



CITY OF TOPEKA DRAINAGE REVIEW GUIDELINES

Design:

A. Reports

A drainage engineering study and report shall be made on all developments.

Exceptions:

- i. When the development results in no impervious area and no existing drainage problems are evident.
- ii. When the development is in an area covered by an existing drainage report that contains the information listed below
- iii. When a drainage study is deemed not necessary by the City Engineer and so stated in written form.

Contents of Report:

- i. Determine existing runoff
- ii. Determine developed runoff using weighted runoff coefficients based on site plan.
- iii. Determine capacity of the City storm sewer system at the point where the site storm sewer will tie in.
- iv. If the City system will not handle the additional runoff, determine type, size and location of detention storage.
- v. Note any Floodplain restrictions.
- vi. Note any previous restrictions or agreements that affect drainage.

The report containing the above noted information must be signed and sealed by a licensed engineer and submitted with the site plan.

B. Storm Sewer Design – PIPING

Storm sewer design shall follow the current City of Topeka Standards and Design Criteria Manual. Exceptions to the manual or the criteria that follows may be made only with the approval of the City Engineer.

The on-site storm sewer system shall be designed according to the latest edition of the "City of Topeka Standards and Design Criteria Manual". The system shall be designed for the 10 year storm with provisions for overflow for the 100 yr storm and the following information shall be noted in tabular form on the site plan:

Plan:

1. Inlet Design:

- a. Area that drains to each inlet
- b. C factor for the area
- c. Time of concentration for the area
- d. Intensity associated with the Tc
- e. Total flow at the inlet (including any upstream bypass)
- f. Total flow entering the inlet
- g. Total bypass

2. Pipe Design:
 - a. Contributing area
 - b. C factor for the area
 - c. Time of concentration (including pipe travel time)
 - d. Flow in pipe
 - e. Pipe size
 - f. N factor
 - g. Slope
 - h. Pipe Capacity
 - i. Velocity

The following minimum design standards shall apply:

- a. Minimum pipe size = 15"
- b. Minimum velocity = 3 fps
- c. Minimum gutter slope = 0.5%
- d. Minimum Tc = 5 minutes
- e. No more than 1.5 cfs is allowed to discharge out a private driveway into public street

C. Storm Sewer Design – CHANNELS

Channel design shall be in accordance with the sections of the "City of Topeka Standards and Design Criteria Manual" that cover channels. Channels shall be designed for the 100 year storm with a depth for the 5 year storm calculated. The following information shall be noted in tabular form on the site plan for each channel:

- a. Contributing area
- b. C factor
- c. Tc
- d. Intensity
- e. Flow
- f. n factor
- g. Slope
- h. 5 year depth and velocity
- i. 100 year depth and velocity

D. Storm Sewer Design – DETENTION FACILITIES

Storm Detention design shall follow the current City of Topeka Standards and Design Criteria Manual. The following information shall be included on the site plan for each detention area:

- a. Easements – An easement shall be dedicated to the City to provide access for inspection, construction and maintenance must be provided for all storm water detention facilities except the following:
 - i. Roofs of buildings or structures used for other purposes
 - ii. Paved surfaces used for other purposes
 - iii. Enclosed underground structures on private property when the surface is used for other purposes.

Easements must cover the land occupied by the facility to the high water elevation plus an access easement of 20 feet adjacent to the structure for maintenance access, plus an entry access easement (if necessary) between the structure and the nearest public street.

- b. Design of the detention facility shall be accomplished using any recognized engineering method to establish the inflow hydrograph. The ration formula may be used for any watershed up to 320 acres. Any type or combination of detention facilities may be used including roofs, parking lots, underground pipes, underground structures and ponds. The post-development discharge from the

site shall not exceed the pre-development discharge for any return period from 2 years to 100 years. The storm frequency and release rate from the detention structure shall be determined by the capacity of downstream structures, previous basin-wide drainage reports or, if designated as an area that requires on-site detention, by the undeveloped flow rate.

- c. The following information shall be submitted with the site plan:
 - i. Inflow hydrograph (tabular)
 - ii. Stage-storage-outflow chart (tabular)
 - iii. Routing information including peak storage and outflow
- d. As-built plans of the detention facility, certified by an engineer or surveyor, shall be submitted upon completion of construction

E. Plan Requirements

Site plan shall contain the following information relative to drainage:

- a. Minimum Building Elevation
- b. The inlet and pipe flow charts noted above
- c. Proposed contours
- d. Inlet types, locations, top and invert elevations
- e. Pipe locations, lengths, types and sizes
- f. Direction of above ground flow (in gutters and overland)
- g. Amount of flow leaving site via driveways
- h. Amount of runoff entering existing system (existing vs proposed, 10 & 100 yr)
- i. How will 100 year water be handled
- j. Location of detention facilities (2-100yr – see design criteria)
- k. Location of proposed drainage easements