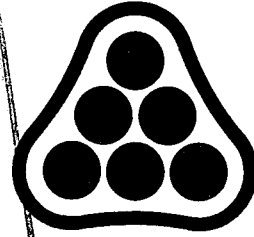
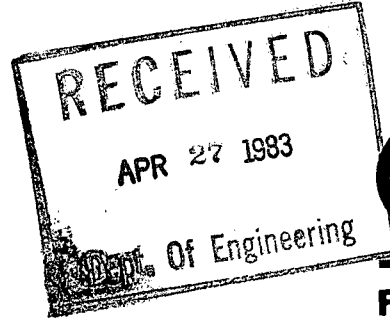
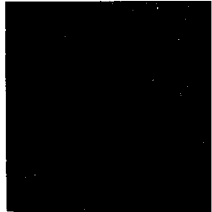


**DIRECTORS**

C. O. KNOP, P.E.  
R. B. PEUGH, P.E.  
C. J. FREUND, P.E.  
W. H. KELTNER, P.E.  
R. D. PLETCHER, P.E.  
F. D. MIDDLETON, JR., P.E.  
D. E. MALTBIE, P.E.  
M. D. SCHOMAKER, P.E.  
G. D. SCHOCK, P.E.  
J. H. BAILEY, P.E.



**P**ROFESSIONAL  
**E**NGINEERING  
**C**ONSULTANTS  
PROFESSIONAL ASSOCIATION



April 26, 1983

The City of Wichita  
Department of Engineering  
7th Floor - City Hall  
455 N. Main  
Wichita, KS 67202

Attention: Mr. Chris Breitenstein, P.E.  
Drainage Engineer

Reference: Colonel James Jabara Airport Addition  
Platting & Zoning  
PEC File No. 36-82258-019

Dear Mr. Breitenstein:

Transmitted herewith are supporting calculations for the Drainage Plan for Colonel James Jabara Airport Addition.

Included in this transmittal are hydrology and hydraulic computations for each of the four (4) storm sewer systems shown on the attached sketch.

We trust this information is sufficient to approve said Drainage Plan.

If you have any questions, or need any additional information, please call at your convenience.

Very truly yours,

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

A handwritten signature in cursive script that reads "Charles S. Brown".

Charles S. Brown, P.E.  
Project Engineer

CSB/bea

Enclosure

cc: Mr. Phil Dietrich

```

LNH
00010 T COL. JAMES JABARA AIRPORT ADDITION
00020 T 5 YEAR STORM ANALYSIS AREA NO. 1
00030 T PEC FILE NO. 36-82258-019 4-22-83
00040 X 5 8 5
00050 I 135 0.8 0.8 4.0 600 0 0 1422.5
00060 I 130 0.7 4.5 7.0 700 0 0 1422.5
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00080 I 120 0.7 3.1 3.0 500 0 0 1421.0
00090 M 115 1419.0
00100 I 110 0.8 0.7 5.0 500 0 0 1416.0
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00130 Y 1411.0 100
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00150 P 130 120 330 24 0.013 0 0
00160 P 125 120 100 18 0.013 90 0
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00180 P 115 105 110 30 0.013 40 0
00190 P 110 105 50 15 0.013 70 0
00200 P 105 100 350 30 0.013 80 0
00210 EJ
00220 T COL. JAMES JABARA AIRPORT ADDITION
00230 T 5 YEAR STORM ANALYSIS AREA NO. 3
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```

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00830 P 390 395 150 30 0.013 0 0  
00840 ER  
\*RDY\*



COL. JAMES JABARA AIRPORT ADDITION  
 5 YEAR STORM ANALYSIS AREA NO. 1  
 REC FILE NO. 36-82258-019 4-22-83

\* \* \* H Y D R A U L I C S \* \* \*

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*****
POINT      HYD-SLOPE  FRICTION  BEND      TRANSITION  MANHOLE  DEFLECTION  JUNCTION  TOTAL  HYD-GL  DESIRED  DIFF.
          (FT/FT)   (FT)      (FT)      (FT)        (FT)     (FT)       (FT)     (FT)   (FT)    (FT)    (FT)
*****
135      .00265     .1326     0.         0.           0.         0.         0.         .1326  1421.06  1422.50  1.44
130      .00636     2.0977    0.         .0398        0.         .0571      1.3690   3.5635  1420.92  1422.50  1.58
125      .00098     .0979     0.         0.           0.         0.         0.         .0979  1417.46  1421.00  3.54
120      .00577     .9233     0.         .0114        0.         0.         .7587   1.6935  1417.36  1421.00  3.64
115      .00577     .6348     0.         0.           .0313     .1182     .0289   .8132  1415.67  1419.00  3.33
110      .00205     .1023     0.         0.           0.         0.         0.         .1023  1414.96  1416.00  1.04
105      .00870     3.0462    0.         .0318        0.         .1182     .4582   3.8544  1414.85  1416.00  1.15
100      0.         0.         0.         0.           0.         0.         0.         0.     1411.00  1411.00  0.
*****

```

COL. JAMES JABARA AIRPORT ADDITION  
 5 YEAR STORM ANALYSIS AREA NO. 3  
 PEC FILE NO. 36-82258-019 4-22-83

\* \* \* H Y D R O L O G Y \* \* \*

***** TRIBUTARY AREA *****										***** HYDROLOGY SUMMARY *****												
POINT TO POINT	C	AREA SLOPE (AC)	LEN (FT)	TC(O) (MIN)	I(O) (IN/HR)	Q(O) (CFS)	TC (MIN)	I (IN/HR)	Q (CFS)	SUM Q (AC)	TC	I	Q	SUM Q	SUM A	SIZE	CONDUIT DATA	VELOCITY (FT/SEC)	LENGTH (FT)	TT (MIN)	TT + TC (MIN)	
360	355	.90	1.20	.71	350	15.0	5.22	5.6	15.0	5.22	5.6	5.6	1.2	15"	4.59	90	.3	15.3				
355	350	.80	.80	.50	400	15.0	5.22	3.3	15.3	5.17	3.3	8.9	2.0	18"	5.06	90	.3	15.6				
350	345	.80	.80	.50	400	15.0	5.22	3.3	15.6	5.13	3.3	12.2	2.8	24"	3.89	230	1.0	16.6				
345	305	.90	.90	.83	300	15.0	5.22	4.2	16.6	5.01	4.1	16.3	3.7	24"	5.19	150	.5	17.1				
340	335	.70	3.80	.83	600	18.7	4.78	12.7	18.7	4.78	12.7	12.7	3.8	18"	7.20	50	.1	18.9				
335	315	.80	1.00	.63	400	15.0	5.22	4.2	18.9	4.77	3.8	16.5	4.8	24"	5.26	440	1.4	20.3				
330	325	.70	5.00	.86	700	20.1	4.66	16.3	20.1	4.66	16.3	16.3	5.0	21"	6.78	90	.2	20.3				
325	315	.70	3.90	1.00	600	17.6	4.90	13.4	20.3	4.64	12.7	29.0	8.9	24"	9.22	60	.1	20.4				
320	315	.80	.70	.57	350	15.0	5.22	2.9	15.0	5.22	2.9	2.9	.7	15"	2.38	70	.5	15.5				
315	310	.90	.50	.38	400	15.0	5.22	2.3	20.4	4.63	2.1	50.2	14.9	36"	7.10	310	.7	21.1				
310	305	0.	0.	0.	0	0.	0.	0.	21.1	4.57	0.	50.2	14.9	36"	7.10	120	.3	21.4				
305	300	.80	5.00	1.50	600	15.0	5.22	20.9	21.4	4.54	18.2	83.3	23.6	48"	6.63	100	.3	21.6				



\* \* \* H Y D R O L O G Y \* \* \*

*****										
TRIBUTARY AREA					*****					
POINT TO POINT	C	AREA (AC)	SLOPE (%)	LEN (FT)	TC (MIN)	I (IN/HR)	Q (CFS)	TC (MIN)	I (IN/HR)	Q (CFS)
*****										
425	420	.90	.20	200	15.0	5.22	.9	15.0	5.22	.9
420	405	.70	.60	200	15.0	5.22	2.2	16.1	5.08	2.1
415	410	.70	3.40	600	22.2	4.48	10.7	22.2	4.48	10.7
410	405	.70	.50	150	15.0	5.22	1.8	22.4	4.46	1.6
405	400	0.	0.	0	0.	0.	0.	23.0	4.41	0.
*****										
HYDROLOGY SUMMATION					*****					
TC (MIN)	I (IN/HR)	Q (CFS)	SUM Q (CFS)	SUM A (AC)	SIZE	VELOCITY (FT/SEC)	LENGTH (FT)	TT (MIN)	TT + TC (MIN)	
15.0	5.22	.9	.9	.2	15"	.77	50	1.1	16.1	
16.1	5.08	2.1	3.1	.8	18"	1.74	210	2.0	18.1	
22.2	4.48	10.7	10.7	3.4	18"	6.03	50	.1	22.4	
22.4	4.46	1.6	12.2	3.9	24"	3.89	160	.7	23.0	
23.0	4.41	0.	15.0	4.7	30"	3.06	50	.3	23.3	
*****										
CONDUIT DATA										
SIZE	VELOCITY (FT/SEC)	LENGTH (FT)	TT (MIN)	TT + TC (MIN)						
15"	.77	50	1.1	16.1						
18"	1.74	210	2.0	18.1						
18"	6.03	50	.1	22.4						
24"	3.89	160	.7	23.0						
30"	3.06	50	.3	23.3						
*****										



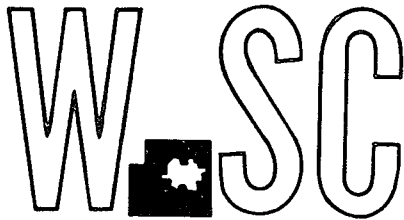
COL. JAMES JABARA AIRPORT ADDITION  
 5 YEAR STORM ANALYSIS AREA NO. 38  
 REC FILE NO. 36-82258-019 4-22-83

\* \* \* H Y D R O L O G Y \* \* \*

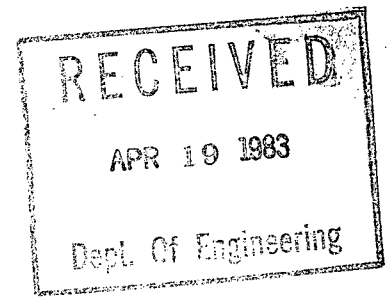
***** TRIBUTARY AREA *****																		
POINT TO POINT	C	AREA (AC)	SLOPE (%)	LEN (FT)	TC(O) (MIN)	I(O) (IN/HR)	Q(O) (CFS)	TC (MIN)	I (IN/HR)	Q (CFS)								
***** HYDROLOGY SUMMATION *****																		
***** CONDUIT DATA *****																		
							SUM Q (AC)	SUM A (AC)	SIZE	VELOCITY (FT/SEC)	LENGTH (FT)	TT (MIN)	TT + TC (MIN)					
375	380	.70	1.00	.86	350	15.0	5.22	3.7	15.0	5.22	3.7	3.7	1.0	15"	2.98	70	.4	15.4
380	385	.70	.70	.50	200	15.0	5.22	2.6	15.4	5.16	2.5	6.2	1.7	18"	3.50	130	.6	16.0
385	390	.90	.70	.50	200	15.0	5.22	3.3	16.0	5.09	3.2	9.4	2.4	24"	2.99	130	.7	16.7
390	395	.90	.80	.83	300	15.0	5.22	3.8	16.7	5.00	3.6	13.0	3.2	30"	2.65	150	.9	17.7



WICHITA - SEDGWICK COUNTY



METROPOLITAN AREA PLANNING  
DEPARTMENT  
CITY HALL - TENTH FLOOR  
455 NORTH MAIN STREET  
WICHITA, KANSAS 67202  
(316) 268-4561



April 15, 1983

Professional Engineering Consultants, P.A.  
Attention: Gary Wiley  
1440 East English  
Wichita, Kansas 67211

Re: S/D 83-15 - Final plat of Colonel James Jabara Airport

Gentlemen:

At the regular meeting of the Subdivision Committee of the Metropolitan Area Planning Commission on Thursday, April 14, 1983, the above-captioned plat was considered. The action of the Committee was to recommend that this plat be approved subject to:

- A. Approval of this plat shall be subject to approval of V-1174 (vacation of 37th Street North). That vacation case includes the requirements for dedicating or obtaining the dedication of all necessary right-of-way for 39th/Lindberg and guaranteeing the improvement of 39th/Lindberg.
- B. The final plat tracing shall label Jabara Court and 35th Street North as private streets.
- C. The final plat tracing shall clarify the "temporary" nature of the cul-de-sac for Jabara Road. That is, it shall specify under what circumstances the cul-de-sac ceases to exist.
- D. The plattor's text on the final plat tracing shall be clarified to state that "the public streets are dedicated to and for the use of the public." It should also make reference to the platting of private streets for purposes of access, utilities and drainage.
- E. The applicant shall guarantee extension of sanitary sewer to serve the airport property.
- F. The final plat tracing shall indicate 200 feet of "complete access control" to Webb Road measured north from the north line of the contingent dedication at the southwest corner of this plat.

- G. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning Department for recording.
- H. Closure computations shall be submitted with the final plat tracing.
- I. Recording of the final plat within 30 days after approval by the Board of City Commissioners.

Enclosed with the applicant's copy of this letter is a list of the five methods which have been adopted as being acceptable for guaranteeing improvements required in the approval of plats. The certificate will be required if petitions are submitted. Forms for the bond and irrevocable letter of credit are available from this office.

The enclosed "marked" copy of the final plat is for your information and files.

This matter will be forwarded to the Planning Commission for its consideration on Thursday, April 21, 1983, at 1:30 p.m. If you have any questions concerning this matter, please call.

Sincerely,



Louise Olivarez  
Senior Planner

LO:bh

cc: The Wichita Airport Authority, Attention: Monroe Funk, Director  
of Engineering, Wichita Mid-Continent Airport  
Mike Lindebak, City Engineering



S/D No. 83-15 Name Colonel James Jabara Airport  
Date Application Rec'd. 3-4-83 Preliminary Approval \_\_\_\_\_  
Scheduled S/D Meeting 3-17-83

DESCRIPTION

General Location East side of Webb Road in an area between 29th and 39th Streets North

Owner The Wichita Airport Authority, Atten: Monroe Funk, Airport Eng.  
Surveyor/Engineer Professional Engineering Consultants, P.A.  
Address 1440 E. English, Wichita, Ks. Zip Code 67211 Phone 262-2691

- 1. Gross Acreage of Plat 397.4 ac +
- 2. Number of Lots :  
Residential \_\_\_\_\_  
Commercial \_\_\_\_\_  
Industrial One  
Other \_\_\_\_\_  
Total Number of Lots One
- 3. Minimum Lot Frontage 2610 feet
- 4. Minimum Lot Area 376.7 acres +
- 5. Existing Zoning AA and LC
- 6. Proposed Zoning E (Z-2496)
- 7. Lineal Feet of New Street  
a. 110' R/W 3300 ft.  
b. \_\_\_\_\_ R/W \_\_\_\_\_ ft.  
c. \_\_\_\_\_ R/W \_\_\_\_\_ ft.  
d. \_\_\_\_\_ R/W \_\_\_\_\_ ft.  
e. \_\_\_\_\_ R/W \_\_\_\_\_ ft.  
TOTAL 3300 ft.
- 8. Sidewalk adjacent to all streets yes X no
- 9. Is public water available X Yes \_\_\_\_\_ No, Name City of Wichita
- 10. Is sanitary sewer available X Yes \_\_\_\_\_ No, Name City of Wichita
- 11. Has Health Dept. approval been obtained (where applicable) N/A Yes \_\_\_\_\_ No
- 12. City of Wichita X 3-Mile Area \_\_\_\_\_ Outside of 3-Mile Area \_\_\_\_\_

STAFF COMMENTS:

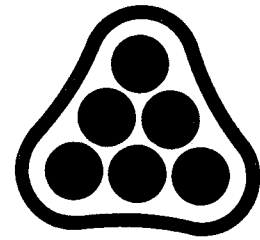
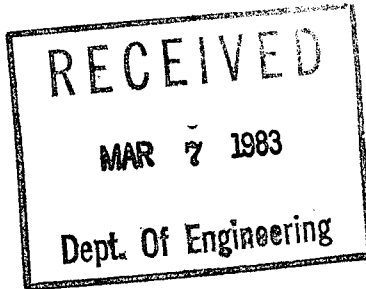
NOTE: Associated zone change Z-2496 (AA and LC to E) have been filed for this entire property.

- A. Approval of this plat shall be subject to approval of V-1174 (vacation of 37th St. North). That vacation case includes the requirements for dedicating or obtaining the dedication of all necessary right-of-way for 39th/Lindberg and guaranteeing the improvement of 39th/Lindberg.
- B. An interior private road system is being platted which coincides with the existing runway. The final plat should label this road system as "access, drainage and utility easement." The private street names approved on this preliminary shall be shown on the final plat along with sufficient bearings and dimensions to determine the location of the roads.
- C. The City Engineer's representative shall be prepared to comment on the applicant's drainage concept.
- D. The applicant shall guarantee extension of sanitary sewer to serve the airport property.
- E. The airport now obtains water from Rural Water District #1. However, a City water line is located on the west side of Webb Road from 37th Street down to 34th Street. Connection to City water and extension of the water line into the private road system is proposed.
- F. An additional ten feet of right-of-way for Webb Road just north of 29th shall be dedicated on the final plat to provide for 75 feet of half-street right-of-way.
- G. The City Engineer's representative shall be prepared to discuss the need for access controls to 29th Street and to 37th Street/Lindberg. The applicant or his agent should be prepared to state how many access points are needed.

- H. It should be noted that 33rd Street west of Webb Road has been vacated. Therefore, the Jabara Road/Webb Road intersection will be a "T" intersection.
- I. It is recommended that Reseve A be platted as a contingent dedication for the Northeast Circumferential (K-96) with a 35-foot setback from the contingent dedication. If the K-96 project is ever abandoned, the contingent dedication and setback can be vacated and this area would become part of the platted lot.
- J. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning Department for recording.
- K. The applicant shall install or guarantee the installation of all utilities and facilities which are applicable and described in Article 8 of the MAPC Subdivision Regulations.
- L. Requirements for a final plat (see pages 20-25, Part 4, Article 5 of the MAPC Subdivision Regulations).

**ECTORS**

- J. KNOP, P.E.
- B. PEUGH, P.E.
- J. FREUND, P.E.
- W. H. KELTNER, P.E.
- R. D. PLETCHER, P.E.
- F. D. MIDDLETON, JR., P.E.
- D. E. MALTBIE, P.E.
- M. D. SCHOMAKER, P.E.
- G. D. SCHOCK, P.E.
- J. H. BAILEY, P.E.



**P**ROFESSIONAL  
**E**NGINEERING  
**C**ONSULTANTS  
PROFESSIONAL ASSOCIATION

March 4, 1983

Mr. Chris Breitenstein, P.E.  
Drainage Engineer  
Engineering Department  
City Hall  
455 N. Main  
Wichita, KS 67202

Reference: Colonel James Jabara Airport Addition  
PEC File No. 36-82258-019

Dear Mr. Breitenstein:

Transmitted herewith is one copy of "Master Utility Plan for Colonel James Jabara Airport" prepared by our firm in July, 1982. This report covers the proposed land use and development plan for the airport, a detailed layout of proposed storm drainage system, and estimated costs.

It is proposed that the enclosed report suffice as the "Drainage Concept" for Colonel James Jabara Airport Addition which will be heard by the Subdivision Committee on March 17, 1983.

If you have any questions or need any other information, please call at your convenience.

Very truly yours,

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

A handwritten signature in cursive script that reads "Charles S. Brown".

Charles S. Brown, P.E.  
Project Engineer

CSB/bea

Enclosure

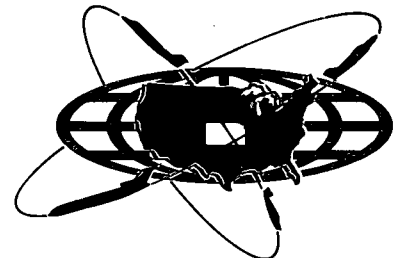
cc: Ms. Louise Olivarez  
Mr. Mike Lindebak  
Mr. Phil Dietrich

# MASTER UTILITY PLAN

for

Colonel James Jabara Airport  
Wichita, Kansas

Wichita Airport Authority



Wichita, Kansas

prepared by

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.  
ENGINEERS  
WICHITA, KANSAS

JULY, 1982

MASTER UTILITY PLAN

FOR

COLONEL JAMES JABARA AIRPORT

WICHITA AIRPORT AUTHORITY

JULY

1982

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

WICHITA, KANSAS

## TABLE OF CONTENTS

CHAPTER		<u>Page</u>
1	INTRODUCTION	1-1
	1.1 Purpose	1-1
	1.2 Need	1-2
2	EXISTING ON-SITE FACILITIES AND UTILITY SERVICES	2-1
	2.1 Runway - Taxiway Geometrics	2-1
	2.2 Support Facilities	2-1
	2.3 Existing On-Site Utilities	2-2
3	OFF-SITE UTILITIES AVAILABLE TO SUPPLY FUTURE DEMANDS	3-1
	3.1 General	3-1
	3.2 Characteristics of Available Utilities	3-1
4	DEVELOPMENT PLAN	4-1
	4.1 General	4-1
	4.2 Developmental Criteria for Jabara Airport	4-1
	4.3 The Development Plan	4-5
5	THE MASTER UTILITY PLAN	5-1
	5.1 General	5-1
	5.2 Potable Water and Fire Protection	5-1
	5.3 Sanitary Sewer	5-4
	5.4 Natural Gas	5-6

## TABLE OF CONTENTS

CHAPTER		<u>Page</u>
5	THE MASTER UTILITY PLAN (-continued-)	
	5.5 Electric Power	5-7
	5.6 Telephone Service	5-9
	5.7 Storm Drainage System	5-9
6	COSTING AND METHODOLOGY FOR THE DEVELOPMENT OF UTILITY SERVICES	6-1
	6.1 General	6-1
	6.2 Potable Water	6-1
	6.3 Sanitary Sewer	6-2
	6.4 Natural Gas	6-3
	6.5 Electric Power	6-4
	6.6 Telephone Service	6-5
	6.7 Drainage Improvements	6-5

### FIGURES

NUMBER	TITLE	FOLLOWS PAGE
2.1	Existing Airport Facilities	2-3
4.1	Development Plan	4-8
4.2	FBO and General Aviation Area Site Grading Plan	Figure 4.1
5.1	Master Utility Plan	5-12
5.2	Storm Drainage Plan	Figure 5.1
5.3	Typical Section - Proposed Utility Corridor	Figure 5.2

## CHAPTER 1 INTRODUCTION

### 1.1 PURPOSE

The purpose of the Colonel James Jabara Airport Master Utility Plan Study is to quantify on-site utility needs and to set forth a plan which will serve to guide future developments on the airport by establishing an orderly interface of roadways, land parcels and utility corridors.

A Development Plan has been prepared which will guide the physical development of the airport in future years. The major circulation route for vehicular traffic has been established and each developable parcel, both land side and air side, has been designated for a type and density of development that will reflect its highest and best use.

Utility corridors, which will best serve the airport and its air-oriented tenants, have been established and easements for the major utilities within these corridors have been recommended.

The major utility lines have been sized to accommodate all areas of the airport which can support development. Site utility demands were determined from projections of maximum allowable building coverage for each parcel and by forecasting the number of employees that could be expected to work at the airport. Vehicular trips were calculated for the various areas using this information, and applicable trip generation rates were utilized to measure the impact a fully developed Jabara Airport would have on the existing transportation system.

Also of major concern was the staging of development of the major elements of the airport. Due to its size and role as a basic transport facility, Jabara Airport will probably not generate significant amounts of revenue for the Wichita Airport Authority; therefore, it is imperative that development occur in the most cost-conscious and orderly manner possible.

## 1.2 NEED

The need for a master utility plan is manifested in the idea that once the new runway is operational there will be a heightened interest by outside concerns in locating and establishing a base of operation at the airport. Presently, development at Jabara consists of only a single fixed base operator (FBO) and some scattered hangar facilities, many of which are destined to be removed. At this writing, however, plans are being drawn for a new and considerably expanded FBO site and an air ambulance facility. Salvageable hangars are being relocated and designs are under way for improved visual flight rules (VFR) nav-aids such as a lighted wind cone and rotating beacon. Paving of the new 5,000-foot runway is certain to accelerate interest in development at Jabara Airport.

It will be the responsibility of the Wichita Airport Authority to direct the expansion at Jabara Airport. In this regard important considerations will be the coordination and timely installation of utility services, adequate sizing of the utility and questions as to who will design, construct, pay for and operate the utility. It is intended that this report will be a ready reference for information about development at Jabara Airport, particularly as it pertains to the following utilities:

## Jabara Airport Utilities

- Water
- Sanitary Sewer
- Power
- Telephone
- Gas
- Storm Drainage

## CHAPTER 2 EXISTING ON-SITE FACILITIES AND UTILITY SERVICES

### 2.1 RUNWAY - TAXIWAY GEOMETRICS

The existing runway at Colonel James Jabara Airport, Figure 2.1, is oriented 18-36. It is 40 feet wide and 2,800 feet in length with an asphaltic concrete surface in fair to good condition.

Parallel taxiway facilities were never developed and the only taxiways are those providing access to the runway from the apron areas and T-hangars. After the new runway and taxiway are paved, the existing facility will no longer be needed for aircraft operations.

### 2.2 SUPPORT FACILITIES

Existing support facilities at Jabara Airport consist of several maintenance hangars, T-hangars and an administration building. Some of the T-hangar buildings are in good condition and will be moved to a new location on the site. The administration building, which presently houses the fixed base operator, is in good condition and will remain in service. The remaining buildings will be razed.

Figure 2.1 shows graphically the airport facilities as they presently exist at Colonel James Jabara Airport. The T hangars that were formerly west of Webb Road are shown in their new location. The configuration and location of 4100 feet of the new runway are also shown on the figure since the grading for it has

been completed. Reference is made to Figure 5.1 for delineation of revised contours within the runway area.

All buildings shown in Figure 2.1 except the present administration building will be removed or relocated to facilitate redevelopment of the land side portion of the airport.

### 2.3 EXISTING ON-SITE UTILITIES

Utilities presently serving Colonel James Jabara Airport are shown on the Existing Airport Facilities map (Figure 2.1) and are further described as follows.

WATER - The airport is buying potable water from Sedgwick County Rural Water District No. 1. The Rural Water District's 3-inch PVC waterline is located along the east side of Webb Road. The airport presently has two meters and two connections to RWD No. 1's waterline. The system does not afford any measure of fire protection.

SANITARY SEWER - Sanitary sewer facilities at the Airport consist of a septic tank/filter field installation which is located immediately north of the FBO administration building. This is the only building on the airport that has sanitary sewer service. The septic tank system has failed due to the low percolation rates of the clay soil on the site and will be taken out of service when central sewer service is available.

STORM DRAINAGE - Since the present runway is located along a ridge, storm sewer facilities were never developed. Storm runoff is sheeted to open ditches which carry the water to culverts under the runway or to natural open channels.

NATURAL GAS - Natural gas is obtained from a 16-inch high-pressure gas main which is located along the west edge of Webb Road. The airport has two service connections to this main, which is owned by Cities Service Gas Company. Cities Service probably will not supply additional gas to the airport in the future.

ELECTRIC POWER - Kansas Gas & Electric Company maintains a single-phase (7.2 KV) overhead line which is located along the west edge of Webb Road. Electrical service to the airport is supplied from this line. All service onto the site is overhead; however, the line that provides power for the existing runway lights is underground from the FBO administration building to the runway. Single-phase power is adequate for present needs but three-phase service is recommended to supply future development.

TELEPHONE SERVICE - Southwestern Bell Telephone Company provides telephone service at Jabara Airport. Their service comes from a buried line along the east side of Webb Road.

There are no maps or records which indicate the locations of intrasite utilities on the Airport. Additional information concerning existing facilities may be obtained by calling Midwest Piper, phone 682-5551.

# EXISTING AIRPORT FACILITIES

## COLONEL JAMES JABARA AIRPORT

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.  
WICHITA, KANSAS

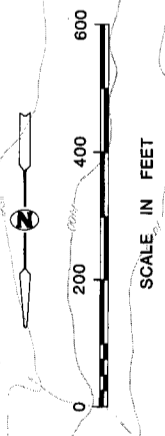


FIGURE 2.1

## CHAPTER 3 OFF-SITE UTILITIES AVAILABLE TO SUPPLY FUTURE DEMANDS

### 3.1 GENERAL

A complete inventory of the major utilities in the vicinity of the airport was made to determine if they would be able to adequately serve the new facilities. A summary of these findings follows.

### 3.2 CHARACTERISTICS OF AVAILABLE UTILITIES

The location, size and/or capacity, condition, ownership and availability of the major utilities in the Jabara Airport vicinity are indicated below.

WATER - A City of Wichita 20-inch water main is located along the west side of Webb Road. It comes up 37th Street from the west, past Comotara, and then turns south at Webb Road and continues to 34th Street along the west side of Webb Road where it dead-ends. The main was constructed with 20-inch asbestos cement pipe and is in very good condition. Pressure tests were made at the Boeing warehouse in Comotara which is served by this line. The static pressure measured 85 to 95 PSI and the residual pressure measured 58 PSI delivering 1,920 GPM through a 4-inch nozzle. These high pressures and delivery rates are maintained by a booster station which is located on 37th Street between Rock Road and Woodlawn Avenue and are more than adequate to satisfy fire flow demands.

Potable water from this 20-inch main will be available to the airport and its tenants. The location of this main is shown graphically on Figure 4.1.

Existing fire hydrants are located on the west side of Webb Road at 37th, 35th and 34th Streets. The contact person at the Wichita Water Department is Mr. Bill Otten, phone 268-4555.

SANITARY SEWER - There are presently two City of Wichita sanitary sewer mains in the Jabara Airport vicinity. One, located midway between 35th and 37th Street, is an 8-inch VCP main which extends through Comotara east to within approximately 220 feet of the west edge of Webb Road. The elevation of the pipe's flow line at the point of termination is 1,417.59 MSL and the top of the manhole is 1,422.4 MSL. Analysis of this sewer main indicated that its elevation would allow it to serve by gravity only a very small portion of the airport site.

The other sanitary sewer line in the airport's environs is an 8-inch VCP main. It also extends east through Comotara, midway between 34th and 35th Streets, and presently terminates approximately 30 feet east of the west right-of-way line of Webb Road. The elevation of the flow line at the point of termination is 1,412.35 MSL. It was determined that this main was deep enough to serve a large portion of the airport site by gravity flow.

According to City of Wichita officials, this sanitary sewer main is available for use and could serve the projected development at Jabara Airport (Section 5.3). The locations of the two sanitary sewer mains are shown graphically on Figure 4.1. The contact person at the City Department of Engineering is Mr. Don Schneider, phone 268-4670.

NATURAL GAS - There are several natural gas mains in the vicinity of the airport. The 16-inch high-pressure main along the west edge of Webb Road, owned by Cities Service Gas Company, will probably not be available for service taps in the future.

The Gas Service Company, however, has an existing 4-inch steel coated and wrapped gas main along 35th Street which extends east to Webb Road. They also have a 4-inch main along 34th Street which, according to company sources, will be extended to Webb Road where it could be looped with the 35th Street line. A single line could then be installed east across Webb Road and onto the airport site. Gas pressure in the 35th and 34th Street lines is 20 PSI. The existing 35th Street main is shown graphically on Figure 4.1.

Another possibility, depending upon the timing of airport development, would be to serve the airport from the 8-inch main that is projected to be installed along 37th Street in the future by the Gas Service Company.

Either alternative would be acceptable since both are capable of supplying adequate amounts of natural gas to satisfy future airport needs. The contact person at Gas Service Company is Mr. Eric Wendt, phone 263-7511.

ELECTRIC POWER - KG&E has a single-phase (7.2KV) distribution line along the west side of Webb Road. These are overhead lines presently serving the airport. A three-phase distribution line (12.47 KV) is presently located at the corner of Webb Road and 37th Street and comes from the KG&E substation which is located approximately 1.5 miles to the west. Three-phase service can be extended onto the airport as soon as it is deemed appropriate to do so. It

is recommended that this service be installed at the time power is supplied to the runway lighting control center. It will be necessary for the Airport Authority to share in the cost of bringing the primary service onto the site. Afterwards, service, either single-phase or three-phase, can be extended to airport tenants at which time KG&E will furnish and install pad-mounted transformers and terminal cabinets (tenant cost) and meter the service.

The location of existing power lines is shown on Figure 4.1. Mr. Mike Huffman, phone 261-6440 is KG&E's contact person.

TELEPHONE SERVICE - Telephone service is provided by Southwestern Bell Telephone Company. The buried cable extends east from Wichita along 37th Street, crosses Webb Road where it turns south along the airport frontage. This telephone cable has a capacity of 600 pairs and according to telephone officials there should be no trouble providing needed service lines to satisfy the demands of a fully developed airport. The location of the telephone cable is shown on Figure 4.1. The contact person at Southwestern Bell Telephone Company is Mr. Rick Jones, phone 268-2222.

TELEVISION CABLE SERVICE - The nearest cable TV service terminal is approximately 2 miles from the airport site. It would not be cost-effective to bring TV cable service to Jabara Airport at this time. The cost for extending TV cable approximates \$10,000 per mile. According to officials at Cable TV Company, they are working their way north and east from Wichita; but service to this part of the city will probably be well into the future. The contact person at Cable TV Company is Ralph DeGarmo, phone 529-2196.

## CHAPTER 4 DEVELOPMENT PLAN

### 4.1 GENERAL

Before any detail utility planning could be initiated for Colonel James Jabara Airport, it was necessary to formulate a Development Plan that delineates the highest and best use for every parcel of land on the developable portion of the site. In order to do this, certain presumptions were made. This section summarizes the criteria that were utilized to project the future development patterns for the Airport.

### 4.2 DEVELOPMENTAL CRITERIA FOR JABARA AIRPORT

As stated in the 1974 "Tri-County Airport System Plan", a public airport to serve the general aviation fleet was needed in the northeast sector of Sedgwick County to provide relief for Wichita Mid-Continent Airport. In 1977-78 an Airport Master Plan for the Northeast Sedgwick County Airport was prepared, and after studying several sites it was determined that the Jabara Airport site (formerly called Piper Airpark and Comotara Airport) would be the most cost-effective location on which to construct this new reliever airport. Subsequently, the airport was officially designated a Basic Transport facility by FAA and renamed Colonel James Jabara Airport.

Knowing the airport's function in the overall airport system was the starting point for predicting the physical makeup of the facility and what kinds of activities it should support in the future. Two existing Kansas airports that are functioning as reliever airports and which are about the same size as

Jabara Airport were studied and characteristics of their occupants noted. Included were activity of occupant, number of employees, size of parcel occupied, building coverage of the site and proximity to metropolitan development. From this information future activities and densities of development were projected for the various sites at Jabara Airport. Three densities of development were utilized. Before individual parcels could be delineated, it was necessary to establish a vehicular route that would serve all areas of the airport satisfactorily. After studying several alignments, it was determined that, due to the long, narrow shape of the land side portion of the airport, a road dividing this area in half would provide the best circulation through, and access to, the individual parcels on either side of the road. The existing runway has almost that alignment and will provide a satisfactory base for a new roadway. For the sake of clarity, this road will be referred to as "Jabara Road" throughout the remainder of the report.

Parcels and their respective densities are delineated on Figure 4.1 using the following categories.

Low-Density Development - It was presumed that air-oriented, low-density development would occur on all of the parcels between the apron area and Jabara Road. This area would be reserved for fixed base operators and other aviation activities needing direct access to apron areas and taxiways. Included would be aircraft sales and service, charter service, flight training, major engine repair and air freight service. It was found that the development standards formulated from analyzing the two Kansas airports were very close to national standards for Airport/Industrial Parks. The criteria are as follows.

### Low-Density Development Standards

Individual Parcel Size	- 1.5 to 3.0 Acres
Building Coverage	- 40% Maximum
Number of Employees	- 6 Per Acre
Number of Vehicle Trips	- 4 Per Acre Per Day
Vehicle Parking (Area)	- 300 Sq. Ft. Per Vehicle
Vehicle Parking (Spaces)	- 1.3 Per Employee

Those areas that are projected to experience low-density development are shown graphically on the Development Plan - Figure 4.1.

Medium-Density Development - There may also be a demand for sites on Jabara Airport for activities that require medium-density development. Businesses in this category are usually service oriented and require more employees than low-density development activities but fewer employees than product-oriented operations that are labor intensive. These will be activities that are aviation related in nature but can utilize sites on the airport that do not have direct access to the flight line. Examples would be firms that process, service or repair equipment or hardware used in the aerospace industry.

Medium-density development standards are shown on the following page.

### Medium-Density Development Standards

Individual Parcel Size	- 4 to 8 Acres
Building Coverage	- 40 to 50% Maximum
Number of Employees	- 12 Per Acre
Number of Vehicle Trips	- 16 Per Acre Per Day
Vehicle Parking (Area)	- 300 Sq. Ft. Per Vehicle
Vehicle Parking (Spaces)	- 1.3 Per Employee

Projected medium-density development areas are shown on the Jabara Airport Development Plan - Figure 4.1.

High-Density Development - There could be demands for parcels on the airport which would support high-density development. These would be firms, possibly aircraft companies, that manufacture or assemble a product. Direct access to flight line facilities would be advantageous to them. These activities are labor intensive as is noted below in the development standards.

### High-Density Development Standards

Individual Parcel Size	- 8 to 20 Acres
Building Coverage	- 50% Maximum
Number of Employees	- 30 Per Acre
Number of Vehicle Trips	- 35 Per Acre Per Day
Vehicle Parking (Area)	- 250 Sq. Ft. Per Vehicle
Vehicle Parking (Spaces)	- 1.3 Per Employee

A projected site for aviation-related high-density development is indicated on the Development Plan.

### 4.3 THE DEVELOPMENT PLAN

The Development Plan, shown on Figure 4.1, is conceptual in nature due to the fact that it is not known at this time who will establish their activities at the airport or how much land each will require. It is expected that the airport will be platted as a single parcel and that division of the site into smaller tracts will occur according to the needs of respective tenants. Certain features of the plan, however, should be considered "fixed"; namely, the easement for KG&E primary service and the main entrance to the airport referred to throughout the remainder of this report as 34th Street. Shown on the Development Plan are the coordinates which "fix" the center lines of these rights-of-way.

CIRCULATION AND PARKING - As mentioned previously, Jabara Road provides for vehicular circulation and access to the developable portion of the airport. 37th Street will be realigned to allow construction of the runway/taxiway extension to the north; however, a short segment of the old 37th Street alignment will be retained and integrated into Jabara Road.

The main access into the airport will be 34th Street which extends east from Webb Road to Jabara Road. This will provide direct access to the proposed FBO development which will probably be the first new facility constructed on the site. From there further development can occur, both to the north and

south, and the development of utilities can be staged to coincide with these expansions.

Vehicular parking should be located in front of buildings which occupy parcels that have direct access to the flight line. On internal sites, or those west of Jabara Road, parking facilities can be developed where they will best serve the individual facilities. Construction of adequate parking will be the responsibility of the occupants. The auto parking criteria, shown previously for the various densities of development, were derived from national standards and serve only as a guide. Each occupant should construct facilities that will serve adequately his particular activity.

There will also be demands for public parking to serve the T-hangar areas. On-street parking should not be allowed on roadways at the airport.

LAND USE - The existing FBO administration building will be the only structure that will remain in its present location. After the current FBO has moved into new facilities on the flight line, this building will be available to serve as the administration center and provide office space for Wichita Airport Authority personnel and tenants. In the future, it is proposed that this building be served by a cul-de-sac which will extend west from Jabara Road. The Webb Road entrances to the parking lot would then be closed.

The T-hangars that are in good physical condition will be moved to the T-hangar area which is located adjacent to taxiway 6.

It is proposed that security fencing be installed to protect aircraft and equipment which is air side. This fencing will also restrict vehicular access to the runway/taxiway facilities.

The recommended site for a building to provide garage space for Crash-Fire-Rescue equipment is shown on the Development Plan (Figure 4.1). Its location is adjacent to Jabara Road and Taxiway C and will provide quick and easy access to the T-hangar area and the runway-taxiway facilities where emergency situations are most likely to occur.

Aircraft aprons will be needed to satisfy the parking needs of both local and itinerant pilots. Initially these tie-down areas can be turf, but when the demand warrants, they should be paved. It is suggested that in the short term, the area immediately south of Taxiway C be retained for aircraft parking purposes.

A heliport is planned in the development of Jabara Airport. It will probably be located at the south end of Jabara Road and serve in Wesley Hospital's emergency medical system. The air ambulance facility will receive patients transported in fixed wing aircraft destined to be treated at Wesley Medical Center and also serve as a dispatch point for calls requesting helicopter service direct to an accident site.

The development plan was utilized to make population forecasts and utility service demands. These projections were, in turn, used to size each of the needed utilities.

SITE GRADING - It is recommended that sites leased for development on the air side of Jabara Road be graded in accordance with the grading plan shown on Figure 4.2.

The contours shown on Figure 4.2 represent a grading design which incorporates the requirements for gravity sewer service, aircraft parking ramp cross slope and taxiway profile grade. Approximately 58,000 cubic yards of excavation will be required to bring the area to a pavement subgrade elevation (the contours shown are finish grade) of which 41,000 cubic yards will have to come from a borrow site.

The grading plan is recommended for use as a reference for architects so that, as individual sites are developed, a "uniform" appearance is maintained along the flight line and a functional interconnect of ramp and taxiway segments is assured.

# DEVELOPMENT PLAN

## COLONEL JAMES JABARA AIRPORT

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ENGINEERS  
WICHITA, KANSAS

### LEGEND

- LOW DENSITY
- MEDIUM DENSITY
- HIGH DENSITY

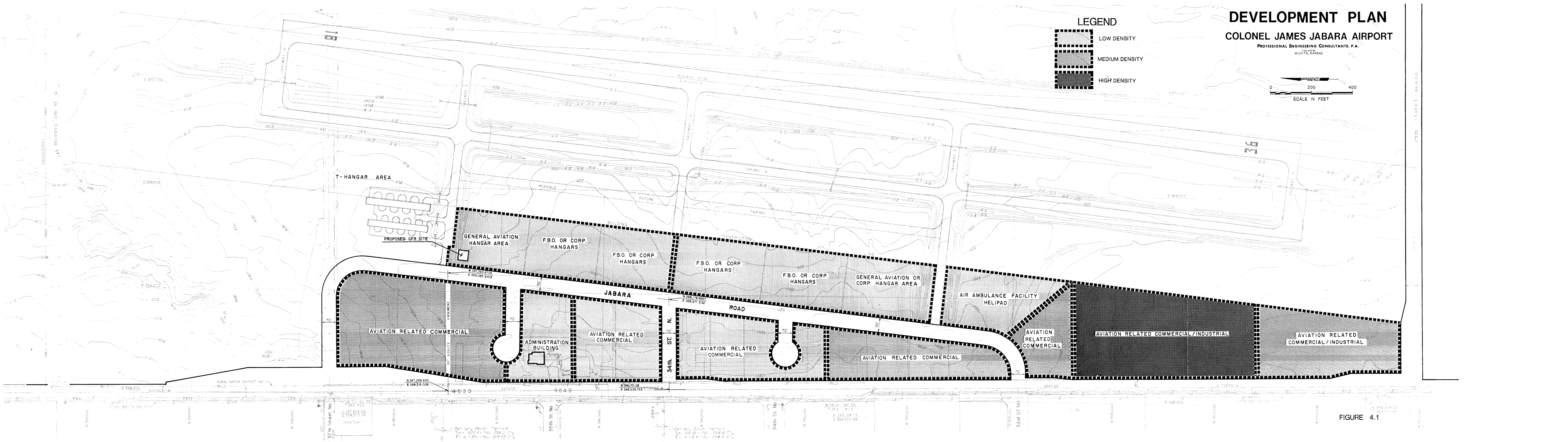
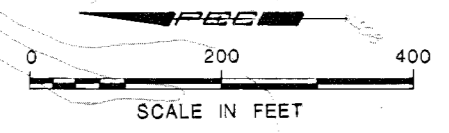


FIGURE 4.1

# FBO & GENERAL AVIATION AREA SITE GRADING PLAN

COLONEL JAMES JABARA AIRPORT

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ENGINEERS  
WICHITA, KANSAS

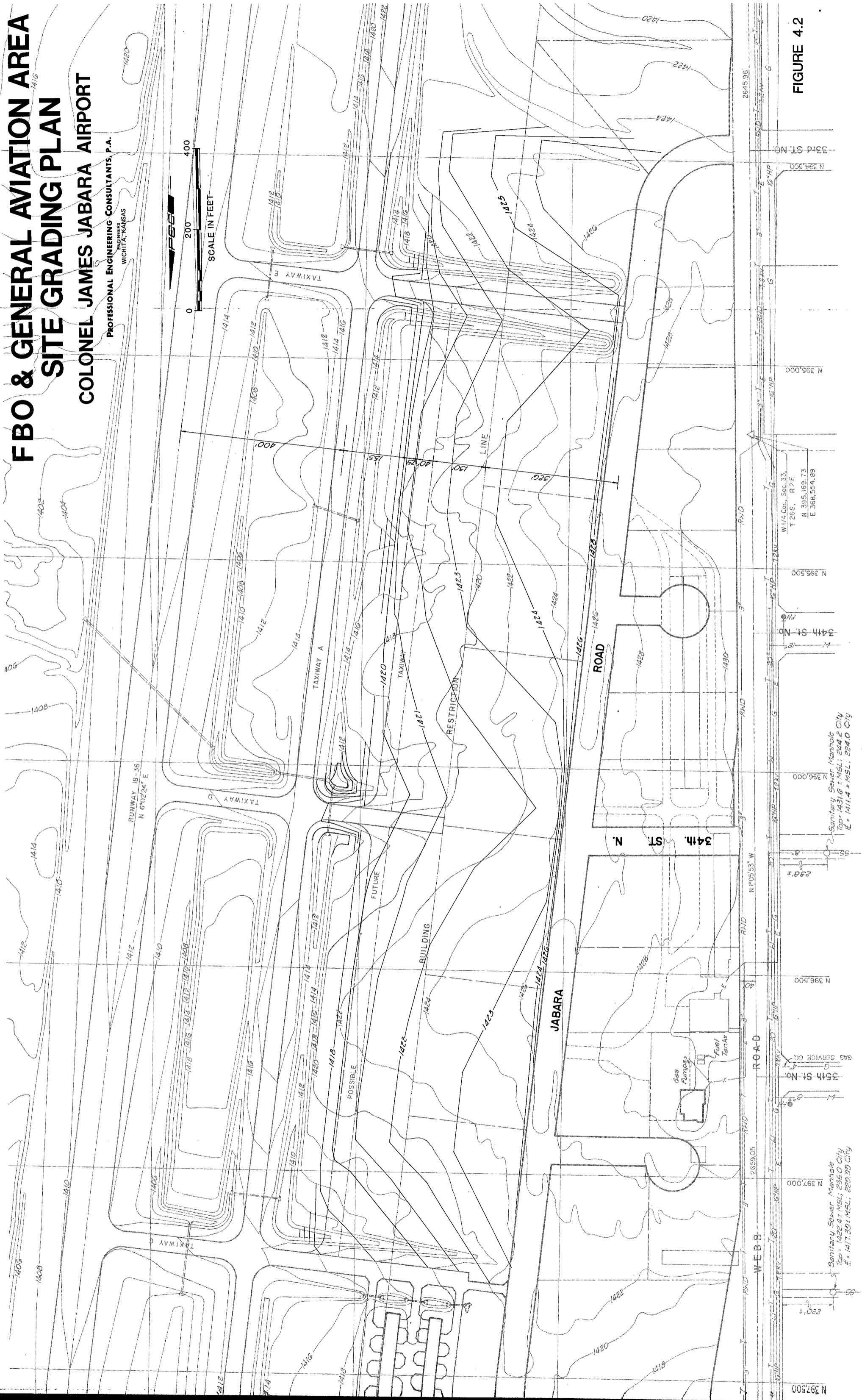
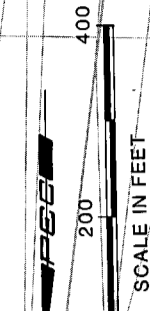


FIGURE 4.2

Sanitary Sewer Manhole  
Top = 1422.4 ± MSL; 236.0 City  
E = 1417.30 ± MSL; 222.99 City

Sanitary Sewer Manhole  
Top = 1431.6 ± MSL; 244.2 City  
E = 1411.4 ± MSL; 224.0 City

W 1/4 Cor., Sec. 33,  
T 26S, R 7E  
N 395,169.73  
E 368,554.89

35th ST. N.  
N 397,500

34th ST. N.  
N 396,500

33rd ST. N.  
N 394,500

2645.95  
2659.05  
2659.05  
2645.95

WEBB ROAD  
JABARA ROAD  
34th ST. N.  
35th ST. N.

Gas Service Co.  
Fuel Tanks  
Gas Pumps

RESTRICTION LINE

BUILDING

FUTURE POSSIBLE

TAXIWAY

1406 1408 1410 1412 1414 1416 1418 1420 1422 1424 1426 1428 1430 1432 1434 1436 1438 1440 1442 1444 1446 1448 1450 1452 1454 1456 1458 1460 1462 1464 1466 1468 1470 1472 1474 1476 1478 1480 1482 1484 1486 1488 1490 1492 1494 1496 1498 1500 1502 1504 1506 1508 1510 1512 1514 1516 1518 1520 1522 1524 1526 1528 1530 1532 1534 1536 1538 1540 1542 1544 1546 1548 1550 1552 1554 1556 1558 1560 1562 1564 1566 1568 1570 1572 1574 1576 1578 1580 1582 1584 1586 1588 1590 1592 1594 1596 1598 1600 1602 1604 1606 1608 1610 1612 1614 1616 1618 1620 1622 1624 1626 1628 1630 1632 1634 1636 1638 1640 1642 1644 1646 1648 1650 1652 1654 1656 1658 1660 1662 1664 1666 1668 1670 1672 1674 1676 1678 1680 1682 1684 1686 1688 1690 1692 1694 1696 1698 1700 1702 1704 1706 1708 1710 1712 1714 1716 1718 1720 1722 1724 1726 1728 1730 1732 1734 1736 1738 1740 1742 1744 1746 1748 1750 1752 1754 1756 1758 1760 1762 1764 1766 1768 1770 1772 1774 1776 1778 1780 1782 1784 1786 1788 1790 1792 1794 1796 1798 1800 1802 1804 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2206 2208 2210 2212 2214 2216 2218 2220 2222 2224 2226 2228 2230 2232 2234 2236 2238 2240 2242 2244 2246 2248 2250 2252 2254 2256 2258 2260 2262 2264 2266 2268 2270 2272 2274 2276 2278 2280 2282 2284 2286 2288 2290 2292 2294 2296 2298 2300 2302 2304 2306 2308 2310 2312 2314 2316 2318 2320 2322 2324 2326 2328 2330 2332 2334 2336 2338 2340 2342 2344 2346 2348 2350 2352 2354 2356 2358 2360 2362 2364 2366 2368 2370 2372 2374 2376 2378 2380 2382 2384 2386 2388 2390 2392 2394 2396 2398 2400 2402 2404 2406 2408 2410 2412 2414 2416 2418 2420 2422 2424 2426 2428 2430 2432 2434 2436 2438 2440 2442 2444 2446 2448 2450 2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472 2474 2476 2478 2480 2482 2484 2486 2488 2490 2492 2494 2496 2498 2500 2502 2504 2506 2508 2510 2512 2514 2516 2518 2520 2522 2524 2526 2528 2530 2532 2534 2536 2538 2540 2542 2544 2546 2548 2550 2552 2554 2556 2558 2560 2562 2564 2566 2568 2570 2572 2574 2576 2578 2580 2582 2584 2586 2588 2590 2592 2594 2596 2598 2600 2602 2604 2606 2608 2610 2612 2614 2616 2618 2620 2622 2624 2626 2628 2630 2632 2634 2636 2638 2640 2642 2644 2646 2648 2650 2652 2654 2656 2658 2660 2662 2664 2666 2668 2670 2672 2674 2676 2678 2680 2682 2684 2686 2688 2690 2692 2694 2696 2698 2700 2702 2704 2706 2708 2710 2712 2714 2716 2718 2720 2722 2724 2726 2728 2730 2732 2734 2736 2738 2740 2742 2744 2746 2748 2750 2752 2754 2756 2758 2760 2762 2764 2766 2768 2770 2772 2774 2776 2778 2780 2782 2784 2786 2788 2790 2792 2794 2796 2798 2800 2802 2804 2806 2808 2810 2812 2814 2816 2818 2820 2822 2824 2826 2828 2830 2832 2834 2836 2838 2840 2842 2844 2846 2848 2850 2852 2854 2856 2858 2860 2862 2864 2866 2868 2870 2872 2874 2876 2878 2880 2882 2884 2886 2888 2890 2892 2894 2896 2898 2900 2902 2904 2906 2908 2910 2912 2914 2916 2918 2920 2922 2924 2926 2928 2930 2932 2934 2936 2938 2940 2942 2944 2946 2948 2950 2952 2954 2956 2958 2960 2962 2964 2966 2968 2970 2972 2974 2976 2978 2980 2982 2984 2986 2988 2990 2992 2994 2996 2998 3000 3002 3004 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## CHAPTER 5 THE MASTER UTILITY PLAN

### 5.1 GENERAL

Utilizing the projected development patterns and densities discussed in Chapter 4, projections for the provision of major utilities to serve Colonel James Jabara Airport were formulated. In addition to determining the sizes of mains and lines that would be needed to serve the estimated population of Jabara Airport fully developed, it was necessary to determine where these major utility lines should be located to achieve the most satisfactory results for providing service. Also, maintenance of these utilities in the future was an important consideration in their location. The following subsections describe each major utility in terms of projected requirements, adequate sizing, location and configuration of necessary easements in relation to the service area and the location of other major utilities. The staging of construction so that these utilities can be extended to serve new occupants is also discussed. Figure 5.1 shows a Master Utility Plan for all utility plants except storm drainage which is shown on Figure 5.2. Figure 5.3 shows the recommended locations of utility lines relative to the suggested street right-of-way and building setback lines.

### 5.2 POTABLE WATER AND FIRE PROTECTION

The proposed water main layout which indicates water main locations, sizes and fire hydrant locations, is shown on Figure 5.1.

As mentioned previously, an existing City of Wichita 20-inch water main is located along the west edge of Webb Road from 37th Street south to just past 34th Street. In the future, this 20-inch main will be extended south and north along Webb Road as required to serve new development.

It is proposed that a 12-inch loop line be constructed starting at the corner of Jabara Road and Webb Road and extending the full length of Jabara Road. Extending from this 12-inch loop would be 8-inch water mains to serve the cul-de-sacs. Also, an 8-inch connecting link between the 12-inch and 20-inch mains is proposed within the 34th Street corridor. The pipe sizes were determined by fire flow requirements and the standard of 50 GPCD (Gallons Per Capita Per Day) for all employees on the airport. The fire hydrant locations shown on the Master Utility Plan are conceptual and reflect the Fire Department's standard of having a fire hydrant within 300 feet of every corner of every building. Since future lot sizes and building configurations are not known at this time, it is recommended that only those fire hydrants needed to serve existing and planned development be installed during the initial phase of water main development. As tenants come onto the airport and construct their facilities, appropriate locations for fire hydrants can then be determined to best serve each individual site and provide maximum protection. The cost difference for fire hydrants installed after water main construction is approximately \$500 and should be paid by the leasee as a site development cost.

Waterline easements should be a minimum of 10 feet wide if the line is a public main. Also, they should be close to a road for ease of maintenance.

As shown on the Master Utility Plan, the waterline easements are located along the east side of Jabara Road, the north side of the cul-de-sacs and the south side of 34th Street.

At present, there is no on-site fire protection at Jabara Airport. The need for fire protection, however, is becoming more apparent as development occurs. The new T-hangar area and the administration building both warrant protection at the present time. Planned developments are certain to accent further the necessity to provide an adequate potable water supply as well as fire protection capability.

The proposed water main system could be stage constructed if financing of the utility is a limiting factor. It would be desirable, however, to construct the 12-inch loop, the 8-inch connecting link and fire hydrants to serve existing development as one project. The minimum alternative would be to construct the 12-inch loop line in Jabara Road from old 37th Street to the 8-inch connecting link. The 8-inch link would thereby create a looped system which could provide fire flow to the hangar area, the administration building and the proposed Midwest Corporate Aviation, Inc. (FBO) site.

The administration building could continue to obtain potable water from the rural water district until it is necessary to construct the cul-de-sac and the main proposed within its corridor. The recently installed fire hydrant at 35th Street and Webb Road is approximately 200 feet west of the administration building and can provide fire flow to it and several existing structures on the airport site.

### 5.3 SANITARY SEWER

A proposed sanitary sewer main layout, shown graphically on the Master Utility Plan, delineates sanitary sewer main locations, sizes and manhole locations.

The existing City of Wichita sanitary sewer main to which the Jabara Airport sewer system will be connected is located midway between 34th and 35th Streets west of Webb Road. This existing sewer is deep enough to provide gravity service to most of the area projected for development in Figure 4.1.

The city sewer main will be extended east across Webb Road. The suggested easement is along the north edge of 34th Street. The easement for the north/south extensions would best be located along the west edge of Jabara Road. Parcels which can be served by this sewer main system on a gravity basis are identified on Figure 5.1 with elevation numbers. The elevations shown are the minimum floor elevations from which gravity service can be provided, assuming a 3-foot riser from the invert of the sewer to the floor.

A pump station would have to be constructed to serve the large area generally north of the old 37th Street alignment. It would be a 100-GPM installation and would pump to the northernmost manhole as shown on the Utility Plan. This area will probably not be developed until after the core area of the airport, which is gravity served, is fully developed. Wastewater from the airport area south of the south end of Jabara Road would also have to be pumped. This would also require a 100-GPM capacity pump station which is the smallest size the City of Wichita will construct and maintain. It is important to note that the south pump station would be temporary. The long-range plans of the city call for

the construction of a sanitary sewer interceptor to serve a portion of Comotara which is adjacent to and west of the airport site. It is probable that this interceptor could be extended to serve the south portion of the airport as well, thereby precluding the need for a pump station in this area.

It should also be noted that should both pump stations be constructed and operate at the same time, combined with a peak discharge from the Airport area served by gravity sewers, the receiving sewer west of Webb Road would approach two-thirds full. To eliminate this occurrence, the two lift stations must be interlocked so that they cannot operate at the same time.

The sewer mains serving the airport should be 8-inch diameter pipe laid at 0.4% grades. Sewer service lines serving individual parcels should be 6-inch VCP, minimum, installed at 1% grades. It is recommended that PVC and ABS pipes not be utilized for service lines due to the fact that petroleum products and degreasing agents in the wastewater would be physically damaging to these kinds of pipe materials.

Based on the development and density criteria described previously, wastewater flows from the airport were estimated. Utilizing the standard of 40 GPCD peak flow plus 100-GPM from the north pump station resulted in an average flow of 109 GPM. Both the proposed sewer main layout and the estimated wastewater flow calculations were reviewed by city officials and it was determined that the estimated flows from the airport would not cause any hydraulic problems in the city's collection system downstream.

Sanitary sewers are normally centered within a 10-foot half of a 20-foot wide easement. A rule of thumb is that the sewer occupies the west or south one-half of the easement, whichever is applicable. Figures 5.1 and 5.3 show the recommended location for the sanitary sewer main relative to other utilities and the street right-of-way.

Construction of sanitary sewer mains could be staged according to need. The administration building is presently in need of service and the planned Midwest Corporate Aviation building will need sewer service when the facility is constructed. It is probable that the proposed air ambulance development will also require a sanitary sewer hookup. A decision to stage construct sewer mains will definitely be dependent on the timing of these developments. If the ambulance complex is contemplated in the near term, it would be advisable to construct all sanitary sewers from the lateral proposed to serve the administration building to the south end of Jabara Road as one project. The alternative would be to provide service initially to only the administration building and the Midwest Corporate Aviation, Inc. facility.

#### 5.4 NATURAL GAS

The Master Utility Plan (Figure 5.1) shows a proposed gas main layout for serving the airport with natural gas. Main sizes are not shown as this would be determined by the Gas Service Company.

As mentioned previously, the nearest available gas line is located in 35th Street at Webb Road. When requested, the Gas Service Company has indicated they will extend their 34th Street line to Webb Road and loop it with their

35th Street line as shown on the Master Utility Plan. A gas main will then be extended east in the airport's 34th Street utility corridor on the same side of the street as the sanitary sewer main. It will then branch north and south along the west edge of Jabara Road and serve abutting parcels all along its length.

Total gas requirements for a fully developed airport were projected by utilizing the State KCC requirement: Building heat loss cannot exceed over 35 BTU's per hour per square foot of building area. By working backward, a figure indicating the maximum amount of gas that will ever be needed was calculated. With a 20 PSI pressure at the source it was determined that there would be ample capacity to serve the fully developed airport by extending the existing gas main facilities.

There are no set standards for gas main easement widths; however, an easement to facilitate a 4-inch main would probably not exceed 10 feet. Again, as with the water and sanitary sewer mains, gas main construction can be staged on an "as-needed" basis with the extension of gas lines occurring as each new tenant develops his facility. It is the policy of the Gas Service Company to locate meters at or very near the street right-of-way line. The service connection and line from the meter to the building is the responsibility of the tenant.

## 5.5 ELECTRIC POWER

Projected electric power facilities are shown on the Master Utility Plan.

The Kansas Gas & Electric Company presently has a major 3-phase, 12.47 KV feeder line at the corner of 37th Street North and Webb Road. They will bring this service approximately 600 feet south, then east across Webb Road to the edge of the airport property. The primary feeder is normally brought to the site overhead; however, if the Airport Authority wants an underground line across Webb Road, KG&E will make this type installation at an additional cost. Regardless, from the point of entry onto the airport, the primary service to air-side development will be underground and will extend east along a 20-foot wide easement recommended for this purpose, then north and south along the east side of Jabara Road. KG&E will install pad mounted transformers at points where service to adjacent parcels is requested. KG&E will have the option of serving development on the west side of Jabara Road from either Webb Road or Jabara Road. It is further recommended that plans be made to bring 3-phase service onto the site at the time the new runway lighting control center is constructed.

Electric cables that pass under roadways, taxiways, etc., will be encased in a 3-inch galvanized rigid steel conduit which can be either pushed under existing streets or installed ahead of new street or taxiway construction. In the future, the Wichita Airport Authority should encourage the extension of primary distribution from the south also. This 3-phase distribution line would be feeding from a different substation and the airport would then be on-line with two substations, indicating that if one of the substations was out of service, the airport power would have the least amount of downtime. The construction of the electrical system can also be staged to coincide with the development of commercial and industrial tenants on the airport and extension of electrical equipment would be provided as needed.

Temporary service to provide single-phase electric power during the construction phases can probably be provided from the existing transformer which is located near the administration building.

## 5.6 TELEPHONE SERVICE

Projected telephone facilities are shown graphically on the Master Utility Plan (Figure 5.1). As mentioned previously, there is a buried telephone cable containing 600 pairs located along the east edge of Webb Road which is presently serving existing facilities at Jabara Airport. It is proposed to come from this existing line at a point adjacent to the west end of the electrical easement and install the telephone service cable in the same easement. The electrical service would be deep with the telephone cable installed at least 3 feet above the primary electric cable. Underground telephone service splice boxes will be installed at points where individual service is needed.

The capacity of the existing telephone cable (600 pairs), which is located in front of the airport, is of the magnitude that can easily accommodate the airport when fully developed. Officials at Southwestern Bell Telephone Company have reviewed the proposed plan for telephone service at Jabara Airport and see no problems with either capacity or construction of the system.

## 5.7 STORM DRAINAGE SYSTEM

A conceptual storm drain plan for the airport is shown on Figure 5.2. The site layouts are also conceptual but were considered typical in terms of drainage design. The heavy, dashed lines delineate large areas each of which

slope to one of four tributaries that receive runoff from the airport site. The light, dashed lines delineate individual subareas within the larger watersheds. For purposes of this report, the subareas have been limited to areas which drain to existing pipe culverts or areas which will definitely require a storm drain outfall at some time in the future. The subareas shown will very likely be further subdivided as development takes place. For example, each FBO site that is developed will, in effect, become a subarea. Considering the slope of the ground along the flight line, it appears logical that the design for each of these tracts should include an internal storm drain system.

Initially and for the short term, it will be possible to drain the airport via open ditches and culverts. In the future, however, as development intensifies and street improvements are required, it will be desirable to drain the area(s) west of the aircraft parking ramp with storm sewers.

Runoff from the sites west of Jabara Road will drain either to Jabara Road or Webb Road. Eventually, the portion of Area No. 3, shown on Figure 5.2, lying west of Jabara Road will have to be drained by a "public" storm sewer outfall extending east in the vicinity of Taxiway D. For clarity, "public" shall be understood to mean a system designed, constructed and paid for by the Wichita Airport Authority. Public storm drain systems will probably also be required at each end of Jabara Road.

Recently, the Metropolitan Area Planning Department (MAPD) has begun to review carefully the impact of development on downstream interests. In this regard, there has been a trend toward invoking a policy of discharge management. The

policy is to limit post-development discharge rates to pre-development rates. The most common means of gaining this control is by incorporating detention and/or retention basins into the drainage plan.

Table 5.1 provides a comparison of runoff volumes in acre feet of water. The difference in the two values is the required maximum capacity of the detention facility. In fact, the required storage would be less than that shown because the volume difference does not take into account the stage-storage relationship. What the data does indicate is that it will not be particularly difficult to meet any storage requirements which might be imposed on the airport development.

Table 5.1  
Stormwater Runoff  
Col. James Jabara Airport

<u>Storm Sewer System</u>	<u>Size of Drainage Basin</u>	<u>Pre-Development Runoff Volume (Acre Feet)</u>	<u>Post-Development Runoff Volume (Acre Feet)</u>	<u>Maximum Detention Storage Required</u>
No. 1	13.1 A.	2.6 A. Ft.	6.0 A. Ft.	3.4 A. Ft.
No. 2	13.8 A.	2.7 A. Ft.	7.6 A. Ft.	4.9 A. Ft.
No. 3	47.6 A.	9.2 A. Ft.	25.2 A. Ft.	15.9 A. Ft.
No. 4	23.4 A.	4.6 A. Ft.	12.2 A. Ft.	7.6 A. Ft.

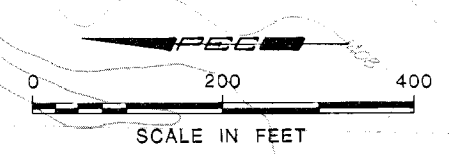
The areas between the runway and the flight line apron can be utilized for stormwater detention and would be adequate to control the discharge rates from Areas No. 2 and No. 3. In addition, a pond situated downstream from the 60-inch culvert beneath the runway could also be used to control runoff from Area No. 3. Special basins might have to be constructed to support Areas

No. 1 and No. 4. In the short-term, however, runoff within these areas will be adequately controlled by the existing soil conservation features; namely terraces, waterways and ponds, and in part by the realignment of 37th Street.

# MASTER UTILITY PLAN

## COLONEL JAMES JABARA AIRPORT

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.  
 145 N. 15th St.  
 WICHITA, KANSAS



- LEGEND**
- 1423.6 MINIMUM FLOOR ELEVATION (FOR GRAVITY SEWER SERVICE)
  - E — E — PROPOSED UTILITIES:
    - T — T — UNDERGROUND ELECTRICAL LINES
    - SS — SS — UNDERGROUND TELEPHONE LINES
    - 4" — 4" — SANITARY SEWER & MANHOLES
    - 8" — 8" — GAS MAIN
    - W — W — WATER MAIN

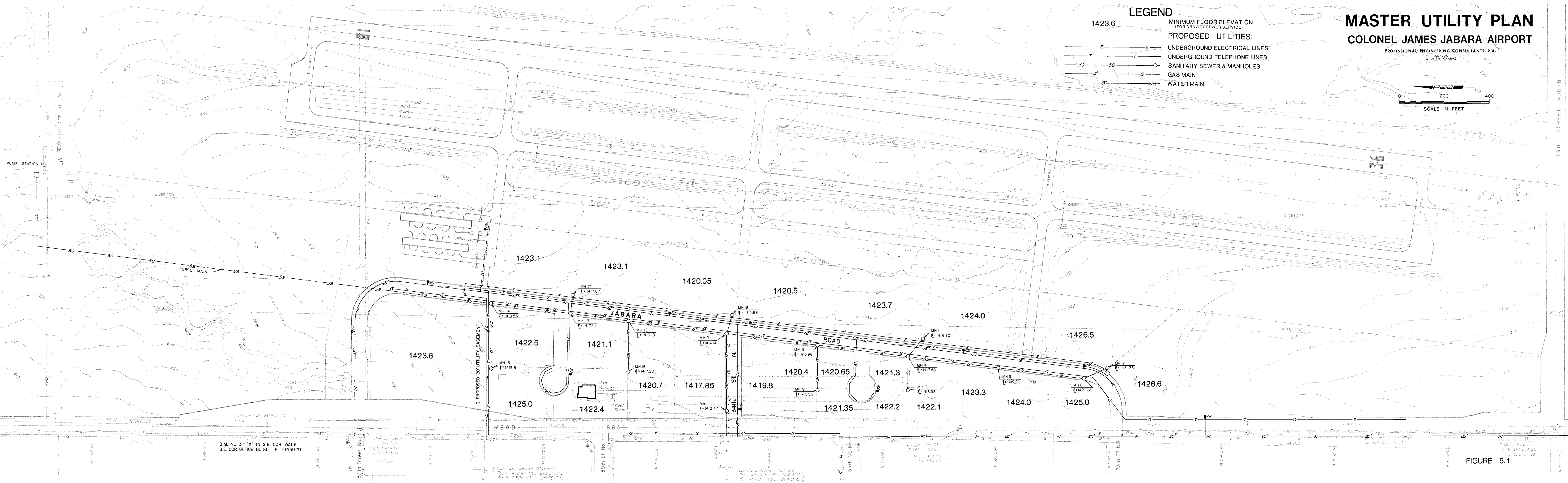
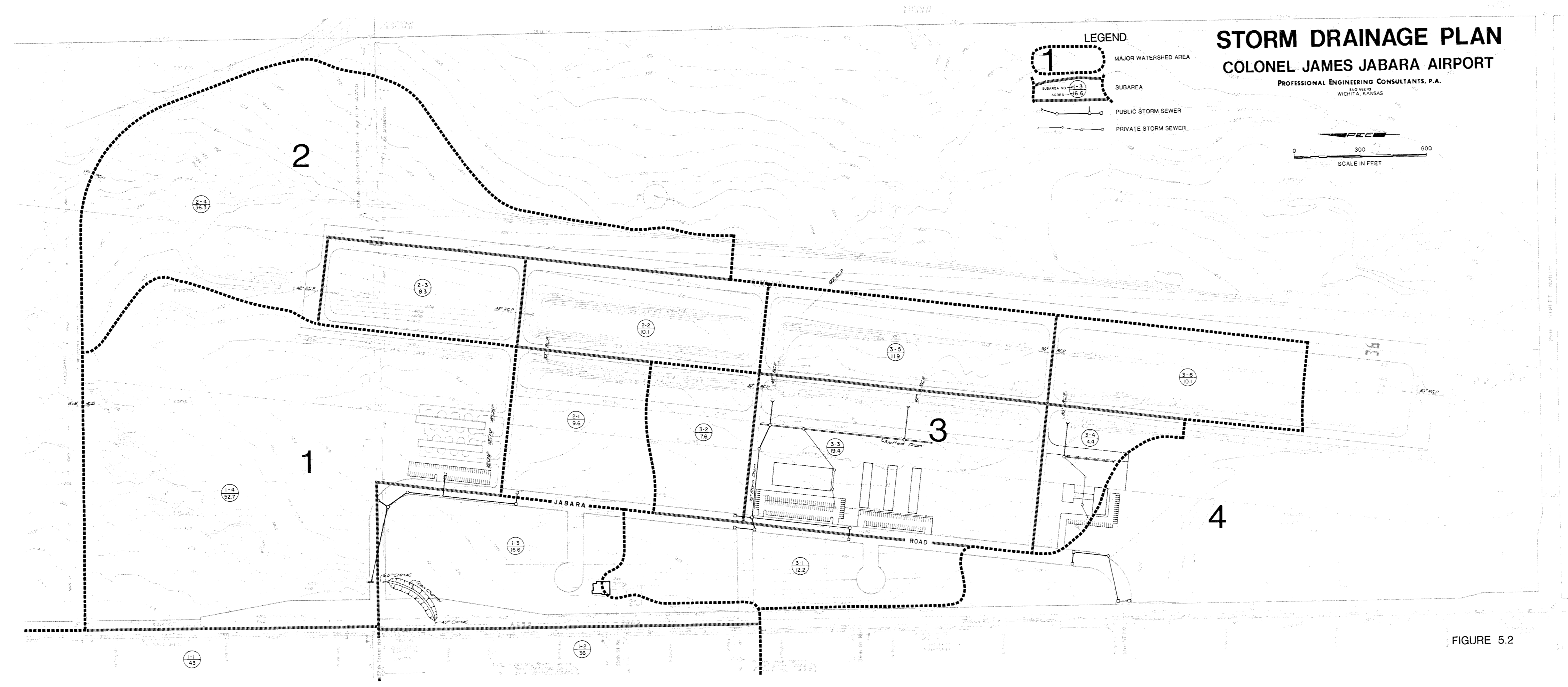
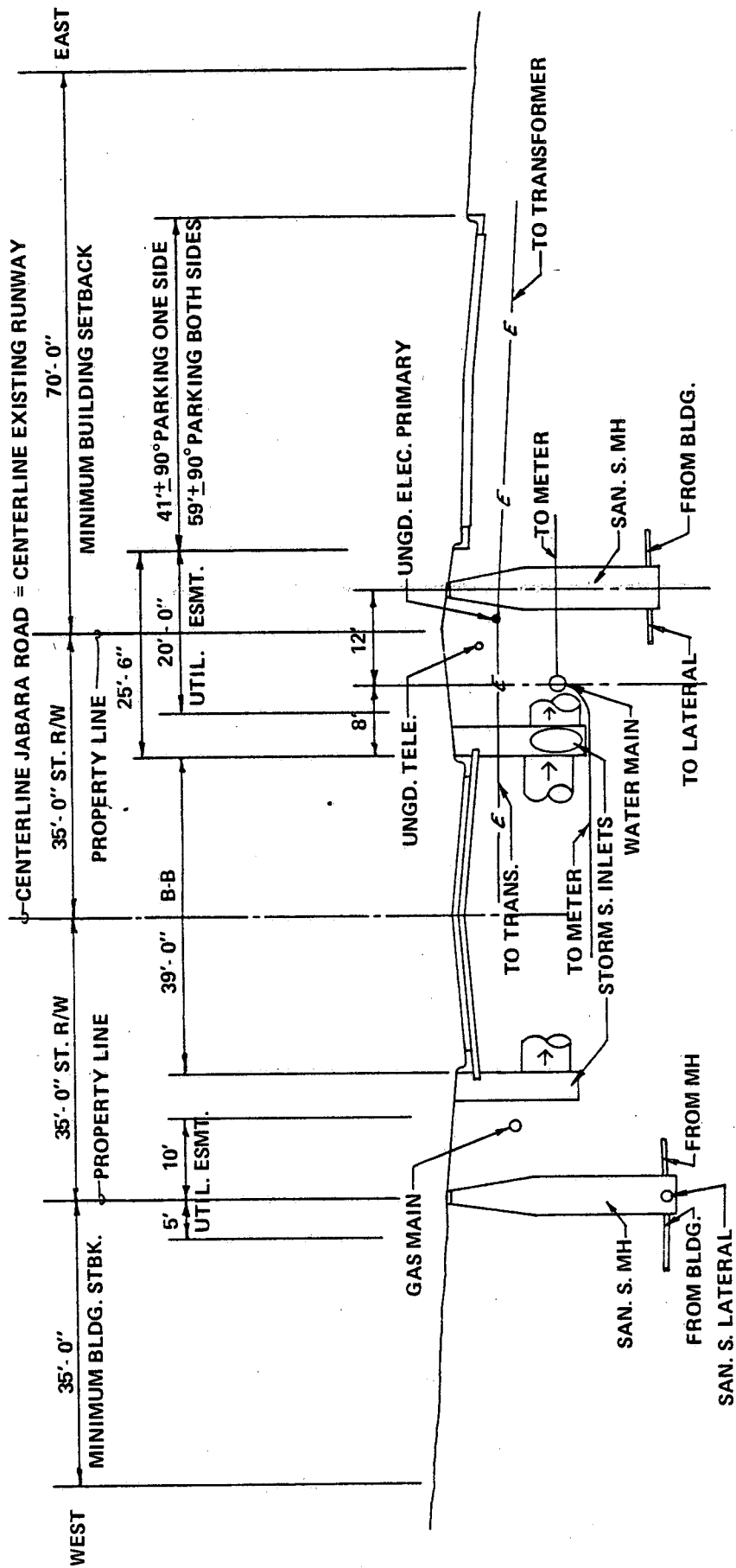


FIGURE 5.1





**TYPICAL SECTION**  
**PROPOSED UTILITY CORRIDOR**

## CHAPTER 6 COSTING AND METHODOLOGY FOR THE DEVELOPMENT OF UTILITY SERVICES

### 6.1 GENERAL

This section analyzes the methods utilized by the various utility companies in the construction of facilities for providing service to a new development. It also outlines what each utility company will provide as well as what portion of the utility installation will be charged to the owner. As described previously, all utility companies require an easement or public right-of-way for their facilities indicating that one of the first prerequisites to development at Jabara will be platting, zoning and the establishment of suitable easements. The following subsections address owner costs presuming that proper easements are already established for each utility.

As written, "owner cost" could mean a cost to the Wichita Airport Authority or an assessed cost to a lessee. In time the WAA will have to develop a finance policy for all utilities at Jabara, setting forth a distinction between Authority costs and tenant costs.

The following paragraphs are intended to provide usable information and suggestions and in no way represent an attempt to formulate policy.

### 6.2 POTABLE WATER

The Wichita Water Department will install potable water facilities to serve new development when it is petitioned to do so. The department contracts for

the installation of all water main pipe, valves and hydrants. These improvements are generally financed with bonds which are retired through long-term special assessments. In this case, the assessment would be against the Wichita Airport Authority. Upon request, the water department, for a nominal charge, will set a meter; the user will pay for installation of the service line; and the water department will proceed to bill the tenant for the amount of water consumed.

Representative unit cost figures for waterline construction are:

Eight-inch water main in place (includes valves, hydrants, etc.) - \$20.00 per linear foot.

Twelve-inch water main in place - \$25.00 per linear foot.

As shown on the Master Utility Plan (Figure 5.1) the water system contains approximately 4,200 lineal feet of 12-inch pipe, 1,775 lineal feet of 8-inch pipe and eleven fire hydrants. Applying unit costs to these quantities results in a total estimated cost of approximately \$140,500 for the water system.

### 6.3 SANITARY SEWER

Sanitary sewer improvements are normally provided by petition to the City of Wichita. City Engineering then contracts construction of the project and assumes the responsibility for maintenance. Repayment for the sewerage facilities would be made in the form of long-term special assessments to the Wichita Airport Authority. In the past, however, the WAA engineering staff has, with the concurrence of City Engineering, assumed the responsibility for

the design and construction of sanitary sewers on airport property. Therefore, it is assumed that the Authority will have some flexibility in the future in deciding the best means of engineering and financing sanitary sewer improvements.

Representative unit costs for sewerage facilities are:

Eight-inch VCP sanitary sewer mains in place - \$20.00 per linear foot.

Manhole - \$1,600.00 each.

Pump station (100 GPM) w/standby power - \$50,000.00.

There are approximately 4,500 lineal feet of 8-inch sewer pipe and 18 manholes in the total collection system. Applying unit costs to these quantities indicates an estimated cost of approximately \$118,800 for the sewage collection system as shown in the Master Utility Plan (Figure 5.1), not including any force main or pump station.

#### 6.4 NATURAL GAS

The Gas Service Company furnishes all materials, pipe and labor and makes the installation of the gas distribution mains. A gas main extension deposit is made by the owner in an amount equal to the total cost of construction and as tenants along the line hook up, a portion of the deposit is refunded. The rebate per customer is an amount equivalent to the construction cost of 75 feet of main. Gas Service Company officials have indicated a willingness to work with the Wichita Airport Authority and engineering staff to develop the most economical and satisfactory gas system for Colonel James Jabara Airport.

The dollar amount of the initial gas main deposit is determined by the Gas Service Company and is dependent upon the size of pipe used and the length of the gas pipe run. When individual service connections are made, the Gas Service Company will install the meter and regulator at an approximate cost of \$2.00 per lineal foot of line up to 60 feet afterwhich the cost per foot escalates to \$3.50 per foot.

Presuming that 4-inch diameter gas mains will be utilized in the construction of the natural gas system and applying an estimated unit cost of \$10 per lineal foot results in an estimated cost of approximately \$45,000. This represents the amount for which the Airport Authority would be responsible if the total gas system shown on Figure 5.1 were constructed as a single project.

## 6.5 ELECTRIC POWER

There will be no charge to the owner when Kansas Gas & Electric Company extends the three-phase pole mounted primary distribution feeders south from 37th Street North on Webb Road to a point opposite the easement which has been established for electric power facilities. From this point, the Electric Company will cross Webb Road with overhead primary service to a power pole at the edge of the airport property at their expense. Installation of the underground primary feeder from the power pole east will be charged to the Airport Authority at a cost of \$2.75 per linear foot, plus the contractor's cost for trenching and backfilling which is approximately \$0.50 per lineal foot.

Since it is imperative that the aviation lighting control facilities be on a separate service from the rest of the airport, a shelter will be needed to

house this equipment. It is recommended that the aviation lighting control equipment be installed in the southeast corner of T-hangar No. 11. There will be some cost to the owner in preparing this 15-foot X 17-foot room to accommodate the control equipment. All costs associated with the runway lighting system will be eligible for FAA participation.

As shown on the Master Utility Plan, there is approximately 4,300 lineal feet of buried electric cable making up the electrical distribution system. The cost to the Wichita Airport Authority for installing this system is estimated to be approximately \$15,600. Included in this estimate are rigid conduit raceways under Jabara Road and Taxiway "B".

## 6.6 TELEPHONE SERVICE

The Southwestern Bell Telephone Company will provide service to new tenants at very little front end cost. The company will supply and install all materials and equipment. The only cost to the owner will be to provide rigid conduit for the telephone cable when it has to pass under a street or taxiway. Typically, 3-inch galvanized rigid steel conduit is utilized for the raceways. The approximate cost, in place, for raceways is \$14.00 per linear foot and the estimated cost for installation under Jabara Road and Taxiway "C" is approximately \$1,500.

## 6.7 DRAINAGE IMPROVEMENTS

The responsibility for construction of "public" (See paragraph 5.7) drainage facilities will befall the Wichita Airport Authority. These facilities will

include storm sewers within street rights-of-way, associated storm sewer outfall lines and detention storage basins. The Authority might also elect to assume a portion of the cost of a storm drain along the west edge of the future parallel taxiway. It would be reasonable to consider other systems which might be required to carry roof drainage or apron and parking lot drainage as an appropriate lease cost.

Summarized below are estimated costs for storm drainage facilities for both public and private areas, and apron areas to be served by a slotted drain system.

<u>Item</u>	<u>Approximate Length or Total</u>	<u>Unit Price</u>	<u>Extension</u>
36" RCP	450'	\$45.00	\$20,250
30" RCP	225'	37.00	8,325
24" RCP	765'	30.00	22,950
18" RCP	1,060'	26.00	27,560
Inlets & Manholes	20 ea.	1,000.00	<u>20,000</u>
		TOTAL	\$99,085
15" Slotted Drain	2,100'	\$75.00	157,500
15" CMP Outfall Pipe	900'	25.00	<u>22,500</u>
		TOTAL	\$180,000