

Policy 26

City Of Knoxville  
Utility Maintenance  
&  
Construction

September 21, 2016



CITY OF KNOXVILLE

**Policy 26**  
**CITY OF KNOXVILLE**  
**UTILITY MAINTENANCE AND CONSTRUCTION**  
**September 21, 2016**

**Introduction**

In order to maintain the quality and durability of streets and sidewalks within public rights-of-way, promote an attractive environment for economic growth and to minimize any detrimental effect on storm water quality and facilities, the City of Knoxville provides the following policy for the non-emergency repair and improvement of utilities within the corporate limits of the City of Knoxville.

**Permit Requirements**

Utility construction performed within the City of Knoxville requires a site development permit and for construction in right-of-way, a right-of-way permit. The Site Development Permit is established by City of Knoxville Code, Chapter 22.5 - Stormwater. The Right-of-Way Permit is established by City of Knoxville Code, Chapter 23 - Streets and Sidewalks. Both Chapter 22.5 and 23 are included in Appendix I.

**Site Development Permit for Utilities**

Any utility construction resulting in a disturbed area within the corporate limits of the City of Knoxville requires a site development permit. Site development permits for utility construction can be obtained by contacting the City of Knoxville Engineering Division, 3131 Morris Ave at 215-6100. Upon permit approval, the utility company shall notify the Engineering Division at 215-6100 as to when the construction will begin. Site Development Permits for utility construction are classified into two categories, Site Development Utility Maintenance Permits and Site Development Utility Construction Permits.

**Site Development Permit for Utility Maintenance**

The City of Knoxville grants an annual Site Development Maintenance Permit to utility companies. This permit is for routine maintenance within the corporate limits of the City of Knoxville, i.e. service connections, emergency repairs, setting of poles, construction within areas already covered by permits of others (i.e. developers) or any maintenance/construction activities that result in a disturbed area of less than 20 square yards. Disturbed areas greater than 20 square yards shall be considered construction activities and permit fees will be assessed in accordance with Knoxville City Code Chapter 22.5, Section 22.5-29, Fees. The utility company shall notify the Civil Engineering Section before any construction activities begin.

## **Site Development Permit for Utility Maintenance – cont'd**

As a condition of the annual utility Site Development Maintenance Permit, the utility company will utilize best management practices (BMP's) for erosion and sediment control. These BMP's will comply with 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 (BMP) Manual, whichever is more restrictive.

The fee for this permit will be based upon the report of disturbed area information, i.e. date, location, size of area disturbed, which is tabulated by the utility and forwarded on a monthly basis to the City of Knoxville Engineering Division, 3131 Morris Ave. The Site Development Maintenance Permit fee will be billed annually to the utility company for the previous year. The actual cost will be based upon the total area disturbed and will be billed in accordance with the rate structure as found in the Knoxville City Code, Chapter 22.5, Section 22.5-29, Fees. The rate structure is as follows:

Disturbed Area: \$15.00 for 20 square yards or less plus \$0.50 per each additional square yard

The minimum charge for the issuance of any permit shall be fifteen dollars (\$15.00).

The Engineering Division shall determine permit fees for utilities currently subject to a court order or decree.

## **Site Development Permit for Utility Construction**

The City of Knoxville grants a Site Development Construction Permit on a per-project basis to utility companies. This permit is for any non-maintenance utility construction within the corporate limits of the City of Knoxville. Utility construction project plans, a permit and permit review checklist must be submitted to the City of Knoxville Engineering Division, 3131 Morris Ave at least 12 business days in advance of the work. The utility construction site development permit and permit review checklist are included in Appendix IV of this policy. Upon permit approval, the utility company shall notify the Engineering Division at 215-6100 as to when the construction will begin.

The utility company shall meet the requirements for the Site Development Permit as set forth in City of Knoxville Code, Chapter 22.5 – Stormwater. Specifically, the utility construction plans shall contain the items included in the Utility Construction Site Development Permit Review Checklist.

An erosion and sediment control plan must be submitted with the Utility Site Development Construction Permit and approved before the permit will be issued. Erosion and sediment control plans are to be prepared and sealed by a competent professional engineer registered in the State of Tennessee. The erosion and sediment control plan must comply with 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 (BMP) Manual, whichever is more restrictive.

## **Site Development Permit for Utility Construction - cont'd**

The City will invoice on a quarterly basis for fees associated with Utility Site Development Construction Permits. As set forth in the City of Knoxville Code, Chapter 22.5, Section 22.5-29, Fees, the Site Development Construction Permit fee is \$1.00 per linear foot of pipe as shown on the construction plans with a \$200 minimum fee per project.

The utility shall not pay any Site Development Permit fees for any work where the utility has obtained and paid fees for work as part of a Right-of-Way Permit. 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 Engineering Division shall determine permit fees for utilities currently subject to a court order or decree.

## **Right-of-Way Permit**

A Right-of-Way Permit is required for any project that requires grading, tree trimming, clearing, excavation or construction within public right-of-way. This permit can be obtained by contacting the Engineering Division, 3131 Morris Ave at 215-6100. Right-of-Way Permits for construction activity are classified into two categories, Maintenance Permits and Construction Permits.

## **Right-of-Way Maintenance Permit**

The City of Knoxville will grant utility companies an annual Right-of-Way Maintenance Permit. This permit is for routine maintenance within the city right-of-way, i.e. service connections, emergency repairs, setting of poles, construction within areas already covered by permits of others (i.e. developers) or any maintenance/construction activities that result in a disturbed area of less than 20 square yards. Disturbed areas greater than 20 square yards shall be considered construction activities and permit fees will be assessed in accordance with the Right-of-Way Construction Permit Section as found on page 5 of this policy. The utility company shall notify the Civil Engineering Section before any construction activities begin.

The fee for this permit will be based upon the report of cut information, i.e. date, location, size of cut, which is tabulated by the utility and forwarded on a monthly basis to the City of Knoxville Engineering Division, 3131 Morris Ave. Utility companies may submit for review bored line extensions outside the pavement edge that are less than 500 feet long and 2-inches or less in diameter as a maintenance permit. The cost assessed for a bored line extension is \$0.10 per linear foot or a minimum of \$15.00 per boring.

## **Right-of-Way Maintenance Permit - cont'd**

The Right-of-Way Maintenance Permit fee will be billed annually to the utility company for the previous year. The actual cost will be based upon the following rate structure.

<b>Classification</b>	<b>Maximum 20 Sq. Yds. Or less</b>
Pavement or sidewalk	\$15.00
Earth or gravel	\$5.00

The minimum charge for the issuance of any permit shall be five dollars (\$5.00).

As part of the maintenance permit, a temporary traffic control permit (TTCP) may be required for each location. See the "Policy on Work Zone Traffic Control" dated September 21, 2016 as found in Section 34.0, Standard Specification for Construction Area Traffic Control of Appendix II. 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 on a State route requiring multi-lane closures or a full road closure. A list of State routes within the corporate limits of the City of Knoxville is included in Appendix III.
2. Any construction requiring a detour on any roadway.

Personnel trained in work zone traffic control procedures may prepare traffic control plans for all other situations. A copy of the Temporary Traffic Control Permit is attached in Appendix III. All traffic control procedures must meet the requirements as set forth in Section 34.0, Standard Specifications for Construction Area Traffic Control, as found in Appendix II.

## **Right-of-Way Construction Permit**

The City of Knoxville will grant utility companies a permit for construction in the right-of-way for all new construction on a per-project basis. Each new construction project must be submitted to the City of Knoxville Engineering Division 3131 Morris Ave at least 12 business days in advance of the work. Upon permit approval, the utility shall notify the Civil Engineering Section at 215-6100 as to when the construction will begin. The City will invoice on a quarterly basis for fees associated with construction permits.

The cutting of a street to install utilities results in long-term damage sustained to the street throughout its life. It also results in problems associated with work zone traffic control and inconvenience to the public when maintenance is required throughout the life of the system located under the pavement. For these reasons, the Engineering Division will carefully review the necessity to locate utility facilities under the pavement.

## **Right-of-Way Construction Permit – cont’d.**

However, recognizing there will be cases where there will be construction on the right-of-way and/or under the pavement the following permit fee structure will apply:

1. \$1.00 per linear foot of pipe within the right-of-way as shown on the construction plans. This fee is \$0.10 per linear foot of bored pipe within the right-of-way, or a minimum of \$15.00 per boring.
2. \$10.00 per linear foot of pipe which is constructed under the pavement of the street and only surface destruction occurs. This \$10.00 fee is to cover the current cost of resurfacing a 12-foot wide section of roadway. Exceptions to this fee shall be as follows:
  - a. When the street is on the current city paving list the utility would pay nothing.
  - b. When the street has been resurfaced within five years or less, the utility would pay \$20.00 per linear foot, i.e. the current cost of paving two 12-foot wide sections of street.
  - c. 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.

As part of the construction permit, a Temporary Traffic Control Permit may be required. See the “Policy on Work Zone Traffic Control” dated September 21, 2016 as found in Section 34.0, Standard Specification for Construction Area Traffic Control of Appendix II. A traffic control plan must be submitted with the construction permit and approved before the 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 on a State route requiring multi-lane closures or a full road closure. A list of State routes within the corporate limits of the City of Knoxville is included in Appendix III.
2. Any construction requiring a detour on any roadway.

Personnel trained in work zone traffic control procedures may prepare traffic control plans for all other situations. A copy of the Temporary Traffic Control Permit is attached in Appendix III. All traffic control procedures must meet the requirements as set forth in Section 34.0, Standard Specifications for Construction Area Traffic Control, as found in Appendix II.

## **Right-of-Way Construction Notes**

Any utility work within right-of-way requiring excavation or tree cutting/trimming for utility maintenance or improvement should be repaired such that it is left in equal or better condition than prior to the work. The removal of trees will in some cases require the planting of new trees. The Engineering Division may require deteriorated areas adjacent to the construction be nominally improved during the repair of utility related cuts. The following are additional construction requirements:

1. Any construction which occurs under the roadway, curbs, gutters, sidewalks or less than three (3) feet from the outside edge of the roadway section shall be backfilled with Mineral Aggregate Base as detailed on the Standard Detail for Trench Cut Repairs, page 8. Stone classified as No. 57 or 67 by the Tennessee Department of Transportation Standard Specifications shall not be used for trench backfilling without prior approval by the Engineering Division.
2. Any construction which occurs three (3) feet from the outside edge of the roadway section, but within right-of-way shall be backfilled 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. Also, this material shall be compacted in layers of not more than six (6) inches to 95% of the Standard Proctor Density at the optimum moisture content as determined by AASHTO T99, Method D. These areas should be repaired such that they are left in equal or better condition than prior to the work. This includes matching existing materials such as rip rap, concrete ditch or etc. The utility company shall furnish the Engineering Division with the Standard Proctor Compaction curve for any soil used for trench backfill material.
3. All utility cuts must be repaired immediately after backfilling and in accordance with the Standard Detail for Trench Cut Repairs, page 8.
4. All references to materials are described in detail in the City of Knoxville's Standard Specifications, which are attached in the Appendix II.
5. All concrete cuts shall occur at contraction or expansion joints only. Where existing construction and expansion joints are encountered in concrete pavement cuts, the Engineering Division shall designate location, size and materials to construct joints in the new concrete surface.
6. All asphalt and concrete cuts shall be saw-cut to provide a smooth edge. Jackhammering the edges of the cut is not acceptable.
7. Remove and replace full concrete sidewalk and concrete street panels. Do not cut trenches or form new joints in the concrete sidewalk or concrete street. In the case of an extremely wide area the Engineering Division may approve creating limited new joints to accommodate replacing only part of the area.

## **Right-of-Way Construction Notes – cont'd.**

8. All accessible ramps must meet the City of Knoxville's Standard Detail, COK-13, Standard Detail for Curb Cuts and Tactile Warning Systems.
9. The subsurface shall be compacted according to the Standard Specification for Mineral Aggregate Base, Section 5.0.
10. Existing concrete streets that have been overlaid with asphalt shall be repaired with asphalt. The depth of the asphalt replacing the concrete shall be increased 50% (plus any overlay). Thus, the total asphalt depth shall be 1.5 times the concrete thickness plus the asphalt overlay thickness.
11. Surface textures and colors shall match, as close as possible, the existing surface.
12. Sidewalks in historical areas shall be replaced with concrete meeting the requirements of Technical Specification 15.0, Concrete, with the exceptions of the concrete mix design shall contain natural brown silica sand and no fly ash.
13. Brick, or other specialty paving, shall be repaired using identical materials (e.g., brick or paver color and size, mortar color), and reconstructed to match existing line and grade.
14. Replace painted surface markings such as lane lines, carefully matching the existing markings. Thermoplastic markings such as crosswalks, turn arrows, and STOP lines shall be replaced by the Engineering Division at the utility's expense. Upon completion of construction, the Engineering Division's Traffic Section shall be notified at 215-6100 to allow for the replacement of Thermoplastic markings destroyed by the utility company.
15. All utility installations resulting in obstructions in the right-of-way shall meet the clear zone requirement of the City of Knoxville. Currently the clear zone distance is 10 feet measured from the edge of pavement or face of concrete curb to the obstruction. Any encroachment upon this clear zone must be approved by the Engineering Division. However, in no case shall an obstruction be placed within an existing sidewalk without prior approval from the Engineering Division.



## **Street Lighting and Overhead Wiring**

### **Central Business District**

City planning groups have made long range projections of where it would be desirable for future development to take place in the Central Business Improvements District (CBID). The attached map provides the specific boundaries and these boundaries include the entire right-of-way of boundary streets. Planning between the City and utility companies should be developed to accommodate utility facilities. Utility drawings should include clear and concise instructions for underground installation.

Utility companies are required to use existing underground facilities or alleys in the CBID area thereby eliminating all overhead wiring to improve the aesthetics of the area.

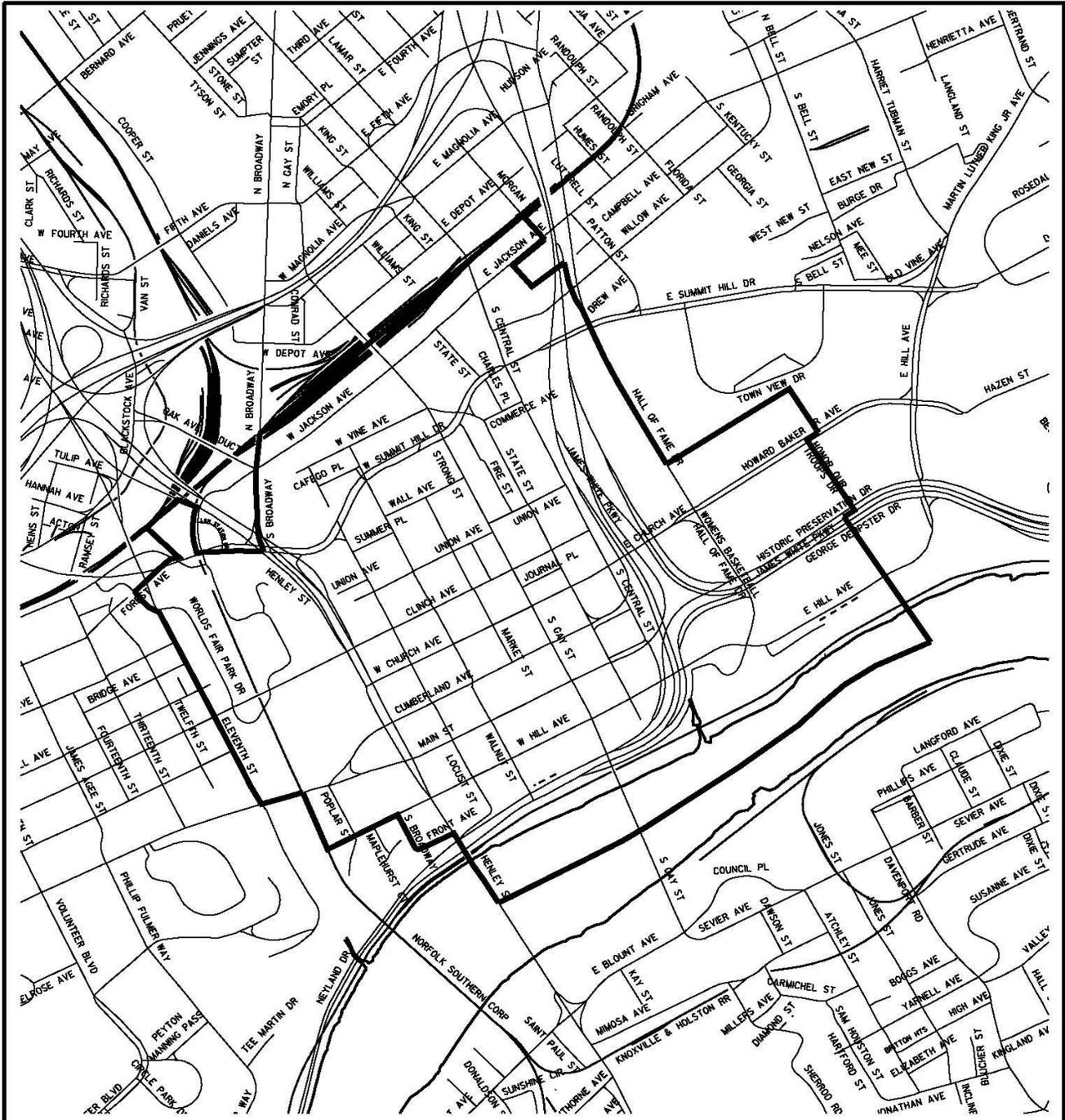
### **Street Lights**

1. **ALL** street light additions or replacements should be in accordance with the agreed upon *STREET LIGHT PLAN*; (e.g. do not add ANY new cobraheads, even if only **one** is being installed--that is one more to replace later).
2. Cobraheads on wooden or other utilitarian poles may be installed as part of the Asentry@ program on **private property**.

### **Overhead Wiring**

1. All new or upgraded street lights should be fed through underground wiring **ONLY**.
2. **NO** new overhead wire should be added (or replaced in the event of non-emergency repair) in the downtown area, except with the express, written consent of the Director of Engineering. The exception will be granted only 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 policies related to repair of utility cuts (see previous section).

**Any exceptions or variances from this policy must be approved in writing by the Director of Engineering prior to 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)**

**APPENDIX I**

**Knoxville City Code**

**Chapter 22.5 – Stormwater**

**Chapter 23 - Streets and Sidewalks**

## **Chapter 22.5 STORMWATER AND STREET ORDINANCE**

### **Chapter 22.5 - STORMWATER** (formerly known as Chapter 22A)

#### **ARTICLE I. In General**

Section 22.5-1.	Title of chapter.
Section 22.5-2.	Purpose.
Section 22.5-3.	Administration of chapter.
Section 22.5-4.	Definitions.
Section 22.5-5.	Performance and Indemnity Agreement.
Section 22.5-6.	Right of entry.
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Section 22.5-8.	Penalties.
Section 22.5-9.	Board of Environmental Appeals.
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Section 22.5-11.	Severability.
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#### **ARTICLE II. Site Development Criteria**

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Section 22.5-20.	Partial plat process.
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Section 22.5-23.	Stormwater detention.
Section 22.5-24.	Erosion and sediment control.
Section 22.5-25.	Objectives of erosion and sediment control.
Section 22.5-26.	Site development permit required before site development.
Section 22.5-27.	Site development permit requirements.
Section 22.5-28.	Emergency site development permit.
Section 22.5-29.	Fees.
Section 22.5-30.	Violation of a site development permit.
Section 22.5-31.	Design standard for detention and/or retention ponds.
Section 22.5-32.	Requirements for developments draining to a sinkhole.
Section 22.5-33.	Hydrologic and hydraulic computations.
Section 22.5-34.	Maintenance of 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 detention ponds.
Section 22.5-37.	Technical requirements for Special Pollution Abatement Permits.
Section 22.5-38.	Additional permits required.
Section 22.5-39.	NPDES permits.
Sections 22.5-40-49.	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.

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*This ordinance was initially issued in June 1997 (Ordinance O-224-97) with further revisions in December 1997 (Ordinance O-666-97), May 1998 (Ordinance O-247-98), May 2003 (Ordinance O-155-03), June 2003 (Ordinance O-264-03), August 2004 (Ordinance O-139-04), January 2005 (Ordinance O-16-05), and February 2005 (Ordinance O-45-05).*

**ARTICLE I. IN GENERAL**

**Section 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. (Ord. No. O-139-04, § 1, 8-17-04)

**Section 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:

- (a) Improve stormwater management;
- (b) Control the discharge of pollutants to the stormwater system;
- (c) Improve public safety;
- (d) To comply with the City of Knoxville’s NPDES Permit;
- (e) Establish procedures to accomplish the above purposes.

(Ord. No. O-139-04, § 1, 8-17-04)

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

The Engineering Director and the engineering staff under the Director's supervision shall administer the provisions of this chapter. (Ord. No. O-139-04, § 1, 8-17-04)

**Section 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 reasonable application.

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

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

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

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

**25-year frequency storm** - A storm event with a four (4) percent chance of being equaled or exceeded in any given year. Defined to be 5.5 inches in 24 hours or other such magnitude the Engineering 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 6.1 inches in 24 hours or other such magnitude the Engineering Director shall establish based upon scientific and engineering information.

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

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

**Administrative Plat** - A plat prepared and certified by a Registered Land Surveyor and approved or denied for recording by the Metropolitan Planning Commission (MPC) through staff administrative procedures. A plat shall be classified as an Administrative Plat when it meets one or more of the following criteria: 1) It divides one tract into no more than two lots; 2) It combines existing lots into no more than two lots; 3) It adjusts the common lot line(s) between two 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 Minimum Subdivision Regulations.

**Best Management Practices Manual (BMP Manual)** - A manual produced by the City of Knoxville 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 the Stormwater and Street Ordinance.

**Buffer Zone** - A naturally undisturbed, vegetated and pervious streamside zone that is protected from clearing, grading, filling, paving, building or other destruction of the naturally vegetated state.

**Condominium (Condo) Development** - A development of attached or detached units where the individual units take access from a private drive that is neither a Joint Permanent Easement nor City Right-of-Way.

**Covenants by Lessee for Maintenance of Stormwater Facilities on Leased Property** - A legal document executed by a Lessee and recorded with the Knox 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 Knox County Register of Deeds guaranteeing perpetual and proper maintenance of stormwater facilities.

**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** - As-built field-verified plans signed and sealed by a registered Professional Engineer and a Registered Land Surveyor, both licensed to practice in the State of Tennessee, showing contours, elevations, grades, locations, drainage and hydraulic structures, and detention basin volumes.

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

**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 control systems.

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

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

**Downstream** - Downgradient from the lowest point of each subwatershed in a development.

**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.

**Extended detention** - A practice to store stormwater runoff by collection as a temporary pool of water and provide for its gradual (attenuated) release over a minimum of twenty-four (24) hours and no more than seventy-two (72) hours and thereby control peak discharge rates and allow for gravity-driven settling of some types of pollutants. A practice which is used to control peak discharge rates, and which provides gravity settling of pollutants.

**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 (1/2) 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.

**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 practice designed 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 of Knoxville that provides additional information about the specifics of the Stormwater and Street Ordinance.

**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.

**Main stream** - A stream on which floods are controlled by the Tennessee Valley Authority reservoir system, i.e., the Tennessee and Holston Rivers.

**Major storm** - A 100-year design storm or a storm that has a probability of one (1) percent chance in any given year.

**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).

**Outfall** - The terminus of a stormwater system where the contents are released.

**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.

**Partial plat** - A survey plat prepared and certified by a Registered Land Surveyor for recording as an exhibit to a written legal document that describes and establishes property easements and access for stormwater facilities. Only that portion of the total property necessary to show new easements relative to the property boundaries and all other conflicting property rights or uses must be included.

**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 a storm.

**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.

**Redevelopment** - The improvement of 50% of the assessed value of the lot, building, or lot use.

**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.

**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 sanitary wastewater to a wastewater treatment plant.

**Sanitary wastewater** - Wastewater from toilets, sinks and other plumbing fixtures.

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

**Sinkhole** - (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 of Knoxville'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 above, the extent of the area considered to be a sinkhole is, at a minimum, the limits determined by the 100-year water surface elevation, assuming plugged conditions (0 cfs outflow).

**Site Development** - To physically alter a site. Site development includes, but is not limited to, 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.

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

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

**Swale** - A natural or manmade depression or wide shallow ditch used to route or filter runoff.

**Upstream** - Upgradient of the lowest point of each subwatershed of a development.

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

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

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

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

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

#### **Section 22.5-5. Performance and Indemnity Agreement.**

In order to ensure that any site development complies with the requirements of this chapter, the Engineering 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

Engineering 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.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-6. Right of entry.**

The Engineering Director or his designated representatives may enter upon any property which discharges or contributes, or is believed to discharge or contribute, to stormwater runoff or the stormwater system; stream; natural drainage way; or other stormwater system during all reasonable hours to monitor, remove foreign objects or blockages, and to inspect for compliance with the provisions of this chapter.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-7. Notice of Violation.**

Whenever the Engineering Director or his representative determines that a violation of any provision of this chapter has occurred, or that work does not have a required plan or permit, or that work does not comply with an approved plan or permit, the representative may issue a Notice of Violation to the property owner, utility, facility operator, Lessee, tenant, contractor, permittee, the equipment operator and/or any other person or entity doing work on the site.

The Notice of Violation shall:

- (a) Be in writing;
- (b) Include a description of the property sufficient for identification of where violation has occurred;
- (c) List the violation;
- (d) State the action required;
- (e) Provide a deadline for compliance or to stop work.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-8. Penalties.**

- (a) Any person violating the provisions of this chapter shall be guilty of a misdemeanor and punished as provided in the general provisions of the City Code. Each day that a continuing violation of this chapter is maintained or permitted to remain shall constitute a separate offense.
- (b) 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 day for each day of violation. Each day of violation shall constitute a separate violation. The city may also recover all damages proximately caused to the city by such violations.
- (c) In assessing a civil penalty, the city may consider:
  - (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; and
- (7) Any equities of the situation that outweigh the benefit of imposing any penalty or damage assessment.

(d) In addition to the civil penalty in subsection (b) above, the city may recover all damages proximately caused by the violator to the city, which may include any reasonable expenses and attorney's fees incurred in investigating, enforcing and/or correcting violations of this chapter.

(e) 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.

(f) 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.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-9. Board of Environmental Appeals.**

- (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 the Stormwater and Street Ordinance.
- (b) The BEA may issue subpoenas requiring attendance of witnesses and production of such evidence as requested, administer oaths, and take testimony as the BEA deems necessary to fulfill its purpose.
- (c) The BEA shall be composed of five 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 licensed Professional Engineer with three (3) years of engineering experience as a Professional Engineer;
    - (B) One architect, engineer, landscape architect or surveyor with three (3) years of experience;
    - (C) One representative of the development or industrial community;
    - (D) One neighborhood representative;
    - (E) One member at large.
  - (2) In addition to the above qualifications (A) through (E), one of the five 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 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 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 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.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-10. Appeals.**

Any person aggrieved by the imposition of a civil penalty or damage assessment as provided by this chapter may appeal said penalty or damage assessment to the Board of Environmental Appeals (BEA).

- (a) The appeal shall be in writing and filed with the Law Department within thirty (30) days after the damage assessment or civil penalty is served in any manner authorized by law.
- (b) 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. 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.
- (c) Any alleged violator may appeal a decision of the BEA pursuant to the provisions of title 27, chapter 8 of Tennessee Code Annotated.
- (d) If a petition for review of such damage assessment or civil penalty is not filed within thirty (30) days after the damage assessment or civil penalty is served in any manner authorized by law, the violator shall be deemed to have consented to the damage assessment or civil penalty, and it shall become final.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 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.

(Ord. No. O-139-04, § 1, 8-17-04)

**Sections 22.5-12--22.5-17. Reserved.**

## **ARTICLE II. SITE DEVELOPMENT CRITERIA**

### **Section 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, to minimize any detrimental effect on water quality by the completed facility, and to avoid such effects during construction.

(Ord. No. O-139-04, § 1, 8-17-04)

### **Section 22.5-19. Approval of plan required prior to issuance of a building permit.**

No building permit shall be issued until the required site development plan and stormwater facilities are approved by the Department of Engineering, and the portion of the property required for stormwater facilities is recorded as a permanent drainage, water quality and/or access easement, except that a Lessee shall be required to record a drainage, water quality and/or access easement running only through the term of its lease.

(Ord. No. O-139-04, § 1, 8-17-04)

### **Section 22.5-20. Partial Plat Process.**

- (a) In limited situations, the Partial Plat Process may be used to establish easements for stormwater facilities, such as detention and retention basins, water quality devices, access from a public road, storm drain pipes, and open drainage ditches, as an alternative to dedicating easements by recording a subdivision plat.
- (b) The Partial Plat Process allows (1) a property owner to create permanent easements, and (2) a Lessee to create easements running through the term of its lease, by recording a written legal document in which the easements are shown and defined on attached survey plat and written property description exhibits. All exhibits shall be prepared on letter or legal-sized paper, certified by a Registered Land Surveyor, and recorded with the Knox County Register of Deeds. At the discretion of the Law Director, the written document may be a form document provided by the Department of Law or may be a document prepared by the property owner's or Lessee's attorney and approved by the Department of Law. Survey plat and property description exhibits shall be approved by the Department of Engineering.
- (c) The Partial Plat Process is not an option in the following situations:
  - (1) When any portion of a pre-existing easement would be relocated or abandoned.
  - (2) If the Law Director or Engineering Director decides, in unforeseen or unusual circumstances, that this process shall not be an option.
- (d) The Partial Plat Process is an option for those sites with the following:
  - (1) An existing survey plat of the entire property recorded with the Knox County Register of Deeds.
  - (2) A site development plan approved by the Department of Engineering and showing the proposed easements.
  - (3) A legal document, "Covenants by Property Owner for the Permanent Maintenance of Stormwater Facilities" in the case of a property owner, or "Covenants by Lessee for the Maintenance of Stormwater Facilities on Leased

Property” in the case of a Lessee, approved by the Department of Engineering and recorded with the Knox County Register of Deeds.

- (4) A Special Pollution Abatement Permit (SPAP) approved by the Department of Engineering, if one was required.

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

**Section 22.5-21. General design criteria.**

- (a) The Engineering Director or his representative has the authority to adopt site development design criteria.
- (b) The standard method of drainage computation shall be as set forth in Article II, Hydrologic and hydraulic computations.
- (c) The stormwater system, excluding stormwater detention ponds, water quality control facilities and sinkholes, shall be designed to accommodate a 10-year return frequency 24-hour duration storm, except for those facilities which would flood public roads classified as locals, collectors or arterials. A 25-year storm runoff prevention plan shall be used to prevent flooding of local roads and collectors, and a 50-year storm runoff prevention plan shall be used to prevent flooding of arterial streets. A 100-year design storm shall be used to prevent flooding of all new structures and have no additional adverse impact on existing structures. For site development on blue-line streams included in the Flood Insurance Study, the Flood Damage Protection Ordinance O-347-90 (Chapter 12 of the City Code) shall govern. All stormwater systems shall be designed to have no additional adverse impact on upstream and adjacent property in the 50-year storm, unless an adequate permanent drainage easement is obtained.
- (d) For drainage generated by areas greater than 200 acres, the flow for a 100-year storm shall be computed. Such flow may exceed the capacity of facilities designed to comply with the requirements of lesser floods as noted in paragraph (c) above, and shall be contained in the public right-of-way or a permanent drainage easement on the property being improved or developed. Pipes and culverts designed for a 100-year storm shall be constructed of reinforced concrete if such pipes or culverts lie in public lands or easements.
- (e) Material for pipes used for conveyance of stormwater within the City of Knoxville shall be in accordance with the following:
  - (1) Cross drains and any other pipe under the pavement surfaces shall be reinforced concrete pipe (RCP). Storm drains within the roadway prism, but not under the pavement, shall also be RCP.
  - (2) Any pipe, culvert, or drainage system dedicated to the City of Knoxville, whether inside or outside the right-of-way, shall be constructed of RCP.
  - (3) RCP is required if the failure of the pipe would cause flooding or potential property damage on adjacent properties. RCP is required for all storm pipes and culverts that carry through water from adjacent properties (“off-site water”).
  - (4) RCP is required for all detention basin outlet structures.
  - (5) Material for driveway pipes may be RCP, corrugated metal pipe (CMP), or double-wall high-density-polyethylene pipe (HDPE) as desired by the responsible agency, corporation or individual. RCP is required underneath any

driveways or entrances that are heavily traveled or which would have the potential to flood areas within the public right-of-way or any structure.

- (6) Double-walled HDPE pipe and CMP may be used to convey stormwater generated on the particular property (“on-site drainage”), such as parking lots, buildings, etc. Both pipe materials (HDPE and CMP) may be used to convey water under driveways in locations, where a pipe is outside of the roadway prism, has adequate cover, and would not cause flooding of adjacent properties or rights-of-way in the event of pipe failure. Installation of all pipe must be done with adequate pipe bedding, backfill material, and coupling bands as recommended by the pipe manufacturer.
- (f) To comply with Federal mandates, protect stream water quality, and to reduce flood insurance rates for the City of Knoxville residents, development or significant redevelopment of land adjacent to or containing a blue-line stream shall include the following permanent protection measures.
- (1) Construction fill that alters the conveyance and/or storage capacity of the regulated floodplain is prohibited in the flood fringe in an area bounded by the floodway line and a line defined as one-half the linear distance between the floodway line and the 100-year floodplain line. This requirement may be waived if a development occurs on a lake/river where regulated by Tennessee Valley Authority and 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 0.1 feet on existing properties within 0.5 miles (upstream or downstream) of the proposed development using a method widely accepted among engineering professionals.
  - (2) All blue-line stream banks shall be left in a stabilized condition upon completion of the project. No actively eroding bare or unstable vertical stream banks shall remain unless TDEC has determined there is no better alternative. Placement of riprap and other hard armor is only allowed when bioengineering alternatives are not technologically feasible.
  - (3) A naturally vegetated and pervious streamside buffer zone shall be created, maintained, and protected from clearing, grading, filling, paving, building, or other destruction of the naturally vegetated state. Acceptable uses of this buffer zone may include but are not limited to: yards, picnic areas, walking trails, greenways, landscaped areas, wildlife habitat, primitive areas, roadway and sidewalk stream crossings as close to perpendicular to the stream centerline as practicable (bridge abutments, driveway/road culverts, etc.), or other similar uses approved by the Engineering Director. Specifically prohibited uses include but are not limited to: parking lots, dumpster storage, grease-bin storage, vehicle storage/maintenance, concentrated animal lots or kennels, or other uses known to contribute pollutants to waterways. The buffer zone will extend the length of the blue-line stream. The width of the buffer zone will be determined by the following criteria:
    - (A) Blue-line streams where a floodway profile has been computed, as part of the Flood Insurance Study, shall require a natural buffer measured fifty (50) feet from the center of the low flow channel or the width of the floodway, whichever is greater.

- (B) Blue-line streams where a floodway profile has not been computed, as part of the Flood Insurance Study but are named on the USGS 7.5 minute quadrangle map, shall require a natural buffer zone measured thirty-five (35) feet from the center of the low flow channel.
  - (C) Blue-line streams and tributaries where a floodway profile has not been computed, as part of the Flood Insurance Study and are not named on the USGS 7.5 minute quadrangle map, shall require a natural buffer zone measured fifteen (15) feet from the center of the low flow channel.
  - (D) Blue-line streams that have been determined not to be Waters-of-the-State by the criteria adopted by the Tennessee Department of Environment and Conservation are excluded from this provision.
  - (E) The Engineering Director may approve mitigation for buffer zones to achieve a higher standard of water quality.
  - (F) Blue-line streams that are in culverts at the date of adoption of this ordinance do not require a buffer zone.
- (g) When existing or documented flooding problems are present, the Engineering 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 other properties or on the subject development.

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

**Section 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 (BMP) Manual. The policy, criteria, and requirements of the Land Development Manual dated February 2002, and the Best Management Practices Manual dated March 2001, as amended by the City of Knoxville's Department of Engineering, shall be enforceable consistent with other provisions of this chapter.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-23. Stormwater detention.**

- (a) The requirement for stormwater detention ponds shall apply to the following:
  - (1) All road construction exceeding one-half (1/2) acre of impervious area;
  - (2) All commercial, industrial, educational, institutional and recreational developments of one (1) acre or more of disturbed area;
  - (3) Large single-family or duplex residential developments of five (5) acres or more of disturbed area or five (5) lots or more;
  - (4) Any site development which contains one-half (1/2) acre or more of additional impervious area.
  - (5) Any redevelopment that meets any of the four criteria above.

- (b) For areas of redevelopment, if the downstream system (to the second existing road crossing or blue-line stream) is examined and found to be adequate to carry the 2 and 10-year 24-hour storms, the requirement for detention for areas of redevelopment may be waived. However, if the examination finds inadequate conveyance for the 2 and 10-year 24-hour storms, the Engineering 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 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 redevelopment, detention or retention is required for the entire developed site, not just the portion of the site being redeveloped. This does not exempt the developer from providing the first flush and/or water quality requirements.
- (c) If in the developer's judgment, stormwater detention is either unwarranted or impractical, hydrologic and hydraulic computations to support such a conclusion and demonstrate that stormwater runoff shall not be increased in peak rate for storm events identified in the design standards for detention ponds in this chapter shall be furnished to the Department of Engineering for review. This does not exempt the developer from providing the first flush and/or water quality requirements.
- (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. This does not exempt the developer from providing the first flush and/or water quality requirements.
- (e) When existing or documented flooding problems are present, the Engineering 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 other properties or on the subject development.
- (f) Detention basins located in subdivisions must be located on two or more buildable lots or in a common area with a legally established property owners' organization with responsibility for maintenance and repair of the detention basin.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-24. Erosion and sediment control.**

To comply with state, federal, and local regulations, erosion and sediment control shall be regulated by this article because of the following water quality impacts:

- (a) Stormwater runoff can carry pollutants into receiving water bodies, thereby degrading water quality;
- (b) The increase in nutrients in stormwater runoff such as phosphorus and nitrogen accelerates eutrophication of receiving waters;
- (c) Construction requiring land clearing and the alteration of natural topography tend to increase erosion;

(d) Siltation of water bodies resulting from increased erosion decreases their capacity to hold and transport water, interferes with navigation, and harms flora and fauna;

(e) Substantial economic losses can result from these adverse impacts on community waters.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-25. Objectives of erosion and sediment control.**

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:

(a) Control erosion and sedimentation to limit deposition in streams and other water bodies;

(b) Facilitate the removal of pollutants in stormwater runoff to perpetuate the natural biological functions of streams.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-26. Site development permit required before site development.**

No person shall:

(a) 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 site development activities without first obtaining a site development permit from the Department of Engineering.

(b) 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, or natural or existing drainage of any area without obtaining a site development permit from the Department of Engineering.

(c) Commence site development and/or construction of any building or structure without obtaining a site development permit from the Department of Engineering.

(d) Clear any site by means that causes disturbance of soil without first obtaining a site development permit from the Department of Engineering.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-27. Site development permit requirements.**

(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) 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 the revocation of the surety bond, cashier's check, or letter of credit and implementation of all available legal remedies. 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;
  - (3) Information that complies with the requirements of the Tree Protection Ordinance and the City Arborist.
- (c) Additional information is required for site development plans based on the type of development.
- (1) Small Single Family Residential Development - requires a topographic map showing the proposed area of land disturbance, the layout of the structure(s), identification of all areas of depression, blue-line streams, easements, and stormwater system, and other information as required by the Engineering Director.
  - (2) Large Residential and Commercial Development - requires plans showing existing and proposed 2-foot contours as they relate to the roadway, parking lot, drainage facilities, cut and fill slopes, all stormwater pipe size, material and location, identification of all areas of depression, blue-line streams, easements, erosion and sediment control measures, detention pond data including size, location, slope of bottom, outlet, invert, top elevations, spillway size and elevation, and the detention easement and an adequately sized traversable access easement. Also, catch basin location, elevation, slope, swales, ditches, and their stabilization treatment. Building pad contours and building pad elevations are also required when existing elevations are altered by more than 4 feet. When this site development plan includes a street to be dedicated to the city, a complete set of roadway plans must be submitted including profiles, grades, and cross sections showing cross slope, limits of construction, clear zone, utility strip, greenway/pedestrian space, signage plan, and a street-lighting fixture type and any aboveground fixed objects on the right-of-way. All Large Residential and Commercial Development plans that are submitted to the Department of Engineering must meet the following minimum standards:
    - (A) Stamp and signature from appropriate design professional;
    - (B) Legible (for microfilming and reproducing);
    - (C) Constructible plans;
    - (D) All required hydraulic and hydrologic calculations with reasonable assumptions (including downstream calculations with descriptive numbers, time of concentration, pre- and post-development delineated watersheds, and the City of Knoxville's detention pond design sheet completed);
    - (E) Pre- and post-developed contours;
    - (F) Erosion and sediment control plan;
    - (G) Required retaining wall calculations;
    - (H) Owner's, and if applicable Lessee's, name, address, and phone number;
    - (I) Vicinity map;
    - (J) City block number;
    - (K) CLT number (including map, insert, group and parcel);
    - (L) Certified address from the Metropolitan Planning Commission.

Plans that do not meet these minimum standards will be rejected, and will not be reviewed further until submission standards are met.

- (3) Utilities Development -
- (A) Except as provided below in subsection (B), requires plans showing the following: the names and addresses of all property owners; the name, address and contact person of the utility; the name, address and contact person of the engineering firm; a vicinity map; a graphical scale; the stamp and signature of a registered Professional Engineer licensed to practice in the State of Tennessee; total project length in feet; all property lines; existing easements; existing and proposed contours; all water features; all topographic features such as sinkholes; appropriate delineations such as no fill, buffer, floodway and F-1 zone; appropriate construction details and an effective erosion and sediment control plan with details adequate for installation and inspection that complies with the TDEC “Erosion and Sediment Control Handbook”, Second Edition dated March 2002, and all subsequent updates thereto, or the City of Knoxville’s Best Management Practices (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.
- (d) Plans shall be prepared and stamped by an engineer, landscape architect, or architect competent in civil and site design and licensed to practice in the state of Tennessee with the following conditions:
- (1) Portions of the Site Development Plan that require hydraulic or hydrology calculations and design must be prepared and stamped by a Professional Engineer competent in civil and site design and licensed to practice in the state of Tennessee.
  - (2) All roads and Joint Permanent Easements that are required to be designed and built to Public Road Standards shall be designed and stamped by a Professional Engineer competent in civil and site design and licensed to practice in the state of Tennessee.
- (e) Prior to the release of a bond, a Development Certification must be completed showing that all roadway lines, grades, cross slopes, locations, contours, elevations, drainage structures or facilities, and detention basin volumes, size, slopes, locations, elevations, and hydraulic structures have been field verified, represent the as-built field conditions, and comply with the approved plans. This certification must be stamped by the appropriate design professional required to stamp the original Site Development Permit as stated in Section 22.5-28(d) as well as a Registered Land Surveyor licensed to practice in the State of Tennessee.
- (f) When the Department of Engineering has determined the site development plan is approvable, it will send a letter authorizing the installation of the erosion and sediment control measures. When the erosion and sediment control plan has been implemented on site, the appropriate design professional required to stamp the erosion and sediment control portion of the site development permit will provide a letter to the Department of Engineering stating that he has inspected the site and the erosion control has been implemented as shown on the approved erosion and sediment control plan. This letter

must be signed and sealed by the appropriate design professional. Once this letter is received by the Department of Engineering, the site development permit can be issued.

- (g) The City Arborist and the Zoning Inspector must approve all plans prior to the issuance of a site development permit. The Metropolitan Planning Commission must approve all plans in a planned zone and overlays prior to the issuance of a site development permit.
- (h) A Registered Land Surveyor licensed to practice in the state of Tennessee shall prepare and submit a plat for all plans that propose stormwater facilities. The plat shall locate, establish, and define an easement around each facility and traversable access to it. The plat must be approved and recorded with the Knox County Register of Deeds before a building permit can be issued.
- (i) When existing or documented flooding problems are present, the Engineering 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 other properties or on the subject development.
- (j) An erosion and sediment control plan must be provided as follows:
  - (1) Small Single Family Residential Development requires no erosion 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 10,000 square feet or except as deemed necessary by the Engineering Director. When a plan is deemed necessary, the erosion and sediment control must comply with the TDEC Erosion and Sediment Control Handbook Second Edition, dated March 2002 and all subsequent updates, or the City of Knoxville's Best Management Practices (BMP) Manual, current as of the date of the submission of the plans, whichever is more restrictive.
  - (2) Large Residential and Commercial Development requires an erosion and sediment control plan that is stamped by a competent 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, Second Edition, dated March 2002 and all subsequent updates, or the City of Knoxville's Best Management Practices (BMP) Manual, current as of the date of the submission of the plans, whichever is more restrictive.
  - (3) Portions of the erosion and sediment control plan that require hydrology or hydraulic calculations and design shall be prepared and stamped by a competent licensed Professional Engineer registered in the State of Tennessee.
- (k) 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 city rights-of-way and 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 city rights-of-way and other property, when sites drain into sinkholes, when the site is used for a borrow pit, a detention pond is required, or there is construction of a joint

permanent easement 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 \$50,000.

- (3) A Performance and Indemnity Agreement is required for Commercial Development when there is a potential for runoff to adversely impact city rights-of-way and other property, when sites drain into sinkholes, when the site is used for a borrow pit, a detention pond is required, or there is construction of a joint permanent easement or public road. The amount is based on the project cost estimate that includes roadway facilities, drainage facilities, and erosion 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 \$10,000.
- (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 Engineering Director based on site conditions and the adverse impact on downstream conditions or other properties.
- (5) The Engineering Director may refuse brokers or financial institutions the right to provide a surety bond, letter of credit, etc. based on past performance, ratings of the financial institution, or other appropriate sources of reference information.

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05; Ord. No. O-45-05, § 1, 2-15-05)

### **Section 22.5-28. Temporary emergency exemption.**

In extreme circumstances when a delay in construction may cause significant property damage or loss of life, the Engineering 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, a failure of a storm system where the flooding could cause property damage or loss of life, etc. 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 Engineering 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 ordinance.

(Ord. No. O-139-04, § 1, 8-17-04)

### **Section 22.5-29. Fees.**

- (a) The following fees shall be charged for reviewing site development plans and will be required upon the submittal of the plans.
  - (1) Site Development Plans for an Administrative Plat:

(A) Small Single Family Residential	\$0.00
(B) Less Than one (1) acre:	\$150.00
(C) One (1) acre to five (5) acres:	\$150.00 + \$20/acre (acres 1-5)
(D) More than five acres:	\$250.00 + \$10/ acre (acres 6+)

- (E) Condominium/Apartment Developments: \$150.00 + \$5/ unit
- (2) Subdivisions:
  - (A) One (1) to fifty (50) lots: \$150.00 + \$12/ lot (lots 1-50)
  - (B) Fifty-One (51) lots or more: \$750.00 + \$8/ lot (lots 51+)
- (b) The following fees shall be charged for site development permits and will be required before the issuance of the permit.
  - (1) Site Development Plans for an Administrative Plat without a bond:
    - (A) Small Single Family Residential \$10.00
    - (B) All other projects: \$50.00
  - (2) Site Development Plans for an Administrative Plat with a bond:
    - (A) Projects of less than (1) acre: \$350.00
    - (B) Projects of one (1) acre or more: \$350.00 + \$15/ acre
    - (C) Condominium/Apartment Developments: \$350.00 + \$5/ unit
  - (3) Subdivisions:
    - (A) One (1) to four (4) lots: \$150.00 + \$10/ lot (lots 1-4)
    - (B) Five (5) to fifty (50) lots: \$350.00 + \$20/ lot (lots 1-50)
    - (C) Fifty-One (51) lots or more: \$1350.00 + \$5/ lot (lots 51+)
  - (4) 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: \$15.00 per 20 square yards plus \$0.50 per each additional square yard.
    - (B) Construction: \$1.00 per linear foot of conduit (pipe, cable, wire, fiber optics, etc.) with a \$200.00 minimum.
- (c) The fee for a site development permit issued after site development has begun without a permit shall be ten times the standard fee.
- (d) A Site Development Permit is valid for one 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 an individual permit for grading, erosion control, or drainage is requested, the appropriate permitting and review fee will be charged for each permit.
- (f) The cost of each special pollution abatement permit shall be one hundred dollars (\$100.00), which will cover the entire period of the permit.
- (g) The following fees shall be charged for reviewing final plats and will be required before approval of plat:
  - (1) Administrative Plat \$80.00
  - (2) Exempt Subdivision and Corrected Plats \$70.00
  - (3) All Other Plats:
    - (A) One (1) to fifty (50) lots \$100 + \$10/ lot
    - (B) Fifty-One (51) or more lots \$600 + \$6/ lot (lots 51+)
  - (4) Partial Plat \$150.00

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

**Section 22.5-30. Violation of a site development permit.**

No person shall perform site development work that does not conform to an approved site development plan. (Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-31. Design standards for detention and/or retention ponds.**

- (a) The calculated peak flow rate of stormwater runoff resulting from a 1-year, 2-year, 5-year, 10-year, 25-year and 100-year return frequency 24-hour duration storm shall be no greater after site development of the site than that which would result from a 1-year, 2-year, 5-year, 10-year, 25-year and 100-year return frequency 24-hour duration 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 facility. This includes, but is not limited to, a minimum of 2% slope in the bottom of all detention ponds, a minimum of 3:1 (H:V) side slopes or with traversable access to the pond's vegetated bottom and side slopes for maintenance, proposed contours should reflect 15% additional area for each two (2) foot contour of the detention or retention pond based on the appropriately sized pond for the 1, 2, 5, 10, 25 and 100-year storms, a minimum of 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 15% additional volume is added. An exception can be made to the minimum slope requirement in the bottom of the pond if the first flush requirement is not managed in the quantity detention pond and the pond invert is finished in concrete.
- (c) The plans shall include sufficient design information to show that the facility will operate as required. This shall include the existing (or before site development) peak flow discharges, the after site development peak flow discharges, and/or volumes of stormwater runoff based on the proposed site development, as well as all necessary computations used to determine the reduced peak flow rates for the design storms. The capacity of the facility shall be sufficient to control the volume of stormwater runoff resulting from 1-year, 2-year, 5-year, 10-year, 25-year and 100-year frequency 24-hour duration storms within the peak rate of flow requirements stated in the subsection.
- (d) Discharge from the stormwater detention pond 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 10-year frequency storm shall be provided. If the receiving stormwater facility is incapable of conveying a 10-year frequency storm, calculations showing the capacity of the receiving stormwater facility and its capability to convey a 2-year frequency storm shall also be provided. The above calculations will be routed to the closer of the second existing street crossing or blue-line stream. The Engineering 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.

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

**Section 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 Engineering 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 redevelopment projects requiring attenuation or retention of the 1-year, 2-year, 5-year, 10-year, 25-year and 100-year frequency 24-hour duration storms with sinkholes entirely on site, calculations shall be provided showing that 100-year 24-hour design storm will not flood any structures assuming plugged conditions (0 cfs outflow) for the sinkhole. These calculations must include the entire contributing watershed for the sinkhole. An easement is required around the sinkhole to include an area that is a minimum of five (5) feet horizontally outside the highest closed contour.
- (c) For site development or redevelopment projects requiring attenuation or retention of the 1-year, 2-year, 5-year, 10-year, 25-year and 100-year frequency 24-hour duration storms with sinkholes partially on site, calculations must be provided showing that there will not be a rise in water surface elevations between the 100-year predeveloped and the 100-year postdeveloped 24-hour design storm assuming plugged conditions (0 cfs outflow) for the sinkhole. An easement is required at a minimum of five (5) feet horizontally outside the highest closed contour on the section of the sinkhole located on the developed property. A rise in the 100-year water surface elevation is allowable when no structures will be flooded and all parties with ownership of the sinkhole agree in writing to allow the rise. In this case, an easement is required around the sinkhole to include an area that is a minimum of five (5) feet horizontally outside the highest closed contour.
- (d) 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) Sinking Creek
  - (3) Emily Ave. and Timothy Ave. area
  - (4) Harrell Hills watershed (near Cranberry Dr, Clairmont Dr, and Gaines Rd)
  - (5) Prosser Road #1 (immediately between north of the railroad crossing and Cherry Street)
  - (6) Prosser Road #2 (approximately halfway between Knoxville Zoo Dr and Magnolia Ave)
  - (7) Pamela Lane
  - (8) All areas draining to a sinkhole
  - (9) Any area of known flooding where deemed necessary by the Engineering Director.

The retention pond shall be designed so that the overflow in the 1-year, 2-year, 5-year, 10-year, 25-year and 100-year design storms must meet the predeveloped discharges in addition to retaining the difference in the predeveloped and postdeveloped 100-year design storm. In basins or sub-basins where there is a documented historical draw down time for the sinkhole or region being drained to, it may be acceptable for a detention pond to be used instead of retention. For detention to be approvable, the draw down time of the detention pond must be a minimum of one and a half times the draw down time for the region.

- (e) When existing or documented flooding problems are present, the Engineering 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 other properties or on the subject development.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 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 engineer proficient in the field of hydrology and hydraulics and licensed to practice engineering in the State of Tennessee.
- (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, or other criteria that the Engineering Director shall establish based on scientific and engineering information. All post-developed conditions must be routed at appropriately small time intervals through the detention pond using either hand calculations or computer models that are widely accepted among engineering professionals. The BMP Manual contains accepted methods and procedures. Other methods may be approved by the Engineering Director in the design of curb inlets and small pipe systems when the final result is verified by a SCS method.

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

**Section 22.5-34. Maintenance of stormwater facilities.**

- (a) Property owners and Lessees are responsible for maintaining stormwater and/or water quality facilities located on their property. 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 Knox 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 Knox County Register of Deeds.
- (b) The Covenants shall specify minimum maintenance requirements to be performed at necessary intervals by the property owner or Lessee, as the case may be.
- (c) In order to provide access to stormwater and/or water quality facilities by personnel, vehicles and equipment, the property owner or Lessee, as the case may be, will provide a traversable 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.
- (d) The Covenants shall grant the City permission to enter the property to inspect any stormwater facility for proper functioning and maintenance. If the facility is not being maintained as required, the City will notify the property owner or Lessee, as the case may be, in writing. If property owner or Lessee, as the case may be, fails to repair or maintain the facility within the allotted time, the Engineering Director may authorize the work to be performed by the City or others. In such cases, the property owner or Lessee, as the



best management practices are used to control water quality for these uses. Before the approval of structural stormwater treatment devices, the Engineering 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 Special Pollution Abatement Permit will be valid for a period of five (5) years, at which point it must be renewed. At the time of renewal, any deficiency in the management method must be corrected. Any development that occurs without a required permit shall be a violation of this chapter of the code.

- (b) A Special Pollution Abatement Permit shall be required for the following land uses:
- (1) Vehicle, truck or equipment maintenance, fueling, washing or storage areas including but not limited to: automotive dealerships, automotive repair shops, and car wash facilities;
  - (2) Any property containing more than 400 parking spaces, or 120,000 square feet of impervious parking area;
  - (3) Recycling and/or salvage yard facilities;
  - (4) Restaurants, grocery stores, and other food service facilities;
  - (5) Commercial facilities with outside animal housing areas including animal shelters, fish hatcheries, kennels, livestock stables, veterinary clinics, or zoos;
  - (6) Other producers of pollutants identified by the Engineering Director by information provided to or collected by him or his representatives, or reasonably deduced or estimated by him or his representatives from engineering or scientific study.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-38. Additional permits required.**

- (a) Where a National Pollutant Discharge Elimination System (NPDES) permit has been issued for NPDES regulated stormwater discharges from a facility, no local permit will be required for those NPDES regulated stormwater discharges from the facility for which such permit has been issued and remains in effect. For site development, both a TDEC construction site NPDES permit and a City of Knoxville Site Development Permit are required.
- (b) Additional permits may be required from various state and federal agencies before a site development permit will be issued by the City of Knoxville.

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-39. NPDES permits.**

- (c) Any person who holds an individual National Pollutant Discharge Elimination System (NPDES) permit shall provide a copy of such permit to the Engineering 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.
- (d) Any person who holds an NPDES general permit and/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 the Tennessee Department of Environment and Conservation to the Engineering Director no later than sixty (60) calendar days after issuance of the permit.

(e) (Ord. No. O-139-04, § 1, 8-17-04)

**Sections 22.5-40--22.5-49. Reserved.**

### **ARTICLE III. ILLICIT CONNECTIONS AND ILLEGAL DUMPING**

#### **Section 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.

- (a) 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 has promulgated regulations implementing the NPDES program.
- (b) The NPDES regulations for stormwater discharges require certain municipalities, including the City of Knoxville, to:
  - (1) 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;
  - (2) Prohibit through ordinance, order or similar means, illicit discharges to the stormwater system;
  - (3) Control through ordinance, order or similar means, discharges to the stormwater system of spills, dumping or disposal of materials other than stormwater;
  - (4) Require compliance with conditions in ordinances, permits, contracts or orders; and
  - (5) 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.

(Ord. No. O-139-04, § 1, 8-17-04)

#### **Section 22.5-51. Objectives.**

This chapter is adopted as part of the city 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. (Ord. No. O-139-04, § 1, 8-17-04)

#### **Section 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 services facilities;
  - (C) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
  - (D) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc;
  - (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, and outdoor eating or drinking areas, etc.;
  - (F) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;
  - (G) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;
  - (H) Discharges of sediment, or construction-related wastes, etc.;
  - (I) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).
- (b) Subject to the provisions of subsection (c), the following discharges shall not be in violation of this chapter:
- (1) Water line flushing;
  - (2) Landscape irrigation;
  - (3) Diverted stream flows or rising groundwater;
  - (4) Infiltration of uncontaminated groundwater [as defined at 40CFR35.2005(20)] to separate storm drains;
  - (5) Pumping of uncontaminated groundwater;
  - (6) Discharges from potable water sources, foundation drains, uncontaminated air conditioning condensation, irrigation waters, springs, water from crawl space pumps, or footing drains;
  - (7) Lawn watering;
  - (8) Individual noncommercial car washing on residential properties; or car washing of less than two (2) consecutive days in duration for a charity, nonprofit fund raising, or similar noncommercial purpose;
  - (9) Flows from riparian habitats and wetlands;
  - (10) Dechlorinated swimming pool discharges;
  - (11) Incidental street wash water from street cleaning equipment designed for cleaning paved surfaces and limiting waste discharges;
  - (12) Street deicing for public safety;
  - (13) Any activity authorized by a valid NPDES permit; and
  - (14) Any flows resulting from firefighting.

- (c) If the Engineering Director finds that any activity, including but not limited to any of the activities listed in subsection (b) above, are found to cause or may cause sewage, industrial wastes or other wastes to be discharged into the stormwater system, the Engineering Director shall so notify the person performing such activities, and shall order that such activities be stopped or conducted in such a manner as to avoid the discharge of sewage, industrial wastes or other wastes into the stormwater system. The Engineering Director may require a stormwater pollution prevention plan to insure that the activity can be conducted without causing further discharge of pollution to the stormwater system.

(Ord. No. O-139-04, § 1, 8-17-04; Ord. No. O-16-05, § 1, 1-18-05)

**Section 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 this chapter, such person shall immediately notify the Engineering Director by telephone 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

(Ord. No. O-139-04, § 1, 8-17-04)

**Section 22.5-54. Requirements for monitoring.**

The Engineering 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.

(Ord. No. O-139-04, § 1, 8-17-04)

**Sections 22.5-55--22.5-60. Reserved.**

## Chapter 23 STREETS AND SIDEWALKS

<b>Chapter 23 - STREETS AND SIDEWALKS</b>
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- ❖ Charter reference--Authority to lay out, open, etc., streets and other improvements, § 206.
  - ❖ Cross references--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 and prevention 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.
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### **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 23-18-40.	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 23-51-70.	Reserved.

**ARTICLE III. Construction Within or Interfering With Right-Of-Way**

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**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 curblineline and property line or between the curblineline 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)

**Sections 23-18--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 Article III, §§ 23-71--23-83, and adding a new Article III, §§ 23-71--23-83, to read as herein set out. The former Article 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.*

**Sec. 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 fee (20 square yards or less)		Exceeding 20 square yards: Minimum fee plus the following rate per square yard
Pavement or sidewalks:	\$15.00	+	\$0.50 / square yard (above 20)
Earth or gravel:	\$5.00	+	\$0.15 / square yard (above 20)

(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 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 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)

**Sec. 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 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 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)

**Sec. 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 (3 1/2) 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 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 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 II**

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Section 5.0

Knoxville, Tennessee  
1996

TECHNICAL SPECIFICATIONS  
FOR  
MINERAL AGGREGATE BASE

1. Description

This work shall consist of furnishing and placing one or more courses of aggregates and additives, if required, on a prepared subgrade in accordance with these Specifications and in reasonably close conformity with the lines, grades, thicknesses and typical cross-section shown on the Plans or established by the Engineer. This work also includes furnishing and placing Maintenance Stone and Backfill Stone in accordance with these Specifications and the Plans.

2. Materials

All materials used in this construction, in addition to the general requirements of these Specifications, unless otherwise stipulated, shall conform to the following:

- (a) Mineral Aggregate Base shall be crushed stone, Class A Aggregate Grading D, as specified in Subsection 903.05 of the TDOTSS, 1995, and all Special Provisions pertaining thereto through the date of advertisement for this Contract.

<u>Sieve Size</u>	<u>Total Percentage by Weight Passing Sieves</u>
1-1/2 inch	100
1 inch	85 - 100
3/4 inch	60 - 95
3/8 inch	50 - 80
No. 4	40 - 65
No. 16	20 - 40
No. 100	9 - 18

- (b) Calcium Chloride shall meet the requirements of the AASHTO Specification for Calcium Chloride, Designation M-144 and shall be Type 2.
- (c) Maintenance Stone and Backfill Stone shall be of quality and gradation as specified in Subsection 2(a) above. The backfill stone in the roadway or less than 5 feet from the outside edge of the roadway, curbs, gutters and sidewalks shall be compacted to 100% of the Standard Proctor Density at 2% less than the optimum moisture content as determined by AASHTO T99 Method D.

3. Equipment & Construction Requirements

- (a) Equipment and Construction Requirements shall conform to Subsections 303.05 to 303.12 of the TDOTSS, 1995, and all Special Provisions Pertaining thereto through the date of advertisement of this Contract. In addition, the following compaction, will be required: Mineral Aggregate Base shall be compacted to 100% of the Standard Proctor Density at 2% less than the optimum moisture content as determined by AASHTO T99 Method D.
- (b) The maximum speed of trucks hauling or traveling over any part of the project under construction shall be 20 mph.

4. Method of Measurement

- (a) Mineral Aggregate Base, Maintenance Stone, and Backfill Stone will be measured by the ton in place, as by the actual scale weight.
- (b) All moisture in the Aggregate at the time of weighing in excess of eight percent will be deducted from the weight of the Aggregate.
- (c) Any water added on the road will be at the Contractor's expense.

5. Basis of Payment

- (a) The accepted quantities of Mineral Aggregate Base, Maintenance Stone, and Backfill Stone of the type specified will be paid for at the Contract unit price per ton, complete in place. This price shall be full compensation for all work, materials, including calcium chloride where specified and water; labor and other incidentals required to complete the work in accordance with the Plans and Specifications.
- (b) Payment will be made under the following bid item as set forth in the Bid Schedule:

Mineral Aggregate Base  
Mineral Aggregate Base with Calcium Chloride  
Maintenance Stone



TECHNICAL SPECIFICATIONS  
FOR  
TACK COAT

1. Description

This work shall consist of the application of bituminous material on a prepared base course, binder course, or existing pavement to provide a bond for superimposed course, in accordance with the requirements of these Specifications.

2. Materials

Bituminous materials used shall conform to the following:

AC-20	AASHTO M-226
Cut-Back Asphalt Grade No. RC-70 or RC-250	AASHTO M-81
Emulsified Asphalt SS-1, SS-1H, CSS-1, or CSS-1H	AASHTO M-140

3. Equipment & Construction Requirements

(a) Equipment and Construction Requirements shall conform to Subsections 403.03 to 403.05 of the TDOTSS, 1995, and all Special Provisions pertaining thereto through the date of advertisement of this Contract.

(b) The ranges of application temperatures in degrees Fahrenheit shall be as follows:

AC-20	375-400 F
RC-70	80-150 F
RC-250	100-175 F
SS-1, SS-1H CSS-1, or CSS-1H	60-140 F

(c) Special care shall be given to the application of a "paint coat" of tack coat material to curbs, the edges of manholes and catch basins and to the cold edge of bituminous material to secure an even coating of tack coat material so that a tight, waterproof bond is secured when the hot plant mix material is placed against these surfaces.

The application rate of tack coat shall be as noted on Plans or as directed by the Engineer. Tack coat shall be applied only so far in advance of the paving operation as is necessary to obtain the proper condition of tackiness.

4. Method of Measurement

Bituminous material will be measured by the number of gallons used in the accepted work, as determined by the Engineer, and at the temperature of application.

5. Payment

Tack Coat will be paid at the Contract unit price per gallon and shall be full compensation for all work, materials, labor, and incidentals required to complete the work in accordance with the Plans and Specifications.



TECHNICAL SPECIFICATIONS  
FOR  
BITUMINOUS PLANT MIX BASE

1. Description

This work shall consist of a foundation composed of hot mixture of aggregate and asphalt prepared in a hot bituminous mixing plant. It shall be constructed in one or more layers, on a prepared subgrade, subbase, or base, in accordance with these Specifications and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the Plans or as directed by the Engineer. Each course shall have a thickness after compaction of not more than 4 inches. This construction shall include a leveling course if specified on the Plans.

2. Materials

- (a) Asphalt Cement shall conform to the requirements of AASHTO Designation M 226 for Viscosity Grade AC-20.
- (b) Aggregates shall conform to Subsection 903.06 of TDOTSS, 1995, and all Special Provisions through the date of the advertisement for this Contract. Grading B and B-M shall be used for base placed upon subgrade or base, and Grading C shall be used on existing pavement for leveling courses, Grading C-S and C-W shall be used for surface unless otherwise specified in the Contract or Plans.

3. Composition of Mixtures

- (a) The bituminous base shall be composed of aggregate and bituminous material. The mix shall comply with the applicable requirements of Subsection 407.03 of TDOTSS, 1995.
- (b) The proportions by weight of the total mixture shall be as follows:

<u>Mixtures</u>	<u>Combined Mineral Aggregate</u>	<u>Asphalt Cement</u>
Grading "B" and "B-M"	93.8 - 95.8	4.2 - 6.2
Grading "C" and "C-W"	93.8 - 95.8	4.2 - 6.2
Grading "C-S"	92.3 - 94.7	5.3 - 7.7

4. Equipment

All equipment necessary for the construction shall be approved before the work will be permitted to begin. The equipment shall meet the requirements of Subsections 407.04 through 407.08 of TDOTSS, 1995, and as revised by all Special Provisions dated through the date of the advertisement for this Contract.

5. (a) The construction requirements shall be as prescribed in Subsection 407.09 and Subsections 407.11 through 407.16 TDOTSS, 1995, and as revised by all Special Provisions dated through the date of this advertisement, and the requirements listed below.
- (b) The Plans will indicate whether the bituminous pavement is to be constructed on a subbase, mineral aggregate base, asphalt base, or an existing surface. The surface of the base or subbase upon which the construction is to be placed shall meet the requirements of the applicable Sections of the Grading, Mineral Aggregate Base, and Bituminous Plant Mix Base Specifications.
- (c) When bituminous mixes are placed upon existing concrete pavement, with or without bituminous overlay, all excess bituminous material shall be removed from joints and cracks.

When bituminous mixes are placed upon existing bituminous pavement, any areas containing excess bitumen and any failures in existing pavement shall be removed to a depth up to 3 feet and backfilled with crushed stone base up to the bottom of the surrounding pavement structure and with appropriate asphaltic base, leveling or surface material to the existing surface, all as directed by the Engineer. Crushed stone base material, asphaltic base, leveling, and surface materials to be paid at the Contract Unit Price for those items. Pavement removal and undercut up to 3 feet will be measured and paid in accordance with subparagraph 6(c) and 7(b) of this Section.

The existing pavement surface shall be thoroughly cleaned of all dirt and loose particles prior to the application of tack coat or prime coat as specified in Specifications for Tack Coat and Prime Coat.

- (d) Thickness shall be controlled during the spreading operation by frequent measurements taken of the freshly spread mixture to establish relationship between the uncompacted mixture and the completed course. Thickness or pounds per square yard shall be within reasonably close conformity with that specified on the Plans.
- (e) Under Subsection 407.18 of TDOTSS, 1995, the surface of the bases meet the requirements specified and when tested in accordance with the provisions of that Subsection, the deviation of the surfaces from the testing edge of the straightedge shall not exceed the amounts shown below for the several types of mixtures.

Grading B and B-M Mixture	3/8 inch
Grading C Mixture	3/8 inch
Grading C-W Mixture	3/8 inch
Grading C-S Mixture	3/8 inch

- (f) Subsection 307.03(b), Recycled Asphalt Pavement, will be accepted for Grading B, Grading B-M and Grading C with the following exception: The Contractor shall be responsible for providing a fully coated and workable mixture that shall have a marshall stability of not less than 1,000 pounds when tested in accordance with AASHTO - T-245, and the compactive effort for all specimens shall be 75 blows of the hammer on each end. No adjustments for asphalt content increases or decreases shall be provided under these Specifications.

6. Method of Measurement

- (a) Bituminous plant mix base, including the mineral aggregate and asphalt cement as specified or required by these Specifications, will be measured by the ton of 2,000 pounds, accepted and placed as indicated or directed.
- (b) Materials for prime or tack coat will be measured for payment as prescribed in their Specifications.
- (c) The surface measurements of any pavement, base or subbase removal shall be made in square yards by the Engineer prior to backfilling.
- (d) Bituminous mixtures used to fill openings left by pavement removal will be measured for payment. Base materials used to fill openings left by base removal will be measured as provided for in the respective Sections for each type specified.
- (e) Adjustment of sewer manholes and castings will be measured for payment as prescribed in its Specification.
- (f) No allowance will be made for unacceptable material; for material used in replacing defective or condemned construction; or for material wasted in handling, hauling or otherwise.

7. Basis of Payment

- a) The accepted quantity of bituminous plant mix base, complete in place, will be paid for at the Contract Unit Price per ton for each "Grading" listed in the Bid Schedule and constructed in accordance with the Plans and Specifications.
- b) The accepted quantity of pavement, base and subbase removal up to 3 feet in depth will be paid for at the Contract Unit Price per square yard listed in the Bid Schedule and performed in accordance with the Plans, Specifications, and under the direction of the Engineer.



TECHNICAL SPECIFICATIONS  
FOR  
ASPHALTIC CONCRETE SURFACE

1. Description

This work shall consist of an asphaltic concrete pavement composed of a mixture of coarse aggregate, fine aggregate, mineral filler if specified or required, and asphalt cement, constructed on a prepared roadbed in accordance with these Specifications and in reasonably close conformity with the lines, grades, typical cross sections and rate of application shown on the Plans, or established by the Engineer.

2. Materials

(a) Asphalt Cement

- 1) Asphalt cement shall conform to the requirements of PG-64-22 as specified in Subsection 904.01 TDOTSS, 1995, and all special provisions pertaining thereto through the date of the advertisement for this Contract.
- 2) Asphalt cement used with aggregate Grading D and E mixtures shall be treated with an anti-stripping additive as specified in Subsection 918.09(B) TDOTSS, 1995, and all special provisions pertaining thereto through the date of the advertisement for this Contract.

(b) Mineral Aggregate

Mineral aggregates shall conform to the following requirements and Subsection 903.11, TDOTSS, 1995, and as revised by all Special Provisions dated through the date of the advertisement of this Contract, with the following exceptions and additions:

The Combined Grading:

The several aggregate fractions shall be sized, graded, and combined in such proportions that the resulting composite blend will meet one of the following grading requirements, as specified, together with the stipulations pertaining to the constituents of the blend hereinafter specified.

ASPHALTIC CONCRETE SURFACE COURSE  
MIXTURE DESIGNATION

MASTER RANGE OF GRADATIONS

Total Percent Passing, by Weight

Grading <u>Sieve Size</u>	<u>D</u>	<u>E</u>
1/2"	95-100	95-100
3/8"	80-93	80-93
No. 4	54-76	54-76
No. 8	35-57	35-57
No. 30	17-29	17-29
No. 50	10-18	10-18
No. 100	3-10	3-11
No. 200	0-6.5	0-8

Grading D

The coarse aggregate shall consist of crushed gravel, crushed granite, crushed quartzite or crushed gneiss. Other crushed aggregate may be used provided it has the following chemical, physical, and performance characteristics for Type I, Type II or Type III aggregate, per TDOTSS 903.11. Crushed slag will not be permitted as a coarse or fine aggregate.

The fine aggregate shall consist of natural sand or sand manufactured from gravel or from crushed stone aggregate meeting the physical and chemical requirements listed above. The use of carbonate rocks such as limestone and dolomite or other aggregates tending to polish under traffic will not be permitted in the coarse aggregate and will be permitted only to the extent specified herein in the fine aggregate.

In addition to the other requirements of these Specifications, the composition of the mineral aggregate shall be such that when combined with the required amount of bitumen the resultant mixture shall have:

High Volume Roads (ADT over 1000)

*Minimum Stability, kN (lbs) -	9.0 (2000)
*Void Content (%) -	3-5.5
*Flow, mm (.01 inch) -	2-4 (8-16)
*Minimum VMA (%) -	14
**Dust to Asphalt Ratio -	0.6-1.2

\*Tested in accordance with AASHTO T 245 with 75 blows of the hammer on each side of the test specimen, using a Marshall Mechanical Compactor.

\*\*The dust to asphalt ratio is the percent of the total aggregate sample that passes the 75 um (200 mesh) sieve as determined by AASHTO T11 divided by the percent asphalt in the total mix.

The addition of limestone screenings or agricultural limestone in a maximum amount of 25 percent by weight of the mineral aggregate may be required to comply with this section. When crushed stone screenings meeting the requirements of Subsection 903.11(c) are used, all additional fines shall be natural or manufactured sand. A maximum of 5 percent mineral filler meeting the requirements of Subsection 903.16 may be substituted for an equal quantity of the limestone fines. If the mixture does not comply with the design criteria, another source of aggregate shall be required.

When gravel is used as the coarse aggregate for a 411 Grading “D” mix, a minimum of 20 percent by weight limestone screenings, agricultural limestone and/or mineral filler shall be required.

#### Grading E:

When Grading E is to be used as a surface for traffic lanes, the mineral aggregate shall be composed of not less than 50 percent, nor more than 80 percent crushed limestone, and not more than 50 percent or not less than 20 percent natural sand, sand manufactured from gravel, or any combination of these materials, except as herein specified. All or any part of this mix may be calcareous sandstone, including Size 10 (screenings) or manufactured sand.

The sand percentage on the job mix formula shall be in the range of 20-50 percent. However, if needed to meet or improve the specified design criteria, the limestone and sand percentage may be altered by the numerical value of 5 percent from the percentage shown by the Contractor on the original job mix formula. If the aggregate percentages shown on the original job mix formula are altered, the Contractor shall submit a new job mix formula using the aggregate percentages shown on the Design.

In addition to the other requirements of these Specifications where Grading E is used for the riding surface, the composition of the mineral aggregate shall be such that when combined with the required amount of bitumen, the resultant mixture shall have:

#### High Volume Roads (ADT over 1000)

*Minimum Stability, kN (lbs) -	9.0 (2000)
*Void Content (%) -	3-5.5
*Flow, mm (.01 inch) -	2-4 (8-16)
*Minimum VMA (%) -	14

\*Tested in accordance with AASHTO T245 with 75 blows of the hammer on each side of the test specimen, using a Marshall Mechanical Compactor.

If the design criteria above cannot be obtained with the aggregate submitted to the laboratory for design, another source of aggregate will be necessary.

3. Composition of Mixtures

- (a) The asphaltic concrete surface shall be composed of aggregate, filler if required, and bituminous material. The mix shall meet all applicable requirements of Subsection 407.03 of TDOTSS 1995.
- (b) The proportions by weight of the total mixture shall be combined in such proportions as to produce mixtures within the following master composition limits.

Proportions of Total Mixture, Percent by Weight

<u>Surface Courses</u>	<u>Combined Mineral Aggregate</u>	<u>Asphalt Cement</u>
Grading D and E*	93.0 - 94.7%	5.3 - 7.0

\*If Grading “E” is used as a roadway surface mix, the above proportions shall be changed to 93.0-95.5 and 4.5-7.0 for mineral aggregate and asphalt cement respectively.

4. Equipment

All the equipment necessary for the construction shall be approved before the work will be permitted to begin. The equipment shall meet the requirements of Subsections 407.04 through 407.08, TDOTSS, 1995, and as revised by all Special Provisions dated through the date of advertisement for this Contract.

5. Construction Requirements

- (a) The construction requirements shall be as prescribed in Subsection 407.09 and Subsections 407.11 through 407.16 of TDOTSS, 1995, and the requirements listed below.
- (b) The Plans will indicate whether the bituminous pavement is to be constructed on an asphalt base or an existing surface.
- (c) When bituminous mixes are placed upon existing bituminous pavement, any areas containing excess bitumen and any failures in existing pavement shall be removed to a depth up to 3 feet and backfilled with crushed stone base up to the bottom of the surrounding pavement structure and with appropriate asphaltic base, leveling or surface material to the existing surface, all as directed by the Engineer.

Crushed stone base material, asphaltic base, leveling and surface materials to be paid at Contract Unit Price for those items. Pavement removal and undercut up to 3 feet will be measured and paid in accordance with Subparagraphs 6(e) and 7(c) of this section.

The existing pavement surface shall be thoroughly cleaned of all dirt and loose particles prior to the application of tack coat as specified in Specifications for Tack Coat.

- (d) The joints, between new asphaltic pavement and bridges, concrete pavement, etc. shall have a joint prepared with the existing pavement by grinding, scarifying, or saw cutting the existing pavement for a length of six (6) feet, the full width of the existing pavement, and to the depth of the overlay of new material. The six (6) feet length of cut may be a wedge cut varying from zero (0) to the required depth over six (6) feet). On new construction projects, all joints shall be constructed as above.
- (e) Thickness shall be controlled during the spreading operation by frequent measurements taken of the freshly spread mixture to establish relationship between the noncompacted mixture and the completed course. Thickness or pounds per square yard shall be within reasonably close conformity with that specified on the Plans.
- (f) The surface shall meet the requirements of Subsection 407.18 of TDOTSS, 1995, and when tested the deviation of the surface from the testing straightedge shall not exceed 1/4 inch.
- (g) Costs for joints shall be included in the cost of the aggregate for asphaltic concrete surface.

6. Method of Measurement

- (a) Asphaltic concrete surface shall include mineral aggregate and asphaltic cement. Measurement shall be by the ton of 2,000 pounds of asphaltic concrete surface accepted and placed as indicated or directed.
- (b) Material for tack coat will be measured for payment as prescribed in the Specifications for tack coat.
- (c) Adjustment of sewer manholes and castings will be measured for payment as prescribed in its Specifications.
- (d) No allowance will be made for unacceptable material, for material used in replacing defective or condemned construction, or for materials wasted in handling, hauling, or otherwise.

- (e) The surface measurements of any pavement, base or subbase removal shall be made in square yards by the Engineer prior to backfilling.

7. Basis of Payment

- (a) The accepted quantity of Mineral Aggregate and Asphalt Cement (PG-64-22) for Asphaltic Concrete Surfaces, complete in place shall be paid for at the Contract unit price per ton listed in the Bid Schedule. This price shall be full compensation for all work, materials, labor and other incidentals required to complete the work in accordance with the Plans and Specifications.
- (b) The acceptance of the mixture shall be as determined in Subsection 407.20(B) of TDOTSS, 1995, and all Special Provisions pertaining thereto through the date of the advertisement for the Contract.
- (c) The accepted quantity of pavement removal (up to 3' in depth) shall be paid for at the Contract Unit Price per square yard listed in the Bid Schedule. This price shall be full compensation for all work, labor, equipment, and other incidentals required to complete the work in accordance with the Plans and Specifications.



TECHNICAL SPECIFICATIONS  
FOR  
PORTLAND CEMENT CONCRETE PAVEMENT (PLAIN)

1. Description

This work shall consist of a pavement composed of portland cement concrete constructed on a prepared roadbed in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses, and typical cross-sections shown on the Plans or established by the Engineer.

2. Materials

(a) Concrete

Concrete shall be composed of portland cement, aggregates, and water. Air-entrainment shall be provided by adding an air-entraining agent.

(b) Portland Cement

Portland cement shall conform to AASHTO M85 or ASTM C150. The cement used in the work shall correspond to that on which selection of concrete proportions was based.

When Types IV and V cements are used, proper recognition shall be given to the effects of slower strength gain and lower heat of hydration on concrete proportioning and construction practices.

The Contractor shall provide suitable means for storing and protecting the cement against dampness. Cement, that for any reason has become partially set or which contains lumps of caked cement shall be rejected.

(c) Aggregates

Fine aggregate for concrete shall conform to the requirements of Subsection 903.01 of TDOTSS, 1995. Coarse aggregate for concrete shall conform to the requirements of Subsection 903.03 of TDOTSS, 1995.

Fine aggregate manufactured from limestone or other polishing aggregate will not be permitted in traffic lanes.

(d) Water

Water used in mixing or curing shall be reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable matter, or other substance injurious to the finished product. Water shall be tested in accordance with and shall meet the requirements of AASHTO T26. Water known to be potable may be used without test.

(e) Admixtures

No admixtures shall be used in the concrete without prior approval, and all approved admixtures shall conform to applicable AASHTO and ASTM requirements.

Air-entraining agents shall conform to AASHTO M154 and shall have proven compatibility with all local concrete materials, including cement, and shall be capable of providing in the concrete the required air contents and an air-void system known to produce durable, scale resistant concrete.

Admixtures other than air-entraining agents shall not be used until trial mixes with job materials have shown them to be compatible at job temperatures. Trial mixes must also show that desired properties will be imparted to the fresh concrete without any subsequent loss of strength or durability in the hardened concrete.

(f) Steel

Unless otherwise specified, all steel reinforcement for concrete shall meet the requirements of TDOTSS, 1995.

(g) Joint Materials

Unless otherwise specified or requested by the Engineer, poured sealer for joints shall conform to the requirements of Subsection 905.05 of TDOTSS, 1995, for Hot Poured Elastic Type Sealant.

Preformed fillers for joints shall meet the requirements of Subsection 905.01 of TDOTSS, 1995.

(h) Curing materials

Curing materials shall conform to the requirements of Section 913 of TDOTSS, 1995.

3. Proportioning

Unless otherwise provided herein, each cubic yard of concrete shall contain a minimum of 470 lb. of cement, and the water-cement ratio by weight shall not exceed 0.50. An air-entraining agent shall be used to produce an air content of 5 □%, plus or minus 1%, by volume of concrete as determined by AASHTO T152.

After the materials have been accepted by the Engineer, they shall be so proportioned as to produce a workable concrete having a maximum slump of 3 in. for vibrated placement or 1 in. for slip-formed placement as determined by AASHTO T119. The concrete shall have a flexural strength at 14 days of not less than 550 pounds per square inch when tested in accordance with AASHTO T97, or a compressive strength of 3,500 pounds per square inch when tested in accordance with AASHTO T22.

The Contractor shall submit a job-mix design and certified test reports indicating compliance of the materials to the applicable specifications in 2. and the job mix to those listed above. Such design and reports shall be submitted in duplicate to the Engineer and other such agencies or persons he may designate well in advance of the time scheduled for starting the work. The Engineer must approve such information before starting concrete operations. Reports or certificates indicating compliance of any shipment of materials shall be placed in the hands of, and approved by the Engineer, prior to use of such materials. The cost of testing materials and the job-mix design shall be borne by the Contractor.

Where reputable materials suppliers maintain regular recognized testing services, certified copies of such tests will be accepted by the Engineer. However, in any case of doubt as to the accuracy and/or adequacy of such tests, the Engineer may require that materials be tested by a recognized commercial testing laboratory which has been selected by the Contractor and approved by the Engineer. The testing laboratory shall then test the cement and aggregates and prepare written reports showing the results of such tests on each shipment. The laboratory shall also certify that the materials covered by the report comply in all respects with these Specifications. In general, materials shall be tested by the manufacturer/producer, but if untested shipments require sampling and testing after arrival at the site of work, the Contractor shall be fully responsible for delays in the progress of the work due to delays in testing and reporting.

If it is impossible to obtain concrete of the desired plasticity and workability with the proportions originally designated, the Engineer shall change aggregate weights as required, maintaining the cement content originally designated. No change in the sources or character of the materials shall be made without due notice to the Engineer.

4. Equipment

All the equipment necessary for the construction shall be approved by the Engineer before the work will be permitted to begin. The equipment shall meet the requirements of Subsection 501.04 of TDOTSS, 1995.

5. Construction Requirements

(a) Subgrade Preparation

Subgrade preparation shall be performed as provided for under Section 4.0 of these Specifications.

(b) Construction of Base

The base course, if required by the plans, shall be constructed in accordance with Section 5.0 of these Specifications and the requirements listed:

- 1) The Contractor shall be responsible for constructing or correcting the base to such grade tolerances as will insure the concrete pavement thickness required.
- 2) The base shall be completed not less than 500 linear feet in advance of the paving unless otherwise authorized by the Engineer.
- 3) The base shall be in a moist condition at the time of placing concrete. If it becomes dry prior to the actual placing of the concrete, it shall be sprinkled, but the formation of pools of water shall be avoided. The base shall not be muddy or soft.

(c) Setting Forms

Forms shall be set in accordance with the requirements of Subsection 501.07 of TDOTSS, 1995. In lieu of setting forms, the edge of a previously placed curb and gutter section may be used as a form if approved by the Engineer.

(d) Handling, Measuring, and Batching Materials

All handling, measuring, and batching of materials shall be performed in accordance with the requirements of Subsection 501.09 of TDOTSS, 1995.

(e) Mixing Concrete

Concrete shall be mixed in accordance with the requirements of Subsection 501.10 of TDOTSS, 1995, with the limitations of Subsection 501.11 of TDOTSS, 1995.

(f) Placing Concrete

Concrete shall be placed in accordance with Subsection 501.12 of TDOTSS, 1995, except as herein noted.

Paragraphs one, three, and five of Subsection 501.12 of TDOTSS, 1995, shall be deleted and the following added:

- 1) The mechanical spreader may not be required at the discretion of the Engineer.
- 2) All concrete placed shall be vibrated. The use of hand vibrators will only be permitted at the discretion of the Engineer. Vibrators mounted on a machine shall be operated only while the machine is in motion.

(g) Test Specimens

The Contractor shall furnish the concrete necessary for casting test specimens in the field and shall provide water-tight tanks of satisfactory size and number to accommodate the test specimens. The Engineer will designate the frequency of sampling the fresh concrete and will prepare the test specimens. The method of making and curing test specimens will be in accordance with AASHTO T23. The cost of testing shall be borne by the City of Knoxville.

(h) Strike-Off, Consolidation, and Finishing

The strike-off, consolidation, and finishing of the concrete shall be performed in accordance with Subsection 501.16 of TDOTSS, 1995, and the following.

The Contractor shall always have available materials to protect the surface of the plastic concrete against rain. These materials shall consist of burlap, curing paper, or plastic sheeting. When slip-form construction is being used, materials such as wood planks or forms to protect the edges of the pavement shall also be required.

Transverse grooving after the burlap drag finishing shall not be required unless shown in the plans or directed by the Engineer.

(i) Surface Test

The pavement surface shall be tested in accordance with Subsection 501.17 of TDOTSS, 1995.

(j) Curing

Curing operations shall be done in accordance with Subsection 501.18 of TDOTSS, 1995, except as follows.

Membrane curing will not be permitted in frost-affected areas or paving that will be exposed to deicing chemicals within 30 days after completion of the curing period.

(k) Removal of Forms

Removal of the concrete forms shall meet the requirements of Subsection 501.19 of TDOTSS, 1995.

(l) Joints

Joints shall be constructed of the type and dimensions, and at the locations required by the plans, and in accordance with the provisions of the Specifications.

Longitudinal joints shall be perpendicular to the pavement surface and shall be along or parallel to the centerline of the pavement, unless otherwise specified. Transverse joints shall be straight, vertical to the pavement surface and shall be at the angle to the centerline of the pavement as shown on the Plans.

1) Transverse Contraction Joints

Transverse contraction joints shall be placed at the intervals and dimensions specified and shall be of the plain sawed groove type as detailed on the Plans and in accordance with these Specifications.

Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling, usually six to twelve hours. All joints shall be sawed before uncontrolled shrinkage cracking takes place. If necessary, the sawing operations shall be carried on both day and night, regardless of weather conditions. The sawing of any joint shall be omitted if a crack occurs at or near the joint location prior to the time of sawing. The sawing of a joint shall be discontinued when a crack develops ahead of the saw. In general, all joints shall be sawed in sequence.

All contraction joints in lanes adjacent to previously constructed lanes shall be sawed before uncontrolled cracking occurs. If extreme conditions exist which makes it impractical to prevent erratic cracking by early sawing, a contraction joint groove shall be formed at intervals of every third or fourth joint, or as often as required prior to initial set of concrete by placing inserts in the plastic concrete at the angle to the centerline of the pavement indicated on the plans and perpendicular to the surface. When the concrete has attained its initial set and after the joint has been carefully finished, the insert shall be removed. The groove so formed shall maintain its full width and depth as shown on the Plans, and the pavement at the joint shall meet surface requirements.

Immediately after sawing, the joints shall be cleaned of all residue by flushing with water under pressure.

2) Transverse Construction Joints

Transverse construction joints of the type shown in the plans shall be placed whenever the placing of concrete is suspended for more than 30 minutes. A butt joint with dowels shall be used if the joint occurs at the location of a contraction joint. Keyed joints with tie

bars shall be used if the joint occurs at any other location.

3) Transverse Expansion Joints

Transverse expansion joints shall consist of a vertical expansion joint filler placed on a butt-type joint with dowel bars as shown in the plans. The expansion joint filler shall be continuous from form to form for the full depth of the pavement and shaped to the subgrade, curb section, and to the key way along the form. Preformed joint filler shall be furnished in lengths equal to the pavement width or equal to the width of one lane. Damaged or repaired joint filler shall not be used unless approved by the Engineer.

The expansion joint filler shall be held in a vertical position. An approved installing bar or other device shall be used if necessary to ensure proper grade and alignment during placing and finishing of the concrete.

Finished joints shall not deviate in horizontal alignment more than 1/4 in. from a straight line. If joint fillers are assembled in sections, there shall be no offsets between adjacent units. The top edge of the filler shall be protected, while the concrete is being placed, by an approved metal channel cap. Dowels shall be held in position, parallel to the surface and centerline of the slab, by an approved metal device that is left in the slab. Dowels that are not corrosion-resistant shall be painted with one coat of approved primer. When the paint has dried and immediately before placing the dowel in position, the sleeve-end of the dowel shall be thoroughly greased. Bond breaker for corrosion-resistant dowels shall be as recommended by the coating manufacturer.

4) Longitudinal Joints

Longitudinal joints shall be constructed by forming a keyed butt-type joint or sawing a groove in the surface of the pavement as detailed in the Plans.

If required by the Plans, deformed steel tie bars of specified length, size, spacing, and materials shall be placed across and perpendicular to the longitudinal joints. They shall be placed by approved mechanical equipment or rigidly secured by chairs, or other approved mechanical equipment, or rigidly secured by chairs or other approved supports to prevent displacement.

When adjacent lanes of pavement are constructed separately, a key-way shall be formed along the construction joint of the first lane constructed by any method approved by the Engineer and to the dimensions shown on the Plans. If required, tie bars may be bent at right angles against the form and straightened into final position before the concrete of the adjacent lane is placed, or they may be placed in holes drilled through the forms

Longitudinal sawed joints shall be cut by means of approved concrete saws to the depth, width and line shown on the Plans, not later than 4 days after placing concrete and before any equipment or vehicles are allowed on the pavement.

Immediately after sawing, all longitudinal contraction and construction joints shall be thoroughly cleaned of all residue by flushing with water under pressure.

5) Isolation Joints

Expansion joints shall be formed about all structures and features projecting through, into or against the slab by the use of premolded joint filler. Unless otherwise indicated, such joints shall be 3/4 inch in width.

(m) Sealing Joints

Joints shall be sealed in accordance with the requirements of Subsection 501.20 of TDOTSS, 1995.

(n) Protection of Pavement

The pavement shall be protected in accordance with the provisions of Subsection 501.21 of TDOTSS, 1995.

(o) Opening to Traffic

The Engineer shall decide when the pavement shall be opened to traffic. It shall not be opened to traffic until the field-cured concrete has attained a flexural strength of 550 psi, or a compressive strength of 3,500 psi. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Before opening to traffic, the pavement shall be cleaned.

6. Method of Measurement

The quantity of pavement laid shall be the number of square yards of full-depth pavement. The number of square yards shall be determined by the Engineer after construction of the pavement has been completed.

7. Basis of Payment

The accepted quantities of concrete pavement will be paid for the contract unit price per square yard for the specified thickness for Portland Cement Concrete Pavement (Plain). Payment shall constitute full compensation for furnishing and preparation of all materials, including all joints, joint fillers, dowels and reinforcing if required in the construction drawings or special provisions; placing, finishing, curing; and all labor, equipment, tools, incidentals, and testing necessary to complete these items. No additional payment over the contract unit bid price will be made for pavement which has an average thickness in excess of that shown on the Plans.



TECHNICAL SPECIFICATIONS  
FOR  
CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER

1. Description

This work shall consist of Curb, Extruded Curb, Gutter, or Combined Curb and Gutter constructed of portland cement concrete in accordance with these Specifications and in conformity with the lines, grades and dimensions shown on the Plans, or established by the Engineer.

2. Materials

- (a) Materials shall meet the applicable requirements of Section 15, City of Knoxville Standard Specification for Concrete Structures together with Section 702 of TDOTSS, 1995, and all Special Provisions thereto dated prior to the advertisement of the Contract.
- (b) Sampling and testing cement aggregates shall be performed as specified in Section 15-2(b) of these Specifications.

3. Equipment and Construction Requirements

Equipment and construction shall meet the requirements of Subsection 702.03 and 702.05 through 702.11 TDOTSS, 1995.

4. Method of Measurement

- (a) Concrete curb, extruded curb, concrete gutter, and concrete combined curb and gutter will be measured for payment by the linear foot, complete in place. Sections formed by curb inlets shall not be measured for payment under this item.
- (b) No measurement for payment will be made for excavation in preparing the foundation or for backfill materials, unless otherwise indicated on the plans, as these are a necessary part of the construction and a responsibility to be assumed by the Contractor.

5. Basis of Payment

These items will be paid for at the Contract unit price per linear foot for concrete curb, extruded curb, gutter, and combined curb and gutter, complete in place, which price shall be full compensation for work, materials, labor, and incidentals required to complete this item in accordance with the Plans and Specifications.



TECHNICAL SPECIFICATIONS  
FOR  
CONCRETE SIDEWALKS, DRIVEWAYS, AND MEDIAN STRIP

1. Description

- (a) This work shall consist of constructing sidewalks, driveways and median strip, except sidewalk driveways and median strip that is integrally a part of a structure, constructed of portland cement concrete, at the locations and to the dimensions, lines, grades, and cross section indicated on the Plans or as directed by the Engineer, and in conformity with the provisions and requirements set out in these Specifications.
- (b) Concrete sidewalk, driveway, and median strip shall include all the necessary excavation, unless otherwise indicated; the subgrade and subbase preparation; the backfilling; the final clearing up; and completing all incidentals thereto; as indicated on the Plans or as directed by the Engineer.

2. Materials

- (a) Materials shall meet the applicable requirements of Section 15, City of Knoxville Standard Specification for Concrete Structures together with Section 701 of the TDOTSS, 1995, and all Special Provisions thereto dated prior to the advertisement of the Contract.
- (b) Sampling and testing Cement Aggregates shall be performed as specified in Section 15 - 2(b) of these Specifications.

3. Equipment and Construction Requirements

Equipment and construction shall meet the requirements of Subsection 701.03 and 701.05 through 701.12 TDOTSS, 1995.

4. Method of Measurement

- (a) Concrete sidewalks, driveways, and medians will be measured for payment per square foot, complete in place.
- (b) The area shall be obtained from surface measurements. The area measured shall not exceed standard widths indicated on the plans, unless otherwise directed in writing by the Engineer.
- (c) Concrete sidewalks, driveways, and medians will be measured separately.

- (d) No measurement for payment will be made for excavation, subgrade preparation, jointing, jointing materials, or for backfill materials, unless the otherwise indicated on the Plans, as these are a necessary part of the construction and a responsibility to be assumed by the Contractor.

5. Basis of Payment

This item will be paid for at the Contract unit price per square foot for concrete sidewalk, driveway, and median, complete in place. The price shall be full compensation for all work, materials, labor and incidentals required to complete this item in accordance with the Plans and Specifications.



TECHNICAL SPECIFICATIONS  
FOR  
CONCRETE

1. Description

- (a) This work shall consist of the construction of structures composed of portland cement concrete and steel reinforcement. They shall be constructed on prepared foundations at the locations indicated or directed, in conformity to the dimensions, lines, and grades shown on the Plans or as directed by the Engineer, and in accordance with these Specifications.
- (b) Concrete structures shall be constructed of Class A Concrete, unless otherwise specified. The concrete shall be composed of a mixture of portland cement, aggregates, air-entraining agents, water and chemical additives when approved, combined and proportioned as specified.
- (c) The work covered by this item shall consist of furnishing, erecting and removing concrete forms; furnishing, proportioning and mixing concrete ingredients; placing, curing and finishing plain and reinforced concrete masonry and all other work incidental thereto as required for the proper construction of the structures shown on the Plans or specified herein.

2. Materials

- (a) Materials shall meet the requirements of Subsection 604.02 and 604.03 TDOTSS, 1995, and any Special Provisions which are dated prior to the advertisement of this Contract.
- (b) Sampling and testing cement and aggregates shall be performed as specified below:
  - 1) The Contractor shall determine the source, kind and quality of the cement, aggregates and admixtures to be used in the work well in advance of the time scheduled for starting the work and shall submit such information to the Engineer for approval before starting concrete operations.
  - 2) The cost of testing cement, aggregates and admixtures shall be borne by the Contractor. Certified test reports and certificates shall be submitted in duplicate to the Engineer and to such other agencies or persons as he may designate. Reports or certificates indicating compliance of any shipment of cement, aggregate or admixtures shall be placed in the hands of the Engineer prior to use of such materials.

- 3) Where reputable cement and aggregate suppliers maintain regular recognized testing services, certified copies of such tests will be accepted by the Engineer. However, in any case of doubt as to the accuracy and/or adequacy of such tests, the Engineer may require that cement and aggregates be tested by a recognized commercial testing laboratory which has been selected by the Contractor and approved by the Engineer. The testing laboratory shall then test the cement and aggregates and prepare written reports showing the results of such tests on each shipment. The laboratory shall also certify that the materials covered by the report comply in all respects with these Specifications. In general, cement and aggregates shall be tested at the mill but if untested shipments require sampling and testing after arrival at the site of the work, the Contractor shall be fully responsible for delays in the progress of the work due to delays in testing and reporting.
- 4) No cement or aggregate which fails to meet the requirements shall be incorporated into the work. In case of emergency, the Engineer may authorize the use of specific lots of cement which have satisfactorily passed the soundness test and the 7-day strength test only.

3. Classification and Proportioning of Concrete

Concrete shall be classified as shown in the proportioning table. Each class shall be manufactured by combining the several materials in the proportion specified. Proportioning shall be based on a predetermined cement content, water cement ratio and air content. The water cement ratio shall not exceed the maximum shown in the proportioning table. Below this limit, the quantity of water shall be adjusted to meet the slump requirement. Unless otherwise specified, the concrete shall contain 6 percent entrained air with a tolerance of plus or minus 1 percent. In no case shall the fine aggregate exceed 44 percent by volume calculation of the total aggregate.

CLASSIFICATION AND PROPORTIONING TABLE

<u>Minimum 28 Day Compressive Strength (PSI)</u>	<u>Minimum Cement Per C.Y. (Sacks)</u>	<u>Maximum Water/Cement lb/lb</u>	<u>Air Content %</u>
<u>CLASS A CONCRETE</u>			
4,000	5.0	0.50	6 ± 1%
<u>CLASS F (LEAN CONCRETE)</u>			
2,500	4.0	0.60	N/A

Fine Aggregate manufactured from limestone will not be permitted in concrete to be used as a riding surface in traffic lanes.

Cement replacement with fly ash in Portland Cement Concrete shall be in accordance with TDOTSS Subsection 604.03 or any subsequent Special Provision dated prior to advertisement of this Contract. In general, fly ash meeting all the requirements of 603.03 may be used as follows:

Case I

Where a concrete production facility has sufficient test records and experience to meet ACI 318-95, Section 4.3.1.1 or 4.3.1.2 and has significant experience in the use and testing of fly ash concrete, the concrete mixture may contain fly ash as shown in the following table.

<u>Class of Fly Ash</u>	<u>Maximum Fly Ash Replacement, lb</u>	<u>Minimum Fly Ash Cement Substitution Ratios (by weight)</u>
F	150	1.25 : 1
C	150	1 : 1

Case II

Where a concrete production facility can meet the requirements of ACI 318-95, Section 4.3.1.1 or 4.3.1.2, and has minimal experience in the use and testing of fly ash concrete, the concrete mixture may contain fly ash as shown in the following table.

<u>Class of Fly Ash</u>	<u>Maximum Cement Replacement, (% by weight)</u>	<u>Minimum Fly Ash Cement Substitution Ratios (by weight)</u>
F	15.0	1.25 : 1
C	15.0	1 : 1

Case III

Where a concrete production facility cannot meet the requirements of ACI 318-95, Section 4.3.1.1 or 4.3.1.2, no fly ash may be used. The mixture shall be proportioned according to the above proportioning table.

In the event the Contractor desires to replace a portion of cement with fly ash, a mix design with fly ash as a partial cement replacement shall be submitted to the Engineer for review and approval together with the following minimum data as verified by an approved independent testing laboratory.

- (a) Certified results of compressive strength tests at ages of 7, 14, and 28 days conducted in accordance with ASTM C-192

- (b) Tests for slump, entrained air content, unit weight and yield conducted in accordance with ASTM C-192
- (c) Copies of results of all tests performed by the fly ash producer within the previous 30 days on shipments to the concrete supplier showing:
  - 1) Fineness (percent retained on No. 325 sieve)
  - 2) L.O.I. (loss on ignition)
  - 3) Specific Gravity
  - 4) Soundness (Autoclave Expansion)
  - 5) Moisture content
  - 6) Pozzuolanic activity, 7 day cement (AASHTO M-295)
- (d) A notarized certification from the fly ash producer stating that the fly ash meets the City of Knoxville and TDOTSS as amended by Special Provisions dated prior to the advertisement for this Contract.

In addition to the above, fly ash materials, proportioning of aggregates, cement water, air and admixtures shall be in accordance with Section 604.02 and 604.03 of TDOTSS, 1995, or Special Provisions dated prior to the date of advertisement of this Contract.

4. Equipment and Construction Requirements

Equipment and Construction shall meet the requirements of subsections 604.04 and 604.05 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

5. Falsework

All falsework used to support the forms and concrete for concrete structures shall be in accordance with TDOTSS, 1995, or any Special Provisions dated prior to the advertisement of this Contract.

6. Camber

Structures of any type or size shall be constructed to a permanent camber only when shown on the construction drawings. Sufficient camber shall be provided in the falsework and forms for each span to allow for the tightening of joints in the forms and supporting falsework.

7. Reinforcement

All reinforcement shall conform to Subsection 604.08 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

8. Drainage and Weep Holes

Drainage openings and weep holes shall meet the requirements as set forth on the construction drawings or as directed by the Engineer together with applicable and non-conflicting requirements of Subsection 604.09 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

9. Placing Pipes, Conduits, Anchors, Castings and Other Appurtenances

Placing of pipes, conduits, anchors, castings and other appurtenances shall be in accordance with details and notes on the construction drawings or as directed by the Engineer. Applicable and nonconflicting provisions of Subsection 604.10 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract shall govern in the absence of details on the Construction Drawings.

10. Expansion Joints

Expansion devices shall be as indicated on the Construction drawings. Applicable and non-conflicting provisions of Subsection 604.11 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract shall govern in the absence of notes or details on the Construction Drawings.

11. Handling, Measuring, and Batching Materials

The handling, measuring and batching of Portland Cement Concrete Materials shall be in accordance with Subsection 501.09 and 604.12 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

12. Limitations of Mixing

Conditions limiting the mixing of Structural Concrete shall be as prescribed in Subsection 501.11 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

13. Mixing Concrete

The requirements for mixing concrete shall be as prescribed in Subsections 501.10, 604.04, and 604.12 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of the Contract.

14. Consistency of Concrete (Slump)

The slump of the concrete shall be measured in accordance with AASHTO T-119 and unless otherwise permitted, shall meet the following requirement:

Mass concrete and heavy, reinforced sections require a 2 inch slump with a tolerance of plus or minus one inch; girders, columns, slabs and thin sections require a slump of three inches with a tolerance of plus or minus one inch. Class "F" (lean concrete) may have a slump up to six inches depending upon its use and directions from the Engineer. The consistency of Class "A" concrete may be varied as directed by the Engineer to meet the requirements in different parts of the construction, provided however, that there shall be no increase in the ratio of water to cement, and the total amount of fine and coarse aggregate shall not be more than the amount designated by the Engineer. In general and unless otherwise directed, the slump of Class "A" concrete shall be 3 inches with a tolerance of plus or minus one inch.

15. Compressive Strength Tests of Concrete

The compressive strength of the various classes of concrete shall be as specified for minimum 28-day compressive strength in the Classification and Proportioning Table in Subsection 3 of this Specification. The verification and testing for compressive strength shall be in accordance with Subsection 604.16 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

16. Placing Concrete

The placing of concrete shall be in accordance with Subsection 604.17 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

17. Bonding Construction Joints

Bonding of Construction Joints shall be in accordance with good practice, workmanship and in accordance with the provisions of Subsection 604.18 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

18. Depositing Concrete Under Water

No concrete except for cofferdam seals shall be deposited under water without the written detailed instructions from the Engineer. Concrete deposited under water for Cofferdam seals or special cases shall be in accordance with Subsection 604.19 of TDOTSS, 1995, or any Special Provisions dated prior to the advertisement of this Contract.

19. Removal of Forms and Falsework

The removal of Forms and/or Falsework shall be in accordance with Subsection 604.20 of TDOTSS, 1995, or any Special Provisions dated prior to the advertisement of this Contract.

20. Defective Concrete

Any defective concrete discovered after placement and form removal shall be removed immediately and replaced. If the surface of the concrete is bulged, uneven, or shows honey-combing which cannot be repaired satisfactorily, the entire section shall be removed and replaced.

Concrete having a 28-day strength of less than the minimum specified in Subsection 3 of this Specification, shall be removed and disposed of by the Contractor, at his expense, unless specifically authorized in writing by the Engineer to remain in place. The removal shall be in such a manner as will not cause damage to the remaining concrete or to other structural units or other facilities and property.

The Engineer may at his discretion, allow concrete which fails to meet the strength specified to remain in place, provided the durability is good, but the payment for such concrete will be made at a reduced price to compensate the City of Knoxville for the loss of strength. The bid price for concrete failing to meet the specified strength, yet considered to be structurally adequate to remain in place shall be adjusted downward in accordance with the following formulas:

$$A.P. = B.P. \frac{fc}{S.S.}$$

where A.P. = Adjusted Price  
B.P. = Contract Bid Price  
fc = Actual 28-day Compressive  
Strength of Affected Concrete  
S.S. = Minimum Specified Strength

21. Finishing Concrete Surfaces

Unless otherwise detailed on the Construction Drawing or authorized by the Engineer, the Finishing of Concrete Surfaces shall be in accordance with Subsection 604.22 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

22. Finishing Slab Surfaces for Pavements or Bases

The finishing of bridge floors, or top slabs of structures serving as finished pavements or bases shall be in accordance with Subsection 604.23 of TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this Contract.

23. Curing Concrete

All concrete surfaces, except those surfaces protected by forms that remain in place 7 days or longer as required under the provisions of Subsection 19 of this Specification, shall be cured as specified herein. All curing materials shall meet the requirements of Section 913 TDOTSS, 1995, or any Special Provisions dated prior to the date of advertisement of this

Contract. Curing shall begin as soon as the Concrete has hardened sufficiently to withstand surface damage to unformed surfaces and immediately after form removal from formed surfaces. Only white-pigmented curing compound shall be used.

When the temperature is expected to fall below 35 degrees F, the concrete shall be protected in accordance with the provisions of Subsection 24 of this Specification.

The "Water Method" of curing with burlap will be required for all bridge decks.

(a) Water Method

All concrete slabs shall be covered immediately with material suitable for use with the water cure and kept thoroughly wet for at least 120 hours from the beginning of the initial curing period. All surfaces other than slabs shall be protected from the sun and shall be kept wet for a period of at least 72 hours from the beginning of the curing period. Curbs, walls, handrails and other surfaces requiring a class II finish may have the covering temporarily removed for finishing, but the covering shall be restored as soon as possible.

(b) Membrane-Forming Compound Method

All surfaces shall be given the required surface finish prior to the application of the curing compound. Prior to the application of the curing compound, the surface shall be kept moist.

The rate of application of curing compound shall be as recommended by the manufacturer, but shall not be less than one gallon for 150 square feet of concrete surface. The curing compound shall be applied under pressure, immediately after acceptance of the concrete finish. Hand sprays shall only be used in areas that are inaccessible to pressure equipment. If the surface is dry, the concrete shall be thoroughly wetted with water and the curing compound applied just as the surface film of water disappears. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment or dye uniformly dispersed throughout the vehicle. If the application of the compound results in a streaked or blotchy appearance, the method shall be stopped and water curing as described herein above, applied until the cause of the defective appearance is corrected. The coating shall be protected against marring for a period of five days from the date of application. Any coating marred or otherwise disturbed within the five day period shall be replaced at once.

24. Protection of Concrete in Cold Weather

After the concrete has been placed, if it is expected that the ambient temperature will drop below 35 degrees F, the contractor shall provide sufficient canvas and framework, or other types of housing, to enclose and protect the structure in such a way that the air surrounding the fresh concrete can be maintained at a temperature of not less than 45 degrees F, and the surface temperature of the concrete shall not exceed 80 degrees F. The above conditions

shall be maintained for a period of 120 hours after the concrete is placed. The Contractor shall furnish a maximum/minimum thermometer to the Engineer for the purpose of temperature documentation.

25. Painting Metals

The painting of metals shall meet the requirements of Section 604.26 of TDOTSS, 1995, or any Special Provisions dated prior to the advertisement of this Contract.

26. Waterproofing and Waterstops

Waterproofing where indicated on the Plans or directed by the Engineer shall be in accordance with Section 605 of TDOTSS, 1995, or any Special Provisions dated prior to the advertisement of this Contract.

Waterstops, as specified, shall be installed in accordance with the details on the Plans and in conformity with Section 604.27 of TDOTSS, 1995, or any Special Provisions dated prior to advertisement of this Contract.

27. Loading and Opening to Traffic

No traffic, heavy equipment, storage of materials, or other loading on a structure or any part thereof until after all forms and falsework have been removed and 10 calendar days have elapsed from the date of removal of forms, falsework and supports is permitted under the provisions of Subsection 19 of this Specification.

28. Method of Measurement

(a) Concrete for concrete structures, unless otherwise stipulated, will be measured for payment by the cubic yard. Computation of the quantities will be based on the dimensions shown on the plans or ordered in writing by the Engineer. Where concrete masonry for which specific dimensions are not given on the Plans is ordered by the Engineer, the volume shall be determined by the Engineer from field measurements.

(b) No deductions will be made in concrete volumes for drainage openings 6 inches in diameter or less, individual cavities or embedded pieces less than 1 cubic foot, or for reinforcement.

29. Basis of Payment

(a) Payment will be made for Structural Concrete and Reinforced Structural Concrete as specified on the Bid Schedule at the Contract unit price per cubic yard.

(b) The volumes allowed for payment shall include only the items of concrete placed in accordance with the Plans and Specifications and accepted by the Engineer.

Payment shall be full compensation for all labor, materials including steel

reinforcement where specified, equipment, tools, plant services and all other expenses incidental to the structural concrete work.



TECHNICAL SPECIFICATIONS  
FOR  
TEMPORARY WATER POLLUTION CONTROL

1. Description

This work shall consist of temporary control measures as shown on the plans or as ordered by the Engineer during the life of the Contract to control soil erosion and water pollution. Such measures shall include, but are not limited to, the use of silt barriers, fiber mats, netting, mulches, grasses, slope drains, and other control devices. Erosion and siltation control measures as described herein shall be applied to any erodible material exposed by any activity within the project limits.

2. Materials

- (a) Seeding – Seed, mulches, fertilizer, agricultural limestone and other materials for seeding shall conform to the Standard Specifications for Seeding.
- (b) Sodding – Sod, fertilizer, agricultural limestone and other materials for sodding shall conform to the Standard Specifications for Sodding.
- (c) Temporary Slope Drains – Slope drains may be constructed of pipe, fiber mats, rubble, Portland cement concrete, bituminous concrete, sod or other materials acceptable to the Engineer that will adequately deter erosion.
- (d) Silt Barriers
  - 1) Silt barriers may be brush barriers, baled straw barriers, or silt fences.
  - 2) Brush barriers shall consist of brush, trees and trimmings, shrubs, plants and other approved refuse from the clearing and grubbing operation.
  - 3) Baled straw barriers shall consist of tightly baled straw, plastic or wire binding preferred to twine, firmly anchored to the ground with steel drift pins or wooden stakes.
  - 4) Silt fences shall consist of an approved fabric filter, Mirafi 140 or equivalent, suitable supported by a woven wire fence.

3. Construction Methods

- (a) General
  - 1) Prior to or simultaneously with the clearing and grubbing operations, the Contractor shall install siltation control devices in accordance with the approved erosion control plan. Such work may involve the construction of

temporary berms, dikes, dams, silt fences, sediment basins, lined channels, permanent cut-off ditches, slope drains or other control devices as necessary to control erosion and siltation. Water from cofferdams is not to be pumped directly into streams, but is to be pumped into sediment ponds or traps. No grading shall be performed until the siltation control devices are in place to the satisfaction of the Engineer. Areas to be graded shall not be cleared and grubbed more than 20 calendar days prior to beginning grading operations in such areas. Stockpiled topsoil or fill material is to be treated so the sediment runoff will not contaminate surrounding areas or enter nearby streams. In order to reduce sediment in runoff, erosion control structures shall be installed promptly during all construction phases.

The Contractor's operations shall be staged so that graded or otherwise disturbed erodible surfaces are protected as the work progresses. Once the Contractor begins grading for a roadway cut or embankment, he shall maintain a continuous, viable operation to complete the cut or embankment to subgrade elevation, unless otherwise approved in writing by the Engineer. Exposed erodible cut or embankment slopes shall be final dressed, topsoiled and protected with permanent seeding or sodding in vertical increments not exceeding 25 feet as the work progresses; and no portion of these slopes shall remain unprotected for more than 20 calendar days unless the Engineer determines that weather conditions or other special circumstances preclude current placement of permanent control measures. Temporary erosion control measures shall be implemented as directed by the Engineer.

Seeding or sodding operations shall be initiated within 48 hours after any one of the following conditions occurs:

- a. Each 25 foot vertical increment is graded, or
- b. Upon suspension or completion of grading operations is a specific area.

The above requirements for progressive siltation control also apply to graded areas off the rights-of-way such as waste area, borrow areas and haul roads.

The Contractor shall incorporate all permanent erosion and siltation control features into the project at the earliest practicable time. Temporary siltation control features shall be used to control erosive conditions that warrant protection prior to installation of permanent control features or that are needed to temporarily control erosion or siltation that develops during construction but which is not associated with permanent control features on the Project.

- 2) In the event of conflict between these requirements and siltation control

laws, rules, or regulations of other Federal or State or local agencies, the more restrictive laws, rules or regulations shall apply.

- 3) The temporary erosion control features installed by the Contractor shall be acceptable maintained by the Contractor until the completion of the Project, and he shall remove such installation if ordered by the Engineer. Any materials removed shall become the property of the Contractor.
  - 4) In case of repeated failure on the part of the Contractor to control erosion, pollution and siltation, the Engineer reserves the right to employ outside assistance or to use his own forces to provide the necessary corrective measures. Such incurred direct costs plus project engineering costs will be charged to the Contractor and appropriated deductions made from the Contractor's monthly progress estimate.
- (b) Seeding – Temporary seeding shall conform to the standard Specifications for Seeding except agricultural limestone need not be applied.
- (c) Sodding – Sodding shall conform to the Standard Specifications for Sodding. Care must be taken to properly anchor the sod to prevent any washouts.
- (d) Temporary Slope Drains

Temporary slope drains shall consist of metal pipe, plastic pipe, flexible rubber pipe, or other materials which can be used as temporary measures to carry water accumulating in the cuts and on the fills down the slopes prior to installation of permanent facilities or growth of adequate ground cover on the slopes.

All temporary slope drains shall be adequately anchored to the slope to prevent disruption by the force of the water flowing in the drains. The base for temporary slope drain shall be compacted and concavely formed to channel the water or hold the slope drain in place. The inlet end shall be properly constructed to channel water into the temporary slope drain. Energy dissipaters, sediment basins or other approved devices shall be constructed at the outlet end of the slope drains to reduce erosion downstream. An ideal dissipater would be dumped rock or a small sediment basin which would slow the water as well as pick up some sediment. All temporary slope drains shall be removed when no longer necessary and the site restored to match the surroundings.

- (e) Silt Barriers – Silt barriers shall be constructed by one of the methods listed below. It shall be the Contractor's choice of which barrier to use unless the silt barrier type is specified in the plans.
- 1) Brush barriers shall consist of brush, trees and trimmings, shrubs, plants and other approved refuse from the clearing and grubbing operations. The brush barriers shall be constructed approximately parallel to original ground contour, placed at the bottom of fill slopes to trap and retain sediment. The top of the brush barrier shall be at least five (5) feet below

finished roadway grade. The brush barrier shall be compressed to an approximate height of three (3) to five (5) feet and an approximate width of five (5) to ten (10) feet. The embankment shall not be supported by the construction of brush barriers.

- 2) Baled Hay or Straw Erosion Checks – Hay or straw erosion checks shall be embedded in the ground a minimum of 4 inches to prevent water flowing under them. The bales shall also be anchored securely to the ground by wooden stakes driven through the bales into the ground. Bales can remain in place until they rot, or be removed after they have served their purpose, as determined by the Engineer. The Contractor shall keep the checks in good condition by replacing broken or damage bales immediately after damage occurs. Normal debris clean-out will be considered routine maintenance.
- 3) Silt fences shall consist of an approved fabric filter, Mirafi 140 or equivalent, suitable supported by a woven wire fence, and are located at the bottom of fill slopes to trap and retain sediment. Fence posts may be wood or metal securely anchored to the ground on centers not to exceed twelve (12) feet. The woven wire fence shall be from two (2) to four (4) feet in height as required, and the mesh openings shall be 4" x 4".

The Contractor shall be required to maintain the silt fence and filter barriers in a satisfactory condition for the duration of the Project or until its removal is requested by the Engineer. The silt accumulation at the fence may be left in place and seeded, removed, etc. as directed by the Engineer. Unless otherwise directed by the Engineer, all silt fence or filter barrier shall be removed prior to completion of the Project and shall become the property of the Contractor.

The Contractor shall install and maintain all temporary erosion and siltation control features until no longer needed or permanent control measures are installed. Any materials removed shall become the property of the Contractor. In order to insure erosion and siltation control structures work properly, it is imperative the sediment be removed; therefore, inspection and maintenance of structures is to be performed on a regular basis. During sediment removal, the Contractor shall take care to insure that structural components of erosion and siltation control structures are not damaged and thus made ineffective. If damage does occur, the Contractor shall repair the structures at his own expense. Upon complete removal of sediment traps, special ditches, etc., the area where they were constructed is to be topsoiled, seeded and mulched.

In the event that temporary erosion and siltation control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense.

(f) Sediment Structures

- 1) Sediment structures can be utilized in many locations to control sediment; at the foot of embankments where slope drains outlet; at the bottom as well as in the ditch lines atop waste sites; in the ditch lines on borrow pits. Sediment structures may be used in most drainage situations to prevent excessive siltation of pipe structures. All sediment structures should be at least twice as long as they are wide.
- 2) When use of temporary sediment structures is to be discontinued, all sediment accumulation shall be removed, all excavation backfilled and properly compacted and the existing ground restored to its natural or intended conditions.

4. Method of Measurement

- (a) In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness or failure to install permanent controls as a part of work as scheduled and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense. Temporary erosion and pollution control work required, which is not attributed to the Contractor's negligence, carelessness or failure to install permanent controls, will be measured and paid for as specified for all acceptable work.
- (b) Seeding will be measured by the square yard seeded in accordance with the Specifications for Seeding.
- (c) Sodding – Sod will be measured by the square yard sodded in accordance with the Specifications for Sodding.
- (d) The quantity of temporary slope drains to be paid for shall be determined by the linear foot constructed and measured. All cost of material, installation, and removal involved with temporary slope drains shall be considered the unit price for slope drains.
- (e) Silt barriers shall be measured and paid for by the linear foot constructed and accepted.
- (f) Excavation for sediment structures shall be measured by the cubic yard on the basis of cross-sectioned measure, or the most feasible method. The unit price for sediment structures shall include excavation, disposal of excavated material, and removal and restoration when no longer required. If not otherwise noted on plans, excavation of the sediment structures shall be paid for under Common Excavation.
- (g) All temporary berms shall be considered as a necessary part of the unit price for road and drainage excavation and shall not be paid for separately.

5. Basis of Payment

- (a) The accepted quantities of the items listed below will be paid for at the Contract price per unit of measurement for each of the pay items that is listed in the Bid Schedule.
  
- (b) Payment will be made under:
  - 1) Seeding as specified under Specifications for Seeding.
  - 2) Sodding as specified under Specifications for Sodding.
  - 3) Temporary Slope Drains per lineal foot.
  - 4) Silt Barriers per lineal foot.
  - 5) Sediment Removal per cubic yard.
  
- (c) The above unit prices will be full compensation for completing the work as outlined in the Plans and Specifications including all materials, labor, and incidentals.



TECHNICAL SPECIFICATIONS  
FOR  
CONSTRUCTION AREA TRAFFIC CONTROL

1. Contractor Responsibility and General Provisions

- (a) The Contractor shall provide, erect, and maintain all traffic control devices necessary to preserve the safe and orderly movement of traffic. All operations shall be scheduled and conducted in such a manner and sequence as to cause the least practicable interference with the traveling public, fire protection, and public utility service.
- (b) Payment for materials and labor associated with the required construction area traffic control shall normally be included in the pay item(s) provided by the Contract. In the event that no such pay item(s) are included, the Contractor shall include such costs in the prices bid for other appropriate Contract items.
- (c) All necessary protective devices and operations shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), published by the Federal Highway Administration. A Traffic Control Plan is included with many projects to define specific or typical traffic control needs. However, the Contractor may request a revision or addition to these plans of operation by making a written request in advance to the Director of Engineering.
- (d) A project safety officer or other similarly responsible individual shall be made known to the Director of the Engineering Division prior to the commencement of construction. This notification shall include a telephone number or numbers where the individual(s) may be reached on a 7 day, 24 hour basis.
- (e) Except as otherwise noted in the "Special Conditions," total road closures are not permitted. However, if the Contractor determines in his opinion that one is required, a written request shall be made at least 72 hours in advance to the Director of the Engineering Division for his consideration. This request shall state the reason for the closure, estimated duration of the closure, proposed traffic control devices, and the routing of detours, if necessary.
- (f) Except as otherwise noted in the project "Special Conditions," the Contractor shall provide one adequate traffic lane, minimum of 10' in width, in each direction during the hours of 7:00 A.M. - 9:00 A.M. and 3:00 P.M. - 6:00 P.M.

During hours when work is not in progress, the Contractor shall also maintain one similarly adequate traffic lane in each direction. Exceptions to the above must be approved by the Director of Engineering.

- (g) The Contractor's attention is called to the *City of Knoxville Policy on Work Zone Traffic Control* (a copy of which is included at the end of this Specification following Section 6).

2. Installation and Maintenance of Traffic Control Devices

- (a) The Contractor shall be fully responsible for the supplying, erection, and maintenance of all traffic control devices. These functions shall occur in a workmanlike manner such that all supports are vertical, sign panels generally perpendicular to the travelway and legends horizontal so that they effectively convey the intended message. Signs shall be mounted on stationary or portable supports dependent on the type work being performed. In general, work being performed at spot locations and of short duration will necessitate the use of portable supports properly weighted for stability.
- (b) All existing traffic signs within the limits of this project shall also be the maintenance responsibility of the contractor for the duration of construction. This includes STOP and street name signs on side streets which intersect within the project limits. This responsibility shall include temporary sign relocations caused by construction activities.

The Contractor shall provide continuous and expeditious maintenance of all required traffic control devices. This shall include replacement of sign panel, barricades, and other devices which in the opinion of the Engineering Division are damaged or deteriorated beyond continued use, replacement of broken supports, plumbing of leaning signs, cleaning of dirty signs, barricades and other devices, repair of defaced sheeting and legends, replacement of stolen items, etc. All items used for traffic control shall be generally maintained in their original placement condition and such maintenance will be considered a part of the original installation cost. Failure to maintain all traffic control devices in such a manner as to provide continuous safety to the public will be cause for suspension of construction operations until proper traffic control is re-established.

- (c) In the event that the Contractor, in the opinion of the Director of Engineering, has failed to provide or maintain adequate traffic control devices, the City of Knoxville shall have the right to provide the necessary items and deduct the expense of same from payments due the Contractor.

3. Application and Use of Traffic Control Devices

- (a) Cones are not permissible as channelizing devices during hours of darkness. Standard barricades, drums or vertical panels are permissible, but where used to delineate vehicle paths during hours of darkness, they must be accompanied by steady-burn lights.
- (b) Except as otherwise directed by the Director of Engineering or his representative, the Contractor shall maintain centerline striping throughout the duration of this project. Where a newly asphalted section of roadway is to be maintained

overnight, temporary centerline and lane line stripes shall be provided by the Contractor at the conclusion of each work day. These stripes shall be a temporary reflective tape or paints with four-inch wide line segments. The segments shall be two feet long with thirty-eight foot gaps. Skip lines shall not be used for lane lines separating a turn lane from a through lane or for edge lines.

- (c) All conflicting and confusing pavement marking shall be removed or obliterated in a fashion consistent with MUTCD, Section 6D-1. Painting over existing striping is not considered to meet the requirements for removal or obliteration. The methods listed below are considered acceptable:
- 1) Sand blasting using air or water
  - 2) High pressure water
  - 3) Steam or super-heated water
  - 4) Mechanical devices such as grinders, sanders, scrapers, scarifiers, and wire brushes
  - 5) Solvents and chemicals
  - 6) Burning

Any damage to the pavement or surfacing caused by the Contractor's pavement marking removal shall be repaired by the Contractor at his expense and by methods and materials acceptable to the Engineering Department.

- (d) Short term operations will be permissible which conflict with existing pavement markings, but proper vehicle path must be ensured through the appropriate use of warning signs, flagmen and/or channelizing devices.
- (e) Mesh or other fabric type signs are not considered acceptable for use during hours of darkness.
- (f) Except in operations of short duration, where good sight distance is available, "Flagger Ahead" signs shall be installed where flaggers are required. Flaggers shall utilize STOP/SLOW paddles and proper attire, including a reflectorized orange vest.

Flagmen will be considered a general requirement of traffic control and no direct payment will be made for such.

- (g) During periods of non-use, warning signs and other devices shall be promptly removed from the work area, covered or otherwise positioned so they do not convey their message to the traveling public. If covered, the covering material shall be maintained in a neat and workmanlike manner.
- (h) The official maximum speed limit is to be used for determining taper lengths, device spacing, sign placement and other pertinent details unless otherwise notified.

4. Materials

Materials for all traffic control and marking devices shall be in accordance with the provisions of the current edition of the MUTCD. Exceptions are listed below with reference to the appropriate subsections of the TDOTSS, 1995.

<u>Material</u>	<u>Subsection</u>
Signs:	
Aluminum	916.02 (a)
Reflective Sheeting	916.06, Type III
Paint	916.09
Cold Rolled Carbon Steel-16 gal.	ASTM A366
Drums and Barricades:	
Reflective Sheeting	916.06, Type I
Temporary Pavement Marking Material:	
The material for temporary traffic centerline and lane line marking shall be a pressure-sensitive, adhesive backed, reflective pavement marking tape, or reflectorized paint.	
Cones:	
Cones shall be a minimum of 28 inches high and weighted at the base.	

In addition to the materials certifications required above, the Contractor shall submit a signed, notarized statement that the materials to be used for temporary traffic control comply with the above provisions. This statement shall be submitted prior to the beginning of the work.

5. Method of Measurement:

When the Bid Schedule stipulates that payment will be made for Construction Area Traffic Control on a Lump Sum basis, the pay item Construction Area Traffic Control will include all sign, barricades, lights, flag persons, temporary pavement markings and all incidentals required by this specification, the Traffic Control Plan included in the Contract Drawings, if any, and the Manual on Uniform Traffic Control Devices for Streets and Highways. Where the Bid Schedule stipulates that payment will be made for Specific Items on a unit basis, measurement will be made by the unit stipulated. Where the Special Conditions and/or notes on the construction drawings stipulate that the cost of Construction Area Traffic Control will be included in other Items Bid, no measurement will be made.

6. Basis of Payment

The accepted quantity of Construction Area Traffic Control will be paid for at the lump sum price bid, which price shall be full compensation for providing Construction Area

Traffic Control for the duration of the project in accordance with the Traffic Control Plan provided with the construction drawings and/or submitted by the Contractor and these Specifications. This compensation shall include all labor, materials, equipment and incidentals necessary to complete the work.

The compensation shall be paid in accordance with the following schedule.

Percent of Total Contract on Partial Pay Estimate	Total Percent Allowed for Compensation for Lump Sum Item
5% -----	30%
50% -----	50%
75% -----	75%
100% -----	100%

**POLICY ON WORK ZONE TRAFFIC CONTROL**  
**CITY OF KNOXVILLE, TENNESSEE**  
**September 21, 2016**

**I. Introduction**

- A. The proper use of warning devices in roadway construction and maintenance work areas must be planned in advance to meet the individual requirements of the job site. The objective of this policy is to provide maximum protection to employees, plant, equipment, and to the public while causing minimum interference to vehicular and pedestrian traffic.
- B. When guarding work areas, always provide more protection than may appear necessary rather than under-protecting. Inadequate protection may promote accidents by presenting the driver or pedestrian with a false impression of the extent of the work area and the deviations that he must take from his route in order to safely pass the work area.
- C. Early project planning for traffic control in construction and maintenance areas and implementation and surveillance of these controls during construction are very important.

**II. Need for Standards**

- A. Problems of traffic control occur when traffic must be moved through, around, or adjacent to road or street construction, maintenance operations, and utility work. No one standard sequence of signs or other control devices can be set up as an inflexible arrangement for all situations due to the variety of conditions encountered.
- B. The Manual on Uniform Traffic Control Devices (MUTCD) has been adopted as Federal and Tennessee Law. The MUTCD established principles to be observed in the design, installation, and maintenance of traffic control devices.
- C. These principles and standards are directed to the safe and expeditious movement of traffic through work areas and to the safety of the work force performing those operations.

**III. Responsibility**

- A. Adequate public protection shall be provided by contractors, public utility companies, railroads, State and City agencies performing any work on roadways or so closely adjacent as to create hazards or to restrict pedestrian or vehicular flow.
- B. It is important that the authorities having jurisdiction be able to require proper protection, that responsibility be clearly assigned, adequate training of personnel be provided, and that there be adherence to the provisions of the MUTCD.

- C. A temporary traffic control plan (TTCP) should include, but not be limited to such items as signing, application and removal of pavement and markings; construction; scheduling; methods and devices for delineation and channelization; placement and maintenance of devices; roadway lighting; traffic regulations; and surveillance and inspection.
- D. A TTCP and permit form should be completed in detail to the complexity of the work project and noting the date of planned beginning of construction and duration shall be prepared by the contractor, public utility company, State or City agency proposing to do work on or adjacent to the roadway.
- E. The TTCP shall be reviewed and approved by the Director of Engineering or his designee. Although every effort will be made to review the TTCP immediately upon submittal, a minimum of 2 days should be allowed for review of the TTCP and 4 days for the (CBID) Central Business Improvement District. The TTCP is to be approved by the Permitting Office at the City of Knoxville Engineering Division, 3131 Morris Ave, Telephone 215-6100.
- F. When the TTCP and permit are approved, the City of Knoxville Engineering Division will fax the information to the following agencies:

<u>AGENCY</u>	<u>FAX NUMBER</u>	<u>PHONE NUMBER</u>
*E-911	215-1141	215-1103
Knoxville Police Department	215-8622	215-7000
*Knoxville Area Transit	215-7820	215-7800
Tennessee Dept. of Transportation	594-5626	594-4512
*Knoxville Fire Department	595-4482	595-4474

\*(Total Road Closures only)

- G. When construction is required that will block one or more lanes of principal collector or arterial roadways or close any principal collector or arterial roadway, the responsible work authority shall notify the public. This is currently best handled by notifying the Permitting Office at the City of Knoxville Engineering Division, telephone 215-6100. The deadline for media notification is 2:00 P.M. for the next day release to radio.
- H. Construction on or adjacent to local streets (traffic volumes of less than 1,000 vehicles-per-day) requiring one lane closures will only require implementation of adequate work zone traffic control procedures as outlined in the MUTCD.

#### **IV. Road Closures**

- A. Total Road Closures for construction and maintenance activities are typically not permitted on principal collector or arterial roadways. Total road closures on secondary collectors and local streets will be considered on a case-by-case basis. Traffic control plans for total road closures must be sealed by a Professional Engineer registered in the State of Tennessee.
- B. In the event of an emergency and there is no alternative but to close the roadway, adequate work zone traffic control procedures as outlined in the MUTCD shall be implemented. Notification of proper authorities must be made as soon as possible by contacting the E-911 Dispatcher at 215-4010.

#### **V. Hours of Work**

- A. When construction is required that will block one or more lanes of a principal collector or arterial roadway, the hours of work shall be limited on weekdays to avoid conflict with peak hour traffic movement. Work on weekdays is permitted before 6:00 A.M., from 9:00 A.M. to 3:00 P.M., and after 6:30 P.M. Work is permitted during off peak conditions and on weekends (except for unusual circumstances, i.e. parades, U.T. football games, etc.). More liberal hours are typically allowed on local streets. Work during peak hours in the off peak travel direction is often permitted. Other arrangements may be approved on a case-by-case basis.
- B. When an emergency occurs that requires total road closure on a principal collector or arterial roadway, every effort should be made to make the repairs as soon as possible. Notification of proper authorities must be made as soon as possible by contacting the E-911 Dispatcher at 215-4010. Overtime should be authorized for evening and weekend work.

#### **VI. Street Cut Permits**

- A. When the work requires that city streets be cut, a permit shall be required from the Permitting Office at the City of Knoxville Engineering Division, 3131 Morris Ave. On an emergency basis, these permits may be obtained by notifying the City of Knoxville Engineering Division at 215-6100 and then following up with a written request as soon thereafter as practical. In routine situations, a written request outlining the need for cutting the street, the proposed location, the proposed date of work and the contractor involved shall be supplied in writing to the individuals at the City of Knoxville Engineering Division at 3131 Morris Ave, preferably 48 hours in advance of the cut.
- B. Construction standards are available at the City of Knoxville Engineering Division offices at 3131 Morris Ave and on the City's website: [http://www.knoxvilletn.gov/government/city\\_departments\\_offices/engineering/](http://www.knoxvilletn.gov/government/city_departments_offices/engineering/)

## VII. Principal Collector and Arterial Roadways

For purposes of this policy, the following shall be defined as principal collector or arterial roadways. Time restrictions apply. See Sec. V. A., Hours of Work.

A. All streets in the Central Business Improvement District (CBID). See map on page 10.

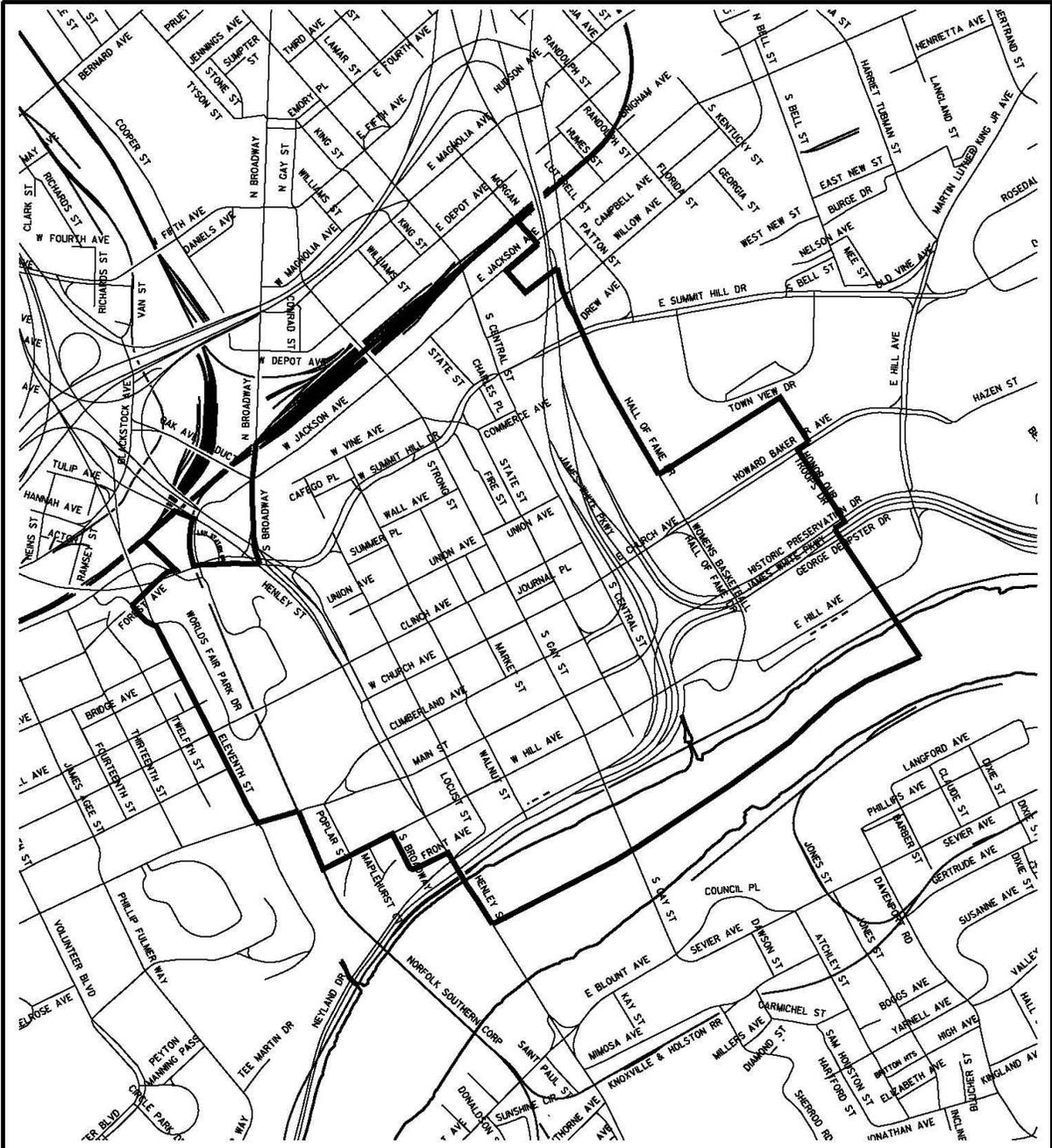
B. Principal collectors, arterials and selected minor collectors:

Adair Drive, Bruhin Road to Sanders Drive  
Ailor Avenue, Western Avenue to 21st Street  
Alcoa Highway  
Amherst Road, Middlebrook Pike to McKamey Road  
Anita Drive, Sevier Avenue to Hillwood Drive  
Asheville Highway  
Atlantic Avenue, Central Street to Broadway  
Ault Road, Buffat Mill Road to Hillview Avenue  
Ball Camp Pike, Western Avenue to John May Road  
Baxter Avenue, Beaumont Avenue to Central Street  
Beaumont Avenue, Baxter Avenue to Keith Avenue  
Bennington Drive, Corteland Drive to Vanosdale Road  
Bernard Avenue, Elm Street to Central Avenue  
Beverly Road, Tazewell Pike to Greenway Drive  
Blount Avenue, Gay Street to Maryville Pike  
Boyds Bridge Pike, Brooks Avenue to Holston River Bridge  
Bradshaw Garden Drive, Pleasant Ridge Road to Clinton Highway  
Bradshaw Road, Ball Camp Pike to Pleasant Ridge Road  
Bridgewater Road, Cross Park Drive to Kingston Pike  
Broadway  
Brooks Avenue, Dandridge Avenue to Boyds Bridge Pike  
Broome Road, N. Gallaher View Road to Middlebrook Pike  
Bruhin Road, Inskip Drive to Heiskell Avenue  
Buckingham Road, Kingston Pike to Vanosdale Road  
Buffat Mill Road, Whittle Springs Road to Loves Creek Road  
Cecil Avenue, Broadway to Cherry Street  
Cedar Bluff Road, Kingston Pike to Cross Park Drive  
Cedar Lane, Central Avenue Pike to Broadway  
Central Avenue Pike, Murray Drive to Bruhin Road  
Central Street, Bruhin Road to Neyland Drive  
Chapman Highway  
Cherokee Boulevard, Scenic Drive to Kingston Pike  
Cherokee Trail, Alcoa Highway to Scottish Pike  
Cherry Street, Cecil Avenue to Magnolia Avenue  
Chilhowee Drive, Rutledge Pike to Holston Hills Drive  
Clancy Avenue, Blount Avenue to Scottish Pike  
Clinch Avenue, 22nd Street to 11th Street  
Clinton Highway  
Coleman Road, Lonas Drive to Papermill Drive

Concord Street, Kingston Pike to Sutherland Avenue  
Copper Kettle Street, Western Avenue to Ed Shouse Drive  
Cross Park Drive, Cedar Bluff Road to Bridgewater Road  
Cumberland Avenue  
Dale Avenue, 21st Street to Western Avenue  
Dandridge Avenue, Hill Avenue to Brooks Avenue  
Dandridge Avenue, Brooks Avenue to Riverside Drive  
Davenport Road, Sevier Avenue to Moody Avenue  
Deane Hill Drive, Morrell Road to Kingston Pike  
Delrose Avenue, Dandridge Avenue to Boyds Bridge Pike  
Downtown West Boulevard, Kingston Pike to Gleason Road  
Dry Gap Pike, Central Avenue Pike to Rifle Range Road  
Dutch Valley Drive, Bruhin Road to Old Broadway  
Ed Shouse Drive, Western Avenue to Middlebrook Pike  
11th Street, Western Avenue to Cumberland Avenue  
Elm Street, Oldham Avenue to Bernard Avenue  
Emory Road  
Essary Drive, Broadway to Briarcliff Road  
Fairmont Boulevard, Broadway to Whittle Springs Road  
5th Avenue, University Avenue to Winona Street  
Forest Glen Drive, Tobler Lane to Kingston Pike  
Forest Park Boulevard, Sutherland Avenue to Kingston Pike  
Fairway Road, Valley View Road to Washington Pike  
Francis Road, Middlebrook Pike to Amherst Road  
Gallaher View Road, Middlebrook Pike to Gleason Drive  
Gap Road, I-640 to Wilson Road  
Gleason Drive, Morrell Road to Gallaher View Road  
Gov. John Sevier Highway  
Greenway Drive, Broadway to Washington Pike  
Hall of Fame Drive, E. Hill Avenue to Broadway  
Haynes Sterchi Road, Dry Gap Pike to Cedar Lane  
Heiskell Avenue, Texas Avenue to Central Street  
Henley Street  
Highland Avenue, 22nd Street to 16th Street  
Highland Drive, Inskip Road to Broadway  
Hillview Avenue, Ault Road to Rutledge Pike  
Hinton Road, Third Creek Road to Western Avenue  
Hollywood Drive, Lonas Drive to Sutherland Avenue  
Hotel Road, Broadway to Holbrook Drive  
Inskip Drive, Clinton Highway to Bruhin Road  
Inskip Road, Cedar Lane to Adair Drive  
Island Home Avenue, Sevier Avenue to Island Home Pike  
Island Home Pike, Island Home Avenue to Sevierville Pike  
Jacksboro Pike, Tazewell Pike to Broadway  
Jackson Road, Amherst Road to Cecil Johnson Road  
James White Parkway  
Johnston Street, Heiskell Avenue to Tennessee Avenue  
Keith Avenue, Beaumont Avenue to Sanderson Road

Kingston Pike  
 Knott Road, Middlebrook Pike to Tenwood Drive  
 Lake Loudoun Boulevard, Volunteer Boulevard to Neyland Drive  
 Liberty Street, Keith Avenue to Sutherland Avenue  
 Lonas Drive, Weisgarber Road to Middlebrook Pike  
 Loves Creek Road, Millertown Pike to Rutledge Pike  
 Lyons Bend Road, Northshore Drive to Glen Cove Drive  
 Lyons View Pike, Northshore Drive to Kingston Pike  
 Mabry Hood Road, Pellissippi Parkway to Kingston Pike  
 Magnolia Avenue  
 Mall Road N, Millertown Pike to Washington Pike  
 Mall Road S, Washington Pike to Millertown Pike  
 Martin Luther King, Jr. Avenue, Dandridge Avenue to Holston Drive  
 Martin Mill Pike, Chapman Highway to Ogle Avenue  
 Maryville Pike, Ogle Avenue to Caleb Avenue  
 McCalla Avenue, Jessamine Street to Martin Luther King, Jr. Avenue  
 McDonald Road, Boyds Bridge Pike to Sunset Road  
 McKamey Road, Amherst Road to Western Avenue  
 Merchant Drive, Pleasant Ridge Road to Central Avenue Pike  
 Middlebrook Pike  
 Millertown Pike, Washington Pike to Mill Road  
 Mineral Springs Road, Broadway to Whittle Springs Road  
 Montvue Road, Kingston Pike to Gleason Road  
 Moody Avenue, Chapman Highway to South Knoxville Boulevard  
 Morrell Road, Kingston Pike to Northshore Drive  
 Murray Drive, Pleasant Ridge Road to Central Avenue Pike  
 Neubert Springs Road, Martin Mill Pike to W. Ford Valley Road  
 Neyland Drive  
 Northshore Drive  
 Ogle Avenue, Maryville Pike to Martin Mill Pike  
 Oglewood Avenue, Harvey Street to Broadway  
 Old Broadway, Broadway to Mineral Springs Road  
 Palmetto Road, Western Avenue to Sullivan Road  
 Papermill Drive, Kingston Pike to Liberty Street  
 Parkdale Road, Rifle Range Road to Cedar Lane  
 Parkside Drive, City Limit to beginning of N. Peters Road  
 Pellissippi Parkway  
 N. Peters Road, Kingston Pike to beginning of Parkside Drive  
 Pleasant Ridge Road, Western Avenue to City Limit (N. of Murray Drive)  
 Proctor Street, Middlebrook Pike to Western Avenue  
 Prosser Road, Buffat Mill Road to Magnolia Avenue  
 Ray Mears Boulevard, Downtown West Boulevard to Montvue Road  
 Riverside Drive, South Knoxville Boulevard to Delrose Drive  
 Riverside Drive, Delrose Drive to Holston Hills Road  
 Rutledge Pike  
 Sanders Drive, Adair Drive to Jacksboro Pike  
 Sanderson Road, Pleasant Ridge Road to Keith Avenue  
 Scenic Drive, Kingston Pike to Southgate

17th Street, Western Avenue to Cumberland Avenue  
Sevier Avenue, Gay Street to Island Home Avenue  
Sevier Avenue, Island Home Pike to Sevierville Pike  
Sevierville Pike, Sevier Avenue to City Limit (E. of E. Ford Valley Road)  
Shea Street, Western Avenue to College Street  
Sisk Road, Hazelwood Road to Pleasant Ridge Road  
South Knoxville Boulevard  
Strawberry Plains Pike, Bell Lane to Huckleberry Springs Road  
Stone Road, Chapman Highway to Magazine Road  
Sullivan Road, Western Avenue to Pleasant Ridge Road  
Sutherland Avenue, University Avenue to Westwood Drive  
Tazewell Pike  
Tennessee Avenue, Western Avenue to Johnston Street  
Texas Avenue, Western Avenue to Heiskell Avenue  
Third Creek Road, Hinton Road to Middlebrook Pike  
Tillery Road, Wilson Road to Central Avenue Pike  
Tobler Lane, Sutherland Avenue to Forest Glen Drive  
21st Street, Dale Avenue to Leslie Avenue  
University Avenue, Western Avenue to Bernard Avenue  
Valley View Drive, Whittle Springs Road to Washington Pike  
Vanosdale Road, Buckingham Road to Middlebrook Pike  
Volunteer Boulevard, Cumberland Avenue to Cumberland Avenue  
Walker Springs Road, Walbrook Drive to Kingston Pike  
Walnoaks Road, Sullivan Road to Pleasant Ridge Road  
Washington Pike, Broadway to Murphy Road  
Weisgarber Road, Middlebrook Pike to Papermill Drive  
Western Avenue  
Westland Drive, Northshore Drive to Morrell Road  
Westwood Drive, Sutherland Avenue to Papermill Drive  
Whittle Springs Road, Mineral Springs Avenue to Cecil Avenue  
Wilson Road, Pleasant Ridge Road to Clinton Highway  
Winston Road, Kingston Pike to Corteland Drive  
Woodland Avenue, I-75 to Broadway  
Woodlawn Pike, Chapman Highway to Chapman Highway  
Young High Pike, Martin Mill Pike to Woodlawn Pike



**CITY OF KNOXVILLE  
CENTRAL BUSINESS  
IMPROVEMENT DISTRICT  
(CBID)**

**APPENDIX III**  
**TEMPORARY TRAFFIC CONTROL PERMIT**  
**AND**  
**STATE ROUTES**

[http://www.knoxvilletn.gov/UserFiles/Servers/Server\\_109478/File/Engineering/Civil/Permits/ttc\\_permit.pdf](http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/Engineering/Civil/Permits/ttc_permit.pdf)



**TEMPORARY TRAFFIC CONTROL PERMIT**  
**CITY OF KNOXVILLE**  
**PUBLIC WORKS**  
**ENGINEERING**  
**PHONE: (865) 215-6100 FAX: (865) 215-6109**



**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: \_\_\_\_\_

# STATE ROUTES WITHIN THE CITY OF KNOXVILLE

<b>STATE ROUTE</b>		
<b>NUMBER</b>	<b>STREET NAME</b>	<b>DESCRIPTION</b>
9	ASHEVILLE HIGHWAY	From the junction with Magnolia Avenue and Rutledge Pike easterly to the city limit line.
33	BROADWAY / MAYNARDVILLE PIKE	From its intersection with Henley/Summit Hill northerly to the city limit line.
71	CHAPMAN HIGHWAY	From its intersection with Blount Avenue southerly to the City limit line.
9	CLINTON HIGHWAY	From the north city limit line southerly to its junction with I-75.
131	EMORY ROAD	From Central Avenue Pike/Heiskell Road easterly to the city limit line.
1	HALL OF FAME DR	From Neyland Dr to Magnolia Ave
71	HENLEY STREET	From its intersection with Western/Summit Hill southerly to its intersection with Blount Avenue.
158	JAMES WHITE PKWY	From I-40 southerly to Riverside Dr (South Knoxville Bridge)
1	KINGSTON PIKE	From west city limit line easterly to the interchange with Neyland Dr.
1	MAGNOLIA AVENUE	From its intersection with Broadway easterly to the junction of Rutledge Pike and Asheville Highway.
169	MIDDLEBROOK PIKE	From the west city limits to the intersection of University Avenue/Western Avenue.
158	NEYLAND DRIVE	From Kingston Pike to James White Parkway.
332	NORTHSHORE DRIVE	From its intersection with I-40 southerly to the city limit line.
33	MARTIN MILL PIKE - MARYVILLE PIKE	From its intersection with Chapman Highway southerly to Ogle Ave to Maryville Pk to the city limit line.
1	RUTLEDGE PIKE	From the junction with Asheville Highway and Magnolia Avenue easterly to the city limit line.
331	TAZEWELL PIKE	From its intersection with Old Broadway to the city limit line.
62	WESTERN AVENUE	From its intersection with Henley Street westerly to the city limit line.
168	W. GOVERNOR JOHN SEVIER HIGHWAY	From Chapman Highway westerly to the city limit line.
168	W. GOVERNOR JOHN SEVIER HIGHWAY	From Alcoa Highway easterly to the city limit line.
129	ALCOA HIGHWAY	From I-40 southwardly to the city limit (Blount County) line

**APPENDIX IV**

**SITE DEVELOPMENT PERMIT FOR UTILITY CONSTRUCTION [-\(link\)](#)**

**CONSTRUCTION WITHIN RIGHT OF WAY PERMIT [-\(link\)](#)**

**AND**

**UTILITY CONSTRUCTION SITE DEVELOPMENT PERMIT REVIEW CHECKLIST**

[http://www.knoxvilletn.gov/UserFiles/Servers/Server\\_109478/File/Engineering/Civil/Permits/sitedev\\_permit.pdf](http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/Engineering/Civil/Permits/sitedev_permit.pdf)

[http://www.knoxvilletn.gov/UserFiles/Servers/Server\\_109478/File/Engineering/Civil/Permits/row](http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/Engineering/Civil/Permits/row)

**SITE DEVELOPMENT PERMIT  
FOR  
UTILITY CONSTRUCTION**

SUBMITTAL DATE: \_\_\_\_\_

PERMIT DATE: \_\_\_\_\_

PERMIT NUMBER: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_

LOCATION: \_\_\_\_\_

**SUBMIT PLANS AND UTILITY CONSTRUCTION SITE DEVELOPMENT CHECKLIST WITH THIS APPLICATION/PERMIT FORM (PLANS MUST INCLUDE ALL ITEMS SHOWN ON THE UTILITY CONSTRUCTION SITE DEVELOPMENT PERMIT CHECKLIST).**

PROJECT DESCRIPTION : \_\_\_\_\_

\_\_\_\_\_

OWNER/AGENT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

ENGINEER: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

CONTACT: \_\_\_\_\_

PHONE NO: \_\_\_\_\_

FAX NO: \_\_\_\_\_

**SITE DEVELOPMENT REQUIREMENTS:**

1. ADEQUATE EROSION AND SEDIMENT CONTROL MEASURES MUST BE MAINTAINED BY THE CONTRACTOR AS REQUIRED BY SECTION 22A-28 OF THE KNOXVILLE STORM WATER AND STREET ORDINANCE. EROSION CONTROL MEASURES MUST BE IN ACCORDANCE WITH THE KNOXVILLE BMP MANUAL AND TDEC MANUAL IN EFFECT AT THE TIME OF APPROVAL
2. EARTHEN SLOPES MAY NOT BE GREATER THAN 2 TO 1 (HORIZONTAL:VERTICAL).
3. THIS PERMIT EXPIRES ONE YEAR FROM DATE OF ISSUE.
4. THE CONTRACTOR IS REQUIRED TO FOLLOW ALL DETAILS AND DIMENSIONS ON THE APPROVED UTILITY CONSTRUCTION PLANS FIELD CHANGES SHOULD BE COORDINATED WITH THE KNOXVILLE FIELD INSPECTOR, WHO MAY REQUIRE REVISED DRAWINGS TO BE SUBMITTED TO THE KNOXVILLE ENGINEERING DIVISION FOR REVIEW.
5. ADDITIONAL REQUIREMENTS MAY BE NECESSARY AS DIRECTED BY THE KNOXVILLE FIELD INSPECTOR BASED ON ACTUAL SITE CONDITIONS AND METHODS OF CONSTRUCTION.

\_\_\_\_\_  
I, THE UNDERSIGNED OWNER OR AGENT, UNDERSTAND ALL OF THE REQUIREMENTS STATED ON THIS PERMIT AND ANY ATTACHED SITE PLANS AND/OR LETTERS. I ALSO UNDERSTAND THAT FAILURE TO COMPLY WITH THESE REQUIREMENTS MAY RESULT IN A CIVIL PENALTY BY THE CITY OF KNOXVILLE OF NOT LESS THAN FIFTY DOLLARS (\$50) AND NOT MORE THAN FIVE THOUSAND DOLLARS (\$5,000) PER DAY FOR EACH DAY OF VIOLATION. EACH DAY OF VIOLATION SHALL CONSTITUTE A SEPARATE VIOLATION.

SIGNATURE OF SUBMITTER: \_\_\_\_\_

SIGNATURE OF OWNER/AGENT: \_\_\_\_\_

DATE: \_\_\_\_\_

PERMIT ISSUED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

PERMIT FEE: \_\_\_\_\_

CITY OF KNOXVILLE  
PUBLIC WORKS  
ENGINEERING DEPARTMENT  
1400 LORAIN STREET  
KNOXVILLE, TN 37921  
PHONE: 215-6100

**PERMIT  
CONSTRUCTION  
WITHIN  
RIGHT-OF-WAY**



DATE: \_\_\_\_\_

PERMIT NUMBER: \_\_\_\_\_

**APPLICANT**

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

**OWNER**

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

**LOCATION OF WORK**

STREET ADDRESS: \_\_\_\_\_

WARD/BLOCK: \_\_\_\_\_

CLT NO: \_\_\_\_\_

LOT SIZE: \_\_\_\_\_

**CONSTRUCTION TYPE**

DRIVEWAY  
 SIDEWALK  
 UTILITY CONST.

PAVEMENT CUT  
 CURB & GUTTER  
 DRAINAGE DITCH

STORM SEWER  
 OTHER  
\_\_\_\_\_

STARTING DATE: \_\_\_\_\_ SIZE (SPECIFY DIMENSIONS OF WORK) \_\_\_\_\_

NOTES: \_\_\_\_\_  
\_\_\_\_\_

**REQUIREMENTS**

THE APPLICANT HEREBY AGREES TO COMPLY WITH ALL PROVISIONS OF THE CODE, ORDINANCES, SPECIFICATIONS, AND REGULATIONS OF THE CITY OF KNOXVILLE, TENNESSEE

ALL WORK SHALL BE PERFORMED BY A LICENSED AND BONDED CONTRACTOR.

THIS PERMIT SHALL BECOME VOID IF CONSTRUCTION HAS NOT BEGUN WITHIN 10 DAYS OF NOTED STARTING DATE. PERMIT EXPIRES 90 DAYS FROM DATE OF APPLICATION.

A PLAN OR TYPICAL SKETCH SHALL ACCOMPANY ALL APPLICATIONS.

A TEMPORARY TRAFFIC CONTROL PERMIT IS REQUIRED TO BLOCK THE RIGHT-OF-WAY FOR CONSTRUCTION.

APPLICANT SIGNATURE: \_\_\_\_\_

APPLICATION APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

DIRECTOR OF PUBLIC WORKS

BY: \_\_\_\_\_ PERMIT FEE: \_\_\_\_\_

PAYMENT: \_\_\_\_\_ PAYMENT RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_



**City of Knoxville**  
**UTILITY CONSTRUCTION**  
**SITE DEVELOPMENT PERMIT**  
**REVIEW CHECKLIST**

Date:

---

Project Name:

---

Address:

---

**General Requirements:**

1. Are all names, phones and addresses of interested parties on the site development PERMIT application?
2. Is there a vicinity map with all adjacent streets shown and labeled?
3. Do all plans have a scale (preferably graphic scale) and north arrow?
4. Are all plans stamped & signed by professional engineer registered in TN?
5. Are all right-of-way and property lines shown clearly and labeled?

Yes	No	N/A

**Drainage:**

1. Are all existing drainage features shown and labeled correctly?
2. If needed, has an ARAP permit been acquired?
3. Are all appropriate flood zone lines shown? (No fill line, Buffer zone, Floodway, 500-year, 100-year, F-1 zone)

Yes	No	N/A

**Erosion and Sediment Control:**

1. Are all existing and proposed contours shown at 2' intervals (maximum)?
2. Are all existing features clearly labeled to either remain or to be removed?
3. Are construction access points properly located with appropriate details?
4. Does the plan show details for Best Management Practices (silt fences, straw bale barriers and etc.)?
5. Does the plan show temporary and permanent seeding?
6. Is temporary inlet protection shown for all catch basins, inlets and culvert entrances?
7. Are stream crossings properly detailed?
8. Are soil stock piles properly detailed?

Yes	No	N/A

**Miscellaneous:**

1. Is there a proper detail for any utility trench that is within city or state right-of-way?
2. Is the disturbed land less than 1 acre? (Otherwise will need NPDES construction permit)
3. Is construction right-of-way permit required?

Yes	No	N/A