

BLACK & VEATCH

MEMORANDUM

Leavenworth, Kansas  
Stormwater Master Plan  
New Development Plan Review Criteria

B&V Project 26529.110  
B&V File W  
May 28, 1999

To: Mike McDonald

From: Jeff Henson

New Development Plan Review Policies and Procedures

I. OBJECTIVE

This document lists the policies and procedures to be used by the City in reviewing drainage plans associated with new developments. A new development is defined as a tract of land containing four (4) or more lots to be developed.

II. POLICIES

The following policies relating to storm drainage were adopted by the City as part of the development of a Stormwater Master Plan (Master Plan).

II.1. A drainage report must be submitted by a professional engineer registered in the State of Kansas. The report shall be signed and sealed.

II.2. New Development plans shall include plans for the conveyance of stormwater and shall be signed and sealed by a professional engineer registered in the State of Kansas. The stormwater facilities shall be designed in accordance with design criteria set forth in "Drainage Criteria Manual, City of Leavenworth, Kansas," (Design Criteria) developed as part of the Master Plan.

II.3. Easements for drainage shall be granted to the City for access to underground drainage improvements and along open channels where the flow is greater than which could be conveyed by a 72 inch diameter pipe. Minimum easement requirements are listed in the Design Criteria.

II.4. Curbs and gutters shall be provided on all new roadways.

II.5. Off-site drainage improvements or detention storage shall be provided if peak flow rates resulting from the new development are greater than those shown in the Master Plan.

II.6. Underground drainage systems shall be installed in all areas where the flow can be contained in a 72 inch diameter pipe.

II.7. Systems shall be designed to address State and Federal regulations regarding stormwater quality.

III. PLAN REVIEW PROCEDURES

As part of the site plan approval process, Drainage Plans shall be reviewed by the Engineering staff. The drainage plan submittal shall consist of a Drainage Report and Drainage System Plans.

III.1. Drainage Report. The drainage report shall be submitted by the developer and it shall be signed and sealed by a professional engineer

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in the State of Kansas. The Drainage Report shall consist of the following:

III.1.1. Assumptions. A listing of the assumptions used in calculation of peak runoff rates and capacities of the proposed system and the existing receiving system.

III.1.1.2. Topographic Map. A topographic map showing the location of the site. The map shall include a plan of the existing surface features; the proposed development; the proposed drainage system location; size, and capacity; the existing receiving system location, size, and capacity; delineation of tributary areas to points of concentration in the drainage system; and delineation of individual lot drainage patterns. The map shall be at a scale of 1"=100' with 2 foot ground elevation contour lines.

III.1.1.3. Watershed Information. A table showing the land use, soil type, area, and slope of each tributary area.

III.1.1.4. Runoff Information. Tables summarizing the runoff characteristics shall be provided. The Rational method shall be used for estimating peak runoff for areas less than 300 acres. A hydrograph method for estimating peak runoff shall be used for areas larger than 300 acres. Computer models such as TR-55, TR-20, HEC-1, or SWMM are acceptable.

III.1.4.1. Rational Method Runoff Information. A table shall be provided showing the Rational method calculations including: cumulative area to the point of concentration, cumulative C value, time of concentration, rainfall intensity, and peak flow rate, drainage system size, and drainage system capacity. These calculations should be provided for both the pre-development and post-development conditions.

III.1.4.2. Hydrograph Method Runoff Information. A table shall be provided showing the runoff information including: drainage areas to each point of concentration, cumulative percent impervious, time of concentration for the watershed, design storm, peak flow rates, drainage system size, and drainage system capacity. These calculations should be provided for both the pre-development and post-development conditions.

III.1.5. Receiving System Information. A comparison of the ultimate development peak flow rate shown in the Master Plan versus the peak flow rate calculated in the report should be made. If the new development increases peak flows above those shown in the Master Plan, then off-site drainage improvements or a detention basin will be required.

III.1.5.1. Off-Site Drainage. Off-site drainage improvements required in section III.1.5. shall be identified in the Drainage Report. A topographic map, watershed information, and runoff information shall be provided for off-site drainage improvements in accordance with sections III.1.1. through III.1.4.

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III.1.5.2. Detention Storage. Detention storage can be provided in lieu of off-site drainage improvements. Storage shall be provided so that peak discharge rates are equal to or less than those shown in the Master Plan. A topographic map meeting the requirements of III.1.2 shall be included. Additional items shall include stage-storage-discharge curves, inflow and outflow hydrographs, and spillway configuration and capacity.

III.2. Drainage System Plans. Plan and profile of the drainage system shall be submitted. The drainage system drawings shall be in conformance with the following.

Plan:	1-inch =	50-feet
Profile:		
Vertical:	1-inch =	10-feet
Horizontal:	1-inch =	50-feet
Cross-Sections:		
Vertical:	1-inch =	10-feet
Horizontal:	1-inch =	50-feet

III.3. City Review. Drainage Plans shall be reviewed by Engineering staff. Comments shall be provided to the developer within 60 days of receipt. Building permits shall not be granted until final approval of the Drainage Plans is obtained.

III.4. Construction Inspection. City building inspectors shall verify that the drainage system and site grading are constructed according to plans. Any changes in the plan during construction shall be approved by the City.

III.5. Permit to Occupy. The developer must show proof that the drainage system and site grading were constructed in accordance with plans to receive the permit to occupy. Proof shall consist of a final site survey including spot elevation checks. Verification of any changes to the plans during construction shall also be submitted with the final site survey and shall show altered drainage patterns. Comments shall be provided to the developer within 30 days of receipt of the final site survey.