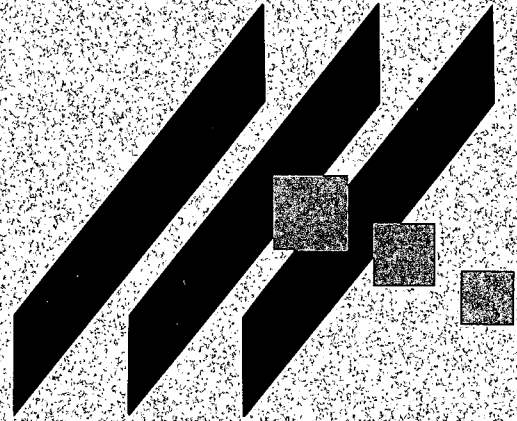


M K E C ENGINEERING CONSULTANTS, I N C



**DRAINAGE REPORT**

**FOR**

**POWER CDC 2<sup>ND</sup> ADDITION**

**SEPTEMBER 2002**

**REVISED NOVEMBER 2002**

# Drainage Report for Power C.D.C. Second Addition Wichita, Kansas

## Location

The site is located in Sedgwick County, Kansas, North of 21<sup>st</sup> Street and West of Hillside Avenue. It lies in the Northwest Quarter, Section 3, Township 27 South, Range 1 East. The total site area is approximately 14.0 acres. The site is shown in the East Wichita, Kansas Quadrangle located in Appendix A.

## Soils

According to the NRCS (SCS) Sedgwick County Soil Survey (Appendix B), most of the site is the Elandco Series (Ea: elandco silt loam). The Hydrological Soil Group (HSG) for the site is "B".

## Pre-developed Conditions

### *Current Development*

The site is undeveloped with grass covering the entire site. Residential housing is located south and east of the site.

### *Current Landform and Slope*

The East Fork Chisholm Creek (East Branch Interception Canal and Wichita Drainage Canal) is adjacent to the West property line. Elevations vary from roughly 134 feet in the northeast corner of the site, to around 130 feet at the bank of the creek. The water surface of the canal is approximately 113 feet. Watershed slopes vary from 0.5% to 4.0%. The site flows into the canal. A drainage ditch runs from East to West South of the site for approximately 800 feet before discharging into the East Fork Chisholm Creek.

### *Current Drainage Conditions*

The site is located in Zone B (FIRM Panel 10, Wichita, Kansas, Sedgwick County, May 15, 1986) (shown in Appendix C). It is in an area between the 100-year flood and 500-year flood. The area may be subject to a 100-year flooding with average depths less than 1 foot. The nearest Zone A is along the canal at the western property line.

### *Upstream of Site*

According to the FEMA Flood Insurance Study, approximately 8800 acres have drained into the East Fork Chisholm Creek when it converges with the Wichita Drainage Canal approximately 5000 feet south of the site. The 100-year peak discharge at the confluence is 9420 cfs. The site is in a watershed of approximately 300 acres.

*Current Runoff Characteristics*

Runoff from the east flows through residential streets to 25<sup>th</sup> Street. At Minnesota Avenue 25<sup>th</sup> Street ends and discharges into an existing ditch south of the site. Approximately 97.7 acres drain into this existing ditch. The rational method was used to determine flows from the site. The site was divided into several sub-watersheds as shown in the Drainage and Utility Plan in Appendix D. The time of concentrations varied from 20 to 77 minutes, which correspond to undeveloped urban lawn areas. Appendix E is a spreadsheet displaying the area, runoff coefficient (c), time of concentration (t<sub>c</sub>), and the flow rate (Q) for each sub-watershed in the 2, 5, 10, and 100-year events. Discharge from the site is approximately 38.3 cfs in the 100-year event. Flow into the existing ditch south of the site is approximately 209 cfs in the 100-year event.

**Post-Developed Condition**

*Proposed Development*

The site will develop as residential lots with an average size of approximately 1/4 acre.

*Proposed Landform and Slope*

Runoff will continue to drain into the East Fork Chisholm Creek/Wichita Drainage Canal. Storm water pipes will transport runoff from the proposed streets into the reserve so that it may reach the canal. The ground surrounding houses will slope away from the houses at a minimum of 1.0%. Streets will have a minimum slope of 0.5%

*Proposed Runoff Characteristics*

Runoff will continue to flow from the east through residential streets to 25<sup>th</sup> Street. Runoff will continue to flow down 25<sup>th</sup> Street and into the existing ditch. The existing ditch will be modified to better accommodate existing and proposed flows. Modifications will include erosion protection where the street connects to the ditch and regrading to support flows. The size of the drainage area flowing to this location will be 97.7 acres.

The rational method was used to determine flows from the site and into the proposed storm water pipe. The site was divided into several sub-watersheds. The time of concentrations varied from 20 to 71 minutes, which correspond to 1/4 acre residential lots. Appendix E is a spreadsheet displaying the area, runoff coefficient (c), time of concentration (t<sub>c</sub>), and the flow rate (Q) for each sub-watershed in the 2, 5, 10, and 100-year events. Discharge from the site is approximately 55.9 cfs in the 100-year event. Discharge into the existing ditch 25<sup>th</sup> Street is approximately 212 cfs in the 100-year event.

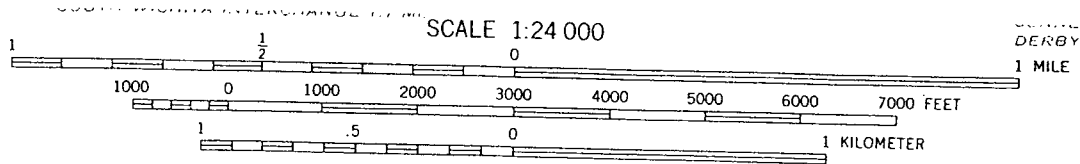
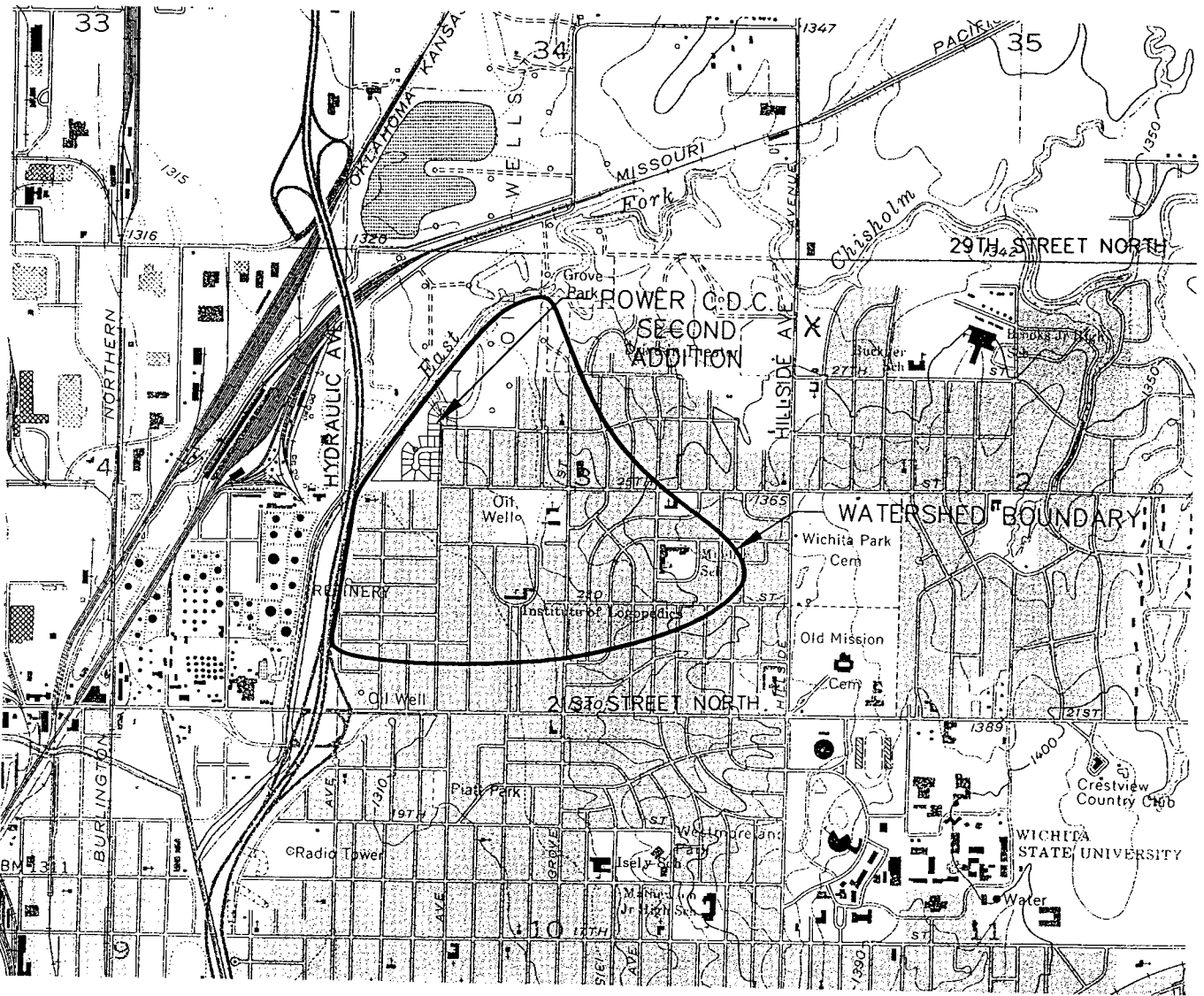
## Summary

The Power C.D.C. Second Addition will be a 14.0 acre development with 23 lots approximately ¼ acre in size. The site drains into the East Fork Chisholm Creek to the west. The East Fork Chisholm creek converges with the Wichita Drainage Canal approximately 5000 feet downstream of the site. At the convergence, approximately 8800 acres have drained into the system with a peak 100-year flow of approximately 9420 cfs. Under pre-developed conditions 38.3 cfs of runoff will leave the site in the 100-year event. After development 55.9 cfs will leave the site in the 100-year event. The increase of 17.6 cfs will enter into the East Fork of the Chisholm Creek. The increase of 17.6 cfs is negligible in an area the size of the East Fork Chisholm Creek watershed. Development will decrease the time of concentration from the site. Due to the proximity of the site to the East Fork Chisholm Creek/Wichita Drainage Canal, peak flows from the site will pass through the East Fork Chisholm Creek/Wichita Drainage Canal before it reaches its peak. Therefore, detention on the proposed residential development should not be required.

Storm sewer has been sized to capture 100-year flows from Pembroke Circle. All other runoff will sheet flow into the drainage canal or drain to the ditch south of the site. Developed land east of the site drains into 25<sup>th</sup> Street. Currently, 25<sup>th</sup> Street discharges into a drainage ditch at Minnesota Avenue. The existing drainage ditch will be modified to accommodate 100-year peak flows from the surrounding area. Erosion protection will be placed where the street discharges into the ditch. Drainage in and around the site will continue to function as it is now.

Appendix A

Quadrangle



CONTOUR INTERVAL 10 FEET  
 DOTTED LINES REPRESENT 5-FOOT CONTOURS  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY

I:\NWL\192035.DWG; V:\PROP\GRINC\192035.DWG

**MKEC**  
 ENGINEERING  
 CONSULTANTS  
 411 N. WEBB ROAD  
 WICHITA, KS. 67206  
 316 - 624 - 9600

**POWER C.D.C. SECOND ADDITION**  
 PROJECT NAME

**WICHITA EAST QUADRANGLE**  
 SHEET TITLE

DESIGN BY:	KLA	DRAWN BY:	KLA	CHECKED BY:	GJA
DATE:	AUGUST 2002	JOB NO.:	02035	1 / 1	
				SHEET/OF	

**Appendix B**

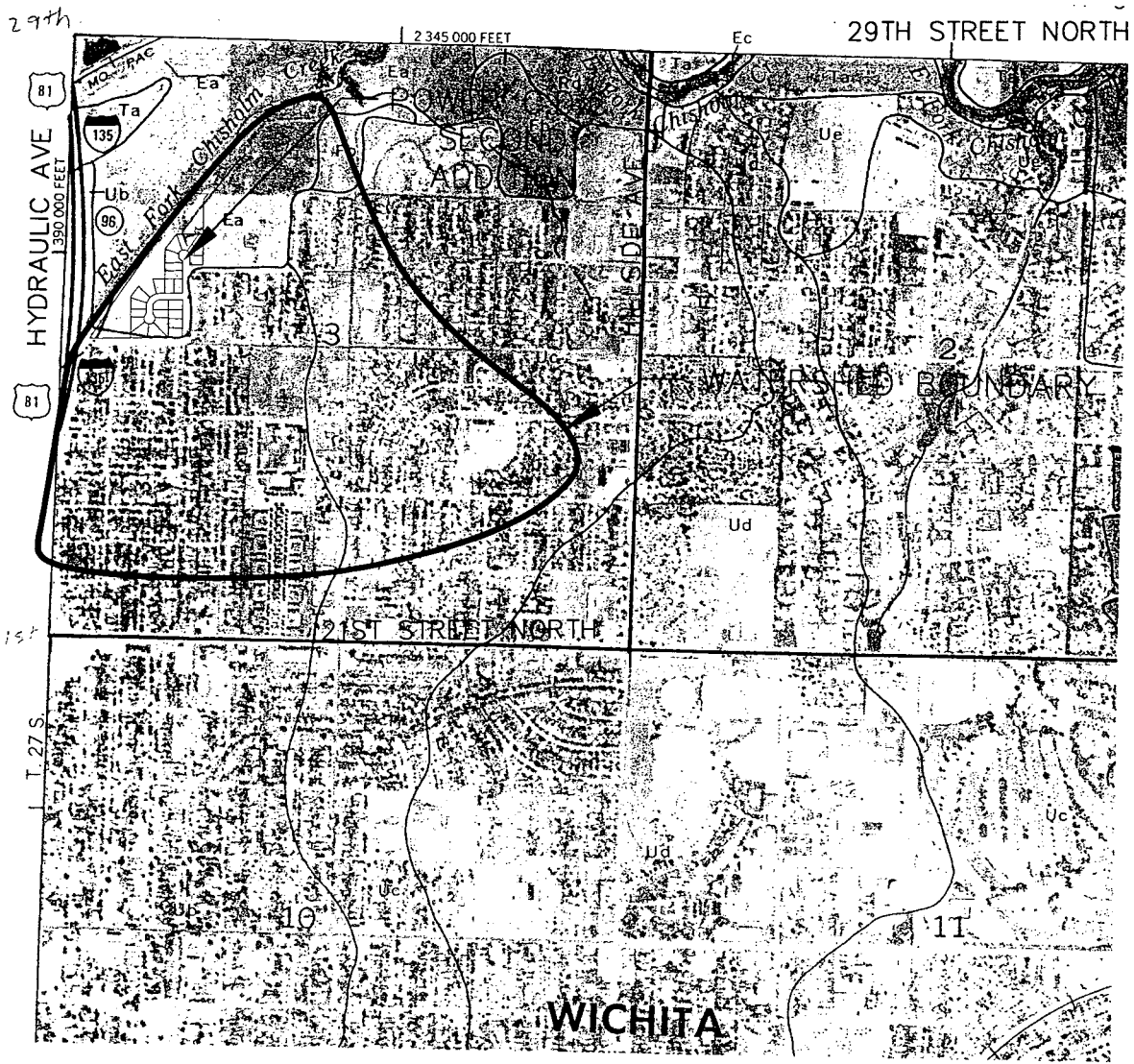
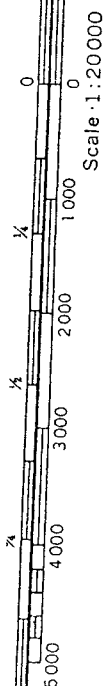
**Soil Survey**



35



1 Mile  
5000 Feet



UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
IN COOPERATION WITH  
KANSAS AGRICULTURAL EXPERIMENT STATION

\\F:\V\20\54\T\W\5\PROJ\5\DRNG\020355W.DWG



**POWER C.D.C. SECOND ADDITION**  
PROJECT NAME

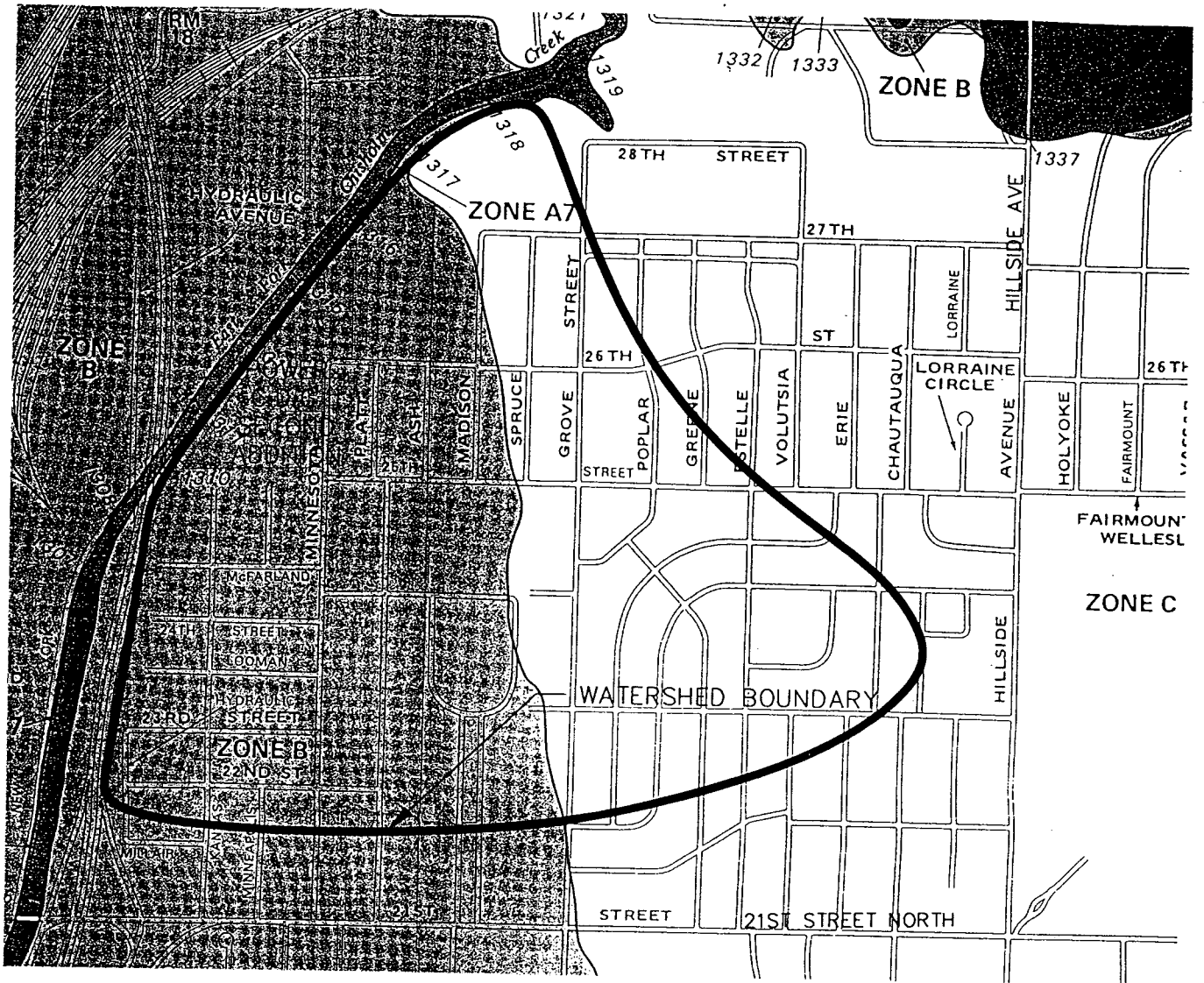
**SEDGWICK COUNTY SOIL SURVEY**  
SHEET TITLE

**KLA** | **KLA** | **GJA**  
DESIGN BY. | DRAWN BY. | CHECKED BY.

**AUGUST 2002** | **02035** | **1 / 1**  
DATE | JOB NO. | SHEET/OF

**Appendix C**

**Flood Insurance Rate Map**



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

CITY OF  
WICHITA,  
KANSAS  
SEDGWICK COUNTY

PANEL 10 OF 40  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER  
200328 0010 B

EFFECTIVE DATE:  
MAY 15, 1986



Federal Emergency Management Agency



APPROXIMATE SCALE



C:\Users\j22035\OneDrive\Projects\DRNC\020328\FIRM.dwg



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

**POWER C.D.C. SECOND ADDITION**

PROJECT NAME

**WICHITA, KANSAS  
FIRM PANEL 10**

SHEET TITLE

**KLA**  
DESIGN BY:

**KLA**  
DRAWN BY:

**GJA**  
CHECKED BY:

**AUGUST 2002**  
DATE

**02035**  
JOB NO.

**1 / 1**  
SHEET/OF

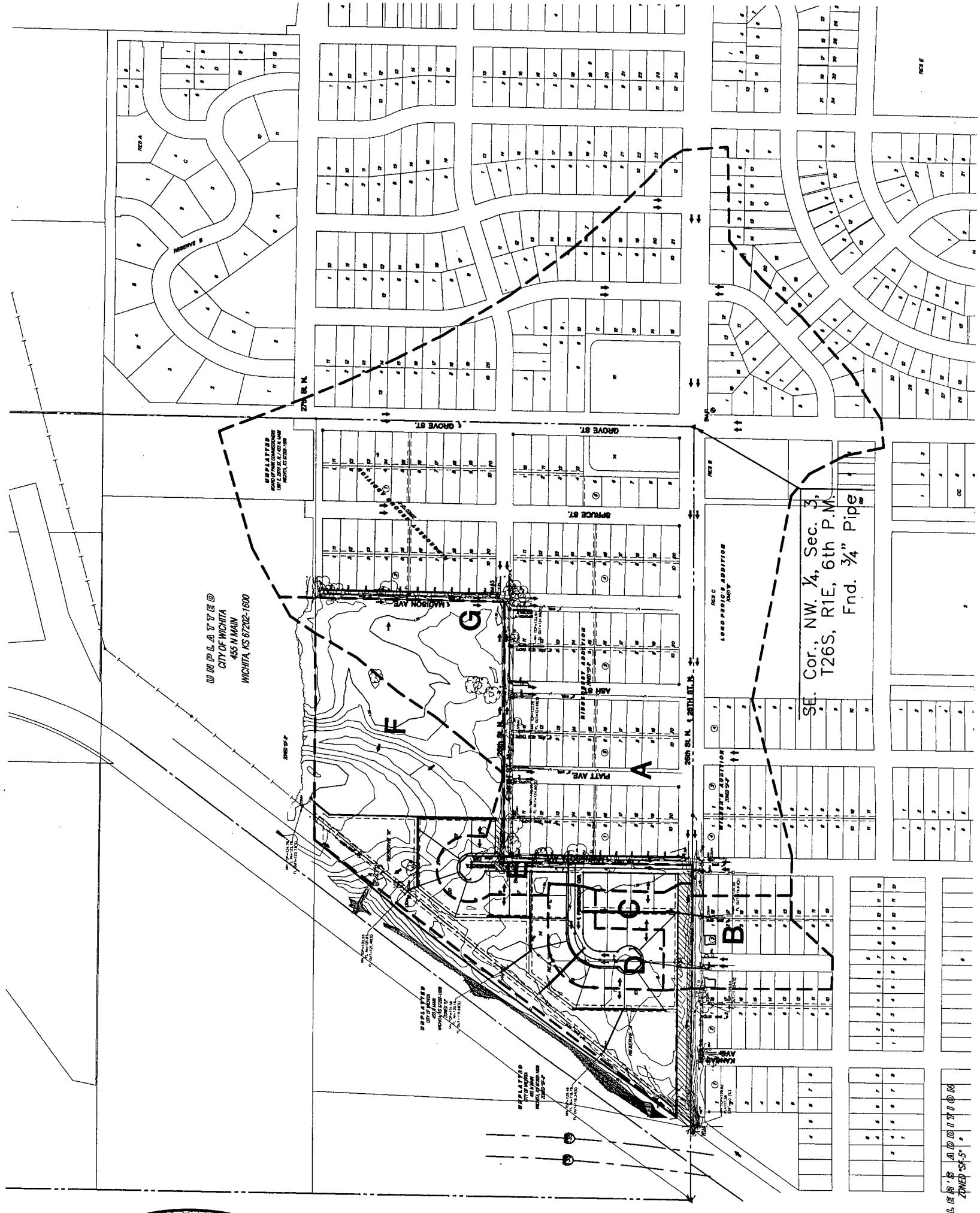
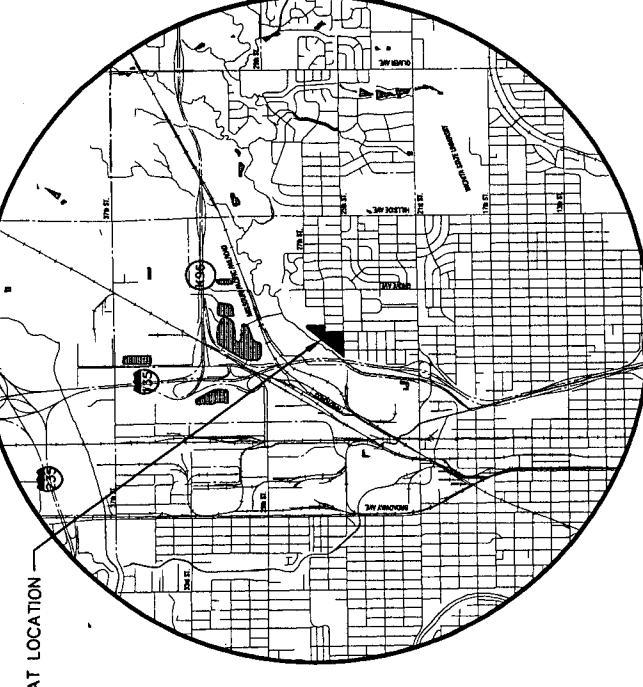
**Appendix D**

**Drainage and Utility Plan**

# DRAINAGE AND UTILITY PLAN

# POWER C.D.C. SECOND ADDITION

OWNERS: City of Wichita, Wichita City Hall, 455 N. Main St., Wichita, KS 67202, 316-268-4351  
 DEVELOPER: Power Community Development Corporation, Inc., 1802 N. Hyarolic St., Wichita, KS 67204, 316-267-3036



- BENCHMARK**
- BM#1 City disc at SE cor. of 25th and Grov. ELEV. = 141.65 City Datum 1329.05 NGVD
  - BM#2 "1" Top of curb W. side of Minnesota, S. of & 25th St. 30±. ELEV. = 130.60 City Datum 1318.00 NGVD
  - BM#3 "1" Top of curb at NE. cor. of Madison and 26th St. ELEV. = 134.505 City Datum 1321.905 NGVD

- NOTES**
1. Zoning: Single Family SF-5
  2. Reserves: "A" is dedicated to the public and shall be owned and maintained by the City of Wichita. "B" is reserved for the use of the home owner association and shall be owned and maintained by the home owner association.
  3. Lot minimum pads as indicated on drainage plan.
  4. According to FIRM Community-Panel Number 200328 0010 B this plot lies within flood zone "B".

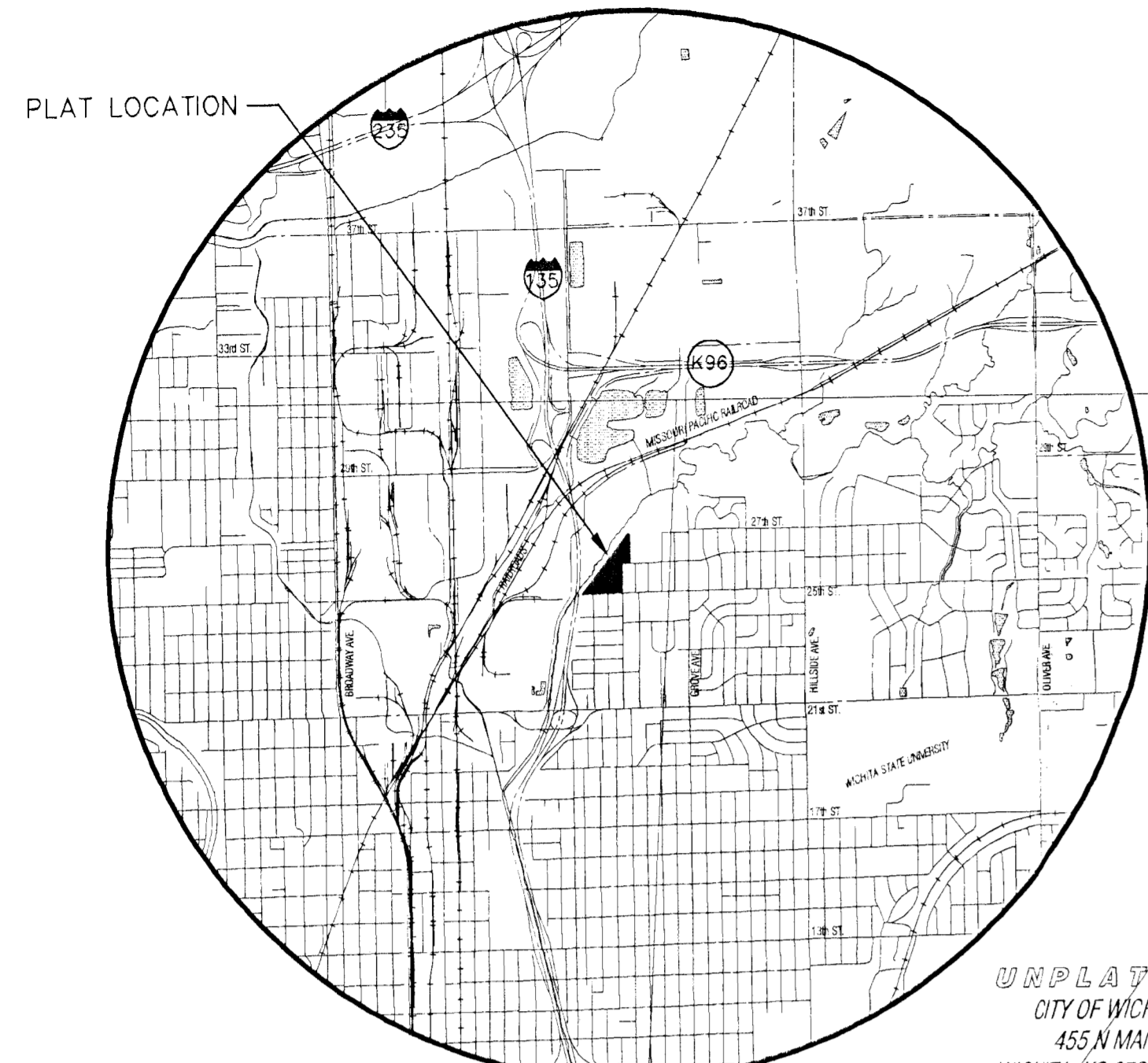
- LEGEND**
- CONTIGUOUS TREE & DIAMETER
  - DECADUOUS TREE & DIAMETER
  - CONIFEROUS TREE & DIAMETER
  - IRISH PILE AND CITY ANCHOR
  - EDGE OF TREES
  - FENCE
  - BENCHMARK
  - SANITARY SEWER MANHOLE
  - TELEPHONE MANHOLE
  - SECTION CORNER
  - 1/2" 10' 10' 10'
  - 1/2" 10' 10' 10'
  - PROPERTY CORNER FOUND
  - POLE PALE
  - GAS METER
  - WALL
  - LIGHT POLE
  - WATER VALVE
  - WATER METER
  - TELEPHONE RISER
  - SANITARY SEWER PIPE
  - WATER LINE
  - SANITARY SEWER LINE
  - GAS LINE
  - UNDERGROUND TELEPHONE LINE
  - OVERHEAD TELEPHONE LINE
  - OVERHEAD ELECTRIC



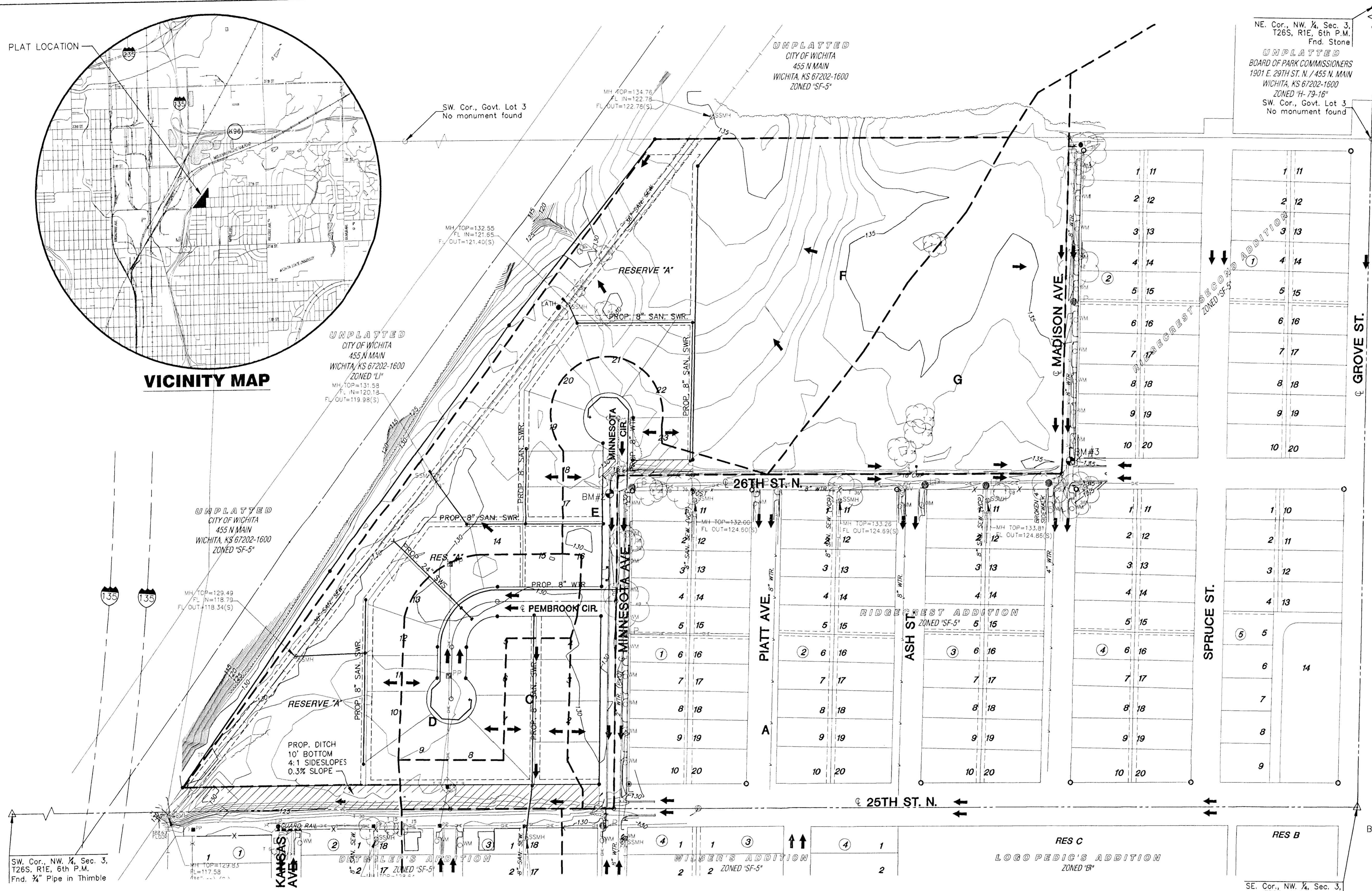
**Appendix E**  
**Drainage Analysis**

Leq/100	Calc	Calc	Calc	Calc	Calc	min	min	min	min	in/hr	in/hr	in/hr	in/hr	in/hr	cfs	cfs	cfs	cfs	cfs	
3000	59.62	0.84	57.81	0.86	52.39	0.95	44.26	1.13	60	58	52	44	1.72	2.22	2.76	4.43	51.90	70.03	98.43	185.32
500	26.56	0.31	25.76	0.32	23.34	0.36	19.72	0.42	27	26	23	20	2.90	3.57	4.31	6.68	4.01	5.16	7.04	12.79
600	49.99	0.20	48.88	0.20	45.55	0.22	38.33	0.26	50	49	46	38	1.97	2.47	3.01	4.79	0.60	0.83	1.28	2.99
300	40.47	0.12	39.57	0.13	36.87	0.14	31.02	0.16	40	40	37	31	2.24	2.80	3.41	5.32	1.05	1.45	2.24	5.13
1000	76.52	0.22	74.82	0.22	69.72	0.24	58.67	0.28	77	75	70	59	1.41	1.88	2.33	3.81	0.72	1.06	1.67	4.00
800	45.82	0.29	44.80	0.30	41.75	0.32	35.13	0.38	46	45	42	35	2.08	2.61	3.17	5.00	5.87	8.11	12.53	28.95
1000	55.18	0.30	53.96	0.31	50.28	0.33	42.31	0.39	55	54	50	42	1.81	2.33	2.83	4.54	7.44	10.53	16.28	38.25
1200	70.70	0.28	69.13	0.29	64.42	0.31	54.21	0.37	71	69	64	54	1.50	1.97	2.44	3.96	1.63	2.35	3.71	8.82
3000	61.64	0.81	59.85	0.84	54.47	0.92	45.99	1.09	62	60	54	46	1.67	2.18	2.70	4.38	55.88	76.48	107.88	208.70
3000	64.84	0.77	63.05	0.79	57.67	0.87	48.66	1.03	65	63	58	49	1.61	2.09	2.61	4.23	59.17	80.90	116.32	230.12
3000	59.62	0.84	57.81	0.86	52.39	0.95	44.26	1.13	60	58	52	44	1.72	2.22	2.76	4.43	51.90	70.03	98.43	185.32
500	26.56	0.31	25.76	0.32	23.34	0.36	19.72	0.42	27	26	23	20	2.90	3.57	4.31	6.68	4.01	5.16	7.04	12.79
600	41.11	0.24	40.00	0.25	36.66	0.27	31.11	0.32	41	40	37	31	2.21	2.80	3.41	5.32	1.21	1.62	2.28	4.37
300	29.68	0.17	28.78	0.17	26.08	0.19	22.03	0.23	30	29	26	22	2.72	3.37	4.05	6.26	2.81	3.64	4.95	8.97
1000	56.12	0.30	54.42	0.31	49.31	0.34	41.66	0.40	56	54	49	42	1.79	2.30	2.86	4.60	2.02	2.71	3.81	7.18
800	39.20	0.34	38.18	0.35	35.64	0.37	30.04	0.44	39	38	36	30	2.28	2.84	3.46	5.40	10.62	14.04	19.54	36.89
1000	45.47	0.37	44.24	0.38	40.98	0.41	34.58	0.48	44	44	41	35	2.08	2.61	3.22	5.07	15.32	20.30	28.56	55.86
1200	70.70	0.28	69.13	0.29	64.42	0.31	54.21	0.37	71	69	64	54	1.50	1.97	2.44	3.96	1.63	2.35	3.71	8.82
3000	60.69	0.82	58.90	0.85	53.53	0.93	45.21	1.11	61	59	54	45	1.69	2.20	2.73	4.38	57.99	79.07	111.42	211.81
3000	61.77	0.81	59.97	0.83	54.71	0.91	46.16	1.08	62	60	55	46	1.67	2.18	2.70	4.33	66.97	91.69	129.04	247.33

24" RCP - Sized for 100-Year



**VICINITY MAP**



NE. Cor., NW 1/4, Sec. 3,  
T26S, R1E, 6th P.M.  
Fnd. Stone  
UNPLATTED  
BOARD OF PARK COMMISSIONERS  
1901 E. 29TH ST. N. / 455 N. MAIN  
WICHITA, KS 67202-1600  
ZONED "H-79-16"  
SW. Cor., Govt. Lot 3  
No monument found

MINIMUM PAD ELEVATIONS  
(LOWEST OPENINGS)

LOT	BLOCK	ELEVATION (CITY DATUM)	ELEVATION (USGS)
1	1		
8	1		
9	1	1314.0	126.6
10	1	1314.0	126.6
11	1	1314.0	126.6
12	1	1315.0	127.6
13	1	1315.0	127.6
14	1	1316.0	128.6
15	1	1317.0	129.6
17	1	1317.0	129.6
18	1	1317.0	129.6
19	1	1317.0	129.6
20	1	1318.0	130.6
21	1	1318.0	130.6
22	1	1318.0	130.6

**BENCHMARK**

- BM#1 City disc at SE cor. of 25th and Grove.  
ELEV. = 141.65 City Datum  
1329.05 NGVD
- BM#2 "0" Top of curb W. side of Minnesota, S. of 26th St. 30'±.  
ELEV. = 130.60 City Datum  
1318.00 NGVD
- BM#3 "0" Top of curb at NE. cor. of Madison and 26th St.  
ELEV. = 134.505 City Datum  
1321.905 NGVD

**NOTES**

1. Zoning: Single Family SF-5
2. Reserves: "A" is dedicated to the public and shall to be owned and maintained by the public. "B" is platted for open space and is owned and maintained by the home owner association
3. According to FIRM Community-Panel-Number 200328 0010 B this plot lies within flood zone "B".

**LEGEND**

- ✳ - CONIFEROUS TREE & DIAMETER
- - DECIDUOUS TREE & DIAMETER
- ⊙ - SIGN
- ⊙ - BUSH
- ⊙ - POWER POLE AND GUY ANCHOR
- ⊙ - ELECTRIC BOX
- ⊙ - EDGE OF TREES
- ⊙ - FENCE
- ⊙ - BENCHMARK
- ⊙ - STORM WATER MANHOLE
- ⊙ - SANITARY SEWER MANHOLE
- ⊙ - TELEPHONE MANHOLE
- ⊙ - SECTION CORNER
- ⊙ - 5/8" REBAR/MKEC CLS #59 SET
- ⊙ - PROPERTY CORNER FOUND
- ⊙ - POLE
- ⊙ - GATE
- ⊙ - GAS METER
- ⊙ - WALL
- ⊙ - LIGHT POLE
- ⊙ - FIRE HYDRANT
- ⊙ - WATER VALVE
- ⊙ - WATER METER
- ⊙ - TELEPHONE RISER
- ⊙ - INLET
- ⊙ - STORM SEWER PIPE
- ⊙ - WATER LINE
- ⊙ - SANITARY SEWER LINE
- ⊙ - GAS LINE
- ⊙ - TELEPHONE LINE
- ⊙ - UNDERGROUND ELECTRIC LINE
- ⊙ - OVERHEAD TELEPHONE
- ⊙ - OVERHEAD ELECTRIC

# DRAINAGE AND UTILITY PLAN

# POWER C.D.C. SECOND ADDITION

OWNERS: City of Wichita, Wichita City Hall 455 N. Main St., Wichita, KS 67202 316-268-4351  
 DEVELOPER: Power Community Development Corporation, Inc. 1802 N. Hydraulic St., Wichita, KS 67204 316-267-3036

**DATE: AUGUST 2002**  
**REVISED: NOVEMBER 2002**

