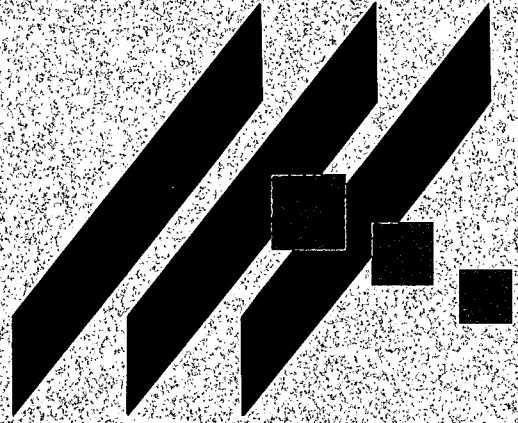


M K E C ENGINEERING CONSULTANTS, I N C



DRAINAGE REPORT

FOR

WICHITA STOCKYARD ADDITION

NOVEMBER 2001

Drainage Report for Wichita Stockyard Addition

Wichita, Kansas

Location

The subject property lies south of 21st St. North and West of Mead Avenue. See Appendix A for a general location map.

Soils

According to the NRCS (SCS) Sedgwick County Soil Survey, the soil types are in the Urban Land group: Urban land-Elandco complex. This is a nearly level group with well-drained Elandco soil. The Hydrological Soil Group (HSG) for this soil is "B".

Pre-developed Conditions

Current Development

The site is currently partially developed with several buildings and paved areas. The remaining area is natural grasses and bare soil. The area of the property being platted is approximately 15.8 acres.

Current Landform and Slope

The site is nearly level, with a gentle slope toward the West Drain (West Branch of Chisholm Creek) channel, which passes through the site. (See Appendix B).

Current Drainage Conditions

The portion of the site abutting the West Drain is included in floodplain zone A according to FBFM Panel 10, Wichita, Kansas effective May 15, 1986. (See Appendix C.)

Upstream of Site

Runoff from upstream properties flows through the site in the West Drain channel. Virtually no runoff from adjacent properties drains onto the subject property. An existing 12" stormwater sewer drains the property to the south and extends across the site to the West Drain. A drainage easement will be platted over the stormwater sewer.

Current Runoff Characteristics

Approximately 1.3 acres of the property along the north property line drains into the 21st St. right-of-way. The remaining 14.5 acres drain to the West Drain, although slopes are very flat. The 12" stormwater sewer along the west side of the property drains the property to the south and picks up runoff from the subject property through six area inlets. A 12" stormwater sewer system located along the east side of the property and runs through proposed Lot 2 and collects runoff through two area inlets. Both 12" stormwater sewer systems drain into the West Drain. See Appendix B for a map of current drainage patterns. Current runoff was calculated using the Rational Method.

Flows for the West Drain have been developed in conjunction with another drainage study currently being performed by MKEC. These flows were developed using the TR-20 computer model. Flows for both the West Drain and the current runoff from the subject property are shown in Table 1 below. See Appendix D for detailed calculations.

Table 1. Pre-developed runoff.

Sub-Watershed	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	100-Year (cfs)
A	4.7	5.7	6.9	10.7
B	18.4	23.4	29.1	47.4
West Drain	245	381	464	790

Post-Developed Condition

Proposed Development

Details of the proposed development are unknown at this time. The current drainage patterns will remain the same as shown on the included Drainage and Utility Plan (Appendix E).

Proposed Landform and Slope

The property is zoned for General Industrial use. We anticipate that paved areas will be sloped at 0.5-1%, and that lawn areas will have 1-2% slopes. Some stormwater sewer will likely be required due to lack of slope and size of the development.

Proposed Runoff Characteristics

Runoff curve numbers for the developed conditions will be based on heavy industrial development and will range from 0.74 for a 2-year storm to 0.84 for a 100-year storm. The time of concentration used will be 15 minutes. Stormwater sewer systems will not be designed with this drainage study since details of the development are not known.

The rational method was used to calculate runoff for fully developed conditions. The resulting flows are shown in Table 2 below.

Table 2. Post-developed runoff.

Sub-Watershed	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	100-Year (cfs)
A	5.0	6.1	7.3	11.0
B	39.7	48.5	57.7	86.7

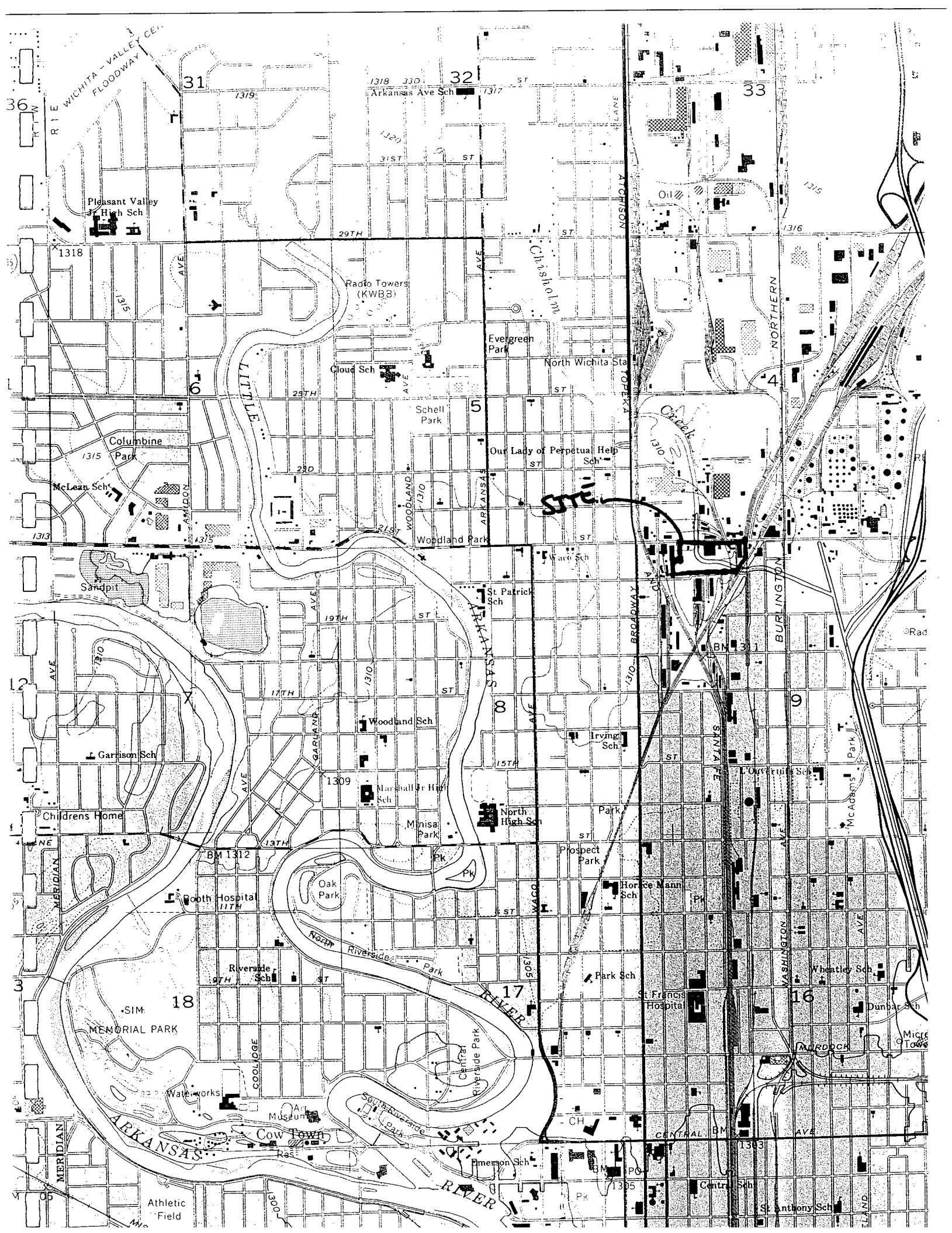
Based on these calculations, the runoff from sub-watershed A will increase by a minimal amount. However, runoff from sub-watershed B will increase by 28.6 cfs on a 10-year storm and by 39.3 cfs on a 100-year storm. This runoff will drain into the West Drain. The site is located near the downstream end of the West Drain watershed. Peak runoff

from the subject property will occur long before West Drain reaches peak flow. Therefore, detention should not be required on this site.

Summary

Wichita Stockyard Addition is a 15.8-acre development near 21st and Mead. The majority of this site currently drains into the West Drain. Development of the site will not change the current drainage patterns. Stormwater sewer may be required on this site. Size and configuration of stormwater sewer should be determined at the time of development. Development will increase the runoff from the site into the West Drain. However, due to the location of the site relative to the West Drain watershed, the increased runoff will have a negligible effect on the peak flow in the West Drain.

Appendix A



R I E WICHITA - VALLEY CEN.
FLOODWAY

31

32

33

Pleasant Valley
High Sch

1318 330
Arkansas Ave Sch

Radio Towers
(KWBB)

Evergreen
Park

North Wichita Sta

Cloud Sch

Schell Park

Our Lady of Perpetual Help
Sch

Columbine
Park

McLean Sch

Woodland Park

STC

Sandpit

St Patrick
Sch

Woodland Sch

Irving
Sch

Garrison Sch

Childrens Home

Marshall H
Sch

North
High Sch

BM 1312

Booth Hospital

Oak Park

Prospect Park

18

Riverside
Sch

Arkansas
River

17

Hor Pe Mann
Sch

MEMORIAL PARK

Water works

Arkansas
River

16

St. Francis
Hospital

Arkansas
River

Cow Town

Arkansas
River

1383

Wheatley Sch

Athletic Field

Arkansas
River

Arkansas
River

1395

St. Anthony Sch

Arkansas
River

Arkansas
River

Arkansas
River

1000

St. Anthony Sch

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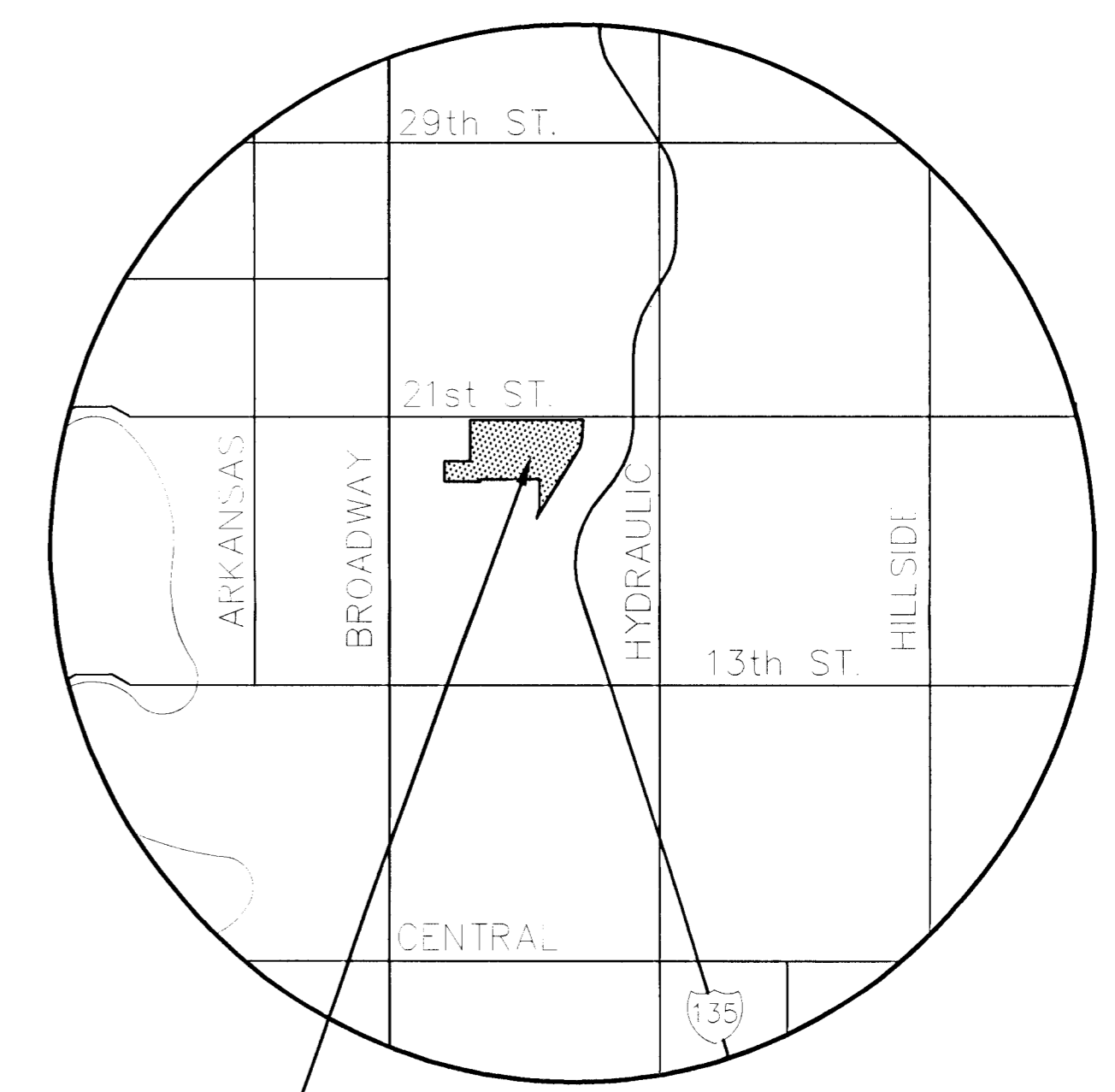
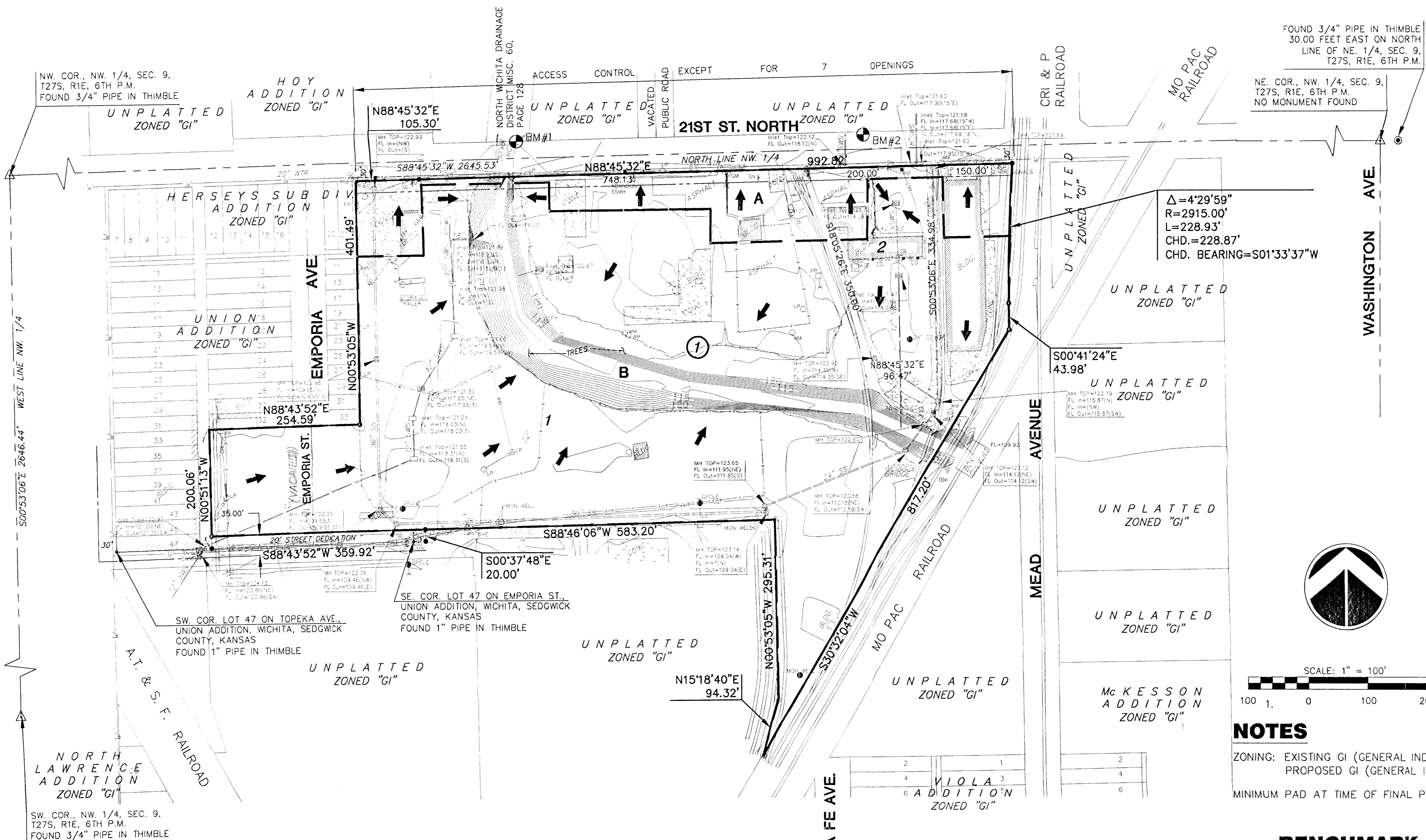
Arkansas
River

1000

St. Anthony Sch

Appendix B





VICINITY MAP

LEGEND

- - GAS METER
- - GROUND YARD LIGHT
- - YARD LIGHT ON POLE
- - ELECTRIC MANHOLE
- - SIGNAL LIGHT
- - CONIFEROUS TREE & DIAMETER
- - DECIDUOUS TREE & DIAMETER
- - SIGN
- - BUSH
- - POWER POLE AND GUY ANCHOR
- - ELECTRIC BOX
- - SEWER CLEANOUT
- - EDGE OF TREES
- - FENCE
- - BENCHMARK
- - STORM WATER MANHOLE
- - SANITARY SEWER MANHOLE
- - TELEPHONE MANHOLE
- - SECTION CORNER
- - 5/8" REBAR/MKEC CLS #39 SET
- - PROPERTY CORNER FOUND
- - POLE
- - GATE
- TRAF - TRAFFIC SIGNAL MANHOLE
- SPK - SPRINKLER HEAD
- - WALL
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- ICV - IRRIGATION CONTROL VALVE
- GR - GRATE INLET
- TR - TELEPHONE RISER
- - INLET
- - STORM SEWER PIPE
- - WATER LINE
- - SANITARY SEWER LINE
- - GAS LINE
- - TELEPHONE LINE
- - UNDERGROUND ELECTRIC LINE
- - OVERHEAD TELEPHONE
- - OVERHEAD ELECTRIC
- - UNDERGROUND FIBER OPTIC CABLE

NOTES

ZONING: EXISTING GI (GENERAL INDUSTRIAL),
 PROPOSED GI (GENERAL INDUSTRIAL).
 MINIMUM PAD AT TIME OF FINAL PLATTING.

BENCHMARK

- BM #1 Square cut on top of wing wall at the Northeast corner of RCB under 21st Street North approximately 1075' East of Broadway. Elevation = 123.52
- BM #2 Square cut on top of curb on the east side of A&A Salvage drive way approximately 1653' East & 24' North of the Centerline of 21st & Broadway. Elevation = 121.645

DATE: NOVEMBER 2001

CURRENT DRAINAGE MAP

WICHITA STOCKYARD ADDITION

OWNERS/DEVELOPER: WEBB ROAD DEVELOPMENT INC. P.O. BOX 782257 WICHITA, KANSAS 67278



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Appendix C

Appendix D

Runoff Calculations

Project: Wichita Stockyard Addition
 Wichita, Kansas
 Nov. 2001
 MKEC Engineering Consultants

Existing Conditions									
Drainage Area A (Time of Conc. = 15 min.)					Drainage Area B (Time of Conc. = 38 min.)				
Storm Event	Runoff Coeff.	Intensity (In/Hr)	Area (Ac.)	Runoff (cfs)	Runoff Coeff.	Intensity (In/Hr)	Area (Ac.)	Runoff (cfs)	Runoff (cfs)
2-yr	0.68	3.83	1.82	4.7	0.57	2.32	13.95	18.4	18.4
5-yr	0.69	4.56	1.82	5.7	0.59	2.84	13.95	23.4	23.4
10-yr	0.73	5.22	1.82	6.9	0.63	3.31	13.95	29.1	29.1
100-yr	0.8	7.37	1.82	10.7	0.71	4.79	13.95	47.4	47.4

Developed Conditions									
Drainage Area A (Time of Conc. = 15 min.)					Drainage Area B (Time of Conc. = 15 min)				
Storm Event	Runoff Coeff.	Intensity (In/Hr)	Area (Ac.)	Runoff (cfs)	Runoff Coeff.	Intensity (In/Hr)	Area (Ac.)	Runoff (cfs)	Runoff (cfs)
2-yr	0.74	3.83	1.77	5.0	0.74	3.83	14.00	39.7	39.7
5-yr	0.76	4.56	1.77	6.1	0.76	4.56	14.00	48.5	48.5
10-yr	0.79	5.22	1.77	7.3	0.79	5.22	14.00	57.7	57.7
100-yr	0.84	7.37	1.77	11.0	0.84	7.37	14.00	86.7	86.7

Appendix E