DRAINAGE PLAN
Ridge Port 2nd Addition
TO
WICHITA, SEDGWICK COUNTY, KANSAS

Prepared By

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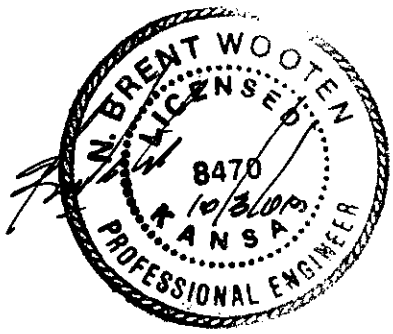
October 3, 2001



DRAINAGE PLAN

Ridge Port 2nd Addition

WICHITA, SEDGWICK COUNTY, KANSAS

TABLE OF CONTENTS

INTRODUCTION

This report provides information and supporting documentation to support the "Drainage Plan" for the property located in Section 33, T-26-S, R-1-W in Wichita, Sedgwick County, Kansas.

The "Drainage Plan" being submitted herein in intended to serve as a guide for the design of streets, stormwater sewers, and site grading to the proposed development. Modifications to structures, pipes, etc. may be made as necessary during the final design in order to obtain the most economical design and construction possible.

INITIAL DATA

The existing topography of the plat is relatively flat, but drains from the north centrally point in the property to its boundary. The general concentration point of all drainage is at the Ridge Road Bridge, crossing the Big Slough North and the reinforced concrete box 400' south of the bridge.

The plat's total area is 27.3 acres. There is approximately 2.7 acres of off-site drainage form the land between the Missouri Pacific railroad tracks and the plat's south boundary. The drainage plans accounts for this additional stormwater runoff. Therefore, the total drainage area of the proposed development is 30 acres.

A portion of the property lies within the 500-yr floodplain per FEMA Federal Insurance Rate Map (FIRM), effective date April 8, 1999. Though the FIRM does not map the plat within the 100-yr floodplain, there is approximately 23 acres of land at or below the base flood elevation (B.F.E.) of a 141.9 city datum.

The existing soil types per S.C.S. "Soil Survey of Sedgwick County" is Canadian fine sandy loam, Lesho loam, Waldeck sandy loam, and Plevna fine sandy loam. These soils are classified in hydrologic group B, C, C and D in their respective order. The composite soil group type used to determine the existing runoff is a C.

The time of concentration (Tc) for the plat under existing conditions is determined from S.C.S method TR-55. The primary flow path used is from the north centrally point of the plat to the east property line. The total flow path is divided between 300 feet of sheet flow and 400 feet of shallow concentrated flow. The slope of the existing ground is approximately 0.0029 ft/ft. The roughness coefficient used for calculating sheet flow is a Manning's n, 0.06. This method determines a Tc of 30 minutes.

COMPUTATIONS

The drainage plan proposes one system that will drain the entire 30 acres. Each lot will be served with at least one inlet and have the potential to extend more storm sewer privately as the siteplan requires. The storm sewer system is designed to convey the 5-year storm event, with the 100-year storm contained within the lots. The minimum building pad set for the subdivision is two feet above the B.F.E. of the Big Slough North.

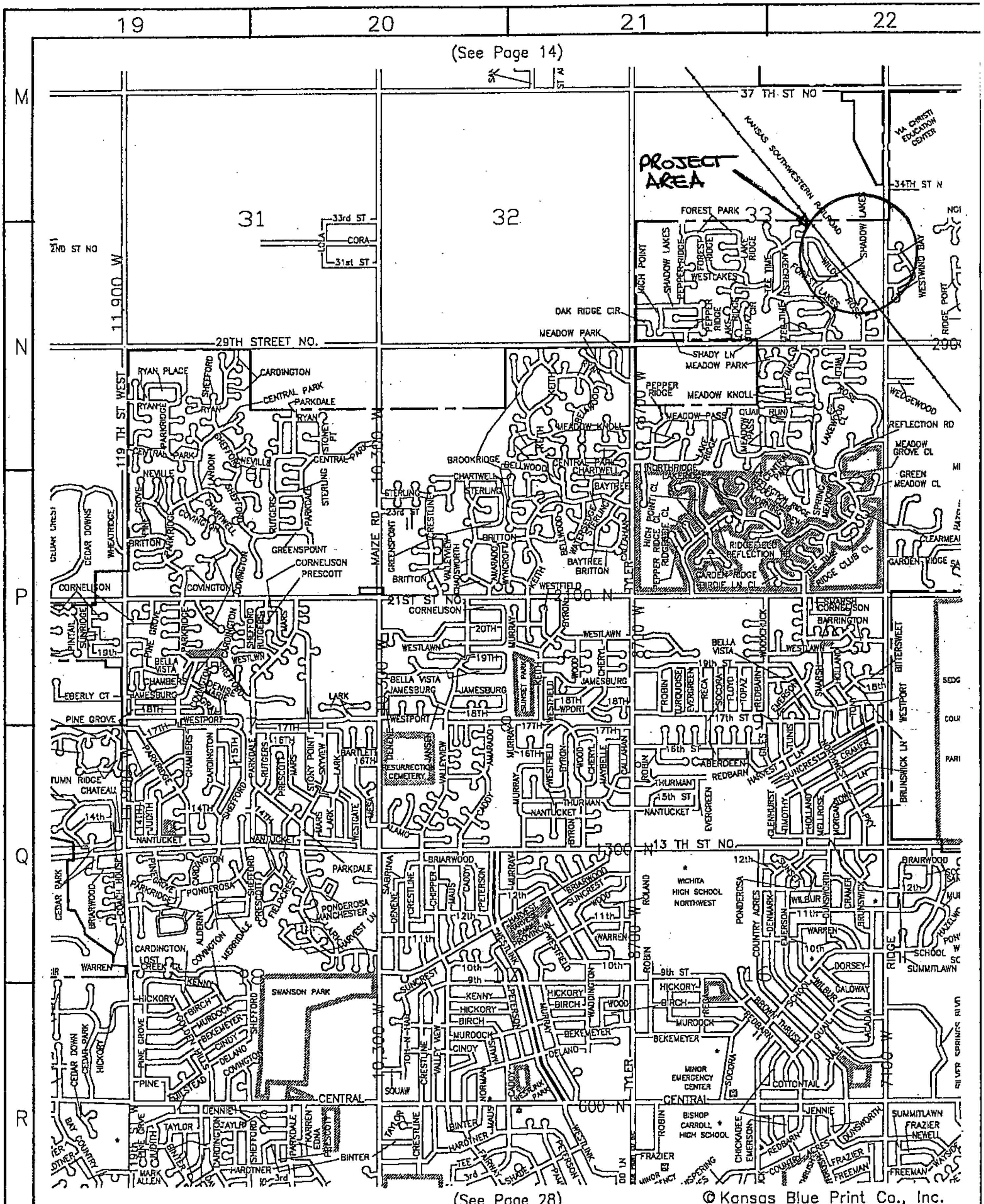
The Rational method is used to calculate the existing and developed runoff. The runoff coefficients used are per the City of Wichita Drainage Criteria, Attachment D. The runoff coefficients and rainfall intensity are as follows:

	Existing Conditions		Developed Conditions	
5-yr	"C"	0.27	"C"	0.85
	I in/hr	3.24	I in/hr	4.56
100-yr	"C"	0.51	"C"	0.91
	I in/hr	5.40	I in/hr	7.37

Table 1. Ridge Port 2nd Addition Total Runoff Summary

Storm Event	Existing Conditions	Developed Conditions
5-Yr.	24 cfs	106 cfs
100-Yr.	75 cfs	183 cfs

The 5-yr hydraulic grade line for the proposed system was calculated using StormCad, by Haestad Methods. Profiles, pipe and node reports are found in pages 1-7 of this report.


19
20
21
22
(See Page 14)
37 TH ST NO
KANSAS SOUTHWESTERN RAILROAD
VIA CHRISTI EDUCATION CENTER
PROJECT AREA
34TH ST N
FOREST PARK
31
32
33
33rd ST
CORA
31st ST
2ND ST NO
11,900 W
29TH STREET NO.
SHADOW LAKES
WESTLAKES
OAK RIDGE CIR
MEADOW PARK
SHADY LN
MEADOW KNOLL
MEADOW PASS
RYAN PLACE
CARDINGTON
CENTRAL PARK
PARKDALE
119 TH ST WEST
MAIZE RD
10,700 W
BROOKRIDGE
BELLWOOD
CHARTWELL
BAYTREE
REFLECTION RD
MEADOW GROVE CL
GREEN MEADOW CL
GREENSPOINT
CORNELISON
PRESCOTT
BRITTON
WESTFIELD
21ST ST NO
2100 N
WESTLAWN
BELLA VISTA
JAMESBURG
LARK
18TH
WESTPORT
17TH
16TH
RESURRECTION CEMETERY
EBERLY CT
PINE GROVE
CHATEAU
14th
NANTUCKET
THURMAN
13 TH ST NO
1300 N
WICHITA HIGH SCHOOL NORTHWEST
PARKDALE
BRIARWOOD
PONDEROSA
CARDINGTON
WARREN
11th
10th
9th ST
SWANSON PARK
HICKORY
BIRCH
MURDOCK
BEKEMEYER
CINDY
DELANO
CENTRAL
600 N
MINOR EMERGENCY CENTER
BISHOP CARROLL HIGH SCHOOL
JENNIE
TAYLOR
BINTER
HARDTNER
SUMMITLAWN
FRAZIER
NEWELL
FREEMAN
(See Page 28)
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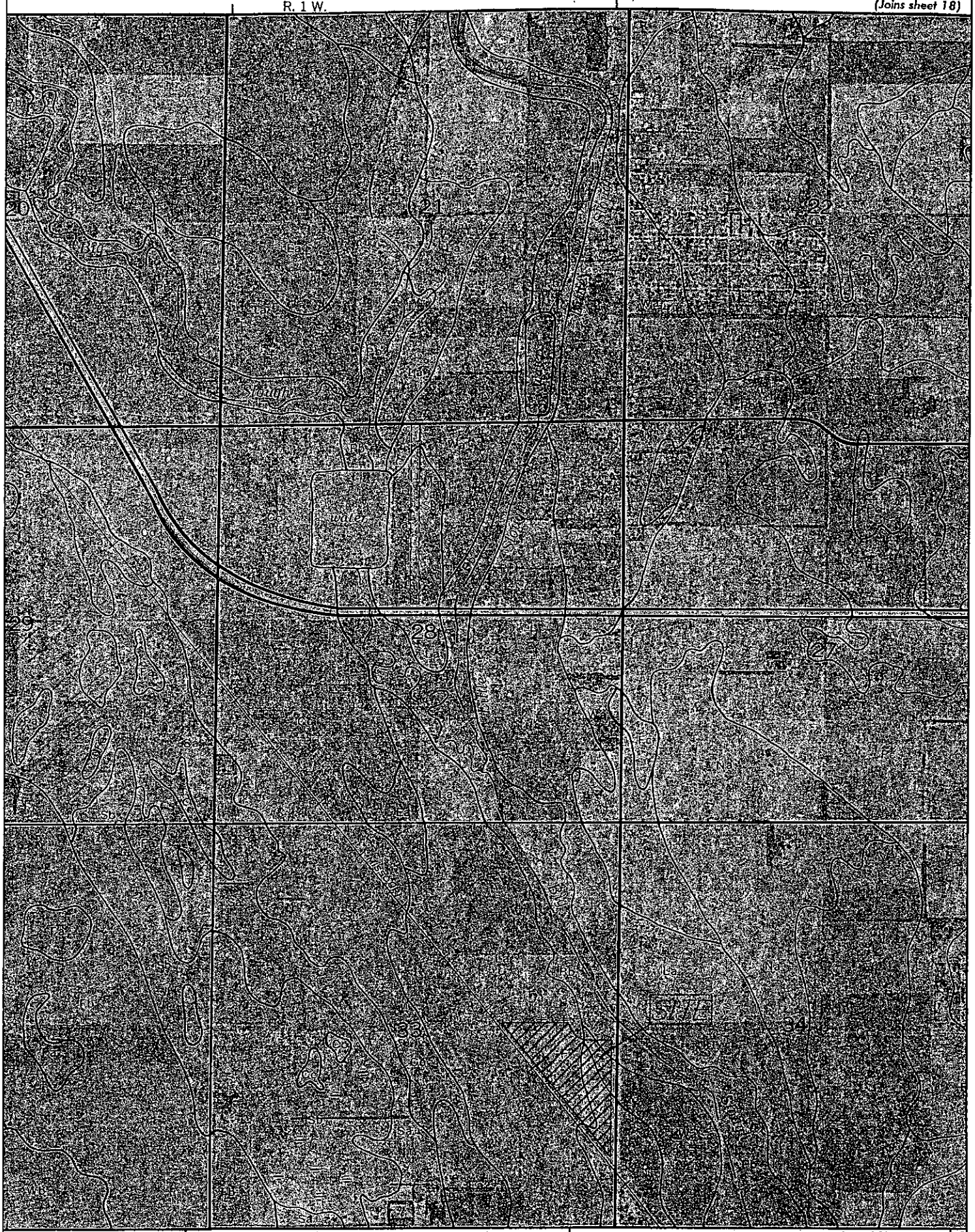
M
N
P
Q
R
N

SEDGWICK COUNTY, KANSAS — SHEET NUMBER 25

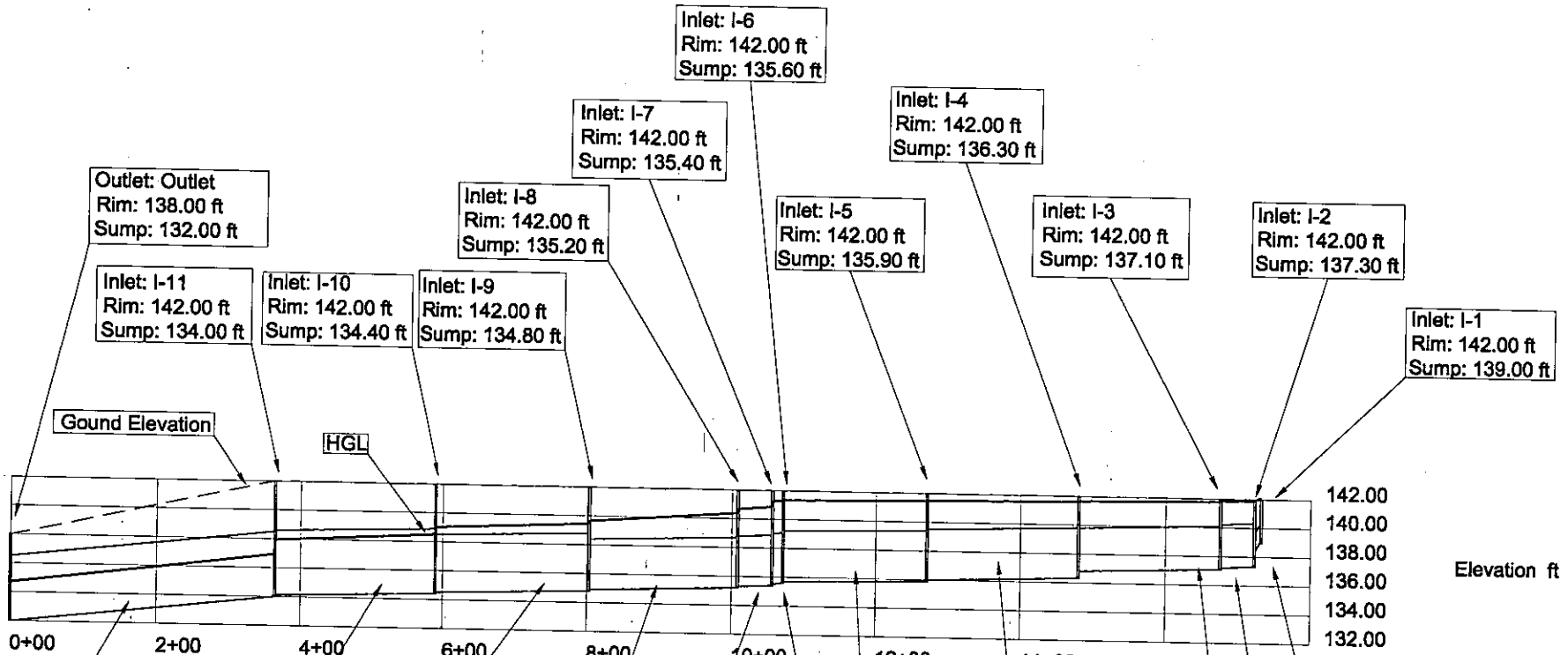


SYSTEM #1

	Pipe Report													
	Pipe Section	Upstream Node	Downstream Node	Discharge (cfs)	Constructed (ft/ft)	Length (ft)	Section Size	Mannings n	Upstream Invet (ft)	Downstream Invert (ft)	Upstream Ground (ft)	Downstream Ground (ft)	Upstream HGL (ft)	Downstream HGL (ft)
5-Yr	P-12	I-12	I-10	38.68	0.1	16	30 inch	0.013	137.50	135.90	142.00	142.00	139.60	139.03
	P-13	I-13	I-7	34.38	0.04	15	36 inch	0.013	136.50	135.90	142.00	142.00	141.30	141.26
	P-14	I-14	I-2	10.55	0.011765	17	24 inch	0.013	138.50	138.30	142.00	142.00	142.01	141.97
	P-1	I-1	I-2	7.03	0.055556	9	15 inch	0.013	139.00	138.50	142.00	142.00	142.08	141.97
	P-2	I-2	I-3	17.93	0.002128	47	36 inch	0.013	137.30	137.20	142.00	142.00	141.90	141.87
	P-3	I-3	I-4	18.16	0.001531	196	36 inch	0.013	137.10	136.80	142.00	142.00	141.81	141.67
	P-4	I-4	I-5	21.99	0.001435	209	42 inch	0.013	136.30	136.00	142.00	142.00	141.63	141.53
	P-5	I-5	I-6	25.43	0.001	200	42 inch	0.013	135.90	135.70	142.00	142.00	141.47	141.35
	P-6	I-6	I-7	28.84	0.006667	15	42 inch	0.013	135.60	135.50	142.00	142.00	141.28	141.26
	P-7	I-7	I-8	59.64	0.002083	48	42 inch	0.013	135.40	135.30	142.00	142.00	140.85	140.68
	P-8	I-8	I-9	59.79	0.001463	205	42 inch	0.013	135.20	134.90	142.00	142.00	140.38	139.65
	P-9	I-9	I-10	63.75	0.001402	214	48 inch	0.013	134.80	134.50	142.00	142.00	139.45	139.03
	P-10	I-10	I-11	98.12	0.001333	225	54 inch	0.013	134.40	134.10	142.00	142.00	138.52	137.94
	P-11	I-11	Outlet	99.13	0.005495	364	54 inch	0.013	134.00	132.00	142.00	138.00	136.93	134.72

SYSTEM #1

	Node Report								
	Node	Area (acres)	Runoff Coefficient	Tc (min)	Rainfall Intensity (in/hr)	Discharge (cfs)	Ground Elevation (ft)	HGL In (ft)	HGL Out (ft)
5-Yr	I-12	9.9	0.85	15	4.56	38.68	142.00	140.20	139.60
	I-13	8.8	0.85	15	4.56	34.38	142.00	141.49	141.30
	I-14	2.7	0.85	15	4.56	10.55	142.00	142.09	142.01
	I-1	1.8	0.85	15	4.56	7.03	142.00	142.33	142.08
	I-2	0.1	0.85	15	4.55	17.93	142.00	141.97	141.90
	I-3	0.1	0.85	15	4.51	18.16	142.00	141.87	141.81
	I-4	1.2	0.85	15	4.35	21.99	142.00	141.67	141.63
	I-5	1.2	0.85	15	4.18	25.43	142.00	141.53	141.47
	I-6	1.2	0.85	15	4.06	28.84	142.00	141.35	141.28
	I-7	0.1	0.85	15	4.05	59.64	142.00	141.26	140.85
	I-8	0.1	0.85	15	4.03	59.79	142.00	140.68	140.38
	I-9	1.4	0.85	15	3.98	63.75	142.00	139.65	139.45
	I-10	0.7	0.85	15	3.91	98.12	142.00	139.03	138.52
	I-11	0.7	0.85	15	3.86	99.13	142.00	137.95	136.93
	Outlet	N/A	N/A	N/A	3.8	N/A	138.00	134.72	134.72



RIDGE PORT 2ND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
5-YR STORM EVENT - PROFILE #1

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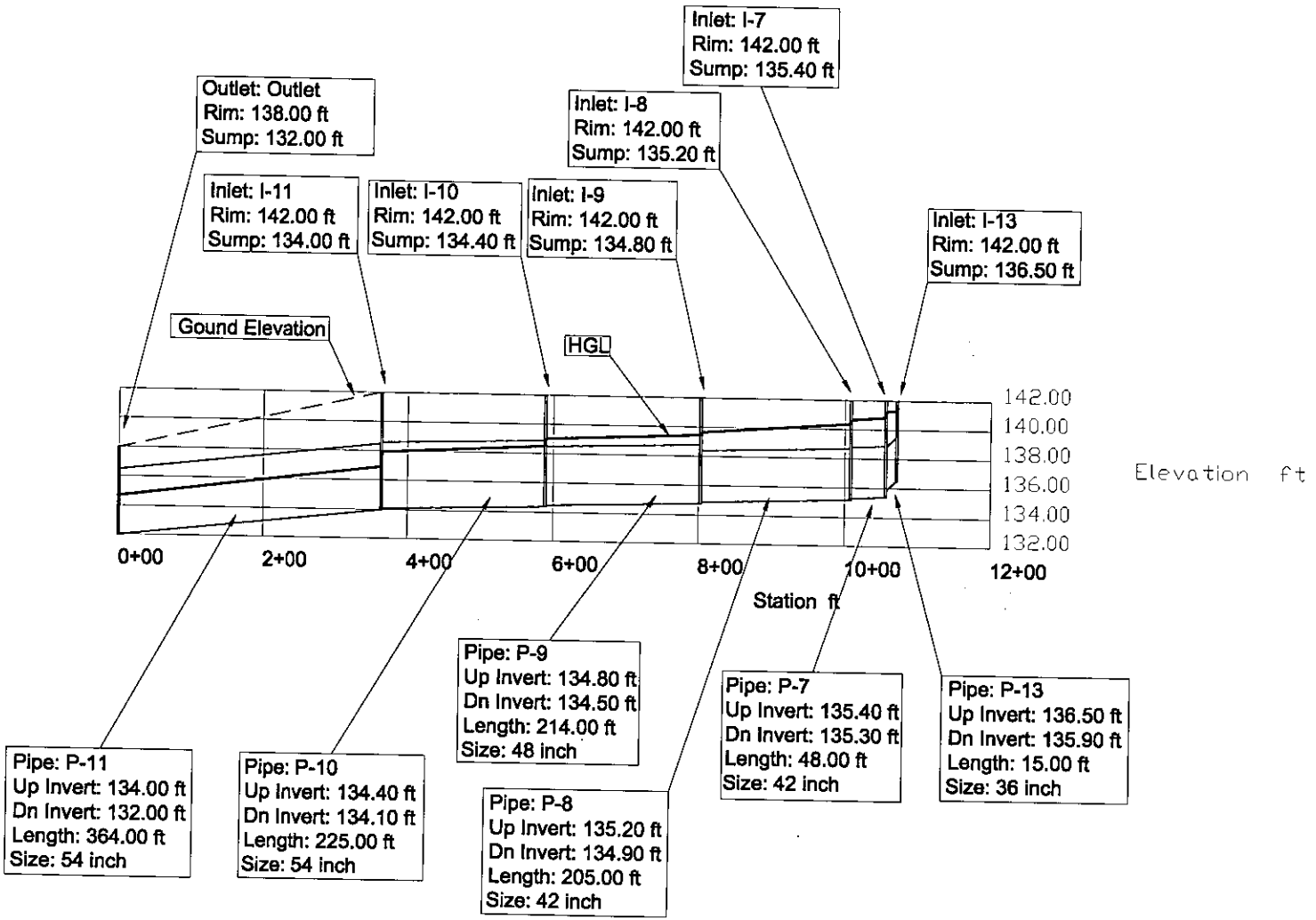

RIDGE PORT 2ND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
5-YR STORM EVENT - PROFILE #3

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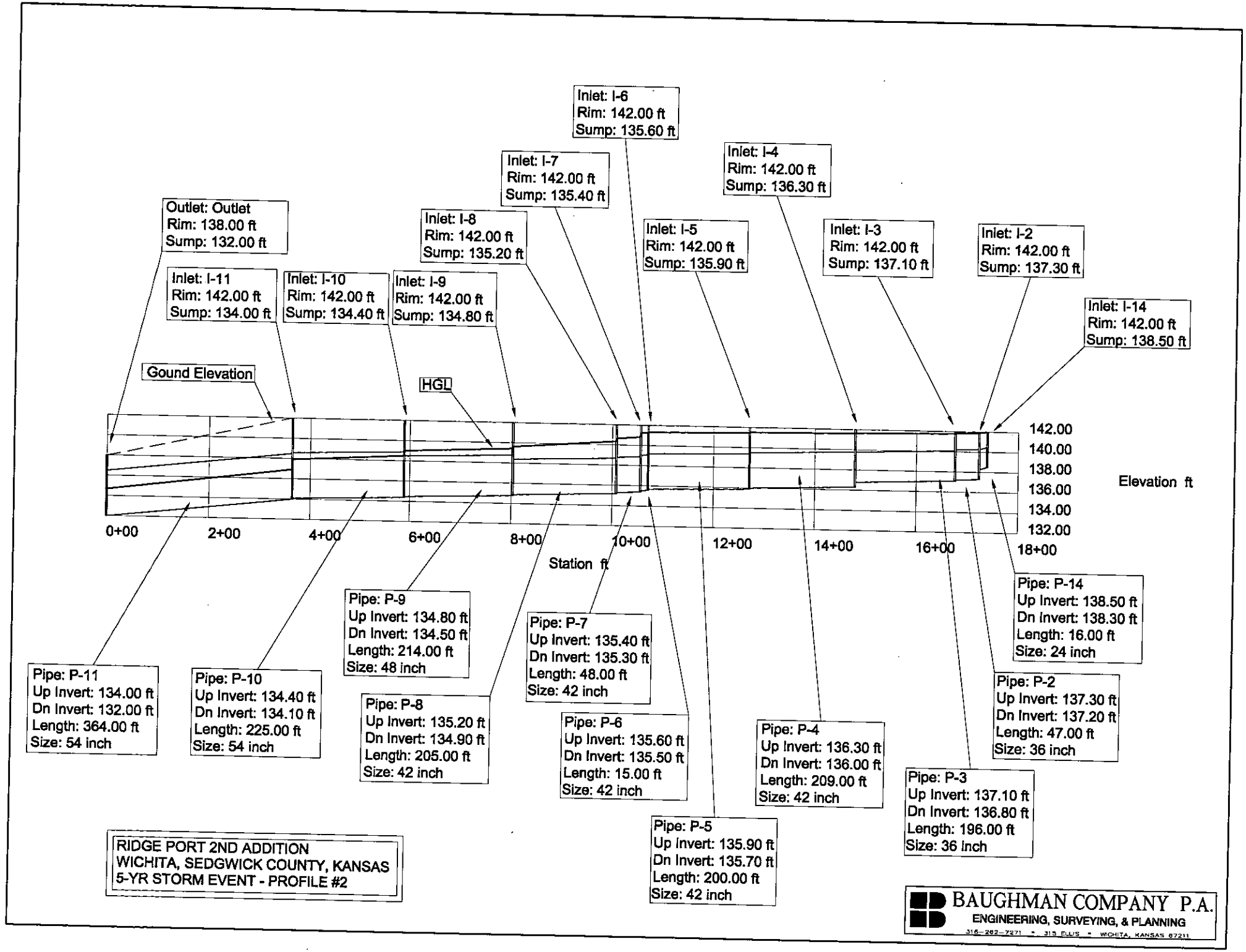
Inlet: I-6
Rim: 142.00 ft
Sump: 135.60 ft
Inlet: I-7
Rim: 142.00 ft
Sump: 135.40 ft
Inlet: I-4
Rim: 142.00 ft
Sump: 136.30 ft
Outlet: Outlet
Rim: 138.00 ft
Sump: 132.00 ft
Inlet: I-8
Rim: 142.00 ft
Sump: 135.20 ft
Inlet: I-5
Rim: 142.00 ft
Sump: 135.90 ft
Inlet: I-3
Rim: 142.00 ft
Sump: 137.10 ft
Inlet: I-2
Rim: 142.00 ft
Sump: 137.30 ft
Inlet: I-11
Rim: 142.00 ft
Sump: 134.00 ft
Inlet: I-10
Rim: 142.00 ft
Sump: 134.40 ft
Inlet: I-9
Rim: 142.00 ft
Sump: 134.80 ft
Inlet: I-14
Rim: 142.00 ft
Sump: 138.50 ft
Gound Elevation
HGL
142.00
140.00
138.00
136.00
134.00
132.00
Elevation ft
0+00
2+00
4+00
6+00
8+00
10+00
12+00
14+00
16+00
18+00
Station ft
Pipe: P-14
Up Invert: 138.50 ft
Dn Invert: 138.30 ft
Length: 16.00 ft
Size: 24 inch
Pipe: P-9
Up Invert: 134.80 ft
Dn Invert: 134.50 ft
Length: 214.00 ft
Size: 48 inch
Pipe: P-7
Up Invert: 135.40 ft
Dn Invert: 135.30 ft
Length: 48.00 ft
Size: 42 inch
Pipe: P-11
Up Invert: 134.00 ft
Dn Invert: 132.00 ft
Length: 364.00 ft
Size: 54 inch
Pipe: P-10
Up Invert: 134.40 ft
Dn Invert: 134.10 ft
Length: 225.00 ft
Size: 54 inch
Pipe: P-8
Up Invert: 135.20 ft
Dn Invert: 134.90 ft
Length: 205.00 ft
Size: 42 inch
Pipe: P-6
Up Invert: 135.60 ft
Dn Invert: 135.50 ft
Length: 15.00 ft
Size: 42 inch
Pipe: P-4
Up Invert: 136.30 ft
Dn Invert: 136.00 ft
Length: 209.00 ft
Size: 42 inch
Pipe: P-2
Up Invert: 137.30 ft
Dn Invert: 137.20 ft
Length: 47.00 ft
Size: 36 inch
Pipe: P-3
Up Invert: 137.10 ft
Dn Invert: 136.80 ft
Length: 196.00 ft
Size: 36 inch
Pipe: P-5
Up Invert: 135.90 ft
Dn Invert: 135.70 ft
Length: 200.00 ft
Size: 42 inch
RIDGE PORT 2ND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
5-YR STORM EVENT - PROFILE #2
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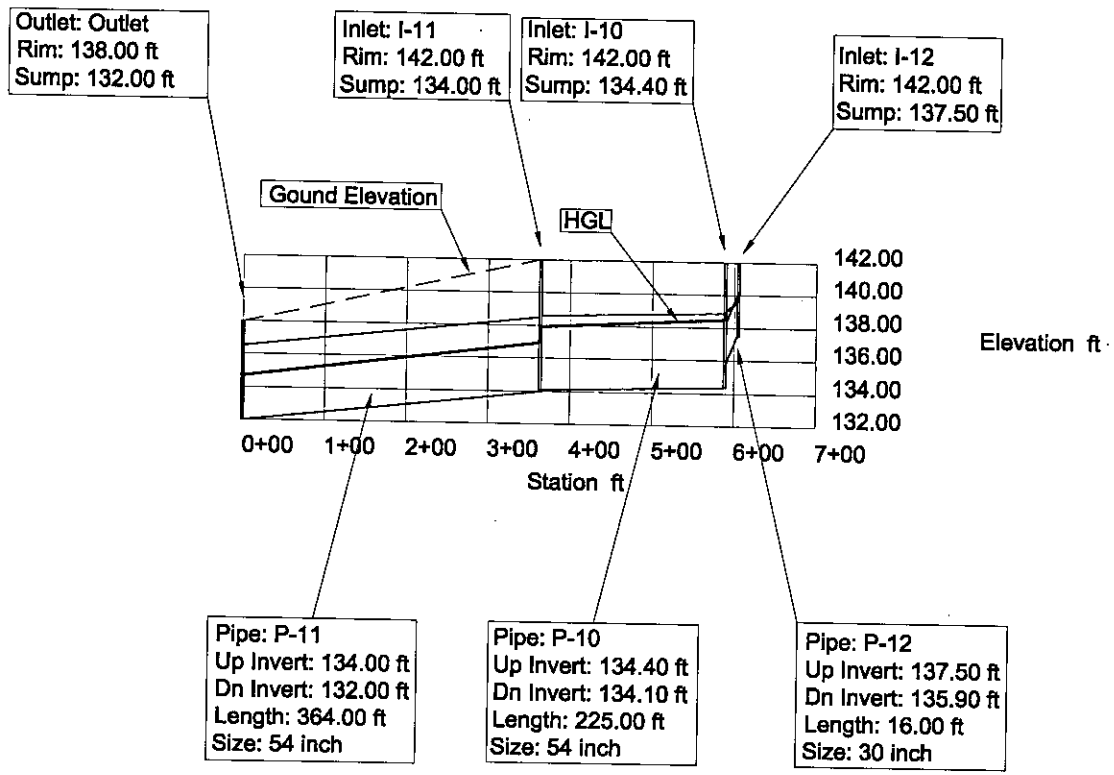

RIDGE PORT 2ND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
5-YR STORM EVENT - PROFILE #4

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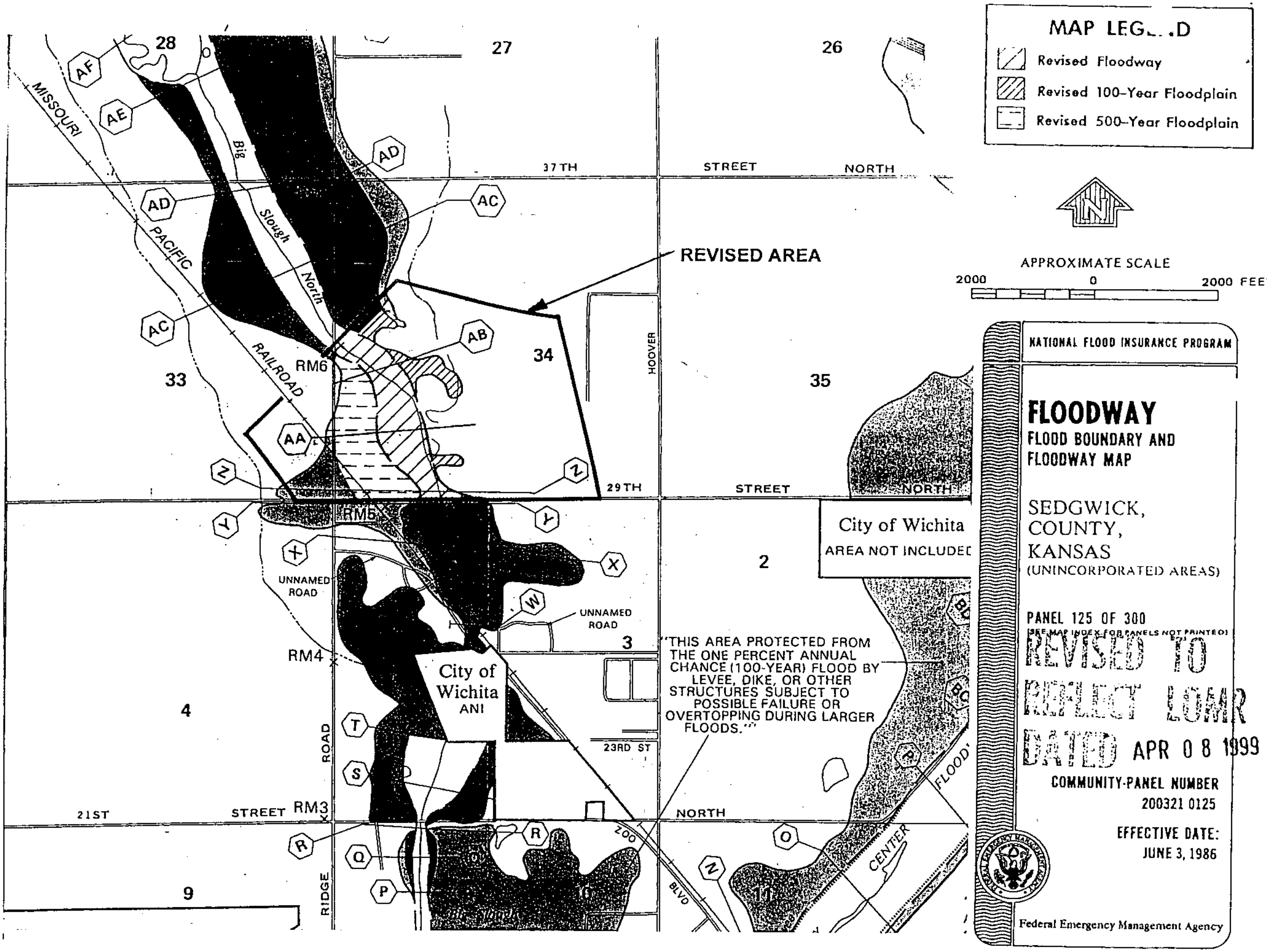


NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY

FLOOD BOUNDARY AND FLOODWAY MAP

SEDGWICK, COUNTY, KANSAS
(UNINCORPORATED AREAS)

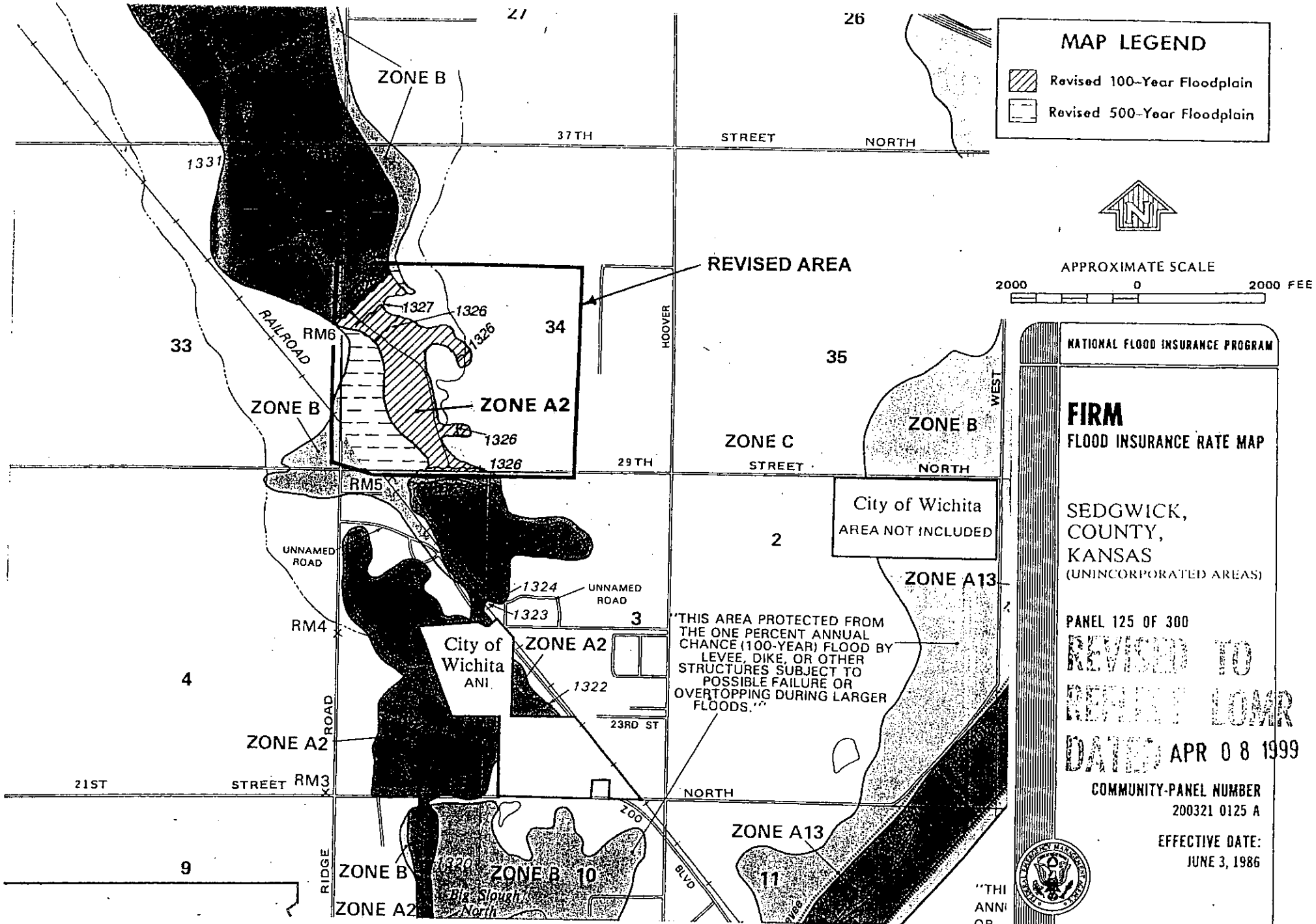
PANEL 125 OF 300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

REVISED TO REFLECT LOMR DATED APR 0 8 1999

COMMUNITY-PANEL NUMBER
200321 0125

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency


MAP LEGEND
Revised 100-Year Floodplain
Revised 500-Year Floodplain
APPROXIMATE SCALE
2000 0 2000 FEE
REVISED AREA
ZONE B
ZONE A2
ZONE C
ZONE A13
City of Wichita
AREA NOT INCLUDED
City of Wichita
ANI
"THIS AREA PROTECTED FROM THE ONE PERCENT ANNUAL CHANCE (100-YEAR) FLOOD BY LEVEE, DIKE, OR OTHER STRUCTURES SUBJECT TO POSSIBLE FAILURE OR OVERTOPPING DURING LARGER FLOODS."
37TH STREET NORTH
29TH STREET NORTH
21ST STREET NORTH
RAILROAD
HOOVER
WEST
UNNAMED ROAD
23RD ST
RIDGE ROAD
ZOO BLVD
Big Slough North
RM6
RM5
RM4
RM3
1331
1327
1326
1324
1323
1322
1320
33
34
35
2
3
4
9
10
11
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
SEDGWICK, COUNTY, KANSAS
(UNINCORPORATED AREAS)
PANEL 125 OF 300
REVISED TO REFLECT LOMR
DATED: APR 08 1999
COMMUNITY-PANEL NUMBER
200321 0125 A
EFFECTIVE DATE:
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Federal Emergency Management Agency