

**DRAINAGE REPORT
FOR
FLIGHTSAFETY ADDITION
SEDGWICK COUNTY,
KANSAS**

January 28, 2008

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**FLIGHTSAFETY ADDITION
DRAINAGE ANALYSIS
January 28, 2008**

INTRODUCTION

This report contains supporting documentation and calculations for the proposed plat FlightSafety Addition. The existing site is a parcel containing several tracts of land. Located between Webb and Goebel Road, and just south of Central Avenue, a list of these parcels is shown on the Preliminary Plat, see Appendix C. The total area for this site is approximately 4.79 acres.

The area is currently developed with a building and adjacent parking and most drains southerly by storm sewer and sheet drainage. A small area of the north parking lot is collected in a curb inlet and routed into the storm sewer system in Central Ave. The existing buildings have a roof drainage system that routes runoff south and into the storm sewer system directly south of the site.

The proposed development to this site will add additional building area and reduce impervious area on this site by approximately 10%. To eliminate the increased peak runoff from the additional impervious area, storm water detention will need to be accomplished with on site detention areas. The proposed design will include 3 areas with restrictive drainage systems to ensure peak runoff will not increase. This will create 3 detention areas in the proposed parking areas.

EXISTING DRAINAGE CONDITIONS

A small area of the north parking lot is collected in a curb inlet and routed into the storm sewer system in Central Ave. The remaining site and existing buildings drain to the south, to a adjacent storm sewer system. The existing building has a roof drainage system that routes runoff directly into that storm sewer system. In 1982, a drainage study for this parcel was completed for the Flight Training Center Addition. In that study, completed by Baughman Co., the downstream sewer has the additional capacity of 42 cfs without an adverse effect to drainage. The offsite adjacent storm sewer system is located in a diversion ditch and dike easement, adjacent to the south edge of this property, and consists of 2-54" RCPs. The study concluded the offsite system will route runoff from land located east of this site and route the overflow to the west and into a box located under Webb Road.

Existing soil consists of soil group C, with the North and Southeast basins covered with approximately 80% impervious pavement or building. The Southwest basin has asphalt parking with approximately 90% impervious pavement. Central Avenue has a storm sewer system and Goebel drains to the south directly into the storm system to the south. This ensures no additional runoff drains onto this site from adjacent property.

The North and Southeast Basins have a land use categorized as Heavy Industrial Use (80% impervious) with minimal time of concentration. The Southwest Basin has a land use categorized as Downtown Business (>90% Impervious) Use with minimal time of concentration. There is no significant detention on site. A minimum time of concentration and of 15 minutes and runoff coefficients was used, per City of Wichita Storm Sewer & Drainage Design Standards. Peak flow rates for the site were determined using the Rational Method and modeled with the use of HydroCad. The results of the existing analysis are shown in the Table 1, below:

Existing	Area	C ⁵	C ¹⁰⁰	TC (min.)	Q ⁵ (cfs)	Q ¹⁰⁰ (cfs)
North Basin	1.17 ac.	0.76	0.84	15	4.09	7.31
Southwest Basin	1.27 ac.	0.85	0.91	15	4.96	8.59
Southeast Basin	2.35 ac.	0.76	0.84	15	8.21	14.68
Entire Site	4.79ac.	-	-	15	17.22	30.19

Table 1

A print out of the HydroCad model with Description and condition is included with Appendix A.

PROPOSED DRAINAGE CONDITIONS

The proposed improvement to this site includes expansion to the existing building and improvements to the parking lot. The proposed site will increase the impervious area of the site to approximately 91%. The increased impervious area will increase the volume of runoff and peak discharge. Parking lot detention can be utilized to eliminate an increased discharge from the existing conditions. Detention areas located in the Northwest, Northeast and Southeast parking lots will detain runoff in shallow areas, noted on the Drainage Plan. This can be accomplished with construction of standard inlets with reduced outfall pipe diameters.

The proposed area will have an overall land use similar to Downtown Business (>90% impervious area) and has been modeled using the Rational Method. Detention area was developed by the Dynamic Storage Indication Method and modeled using HydroCad. A preliminary ponding area and required pipe restriction is noted on the Drainage Plan, see Appendix D. The results of the proposed runoff analysis are shown in the Table 2, below:

Proposed Improvements	Area	C ⁵	C ¹⁰⁰	TC (min.)	Q ⁵ (cfs)	Q ¹⁰⁰ (cfs)	Pond ⁵ (cf)	Net (cfs)	Pond ¹⁰⁰ (cf)	Net (cfs)
Northwest Basin	1.18 ac.	0.85	0.91	15	4.61	7.98	382	3.32	643	7.72
Northeast Basin	0.32 ac.	0.85	0.91	15	1.25	2.16	14	1.12	443	1.17
Southwest Basin	0.94 ac.	0.85	0.91	15	3.67	6.36	0	3.67	0	6.36
Southeast Basin	2.35 ac.	0.85	0.91	15	9.18	15.90	0	9.18	1007	13.19
Entire Site	4.79ac.	0.85	-	15	18.71	32.40	396	17.22	2093	26.94

Table 2

Appendix A

EXISTING CONDITIONS

Appendix B

PROPOSED CONDITIONS

Appendix C

**USGS MAP
PRELIMINARY PLAT
FEMA FIRM
ORTHOPHOTO OF SITE**

Appendix D

DRAINAGE PLAN