Stormwater Management Ordinance

0-00-11-105

Department of Engineering and Public Works
December, 2000

AN ORDINANCE FOR STORMWATER MANAGEMENT
0-00-11-105
KNOX COUNTY, TENNESSEE

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

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

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

SECTION 1. DEFINITIONS

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

2-Year Flood – The flood event expected to be equaled or exceeded once in a 2-year period. Statistically, a flood that has a fifty-percent chance of being equaled or exceeded in any given year. Also known as the fifty-percent annual chance flood.

10-Year Flood – The flood event expected to be equaled or exceeded once in a 10-year period. Statistically, a flood that has a ten-percent chance of being equaled or exceeded in any given year. Also known as the ten-percent annual chance flood.

25-Year Flood – The flood event expected to be equaled or exceeded once in a 25-year period. Statistically, a flood that has a four-percent chance of being equaled or exceeded in any given year. Also known as the four-percent annual chance flood.

100-Year Flood – The flood event expected to be equaled or exceeded once in a 100-year period. Statistically, a flood that has a one-percent chance of being equaled or exceeded in any given year. Also known as the one-percent annual chance flood.

500-Year Flood – The flood event expected to be equaled or exceeded once in a 500-year period. Statistically, a flood that has a 0.2-percent chance of being equaled or exceeded in any given year. Also known as the 0.2-percent annual chance flood.

500-Year Flood Elevation – Elevation of the 500-year flood at a given location.

Aquatic Resources Alteration Permit (ARAP) – Permit issued by the Tennessee Department of Environment and Conservation for physically altering waters (streams and wetlands) of the state.

Base Flood Elevation (BFE) – Elevation of the 100-year flood at a given location.

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

CFR– Code of Federal Regulations.

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

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

Cross Drain – A pipe used to convey stormwater from one side of a Knox County Road to another.

Development – Any land change that alters the hydrologic or hydraulic conditions of any property. Development includes but is not limited to land clearing, topographic alterations (grading), utility construction projects, and construction of new buildings, roads, or parking facilities.

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

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

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

Erosion – The detachment or wearing away of soil by the action of water.

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

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

Flood Event – The resulting flood for a specific statistical return period or annual chance.

Flood Fringe – That portion of the 500-year floodplain lying outside the floodway.

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

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

Floodplain – The relatively flat or lowland area adjoining a river, stream, watercourse, lake, or other body of standing water, which has been or may be covered temporarily by flood water. Floodplains are typically assigned a recurrence interval (i.e. the 500-year floodplain) which defines the magnitude of the flood event that causes the inundation. The 500-year floodplain is the area subject to flood for the 500-year flood.

Flood Proofing – A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures, and contents of buildings in a flood hazard area.

Floodway – That portion of the stream channel and adjacent floodplain required for the passage or conveyance of a 100-year flood discharge without cumulatively increasing the 100-year water surface elevation more than 1 foot. This is the portion of special flood hazard area characterized by significant depths and velocities.

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

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

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

Illicit Discharge – Any discharge to the municipal separate storm sewer system that is not composed entirely of stormwater, except for discharges allowed under Section 4 of this ordinance.

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

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

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

No Rise – A floodway encroachment that causes no change to the BFE, floodway width or floodway water surface elevation.

Peak Discharge – The maximum discharge computed for a given design flood event.

Public Water – Stormwater runoff that originates in whole or part from publicly owned facilities such as roads.

Sinkhole – A depression characterized by closed contours on a topographic map. A sinkhole throat, or opening to the subsurface, may or may not be visible. Field verification may be required in areas where the depth of the depression is below the tolerance of currently available topographic mapping.

Sinkhole Floodplain Elevation – The elevation at the sinkhole lip or the flood elevation expected under extreme flood conditions.

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

Sinkhole No-Fill Line – The outside line of the area in a sinkhole where new construction is prohibited. The no-fill line is determined by the contour elevation that defines storage equal to sixty (60) percent of the floodplain storage volume.

Special Flood Hazard Area (SFHA) – The land in the floodway and floodplain subject to flood in a 100–year flood.

Stormwater – The direct response of a drainage basin to rainfall including surface and subsurface runoff that enters a ditch, stream, pipe or other conveyance system during and following precipitation.

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

Stormwater Management Plan – An engineering study for the design of the drainage system for a proposed development.

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

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

Substantial Improvement – Any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds fifty percent (50%) of the market value of the structure prior to the improvement.

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

Watershed – A drainage basin within Knox County that discharges to one of the major streams/rivers that flow through Knox County: Tennessee River, Holston River, French Broad River, and Clinch River.

SECTION 2. AUTHORITY OF THE DIRECTOR

The Director of the Knox County Department of Engineering and Public Works (Director) with the approval of the Knox County Executive shall establish written regulations and technical guidelines as may be necessary to enforce the terms of this ordinance. These regulations shall be filed in the Department of Engineering and Public Works Office and made available to the public.

The Director shall have the authority to inspect private drainage systems within Knox County, and may order corrective actions to said private drainage systems as are necessary to properly maintain the drainage systems within Knox County.

The Director shall have the authority to prepare, or have prepared, master plans for drainage basins and establish regulations or direct capital improvements to carry out said master plans.

SECTION 3. STORMWATER MANAGEMENT REQUIREMENTS

3.1 Limitation of Flooding

All development, whether by private or public action, shall be performed in such a manner as to not increase the peak discharge rate leaving the site for the 2-, 10- and 25-year flood events. More stringent standards, including restrictions on peak velocity and/or runoff volumes or less frequent design events, may be adopted in areas where the Director has determined, through stormwater master plans, engineering studies, a review of site history, or engineering judgement, that additional restrictions are needed to limit flooding downstream or upstream of the site.

The Director may waive or modify site requirements if the increase in peak discharge at the site is mitigated by a regional stormwater facility or if engineering studies determine that installing the required stormwater facilities would not be in the best interest of Knox County.

3.2 Integrity of Existing Stormwater Systems

Any alteration to existing drainage channels, pipes, or other stormwater systems that convey public water is prohibited without authorization from the Director. Any alteration must maintain the intended performance of the drainage system.

3.3 Stormwater Management Plan Requirements

Persons responsible for land development activities not exempted by Section 3.4 must submit a stormwater management plan. The stormwater management plan must include at a minimum a map showing the extent of the land development activity, a sediment and erosion control plan, and sufficient hydrologic calculations to determine the impact of the development on stormwater discharges. Specific requirements for the stormwater management plan will be published by the Director in the Stormwater Design Manual.

3.4 Developments Exempt from a Stormwater Management Plan

The following developments are exempt from the requirements for a stormwater management plan:

(1) Single to two-family individual residential dwellings in any given area that do not alter a drainage channel, and do not disturb over 1 acre of the natural ground.

(2) Commercial or industrial development that:

(a) adds less than 10,000 square feet of impervious surface, *and*

(b) does not alter a drainage channel, *and*

(c) does not alter the natural ground elevation by more than five (5) feet.

These exemptions shall not be construed as exempting these activities from onsite drainage improvements that may be required in accordance with building and construction codes, nor from compliance with Section 5 of this ordinance.

3.5 Drainage System Capacity Requirements

All stormwater conveyance for drainage systems shall be designed to carry the peak discharge for the 10-year flood event. All cross drains shall be designed to carry the peak discharge for the 25-year flood event. The capacity requirements may be waived or modified if the Director determines the required stormwater facilities would not be in the best interest of Knox County.

All drainage systems shall be designed to insure that no habitable finished floor elevations are flooded for the 100-year flood event.

3.6 Water Quality Best Management Practices

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3.7 Maintenance of Stormwater Management Facilities

Routine maintenance of all stormwater management facilities shall be performed by the property owner(s) in such a manner as to maintain the full function of the facility. All routine maintenance of privately-owned stormwater management facilities shall be at the sole cost and expense of the owner(s) of such facilities. The Director shall have the authority to order corrective action at the expense of the owner(s) if the Director determines that an owner has failed to maintain a stormwater management facility.

SECTION 4. NON-STORMWATER DISCHARGES

4.1 Illicit Discharges

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

4.2 Allowable Discharges

Unless the Director has identified them as a source of pollutants to the waters of the State of Tennessee, the following non-stormwater discharges into the Municipal Separate Storm Sewer System of Knox County are permitted:

(a) water line flushing;
(b) landscape irrigation;
(c) diverted stream flows permitted by the State of Tennessee;
(d) rising ground waters;
(e) uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers;
(f) uncontaminated pumped ground water;
(g) discharges from potable water sources;
(h) foundation drains;
(i) air conditioning condensate;
(j) irrigation water;
(k) springs;
(l) water from crawl space pumps;
(m) footing drains;
(n) lawn watering;
(o) individual residential car washing;

(p) flows from riparian habitats and wetlands;
(q) dechlorinated swimming pool discharges;
(r) street wash waters resulting from normal street cleaning operations;
(s) discharges or flows from emergency fire fighting activities; and
(t) discharges pursuant to a valid and effective NPDES permit issued by the State of Tennessee.

Discharge due to water line flushing directly to the waters of the State of Tennessee is prohibited. Persons responsible for water line flushing activities are required to de-chlorinate discharges before such discharges come in contact with waters of the State of Tennessee.

4.3 Illegal Dumping

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

4.4 Implementation

The Director shall have authority to implement the prevention of non-stormwater discharges by appropriate regulations. Such regulations may include, but are not limited to, provisions for inspection by Knox County of points of origin of known or suspected non-permitted discharges.

SECTION 5. FLOODPLAIN REQUIREMENTS

5.1 General Requirements

Uses permitted within the flood fringe shall be in accordance with Article 3.70 Flood Fringe Requirements of the Knox County Zoning Ordinance. Uses permitted within the floodway shall be in accordance with Article 5.70 Floodway Zone of the Knox County Zoning Ordinance. The regulations and controls set forth in this Section shall be applied to all areas within the 500-year floodplain as designated on the adopted FEMA Flood Insurance Rate Maps (FIRM) in the jurisdiction of Knox County.

5.2 Administration

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

5.3 Floodplain Development Requirements

5.3.1 General Requirements

A Floodplain Development Permit is required for any development or alteration to the natural drainage system within the 500-year floodplain in Knox County. The Director shall approve said permit based on the requirements herein and the required engineering calculations stipulated by the Director.

Persons responsible for property developments that are determined to be in the 500-year floodplain of Knox County must prepare and submit a Floodplain Development Permit application. A Stormwater Management Plan, as outlined in Section 3.3 may be required. A registered land surveyor or professional engineer in the State of Tennessee must certify the as-built elevations of all structures in the floodplain. The Director shall provide a list of the specific requirements for the application.

The applicant is responsible for all state and federal permits that may be applicable to the site including State permits for the NPDES and ARAP, US Army Corps of Engineers Section 404 permits, and TVA Section 26A permits.

5.3.2 Flood Fringe Fill Requirements

Construction fill that alters the conveyance and storage capacity of the natural floodplain is prohibited in the flood fringe one-half the linear distance between the floodway line and the 100-year floodplain line. This requirement may be waived if a drainage study prepared by a registered Professional Engineer in the State of Tennessee shows a rise of less than 0.1 ft on existing BFEs within 0.5 miles (upstream or downstream) of the proposed development.

5.3.3 Structure Requirements

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

(a) The **flood protection elevation** shall be established as the existing 500-year flood elevation or the future 100-year flood elevation (if available) whichever is higher.

(b) The minimum finished floor elevation (FFE) intended for human occupancy **shall be equal to or higher than one (1) foot above the flood protection elevation**. Those portions of such structures not intended for human occupancy shall be either equal to or higher than the flood protection elevation. All other related facilities thereto such as electrical equipment, water service and sanitary sewer connections shall be either equal to or higher than the flood protection elevation or shall be flood proofed to the flood protection.

(c) The minimum floor elevation of structures not intended for human occupancy shall be either equal to or higher than the flood protection elevation. The Director will only authorize individual exceptions to minimum floor elevation requirements where it can be shown that flood proofing is acceptable from an engineering standpoint.

5.3.4 Post Construction Requirements

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

5.4 Flood Proofing Measures.

5.4.1 General Flood Proofing Requirements

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

1) Anchorage to resist flotation and lateral movement.

2) Installation of watertight doors, bulkheads and shutters.

3) Reinforcement of walls to resist water pressures.

4) Use of paints, membranes or mortars to reduce seepage of water through walls.

5) Addition of mass or weight to structures to resist flotation.

6) Installation of pumps to lower water levels in structures.

7) Construction of water supply and waste treatment systems to prevent the entrance of floodwaters.

8) Pumping facilities for subsurface drainage systems for buildings to relieve external foundation wall and basement floor pressures.

9) Construction to resist rupture or collapse, caused by water pressure or flotation debris.

10) Cutoff valves on sewer lines or the elimination of gravity flow basement drains.

5.4.2 Residential Flood Proofing

Flood proofing of new residential structures in Knox County is prohibited.

5.5 Development Within Floodways

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

5.6 Developments in SFHAs without Base Flood Elevations

5.6.1 Areas Requiring Flood Studies

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

5.6.2 Floodway Data Not Available

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

5.6.3 Base Flood Elevations Not Available

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

5.7 Development in Unstudied Areas

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

5.8 Developments In and Around Sinkholes

5.8.1 General Requirements

Developments in and around sinkholes require a stormwater management plan and a floodplain development permit.

5.8.2 Sinkhole Floodplains

The sinkhole floodplain storage volume is the storage volume below the sinkhole floodplain elevation, which is defined as the sinkhole lip. This storage volume may be reduced if

engineering calculations prepared by a registered Professional Engineer in the State of Tennessee, approved by the Director, document a lower floodplain elevation under extreme flood conditions.

The pre-development sinkhole floodplain storage volume must be preserved under post-development conditions.

5.8.3 Sinkhole No-Fill Line

The no-fill line shall be established by the contour line or interpolated contour line for the elevation that defines sixty (60) percent of the floodplain storage volume. The area encompassed by this line shall be defined as a no-fill zone for all construction activities. No construction fill will be allowed in this zone.

Any fill added in the floodplain outside the no-fill lines must by compensated for by an equal volume cut below the floodplain elevation. Any excavation in a sinkhole must be approved by the Director.

5.9 Degree of Flood Protection

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

SECTION 6. PERMIT CONTROLS WITHIN DRAINAGE SYSTEMS

No building permit, except for developments exempted in Section 3.4, shall be issued until grading, stormwater management and erosion control plans are approved by the Director.

Any non-permitted drainage system, construction or fill located within a floodplain shall, upon written notice from the Director, be removed at the property owner's expense.

SECTION 7. RESPONSIBILITY

Conformance with this ordinance is a minimum requirement and does not relieve the design engineer from applying sound engineering judgment and taking measures which go beyond the scope of the requirements of this ordinance where necessary. Nor does this ordinance imply a warranty or the assumption of responsibility on the part of Knox County for the suitability, fitness or safety of any structure with respect to flooding or structural integrity. This ordinance

is a regulatory instrument only, and is not to be interpreted as an undertaking by Knox County to design any structure or facility.

SECTION 8. VARIANCES

Variances to the requirements of this ordinance shall be handled by the Knox County Board of Zoning Appeals as defined under Section 6.60 Board of Zoning Appeal of the Knox County Zoning Ordinance.

SECTION 9. PENALTIES AND INJUNCTIONS

Any violations of this ordinance shall be punishable by a fine of not more than one thousand ($1000.00) dollars for each and every violation. Every day that said violation continues shall be a separate offense.

In addition to all other remedies provided by law, Knox County shall have the right to injunctive relief for any violation of this ordinance.

SECTION 10. VALIDITY OF ORDINANCE

If any section, subsection, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions of this ordinance.

If any provisions of this ordinance and any other provisions of law impose overlapping or contradictory regulations, or contain any restrictions covering any of the same subject matter, that provision which is more restrictive or imposes higher standards or requirements shall govern.