WICHITA—SEDGWICK COUNTY
W.S.C.
METROPOLITAN AREA PLANNING DEPARTMENT
CITY HALL — TENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4561

October 1, 1981

Poe and Associates
1720 E. Morris
Wichita, Kansas 67218

Re: S/D 80-42 - Revised preliminary plat of Great Plains Business Park Addition

Gentlemen:

At the regular meeting of the Subdivision Committee of the Metropolitan Area Planning Commission, October 1, 1981, the above-captioned plat was considered. The action of the Committee was to approve the preliminary plat and authorize preparation of the final plat subject to the following:

A. The applicant shall submit a drainage plan to City Engineering prior to or at the time of submitting a final plat. The applicant shall be advised that an off-site drainage easement on the park property to the south will be required plus a guarantee for construction of the proposed detention reservior.

B. Prior to filing a final plat, the applicant shall meet with City Engineering regarding the labeling of utility and drainage easements.

C. Access to Oliver shall be limited to one opening for each lot south of 35th Street provided a guarantee is submitted for permanent decel lane construction. If the drive approach into Lot 1, Block 1 still exists, it shall be removed prior to recording the plat. The appropriate access control labeling shall be shown on the final plat.

D. The applicant shall guarantee the construction of 34th Street North Circle and Great Plains and shall guarantee, if necessary, any changes in construction of 35th Street North so that it can be accepted as a public street.

E. The applicant shall guarantee extension of sanitary sewer to serve the lots not already served.

F. The applicant shall guarantee extension of City water to serve the lots not already served.

G. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning

Department for recording.

H. Approval of a final plat in this configuration shall be subject to approval of the associated zone case requesting "E" zoning.

I. A temporary cul-de-sac with a 75-foot radius is needed to terminate Great Plains at the north end of this plat. This may be granted by separate instrument on property north of the plat or shown as a temporary cul-de-sac easement on Lot 4, Block 1 and Lot 21, Block 2. A guarantee for construction of this cul-de-sac will be required.

J. City Engineering has advised that a covenant is required for recording with this plat which states that an ejector sanitary sewer system will be required in order to provide sanitary sewer service to certain lots.

K. The final plat shall indicate the K.G. and E. and Southwestern Bell utility easements which are indicated on the enclosed "marked copy" of this plat.

L. Prior to filing a final plat the applicant shall meet with the Gas Service Company relative to a possible conflict between their existing facilities and the proposed road alignment.

L. 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.

M. Requirements for a final plat (see pages 20-25, Part 4, Article 5 of the MAPC Subdivision Regulations).

Enclosed herewith is the "marked" copy of the preliminary plat for your information and files.

If you have any questions concerning this matter, please call.

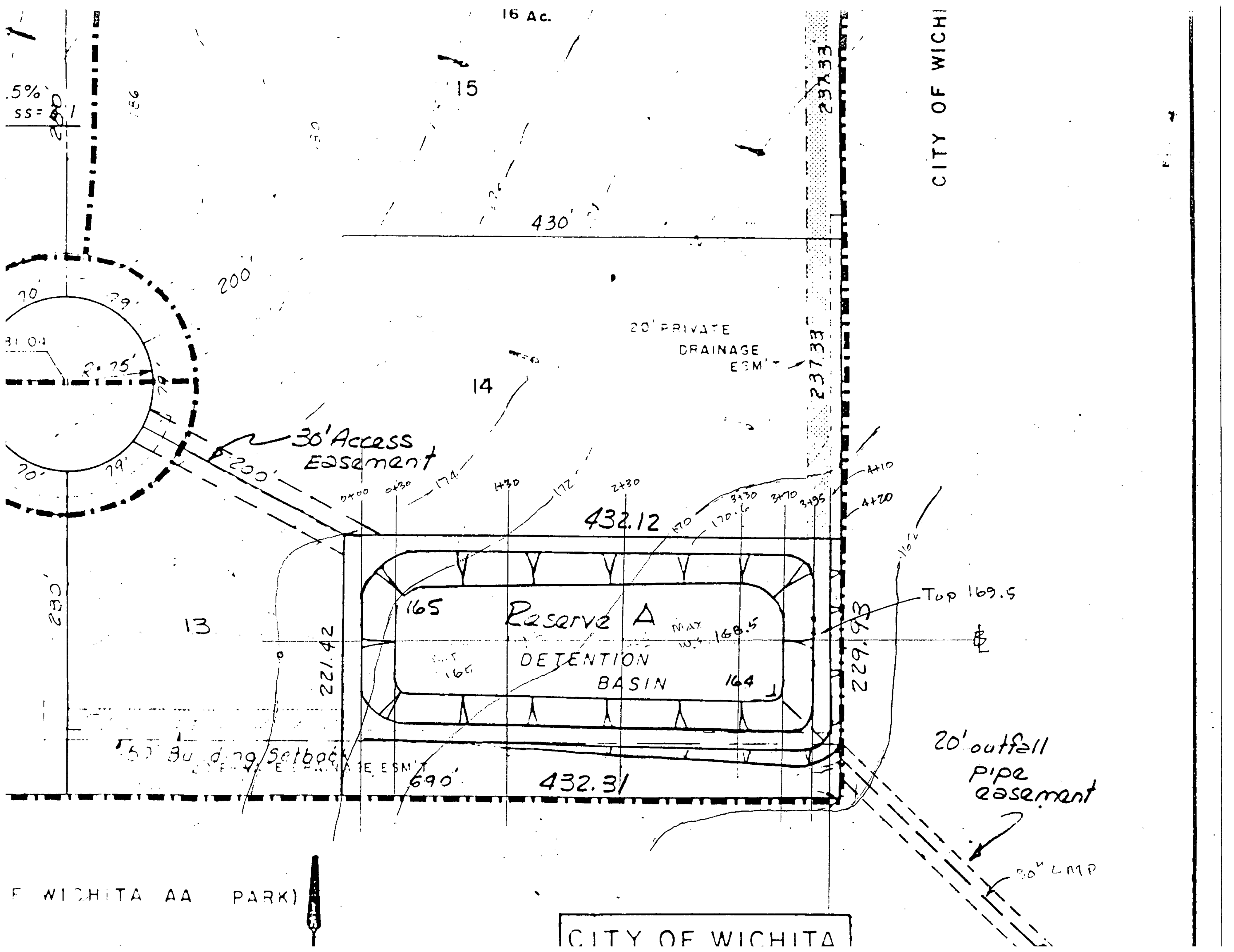
Sincerely,

Forrest L. Nagley

Forrest L. Nagley
Junior Planner

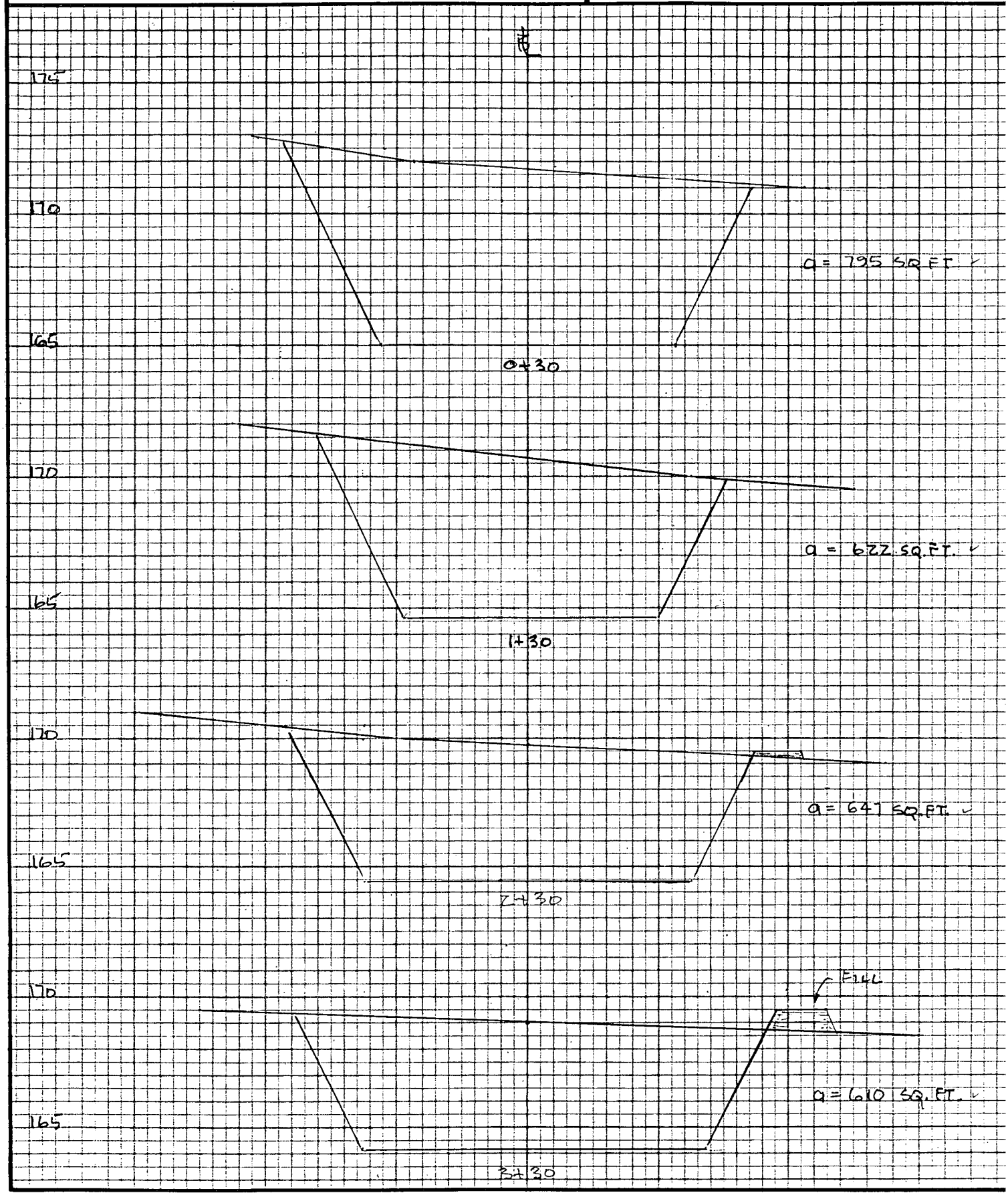
FLN:bh

cc: Great Plains Ventures, Attention: Larry Dean, 1711 Longfellow, 67207
Mike Lindebak, City Engineering


16 Ac.
15
CITY OF WICHI
430'
200'
20' PRIVATE
DRAINAGE
ESM'T
237.33
14
30' Access
Easement
200'
432.12
Reserve A
DETENTION
BASIN
165
164
MAX W.S. 168.5
Top 169.5
221.42
229.93
13
230'
690'
432.31
20' outfall
pipe
easement
WICHITA AA PARK)
CITY OF WICHITA

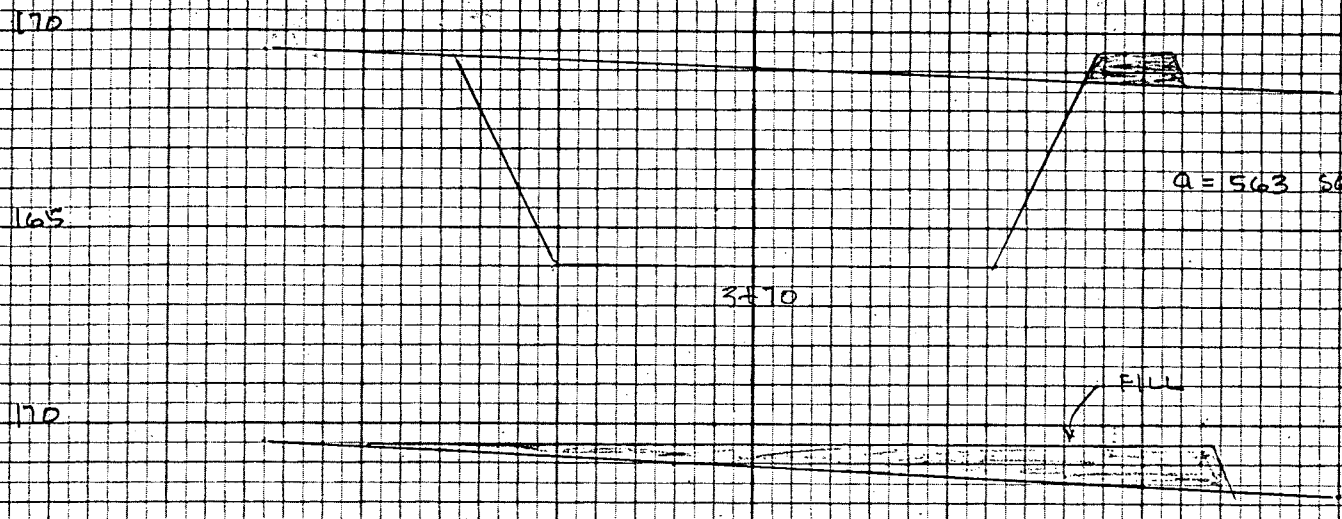
POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT GREAT PLAINS NO. _____
SUBJECT DET. BASIN EXCAVATION
CALCULATED BY K. HILL DATE 11-6-81
CHECKED BY _____ DATE _____
SCALE: 1" = 40' SHEET NO. 1 OF 2



POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT GREAT PLAINS NO. _____
SUBJECT DET. BASIN EXCAVATION
CALCULATED BY K. HILL DATE 11-6-91
CHECKED BY _____ DATE _____
SCALE: 1"=40 SHEET NO. 2 OF 2



STA.	AREA		
0+00	0		
		$\frac{795}{2} \times 30 =$	11925
1+30	795	$\frac{795+622}{2} \times 100 =$	70850
	622	$\frac{622+647}{2} \times 100 =$	63450
2+30	647	$\frac{647+610}{2} \times 100 =$	62850
3+30	610	$\frac{610+563}{2} \times 40 =$	23460
3+70	563	$\frac{563}{2} \times 25 =$	7038
3+95	0		

239573 ÷ 27 = 8873 CU. YDS.

COST ESTIMATE

8873	CU. YDS	EXCAVATION	1.50	13309.50
320	LIN. FT.	30" CMP.	25.00	8000.00
				$21309.50

USE $21,300

PAK-1

SOLUTION OF MANNING'S EQUATION
TRAPEZOIDAL CHANNEL

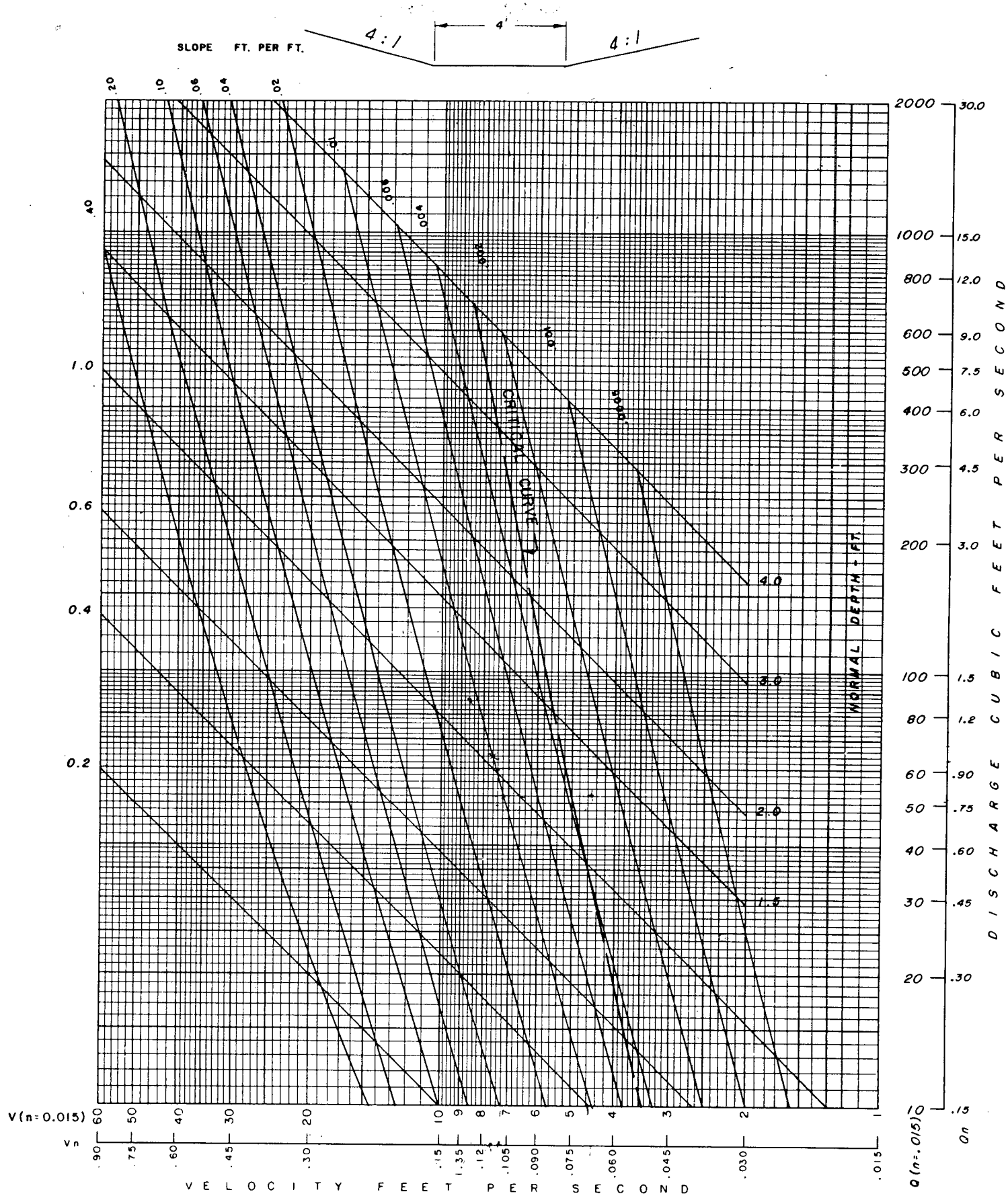


Figure 3D-4-2-1-2-B

n=.035

THE CITY OF WICHITA

OFFICE OF ENGINEERING DEPARTMENT
Design

DATE October 19, 1981

TO Paul Johnston, Flood Control & Landfill Director

FROM Chris Breitenstein, P.E., Drainage & Flood Control Engineer

SUBJECT Great Plains Business Park
Drainage Plan

Please find attached drainage plan and supportive calculations for Great Plains Business Park.

CB

Chris Breitenstein, P.E.
Drainage & Flood Control Engineer

CB:gf

Attachment

THE CITY OF WICHITA

OFFICE OF ENGINEERING DEPARTMENT **DATE** November 5, 1981
Design

TO Paul Johnston, Flood Control & Landfill Director

FROM Chris J. Breitenstein, Drainage & Flood Control Engineer

SUBJECT Drainage Plan

Please find attached the revised drainage plan for Great Plains Business Park.

CJB gf

Chris J Breitenstein
Drainage & Flood Control Engineer

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY JWhitson DATE 10/6/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 1 OF 16

AREA A

Overland:

DA = 1.4 (Lot 4) L = 310' S = 2/100 = .02 n = .40

t_c = 22.2 min. I_5 = 4.49 (Chart 1) C = .9

Q_5 = .9 x 4.49 x 1.4 = 5.7 cfs <6>

Q_{100} = .9 x 7.74 x 1.4 = 9.75 cfs <10>

Ditch:

V-Ditch - Q_{100} = 10 S = .005 3:1 side (Chart 2) L = 690'

D = 1.3 V = 2.6 fps t_c = 4.42 min. ΣDA = 5.7

Σt_c = 26.62 min. I_5 = 4.21 I_{100} = 7.25

Q_5 = .9 x 4.21 x 5.7 = 21.60 cfs <22> S = .005

Q_{100} = .9 x 7.25 x 5.7 = 37.19 cfs <38> D = 2 V = 2.85

AREA B

Gutter Flow:

DA = 1.2

t_c = 15 Min. I_5 = 5.21 C = .9

Q_5 = .9 x 5.21 x 1.2 = 5.63 cfs <6>

Gutter Depth .27' Width 11' (Chart 3)

AREA C

Overland:

DA = 1.3 (Lot 5 BUK 2) L = 283' S = 2/100 = .02 n = .40

t_c = 21.22 min. I_5 = 4.57 C = .9

Q_5 = .9 x 4.57 x 1.3 = 5.35 cfs

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY L Whitm DATE 10/6/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 2 OF 16

AREA C

Gutter Flow:

Gutter Depth = .27' width 11'

t_c = 15 Min. ΣDA = 3.83 Σt_c = 36.22 Min.

I_5 = 3.4 I_{100} = 5.89 C = .9 S = .02 Average

Q_5 = .9 x 3.4 x 3.83 = 11.7 Cfs <12>

Q_{100} = .9 x 5.89 x 3.83 = 20.3 Cfs <21>

Gutter Depth = .45 width 14.5' (100 yr.)

Total Runoff:

ΣDA = 6.2 ΣT_c = 36.22 Min C = .9

I_5 = 3.4 I_{100} = 5.89

Q_5 = .9 x 3.4 x 6.2 = 18.97 <19>

Q_{100} = .9 x 5.89 x 6.2 = 32.87 <33>

18" CMP Cap. Inlet Control at 35th St. No.

$Q = Ca\sqrt{2g\Delta h}$ C = .73 Δh = 3.5

a = 1.8 g = 32.2

$Q = .73 \times 1.8 \sqrt{64.4 \times 3.5}$ = 19.73 Cfs

(Pipe will handle 5yr Storm)

Existing Ditch V Ditch 3:1 D = 2' S = .01

Q_5 = 19 D = 1.4 V = 3.3 fps

Q_{100} = 33 D = 1.7 V = 3.7 fps

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY QWhitm DATE 10/6/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 3 OF 16

AREA D

Overland:

DA = 1.33 (1/2 Lot & BUK2) L = 390' S = 2/120 = .02 n = .40

t_c = 26 Min I_5 = 4.21 I_{100} = 7.25 C = .9

Q_5 = .9 x 4.21 x 1.33 = 5.04 cfs <5>

Q_{100} = .9 x 7.25 x 1.33 = 8.68 cfs <9>

Ditch:

Q_5 = 5 Q_{100} = 9 S = 2/300 = .01

V Ditch Q_5 — D = .8 V = 2.2 L = 400'

$t_{c_5} = \frac{400}{2.2} \div 60 = 3.03$ min

Q_{100} — D = 1.2 V = 2.7 L = 400'

$t_{c_{100}} = \frac{400}{2.7} \div 60 = 2.47$ Min

TOTAL RUNOFF:

ΣDA = 4.9 Σt_{c_5} = 29.03 $\Sigma t_{c_{100}}$ = 28.47 C = .9

I_5 = 4.02 I_{100} = 7.04

Q_5 = .9 x 4.02 x 4.9 = 17.73 <18>

Q_{100} = .9 x 7.04 x 4.9 = 31.05 <31>

Existing Ditch V Ditch 3:1 D = 2' S = .01

Q_5 = 18 D = 1.4' V = 3.15 fps

Q_{100} = 31 D = 1.7' V = 3.6 fps

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY J White DATE 10/6/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 4 OF 16

AREA E

Gutter Flow:

DA = 6.3 S = .0045 C = .9 n = .02 L = 960'

t_c = 18.69 min <15> I_5 = 5.21 I_{100} = 8.98

Q_5 = .9 x 5.21 x 6.3 = 29.54 cfs <30>

Q_{100} = .9 x 8.98 x 6.3 = 50.92 cfs <51>

5yr. Exceeds Crown of Street w/o Inlets Max Q = 13 cfs

$A = \frac{Q_5}{CI} = \frac{13}{.9 \times 5.21} = 2.77$ Ac

PT E-1

Q_5 = .9 x 2.26 x 5.21 = 10.6 cfs <11>

Q_{100} = .9 x 2.26 x 8.98 = 18.27 cfs <19>

5yr - Gutter Depth .47' Width 15'

100yr - Gutter Depth .57' Width 19.3' (1.4' Dry)

PT E-2

Q_5 = .9 x 2.77 x 5.21 = 13 cfs

Q_{100} = .9 x 2.77 x 8.98 = 22.39 cfs <23>

5yr - Gutter Depth .50' Width 16'

100yr - Gutter Depth .61' Width 19.5' (1.3' Dry)

PT E-3 S = .0085

Q_5 = .9 x 1.27 x 5.21 = 5.96 cfs <6>

Q_{100} = .9 x 1.27 x 8.98 = 10.26 cfs <11>

5yr - Gutter Depth .38 Width 11'

100yr - Gutter Depth .50 Width 16'

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY J White DATE 10/6/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 5 OF 16

AREA E

PT E-1

Q_5 = 11 cfs – Require 2 Inlets

Pipe size – 18" RCP @ .9% (n=.012)

PT E-2

Q_5 = 13 cfs – Require 3 Inlets

Pipe size – (SEE AREA G, PT G-2)

PT E-3 $Q_5 = .9 \times 1.27 \times 5.21 = 5.96$ <6> RCB Outlet Required

AREA G

Gutter Flow:

PT G-1

t_c = 15 Min (see PT. E-1) C=.9 S=.0045 n=.02

$I_5 = 5.21$ $I_{100} = 8.98$ DA = 2.65

Inlet

$Q_5 = .9 \times 2.65 \times 5.21 = 12.43$ cfs <13>

Requires 3 Inlets

Pipe – DA = 4.91

$Q_5 = .9 \times 4.91 \times 5.21 = 23.02$ cfs <23>

Pipe size – 24" RCP (n=.012) @ 1%

Ditch – DA = 4.91 S = 2/300 x 100 = .67%

Q_5 = 23 D = 1.6' V = 2.8 cfs

PAK-1

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY Wilson DATE 10/7/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 6 OF 16

AREA G

PT-6-2

t_c = 15 Min C = .9 S = .35% DA = 1.8

I_5 = 5.21 I_{100} = 8.98

Inlet & Pipe

Q_5 = .9 x 1.8 x 5.21 = 8.44 cfs <9>

Q_{100} = .9 x 1.8 x 8.98 = 14.56 cfs <15>

5 yr. Requires 2 Inlets

Pipe Size - 18" RCP @ .7% (n = .012)

100 yr. Gutter Depth .56' Width 18'

PT E-2

Pipe Size DA = 4.57 I_5 = 5.21 t_c = 15 Min.

Q_5 = .9 x 4.57 x 5.21 = 21.43 <22>

Requires 24" RCP @ 1% (n = .012)

Q_{100} = 37 - Ditch - S = .02 D = 1.6' V = 4.8 fps

PT 6-3

t_c = 15 Min S = .35% C = .9 DA = 1.5

I_5 = 5.21 I_{100} = 8.98

Q_5 = .9 x 1.5 x 5.21 = 7.03 cfs <7>

Q_{100} = .9 x 1.5 x 8.98 = 12.12 cfs <12>

Outlet Required at RCB

Q_5 = 7 Gutter Depth .42' Width 13'

AREA H

Overland:

DA = 8.4 L = 750' S = 2/170 = .01 n = .40 C = .9

t_c = 41 min I_5 = 3.07 I_{100} = 5.32

Q_5 = .9 x 8.4 x 3.07 = 23.21 cfs <24>

Q_{100} = .9 x 8.4 x 5.32 = 40.22 cfs <41>

AREA I

Overland:

DA = 5 L = 370' S = 2/130 = .0154 n = .40 C = .9

t_c = 26 min I_5 = 4.21 I_{100} = 7.25

Q_5 = .9 x 5 x 4.21 = 18.95 cfs <19>

Q_{100} = .9 x 5 x 7.25 = 32.63 cfs <33>

AREA J

Overland:

DA = 1.6 L = 340' S = 2/100 = .02 n = .40 C = .9

t_c = 23 min. I_5 = 4.41 I_{100} = 7.74

Q_5 = .9 x 1.6 x 4.41 = 6.35 cfs <7>

Q_{100} = .9 x 1.6 x 7.74 = 11.15 <12>

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY G. Whitford DATE 10/7/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 8 OF 16

AREA K

Overland:

DA = 1.44 Ac (Lot + 16 Blk 2) $S = 2/100 = .02$ $n = .40$ $L = 220'$

$t_c = 18$ Min $T_5 = 4.86$ $I_{100} = 8.37$

$Q_5 = .9 \times 1.44 \times 4.86 = 6.3$ cfs <7>

$Q_{100} = .9 \times 1.44 \times 8.37 = 10.85$ cfs <11>

V-Ditch $S = .007$ $D = 1.1$ $V = 2.6$ fps $Q_5 = 7$

$Q_{100} = 11$ $D = 1.3$ $V = 2.4$ fps $S = .005$

Channel Flow: V-Ditch

$\Sigma DA = 3.5$ $\Sigma t_c = 18 + \frac{200}{3.6} \div 60 = 18.93$ Min <18>

$I_5 = 4.86$ $I_{100} = 8.37$

$Q_5 = .9 \times 3.5 \times 4.86 = 15.31$ cfs <16>

$Q_{100} = .9 \times 3.5 \times 8.37 = 26.37$ cfs <27>

V-Ditch $S = .005$ $D = 1.5'$ $V = 2.4$ fps $Q_5 = 16$

$Q_{100} = 27$ $D = 1.8'$ $V = 2.7$ fps

AREA F

Overland:

DA = 5.3 $n = .4$ $C = .9$ $S = 2/100 = .02$ $L = 520'$

$t_c = 28$ min. $I_5 = 4.09$ $I_{100} = 7.04$

$Q_5 = .9 \times 5.3 \times 4.09 = 19.51$ cfs <20>

$Q_{100} = .9 \times 5.3 \times 7.04 = 33.58$ cfs <34>

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY [illegible] DATE 10/7/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 9 OF 16

AREA M

Overland:

DA = 3.4 S = 2/100 = .02 n = .4 L = 470'

t_c = 27 Min. I_5 = 4.15 I_{100} = 7.14

Q_5 = .9 x 3.4 x 4.15 = 12.7 cfs <13>

Q_{100} = .9 x 3.4 x 7.14 = 21.85 <22>

DISCHARGE NORTH R via Oliver Ditch

ΣDA = A + B + C = 5.7 + 1.2 + 6.2 = 13.10 Ac

Σt_c = Area C + Channel Flow

t_c Ditch North of 35th

ΣDA = B + C = 6.2 + 1.2 = 7.4 L = 400'

t_c = Area C = 36 min I_5 = 3.4 I_{100} = 5.89

Q_5 = .9 x 3.4 x 7.4 = 22.64 cfs <23>

Q_{100} = .9 x 5.89 x 7.4 = 39.23 cfs <40>

V-Ditch S = .01 D = 2' (Existing)

Q_{100} = 40 D = 1.7 V = 3.6

$t_c = \frac{400}{3.6} \div 60 = 1.85$ Min

Σt_c = 36 min + 1.85 Min = 37.85 Min <37>

I_5 = 3.33 I_{100} = 5.76

Q_5 = .9 x 13.10 x 3.33 = 39.26 cfs <40>

Q_{100} = .9 x 13.10 x 5.76 = 67.91 cfs <68>

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY L. Whitten DATE 10/7/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 10 OF 16

DISCHARGE NORTH R

Existing ditch 2' bottom 3:1 Side Slopes

S = .0050 n = .035 Depth 2.0'

Area = 16 WP = 14.6491 R = 1.0922 V = 3.1840

Q_{cap} = 50.94 cfs

Q_5 = 40 cfs Q_{100} = 68 cfs

Under a 5yr. Storm the runoff would remain in the ditch. Under a 100yr. storm the water surface Elev. would be approx. 2.25' above the R of the existing ditch.

AMOUNT OF WATER ON OUTER

Cross Slope = 1/2"/ft or S = .04

WaterSurface above Shoulder .25'

$$\frac{\text{Rise}}{\text{Span}} = \text{Slope}$$

$$\text{Span} = \frac{\text{Rise}}{\text{Slope}} = \frac{.25}{.04} = 6.25'$$

Proposed R/W line is approx 3' above existing R of ditch therefore adjacent land owners would not get water to setback lines during a 100 yr. Storm.

PAK-1

EXISTING 4' x 3' RCB

$\Sigma DA = A + B + C + 16Ac = 13.10 + 16 = 29.10 Ac$ $C = .9$

$S = .02$ $n = .40$ $L = 1100'$

$t_c = 31$ Min. $I_5 = 3.82$ $I_{100} = 6.62$

$Q_5 = .9 \times 29.10 \times 3.82 = 100.06$ cfs <100>

$Q_{100} = .9 \times 29.10 \times 6.62 = 173.33$ cfs <174> } Full Industrial Development

$Q_{cap} = Ca\sqrt{2g\Delta h}$ (Inlet Control) $WP = 22$ $a = 12$

$r = \frac{a}{WP} = \frac{12}{22} = .55$

$C = .81$

$Q_{cap} = .81 \times 12\sqrt{64.4 \times 3} = 135.10$ cfs

$Q_{25} = .9 \times 29.10 \times 5.19 = 135.93$ cfs <136>

POE & ASSOCIATES OF KANSAS, INC.
CONSULTING ENGINEERS

PROJECT Great Plains NO. 1210-6
SUBJECT Drainage Plan
CALCULATED BY Q. Whitten DATE 10/7/81
CHECKED BY _____ DATE _____
SCALE: _____ SHEET NO. 12 OF 16

AREA N

Gutter Flow:

DA = 1.2

t_c = 15 min, I_5 = 5.21 C .9 I_{100} = 8.98 S = .004

Q_5 = .9 × 5.21 × 1.2 = 5.63 cfs <6>

Q_{100} = .9 × 8.98 × 1.2 = 9.70 cfs <10>

100yr - Gutter Depth .47' width 15'

AREA O

Gutter Flow:

DA = 1.3

t_c = 15 Min, I_5 = 5.21 I_{100} = 8.98 C .9 S = .004

Q_5 = .9 × 5.21 × 1.3 = 6.10 <6>

Q_{100} = .9 × 8.98 × 1.3 = 10.51 <11>

100yr - Gutter Depth .47' width 15'

Great Plains Drainage Plan Chart I

RAINFALL INTENSITY TABLE

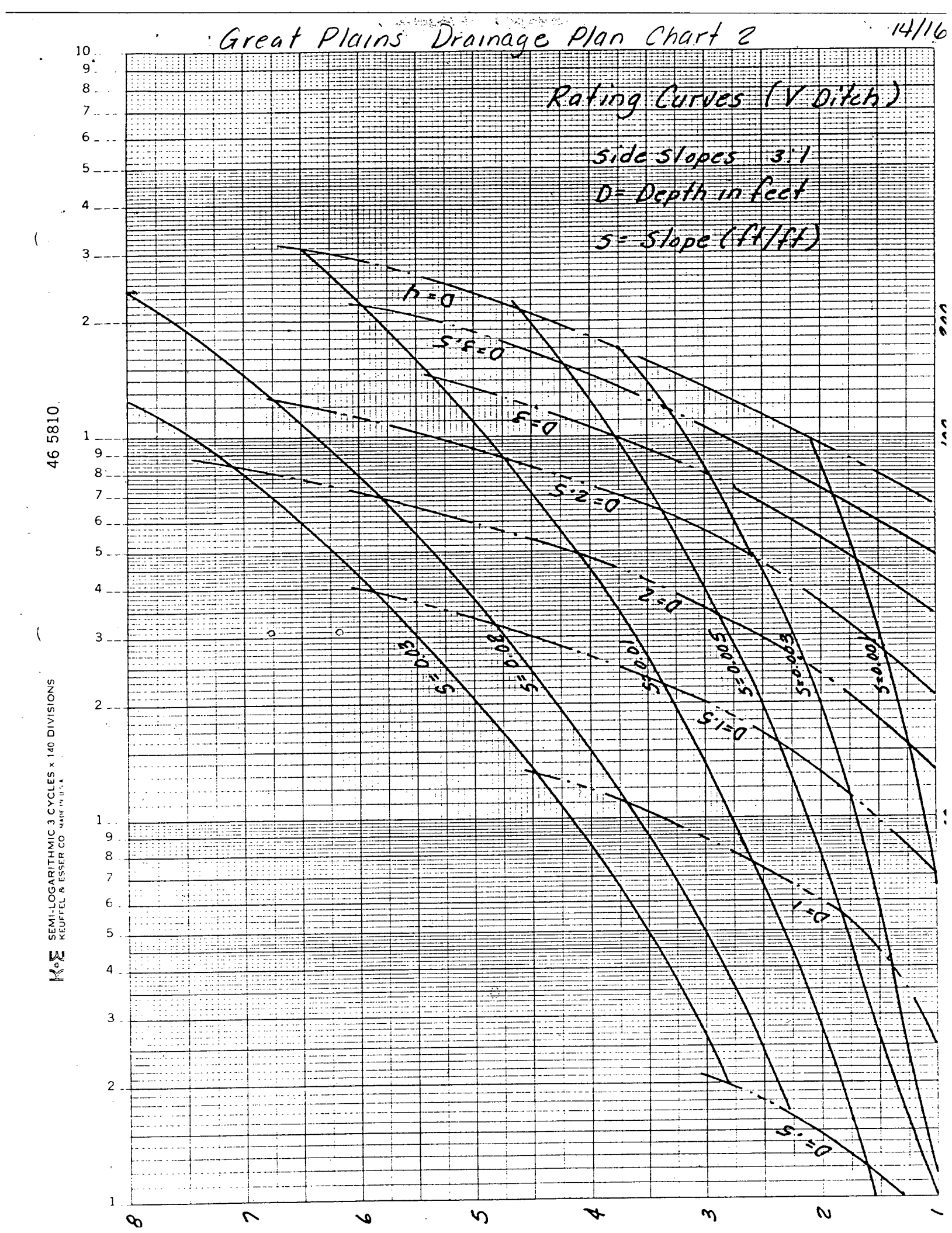
for

SEDGWICK COUNTY KANSAS

The following tabulation contains rainfall intensity in inches per hour as derived from ESSA Weather Bureau Technical Paper 40.

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5	4.67	6.23	8.00	9.34	10.67	12.23	13.79
6	4.35	5.80	7.45	8.70	9.94	11.39	12.84
7	4.09	5.45	7.02	8.19	9.36	10.72	12.09
8	3.88	5.18	6.66	7.77	8.89	10.18	11.48
9	3.71	4.95	6.36	7.43	8.49	9.72	10.96
10	3.56	4.75	6.11	7.13	8.15	9.33	10.52
11	3.43	4.58	5.89	6.87	7.85	8.99	10.14
12	3.32	4.43	5.69	6.64	7.59	8.69	9.80
13	3.21	4.29	5.51	6.43	7.35	8.42	9.50
14	3.12	4.17	5.36	6.25	7.14	8.18	9.23
15	3.04	4.06	5.21	6.08	6.95	7.97	8.98
16	2.96	3.96	5.09	5.93	6.78	7.77	8.76
17	2.90	3.86	4.97	5.79	6.62	7.59	8.55
18	2.83	3.78	4.86	5.67	6.48	7.42	8.37
19	2.77	3.70	4.76	5.55	6.34	7.27	8.19
20	2.72	3.63	4.66	5.44	6.22	7.12	8.03
21	2.67	3.56	4.57	5.34	6.10	6.99	7.88
22	2.62	3.49	4.49	5.24	5.99	6.86	7.74
23	2.57	3.43	4.41	5.15	5.89	6.74	7.60
24	2.53	3.38	4.34	5.07	5.79	6.63	7.48
25	2.49	3.32	4.27	4.99	5.70	6.53	7.36
26	2.45	3.23	4.21	4.91	5.61	6.43	7.25
27	2.42	3.13	4.15	4.84	5.53	6.33	7.14
28	2.38	3.05	4.09	4.77	5.45	6.25	7.04
29	2.35	2.97	4.02	4.68	5.38	6.16	6.95
30	2.32	2.89	3.92	4.56	5.31	6.08	6.79
31	2.29	2.82	3.82	4.44	5.19	6.00	6.62
32	2.26	2.75	3.73	4.33	5.07	5.87	6.45
33	2.24	2.68	3.64	4.23	4.95	5.73	6.30
34	2.19	2.62	3.55	4.13	4.83	5.60	6.16
35	2.14	2.57	3.47	4.04	4.73	5.47	6.02
36	2.09	2.51	3.40	3.95	4.62	5.35	5.89
37	2.05	2.46	3.33	3.87	4.52	5.23	5.76
38	2.00	2.41	3.26	3.79	4.43	5.13	5.64
39	1.96	2.36	3.19	3.71	4.34	5.02	5.53
40	1.92	2.32	3.13	3.64	4.26	4.92	5.42
41	1.89	2.27	3.07	3.57	4.18	4.83	5.32
42	1.85	2.23	3.01	3.51	4.10	4.74	5.22
43	1.82	2.19	2.96	3.44	4.02	4.65	5.13
44	1.78	2.15	2.91	3.38	3.95	4.56	5.03
45	1.75	2.11	2.86	3.32	3.88	4.48	4.95

Great Plains Drainage Plan Chart 2

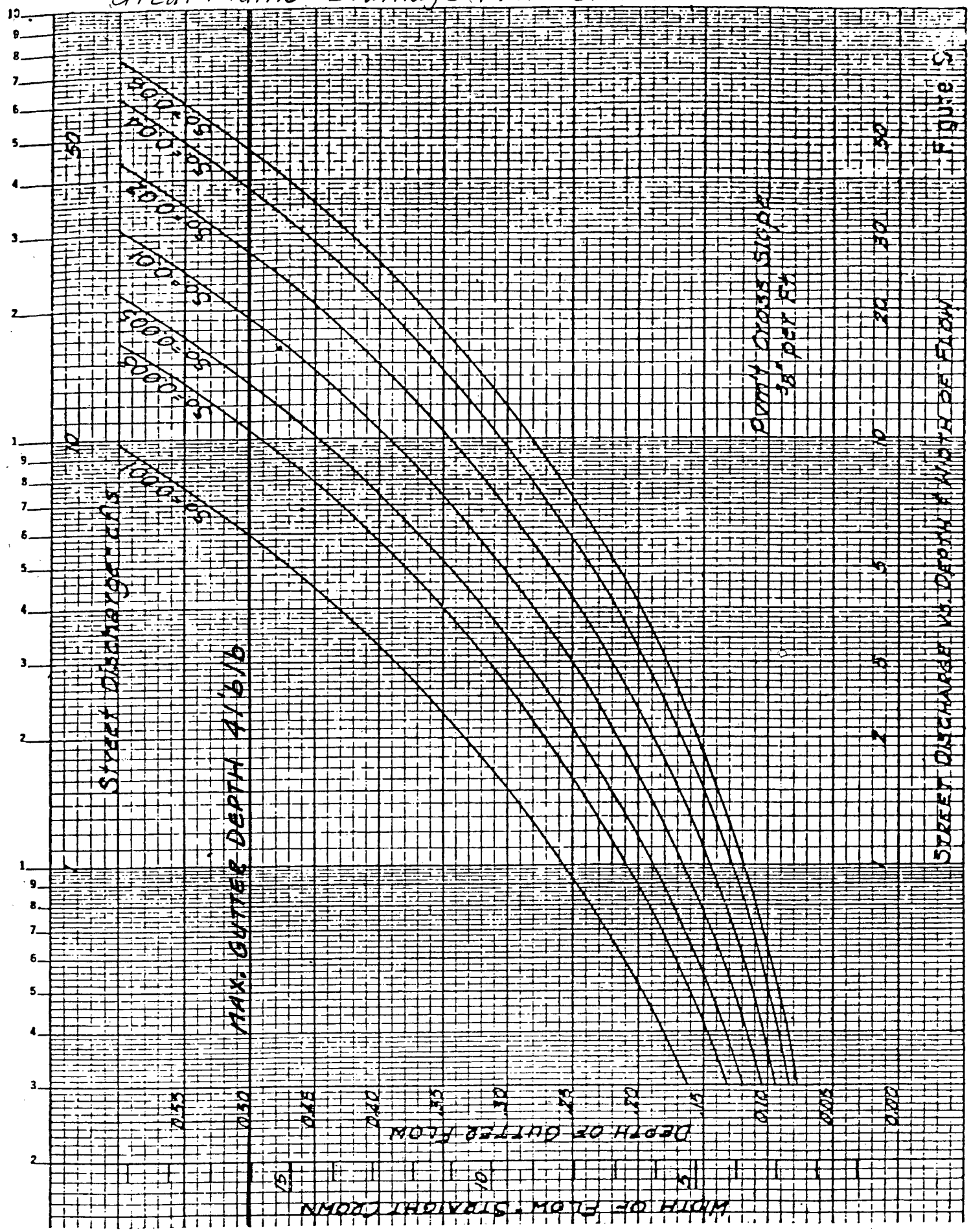


46 5810

KEUFFEL & ESSER CO. SEMI-LOGARITHMIC 3 CYCLES x 140 DIVISIONS

Great Plains Drainage Plan Chart 3

15/16



TIME OF CONCENTRATION

$$t_c = 1.5\sqrt{\frac{NL}{4\sqrt{S}}}$$

t_c = Time of Concentration
n = Retardance Coefficient
L = Length of Overland Flow in Feet (1200' Max.)
S = Slope in Feet per Foot of Length

RETARDANCE COEFFICIENT

Type of Surface	Value of n
Smooth impervious surface	0.02
Smooth bare packed soil	0.10
Poor grass, cultivated row crops or moderately rough bare surface	0.20
Pasture or average grass	0.40
Deciduous timberland	0.50
Conifer timberland, deciduous timberland with deep forest litter or dense grass	0.80

Triggs, Laverne E., The Rational Formula and A Method of Solution, Tulsa District, Corps of Engineers, 1961, p. 6.

POE & ASSOCIATES
OF KANSAS, INC.
CONSULTING ENGINEERS
1720 East Morris Wichita, Kansas 67211 (316) 262-1497

October 12, 1981

City of Wichita
Engineering Department
455 North Main
Wichita, Kansas 67202

Attention: Mr. Chris Breitenstein
Drainage Engineer

Re: Great Plains Business Park Addition

Dear Mr. Breitenstein:

Please find enclosed three copies of the drainage plan and one copy of the drainage computations for the above project. Please note that computations for area L, including the detention basin, and the 100 foot foodway, is being handled by Mr. M. S. Mitchell.

Yours truly,

POE & ASSOCIATES OF KANSAS, INC.

Jack Whitson

Jack Whitson, C.E.T.

JW:csr

Encls.

cc: Larry Dean w/o Enclosures
Mr. M. S. Mitchell w/Drainage Plan

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

November 1, 1981

Poe and Associates of Kansas, Inc.
1720 E. Morris
Wichita, Ks. 67211

Re: S/D 80-42 - Final plat of Great Plains Business Park Addition

Gentlemen:

At the regular meeting of the Subdivision Committee of the Metropolitan Area Planning Commission on October 29, 1981, 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 proposed industrial plat shall be subject to approval of associated zone case Z-2382 "AA" to "E".

B. The applicant shall submit a revised drainage plan to City Engineering which shows the changes recommended by Engineering and approved by the applicant.

C. The applicant shall guarantee all drainage improvements required by the approved drainage plan. These include the construction of the detention pond in Reserve A, the box culvert underneath 34th Street, and storm sewers where necessary to drain the streets. Regrading the floodway will also be required.

D. The applicant shall obtain the necessary drainage easements across the City Park property to the south. These shall be submitted to the Planning Department for recording with the plat.

The applicant shall submit covenants which provide for the perpetual ownership and maintenance of the floodway and Reserve A. The covenants shall specify when the landowners' association will be formed and shall include a clause which gives the City authority to maintain the reserves and floodway and assess the costs to the lot owners if these areas are not adequately maintained. The plattor's text shall include a brief reference to the ownership and maintenance responsibilities of these two areas.

F. The applicant shall guarantee construction of a permanent decel lane from the south line of the plat to the south line of 35th Street North.

G. A temporary cul-de-sac with a 75-foot radius is needed to terminate Great Plains at the north end of this plat. It shall be granted by separate instrument and submitted to the Planning Department for recording with the plat. The final plat tracing shall indicate the location of this cul-de-sac with a broken line and with the wording "being dedicated by separate instrument."

H. The applicant shall guarantee construction of 34th Street North Circle, Great Plains (including the cul-de-sac) and shall guarantee, if necessary, any changes in construction of 35th Street North so that it can be accepted as a public street.

I. The applicant shall guarantee extension of City water to serve all lots not already served.

J. The applicant shall guarantee extension of sanitary sewer to serve all lots not already served.

K. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning Department for recording.

L. The reference to access control in the plattor's text shall be revised to read as follows: All aubtters' rights of access to or from Oliver over and across the west line of Blocks 1 and 2 are hereby granted to the City of Wichita except, however, that Lots 1, 2 and 3, Block 2 shall each have access to Oliver at one location to the determined by the City Engineer.

M. If the existing gas main serving Great Plains Industries needs to be relocated, it will be at the applicant's expense.

N. Since several lots may not be able to utilize gravity sewer without installation of an ejector system, the plattor's text or the covenants shall address this issue so that future lot owners will be aware of this possible added expense.

O. Since the labeling of numerous easements is to be changed, the applicant's engineer shall furnish 6 prints of the revised plat to the Planning Department for distribution to the utility companies.

P. Recording of the 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 November 5, 1981, at 1:30 p.m. If you have any questions concerning this matter please call.

Sincerely,

L.O.

Louise Olivarez
Senior Planner

LO:bh

cc: Great Plains Ventures, Inc. Attention: Larry Dean, 1711 Longfellow Lane, 67207
Mike Lindebak, City Engineering

City Park Tributary

GREAT PLAINS BUSINESS PARK ADDITION

Drainage Area of G.P.B.P. draining east to City Park is 16 acres. DA = 16 A

Length of sub-basin L = 1300 feet
.25 miles

Fall thru sub-basin (185 - 169.5) H = 15.5 feet

Time of concentration T_c, in hours, $= \left(\frac{11.9 L^3_{miles}}{H}\right)^{.385}$

$$T_c = \left[\frac{11.9 (.25)^3}{15.5}\right]^{.385} = 11 \text{ minutes}$$

Use 15 minutes as minimum

Rainfall Intensity for 100 year - 15 minute storm from TP-40 I = 8.98 in./hr.

For condition prior to development use C = 0.3

Peak Discharge for 100 yr - 15 minute storm from Rational Formula is $q_{p100} = CIA = 0.3(8.98)16 = 43$ cfs

Limit industrail land use peak discharge to 43 cfs

For industrial land use C = 0.9

Peak Discharge for 100 year - 15 minute storm from Rational Formula is $q_{p100} = CIA = 0.9(8.98)16 = 129$ cfs

City Park Tributary

GREAT PLAINS INDUSTRIAL PARK ADDITION

Using SCS method to determine volume of runoff from Industrial Land Use

All drainage basin for tributary in City Park is in Hydrologic Group B (Soils map #27) —

From Table 2-2 TR-55 for Hydrolgic Group B

CN for Industrial District (72% impervious) = 88 —

Rainfall for 100 year - 6 hour storm P = 5.9 inches —

Direct Runoff from 5.9 inch rainfall w/ CN = 88

is $Q = \frac{(P - 0.2S)^2}{P + 0.8S}$ where $S = \frac{1000}{CN} - 10$

$S = \frac{1000}{88} = 1.36$; $Q = \frac{[5.9 - (.2 \times 1.36)]^2}{5.9 + (.8 \times 1.36)} = \frac{4.53}{1.09}$ inches

Volume of Runoff is $R = \frac{DA\,Q}{12} = \frac{16(4.53)}{12} = 6.04$ —

Use 6 acre/ft. —

Plotting Coefficients for Development of Commons Inflow Hydrograph:

100 year - 6 hour Storm Hydrograph - City Park Tributary

GREAT PLAINS BUSINESS PARK ADDITION

Ordinate Plotting Value =	1 Unit of Flow X	Unit of Flow Coefficient	Unit of Time Coefficient	X 1 Unit of Time =	Abcissa Plotting Value
	2.15	0	0	1.67	0
0		2	1.4		2
4		4	2.5		4
9		5	2.95		5
11		7	3.75		6
15		10	4.5		8
22		55	10.6		18
118		58	11.2		19
125		59	11.7		20
127		60	13.4		22
129		59	15.15		25
127		58	15.85		26
125		55	16.75		28
118		20	24.5		41
43		18	25.2		42
39		16	26.2		44
34		14	27.75		46
30		12	29.90		50
26		10	32.95		55
22		8	37.5		63
17		7	41.0		68
15		6	47.5		79
13		0	100		167
0					

City Park Tributary

Volume of Runoff, R = 6 acre-feet ; Peak Discharge q_{P100} = 129 cfs

$\frac{R}{1196.5} = \frac{6}{1196.5} = .005$, Value of square unit

$\frac{q_{P100}}{60} = \frac{129}{60} = 2.15$, Value of 1 unit of flow

$.005 \times \frac{12}{} \times 60 = 1.67$ minutes, value of 1 unit of time

City Park Tributary

Detention Pond Design

Planimeter survey of Pond areas.

Area at bottom of pond.

74.89	78.00
71.69	74.89
3.20	3.11

Ave = 3.16 Sq. in. × 0.23 acres/Sq. in = 0.73 acres

Area at top of pond.

83.23	88.63
77.79	83.23
5.44	5.40

Ave = 5.42 Sq. in. × 0.23 acres/Sq. in. = 1.25 acres

1.25 acres @ Top w/ Ave Elev 170.6

.73 acres @ Bottom w/ Elev 165

.52 ÷ 5.6 = .09 acres/foot of depth

Stage - Storage Curve Computations

Elevation (City Datum)	Area (Acres)	Depth (feet)	Volume (Acre-feet)	Accumulate Volume (Acre-feet)	(Cubic feet)
165	.73	0	0	0	0
166	.82	1	.78	.78	33,977
167	.91	2	.86	1.64	71,438
168	1.0	3	.96	2.60	113,256
169	1.09	4	1.04	3.64	158,558
170	1.18	5	1.14	4.78	208,217
170.6	1.25	5.6			

City Brk Tributary

GREAT PLAINS BUSINESS PARK ADDITION

Stage - Discharge (Outflow) Curve Computations w/ Spillway of 30" ϕ CMP w/inlet control using BPR chart 1055 w/ D = 2.5

Elevation (City Datum)	HW (feet)	$\frac{HW}{D}$ (feet)	Q (cfs)	
164	0	0	0	–
165	1	0.4	nil	–
165.5	1.5	0.6	10	–
166	2	0.8	16	–
166.5	2.5	1	22	–
167	3.0	1.2	28	–
167.5	3.5	1.4	32	–
168	4	1.6	36	–
168.5	4.5	1.8	40	–
169	5.0	2.0	44	✓

City Park Tributary

GREAT PLAINS BUSINESS PARK ADDITION

STORAGE INDICATION CURVE

Time to peak of Inflow Hydrograph is 22 minutes

$\Delta T = 0.1\ Tp = 2.2$ minutes, use 2 minutes

ΔT in seconds $= 2 \times 60 = 120$ seconds

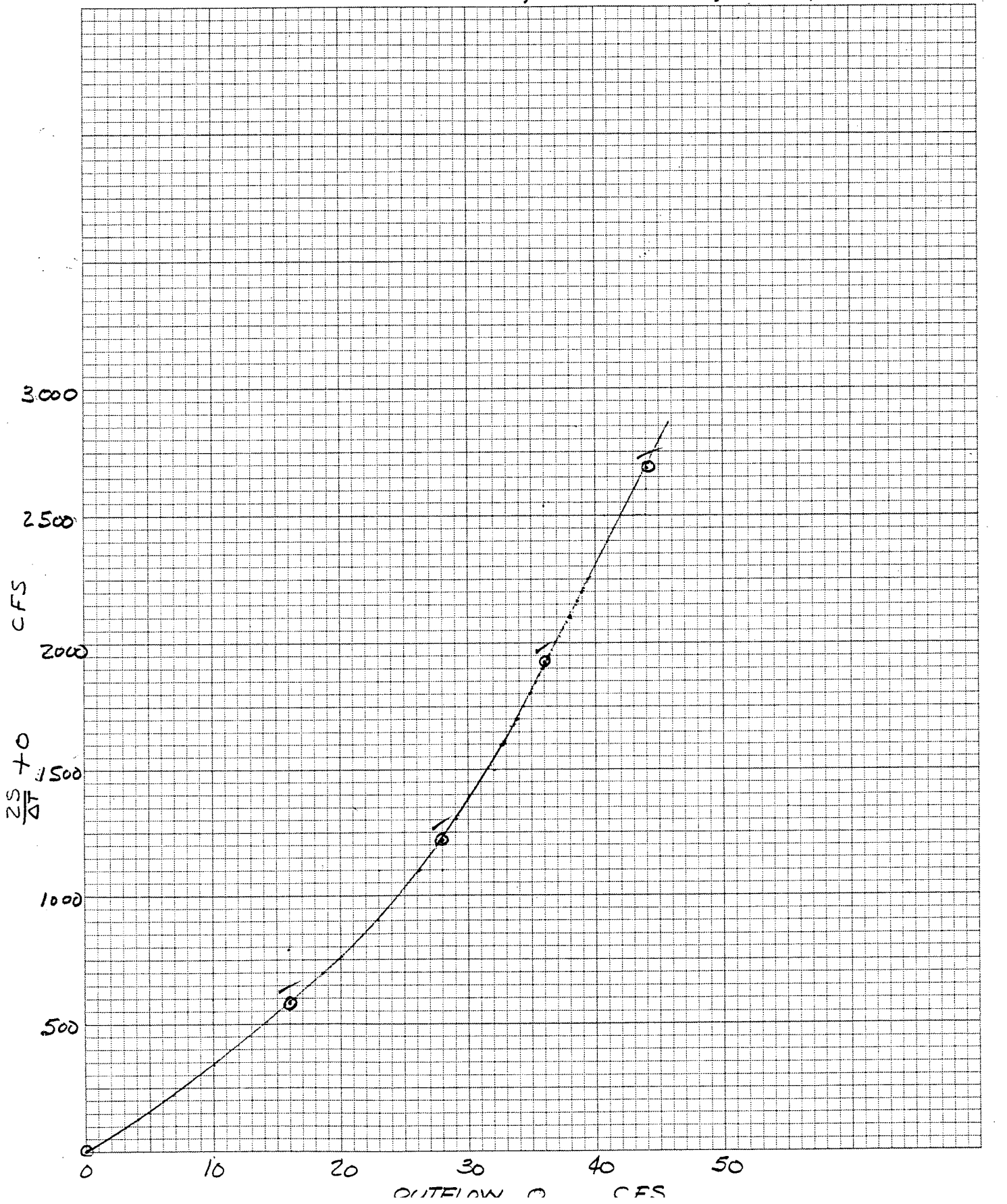
Using Stage-Storage Curve to take off Storage, S, and Stage-Discharge Curve to take off Outflow, O, a value of $\frac{2S}{\Delta T} + O$ will be plotted vs Outflow for use in flood routing computations

Elevation (city Datum)	Volume of Storage, S, (Cubic feet)	Outflow Discharge, O, (cfs)	$\frac{2S}{\Delta T} + O$ (cfs)
164	0	0	0
165	0	nil	0
166	33,977	16	582
167	71,438	28	1219
168	113,256	36	1924
169	158,558	44	2687

GREAT PLAINS BUSINESS PARK ADDITION

City Park Tributary - Storage Indication Curve

DATE _____ PAGE ____ of ____



City Park Tributary

GREAT PLAINS BUSINESS PARK ADDITION

Flood routing runoff from 16 acre Industrial Land Use thru Detention Reservoir to limit maximum discharge from 100 year - 6 hour storm to 43 cfs.

ΔT in seconds = 120

Column 1 Time, T (minutes)	Column 2 Initial Inflow, I_j (cfs)	Column 3 Incremental Inflow, I_j (cfs)	Column 4 $\frac{2S}{\Delta T} - O$ (cfs)	Column 5 $\frac{2S}{\Delta T} + O$ (cfs)	Column 6 Outflow, O (cfs)	Column 7 Storage, S Acre-feet
0	0	2	0	—		0
2	2	9	2	2 —	0 —	nil
4	9	15	13	13 —	0 —	"
6	15	22	35	37 —	1 —	"
8	22	42	68	72 —	2 —	0.09
10	42	60	124	132 —	4 —	0.18
12	60	78	212	226 —	7 —	0.30
14	78	98	330	350 —	10 —	0.47
16	98	118	478	506 —	14 —	0.68
18	118	127	656	694 —	19 —	0.93
20	127	129	855	901 —	23 —	1.21
22	129	128	1059	1111 —	26 —	1.49
24	128	125	1258	1316 —	29 —	1.77
26	125	118	1447	1511 —	32 —	2.04
28	118	106	1622	1690 —	34 —	2.28
30	106	95	1776	1846 —	35 —	2.49
32	95	84	1903	1977 —	37 —	2.67
34	84	72	2006	2082 —	38 —	2.82
36	72	61	2086	2162 —	38 —	2.87
38	61	49	2141	2219 —	39 —	3.00
40	49	39	2171	2251 —	40 —	3.05

City Park Tributary

GREAT PLAINS BUSINESS PARK ADDITION

Flood routing continued

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
42	39	34	2179	2259	40	3.06
44	34	30	2172	2252	40	3.05
46	30	28	2158	2236	39	3.03
48	28	26	2138	2216	39	3.00
50	26	24	2114	2192	39	2.97
52	24	22	2086	2164	39	2.93
54	22	21	2056	2132	38	2.88
56	21	20	2023	2099	38	2.84
58	20	19	1990	2064	37	2.79
60	19	18	1955	2029	37	2.74
62	18	17	1918	1992	37	2.69
64	17	16	1881	1953	36	2.64
66	16	15	1842	1914	36	2.59
68	15	15	1801	1873	36	2.53
70	15	14	1761	1831	35	2.47
72	14	14	1720	1790	35	2.42
74	14	14	1680	1748	34	2.36
76	14	13	1640	1708	34	2.31
78	13	13	1601	1667	33	2.25
80	13	13	1561	1627	33	2.20

Column 1 - Time @ end of sucessive periods of ΔT
Column 2 - Inflow taken from Inflow Hydrograph at time T
Column 3 - " " " " " " " " for next period.
Column 4 - Value in Column 5 minus twice value in Column 6
Column 5 - Sum of values in Columns 2, 3 and 4 for preceeding time.
Column 6 - Value of outflow discharge taken from Storage Indication Curve
Column 7 - Storage volume = $\frac{\text{Sum of Values in Col 4 \& Col 5}) \times (\Delta T \text{ minutes} \times 60)}{}$

POE & ASSOCIATES
OF KANSAS, INC.

1720 East Morris Wichita, Kansas 67211 (316) 262-1497

November 11, 1981

Mr. Mike Lindebak
City Engineer Department
City of Wichita
455 N. Main Street
Wichita, Kansas 67202

Re: Great Plains Business Park Addition

Dear Mike:

To assist you in preparing the petitions for this property, we have enclosed a copy of the Title Report.

Please contact us if we can provide any further assistance.

Yours truly,

POE & ASSOCIATES OF KANSAS, INC.

Kenny E. Hill

Kenny E. Hill, P.E.
Project Manager

KEH:csr

Encl.

T-1415
Commitment No._____

St. Paul Title Insurance Corporation

ST. PAUL TITLE INSURANCE CORPORATION, a Missouri corporation, herein called the Company, for a valuable consideration, hereby commits to issue its policy or policies of title insurance, as identified in Schedule A, in favor of the proposed Insured named in Schedule A, as owner or mortgagee of the estate or interest covered hereby in the land described or referred to in Schedule A, upon payment of the premiums and charges therefor; all subject to provisions of Schedules A and B and to the Conditions and Stipulations hereof.

This Commitment shall be effective only when the identity of the proposed Insured and the amount of the policy or policies commited for have been inserted in Schedule A hereof by the Company, either at the time of the issuance of this Commitment or by subsequent endorsement.

This Commitment is preliminary to the issuance of such policy or policies of title insurance and all liability and obligations hereunder shall cease and terminate SIX MONTHS after the effective date hereof or when the policy or policies committed for shall issue, whichever first occurs, provided that the failure to issue such policy or policies is not the fault of the Company.

IN WITNESS WHEREOF, ST. PAUL TITLE INSURANCE CORPORATION has caused this commitment to be signed and sealed by its duly authorized officers, the commitment to become valid when countersigned by an authorized signatory as of Effective Date shown in Schedule A.

ST. PAUL TITLE INSURANCE CORPORATION

BY: _____
CHAIRMAN OF THE BOARD

ATTEST: _____
SECRETARY

COUNTERSIGNED:

By _____
AUTHORIZED SIGNATURE

Fidelity Title COMPANY, INC.
262-8261
221 N. MARKET WICHITA, KS.

ALTA COMMITMENT – 1966

SCHEDULE A

Commitment No. T-1415

Replaces Y-91,330 of 10/6/80 7A.M.

1. Effective date: October 29, 1981 @ 7:00 A.M.

		Amount
2. Policy or Policies to be issued:	Limited to	$ 250.00
_____ ALTA Owner's Policy Form A-1970 (Amended 10-17-70)		
(a) X _____ ALTA Owner's Policy Form B-1970 (Amended 10-17-70)		
Proposed Insured: City of Wichita		
_____ ALTA Loan Policy (Amended 10-17-70)		
(b) _____		
Proposed Insured: None Proposed.		

3. The estate or interest in the land described or referred to in this Commitment and covered herein is a fee simple

4. Title to the ~~fee simple~~ estate or interest in said land is at the effective date hereof vested in:
Bel Aire Improvement District of Sedgwick County, Kansas, as to East 1404.34 feet of Lot 2; Great Plains Industries, Inc., as to Lot 2 except the East 1404.34 feet; Jesse L. Graham and Luis A. Casado, as to insured premises except Lot 2.

5. The land referred to in this Commitment is situated in the County of Sedgwick, State of Kansas, and is described as follows:

Lot 2, Block 1, NORTH OLIVER INDUSTRIAL PARK ADDITION to Sedgwick County, Kansas, and that part of the NW/4 of Section 36, Township 26 South, Range 1 East of the 6th P.M., lying South of the North line of said Lot 2, extended. More particularly described as: Beginning at the Southwest Corner, Northwest Quarter (SW/cNW/4) Section 36; thence North 1330.28 feet to a point on the North line of said Lot 2 extended; thence South 89 degrees 56 minutes 38 seconds E 2639.34 feet to a point on the East line of said NW/4; thence South 0 degrees 02 minutes 55 seconds East 1330.85 feet to SE/cNW/4; thence North 89 degrees, 55 minutes, 53 seconds West 2640.48 feet to the point of beginning.

TO BE PLATTED AS:

GREAT PLAINS BUSINESS PARK ADDITION,
Wichita, Sedgwick County, Kansas.

ST PAUL TITLE

The following are the requirments to be complied with:

(1) Procure and file and record a properly approved and satisfactorily executed Plat of GREAT PLAINS BUSINESS PARK ADDITION, Wichita, Sedgwick County, Kansas, executed by Great Plains Industries, Inc., City of Bel Aire, Kansas and Jesse L. Graham and Louis A. Casado and spouses, if any, as fee owners.

(2) Proposed plat must be executed by or consented to by the Buyer, Great Plains Industries, Inc., under unrecorded Real Estate Purchase Contract dated March 12, 1980 by Jesse L. Graham and Luis A. Casado, as Sellers, and Paul D. Treadwell and Cecil G. Masters, as Buyers, as amended by Agreement For the Assignment of Real Estate Purchase Contract dated February 4, 1981, by Jesse L. Graham, Luis A. Casado, Paul D. Treadwell, Cecil G. Masters, to Great Plains Industries, Inc., as buyer.

(3) Proposed plat must be executed by or consented to by the Trustee under:

(a) Industrial Revenue Bond Series #A-1979, wherein certain duties, responsibilties and obligations accrue involving Bel Aire Improvement District of Sedgwick County, Kansas as "Issuer" of the certain Industrial Revenue Bonds; Great Plains Industries, Inc. as "Tenant", and as assigned to First National Bank of Wichita, as "Paying Agent" as disclosed by Notice recorded in Film 366 at page 367 and Assignment of Leases recorded in Film 366 at page 369.

(b) Financing Statement #13343, by and between Great Plains Industries, Inc., "Debtor" and Bel Aire Improvement Dist., "Secured Party and First National Bank in Wichita, "Fiscal Agent", filed May 22, 1979 @ 5:00 P.M., recorded in Film 366 at Page 380.

(4) Proposed plat must be executed by or consented to by the Lessee under unrecorded Lease dated April 1, 1979 and any amendments thereto by and between Bel Aire Improvement District of Sedgwick County, Kansas and its tenant, Great Plains Industries, Inc.

(5) Proposed plat must be executed by or consented to by the Buyers under Contract for Sale and Purchase of Real Estate recorded in Film 501 at Page 780, dated October 27, 1981 by Great Plains Industries, Inc., as "Sellers", and Fredric B. Kraft and Susan M. Kraft, as "Buyers".

(6) Furnish Company satisfactory evidence that the City of Bel Aire is properly incorporated, and that the property of Bel Aire Improvement District has been conveyed to the City of Bel Aire.

(7) 1980 Real Estate Taxes are shown paid, KEY NO. C-42788-1 and C-42787.

Continued on Page 4

(8) Company has been furnished with a copy of proposed plat which contains grants for reserve, floodway, utility easements, private drainage easements, access control and possible sewage pumping requirement.

(9) Item 7 of Schedule B Exceptions is a Blanket Easement granted in the Corporation Warranty Deed recorded in Film 366 at Page 358. Procure and record a satisfactory release by Bel Aire Improvement District of Sedgwick County, Kansas of that 41 foot undefined ~~easement~~ across a portion of Lot 2, Block 1, North Oliver Industrial Park, Sedgwick County, Kansas as granted in that Corporation Warranty Deed recorded in Film 366 at page 358.

SCHEDULE B
(REQUIREMENTS)

Commitment No. T-1415

1. The following are the requirements to be complied with:

A. Payment to, or for the account of, the sellers or mortgagors of the full consideration for the estate or interest to be insured.

B. Instruments in insurable form which must be executed, delivered and duly filed for record.

See Schedule B continued Page 3 & 4

(EXCEPTIONS)

Schedule B of the policy or policies to be issued will contain exceptions to the following matters unless the same are disposed of to the satisfaction of the Company:

1. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed Insured acquires for value of record the estate or interest or mortgage thereon covered by this Commitment.

2. (A) Rights of dower, curtesy, homestead or other marital rights of spouse, if any, of any individual insured. (B) Any lien, or right to lien, for services, labor, or material heretofore or hereafter furnished imposed by law and not shown by the public records. (C) Survey: Any encroachments, measurements, party walls, or other facts which a correct survey of the premises would show. (D) Easements, or claims of easements, not shown by the public records. (E) Rights or claims of parties in possession not shown by the public records.

3. All assessments and taxes for the year 19 81 and all subsequent years.

4. Any restrictions, covenants and conditions to be imposed subsequent to the recordation of the title.

5. Any easements, streets or right-of-ways to be dedicated to the public including but not limited to all abutter's rights or access to any streets, drainage rights of way, public utilities, approval of elevation or other restrictive matters that may be reserved, dedicated or granted in the recorded Plat.

continued on page 2

ST. PAUL TITLE

6. Matters granted on the plat of North Oliver Industrial Park including Floodway, building setback and access control. (To be omitted upon filing of proposed plat.)

7. 41 foot easement for ingress and egress over Lot 2 except the East 1404.34 feet as granted in instrument recorded in Film 366 at Page 358.

8. 30 foot Section Line Road on the West increased to 50 feet by Right of Way Agreement recorded in Misc. Book 467 at Page 134.

9. Easement for transmission lines granted to Kansas Gas and Electric Company in instrument recorded in Misc. Book 168 at page 289 over the West 42 feet of insured premises.

10. Easement for water system granted in instrument recorded in Film 407 at Page 242.

11. Easement for public utilities granted in instrument recorded in Film 411 at page 601.

12. Easement for overhead electric distribution granted to Kansas Gas and Electric Company in instrument recorded in Film 427 at page 1070 over the North 10 feet of Lot 2.

13. Easement to supply electric service as installed underground acquired by Kansas Gas and Electric Company as disclosed by Affidavit recorded in Film 427 at page 1291.

Conditions and Stipulations

1. The term mortgage, when used herein, shall include deed of trust, trust deed, or other security instrument.

2. If the proposed Insured has or acquires actual knowledge of any defect, lien, encumbrance, adverse claim or other matter affecting the estate or interest or mortgage thereon covered by this Commitment other than those shown in Schedule B hereof, and shall fail to disclose such knowledge to the Company in writing, the Company shall be relieved from liability for any loss or damage resulting from any act of reliance hereon to the extent the Company is prejudiced by failure to so disclose such knowledge. If the proposed Insured shall disclose such knowledge to the Company, or if the Company otherwise acquires actual knowledge of any such defect, lien, encumbrance, adverse claim or other matter, the Company at its option may amend Schedule B of this Commitment accordingly, but such amendment shall not relieve the Company from liability previously incurred pursuant to Paragraph 3 of these Conditions and Stipulations.

3. Liability of the Company under this Commitment shall be only to the named proposed Insured and such parties included under the definition of Insured in the form of policy or policies committed for and only for actual loss incurred in reliance hereon in undertaking in good faith (a) to comply with the requirements hereof, or (b) to eliminate exceptions shown in Schedule B, or (c) to acquire or create the estate or interest or mortgage thereon covered by this Commitment. In no event shall such liability exceed the amount stated in Schedule A for the policy or policies committed for and such liability is subject to the insuring provisions, the Conditions and Stipulations, and the Exclusions from Coverage of the form of policy or policies committed for in favor of the proposed Insured which are hereby incorporated by reference and are made a part of this Commitment except as expressly modified herein.

4. Any claim of loss or damage, whether or not based on negligence, and which arises out of the status of the title to the estate or interest or the lien of the insured mortgage covered hereby or any action asserting such claim, shall be restricted to the provisions and conditions and stipulations of this commitment.