Preliminary Drainage Report
The Foliage Center Addition
Wichita, Sedgwick County, Kansas

Location

The subject property is in the city of Wichita, Sedgwick County, Kansas. The proposed development is located north of 13th Street North, west of Webb Road, in the southeast ¼ of the southeast ¼ of Section 8, Township 27 South, Range 2 East. The site has an area of 7.1 acres. The Waterfront Addition is east of the site. The site is shown on the Andover, Kansas Quadrangle, located in Appendix A.

Soils

According to the NRCS (SCS) Sedgwick County Soil Survey (Appendix B) soils on the site are Rosehill silty clay 1 to 3 percent slopes, (Rd – HSG "D") and Irwin silty clay loam 1 to 3 percent slopes, (Ia, - HSG "D). The Hydraulic Soil Group used to select runoff coefficients was "D".

Pre-Project Conditions

Pre-Project Development
The site is currently vacant with maintained grass.

Pre-Project Landform and Slope
Slopes across the site range from 1.0-2.0%. Existing berms line the site along the south and east sides of the property limiting the amount of runoff entering 13th Street and Webb Rd.

Pre-Project Drainage Conditions
The site is entirely in Zone C, areas of minimal flooding. The nearest zone A, areas within the 100-year flood plain, is located approximately 100 feet east of the site (FIRM Panel 225, Sedgwick County, Kansas, June 3, 1986) (Appendix C).

Pre-Project Runoff Characteristics
There are existing stormwater sewer systems (SWS) running along the south and east sides of the property. The SWS east of the property drains into the lakes east of Webb Road. The SWS south of the site flows south along Webb Road and drains into an existing ditch where it is routed into the Lake Point lakes. Berms limit the amount of flow entering the streets. Therefore, the majority of the site drains to a low spot located in the southeast corner of the site, where it ponds until an 18" CMP is able to drain the runoff

into the SWS south of the site. The times of concentration and runoff were calculated in a spreadsheet, Appendix D. The FAA Method was used to calculate the time of concentration, and the Rational Method was used to calculate the runoff from the site. Flow entering the 18" CMP was analyzed using Hydraflow Hydrographs by Intelisolve, Appendix E. A summary of the pre-project runoffs is located below in Table 1. A drawing showing the pre-project drainage areas is located in Appendix F.

Table 1. Pre-Project runoff

Runoff To	2-Year	5-Year	10-Year	100-Year
Southeast corner of site	10.5	14.9	24.0	56.0
18" CMP in SE Corner	4.0	4.9	6.9	9.2
21" RCP to East Lakes	6.8	9.2	13.0	26.9

Post-Project Conditions

Post-Project Development
The site will develop as two commercial lots. The lots are expected to be used for retail.

Post-Project Landform and Slope
Post-Project slopes have not yet been determined, but are expected to range from 0.5% to 2.0%.

Post-Project Runoff Characteristics
SWS systems will be constructed in order to route runoff from an existing pond northwest of the site and the runoff from the site to the Waterfront lake east of Webb Road. The location of inlets within the site will be determined when the final grading of the site is complete. An addition 42" Reinforced Concrete Pipe (RCP) will be placed under Webb Road to assist the existing 21" RCP in the draining of the site. The post-project runoff values were also calculated using the rational method in Excel, Appendix D. A summary of the post-project runoffs is located below in Table 2. A drawing showing the post-project drainage areas is located in Appendix G.

Table 2. Post-Project runoff

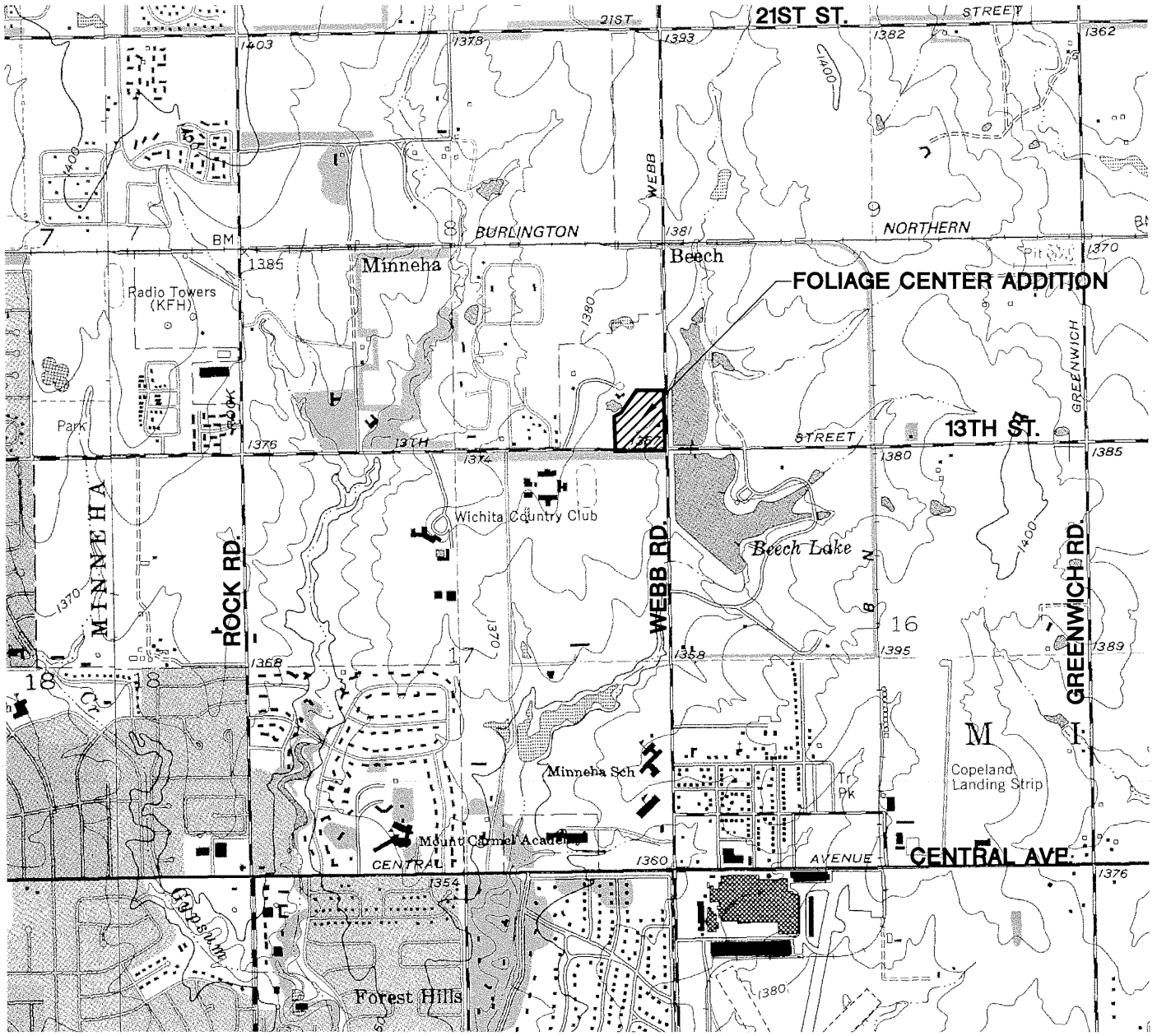
	2-Year	5-Year	10-Year	100-Year
To 42" RCP	18.2	24.5	35.0	71.8
To 21" RCP	9.3	11.3	14.0	21.3

Runoff will not enter the SWS south of the site. The runoff entering the lakes east of Webb Road will be increased by 66.2 cfs. However, the lakes have the capacity needed to detain the additional runoff without adversely affecting downstream property.

Summary

The Foliage Center Addition is approximately 7.1 acres of vacant grassland located on the northwest corner of 13th Street North and Webb Road. The property will be developed for commercial use. Stormwater Sewer Systems will be constructed to route runoff from both the site and from a private pond northwest of the site into the Waterfront lake east of Webb Road. An additional 42" RCP will be placed under Webb Road to assist the existing 21" RCP in the drainage of the site. The Waterfront lake will provide detention for the site. This lake has the capacity to maintain the additional runoff.

Appendix A
Quadrangle



SCALE 1:24 000

1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

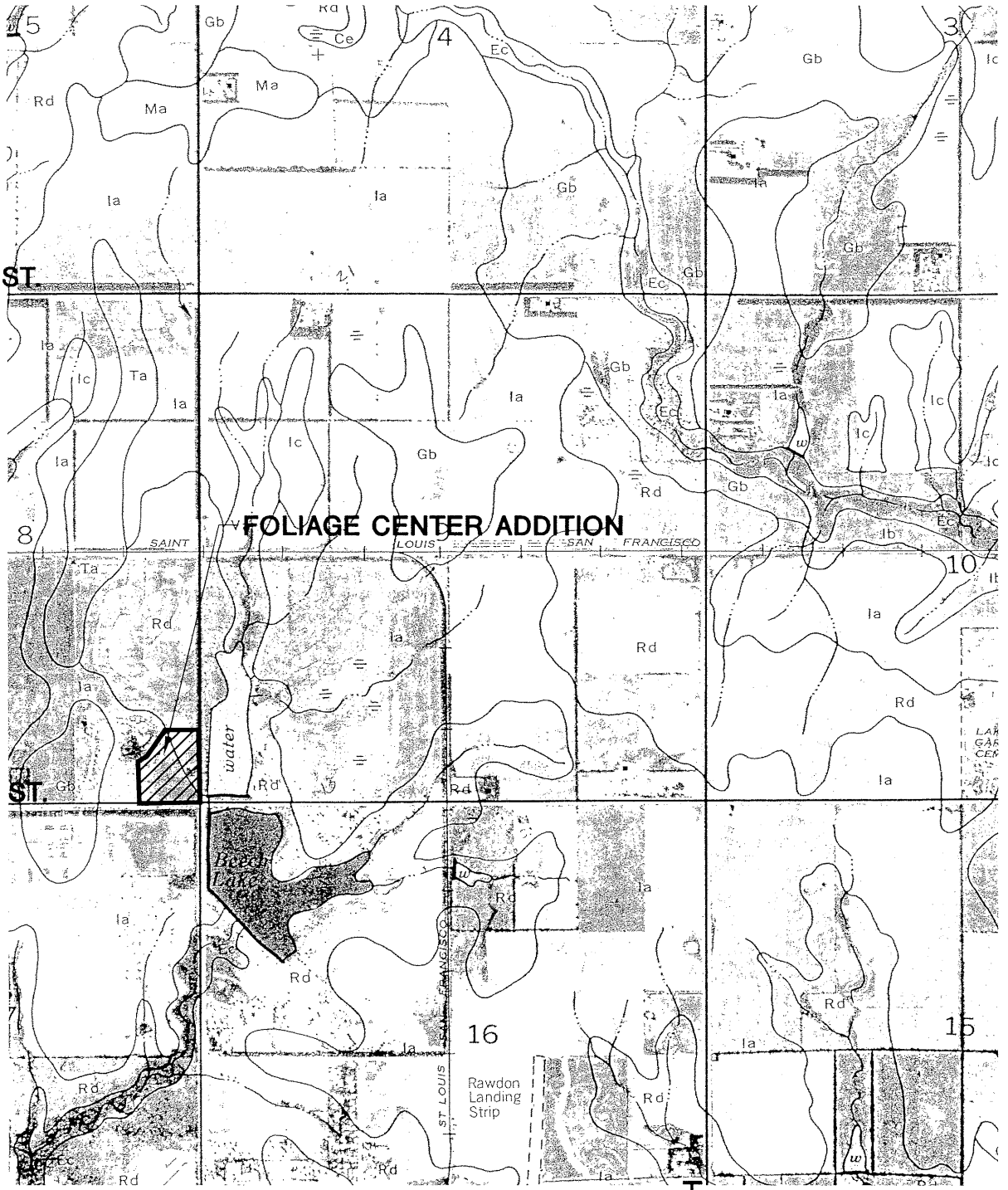
FOLIAGE CENTER ADDITION
PROJECT NAME

USGS GEOLOGICAL SURVEY
EAST WICHITA, KANSAS QUANRANGLE
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04274	1 / 1
DATE	JOB NO.	SHEET/OF

J:\CIVIL\04274\DWG\DRNG\QUAD MAP.DWG

Appendix B
Soil Survey



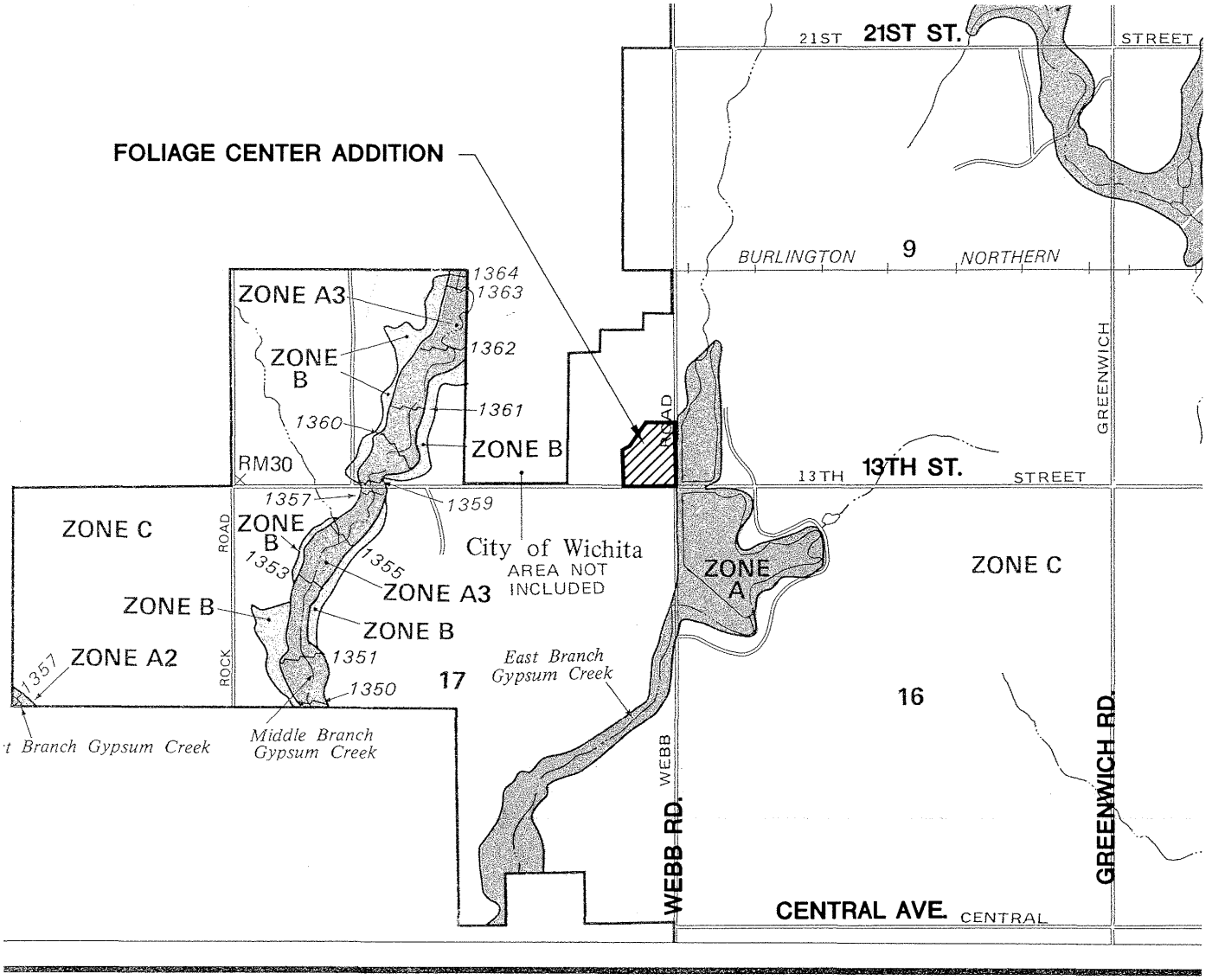
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

FOLIAGE CENTER ADDITION
PROJECT NAME

SOIL SURVEY
SEDGWICK COUNTY, KANSAS
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04274	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix C
FIRM & FBFM



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK
COUNTY,
KANSAS
(UNINCORPORATED AREAS)

PANEL 150 OF 300

COMMUNITY-PANEL NUMBER
200321 0150 A

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency

APPROXIMATE SCALE

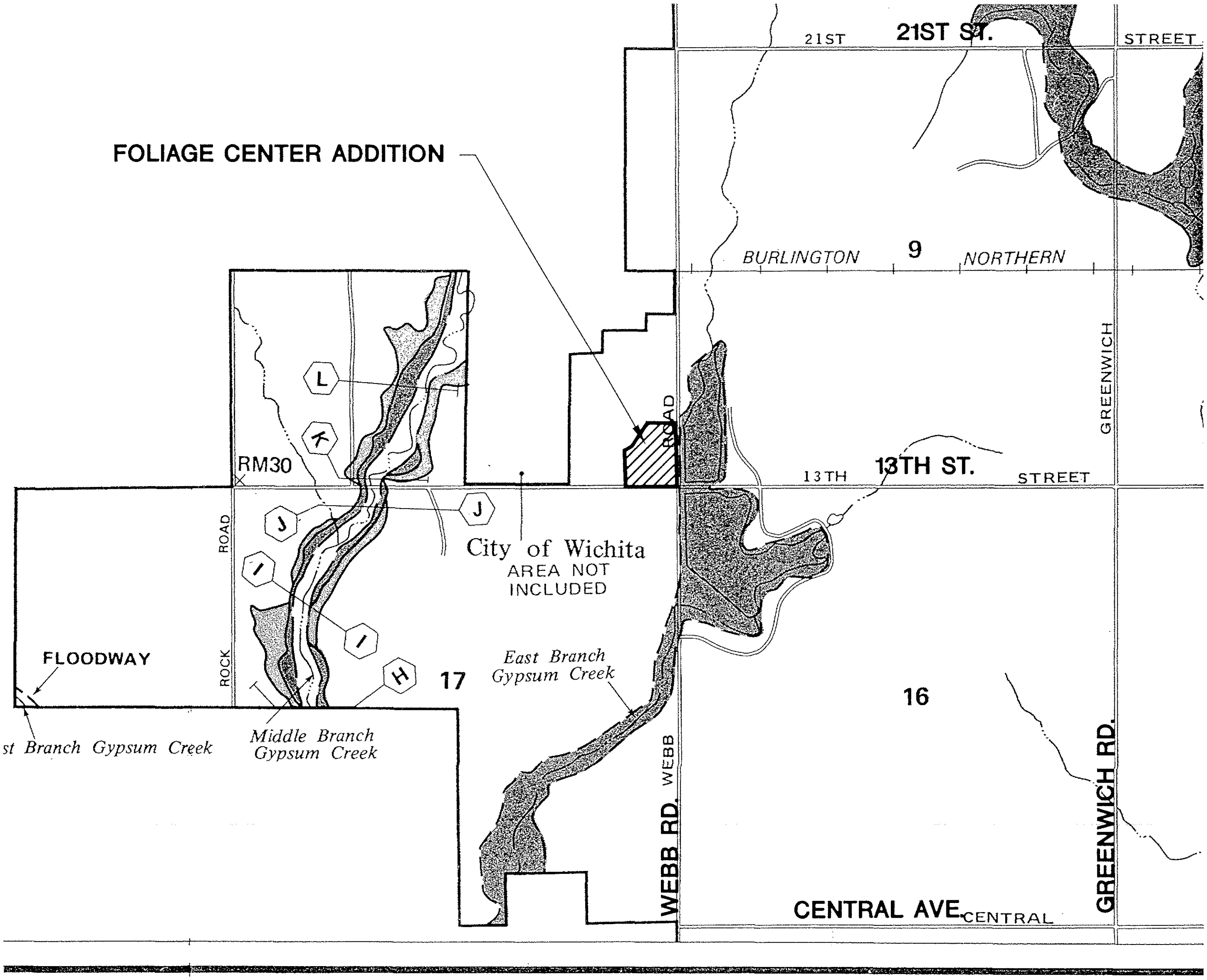
2000 0 2000 FEET

MKEC
ENGINEERING
CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

FOLIAGE CENTER ADDITION
PROJECT NAME

PANEL 150 OF 300
FLOOD INSURANCE RATE MAP
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04274	1 / 1
DATE	JOB NO.	SHEET/OF



NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY

FLOOD BOUNDARY AND FLOODWAY MAP

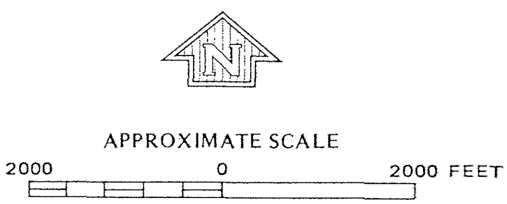
SEDGWICK COUNTY, KANSAS
(UNINCORPORATED AREAS)

PANEL 150 OF 300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
200321 0150

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency



MKEC
ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

PROJECT NAME	*FOLIAGE CENTER ADDITION*
SHEET TITLE	*PANEL 150 OF 300 FLOOD BOUNDARY AND FLOODWAY MAP*
DESIGN BY:	AJK
DRAWN BY:	KWS
CHECKED BY:	GJA
DATE	JUNE 2005
JOB NO.	04394
SHEET/OF	1 / 1

Appendix D
Excel Spreadsheet

DRAINAGE ANALYSIS SUMMARY
The Foliage Addition

Soil Group D

Area ID	Area ac	Accum. Area ac	C2	C5	C10	C100	Tc2 min	Tc5 min	Tc10 min	Tc100 min	I2 in/hr	I5 in/hr	I10 in/hr	I100 in/hr	Q2 cfs	Q5 cfs	Q10 cfs	Q100 cfs
Pre-Project																		
A1	3.47		0.30	0.35	0.45	0.65	26	25	21	15	2.90	3.65	4.50	7.37	3.02	4.43	7.03	16.62
A2	1.07		0.84	0.85	0.87	0.91	15	15	15	15	3.83	4.56	5.22	7.37	3.44	4.15	4.86	7.18
A1+A2		4.5	0.43	0.47	0.55	0.71	26	25	21	15	2.90	3.65	4.50	7.37	5.63	7.75	11.22	23.80
A3	0.46		0.84	0.85	0.87	0.91	15	15	15	15	3.83	4.56	5.22	7.37	1.48	1.78	2.09	3.09
A1+A2+A3		5.0	0.47	0.50	0.58	0.73	26	25	21	15	2.90	3.65	4.50	7.37	6.75	9.18	13.02	26.88
A4	4.44		0.41	0.45	0.54	0.71	30	29	25	17	2.67	3.37	4.22	7.00	4.86	6.73	10.12	22.07
A5	7.98		0.30	0.35	0.45	0.65	34	32	28	19	2.48	3.10	3.98	6.68	5.94	8.66	14.29	34.65
A4 + A5		12.4	0.34	0.39	0.48	0.67	34	32	28	19	2.48	3.10	3.98	6.68	3.82	5.43	8.71	20.36
A6	0.07		0.30	0.35	0.45	0.65	15	15	15	15	3.83	4.56	5.22	7.37	0.08	0.11	0.16	0.34
A4+A5 +A6		12.5	0.34	0.39	0.48	0.67	34	32	28	19	2.48	3.10	3.98	6.68	10.50	14.93	23.96	56.01
Post-Project																		
B1	3.20		0.30	0.35	0.45	0.65	17	16	15	15	3.61	4.43	5.22	7.37	3.47	4.96	7.52	15.33
B2	4.44		0.41	0.45	0.54	0.71	30	29	25	17	2.67	3.37	4.22	7.00	4.86	6.73	10.12	22.07
B3	0.89		0.30	0.35	0.45	0.65	16	15	15	15	3.83	4.56	5.22	7.37	1.02	1.42	2.09	4.26
B4	5.55		0.68	0.69	0.73	0.80	17	16	15	15	3.72	4.43	5.22	7.37	14.04	16.96	21.15	32.72
B1+B2+B3+B4		14.1	0.48	0.52	0.59	0.73	30	29	25	17	2.67	3.37	4.22	7.00	18.21	24.46	34.98	71.76
B5	0.24		0.30	0.35	0.45	0.65	15	15	15	15	3.83	4.56	5.22	7.37	0.28	0.38	0.56	1.15
B6	1.73		0.68	0.69	0.73	0.80	17	16	15	15	3.72	4.43	5.22	7.37	4.38	5.29	6.59	10.20
B5+B6		2.0	0.63	0.65	0.70	0.78	17	16	15	15	3.72	4.43	5.22	7.37	4.64	5.66	7.16	11.35
B7	0.95		0.87	0.88	0.90	0.93	15	15	15	15	3.83	4.56	5.22	7.37	3.17	3.81	4.46	6.51
B8	0.50		0.87	0.88	0.90	0.93	15	15	15	15	3.83	4.56	5.22	7.37	1.67	2.01	2.35	3.43
B5+B6+B7+B8		3.4	0.73	0.75	0.78	0.84	17	16	15	15	3.72	4.43	5.22	7.37	9.34	11.31	13.97	21.29

NOTE: Pre-project Area IDs do not correspond to post-project Area IDs.

Rosehill silty clay 1 to 3 percent slopes, (Rd – HSG "D") and Irwin silty clay loam 1 to 3 percent slopes, (Ia, - HSG "D). ***Soil Group D***

Appendix E
Hydraflow Hydrographs
By Intelisolve
Output

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	10.51	1	34	0.492	----	------	------	Water entering South SWS
2	Reservoir	4.03	1	55	0.492	1	1370.26	0.247	Southeast Corner of Si

Proj. file: 2yr South of site.gpw | Return Period: 2 yr | Run date: 06-20-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	15.24	1	32	0.672	----	------	------	Water entering South SWS
2	Reservoir	4.90	1	54	0.672	1	1370.52	0.400	Southeast Corner of Si

Proj. file: 5yr South of site.gpw | Return Period: 5 yr | Run date: 06-20-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	23.39	1	28	0.902	----	------	------	Water entering South SWS
2	Reservoir	6.90	1	48	0.902	1	1370.84	0.593	Southeast Corner of Si

Proj. file: 10yr South of site.gpw | Return Period: 10 yr | Run date: 06-20-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	Rational	55.93	1	19	1.464	----	------	------	Water entering South SWS
2	Reservoir	9.18	1	35	1.464	1	1371.35	1.163	Southeast Corner of Si

Proj. file: 100yr South of site.gpw | Return Period: 100 yr | Run date: 06-20-2005

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Water entering South SWS

Hydrograph type	= Rational	Peak discharge	= 55.93 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 12.5 ac	Runoff coeff.	= 0.67
Intensity	= 6.678 in/hr	Time of conc. (Tc)	= 19 min
IDF Curve	= SedgwickCoKS.IDF	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 1.464 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
0.07	11.77
0.08	14.72
0.10	17.66
0.12	20.60
0.13	23.55
0.15	26.49
0.17	29.44
0.18	32.38
0.20	35.32
0.22	38.27
0.23	41.21
0.25	44.15
0.27	47.10
0.28	50.04
0.30	52.98
0.32	55.93 <<
0.33	52.98
0.35	50.04
0.37	47.10
0.38	44.15
0.40	41.21
0.42	38.27
0.43	35.32
0.45	32.38
0.47	29.44
0.48	26.49
0.50	23.55
0.52	20.60
0.53	17.66
0.55	14.72
0.57	11.77

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Southeast Corner of Si

Hydrograph type	= Reservoir	Peak discharge	= 9.18 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Inflow hyd. No.	= 1	Reservoir name	= South Pond
Max. Elevation	= 1371.35 ft	Max. Storage	= 1.163 acft

Storage Indication method used.

Outflow hydrograph volume = 1.464 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.08	14.72	1369.67	2.14	-----	-----	-----	-----	-----	-----	-----	-----	2.14
0.10	17.66	1369.80	2.63	-----	-----	-----	-----	-----	-----	-----	-----	2.63
0.12	20.60	1369.95	3.16	-----	-----	-----	-----	-----	-----	-----	-----	3.16
0.13	23.55	1370.03	3.41	-----	-----	-----	-----	-----	-----	-----	-----	3.41
0.15	26.49	1370.08	3.57	-----	-----	-----	-----	-----	-----	-----	-----	3.57
0.17	29.44	1370.14	3.74	-----	-----	-----	-----	-----	-----	-----	-----	3.74
0.18	32.38	1370.20	3.92	-----	-----	-----	-----	-----	-----	-----	-----	3.92
0.20	35.32	1370.27	4.05	-----	-----	-----	-----	-----	-----	-----	-----	4.05
0.22	38.27	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
0.23	41.21	1370.43	4.27	-----	-----	-----	-----	-----	-----	-----	-----	4.27
0.25	44.15	1370.51	4.88	-----	-----	-----	-----	-----	-----	-----	-----	4.88
0.27	47.10	1370.61	5.53	-----	-----	-----	-----	-----	-----	-----	-----	5.53
0.28	50.04	1370.71	6.15	-----	-----	-----	-----	-----	-----	-----	-----	6.15
0.30	52.98	1370.81	6.73	-----	-----	-----	-----	-----	-----	-----	-----	6.73
0.32	55.93 <<	1370.92	7.30	-----	-----	-----	-----	-----	-----	-----	-----	7.30
0.33	52.98	1371.01	7.75	-----	-----	-----	-----	-----	-----	-----	-----	7.75
0.35	50.04	1371.06	7.95	-----	-----	-----	-----	-----	-----	-----	-----	7.95
0.37	47.10	1371.10	8.14	-----	-----	-----	-----	-----	-----	-----	-----	8.14
0.38	44.15	1371.13	8.30	-----	-----	-----	-----	-----	-----	-----	-----	8.30
0.40	41.21	1371.17	8.45	-----	-----	-----	-----	-----	-----	-----	-----	8.45
0.42	38.27	1371.20	8.59	-----	-----	-----	-----	-----	-----	-----	-----	8.59
0.43	35.32	1371.23	8.70	-----	-----	-----	-----	-----	-----	-----	-----	8.70
0.45	32.38	1371.25	8.81	-----	-----	-----	-----	-----	-----	-----	-----	8.81
0.47	29.44	1371.28	8.90	-----	-----	-----	-----	-----	-----	-----	-----	8.90
0.48	26.49	1371.30	8.98	-----	-----	-----	-----	-----	-----	-----	-----	8.98
0.50	23.55	1371.31	9.04	-----	-----	-----	-----	-----	-----	-----	-----	9.04
0.52	20.60	1371.32	9.09	-----	-----	-----	-----	-----	-----	-----	-----	9.09
0.53	17.66	1371.33	9.13	-----	-----	-----	-----	-----	-----	-----	-----	9.13
0.55	14.72	1371.34	9.16	-----	-----	-----	-----	-----	-----	-----	-----	9.16
0.57	11.77	1371.35	9.18	-----	-----	-----	-----	-----	-----	-----	-----	9.18
0.58	8.83	1371.35 <<	9.18	-----	-----	-----	-----	-----	-----	-----	-----	9.18 <<
0.60	5.89	1371.34	9.18	-----	-----	-----	-----	-----	-----	-----	-----	9.18
0.62	2.94	1371.34	9.16	-----	-----	-----	-----	-----	-----	-----	-----	9.16
0.63	0.00	1371.33	9.13	-----	-----	-----	-----	-----	-----	-----	-----	9.13
0.65	0.00	1371.32	9.09	-----	-----	-----	-----	-----	-----	-----	-----	9.09
0.67	0.00	1371.31	9.05	-----	-----	-----	-----	-----	-----	-----	-----	9.05
0.68	0.00	1371.31	9.02	-----	-----	-----	-----	-----	-----	-----	-----	9.02
0.70	0.00	1371.30	8.98	-----	-----	-----	-----	-----	-----	-----	-----	8.98

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.72	0.00	1371.29	8.94	-----	-----	-----	-----	-----	-----	-----	-----	8.94
0.73	0.00	1371.28	8.91	-----	-----	-----	-----	-----	-----	-----	-----	8.91
0.75	0.00	1371.27	8.87	-----	-----	-----	-----	-----	-----	-----	-----	8.87
0.77	0.00	1371.26	8.83	-----	-----	-----	-----	-----	-----	-----	-----	8.83
0.78	0.00	1371.25	8.80	-----	-----	-----	-----	-----	-----	-----	-----	8.80
0.80	0.00	1371.24	8.76	-----	-----	-----	-----	-----	-----	-----	-----	8.76
0.82	0.00	1371.23	8.72	-----	-----	-----	-----	-----	-----	-----	-----	8.72
0.83	0.00	1371.22	8.69	-----	-----	-----	-----	-----	-----	-----	-----	8.69
0.85	0.00	1371.22	8.65	-----	-----	-----	-----	-----	-----	-----	-----	8.65
0.87	0.00	1371.21	8.62	-----	-----	-----	-----	-----	-----	-----	-----	8.62
0.88	0.00	1371.20	8.58	-----	-----	-----	-----	-----	-----	-----	-----	8.58
0.90	0.00	1371.19	8.54	-----	-----	-----	-----	-----	-----	-----	-----	8.54
0.92	0.00	1371.18	8.51	-----	-----	-----	-----	-----	-----	-----	-----	8.51
0.93	0.00	1371.17	8.47	-----	-----	-----	-----	-----	-----	-----	-----	8.47
0.95	0.00	1371.16	8.43	-----	-----	-----	-----	-----	-----	-----	-----	8.43
0.97	0.00	1371.16	8.39	-----	-----	-----	-----	-----	-----	-----	-----	8.39
0.98	0.00	1371.15	8.36	-----	-----	-----	-----	-----	-----	-----	-----	8.36
1.00	0.00	1371.14	8.32	-----	-----	-----	-----	-----	-----	-----	-----	8.32
1.02	0.00	1371.13	8.29	-----	-----	-----	-----	-----	-----	-----	-----	8.29
1.03	0.00	1371.12	8.25	-----	-----	-----	-----	-----	-----	-----	-----	8.25
1.05	0.00	1371.11	8.21	-----	-----	-----	-----	-----	-----	-----	-----	8.21
1.07	0.00	1371.11	8.18	-----	-----	-----	-----	-----	-----	-----	-----	8.18
1.08	0.00	1371.10	8.14	-----	-----	-----	-----	-----	-----	-----	-----	8.14
1.10	0.00	1371.09	8.10	-----	-----	-----	-----	-----	-----	-----	-----	8.10
1.12	0.00	1371.08	8.07	-----	-----	-----	-----	-----	-----	-----	-----	8.07
1.13	0.00	1371.07	8.03	-----	-----	-----	-----	-----	-----	-----	-----	8.03
1.15	0.00	1371.07	7.99	-----	-----	-----	-----	-----	-----	-----	-----	7.99
1.17	0.00	1371.06	7.96	-----	-----	-----	-----	-----	-----	-----	-----	7.96
1.18	0.00	1371.05	7.92	-----	-----	-----	-----	-----	-----	-----	-----	7.92
1.20	0.00	1371.04	7.88	-----	-----	-----	-----	-----	-----	-----	-----	7.88
1.22	0.00	1371.03	7.85	-----	-----	-----	-----	-----	-----	-----	-----	7.85
1.23	0.00	1371.03	7.81	-----	-----	-----	-----	-----	-----	-----	-----	7.81
1.25	0.00	1371.02	7.77	-----	-----	-----	-----	-----	-----	-----	-----	7.77
1.27	0.00	1371.01	7.74	-----	-----	-----	-----	-----	-----	-----	-----	7.74
1.28	0.00	1371.00	7.70	-----	-----	-----	-----	-----	-----	-----	-----	7.70
1.30	0.00	1370.99	7.63	-----	-----	-----	-----	-----	-----	-----	-----	7.63
1.32	0.00	1370.97	7.55	-----	-----	-----	-----	-----	-----	-----	-----	7.55
1.33	0.00	1370.95	7.46	-----	-----	-----	-----	-----	-----	-----	-----	7.46
1.35	0.00	1370.94	7.38	-----	-----	-----	-----	-----	-----	-----	-----	7.38
1.37	0.00	1370.92	7.29	-----	-----	-----	-----	-----	-----	-----	-----	7.29
1.38	0.00	1370.90	7.21	-----	-----	-----	-----	-----	-----	-----	-----	7.21
1.40	0.00	1370.89	7.13	-----	-----	-----	-----	-----	-----	-----	-----	7.13
1.42	0.00	1370.87	7.04	-----	-----	-----	-----	-----	-----	-----	-----	7.04
1.43	0.00	1370.85	6.96	-----	-----	-----	-----	-----	-----	-----	-----	6.96
1.45	0.00	1370.84	6.87	-----	-----	-----	-----	-----	-----	-----	-----	6.87
1.47	0.00	1370.82	6.79	-----	-----	-----	-----	-----	-----	-----	-----	6.79
1.48	0.00	1370.81	6.71	-----	-----	-----	-----	-----	-----	-----	-----	6.71
1.50	0.00	1370.79	6.62	-----	-----	-----	-----	-----	-----	-----	-----	6.62
1.52	0.00	1370.78	6.54	-----	-----	-----	-----	-----	-----	-----	-----	6.54
1.53	0.00	1370.76	6.45	-----	-----	-----	-----	-----	-----	-----	-----	6.45
1.55	0.00	1370.75	6.37	-----	-----	-----	-----	-----	-----	-----	-----	6.37

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
1.57	0.00	1370.73	6.29	-----	-----	-----	-----	-----	-----	-----	-----	6.29
1.58	0.00	1370.72	6.20	-----	-----	-----	-----	-----	-----	-----	-----	6.20
1.60	0.00	1370.70	6.12	-----	-----	-----	-----	-----	-----	-----	-----	6.12
1.62	0.00	1370.69	6.04	-----	-----	-----	-----	-----	-----	-----	-----	6.04
1.63	0.00	1370.67	5.95	-----	-----	-----	-----	-----	-----	-----	-----	5.95
1.65	0.00	1370.66	5.86	-----	-----	-----	-----	-----	-----	-----	-----	5.86
1.67	0.00	1370.65	5.78	-----	-----	-----	-----	-----	-----	-----	-----	5.78
1.68	0.00	1370.63	5.70	-----	-----	-----	-----	-----	-----	-----	-----	5.70
1.70	0.00	1370.62	5.62	-----	-----	-----	-----	-----	-----	-----	-----	5.62
1.72	0.00	1370.61	5.54	-----	-----	-----	-----	-----	-----	-----	-----	5.54
1.73	0.00	1370.60	5.45	-----	-----	-----	-----	-----	-----	-----	-----	5.45
1.75	0.00	1370.58	5.36	-----	-----	-----	-----	-----	-----	-----	-----	5.36
1.77	0.00	1370.57	5.28	-----	-----	-----	-----	-----	-----	-----	-----	5.28
1.78	0.00	1370.56	5.19	-----	-----	-----	-----	-----	-----	-----	-----	5.19
1.80	0.00	1370.55	5.11	-----	-----	-----	-----	-----	-----	-----	-----	5.11
1.82	0.00	1370.54	5.02	-----	-----	-----	-----	-----	-----	-----	-----	5.02
1.83	0.00	1370.52	4.94	-----	-----	-----	-----	-----	-----	-----	-----	4.94
1.85	0.00	1370.51	4.86	-----	-----	-----	-----	-----	-----	-----	-----	4.86
1.87	0.00	1370.50	4.78	-----	-----	-----	-----	-----	-----	-----	-----	4.78
1.88	0.00	1370.49	4.71	-----	-----	-----	-----	-----	-----	-----	-----	4.71
1.90	0.00	1370.48	4.64	-----	-----	-----	-----	-----	-----	-----	-----	4.64
1.92	0.00	1370.47	4.56	-----	-----	-----	-----	-----	-----	-----	-----	4.56
1.93	0.00	1370.46	4.49	-----	-----	-----	-----	-----	-----	-----	-----	4.49
1.95	0.00	1370.45	4.42	-----	-----	-----	-----	-----	-----	-----	-----	4.42
1.97	0.00	1370.44	4.35	-----	-----	-----	-----	-----	-----	-----	-----	4.35
1.98	0.00	1370.43	4.28	-----	-----	-----	-----	-----	-----	-----	-----	4.28
2.00	0.00	1370.42	4.22	-----	-----	-----	-----	-----	-----	-----	-----	4.22
2.02	0.00	1370.41	4.15	-----	-----	-----	-----	-----	-----	-----	-----	4.15
2.03	0.00	1370.30	4.09	-----	-----	-----	-----	-----	-----	-----	-----	4.09
2.05	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.07	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.08	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.10	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.12	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.13	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.15	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.17	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.18	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.20	0.00	1370.30	4.10	-----	-----	-----	-----	-----	-----	-----	-----	4.10
2.22	0.00	1370.30	4.09	-----	-----	-----	-----	-----	-----	-----	-----	4.09
2.23	0.00	1370.29	4.08	-----	-----	-----	-----	-----	-----	-----	-----	4.08
2.25	0.00	1370.28	4.06	-----	-----	-----	-----	-----	-----	-----	-----	4.06
2.27	0.00	1370.27	4.04	-----	-----	-----	-----	-----	-----	-----	-----	4.04
2.28	0.00	1370.26	4.03	-----	-----	-----	-----	-----	-----	-----	-----	4.03
2.30	0.00	1370.25	4.01	-----	-----	-----	-----	-----	-----	-----	-----	4.01
2.32	0.00	1370.24	3.99	-----	-----	-----	-----	-----	-----	-----	-----	3.99
2.33	0.00	1370.23	3.98	-----	-----	-----	-----	-----	-----	-----	-----	3.98
2.35	0.00	1370.22	3.96	-----	-----	-----	-----	-----	-----	-----	-----	3.96
2.37	0.00	1370.21	3.94	-----	-----	-----	-----	-----	-----	-----	-----	3.94
2.38	0.00	1370.20	3.93	-----	-----	-----	-----	-----	-----	-----	-----	3.93
2.40	0.00	1370.19	3.90	-----	-----	-----	-----	-----	-----	-----	-----	3.90

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
2.42	0.00	1370.18	3.88	-----	-----	-----	-----	-----	-----	-----	-----	3.88
2.43	0.00	1370.18	3.85	-----	-----	-----	-----	-----	-----	-----	-----	3.85
2.45	0.00	1370.17	3.83	-----	-----	-----	-----	-----	-----	-----	-----	3.83
2.47	0.00	1370.16	3.80	-----	-----	-----	-----	-----	-----	-----	-----	3.80
2.48	0.00	1370.15	3.78	-----	-----	-----	-----	-----	-----	-----	-----	3.78
2.50	0.00	1370.14	3.75	-----	-----	-----	-----	-----	-----	-----	-----	3.75
2.52	0.00	1370.13	3.73	-----	-----	-----	-----	-----	-----	-----	-----	3.73
2.53	0.00	1370.12	3.70	-----	-----	-----	-----	-----	-----	-----	-----	3.70
2.55	0.00	1370.12	3.68	-----	-----	-----	-----	-----	-----	-----	-----	3.68
2.57	0.00	1370.11	3.65	-----	-----	-----	-----	-----	-----	-----	-----	3.65
2.58	0.00	1370.10	3.63	-----	-----	-----	-----	-----	-----	-----	-----	3.63
2.60	0.00	1370.09	3.60	-----	-----	-----	-----	-----	-----	-----	-----	3.60
2.62	0.00	1370.08	3.57	-----	-----	-----	-----	-----	-----	-----	-----	3.57
2.63	0.00	1370.07	3.55	-----	-----	-----	-----	-----	-----	-----	-----	3.55
2.65	0.00	1370.07	3.52	-----	-----	-----	-----	-----	-----	-----	-----	3.52
2.67	0.00	1370.06	3.49	-----	-----	-----	-----	-----	-----	-----	-----	3.49
2.68	0.00	1370.05	3.47	-----	-----	-----	-----	-----	-----	-----	-----	3.47
2.70	0.00	1370.04	3.44	-----	-----	-----	-----	-----	-----	-----	-----	3.44
2.72	0.00	1370.03	3.42	-----	-----	-----	-----	-----	-----	-----	-----	3.42
2.73	0.00	1370.03	3.39	-----	-----	-----	-----	-----	-----	-----	-----	3.39
2.75	0.00	1370.02	3.37	-----	-----	-----	-----	-----	-----	-----	-----	3.37
2.77	0.00	1370.01	3.34	-----	-----	-----	-----	-----	-----	-----	-----	3.34
2.78	0.00	1370.00	3.32	-----	-----	-----	-----	-----	-----	-----	-----	3.32
2.80	0.00	1369.98	3.24	-----	-----	-----	-----	-----	-----	-----	-----	3.24
2.82	0.00	1369.95	3.15	-----	-----	-----	-----	-----	-----	-----	-----	3.15
2.83	0.00	1369.92	3.05	-----	-----	-----	-----	-----	-----	-----	-----	3.05
2.85	0.00	1369.89	2.96	-----	-----	-----	-----	-----	-----	-----	-----	2.96
2.87	0.00	1369.86	2.86	-----	-----	-----	-----	-----	-----	-----	-----	2.86
2.88	0.00	1369.84	2.77	-----	-----	-----	-----	-----	-----	-----	-----	2.77
2.90	0.00	1369.81	2.67	-----	-----	-----	-----	-----	-----	-----	-----	2.67
2.92	0.00	1369.79	2.58	-----	-----	-----	-----	-----	-----	-----	-----	2.58
2.93	0.00	1369.76	2.49	-----	-----	-----	-----	-----	-----	-----	-----	2.49
2.95	0.00	1369.74	2.41	-----	-----	-----	-----	-----	-----	-----	-----	2.41
2.97	0.00	1369.72	2.32	-----	-----	-----	-----	-----	-----	-----	-----	2.32
2.98	0.00	1369.70	2.24	-----	-----	-----	-----	-----	-----	-----	-----	2.24
3.00	0.00	1369.68	2.16	-----	-----	-----	-----	-----	-----	-----	-----	2.16
3.02	0.00	1369.66	2.08	-----	-----	-----	-----	-----	-----	-----	-----	2.08
3.03	0.00	1369.64	2.01	-----	-----	-----	-----	-----	-----	-----	-----	2.01
3.05	0.00	1369.62	1.94	-----	-----	-----	-----	-----	-----	-----	-----	1.94
3.07	0.00	1369.60	1.87	-----	-----	-----	-----	-----	-----	-----	-----	1.87

...End

Reservoir Report

Reservoir No. 1 - South Pond

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1368.90	00	0.000	0.000
0.50	1369.40	420	0.002	0.002
1.10	1370.00	12,402	0.088	0.091
2.10	1371.00	39,645	0.597	0.688
3.10	1372.00	79,790	1.371	2.059

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 18.0	0.0	0.0	0.0
Span in	= 18.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1368.91	0.00	0.00	0.00
Length ft	= 70.0	0.0	0.0	0.0
Slope %	= 0.32	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1368.90	0.00	---	---	---	---	---	---	---	---	0.00
0.05	0.000	1368.95	0.01	---	---	---	---	---	---	---	---	0.01
0.10	0.000	1369.00	0.05	---	---	---	---	---	---	---	---	0.05
0.15	0.001	1369.05	0.10	---	---	---	---	---	---	---	---	0.10
0.20	0.001	1369.10	0.20	---	---	---	---	---	---	---	---	0.20
0.25	0.001	1369.15	0.29	---	---	---	---	---	---	---	---	0.29
0.30	0.001	1369.20	0.46	---	---	---	---	---	---	---	---	0.46
0.35	0.002	1369.25	0.60	---	---	---	---	---	---	---	---	0.60
0.40	0.002	1369.30	0.76	---	---	---	---	---	---	---	---	0.76
0.45	0.002	1369.35	0.94	---	---	---	---	---	---	---	---	0.94
0.50	0.002	1369.40	1.03	---	---	---	---	---	---	---	---	1.03
0.56	0.011	1369.46	1.34	---	---	---	---	---	---	---	---	1.34
0.62	0.020	1369.52	1.56	---	---	---	---	---	---	---	---	1.56
0.68	0.029	1369.58	1.79	---	---	---	---	---	---	---	---	1.79
0.74	0.038	1369.64	2.02	---	---	---	---	---	---	---	---	2.02
0.80	0.047	1369.70	2.25	---	---	---	---	---	---	---	---	2.25
0.86	0.055	1369.76	2.48	---	---	---	---	---	---	---	---	2.48
0.92	0.064	1369.82	2.70	---	---	---	---	---	---	---	---	2.70
0.98	0.073	1369.88	2.92	---	---	---	---	---	---	---	---	2.92
1.04	0.082	1369.94	3.12	---	---	---	---	---	---	---	---	3.12
1.10	0.091	1370.00	3.31	---	---	---	---	---	---	---	---	3.31
1.20	0.150	1370.10	3.63	---	---	---	---	---	---	---	---	3.63
1.30	0.210	1370.20	3.92	---	---	---	---	---	---	---	---	3.92
1.40	0.270	1370.30	4.10	---	---	---	---	---	---	---	---	4.10
1.50	0.330	1370.40	4.09	---	---	---	---	---	---	---	---	4.09
1.60	0.389	1370.50	4.78	---	---	---	---	---	---	---	---	4.78
1.70	0.449	1370.60	5.49	---	---	---	---	---	---	---	---	5.49
1.80	0.509	1370.70	6.11	---	---	---	---	---	---	---	---	6.11
1.90	0.569	1370.80	6.68	---	---	---	---	---	---	---	---	6.68
2.00	0.628	1370.90	7.20	---	---	---	---	---	---	---	---	7.20
2.10	0.688	1371.00	7.69	---	---	---	---	---	---	---	---	7.69
2.20	0.825	1371.10	8.15	---	---	---	---	---	---	---	---	8.15
2.30	0.962	1371.20	8.59	---	---	---	---	---	---	---	---	8.59

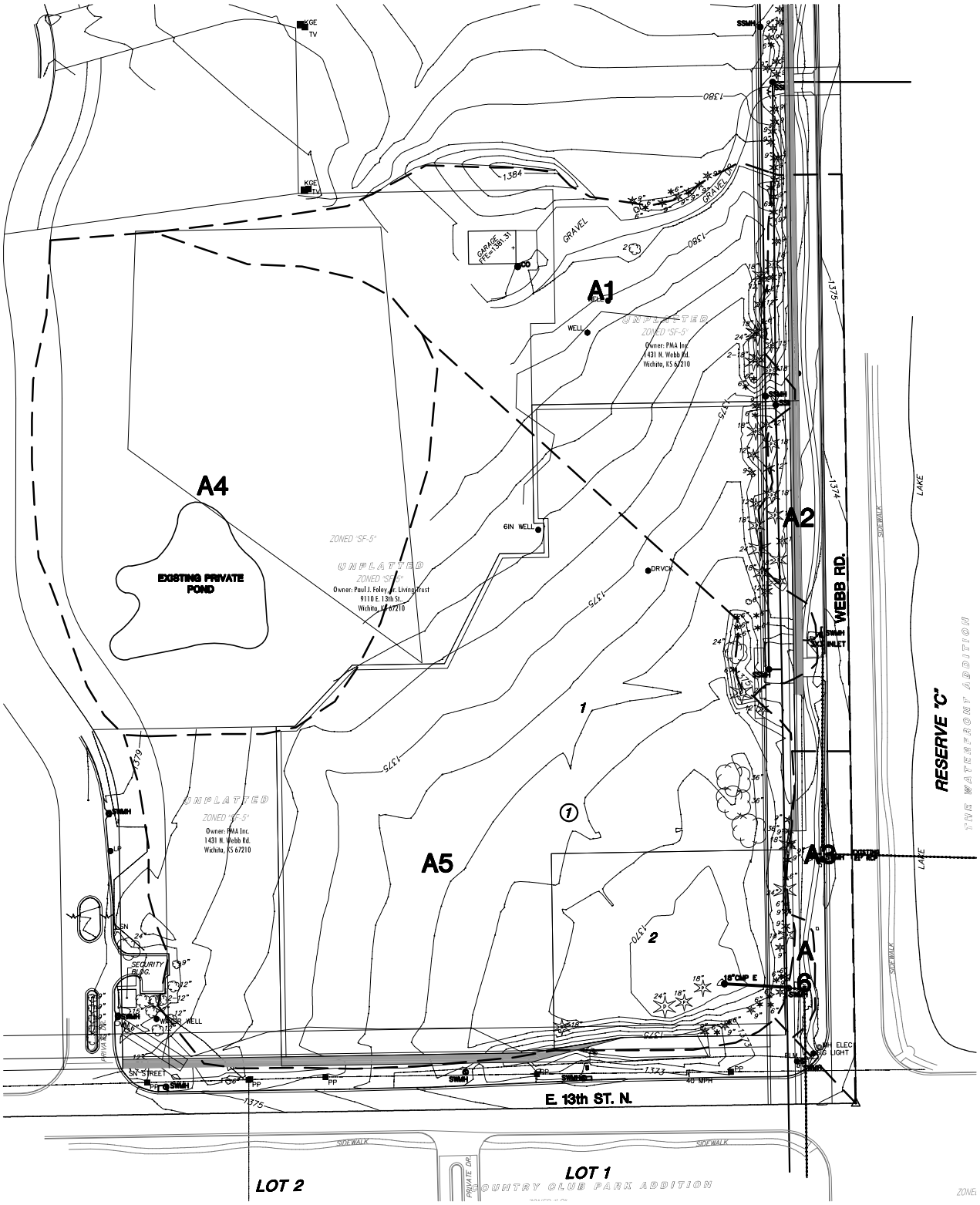
Continues on next page...

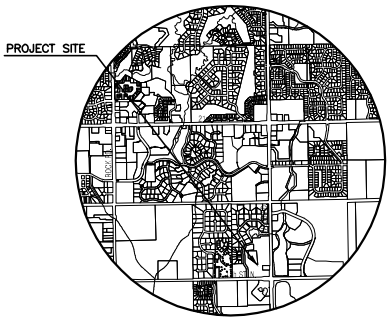
Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
2.40	1.099	1371.30	9.00	---	---	---	---	---	---	---	---	9.00
2.50	1.237	1371.40	9.40	---	---	---	---	---	---	---	---	9.40
2.60	1.374	1371.50	9.77	---	---	---	---	---	---	---	---	9.77
2.70	1.511	1371.60	10.14	---	---	---	---	---	---	---	---	10.14
2.80	1.648	1371.70	10.49	---	---	---	---	---	---	---	---	10.49
2.90	1.785	1371.80	10.83	---	---	---	---	---	---	---	---	10.83
3.00	1.922	1371.90	11.16	---	---	---	---	---	---	---	---	11.16
3.10	2.059	1372.00	11.49	---	---	---	---	---	---	---	---	11.49

...End

Appendix F
Pre-Project Drainage Areas





LOCATION MAP

N

SCALE: 1"=50'

0 50 100 150

J:\Civil\04274\dwg\prop\drng\Existing_DUP.dwg

MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

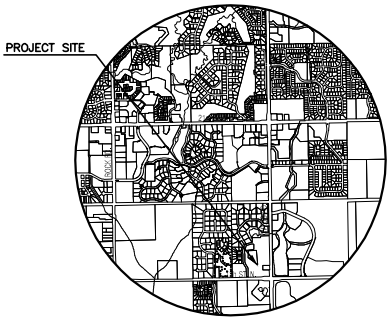
THE FOLIAGE ADDITION
PROJECT NAME

PRE-PROJECT SITE DRAINAGE
SHEET TITLE

AJK	AJK	GLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04274	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix G
Post-Project
Drainage & Utility Plan

NOTE: STORMWATER SEWER INLET LOCATIONS WILL BE SET AFTER FINAL GRADING PLAN IS COMPLETE.



LOCATION MAP

N

SCALE: 1"=50'

0 50 100 150

J:\Civil\04274\dwg\prop\drng\DUP.dwg

MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

THE FOLIAGE ADDITION
PROJECT NAME

PRELIMINARY DRAINAGE & UTILITY PLAN
SHEET TITLE

AJK	AJK	GLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04274	1 / 1
DATE	JOB NO.	SHEET/OF