

**DRAINAGE REPORT**  
**FlightSafety 2nd Addition**  
**SEDGWICK COUNTY,**  
**KANSAS**

**November 3, 2008**

# FlightSafety 2<sup>nd</sup> Addition DRAINAGE ANALYSIS

November 3, 2008

## INTRODUCTION

This report contains supporting documentation and calculations for the proposed FlightSafety 2<sup>nd</sup> Addition development. The proposed site is a 4.9 acre parcel of land located in the NE ¼ of Section 16 T27S R2E on Greenwich Road south of 13<sup>th</sup> Street. The area is currently pastureland and the soil types located on site are Rosehill and Irwin, both silty clays in hydrologic group D. An offsite area of 0.3 acres is accepted onto the northeast corner of the site. The majority of the site drains to an existing pond located in the approximate center of the south property line. The pond is located on both the project site and the parcel to the south. Portions of the site also bypass the pond and drain to the east to the Greenwich road ditch and also sheet drains west off the site.

The development will cut the dike of the existing pond. A new pond will be created entirely within the boundaries of the site. An outlet pipe will control the pond outflow and a channel will be graded through the former location of the existing pond.

## HYDROLOGY

The detention analysis and the hydrology for the pre and post development models were performed using HEC-HMS. The times of concentration were calculated using the velocity method and overland flow rates from attachment E of the City of Wichita Drainage Criteria. The parameters and results of the existing and proposed analysis are shown in the tables below.

Existing	Area (ac.)	CN	Q100 (cfs)
Onsite	3.5	80	13.0
Offsite	0.3	80	1.1
Bypass	1.4	80	5.3
Junc.-1*	5.2	--	19.4

\* Comparison point for Existing vs. Proposed conditions.

Proposed	Area (ac.)	CN	Q100 (cfs)
Onsite	4.6	90	20.5
Offsite	0.3	80	1.1
Bypass	0.3	80	1.1
Reservoir 1	4.9	--	10.6
Junc.-1*	5.2	--	11.2

\* Comparison point for Existing vs. Proposed conditions.

The results demonstrate that the detention provided in the pond will adequately reduce the peak runoff from the site to less than or equal to pre development levels. Design parameters of the proposed detention ponds are discussed in a later section.

The rational method was used to determine peak flow rates for the basins located within the plat. The attached Drainage Plan shows the on site drainage calculations.

### **DETENTION POND**

The SCS Type II Rainfall Distribution as modeled by the HEC-HMS program is used for analysis, with a total 100-year 24 hour rainfall event of 7.8 inches (TR-55). This rainfall model is used for all basins. The attached drainage maps demonstrate the extents of the detained tributary area. A 15” RCP outlet shall control the outflow of the pond. The pond shall have an outlet elevation of 1385.00. A summary of the detention pond performance in the design storm can be found in the table below.

<u>Detention Pond</u>				
<u>Design Storm</u>	<u>Peak Inflow (cfs)</u>	<u>Peak Outflow (cfs)</u>	<u>Peak Storage (ac-ft.)</u>	<u>Peak Elevation</u>
100-yr	21.3	10.6	0.6	1388.5

The stage-storage data was calculated by HEC-HMS using the parameters located in the table below.

<u>Stage</u>	<u>Area (ac-ft)</u>
1385.0	0.0
1386.0	0.13
1387.0	0.23
1388.0	0.29
1389.0	0.35