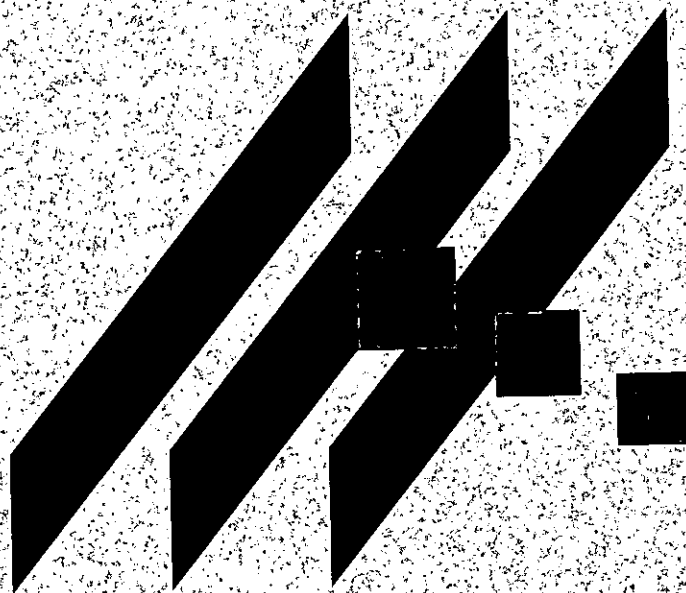


M I D - K A N S A S E N G I N E E R I N G C O N S U L T A N T S , I N C



**DRAINAGE REPORT**

**FOR**

**WILSON FARMS THIRD ADDITION**

**SEPTEMBER 2001**

# Drainage Report for Wilson Farms Third Addition

## Location

The site is located South of 21<sup>st</sup> Street North between Rock Road and Webb Road, in the North Half of Section 8, T27S, R2E. The dimensions are roughly 1200 feet east to west and 1200 feet north to south. The total site area is approximately 25.4 acres. A FEMA floodplain is adjacent to the site, to the West.

## Soils

According to the NRCS (SCS) Sedgwick County Soil Survey, the drainage watershed is in the Irwin Series: (Ia: silty clay loam, 1-3 percent slopes), the Rosehill Series: (Rd: silty clay, 1-3 percent slopes), and the Clime series: (Ce: silty clay, 3-6 percent slopes). The Hydrological Soil Group (HSG) to select runoff coefficients is "D".

## Developed Condition

### *Development*

The site will be developed as a residential subdivision with the average lot size approximately  $\frac{3}{4}$  acre.

### *Landform and Slope*

Final slopes in the residential development have not been determined, but the minimums will be 0.5% within street right-of-way, and 1-2% in backyards.

### *Runoff Characteristics*

The rational method was used in determining the size of the storm sewers shown in the Drainage and Utility Plan, Appendix A. The spreadsheet in Appendix B displays the area, runoff coefficient (c), time of concentration ( $t_c$ ), and the flow rate (Q) for each sub-watershed, for the 2 and 5 year events. Once the discharge was determined for each of the sub-watersheds, the Manning's nomograph was used to determine a preliminary size for the structures. The structure sizes are listed in the spreadsheet also.

The peak runoff from the Middle Branch Gypsum Creek basin (shown in Appendix C) into the ponds West of the site is 851 cfs. This is calculated to the Burlington-Northern Railroad tracks at the south end of the Wilson Farms development. The Middle Branch Gypsum creek watershed area is 2.08 square miles at this point. The increase in peak runoff from the site is 8 cfs, or 0.9% of the total basin. Due to the proximity of the development to the ponds, the peak flow from this development will pass through the pond before the peak flow from the larger Middle Branch Gypsum Creek basin reaches the pond. The development of this site has a negligible effect on water surface in and peak flow through the pond due to the relative sizes of the basins.

**Summary**

The currently undeveloped area will be replatted from 1/2 acre lots to 3/4 acre lots. Detention ponds are located to the west of the site and will contain excess runoff created by this development. The peak runoff from this development will occur before the peak in the FEMA floodplain. The rational method and Manning's nomograph were used to determine pipe sizes for the site. The storm sewer and detention ponds support development of the site.

Appendix A

Appendix B



Appendix C

