IV. STORM WATER MANAGEMENT

Overland drainage and detention are required to minimize the impact of peak water discharges on downstream facilities. The rate of peak run-off at site boundaries cannot be greater than peak run-off prior to development. Where site run-off requires detention areas, the areas shall be designed as a visual amenity for the site and be incorporated into the overall landscaping of the site.

All drainage must conform to the Town of Kingston Springs Subdivision Regulations and shall be approved by the Town Engineer prior to construction, or alteration in the case of existing storm water facilities.

All detention areas shall incorporate the following standards:

1. Detention basins must be fully sodded.

2. A concrete swale shall be provided for adequate drainage flow to drain outlets.

3. Earth cut slopes of 3:1 horizontal to vertical shall be preferred for erosion control and maintenance.

4. Landscaping shall be provided adjacent to the basin so as to provide a visual amenity within the overall landscaping of the site.

5. In basins that shall retain water so as to provide an aesthetic feature of the development, water should not remain stagnant. Fountains shall be provided to aerate the water surface.

A. MAINTENANCE AND IRRIGATION

1. All planted areas installed by the developer shall be privately maintained as originally designed and approved by the DRC for the life of the project. All dead and/or dying landscape material shall be removed by the property owner and replanted per the DRC's originally approved Landscape Plan. Any revisions to the landscaping not in conformance with the approved plan require prior approval of the DRC.

2. Irrigation shall be provided to ensure sufficient longevity and health of the planting areas on all new construction. Existing and renovated landscaped areas will be evaluated individually based on the complexities of providing irrigation.

3. Irrigation backflow preventors shall be screened or concealed. Backflow preventors shall not be located within a required Streetscape area.

4. Irrigation systems must be installed below ground, with spray hood, flush with the ground surface.

#93-007

TOWN OF KINGSTON SPRINGS STORMWATER MANAGEMENT REGULATIONS

TOWN OF KINGSTON SPRINGS
DEPARTMENT OF PUBLIC WORKS
KINGSTON SPRINGS, TENNESSEE 37082

PREPARED BY: M & K, INCOPORATED
2110 BLAIR BOULEVARD
NASHVILLE, TENNESSEE 37212

Table of Contents

Chapter 1

INTRODUCTION

1.1 AUTHORIZATION AND TITLE

As authorized by Ordinance No. 93-007 and approved by the Mayor, the provisions of this document establish the regulations and technical guidelines developed by the Town Engineer and the Director of the Town of Kingston Springs Department of Public Works (KSDPW) to enforce the terms of that ordinance. This manual shall be cited as the "Town of Kingston Springs Stormwater Management Manual".

1.2 SCOPE

The provisions of this manual shall replace any previous regulations and shall apply to all surface alteration and construction within the boundary of Town of Kingston Springs.

1.3 LANGUAGE

1.3.1 RULES

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

1. The particular shall control the general.

2. In the case of any difference in meaning or implication between the text of these regulations and the text of the Ordinance, the text of the Ordinance shall control.

3. The words "shall" and "should" are always mandatory and not discretionary. The word "may" is permissive.

4. The word "permitted" or words "permitted as of right" mean permitted without meeting the requirements of these regulations.

5. Words used in the present tense include the future tense. The singular includes the plural, unless the context clearly indicates the contrary.

6. All public officials, bodies, and agencies to which reference is made are those of the Town of Kingston Springs, Tennessee, unless otherwise indicated.

7. The term "Kingston Springs" shall mean the area of jurisdiction of the Town of Kingston Springs.

1.3.2 DEFINITIONS

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

1.4 LEGAL CONSIDERATIONS

1.4.1 CAVEAT

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

1.4.2 DISCLAIMER OF LIABILITY

The degree of flood protection intended to be provided by these regulations is considered reasonable for regulatory purposes, and is based on engineering and scientific methods of study. Larger floods may occur on occasion, or the flood height may be increased by man-made or natural causes, such as bridge openings restricted by debris. These ordinances and regulations do not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or flood damages. These regulations or ordinances shall not create a liability on the part of, or a cause of action against, the Town of Kingston Springs or any officer or employee thereof for any flood damages that result from reliance on these regulations or ordinances, or any administrative decision lawfully made thereunder.

1.4.3 SEVERABILITY

If any section, subsection, sentence, clause, phrase, or portion of these regulations 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 these regulations.

1.4.4 COMPATIBILITY

If any provisions of these regulations and any other provisions of law impose overlapping or contradictory requirements, 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. These regulations do not relieve the applicant from adhering to provisions of any other applicable codes, ordinances, or regulations not explicitly repealed by these regulations.

1.4.5 SAVING PROVISION

1.4.5 SAVING PROVISION

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

Chapter 2

STORMWATER MANAGEMENT POLICY

2.1 OBJECTIVES

The objectives of these regulations are:

1. To protect human life and health.

2. To minimize expenditure of public money for costly flood control projects.

3. To minimize the need for rescue and relief efforts associated with flooding.

4. To help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to maximize beneficial use without increasing flood hazard potential.

5. To ensure that potential home buyers (and property owners) are notified that property is in a flood area and generally increase the public awareness of flooding potential.

6. To minimize prolonged business interruptions.

7. To minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, and sewer lines; and streets and bridges located in flood plains.

8. To ensure a functional drainage system that will not result in excessive maintenance costs.

9. To encourage the use of natural and aesthetically pleasing design.

10. To guide the construction of drainage and flood plain management facilities by performing comprehensive master drainage planning.

2.2 POLICY STATEMENTS

To implement the objectives presented above, the following general policy statements shall apply:

1. The Town of Kingston Springs Stormwater Management Program is intended to establish guidelines, criteria, and procedures for stormwater management activities within the Town of Kingston Springs.

2. If available, each individual project shall be evaluated for consistency with the master

stormwater management plan for the major watershed or watersheds within which the project site is located.

3. In the absence of such a master plan, a system of uniform requirements shall be applied to each individual project site. In general, these uniform requirements will be based on the criterion that post-development stormwater peak runoff and water quality must not differ significantly from pre-development conditions.

4. No construction, whether by private or public action, shall be performed in such a manner as to materially increase the degree of flooding in its vicinity or in other areas whether by flow restrictions, increased runoff, or by diminishing channel or overbank storage capacity.

5. New construction may not aggravate upstream or downstream flooding. Existing downstream or upstream problems may be required to be corrected in conjunction with new development.

6. Unwarranted acceleration of erosion due to various land development activities must be controlled.

7. An adverse accumulation of eroded soil particles in the major stormwater management system must be avoided.

8. The minimum diameter for all storm drains shall be 15 inches. Cross-drains shall be a minimum of 18 inches.

9. Development within a flood plain shall be prohibited.

2.3 DRAINAGE SYSTEMS

For the purposes of these regulations, drainage systems are considered to comprise two parts, the major and minor systems. A brief description of these two parts is presented below.

2.3.1 MINOR SYSTEMS

The minor system of a drainage network is sometimes termed the "initial system" and may consist of a variety of drainage appurtenances ranging from inlets, manholes, street gutters, roadside ditches, and swales to small channels or pipes. This system collects the initial stormwater runoff and conveys it to a proper outfall within the major system.

2.3.2 MAJOR SYSTEMS

The major system primarily consists of natural waterways, large storm sewers, and large water

impoundments, but it can also include less obvious drainageways such as overland relief swales and infrequent temporary ponding at storm sewer inlets. The major system includes not only the trunk line drain that receives the water from the minor system, but also the natural flow path that functions in case of overflow from or failure of the minor system. Properly designed overflow relief will not flood or damage homes, businesses, or other property. It must always be remembered that the major system will function whether or not it has been planned and designed, and whether or not development is situated wisely with respect to it.

2.4 STORMWATER DETENTION

Development with the Town of Kingston Springs can cause radical changes to the topography, ground cover, and minor drainage systems within each drainage basin. These changes may have adverse effects on the environment, primarily through the subsequent increase in stormwater runoff. In some areas, the combination of increased runoff and the location of property near a stream can result in more frequent flooding. In these areas, upstream control of frequent as well as large flows may not provide adequate flood protection for residents and property downstream.

To minimize adverse effects, onsite detention of stormwater is mandatory for all developments subject to review by the KSDPW. Because detention in downstream areas of a large watershed can cause increased peak flows in downstream channels, the KSDPW reserves the right to alter the detention criteria and to prohibit it where it is not in the best interests of the town. This decision shall be based on sound engineering judgement and/or studies. The KSDPW may also require or allow some type of in-stream mitigation measure in lieu of detention, where it can be shown that such measures are of equal or greater benefit. Nevertheless, in all cases where detention facilities are required, the location and design must comply with any master drainage plans that may have been adopted.

Although this policy is primarily concerned with maintaining post-development peak outflow at the level of the pre-development condition, it may be applied under certain conditions for the purpose of maintaining adequate capacity of an existing outfall. When used for this purpose, a detention facility may also aid in meeting the requirement for adequate drainage.

2.5 FLOOD PLAINS

Development of property located within the flood plain is prohibited.

2.6 EROSION AND SEDIMENT CONTROL

Any development shall be conducted in a manner which minimizes soil erosion and resulting sedimentation. Site- specific variables such as topography, soil erodibility, drainage features, and vegetation shall be considered when developing an erosion control plan. The exposed area of

any disturbed land shall be limited to the smallest practical area for the shortest possible period of time.

Chapter 3
ADMINISTRATION

3.1 OVERVIEW

The division of responsibilities for administering stormwater management activities among public agencies is summarized. The requirements for permitting and activities exempted from permit review by the Department of Public Works, the Building Inspector and the Town Engineer are delineated, both for building and grading. Procedures are established for enforcement of stormwater regulations and inspection of affected sites. Requirements for as-built certifications are also addressed.

3.2 ORGANIZATION

Administration of stormwater management activities is carried out by the Department of Public Works (KSDPW), the Town Engineer and the Planning Commission. An applicant may appeal an adverse decision of these agencies to the Board of Zoning Appeals. Specific stormwater management responsibilities of these entities are briefly discussed below.

3.2.1 TOWN ENGINEER

The Town Engineer reviews building and grading permit applications referred to it by the Building Inspector. Applications are reviewed for completeness and for technical compliance with the requirements of these stormwater management regulations and other pertinent laws and ordinances. A recommendation for approval or denial is submitted to the Building Inspector.

The Town Engineer also reviews subdivision plats and planned unit development (PUD) plans at the request of the Planning Commission. In addition, the KSDPW is responsible for enforcement and inspection activities, and for obtaining as-built certifications.

3.2.2 DEPARTMENT OF PUBLIC WORKS (KSDPW)

In order to carry out the duties set forth in these regulations, the Director of KSDPW has the authority to initiate the following actions:

1. Authorize designated employees of the KSDPW to act in his behalf in carrying out the duties set forth in Ordinance No. 93-007 and these regulations.

2. Establish and amend written regulations and technical guidelines to enforce the terms of Ordinance No. 93-007 (approval of the Mayor required).

3. Inspect private drainage systems and order corrective actions as necessary to properly

maintain drainage systems.

4. Prepare or have prepared master plans for drainage basins and such details as may be needed to implement the master plans.

3.2.3 BUILDING INSPECTOR

The Building Inspector receives building and grading permit applications and refers them to the Town Engineer and the Department of Public Works for approval before issuance. Except for exempted structures (see Section 3.5), a building permit cannot be issued until grading, drainage, and erosion control plans are approved by the Town Engineer and the KSDPW.

The Director of the Department of Public Works, with the approval of the Mayor, has the authority to establish written regulations and technical guidelines as may be necessary to enforce the terms of Ordinance No. 93-007.

3.2.4 PLANNING COMMISSION

The Planning Commission is responsible for receiving and referring subdivision plats and PUD plans to the KSDPW. Subdivision plats or PUD plans must be approved prior to applying for building or grading permits.

All preliminary concept plans for PUDs and major subdivisions submitted to the Planning Commission shall include a statement that no grading, excavating, stripping, filling, or other disturbance of the natural ground cover shall take place prior to the approval of a grading, drainage, and erosion control plan, as appropriate. Depending on the potential impact of the proposed project, the Planning Commission may require that certain requirements of these regulations be included on the preliminary plan for review by the KSDPW and the Town Engineer (see Section 4.2.2).

3.2.5 Board of Stormwater Appeals

If an applicant desires to appeal an adverse decision related to compliance with the stormwater management regulations, the Kingston Springs Board of Stormwater Appeals has been established for that purpose.

Appeals for consideration by the Board must be filed on a form provided by the KSDPW and will be handled in accordance with variance procedures of Section 3.6 and the internal operating rules and regulations of the Committee.

3.3 PERMIT REQUIREMENTS

Stormwater management activities associated with development projects require either building

or grading permits or both. Building and grading permits can be issued separately and at different times in the sequence of a project, or they can be issued jointly. Additional permits may be required by state or federal agencies.

Except for exempted activities (see Section 3.5), a building permit cannot be issued until grading, drainage, and erosion control plans are approved by the Town Engineer and the KSDPW. When grading, stripping, excavating, filling, or any disturbance to the natural ground cover is planned for non-exempted activities not requiring a building permit (see Section 3.4 for exemptions), then a grading permit is required. Any development activity within a designated flood plain is prohibited unless it is an accepted agricultural land management practice. Even when development is exempt from obtaining a grading permit (see Section 3.4) or KSDPW approval for a building permit (see Section 3.5), the KSDPW retains the authority to remove such exemption should development be found in violation of exemption criteria.

In addition, none of the following documents shall be issued or granted under applicable zoning regulations or other laws unless and until a grading, drainage, and erosion control plan has been approved by the KSDPW:

1. Final approval for a proposed major subdivision.
2. Final approval for a proposed PUD.
3. Building permit.
4. Final approval for a site plan.

Any of the above should be applied for or submitted at the same time as the grading permit application. "Conditional final approval" does not constitute "final approval" under this section.

All grading permit applications shall include a grading, drainage, and erosion control plan prepared by a professional engineer or landscape architect, as appropriate.

3.4 GRADING PERMIT EXEMPTIONS

Specific activities that are exempt from obtaining a grading permit are identified in Sections 3.4.1 through 3.4.6. These exemptions shall not be construed as exempting the identified activities from onsite drainage improvements that may be required to conform to adopted building and construction codes, or from compliance with flood plain requirements presented in Chapter 5 of this volume.

In addition, the property owner or developer whose activities have been exempted from the requirements for permits and approvals enumerated in this manual shall nevertheless be responsible for complying with the intent and provisions of these regulations.

3.4.1 EXEMPTION FOR APPROVED SUBDIVISION OR PUD GRADING PLANS

No grading permit shall be required for any structure within a major subdivision or PUD for which there exists an approved grading, drainage, and erosion control plan. However, any alteration to the original grading, drainage, and erosion control plan may require submittal of an additional grading, drainage, and erosion control plan.

Any person disturbing the natural ground cover in an area for which there is an approved grading, drainage, and erosion control plan shall conform to the requirements of such plan without exception. In addition, subsequent development activities shall not impair existing drainage, constitute a potential erosion hazard, or act as a source of sedimentation to any adjacent land or watercourse.

3.4.2 EXEMPTION FOR FINISH GRADING

No grading permit shall be required for finish grading or excavation below finished grade for the following structures:

1. Basements and footings of a single family or duplex residential structure.

2. Retaining walls.

3. Swimming pools.

4. Human or animal cemeteries.

5. Accessory structures related to single family residences or duplex structures authorized by a valid building permit, provided the disturbed material or fill is handled in such a manner as to conform to the approved erosion control plan for the area or, where no such erosion control plan is in effect, that such work is done in a manner which presents no significant erosion hazard.

3.4.3 EXEMPTION FOR EXCAVATION OR FILL

No grading permit shall be required for an excavation or fill that satisfies all of the following criteria:

1. Is less than five (5) feet in vertical depth at its deepest point as measured from the natural ground.

2. Does not result in a total quantity of more than 100 cubic yards of material being removed from, deposited on, or disturbed on any lot, parcel, or subdivision thereof.

3. Does not impair existing surface drainage, constitute a potential erosion hazard, or act as a source of sedimentation to any adjacent land or watercourse.

4. Has no fill placed on a surface having a slope steeper than five (5) feet horizontal to one (1) foot vertical (steeper slopes can be allowed if justified by calculations for appropriate stabilization measures).

5. Has no final slopes steeper than one (1) foot vertical to three (3) feet horizontal (steeper slopes can be allowed if justified by calculations for appropriate stabilization measures).

6. Has proper vegetative cover re-established as soon as possible on all disturbed areas.

7. Does not contain hazardous substances.

8. Is not partially or totally in a drainage basin with primary outlet to a sinkhole or drainage well.

3.4.4 EXEMPTION FOR AGRICULTURAL PRACTICES

No grading permit shall be required for accepted agricultural land management practices such as plowing; cultivation; construction of agricultural structures; nursery operations such as the removal of or transplanting of cultivated sod and trees; tree cuttings at or above existing ground level; and logging operations leaving the stump, ground cover, and root mat intact.

3.4.5 EXEMPTION FOR MAINTENANCE GRADING

No grading permit shall be required for grading as a maintenance measure, or for landscaping on existing developed lots or parcels, provided all of the following criteria are met:

1. The aggregate area affected or stripped at any one time does not exceed 10,000 square feet, and is not within a natural drainageway (e.g., designated flood plain).

2. The grade change does not exceed eighteen (18) inches at any point and does not alter the direction of the drainage flow path.

3. Proper vegetative cover is re-established as soon as possible on all disturbed areas.

4. The grading does not involve a quantity of material in excess of 100 cubic yards.

3.4.6 EXEMPTION FOR PUBLIC UTILITIES

No grading permit shall be required for installation of lateral sewer lines, telephone lines, electricity lines, gas lines, or other public service facilities. Although exempt, public agencies are requested to submit documents to the KSDPW for consistency reviews and to allow coordination with other activities.

3.5 EXEMPTIONS FROM KSDPW BUILDING PERMIT REVIEW

When making building permit application referrals to the KSDPW, the Building Inspector shall exempt or exclude certain residential, commercial, or industrial activities as identified below.

3.5.1 RESIDENTIAL EXEMPTIONS

Grading plan exemptions shall be given for single to two family individual residential dwellings in any given area that do not alter a drainage channel and do not alter the landscape by excavation or fill, provided the project meets all of the criteria presented in Section 3.4.3 for grading permit exemptions for excavation or fill.

3.5.2 COMMERCIAL OR INDUSTRIAL EXEMPTIONS

Grading plan exemptions shall be given for commercial or industrial development provided such development adds less than 10,000 square feet of impervious surface and all of the criteria presented in Section 3.4.3 for grading permit exemptions for excavation or fill are met.

3.6 VARIANCE PROCEDURES

The Board of Zoning Appeals shall hear and decide appeals and requests for variances from the requirements of these regulations. Appeals and requests for variances must be filed with the Board and will be handled in accordance with the variance considerations and internal operating rules and regulations of the Board. Proper justification is required for specific variances such as lower elevations or compensating storage criteria.

3.7 ENFORCEMENT

3.7.1 RIGHT OF ENTRY

The Director of KSDPW, the Town Engineer, or any of their duly authorized representatives may enter upon the premises of any land within The Town of Kingston Springs for the purposes of inspecting the site before, during, and after construction to determine compliance with these regulations.

3.7.2 REVOCATION

The Director of KSDPW may revoke any approval or permit issued under the provisions of these regulations when informed of any false statement or misrepresentation of facts in the application or plans on which the permit or approval was based.

3.7.3 CORRECTIVE MEASURES

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

3.7.4 STOP WORK ORDER

Upon notice from the Director of KSDPW or the Building Inspector, work being performed on any site within The Town of Kingston Springs contrary to the provisions of these regulations shall be immediately stopped. Such notice shall be in writing and shall be given to the owner of the property, or to the person doing the work, and shall state the conditions under which the work may be resumed.

3.7.5 PENALTIES AND INJUNCTIONS

Any violation of these regulations shall be punishable by a fine of not more than fifty ($50.00) dollars for each and every violation. Each day that a violation is not corrected shall be a separate offense.

In addition to all other remedies provided by law, the Town of Kingston Springs shall have the right to injunctive relief for any violation of these regulations.

3.8 INSPECTIONS

The KSDPW may make or cause to be made the inspections required by this section. Reports by inspectors employed by recognized inspection services may be accepted provided that, after investigation, their qualifications and reliability prove satisfactory. No certificate called for by any provision of these regulations shall be based on such reports unless the same are in writing and certified by a responsible officer of such service.

3.8.1 PERMITTING

Before the Building Inspector issues a building permit, the KSDPW may examine or cause to be examined any tract of land for which an application has been received. The KSDPW may also examine or cause to be examined any tract of land for which a grading permit application has been received.

3.8.2 CONSTRUCTION

The KSDPW shall inspect or cause to be inspected at various intervals all construction or grading for which a building permit or grading permit has been issued, and a final inspection or waiver thereof shall be made of the tract of land upon completion.

Upon notification from the permittee or his agent, inspections of the tract of land shall be performed at the following times, as well as such other inspections as may be necessary:

1. Prior to the initiation of the project.

2. After the completion of the rough grading, after installation of drainage structures, and after erosion and sediment control practices have been instituted.

3. Upon completion of the project.

The KSDPW shall either approve that portion of the construction or grading as completed or shall notify the permittee or his agent where violations are noted.

Work shall not be done on any part of the tract of land beyond the point indicated in each successive inspection without first obtaining written approval from the KSDPW.

3.9 AS-BUILT CERTIFICATIONS

Prior to the issuance of a use and occupancy permit for any structure in a development (unless exempted by Sections 3.4 and 3.5), a registered engineer shall submit to the KSDPW a certificate that the drainage system (both public and private) and the public road system is complete and functional in accordance with the plans approved by the KSDPW. To insure the adequacy of detention facilities, this certification shall include as-built drawings showing final topographic features of all these facilities.

Prior to the issuance of a use and occupancy permit for any new or substantially improved structure subject to minimum floor elevation requirements, a registered engineer and/or registered land surveyor shall submit to the KSDPW certification of the elevation (in relation to mean sea level) of the lowest floor (including basement); or if the structure has been floodproofed, the elevation (in relation to mean sea level) to which the structure was floodproofed.

Chapter 4
PERMITTING PROCEDURES

4.1 OVERVIEW

The procedure for applying for permits for building or grading and the process by which the KSDPW reviews permits is explained. Responsibilities of the applicant for posting permits, maintaining compliance with regulations, meeting time limits, and obtaining other required federal and state permits are also discussed.

4.2 APPLICATION PREPARATION

4.2.1 PREAPPLICATION CONFERENCE

All applicants may schedule a preapplication conference with the KSDPW and/or the Town Engineer to discuss their proposed project. While not mandatory, a preapplication conference is strongly encouraged to assure timely permit application preparation and review. This conference should be used to determine if a proposed project qualifies for exemption and to determine how technical guidelines and criteria should be applied.

4.2.2 REQUIRED INFORMATION AND CHECKLIST

Each application for a grading permit or a building permit referred to the KSDPW shall contain site preparation plans sealed by a registered engineer, landscape architect, or land surveyor, as appropriate. Developer shall indicate whether or not the tract will be developed in stages and timing schedules shall be included when appropriate. Site preparation plans shall include grading, drainage, and erosion control plans with appropriate plan and profile sheets for proposed streets or roads.

To assist the applicant to prepare a complete application package and thereby ensure a timely review, an application checklist is provided in Appendix A. The applicant is encouraged to attach a signed copy of the checklist with the application to certify that a complete package is being submitted.

Some requirements of the checklist will not be applicable to all projects, depending on the permit being requested. Omission of any required items shall render the plans incomplete, and they shall be returned to the applicant, or his engineer, for additional information.

4.2.3 GRADING, DRAINAGE, AND EROSION CONTROL PLANS

The grading, drainage, and erosion control plan shall be of quality suitable for reproduction by microfilm, and shall include as a minimum all of the following:

1. A complete plan of the proposed development at a scale no less than 1" (one inch) = 100' (one hundred feet). This plan is to include existing and proposed contours at intervals no greater than 2' (two feet) (NGVD to be used exclusively). Contours shall extend to the centerline of all roads bordering the site. Where drainage ultimately enters the groundwater via a sinkhole or drainage well, the drainage area tributary to the sinkhole or drainage well shall be delineated.

2. Existing and proposed buildings on the property.

3. Existing and proposed impervious surfaces.

4. Proposed and existing drainage structures, including inlets, catch basins, junction boxes, drive pipes, culverts, cross drains, headwalls, and outlet facilities, with size, type, slope, invert elevations, and quantity indicated.

5. Hydrologic and hydraulic calculations for appropriate design conditions and facilities.

6. Detention pond control structure details. If the pond is overtopped by the 100-year storm, include the emergency overflow.

7. Any proposed swale ditches, channel changes, or improvements, with typical section and length of change indicated.

8. Any high water or flood lines, either calculated or observed in the vicinity of the proposed development, and the source of said line or elevation indicated.

9. All fill areas indicated as such, with the limits and elevation indicated.

10. At least one benchmark located, with the proper elevation indicated (NGVD to be used exclusively).

11. The location and size of the two drainage structures immediately downstream of the proposed development. This may be shown on a vicinity map with a scale no less than 1" (one inch) = 2000' (two thousand feet).

12. Drainage arrows indicating the existing and proposed direction of runoff throughout the plan.

13. Invert and top of grate elevations on all catch basins and inlets in addition to flow line elevations, stations, and percent grades of all cross drains and pipe between inlets and catch basins.

14. Flood plain areas require the following information: existing and proposed flood plain and floodway boundaries along with flood plain elevations. Hydraulic calculations should

be submitted, as appropriate.

15. Temporary erosion and sediment control measures to be implemented during construction (straw bales, silt fence, etc.).

16. Final stabilization measures proposed for all disturbed areas on the property. Areas with slopes 2:1 or greater shall be stabilized with riprap or by other methods approved by the KSDPW. Show stabilization for each ditch.

17. Where special structures such as box culverts, bridges, or junction boxes are proposed, detail plans showing dimensions, reinforcement, spacing, sections, elevations, and other pertinent information shall be submitted.

18. Plans and calculations shall be signed and sealed by a registered engineer, landscape architect, and/or land surveyor, if application is for a grading permit. If application is for a building permit, they shall be signed and sealed by a registered engineer. All plans requiring engineering calculations (e.g., subsurface drainage design) shall be signed and sealed by a registered engineer.

Omission of any of the above requirements for detailed plans and calculations shall render the application incomplete, and it will be returned to the applicant, or his engineer, for additional information.

4.2.4 STREET PLAN AND PROFILE SHEETS

Street plan and profile sheets submitted for subdivisions shall include as a minimum all of the following:

1. Detail plans plotted on plan and profile sheets to a minimum scale of 1" (one inch) = 100' (one hundred feet) horizontal, and 1" (one inch) = 10' (ten feet) vertical.

2. Plan section including the street and right of way plotted to the proper scale with stationing shown, which should match that of the profile section as nearly as possible.

3. Where conventional sections are used, the stabilization required for the roadside ditches, including the linear extent and type of stabilization required.

4. Typical roadway sections, as appropriate.

5. Profile section plotted to the same scale as identified above and including the proposed centerline finish grade profile, in addition to the existing centerline profile.

6. Existing ground profiles at 25' (twenty-five feet) left and right of centerline, including the centerline, in accordance with Kingston Springs Subdivision Regulations.

7. All vertical control points on or pertaining to the proposed centerline profile such as P.V.C., P.V.I., and P.V.T.; all low points and street intersections as to station and elevation.

8. All percent grades and vertical curve data, both balanced and unbalanced.

9. Centerline finished grade elevations every 50' (fifty feet) to the nearest hundredth of a foot, at the bottom of the profile sheet.

10. Plan and profile sheets shall be signed and sealed by a registered engineer.

4.2.5 SINKHOLE AND DRAINAGE WELL INFORMATION

Because of the many drainage problems commonly associated with sinkholes and drainage wells, the applicant must provide the following information prior to the alteration of the natural drainage for watersheds discharging to such features:

1. Proposed onsite and offsite drainage channels that are tributary to a sinkhole throat or drainage well inlet shall be delineated, along with appropriate hydraulic calculations to define the existing and altered (if appropriate) 100-year flood plain and to confirm that offsite flooding will not be increased. Such drainage plans and hydraulic calculations are to be certified by a registered engineer.

2. Detailed contours are to be shown for all sinkholes that are to receive stormwater runoff from the site. These contours are to have a maximum interval of 2 feet and are to be verified by field surveys.

3. A geologic investigation of all sinkholes receiving stormwater runoff from the site shall be performed. The report from this investigation shall be certified by a registered engineer experienced in geology and groundwater hydrology and shall contain the following:

    a. Location and nature of underground aquifers.

    b. Direction of flow for the subsurface drainage associated with the sinkhole or drainage well.

    c. Estimated safe discharge from sinkhole to aquifers. Include information on method of sinkhole discharge estimation.

    d. Potential for siltation problems.

    e. Foundation problems that may be expected around sinkhole.

f. Details of drainage structures to be built in sinkholes.

g. Any other factors relevant to the design of drainage from sinkholes.

h. Plans showing the current and altered (if appropriate) 100-year flood plain.

i. Details of plan for grading and clearing of vegetation within the 100-year flood plain established for the sinkhole or drainage well. The regulations prohibiting construction in flood plains shall apply to this flood plain also.

4. Compliance with any and all conditions that may be required by the federal government or the State of Tennessee shall be documented. The Tennessee Department of Environment and Conservation Division of Ground Water Protection is the primary regulatory agency for drainage wells. Drainage into a sinkhole may require a permit for a Class V well under rules for Underground Injection Control (UIC).

5. Demonstration that development will not occur within the area flooded by the 100-year flood. The 100-year elevation may be lowered by construction of a drainage well or detention pond. Calculations that document a lowering of the 100-year flood elevation shall be based on the 100-year, 24-hour storm using an appropriate safety factor for discharge into the sinkhole.

Multiple residential developments must be designed assuming total sinkhole or drainage well blockage. A surface outlet may be provided to prevent stormwater from rising above the 100-year flood elevation. No development will be allowed within the drainage basin of a sinkhole if such development will lead to any additional increase in flood levels within that or adjacent basins. Special care will be required during construction to prevent eroded soil or debris from being washed into the sinkhole.

4.3 APPLICATION PROCESSING

Applications for grading / building permits are made to the Department of Public Works. Each major component of this review process is briefly described below.

4.3.1 INITIAL RECEIPT

When referred to KSDPW, permit applications are logged in by date.

4.3.2 REVIEW

The Town Engineer first conducts a sufficiency review of the permit application to determine if all basic information has been included. A sufficiency review checklist similar to the application checklist presented in Appendix A will be used for this purpose. Should the permit application

be determined to be incomplete, the application will be returned to the applicant along with a written request for any additional information.

When all basic information has been supplied, the Town Engineer will conduct a technical evaluation of the permit application. This technical evaluation will be based on the technical criteria outlined in Chapter 6.

4.3.3 TOWN ENGINEER RECOMMENDATION

If in the opinion of the Town Engineer, the work described in the permit application, including drawings, conforms to the requirements of these regulations and other pertinent laws and ordinances, a grading permit shall be issued and a recommendation for approval shall be given to the Building Inspector who may then issue a building permit.

However, if in the opinion of the Town Engineer, the application, including the drawings, describes work that does not conform to the requirements of these regulations or other pertinent laws or ordinances, the Town Engineer shall disapprove the application. The denial shall be accompanied by written reasons and returned to the applicant. The opinion of the Town Engineer shall be based on the results of the sufficiency review and the technical evaluation.

4.3.4 REVISIONS TO APPROVED PLANS

Should prior to or during construction, changes be anticipated that would constitute a revision of the plans already approved by the Town Engineer, the approved plans shall be revised and resubmitted in triplicate by a registered engineer, along with a letter stating why such changes are believed necessary. The Town Engineer reserves the right to waive this requirement or to re-review the entire set of plans in the light of requested changes.

4.4 CONSTRUCTION PROCEDURES

A person, firm, or corporation required to obtain a grading permit from the KSDPW in compliance with these regulations must do so prior to commencing any work pertaining to the permit. Corrective measures including but not limited to stop work orders, penalties, and injunctions may be taken as required to enforce the terms of this requirement.

4.4.1 POSTING OF PERMIT

Work requiring a grading permit shall not be commenced until the permit holder or his agent shall have posted the grading permit card in a conspicuous place on the front of the premises. The permit shall be protected from the weather and be placed to allow easy access for recording entries. The permit card shall remain posted by the permit holder until the certificate of occupancy has been issued by the Department of Codes Administration.

4.4.2 EFFECT OF PERMIT

A grading permit issued pursuant to this section shall be construed to be a license to proceed with the work and shall not be construed as authority to violate, cancel, alter, or set aside any of the provisions of these regulations, nor shall issuance of a permit prevent the KSDPW from thereafter requiring a correction of errors in plans or in construction or of violations of these regulations.

4.4.3 TIME LIMITS ON PERMIT

Unless the work authorized by a grading permit is commenced within six (6) months after the date the permit was issued, the grading permit shall become invalid and a new permit shall be required. If the work authorized by such permit is not completed in accordance with approved timing schedules, the permit shall be invalid; however, for just and reasonable cause, one or more extensions for periods not exceeding thirty (30) days each may be allowed. Requests for such extensions shall be submitted in writing to the KSDPW. Authorization shall also be in writing.

4.5 FEDERAL AND STATE PERMITS

Approval by The Town of Kingston Springs does not relieve the applicant of responsibility for obtaining any permits required by the U.S. Army Corps of Engineers, Tennessee Division of Water Management, Tennessee Department of Ground Water, Region IV of the U.S. Environmental Protection Agency, or by any other federal or state agencies.

Regulatory programs of the Corps of Engineers and requirements for Department of the Army (DA) permits are summarized below.

Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the United States unless the work has been previously authorized by a DA permit. The construction of outfalls, drainage outlets, or other structures below ordinary high water of any navigable water will require a DA permit prior to construction.

Section 301 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States unless the work has been previously authorized by a permit pursuant to Section 404 of the same Act. Placement of dredged or fill material below ordinary high water of any water in conjunction with drainage improvements (e.g., channel realignments, concrete slope paving) will require a DA permit prior to construction.

If a permit is required, approximately 60 days would normally be required for permit processing. Depending on the nature and location of the work, it is possible that the work has been previously approved under authority of the Nationwide Permit and individual processing would not be required.

Details related to permitting requirements can be obtained from the Corps of Engineers.

Chapter 5
FLOOD PLAIN REQUIREMENTS

5.1 ZONING ORDINANCE

Uses permitted within the flood plain shall be in accordance with Articles 4 and 5 of the Zoning Ordinance of Kingston Springs, Tennessee and as summarized in Sections 5.2 and 5.3 of this manual. The regulations and controls set forth shall be applied within the areas designated on the zoning map that are made a part of the Zoning Ordinance and may be viewed upon request at the Town Hall. However, nothing contained herein shall prohibit the application of the Article 4 regulations to lands that can be demonstrated by competent engineering survey, using the adopted profiles from which the flood protection elevation is derived, to lie within any flood plain. Conversely, any lands that can be demonstrated by competent engineering to lie beyond the flood plain shall not be subject to the Article 4 regulations. Any lands within the areas designated as flood plains on the zoning map or special overlays shall be subject to the regulations on controls pertaining to flood plains as set forth in this manual.

5.2 BASE FLOOD AND FLOODWAY DATA

All applications for proposed projects within areas of special flood hazard shall provide base flood elevations and floodway data to establish flood plain easements. Areas of special flood hazard along with base flood elevation and floodway data for many streams in the county are available from the Flood Insurance Rate Map (FIRM), KSDPW map revision files, and any work to develop master plans for selected watersheds. All proposed developments near streams included in these studies must be designed in accordance with the provisions of these regulations.

If a project is located in an unnumbered A zone, the applicant shall provide base flood elevation and floodway data as documented in a Flood Plain Report when the project is greater than the lesser of 50 lots or 5 acres. In addition, a Flood Plain Report shall be required for areas outside unnumbered A zones, when the stream has a drainage area of one square mile or greater. Approximate methods for flood level determination may be used if prior approval is granted by KSDPW.

The Flood Plain Report shall consist of plan and profile data and water surface elevation calculations. The plan view shall show the flood plain water surface limits, flood plain easement lines, base line, cross section stations, and adjacent boundaries. The profile should show stream invert, cross section stations, and computed water surface elevations. The report should also show the drainage divides on the plan and the ultimate zoning categories used.

Base flood elevation and floodway data submitted by the applicant for areas previously without such data or for areas not studied by FEMA, shall be reviewed by KSDPW and if acceptable, shall be processed for adoption as part of the official flood plain management data for these

regulations. When the base flood elevation and floodway data submitted by the applicant results in a deviation from the data developed by FEMA, such deviations shall become official following review and approval by both KSDPW and FEMA. All costs for FEMA review and engineering studies shall be borne by the applicant.

5.3 GENERAL STANDARDS

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

1. New construction and substantial improvements above existing surface elevations are prohibited.

2. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.

3. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters.

4. Onsite waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.

5. Any alteration, reconstruction, or improvements to a structure that is located within the one hundred year flood plain is prohibited. Repairs to an existing structure may be allowed if all other requirements of these regulations are satisfied.

5.4 SPECIFIC STANDARDS

In all areas of special flood hazard where base flood elevation data have been provided, the provisions detailed below are required. It is the intent of KSDPW that all construction, whether within or adjacent to delineated flood plains, shall be subject to the provisions of these regulations. Exceptions to this standard may be granted on appeal to the Board of Zoning Appeals based on a demonstration that the regulatory elevation is so conservative as to place an unreasonable burden upon developers or property owners.

5.4.1 RESIDENTIAL CONSTRUCTION

New construction or substantial improvement of any residential structure within the one hundred year flood plain is prohibited.

5.4.2 NON-RESIDENTIAL CONSTRUCTION

New construction or substantial improvement of any commercial, industrial, or non-residential structure within the one hundred year flood plain is prohibited.

5.4.3 FLOODWAYS

Areas designated as floodways are located within areas of special flood hazard. The floodway is an extremely hazardous area because of the velocity of floodwaters, which can carry debris and potential projectiles and have erosion potential. Thus, the following provisions shall apply:

1. Encroachments, including fill, new construction, substantial improvements, and other developments, are prohibited unless certification (with supporting technical data) by a registered engineer is provided demonstrating that the floodway as shown is in error. The applicant shall be responsible, at no expense to the Town of Kingston Springs, for obtaining a revision to the FEMA Floodway Map reflecting the revised flood plain and floodway.

2. If Item 1 above is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of these regulations.

The open space uses listed below shall be permitted within the floodway to the extent that they are not prohibited in a particular area by any base zoning ordinance and all applicable flood hazard reduction provisions of these regulations are met.

1. Agricultural uses such as general farming, pasture, truck farming, forestry, sod farming, and wild crop harvesting.

2. Public and private recreational uses not requiring "permanent or temporary structures" designed for human habitation; some examples are parks, swimming areas, golf courses, driving ranges, picnic grounds, wildlife and nature preserves, game and skeet ranges, and hunting, fishing, and hiking areas. Temporary structures are placed on a site for less than 180 consecutive days and are not intended to be improved property.

3. Utility facilities such as flowage areas, transmission lines, pipelines, water monitoring devices, roadways, and bridges.

5.4.5 FLOOD PLAIN ALTERATIONS

All flood plain alterations that result in the filling or elimination of flood plain storage are prohibited.

No alterations can be made to flood plain land and drainage channels without the written approval of the Director of KSDPW. All applicable requirements of and, in addition, the following specific conditions must be met before such approval will be granted:

1. The construction of a levee, earth fill, building, or other structure that alters a flood plain area is prohibited.

2. The proposed excavation, filling, or change of alignment of any existing channel under the jurisdiction of the U.S. Corps of Engineers shall be approved by same.

3. The plan shall be approved by the Kingston Springs Planning Commission. Any duly approved alteration of the flood plain will be so noted on the official zoning map as a matter of information. This notation will be made upon certification by the Director of the KSDPW to the Planning Commission that such alteration has been completed in accordance with the approved plan.

5.5 STANDARDS FOR STREAMS WITHOUT ESTABLISHED BASE FLOOD ELEVATIONS AND/OR FLOODWAYS

It is the intent of KSDPW that all construction whether within or adjacent to delineated flood plains, shall be subject to the provisions of these regulations. Exceptions to this standard may be granted on appeal to the Board of Stormwater Appeals based on a demonstration that the regulatory elevation is so conservative as to place an unreasonable burden upon developers or property owners.

For proposed developments located near small streams but where no base flood data or floodways have been provided or required under the Federal Flood Insurance Program or by Section 5.2 of these regulations, the following provisions apply:

1. No encroachments, including fill material and structures, shall be located within a minimum distance of 25 feet from the top of the stream bank on each side or 30 feet from the centerline of a stream channel, whichever is greater, unless certification by a registered engineer is provided demonstrating that such encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

2. New construction or substantial improvements of residential structures within the one hundred year flood plain are prohibited.

3. New construction and substantial improvements of non-residential structures are prohibited.

5.6 SUBDIVISION STANDARDS

All subdivision projects shall meet the following provisions:

1. Design shall be consistent with the need to minimize flood damage.

2. Public utilities and facilities such as sewer, gas, electrical, and water systems shall be located and constructed to minimize flood damage.

3. Drainage facilities shall be provided to reduce exposure to flood hazards.

4. Base flood elevation and floodway data shall be provided as required in Section 4.2.

5.7 STANDARDS FOR AREAS OF SHALLOW FLOODING (AO ZONES)

Designated shallow flooding areas are located within the areas of special flood hazard. These areas have special flood hazards associated with base flood depths of 1 to 3 feet where a clearly defined channel does not exist and where the path of flooding is unpredictable and indeterminate. Thus, the following provisions apply:

1. All new construction and substantial improvements of residential structures are prohibited.

2. All new construction and substantial improvements of non-residential structures are prohibited.

5.8 NONCONFORMING USES

The existing lawful use of a structure or premise that is not in conformity with the flood plain requirements of this manual may be continued subject to the following conditions:

1. No such use shall be expanded or enlarged except in conformity with the provisions of this manual.

2. No structural alterations, additions to, or repairs to any nonconforming structure over the life of the structure shall exceed 50 percent of its assessed value at the time of its becoming a nonconforming use unless permanently changed.

3. If such use is discontinued for 12 consecutive months, any future use of the building and premises shall conform to the provisions of this manual.

4. Uses or adjuncts thereof which are nuisances shall not be permitted to continue as nonconforming uses.

5. Any alteration, addition to, or repair to any nonconforming structure permitted is prohibited.

Chapter 6
TECHNICAL GUIDELINES AND CRITERIA

6.1 ADEQUATE DRAINAGE

Adequate drainage systems shall have the hydraulic capacity to accommodate the maximum expected stormwater discharge for a specified tributary drainage area and precipitation duration and intensity.

Adequate drainage systems shall be designed to accomplish the following:

1. Account for both offsite and onsite stormwater.

2. Maintain natural drainage divides.

3. Convey stormwater to a stream, channel, natural drainageway, or other existing facility.

4. Discharge stormwater into the natural drainageway by connecting the drainageway at natural elevations, or by discharging the stormwater into an existing facility of sufficient capacity to receive it, or by discharging into an approved drainage well.

Determination of the size and capacity of an adequate drainage system shall take into account the future development in the watershed or affected portions thereof. The design must not adversely affect adjacent or neighboring properties.

It is the responsibility of the developer or property owner to pick up or acceptably handle the runoff as it flows onto his property from the watershed above, and conduct it through his property to an adequate outfall at his lower property line or beyond. The outfall must be sufficient to receive the runoff without deterioration of the downstream drainageway.

6.1.1 MINOR SYSTEMS

The design of the minor storm drainage system shall be based on a storm frequency of 10 years. This criterion shall be applied to both closed conduit and open channel systems. However, if the 10-year design flow for an open channel system is greater than 100 cubic feet per second (cfs), then the open or closed system shall be capable of passing the 100-year design flow within the drainage easement. Systems relying on sinkholes or drainage wells for discharge shall be capable of passing the 100-year design flow within the drainage easement.

In residential subdivision developments where the average lot size is less than 20,000 square feet, the following general guidelines shall be observed in the design of the minor system:

1. Design surface runoff across lots shall not have erosive velocities.

2. Quantities of surface runoff greater than 4 cfs that flow through lots shall be collected and conveyed in a system of open channels, closed conduits, or a combination of both.

3. Lots should generally be graded in such a manner that surface runoff does not cross more than three lots before it is collected in a system of open channels, closed conduits, or a combination of both.

6.1.2 MAJOR SYSTEMS

Wherever possible, natural waterways serving the major system should remain undisturbed, with proposed development situated wisely accordingly. However, due to the insufficient capacity of most natural drains, improvements to the channel may be necessary to properly utilize the adjacent property. Improvements to natural open channels that are to function primarily as the major system shall be designed to pass the 100-year design flow without damage to the channel. Man-made channels designed to function as the major system (trunk line system) shall be capable of carrying a 100-year design flow. Where man-made channels are necessary, the channels should be located as far away from buildings or structures as possible and preferably in established greenbelts.

The onsite major storm drainage system for most developments is the natural backup system and consists of the less obvious drainageways. Ideally, this major system should provide drainage relief such that no building will be flooded with a 100-year design flow even if the minor system capacity is exceeded. The 100-year frequency storm shall be used to compute runoff for the design of the onsite major drainage system. This system shall be designed to provide relief for flow in excess of the 10-year design flow.

The following guidelines pertain to design of the onsite major drainage system:

1. Areas should be graded in such a manner or buildings located or constructed in such a manner that if the capacity of the minor system is exceeded, no building will be flooded by the design flow.

2. Critical areas to consider are sumps, relatively flat areas, and areas where buildings are located below streets or parking lots.

3. The 100-year frequency storm shall be used to compute runoff for the major drainage system.

4. For the first trial, the same time of concentration values shall be used that were used in designing the minor drainage system and the minor system assumed to be completely inoperable. If no building will be flooded based on these assumptions, then the analysis can be considered complete.

5. If buildings will be flooded based on the assumptions used in the preceding item, more precise hydrologic and hydraulic computations are required. The minor system, overland relief swales, or surface storage should be designed so that no building will be damaged by flooding.

6. In general, the minor storm drainage system should not be oversized as a basis for providing major system capacity. The major drainage system should be in the form of area grading or the location and construction of buildings in such a manner that overland relief swales or surface storage will provide adequate flood protection.

The major drainage system should be evident on the drainage plan, including overland relief swales and areas that may be affected by surface storage for a 100-year design storm. Calculations performed for major system design should be submitted with the drainage plan.

6.2 OPEN CHANNELS

6.2.1 CHANNEL CAPACITY

Open channel capacity shall be determined by Manning's equation. Appropriate Manning's n values as presented in Volume 2 shall be utilized for design and are subject to approval from the Town Engineer.

6.2.2 LINED CHANNELS

Open channels may be designed as lined channels. Acceptable lining materials must be placed in accordance with applicable subdivision regulations. Approval of lining materials is subject to review by the Town Engineer.

Channel lining shall be required when the design velocity exceeds the allowable, non-erosive velocity for a given channel reach and no other erosion control measures provide adequate protection.

6.2.3 GRASSED CHANNELS

The design of grassed channels shall consider the variable degree of retardance generated by different types of cover.

Temporary erosion control shall be utilized during non- growing seasons and during grass cover establishment. The engineer shall note on the drawings or in the specifications that "All grassed channels must be in a well-stabilized condition and show no sign of erosion at the time of final acceptance by the maintaining authority."

6.2.4 EASEMENT WIDTH

All open channels shall be located within the right-of-way of a drainage easement. Minimum easement width shall be determined from Table 6-1.

Table 6-1
MINIMUM EASEMENT WIDTH FOR OPEN CHANNELS

Top Width of Channel	Easement Width
Less than 5 feet	10 feet
5 - 20 feet	10 feet greater than top width of channel, with minimum of 5 feet on one side
Greater than 20 feet	15 feet greater than top width of channel, with minimum of 5 feet on one side

6.3 STORM DRAINS

6.3.1 CONDUIT CAPACITY

Closed conduits shall be designed for the total flow intercepted by the inlets during the design storm event.

6.3.2 PRESSURE FLOW

Storm drain systems should generally be designed as non-pressure systems. However, pressure flow systems if coordinated with the KSDPW during the preliminary design phase, may be allowed. The hydraulic gradient for pressure flow systems shall not exceed the following criteria:

1. An elevation greater than one foot below the established ground surface, or

2. More than five feet above the crown of the conduit.

6.3.3 EASEMENT WIDTH

Minimum allowable easement width for storm drains shall be determined from Table 6-2.

Table 6-2
MINIMUM EASEMENT WIDTH FOR STORM DRAINS

Conduit Size	Easement Width
15 - 18 inches	10 feet
21 - 33 inches1	5 feet
36 - 48 inches	20 feet
54 - 72 inches	25 feet

6.4 INLETS

Since curb and gutter inlets shall not be used as components of a major drainage system, the 100-year frequency storm shall not be considered.

6.5 CULVERTS

The design flow for culverts shall be based on the following return frequencies:

1.100-year for residential collector and commercial road crossings.

2.10-year for residential roads and crossings.

In addition, building elevations shall be checked for flooding caused by the 100-year, 24-hour storm.

6.6 OUTLET PROTECTION

The design discharge at the outlet of drainage systems shall not result in velocities that equal or exceed the erosive velocity of the receiving channel, unless energy dissipation and erosion protection measures are placed at the outlet. Energy dissipation and erosion control devices shall have no overfall at the terminal end and shall discharge onto a stable section. The

terminal section shall be considered stable if the terminal section design velocity is less than the erosive velocity.

6.7 BRIDGES

All bridges with spans of 20 feet or greater shall be designed for the 100-year, 24-hour storm event. The design flow shall consider runoff from the total tributary area and will require stream channel routing, as appropriate.

6.8 STORMWATER DETENTION/RETENTION

6.8.1 RELEASE RATE

The release rate from any detention facility should approximate that of the developed site prior to the proposed development for the 2-year through 10-year storms, with emergency overflow capable of handling the 100-year discharge except where waived or altered by the KSDPW. Adequate alternate drainage must be provided to accommodate major storm flows. Detention systems must be constructed during the first phase of major developments to eliminate damage to adjacent properties during construction. If siltation has occurred, detention systems must be restored to their design dimensions after construction is complete and certified as part of the as-built submittal (see Section 3.9).

6.8.2 DETENTION VOLUME

The required detention volume shall be that volume necessary to attenuate the post-development peak discharge to a level not to exceed the pre-development peak discharge. This volume may be minimized by careful attention to outlet structure design.

6.8.3 DRAWDOWN

Detention storage volume shall be drained within 72 hours. This requirement includes that volume above permanent pool in retention systems. Drawdown may be accomplished by a small orifice or notched weir. Other methods may be approved subject to KSDPW review.

6.8.4 MAINTENANCE

Care must be taken to ensure that any required detention facilities do not become nuisances or health hazards. Detention facilities should be designed to require minimal maintenance, and maintenance responsibility must be clearly stated on the plans. Where dual purpose facilities are provided, or where flat grades or poorly draining soils encountered, provisions for adequate low flow drainage may be required. Where the retention/detention facility is planned to be used as a lake or pond with a permanent pool, water budget calculations shall

be performed to demonstrate that an adequate pool is expected during dry summer months.

All detention facilities located in residential developments, excluding condominium developments and single family PUDs, shall be within storm drainage easements and shall be maintained by the KSDPW. Detention facilities located in industrial, commercial, or institutional developments, apartment developments, and rental townhouses must be maintained by the property owner, and a maintenance agreement must be executed before the development plan is approved.

6.9 SINKHOLES AND DRAINAGE WELLS

All drainage systems discharging to sinkholes or drainage wells shall be designed using the 100-year storm for the critical duration of the watershed tributary to the sinkhole or drainage well. A geologic investigation and report as described in Section 4.2.5 is required, along with a demonstration that development will not occur within the area flooded by the 100-year storm and that all state and federal permitting requirements are complied with.

6.10 EROSION CONTROL PLANS

An erosion control plan shall identify the erosion control practices and sediment trapping facilities which are appropriate for the site conditions in question. In addition, the appropriate schedule of implementation shall be identified. Particular attention is required for concentrated stormwater flows. Either concentrated stormwater flows shall be avoided or the conveyance system shall be protected sufficiently to prevent significant erosion. Sediment trapping devices are generally required at all points where stormwater leaves a site laden with sediment. The plan shall identify permanent stormwater conveyance structures, final stabilized conditions of the site, provision for removing temporary control measures, stabilization of the site where temporary measures are removed, and maintenance requirements for any permanent measures.

6.10.1 STABILIZATION OF DENUDED AREAS AND SOIL STOCKPILES

Permanent or temporary soil stabilization shall be applied to denuded areas within 15 days after final grade is reached on any portion of the site. Soil stabilization shall also be applied within 15 days to denuded areas which may not be at final grade, but will remain dormant (undisturbed) for longer than 60 days.

Soil stabilization refers to measures that protect soil from the erosive forces of raindrop impact and flowing water. Applicable practices include vegetative establishment, mulching, and the early application of gravel base on areas to be paved. Selected soil stabilization measures should be appropriate for the time of year, site conditions, and estimated duration of use.

Soil stockpiles shall be stabilized or protected with sediment trapping measures to prevent soil loss.

6.10.2 ESTABLISHMENT OF PERMANENT VEGETATION

A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved which, in the opinion of the KSDPW, is mature enough to control soil erosion satisfactorily and to survive severe weather conditions.

6.10.3 PROTECTION OF ADJACENT PROPERTIES

Properties adjacent to the site of a land disturbance shall be protected from sediment deposition. This may be accomplished by preserving a well-vegetated buffer strip around the lower perimeter of the land disturbance; by installing perimeter controls such as sediment barriers, filters or dikes, or sediment basins; or by a combination of such measures.

Vegetated buffer strips may be used alone only where runoff in sheet flow is expected. Buffer strips should be at least 20 feet in width. If at any time it is found that a vegetated buffer strip alone is ineffective in stopping sediment movement onto adjacent property, additional perimeter controls shall be provided.

6.10.4 TIMING AND STABILIZATION OF SEDIMENT TRAPPING MEASURES

Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment onsite shall be constructed as a first step in grading, and be made functional before upslope land disturbance takes place. Earthen structures such as dams, dikes, and diversions shall be seeded and mulched within 15 days of installation.

6.10.5 SEDIMENT BASINS

Stormwater runoff from drainage areas with 5 acres or greater disturbed area shall pass through a sediment basin or other suitable sediment trapping facility.

6.10.6 CUT AND FILL SLOPES

Cut and fill slopes shall be designed and constructed in a manner which will minimize erosion. Consideration must be given to the length and steepness of the slope, the soil type, upslope drainage area, groundwater conditions, and other applicable factors. As a minimum, all slopes at 2 to 1 or greater shall be stabilized with rock riprap, or other method approved by the Town Engineer.

6.10.7 CONSTRUCTION EXITS

A stabilized stone pad shall be placed at any point where traffic will be leaving a construction site to a public right-of-way, street, alley, sidewalk, or parking lot. Stone pads shall contain ASTM-1 stone, six (6) inches thick and be a minimum of one-hundred (100) feet long.

Appendix A

CHECKLIST

1. Property map and parcel number (obtain from Tax Assessors office). _____

2. Three (3) copies of grading, drainage, and erosion control plans as described in Section 4.2.3. _____

3. Three (3) copies of street plan and profile sheets as described in Section 4.2.4. _____

4. Three (3) copies of sinkhole and drainage well information, if applicable to the site conditions (see Section 4.2.5). _____

5. All plans and calculations submitted shall be signed and sealed by a registered engineer or landscape architect, if application is for a grading permit. If application is for a building permit, they shall be signed and sealed by a registered engineer. _____

Appendix B
DEFINITIONS

The following definitions shall apply in the interpretation and enforcement of the provisions of these regulations in addition to those terms defined in the Ordinance, unless specifically stated otherwise:

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

Appeal - A request for a review of the KSDPW's or the Town Engineer's interpretation of any provision of these regulations or a request for a variance.

Area of Shallow Flooding - A designated AO Zone on the Flood Insurance Rate Map (FIRM) with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident.

Area of Special Flood Hazard - The land in the flood plain subject to a one percent or greater chance of flooding in any given year.

Base Flood - The flood having a one percent chance of being equaled or exceeded in any given year.

Basement - That portion of a building having its floor subgrade (below ground level) on all sides.

Building - Any structure built for support, shelter, or enclosure for any occupancy or storage.

Building Permit - Permit required under the Kingston Springs Building Code.

Certification - Written verification received by the Director of the KSDPW from a registered engineer that all work performed was done in compliance with any approvals or permits previously granted.

Channel - A natural or artificial watercourse of perceptible extent, with definite bed and banks to confine and conduct continuously or periodically flowing water. Channel flow is that water which is flowing within the limits of the defined channel.

Critical Area - A site subject to erosion or sedimentation as a result of cutting, filling, grading, or other disturbance of the soil; a site difficult to stabilize due to exposed subsoil, steep slope, extent of exposure, and other conditions.

Cut - Portion of land surface or area from which earth has been removed or will be removed by excavation; the depth below original ground surface to the excavated surface.

Detention - The temporary delay of storm runoff prior to discharge into receiving waters.

Developer - Any individual, firm, corporation, association, partnership, or trust involved in commencing proceedings to effect development of land for himself or others.

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

Drainage Basin - A part of the surface of the earth that is occupied by and provides surface water runoff into a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Drainage Well - A bored, drilled, driven, dug, or naturally occurring shaft or hole with a depth greater than the largest surface dimension; used to drain surface fluid, primarily storm runoff, into a subsurface formation.

Elevated Building - A non-basement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, columns (posts and piers), shear walls, or breakaway walls.

Erosion - The disintegration or wearing away of soil by the action of water.

Excavation - See cut.

Existing Grade - The slope or elevation of existing ground surface prior to cutting or filling.

Fill - Portion of land surface or area to which soil, rock, or other materials have been or will be added; height above original ground surface after the material has been or will be added.

Finished Grade - The final slope or elevation of the ground surface, after cutting or filling.

Flood or Flooding - 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 Insurance Rate Map (FIRM) - An official map for the Town of Kingston Springs, on which the Federal Emergency Management Agency has delineated both the areas of special flood hazard and the risk premium zones applicable to the Town of Kingston Springs.

Flood Insurance Study - The official report provided by the Federal Emergency Management Agency. The report contains flood profiles, as well as the Flood Boundary Floodway Map and the water surface elevation of the base flood.

Flood Plain - 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 floodwater. For administrative purposes, the flood plain is defined as the area that would be inundated by high water at the flood profile from which the flood protection elevation is established.

Floodway - That portion of the stream channel and adjacent flood plain required for the passage or conveyance of a 100-year flood discharge. The floodway boundaries are placed to limit encroachment in the flood plain so that a 100-year flood discharge can be conveyed through the flood plain without materially increasing (less than one foot) the water surface elevation at any point and without producing hazardous velocities or conditions. This is the area of significant depths and velocities and due consideration should be given to effects of fill, loss of cross sectional flow area, and resulting increased water surface elevations.

Floodway Fringe - That portion of the flood plain lying outside the floodway. This is the area of the flood plain that may be developed or encroached upon as long as the water surface elevation of the 100-year flood is not increased by more than one foot at any point. Compensating storage is required when fill is placed in this area.

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

Functionally Dependent Facility - A facility that cannot be used for its intended purpose unless it is located or carried out in proximity to water, such as a docking or port facility necessary for the loading and unloading of cargo or passengers, shipbuilding, ship repair, or fish processing facilities. The term does not include long-term storage, manufacture, sales, or service facilities.

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

Grading - Any operation or occurrence by which the existing site elevations are changed; or where any ground cover, natural, or man- made, is removed; or any watercourse or body of water, either natural or man- made, is relocated on any site, thereby creating an unprotected area. This includes stripping, cutting, filling, stockpiling, or any combination thereof, and shall apply to the land in its cut or filled condition.

Grading Permit - A permit issued to authorize excavation or fill to be performed under the provisions of this manual.

Impervious Surface - A term applied to any ground or structural surface that water cannot penetrate or through which water penetrates with great difficulty.

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

KSDPW - Town of Kingston Springs Department of Public Works.

Major Drainage System - Storm drainage system that carries the runoff from a 100-year frequency storm. Although damage may occur, runoff will be carried by the major system whether or not it has been planned and designed, and whether or not improvements are situated wisely in respect to it.

The major system usually includes features such as streets, gulches, and major drainage channels. Storm sewer systems may reduce the flow in many parts of the major system by storing and transporting water underground. Good planning and designing of a major system should eliminate major damage and loss of life from storms having a one percent chance of occurring in any given year.

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

Minor Drainage System - Storm drainage system that is frequently used for collecting, transporting, and disposing of snowmelt, miscellaneous minor flows, and storm runoff up to the capacity of the system. The capacity should be equal to the maximum rate of runoff to be expected from the initial design storm, which has statistical frequency of occurrence of once in ten years.

The minor system is sometimes termed the "convenience system," "initial system," or the "storm sewer system", and may include features ranging from curbs and gutters to storm sewer pipes and open drainageways.

National Geodetic Vertical Datum (NGVD) - As corrected in 1929, a vertical control used as a reference for establishing varying elevations within the flood plain.

Natural Ground Surface - The ground surface in its original state before any grading, excavating, or filling.

New Construction - Structures for which the "start of construction" commenced on or after the effective date of these regulations.

One Hundred-Year Flood - One that has an average frequency of occurrence of once in one hundred (100) years, determined from an analysis of floods on a particular watercourse and other watercourses in the same general region. Statistically, it has a one percent chance of occurring in any given year.

Permittee - Any person, firm, or any other legal entity to whom a grading or building permit is issued in accordance with these regulations.

Planning Commission - Town of Kingston Springs Municipal Planning Commission.

PUD - Planned unit development, as defined in the Town of Kingston Springs Zoning Ordinance.

Registered Engineer - An engineer duly registered or otherwise authorized by the State of Tennessee to practice in the field of civil engineering.

Registered Architect - An architect duly registered or otherwise authorized by the State of Tennessee to practice in the field of building architecture.

Registered Landscape Architect - A landscape architect duly registered or otherwise authorized by the State of Tennessee to practice in the field of landscape architecture.

Registered Land Surveyor - A land surveyor duly registered or otherwise authorized by the State of Tennessee to practice in the field of land surveying.

Registered Grading - Any grading performed with the approval of and in accordance with criteria established by the KSDPW.

Retention - The prevention of storm runoff from direct discharge into receiving waters. Examples include systems which discharge through percolation, exfiltration, filtered bleed-down and evaporation processes.

Sediment - Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, or gravity as a product of erosion.

Site - All contiguous land and bodies of water in one ownership, graded or proposed for grading or development as a unit, although not necessarily at one time.

Slope - Degree of deviation of a surface from the horizontal, usually expressed in percent or ratio.

Soil - All unconsolidated mineral and organic material of any origin that overlies bedrock and that can be readily excavated.

Soil Engineer - A professional engineer who is qualified by education and experience to practice applied soil mechanics and foundation engineering.

Start of Construction - Includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date. The actual start means the first placement of permanent construction of a structure (including a manufactured home) on a site, such as the pouring of slabs or footings, installation of piles, construction of columns, or any work beyond the stage of excavation or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds, not occupied as dwelling units or not part of the main structure.

Stripping - Any activity that removes or significantly disturbs the vegetative surface cover, including clearing and grubbing operations.

Structure - Anything constructed or erected, the use of which 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.

Structure, Permanent - A structure that is built of such materials and in such a way that it would commonly be expected to last and remain useful for a substantial period of time.

Structure, Temporary - A structure that is built of such materials and in such a way that it would commonly be expected to have a relatively short useful life, or is built for a purpose that would commonly be expected to be relatively short-term.

Substantial Improvement - Any combination of repairs, reconstruction, alteration, or improvements to a structure, taking place during the life of a structure, in which the cumulative cost equals or exceeds fifty percent of the market value of the structure. The market value of the structure should be (1) the appraised value of the structure prior to the start of the initial repair or improvement, or (2) in the case of damage, the value of the structure prior to the damage occurring. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the

external dimensions of the structure. The term does not, however, include any project for improvement of a structure required to comply with existing health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions.

SWCD - Cheatham County Soil and Water Conservation District.

Temporary Protection - Short-term stabilization of erosive or sediment-producing areas.

Variance - A grant of relief from the requirements of these regulations which permits construction in a manner otherwise prohibited by these regulations where specific enforcement would result in unnecessary hardship.

Vegetative Protection - Stabilization of erosive or sediment producing areas by covering the soil with any of the following materials:

1. Permanent seeding for long-term vegetative cover
2. Short-term seeding for temporary vegetative cover
3. Sodding, producing areas covered with a turf of perennial sod-forming grass
4. Tree planting
5. Other planting

Water Budget - A chronological accounting of water volume changes (including infiltration, exfiltration, evaporation, diversion, inflow, and outflows) to and from a point of storage such as an aquifer, retention pond, or other natural or man-made water system.

Watercourse - A channel, natural depression, slough, gulch, 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.

Zoning Permit - Permit required under the Town of Kingston Springs Zoning Ordinance.

Approved and certified by the Planning Commission on March 11, 1993.

Kathy McClanahan
Chairperson

Approved by the Mayor and Board:

Mayor

Attest: Debbie K. Finch
City Recorder

First Reading May 20, 1993

Second Reading June 17, 1993

Third Reading July 15, 1993

Approved as to Form and Legality:

City Attorney