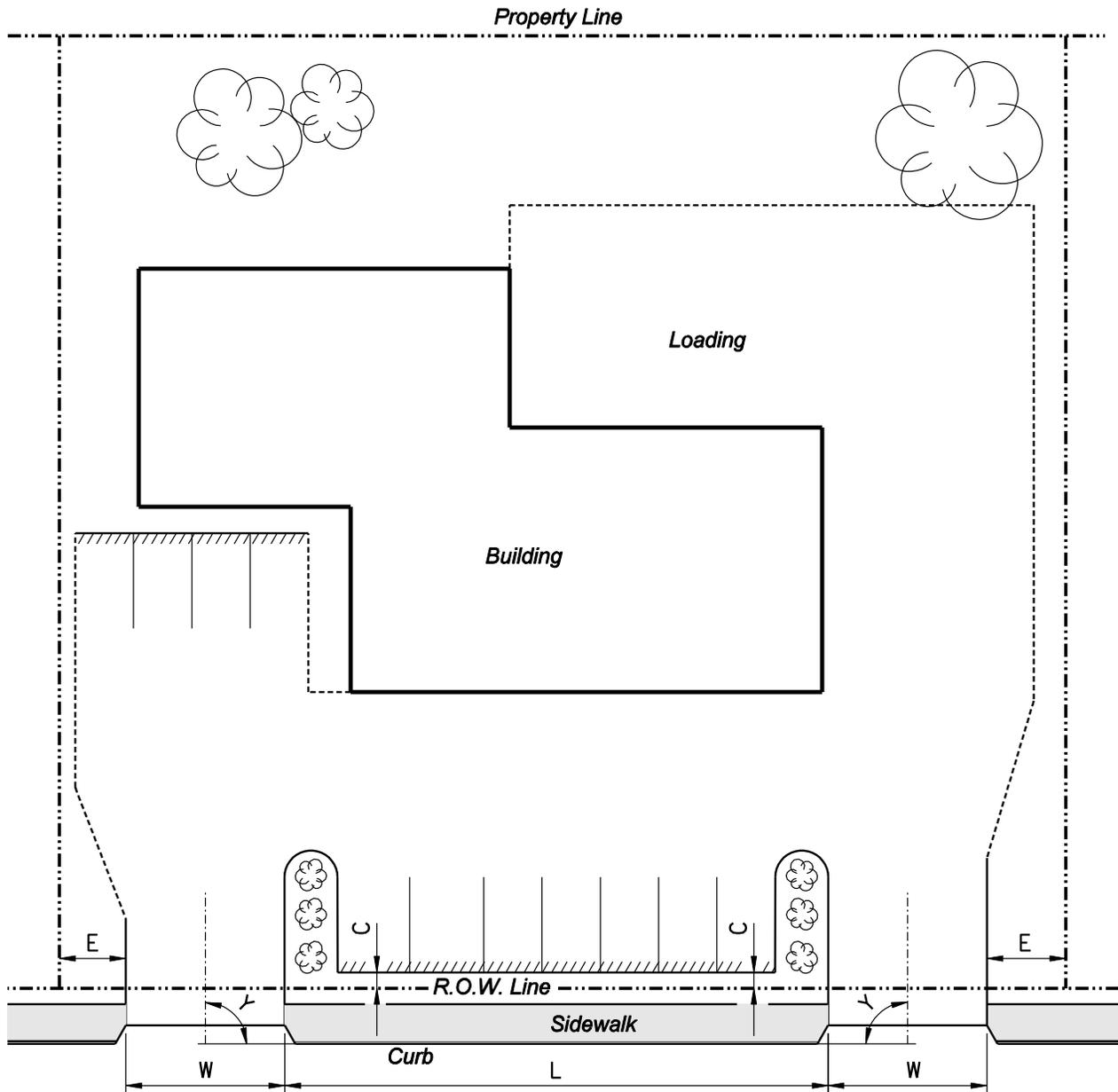
////// 6" RAISED CURB

NOTE: SEE APPROPRIATE ZONING ORDINANCE FOR BUILDING AND PARKING LOT SET BACK REQUIREMENTS.

Figure 3

## Example of Double Driveway Schematic

Not to scale



W = ONEWAY DRIVE: 15' MIN - 20' MAX  
 TWOWAY DRIVE: 20' MIN - 30' MAX  
 C = 3' MIN  
 L = WIDTH OF WIDEST DRIVEWAY, MIN

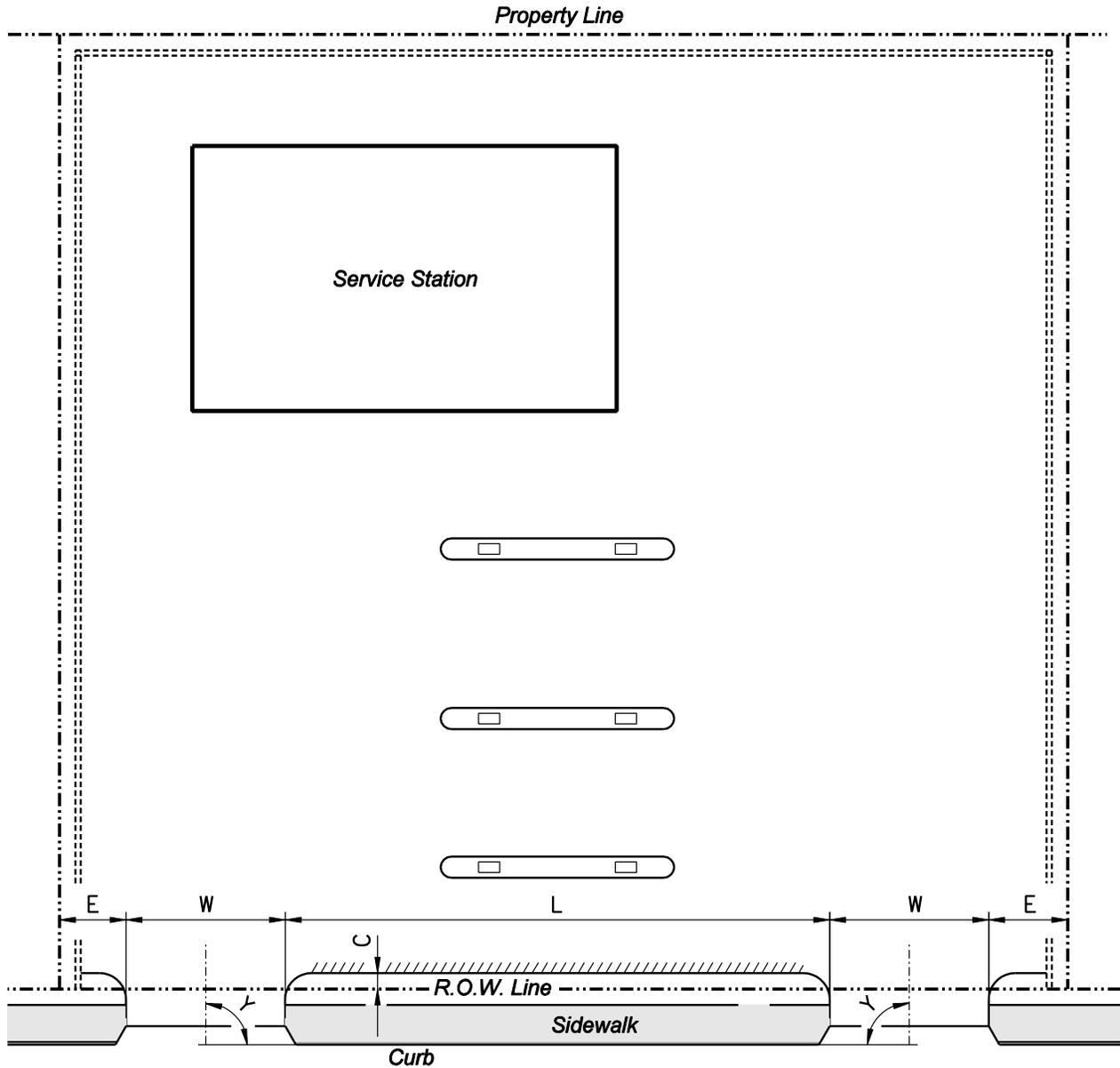
E = MIN/MAX VARIES WITH STREET CLASSIFICATION  
 Y = 75° TO 90°  
 // 6" RAISED CURB

NOTE: SEE APPROPRIATE ZONING ORDINANCE FOR BUILDING AND PARKING LOT SET BACK REQUIREMENTS.

Figure 4

## Example of Gas Station Double Driveway Schematic

Not to scale



W = ONE DRIVEWAY: 20' MIN - 40' MAX  
 E = MIN/MAX VARIES WITH STREET CLASSIFICATION  
 L = WIDTH OF WIDEST DRIVEWAY MIN

Y = 75° TO 90°  
 C = 3' MIN  
 ///// 6" RAISED CURB

NOTE: SEE APPROPRIATE ZONING ORDINANCE FOR BUILDING AND PARKING LOT SET BACK REQUIREMENTS.

Figure 5

### Example of Ramp Type Driveway Schematic

Not to scale

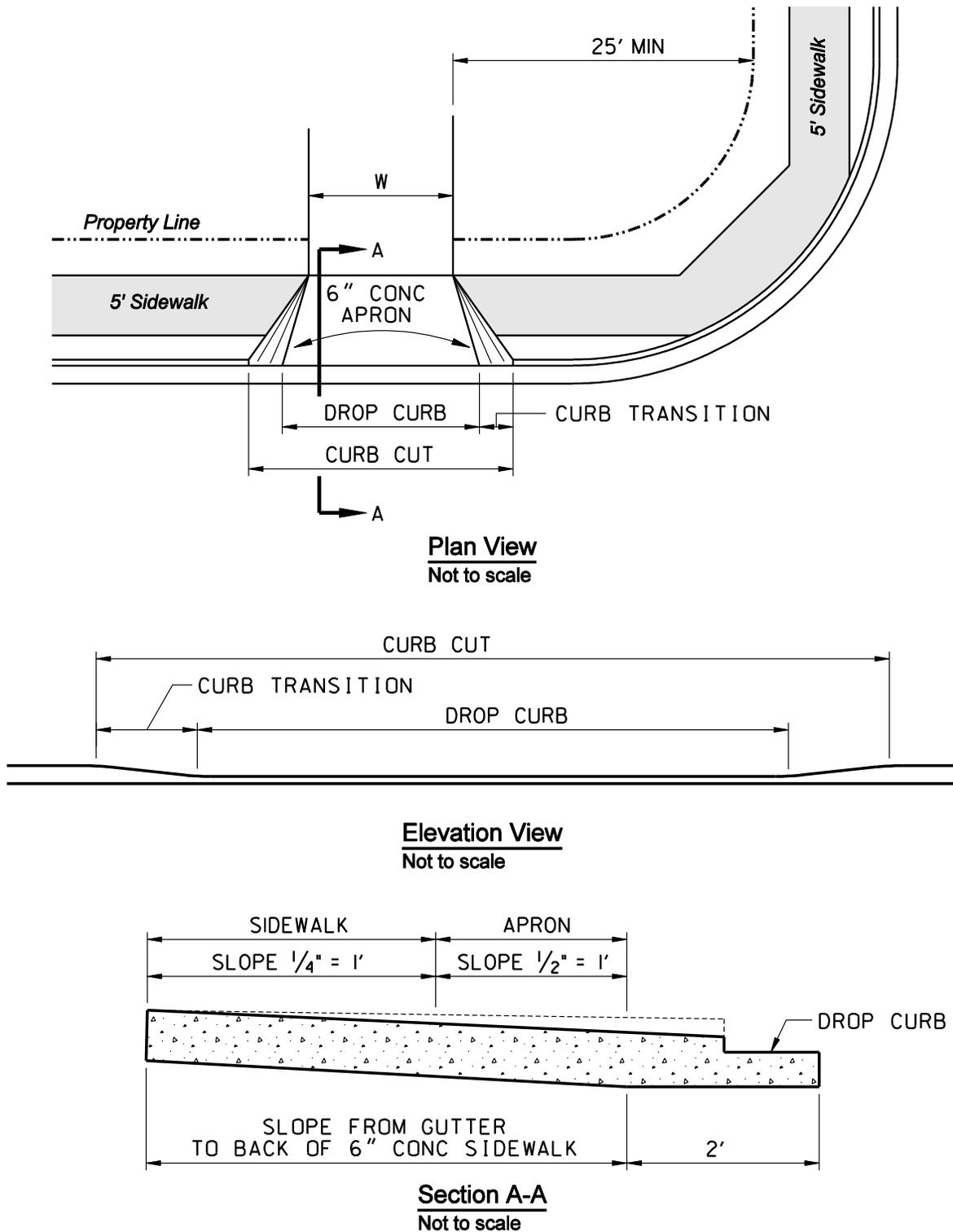


Figure 3



### Examples of Driveway Types

Not to scale

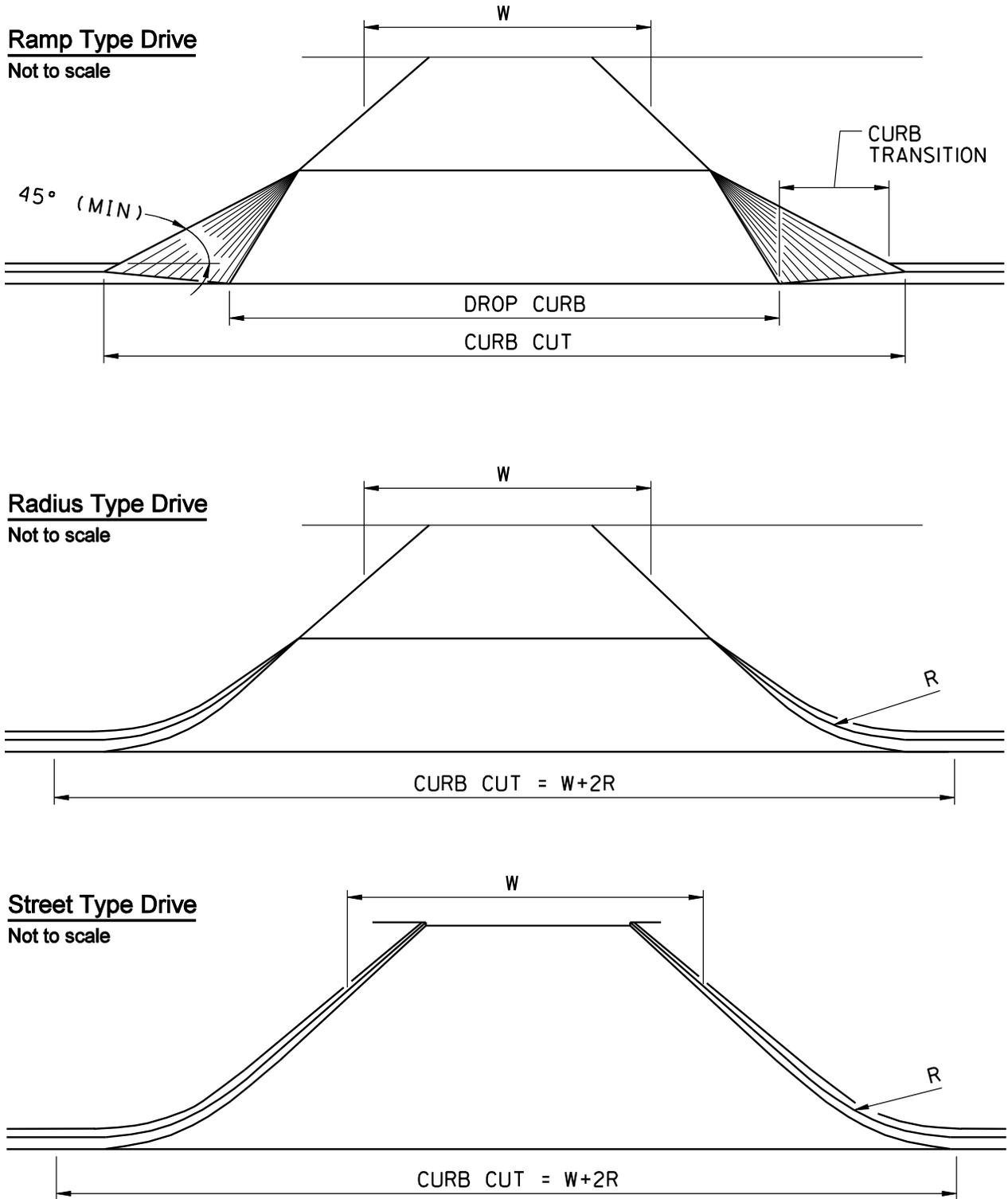


Figure 5



## PERMITS FOR UTILITY CONSTRUCTION

- Construction permits are for any non-maintenance utility construction and any maintenance related projects consisting of greater than 20 square yards of disturbance within city right-of-way (ROW) and on private property.
- The Engineering Department will carefully review the necessity to locate utility facilities under the pavement for the following reasons:
  - Street cuts needed for installation result in long-term damage to the street.
  - Maintenance results in the necessity of work zone traffic control and inconvenience to the public.
- Projects on private property must comply with requirements for the Site Development Permit in the *Stormwater and Street Ordinance of the City of Knoxville*. Projects must include an erosion prevention and sediment control (EPSC) plan. The EPSC plan must be:
  - Submitted and approved before the permit will be issued,
  - Prepared and sealed by a professional engineer registered in the State of Tennessee, and
  - In compliance with the more restrictive of either the:
    - *Erosion and Sediment Control Handbook* produced by the Tennessee Department of Environment and Conservation, dated March 2002, as amended by that organization or its successor, or
    - The City of Knoxville's *Best Management Practices Manual* (BMP Manual).
- Utility Construction permits are issued on a per-project basis.
- Permits for utilities can be obtained by contacting the Engineering Department, 3131 Morris Ave at 865-215-6100.
- New construction projects must be submitted at least 12 business days in advance of the work.
- The utility company shall notify the Civil Engineering Section before any construction activities begin.

## Permit Fees

### Construction in the ROW

- Billed on a quarterly basis for fees associated with construction permits.
- The following permit fee structure will apply:
  - Work within the right-of-way:
    - \$1.00 per linear foot of pipe,
    - \$0.10 per linear foot of bored pipe, or
    - \$15.00 minimum per boring.
  - Work under the pavement of the street when only surface destruction occurs.
    - \$15.00 per linear foot of pipe.
    - \$0.00 per linear foot of pipe if the street is on the current city-paving list.
    - \$30.00 per linear foot of pipe if the street has been resurfaced within five years or less.
    - In cases when there are deep trenches and subgrade destruction as well as surface destruction, the utility will be billed on a case-by-case basis for the cost of roadway restoration.

### Construction on Private Property

- Billed on a quarterly basis for fees associated with construction permits.
- Based on the rate structure found in the *Stormwater and Street Ordinance of the City of Knoxville* (see fees for site development permits for utilities).
  - The Engineering Department shall determine permit fees for utilities currently subject to a court order or decree.
- If a utility project requires work within the right-of-way and on private property, the utility shall pay Right-of-Way Permit fees for the limits of work within the right-of-way and Site Development Permit fees for the limits of work on private property.
  - The utility shall not pay any Site Development Permit fees for work where the utility has obtained and paid fees for work as part of a Right-of-Way Permit.



## PERMITS FOR UTILITY MAINTENANCE

- Permits are for routine maintenance are required for projects consisting of less than 20 square yards within the city right-of-way (ROW) or on private property, including, but not limited to:
  - Tree Trimming in the ROW,
  - Service connections,
  - Emergency repairs,
  - Setting of poles,
  - Construction within areas already covered by permits of others (i.e. developers), or
  - Bored line extensions outside the pavement edge that are less than 500 feet long and 2 inches or less in diameter.
- Projects with disturbed areas greater than 20 square yards are considered construction activities and should apply for permits for utility construction (See the guidelines for “Utility Construction”)
- Work on private property must utilize best management practices (BMPs) for erosion prevention and sediment control. BMPs must comply with the more restrictive of either the:
  - *Erosion and Sediment Control Handbook* produced by the Tennessee Department of Environment and Conservation, dated March 2002, as amended by that organization or its successor, or
  - City of Knoxville’s *Best Management Practices Manual* (BMP Manual).
- Utility Maintenance Permits may be issued on an annual basis.
- Permits for utilities can be obtained by contacting the Engineering Department, 3131 Morris Ave at 865-215-6100.
- Utility companies shall notify the Civil Engineering Section before any construction activities begin.

## Permit Fees

### Maintenance in the ROW

- Billed annually to the utility company for the previous year.
- Based upon the report of cut information
  - Cut information should be tabulated by the utility and forwarded on a monthly basis to the City of Knoxville Engineering Department at 3131 Morris Ave.
- Based on the following rate structure
  - Surface Type
    - Pavement or Sidewalk - \$15.00
    - Earth or Gravel - \$5.00
    - Minimum Permit Fee - \$5.00
  - Bored line extensions
    - \$0.10 per linear foot or a minimum of \$15.00 per boring.

### Maintenance on Private Property

- Billed annually to the utility company for the previous year.
- Based upon the total area disturbed,
  - Disturbed area information shall be tabulated by the utility and forwarded monthly to the City of Knoxville Engineering Department, 3131 Morris Ave
- Billed in accordance with the rate structure as found in the *Stormwater and Street Ordinance of the City of Knoxville*.
  - The Engineering Department shall determine permit fees for utilities currently subject to a court order or decree.



## SIDEWALK CONSTRUCTION AND MAINTENANCE

Some construction permit applicants are required to construct sidewalk at their expense if certain criteria are met in accordance with Chapter 23 of the City of Knoxville Code of Ordinances. The requirements determining if a project requires sidewalk are specified below.

- **Greenfield Site** - All greenfield sites, excluding individual single-family residences or duplexes.
- **Previously Developed Sites** - Private property owners/developers who apply for construction permits and meet the Substantial Investment threshold as defined in Chapter 22.5 of the City of Knoxville Code of Ordinance (Stormwater and Street Ordinance) must construct sidewalk along all ROW frontages abutting the property. This does not apply to individual single-family residences or duplexes.
- **Existing Sidewalk** - If property's frontage contains existing sidewalk and the applicant meets substantial investment the Department of Engineering will evaluate the sidewalk. If it is determined the existing sidewalk does not meet ADA standards, the applicant will be required to repair the sidewalk.
- **Knoxville-Knox County Planning** - Knoxville-Knox County Planning may require sidewalk to be constructed.

### Appeal Process

The owner/developer may request an administrative waiver by the Director of Engineering for the sidewalk requirement.

### Design requirements

Sidewalks must meet the requirement of City of Knoxville, Tennessee Department of Transportation (TDOT) and the United States Access Board.



## **STREET LIGHTING AND OVERHEAD WIRING IN THE CENTRAL BUSINESS IMPROVEMENT DISTRICT**

City planning groups have made long-range projections of desirable locations for future development in the Central Business Improvements District (CBID) (See attached map). In an effort eliminate all overhead wiring and thereby improve the aesthetics of this area, utility companies are required to use existing underground facilities or alleys in the CBID.

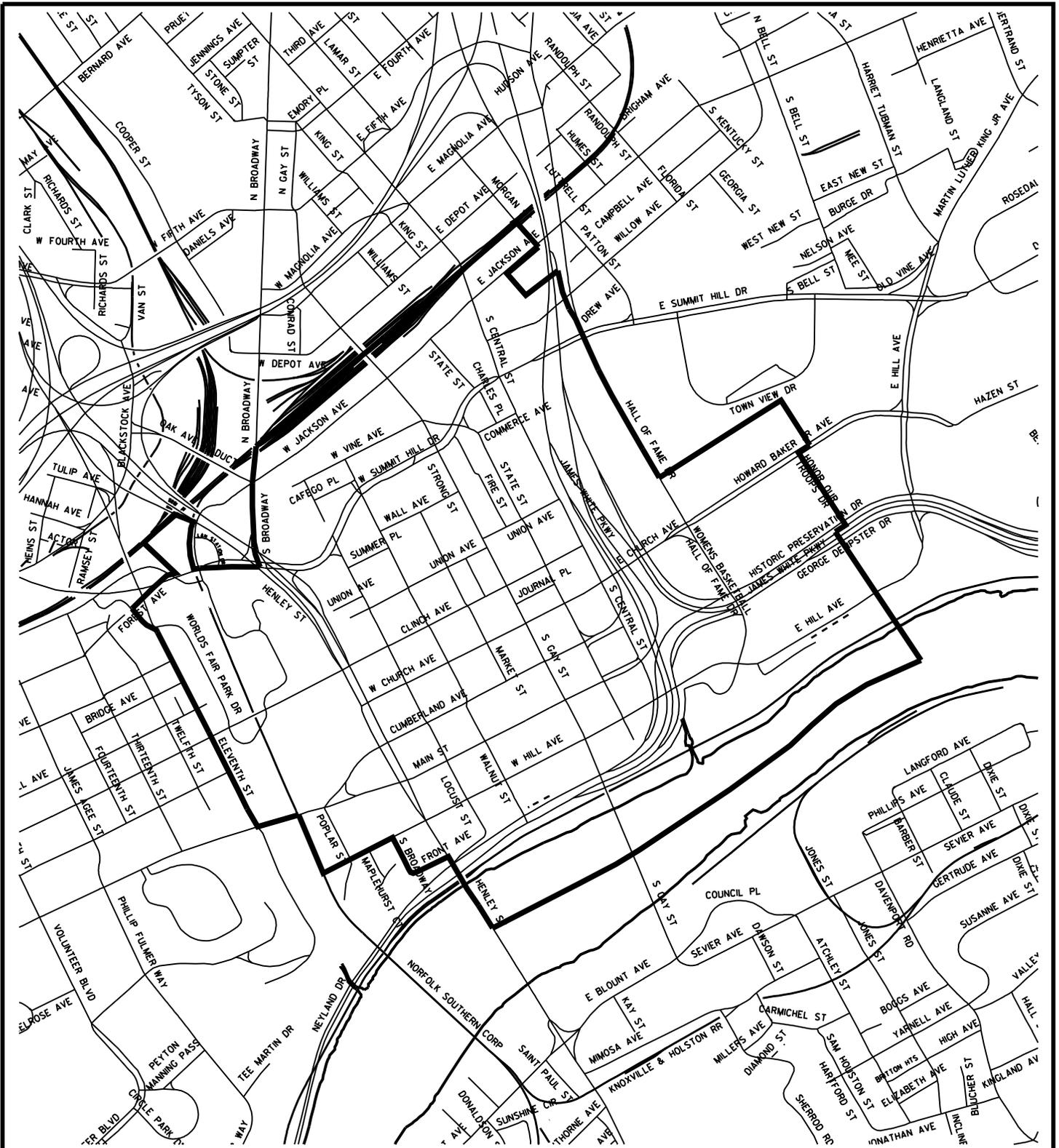
### Street Lights

1. Street light additions or replacements should be in accordance with the agreed upon Street Light Plan (i.e. No new cobraheads may be installed)
2. Cobraheads may only be installed on wooden or other utilitarian poles on private property as part of the Aentry@ program.

### Overhead Wiring

1. New or upgraded streetlights should be fed through underground wiring.
2. Without express, written consent of the Director of Engineering, no new overhead wire should be added or replaced (in the event of non-emergency repair) in the downtown area. Exceptions will only be granted in cases where underground connection presents an extreme hardship and where a reasonable alternative which does not detract from the visual quality of the area, is proposed (e.g. running overhead wire service along an alley).
3. Installation of conduit or other equipment required to provide underground service should be done in accordance with the guidelines for "ROW Construction".

Any exceptions or variances from this policy must be approved in writing by the Director of Engineering prior to the beginning of work. Failure to secure prior approval of exceptions will result in corrections being required after the fact.



**CITY OF KNOXVILLE  
CENTRAL BUSINESS  
IMPROVEMENT DISTRICT  
(CBID)**



## TEMPORARY TRAFFIC CONTROL PERMIT

As part of any Right-of-Way permit, a Temporary Traffic Control Permit may be required. See COK *Technical Specifications for Construction Area Traffic Control* (TS-34).

- A copy of the Temporary Traffic Control Permit is attached.
- A traffic control plan must be submitted with the right-of-way permit and approved before the right-of-way permit will be issued.
- Traffic control plans for the following require a plan prepared and sealed by a professional engineer registered in the State of Tennessee:
  1. Any construction requiring a detour on any roadway.
  2. Please be aware that construction on a state route is issued by TDOT.
- Personnel trained in work zone traffic control procedures may prepare traffic control plans for all other situations.
- All traffic control procedures must meet the requirements in TS- 34.



**TEMPORARY TRAFFIC CONTROL PERMIT  
CITY OF KNOXVILLE  
Traffic Engineering**



**PHONE: (865) 215-6100 email: roadclosures@knoxvilletn.gov**

**SUBMITTED**

DATE: \_\_\_\_\_ TRAFFIC CONTROL PERMIT NUMBER: \_\_\_\_\_

SITE DEVELOPMENT PERMIT NUMBER: \_\_\_\_\_ RIGHT-OF-WAY PERMIT NUMBER: \_\_\_\_\_

DATE OF WORK: \_\_\_\_\_ THRU \_\_\_\_\_

TIME OF WORK: FROM \_\_\_\_\_ TO \_\_\_\_\_

STREET NAME LOCATION: \_\_\_\_\_

BETWEEN: \_\_\_\_\_ AND \_\_\_\_\_

APPLICANT NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_ CONTACT: \_\_\_\_\_

E-MAIL: \_\_\_\_\_

PROJECT DESCRIPTION: \_\_\_\_\_

DESCRIBE TYPE OF CLOSURE: STREET, SIDEWALK, LANE, OTHER

**NOTES:**

1. A DETAILED TRAFFIC CONTROL PLAN MUST BE PROVIDED TO SHOW THE PLAN FOR TRAFFIC CONTROL, INCLUDING DEVICES TO BE USED AND THE LOCATION OF THESE DEVICES. ANY ACTIVITY OR WORK MAY NOT BEGIN UNTIL THE ENGINEERING DIVISION HAS APPROVED THE PLAN. TRAFFIC CONTROL PLANS FOR THE FOLLOWING REQUIRE A PLAN PREPARED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TENNESSEE:
  - A. ANY ACTIVITY ON A STATE ROUTE REQUIRING MULTI-LANE CLOSURES
  - B. ANY ACTIVITY REQUIRING A DETOUR ON ANY ROADWAY.

TRAFFIC CONTROL PLANS FOR OTHER SITUATIONS MAY BE PREPARED BY PERSONNEL TRAINED IN WORK ZONE TRAFFIC CONTROL PROCEDURES.
2. PERMITTEES AND THEIR AGENTS OR EMPLOYEES MUST COMPLY WITH ALL ORDINANCES OF THE CITY OF KNOXVILLE AND WITH THE POLICY ON WORK ZONE TRAFFIC CONTROL. THE ENGINEERING DIVISION MAY DEMAND ADDITIONAL REQUIREMENTS.
3. A MINIMUM OF (2) TWO WORKING DAYS ARE REQUIRED FOR REVIEW AND PROCESSING OF PERMIT  
A MINIMUM OF (4) FOUR WORKING DAYS ARE REQUIRED FOR THE CENTRAL BUSINESS IMPROVEMENT DISTRICT (CBID) AND UT./ FT. SANDERS AREA
4. TOTAL ROAD CLOSURES ARE REVIEWED AND APPROVED BY THE KNOXVILLE POLICE DEPARTMENT PRIOR TO THE SPECIAL EVENTS, POLICY & REDEVELOPMENT, or ENGINEERING OFFICE REVIEW PROCESS
5. A COPY OF THIS PERMIT MUST BE AVAILABLE AT WORK SITE.

APPLICANT'S SIGNATURE: \_\_\_\_\_

SPECIAL EVENTS OFFICE APPROVAL: (IF APPLICABLE) \_\_\_\_\_ DATE: \_\_\_\_\_

POLICY AND REDEVELOPMENT APPROVAL: (IF APPLICABLE) \_\_\_\_\_ DATE: \_\_\_\_\_

POLICE DEPARTMENT APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

ENGINEERING SECTION APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_



## Policy 28

### UTILITY ACCESS DRIVEWAYS

This policy specifies the requirements for the submittal of plans for utility access driveways. The plans shall be submitted in accordance with this policy.

Plans submitted require both a plan view and a profile and sometimes a grading plan is needed as well.

The plan view must show:

1. Stationing,
2. Radii of centerline horizontal curves,
3. Points of curvature and tangency of the horizontal curves,
4. Horizontal curves that tie the driveway to the roadway,
5. Width of the pavement,
6. Width of the easement, and
7. The turnaround area for fire apparatus

The minimum width of pavement permitted is sixteen (16) feet. However, the portion of the driveway in the right-of-way must be twenty (20) feet.

Turning templates are needed to show that the fire truck can make the necessary movements. The design vehicle is a BUS-40 as it is similar to the fire truck in that it has a forty (40) foot length and a twenty-five (25) foot wheelbase. The turning templates should be applied on a separate plan view. Dead end driveways in excess of one-hundred fifty (150) feet in length shall be provided with an approved area for turning around fire apparatus. For layouts and dimensions of the turnaround area, Appendix D of the International Fire Code (IFC) may be used as a guideline.

The profile must show:

1. Stations,
2. Grades,
3. Vertical curves,
4. Points of vertical intersection of the grades, and
5. No grade shall exceed 15%

The typical cross section of pavement to be provided meets the driveway requirements of what the City of Knoxville uses for business driveways on capital projects.

The section is as follows:

1. A compacted subgrade with four (4) inches of base (mineral aggregate type "A", grade "D")
2. One and three-fourth (1-3/4) inches binder (bituminous hot mix grade B-M), and
3. One and one-fourth (1-1/4) inches topping (asphaltic concrete surfacing grade "D")

This cross-section provides seven (7) inches of material.

The need for a grading plan is decided on a case-by-case basis. The effects of stormwater runoff on the side slopes of the proposed access driveway may require curbs, culverts, catch basins or road side swales. Once again, the need for these items is decided on a case-by-case basis

If a utility wishes to collocate on an existing structure that does not have vehicular access, then access must be provided and will need to meet the conditions listed above.



## UTILITY CONSTRUCTION IN THE RIGHT-OF-WAY

References to materials are described in detail in the City of Knoxville's Standard Specifications.

### Excavation or tree cutting/trimming

- Repair such that it is left in equal or better condition than prior to the work.
- May require new trees, if trees are removed.
- May require deteriorated areas adjacent to the construction to be nominally improved during the repair of utility related cuts.

### Construction under roadway, curbs, gutters, sidewalks, or less than 3 feet from the outside edge of the roadway section

- Backfill with Mineral Aggregate Base as detailed on the "Standard Detail for Trench Cut Repairs".
- 57 or 67 stone shall not be used for trench backfilling.

### Construction occurring 3 feet from the outside edge of the roadway section

- Backfill with:
  - Fine, compactable, soil free of sod, brush, roots, and other perishable material and
  - Stones having a maximum dimension of more than six (6) inches.
  - Material compacted in layers six (6) inches or less to 95% of the Standard Proctor Density at the optimum moisture content as determined by AASHTO T99, Method D.
- Repair in equal or better condition than prior to the work, including matching existing materials such as rip rap, concrete ditch, etc.
- Furnish the Engineering Department with the Standard Proctor Compaction curve for soil used for trench backfill material.

### Utility cuts

- Must be repaired immediately after backfilling.
- Must be repaired in accordance with the "Standard Detail for Trench Cut Repairs".

### Concrete cuts

- Shall occur at contraction or expansion joints only.
- Where existing construction and expansion joints are encountered in concrete pavement cuts, the Engineering Department shall designate the location, size, and materials to construct joints in the new concrete surface.

### Asphalt and concrete cuts

- Saw-cut to provide a smooth edge.
- Do not jackhammer the edges of the cut.

#### Concrete sidewalk and street panels (Removing and replacing)

- The full concrete sidewalk and concrete street panels should be removed and replaced.
- Do not cut trenches or form new joints in the concrete sidewalk or concrete street.
- In extremely wide areas, the Engineering Department may approve creating limited new joints to accommodate replacing only part of the area.

#### Accessible ramps

- Meet the City of Knoxville’s Standard Detail, COK-13 “Standard Detail for Curb Cuts and Tactile Warning Systems”.

#### Subsurface

- Compact according to the Standard Specification for Mineral Aggregate Base, Section 5.0.

#### Concrete streets that previously overlaid with asphalt

- Repair with asphalt.
- Increase the depth of the asphalt replacing the concrete by 50% plus any overlay.
- Increase the total asphalt depth by 1.5 times the concrete thickness plus the asphalt overlay thickness.

#### Surface textures and colors

- Match the existing surface, as closely as possible.

#### Sidewalks in historical areas

- Replace with concrete meeting the requirements of Technical Specification 15.0, Concrete.
- The concrete mix design shall contain natural brown silica sand and no fly ash.

#### Brick and specialty paving

- Repair using identical materials, i.e., brick, paver, and mortar color and size.
- Reconstruct to match existing line and grade.

#### Painted surface markings

- Replace markings such as lane lines by carefully matching the existing markings.
- Thermoplastic markings such as crosswalks, turn arrows, and STOP lines shall be replaced by the Engineering Department at the utility’s expense.
- Upon completion of construction, the Engineering Department’s Traffic Section shall be notified at (865) 215-6100 to allow for the replacement of Thermoplastic markings damaged or removed by the utility company.

#### Utility installations resulting in obstructions in the ROW

- Provide a clear zone of 10 feet from the edge of pavement or face of concrete curb to the obstruction.
- Any encroachment upon the clear zone must be approved by the Engineering Department.
- Obstructions shall not be placed within an existing sidewalk without prior approval from the Engineering Department.