DRAINAGE PLAN

AND

SUPPORTING CALCULATIONS

FOR

WEST WICHITA MEDICAL PARK

WICHITA, KANSAS

Tyler Acres 6TH Addition

OCTOBER 14, 1993

PREPARED BY:

CERTIFIED ENGINEERING DESIGN

1330 E. FIRST, #113

WICHITA, KANSAS 67214

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OCTOBER 14, 1993

PREPARED BY:

CERTIFIED ENGINEERING DESIGN

1330 E. FIRST, #113

WICHITA, KANSAS 67214

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 8-13-93

BY HOF CKD

JOB NO. ____ SHEET NO. 1 OF 18

EXISTING HYDROLOGY

THE PROJECT SITE CONSISTS OF APPROXIMATELY 13.6 ACRES LOCATED ON THE UNDEVELOPED PORTION OF LOT 1, TYLER ACRES 6TH ADDITION. APPROXIMATELY 3.0 ACRES OF LOT 1, TYLER ACRES 6TH ADDITION HAS BEEN DEVELOPED AND IS THE LOCATION FOR THE WEST WICHITA FAMILY PHYSICIANS BUILDING. THE DRAINAGE PATTERN FOR THE EXISTING BUILDING AND THE ADJACENT PARKING LOTS CONSISTS OF SURFACE DRAINAGE FROM EAST TO WEST TO SOCORRA ON THE WEST SIDE OF THIS PROPERTY. THE REMAINING 13.6 ACRES OF THIS SITE IS UNDEVELOPED. FOUR DRAINAGE BASINS CAN BE IDENTIFIED FOR THE TOTAL 16.1 ACRES OF LOT 1, TYLER ACRES 6TH ADDITION. (PLEASE REFER TO THE ATTACHED SITE SURVEY DEPICTING THESE DRAINAGE BASINS):

DRAINAGE BASIN #1

BY PLANIMETER AREA = 1.5 ACRES

THIS DRAINAGE BASIN INCLUDES THE DEVELOPED PORTION OF THIS LOT AND APPROXIMATELY 1.5 ACRES OF UNDEVELOPED GROUND. THE MAJORITY OF THE DRAINAGE IS BY SHEET FLOW TO SOCORA. A RECENTLY CONSTRUCTED PARKING LOT ON THE EAST SIDE OF THE EXISTING BUILDING DOES DRAIN TO DROP INLETS WHICH ARE CONNECTED TO STORM SEWER IN SOCORA.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 8-13-93

BY HOF CKD

JOB NO. ____ SHEET NO. 2 OF 18

DRAINAGE BASIN #2

BY PLANIMETER AREA = 5.0 ACRES

THIS DRAINAGE AREA CONSISTS OF THE NORTHWEST PORTION OF LOT 1, TYLER ACRES 6TH ADDITION AND IS UNDEVELOPED. DRAINAGE IS BY SHEET FLOW TO THE SOTHWEST AND THEN WEST TO SOCORA.

DRAINAGE BASIN #3

BY PLANIMETER AREA = 3.4 ACRES

THIS DRAINAGE AREA CONSISTS OF THE NORTHEAST PORTION OF LOT 1, TYLER ACRES 6TH ADDITION AND IS UNDEVELOPED. DRAINAGE FROM THIS SUBAREA COLLECTS IN A DEPRESSION IN THE CENTER OF LOT 1. UPON COLLECTION OF A SUBSTANTIAL AMOUNT OF RUNOFF IN THIS DEPRESSION, WATER BREAKS OVER THE RIDGE LINE BETWEEN AREA 2 AND 3 AND SHEET FLOWS WEST TO SOCORA.

DRAINAGE BASIN #4

BY PLANIMETER AREA = 3.2 ACRES

THIS DRAINAGE AREA CONSISTS OF THE SOUTHEAST PORTION OF LOT 1, TYLER ACRES 6TH ADDITION AND IS UNDEVELOPED. DRAINAGE IS BY SHEET FLOW TO THE SOUTHEAST CORNER OF LOT 1 AND INTO STREET RIGHT-OF-WAY FOR WOODCHUCK.

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 8-13-93
BY HOF CKD
JOB NO. SHEET NO. 3 OF 18

BASIN NO. 1

APPROXIMATELY 3.0 ACRES OF BASIN NO. 1 ARE DEVELOPED AND WILL REMAIN AS EXISTING. THE REMAINING 1.5 ACRES IS PRESENTLY UNDEVELOPED. PEAK RUNOFF DISCHARGES WILL BE COMPUTED USING THE RATIONAL METHOD AND THE FIVE YEAR RETURN PERIOD STORM

CALCULATE PEAK DISCHARGE USING RATIONAL FORMULA $Q = CiA$

① DETERMINE 'C' FACTOR

FROM SEDGWICK COUNTY SCS SURVEY
SOIL TYPE = Ta, TABLER SILTY CLAY LOAM (TYPE D) &
Ma, MILAN LOAM (TYPE B)
FROM ATTACH. D, DRAINAGE CRITERIA, CITY OF WICHITA,

LAND USE 1.5 AC. OF AG. USE, $C_5 = 0.20$ (TYPE B), $C_5 = 0.35$ (TYPE D)
3.0 AC. DEVELOPED
10% GRASSED $C_5 = .25$
90% PARKING LOTS, BLDG, ETC. $C_5 = 0.87$

$$\text{WEIGHTED 'C'} = \frac{\left(\frac{.2+.35}{2}\right)1.5 + (.1(.25) + .9(.87))3.0}{4.5} = 0.63$$

② DETERMINE "T_c" TIME OF CONCENTRATION

FROM WORKSHEET NO. 3, $T_c = 0.50$ HR = 30 minutes

③ FIND Intensity, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KANSAS.

$i_5 = 3.92$"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = CiA = 0.63(3.92\text{"/HR})(4.5\text{AC}) = 11.1$ CFS ←

4/18

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 8-13-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: (Present) Developed

Circle one: (T_c) T_t through subarea BASIN NO. 1

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID		
1. Surface description (table 3-1)		CULTIVATED		
2. Manning's roughness coeff., n (table 3-1)		0.15		
3. Flow length, L (total L ≤ 300 ft)	ft	300'		
4. Two-yr 24-hr rainfall, P_2	in	3.4		
5. Land slope, s	ft/ft	.011		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	0.48	+	= 0.48

Shallow concentrated flow		Segment ID		
7. Surface description (paved or unpaved)		UNPAVED		
8. Flow length, L	ft	130'		
9. Watercourse slope, s	ft/ft	.011		
10. Average velocity, V (figure 3-1)	ft/s	1.8		
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	0.02	+	= .02

Channel flow		Segment ID		
12. Cross sectional flow area, a	ft^2			
13. Wetted perimeter, p_w	ft			
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft			
15. Channel slope, s	ft/ft			
16. Manning's roughness coeff., n				
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s			
18. Flow length, L	ft			
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+	= —

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) ..... hr 0.50

30 minutes

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, THREE ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 8-13-93

BY ADF CKD

JOB NO. _____ SHEET NO. 5 OF 18

BASIN No. 2

THE 5.0 ACRES OF BASIN No. 2 ARE UNDEVELOPED.

CALCULATE PEAK DISCHARGE USING RATIONAL FORMULA $Q = CiA$

① DETERMINE 'C' FACTOR

SOIL TYPE = Ta, TABLER SILTY CLAY LOAM, SOIL GROUP = D &
Mg, MILAN LOAM, SOIL GROUP B
FROM ATTACHMENT D, DRAINAGE CRITERIA, CITY OF WICHITA

LAND USE: 5.0 ACRES OF AGRICULTURE CULTIVATION

$\therefore C_5 = 0.20$ (TYPE B); $C_5 = 0.35$ (TYPE D); AVG. $C_5 = 0.28$

② DETERMINE 'Tc' TIME OF CONCENTRATION

FROM WORKSHEET No. 3, $T_o = 0.70$ HR = 42 minutes

③ FIND Intensity, i_5

FROM INTENSITY TABLES

$i_5 = 3.01$ "/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = 0.28 (3.01"/HR)(5.0 ACRES) = \underline{4.2 CFS}$ ←

6/18

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date _____

Location LOT 1, TYLER ACRES 6TH ADDITION Checked _____ Date _____

Circle one: (Present) Developed

Circle one: (T_c) T_t through subarea BASIN #2

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID		
1. Surface description (table 3-1)		CULTIVATED		
2. Manning's roughness coeff., n (table 3-1)		0.15		
3. Flow length, L (total L ≤ 300 ft)	ft	300'		
4. Two-yr 24-hr rainfall, P_2	in	3.4		
5. Land slope, s (2.20/300)	ft/ft	.0073		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	0.57	+	= 0.57

Shallow concentrated flow		Segment ID		
7. Surface description (paved or unpaved)		UNPAVED		
8. Flow length, L	ft	540'		
9. Watercourse slope, s	ft/ft	.005		
10. Average velocity, V (figure 3-1)	ft/s	1.2		
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	0.13	+	= 0.13

Channel flow		Segment ID		
12. Cross sectional flow area, a	ft^2			
13. Wetted perimeter, p_w	ft			
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft			
15. Channel slope, s	ft/ft			
16. Manning's roughness coeff., n				
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s			
18. Flow length, L	ft			
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+	=

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) ..... hr 0.70

42 minutes

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 8-13-93
BY HOF CKD
JOB NO. ____ SHEET NO. 7 OF 18

BASIN NO. 3

THE 3.4 ACRES OF BASIN NO. 3 ARE UNDEVELOPED.

CALCULATE PEAK DISCHARGE USING RATIONAL FORMULA $Q = CiA$

① DETERMINE 'C' FACTOR

SOIL TYPE = Ma, MILAM LOAM, TYPE B SOIL
FROM APPEND. D DRAINAGE CRITERIA, CITY OF WICHITA
LAND USE 3.4 ACRES OF AGRICULTURAL CULTIVATION
$\therefore C = 0.20$

② DETERMINE TIME OF CONCENTRATION 'T_c'

FROM WORKSHEET No. 3 $T_c = 0.77$ HR = 46 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE

$i_5 = 2.81$ "/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = CiA = 0.20(2.81\text{"/HR})(3.4 \text{ ACRES}) = \underline{1.9 \text{ CFS}}$ ←

8/18

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 8-13-93

Location LOT 1, TYLEE ACRES 6TH ADDITION Checked ____ Date ____

Circle one: (Present) Developed

Circle one: (T_c) T_t through subarea BASIN #3

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)	Segment ID				
1. Surface description (table 3-1)		CULTIVATED			
2. Manning's roughness coeff., n (table 3-1) ..		0.15			
3. Flow length, L (total L ≤ 300 ft)	ft	300'			
4. Two-yr 24-hr rainfall, P_2	in	3.4			
5. Land slope, s 3511-3336/300	ft/ft	0.0058			
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	0.63	+		= 0.63
Shallow concentrated flow	Segment ID				
7. Surface description (paved or unpaved)		UNPAVED			
8. Flow length, L 110'+100'+400'	ft	610'			
9. Watercourse slope, s	ft/ft	.005			
10. Average velocity, V (figure 3-1)	ft/s	1.2			
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	0.14	+		= .14
Channel flow	Segment ID				
12. Cross sectional flow area, a	ft^2				
13. Wetted perimeter, p_w	ft				
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft				
15. Channel slope, s	ft/ft				
16. Manning's roughness coeff., n					
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s				
18. Flow length, L	ft				
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+		= —
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr				0.77

46 minutes

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSA ARCHITECTS

DATE 8-13-93
BY HOF CKD
JOB NO. ____ SHEET NO. 9 OF 18

BASIN NO. 4

THE 3.2 ACRES OF BASIN NO. 4 ARE UNDEVELOPED.

CALCULATE PEAK DISCHARGE USING RATIONAL FORMULA $Q = CiA$

(1) DETERMINE 'C' FACTOR

SOIL TYPE - MO, MICA LOAM, SOIL TYPE B

FROM ATTACH. D, DRAINAGE CRITERIA, CITY OF WICHITA

EXISTING LAND USE IS 3.2 ACRES OF AGRICULTURE CULTIVATION

$\therefore C = 0.20$

(2) DETERMINE TIME OF CONCENTRATION 'Tc'

FROM WORKSHEET NO. 3 $T_c = 0.73$ HR = 44 minutes

(3) FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE

$i_5 = 2.91$"/HR

(4) CALCULATE PEAK DISCHARGE

$Q_5 = CiA = 0.20(2.91"/HR)(3.2 \text{ ACRES}) = 1.9$ CFS ←

10/18

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 8-13-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: (Present) Developed

Circle one: (T_c) T_t through subarea BASIN #4

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID		
1. Surface description (table 3-1)		CULTIVATED		
2. Manning's roughness coeff., n (table 3-1) ..		0.15		
3. Flow length, L (total L ≤ 300 ft)	ft	300'		
4. Two-yr 24-hr rainfall, P_2	in	3.4'		
5. Land slope, s (5543 - 5537/300')	ft/ft	.004		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	0.73	+	= 0.73

Shallow concentrated flow		Segment ID		
7. Surface description (paved or unpaved)				
8. Flow length, L	ft			
9. Watercourse slope, s	ft/ft			
10. Average velocity, V (figure 3-1)	ft/s			
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+	= —

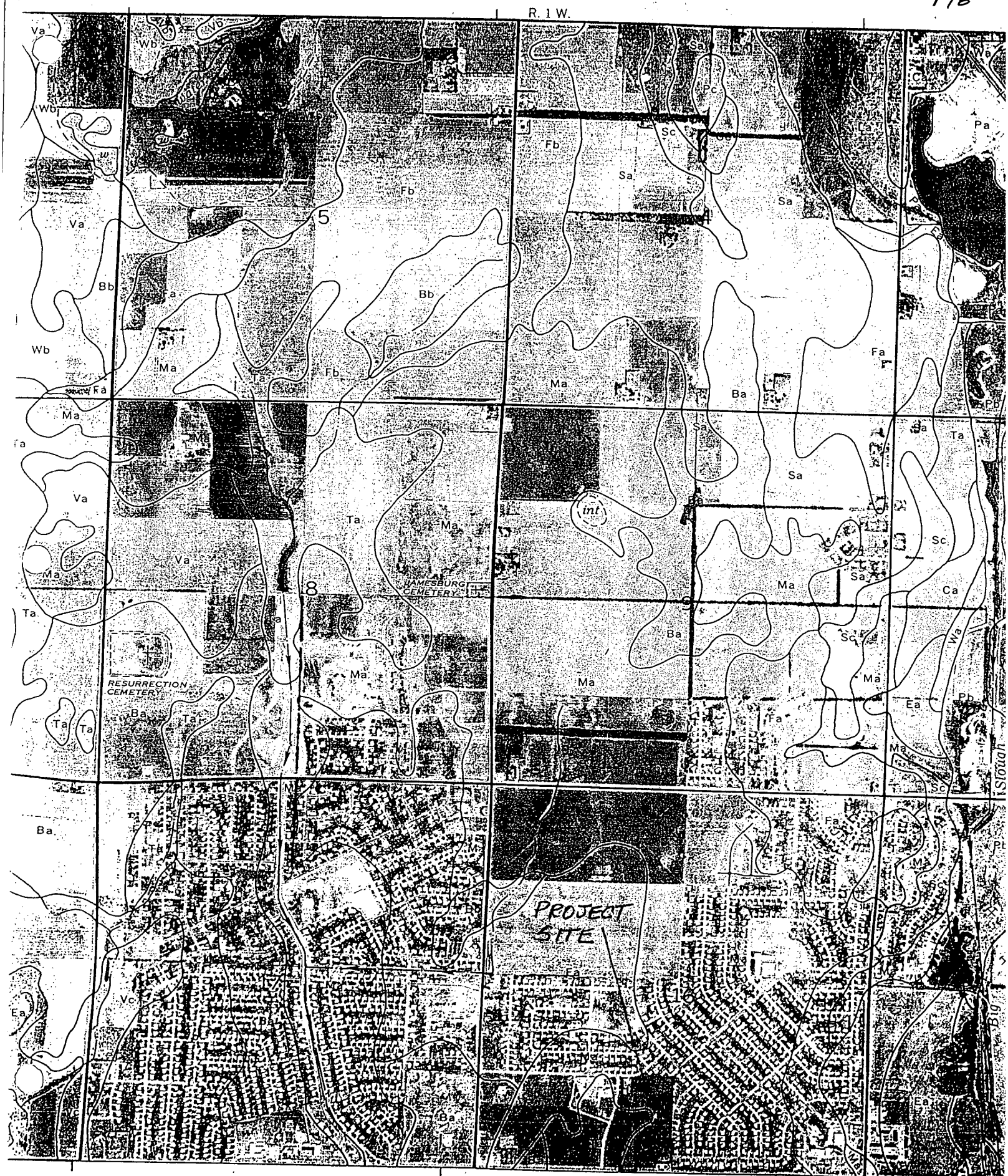
Channel flow		Segment ID		
12. Cross sectional flow area, a	ft^2			
13. Wetted perimeter, p_w	ft			
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft			
15. Channel slope, s	ft/ft			
16. Manning's roughness coeff., n				
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s			
18. Flow length, L	ft			
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+	= —

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) ..... hr 0.73

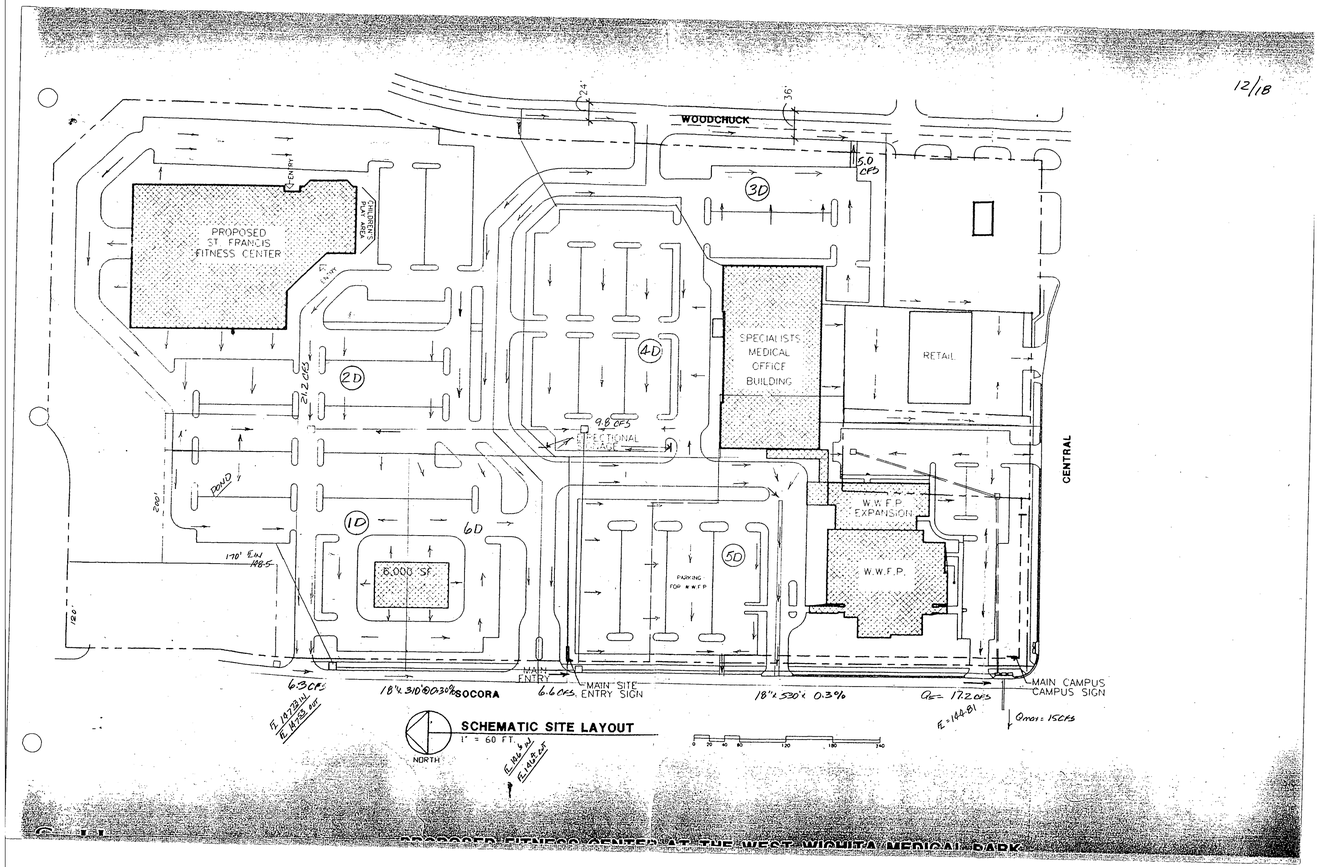
44 minutes

SEDGWICK COUNTY, KANSAS — SHEET NUMBER 33

11/18



12/18



PROPOSED FITNESS CENTER AT THE WEST WICHITA MEDICAL PARK

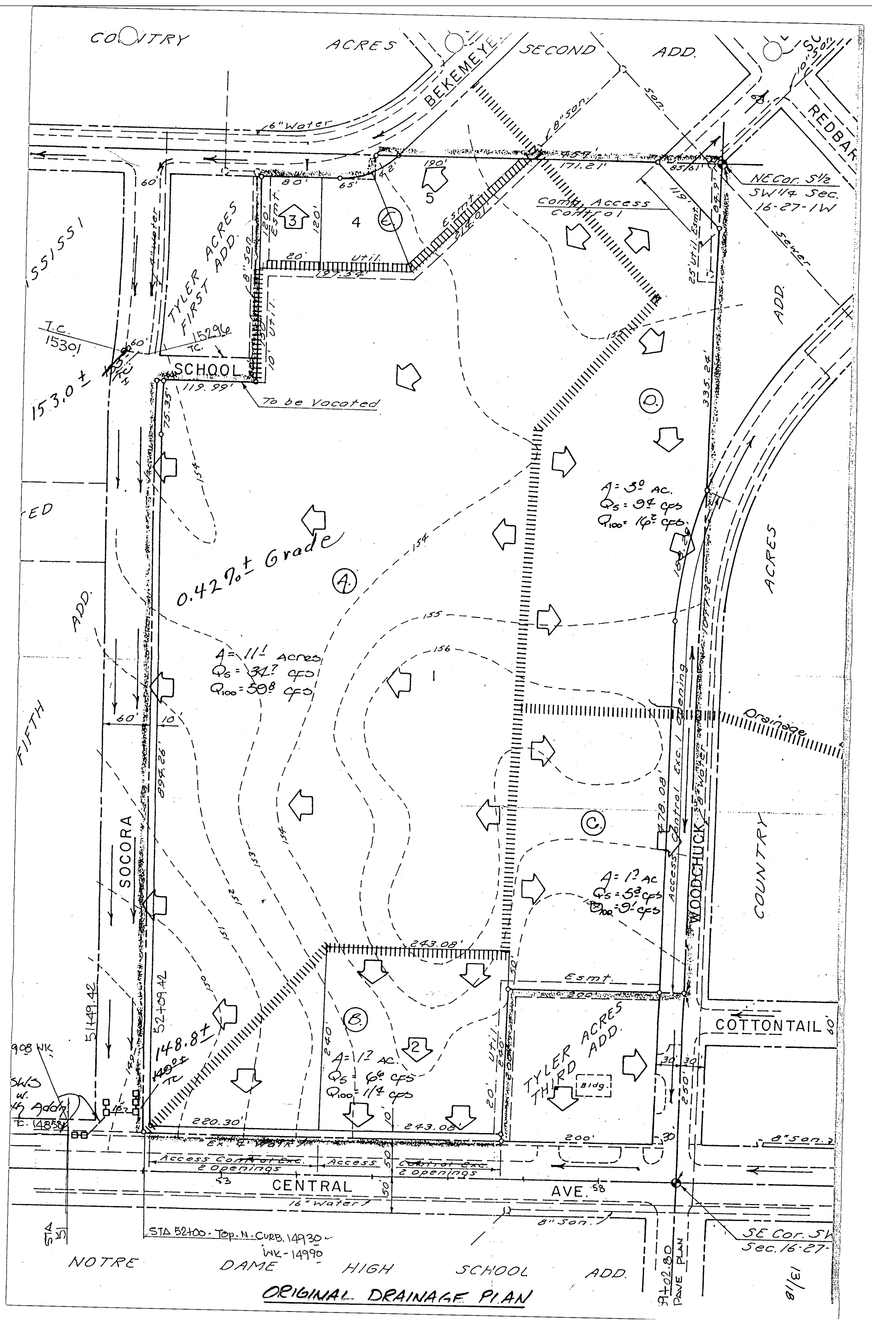

COUNTRY ACRES
BEKEMEYER SECOND ADD.
REDBAK
6" Water
8" San.
NE Cor. S½ SW¼ Sec. 16-27-1W
Common Access Control
TYLER ACRES FIRST ADD
SCHOOL
To be Vacated
T.C. 153.96
153.0 ± T.C. 15301
0.42% ± Grade
A = 3.9 ac. Qs = 9.4 cfs Q100 = 16.2 cfs
A = 11.1 Acres Qs = 32.7 cfs Q100 = 50.8 cfs
A = 1.2 ac. Qs = 6.8 cfs Q100 = 11.4 cfs
A = 1.2 Ac Qs = 5.8 cfs Q100 = 9.7 cfs
Drainage
ADD.
ACRES
COUNTRY
FIFTH
SOCORA
WOODCHUCK
COTTONTAIL
TYLER ACRES THIRD ADD.
Esmt.
Access Control Exc. 2 openings
CENTRAL AVE.
148.8 ± T.C. 148.2 ±
220.30'
243.08'
200'
250'
STA 82+00 - Top. N. Curb. 14930 - Inv. - 14990
NOTRE DAME HIGH SCHOOL ADD.
SE Cor. S½ Sec. 16-27-
ORIGINAL DRAINAGE PLAN
8/13/81

EXHIBIT NO. 1

14/18

SOIL LEGEND

SYMBOL	HYDROLOGIC GROUP	NAME
Aa	B	Albion-Shellabarger sandy loams, 1 to 4 percent slopes
Ab	B	Albion and Shellabarger sandy loans, 7 to 15 percent slopes
Ba	C	Blanket silt loam, 0 to 1 percent slopes
Bb	C	Blanket silt loan, 1 to 3 percent slopes
Ca	B	Canadian fine sandy loan
Cb	B	Canadian-Waldeck fine sandy loams
Cc	D	Carwile fine sandy loam
Cd	B	Clark-Ost clay loams, 1 to 4 percent slopes
Ce	C	Clime silty clay, 3 to 6 percent slopes
Ea	B	Elandco silt loam
Eb	B	Elandco silt loam, occasionally flooded
Ec	B	Elandco silt loam, frequently flooded
Fa	B	Farnum loam, 0 to 1 percent slopes
Fb	B	Farnum loam, 1 to 3 percent slopes
Fc	B	Farnum loam, sandy substratum, 0 to 1 percent slopes
Ga	D	Goessel silty clay, 0 to 1 percent slopes
Gb	D	Goessel silty clay, 1 to 2 percent slopes
Ia	D	Irwin silty clay loam, 1 to 3 percent slopes
Ib	D	Irwin silty clay loam, 3 to 6 percent slopes
Ic	D	Irwin silty clay loam, 2 to 6 percent slopes, eroded
La	C	Lesho loam
Lb	A	Lincoln soils
Ma	B	Milan loam, 1 to 3 percent slopes
Mb	B	Milan form, 3 to 6 percent slopes
Mc	B	Milan clay loam, 2 to 6 percent slopes, eroded
Na	B	Naron fine sandy loam
Oc	D	Owens clay loam, 1 to 3 percent slopes
Od	D	Owens-Rock outcrop complex, 3 to 10 percent slopes
Pa		Pits
Pb	D	Plevna fine sandy loam
Pc	A	Pratt loamy fine sand, undulating
Pd	A	Pratt-Tivoli complex, rolling
Ra	D	Renfrow silty clay loam, 1 to 3 percent slopes
Rb	D	Renfrow silty clay loam, 3 to 6 percent slopes
Rc	D	Renfrow-Owens clay loams, 1 to 4 percent slopes
Rd	D	Rosehill silty clay, 1 to 3 percent slopes
Sa	B	Shellabarger sandy loam, 1 to 3 percent slopes
Sb	B	Shellabarger sandy loam, 3 to 6 percent slopes
Sc	B	Shellabarger sandy loam, 3 to 6 percent slopes, eroded
Ta	D	Tabler silty clay loam
Tb	D	Tabler-Drummond complex
Ua	B	Urban land-Canadian complex
Ub	B	Urban land-Elandco complex
Uc	B	Urban land-Farnum complex, 0 to 3 percent slopes
Ud	D	Urban land-Irwin complex, 1 to 3 percent slopes
Ue	D	Urban land-Tabler complex
Va	B	Vanoss silt loam, 0 to 1 percent slopes
Vb	B	Vanoss silt loam, 1 to 3 percent slopes
Vc	B	Vanoss silt loam, 3 to 6 percent slopes
Vd	B	Vanoss silt loam, 3 to 6 percent slopes, eroded
Ve	D	Vernon sandy loam, 1 to 3 percent slopes
Vf	D	Vernon sandy loam, 3 to 6 percent lopes
Wa	C	Waldeck sandy loam
Wb	D	Waurika silt loam

(SECTION 5.10, B. - CONTINUED)

FIGURE 5-3

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	5.46	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	4.40	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	3.18	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

16/18

FIGURE 5-3 (Continued)

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
46	1.72	2.08	2.81	3.27	3.82	4.41	4.86
47	1.69	2.04	2.76	3.21	3.75	4.33	4.78
48	1.67	2.01	2.72	3.16	3.69	4.26	4.70
49	1.64	1.98	2.67	3.11	3.63	4.19	4.63
50	1.61	1.95	2.63	3.06	3.58	4.13	4.56
51	1.59	1.92	2.59	3.01	3.52	4.06	4.49
52	1.56	1.89	2.55	2.97	3.47	4.00	4.42
53	1.54	1.86	2.51	2.92	3.42	3.94	4.35
54	1.52	1.84	2.48	2.88	3.37	3.88	4.29
55	1.50	1.81	2.44	2.84	3.32	3.83	4.23
56	1.47	1.79	2.41	2.80	3.27	3.77	4.17
57	1.45	1.76	2.37	2.76	3.23	3.72	4.11
58	1.43	1.74	2.34	2.73	3.19	3.67	4.06
59	1.42	1.72	2.31	2.69	3.14	3.62	4.01
60	1.40	1.69	2.28	2.65	3.10	3.57	3.95
61	1.38	1.67	2.25	2.62	3.06	3.53	3.90
62	1.36	1.65	2.22	2.59	3.02	3.48	3.85
63	1.34	1.63	2.20	2.55	2.99	3.44	3.81
64	1.33	1.61	2.17	2.52	2.95	3.40	3.76
65	1.31	1.59	2.14	2.49	2.92	3.35	3.71
66	1.30	1.57	2.12	2.46	2.88	3.31	3.67
67	1.28	1.56	2.09	2.44	2.85	3.27	3.63
68	1.26	1.54	2.07	2.41	2.81	3.24	3.59
69	1.25	1.52	2.05	2.38	2.78	3.20	3.54
70	1.24	1.50	2.02	2.35	2.75	3.16	3.51
71	1.22	1.49	2.00	2.33	2.72	3.13	3.47
72	1.21	1.47	1.98	2.30	2.69	3.09	3.43
73	1.20	1.46	1.96	2.28	2.66	3.06	3.39
74	1.18	1.44	1.94	2.25	2.63	3.03	3.36
75	1.17	1.43	1.92	2.23	2.61	3.00	3.32
76	1.16	1.41	1.90	2.21	2.58	2.96	3.29
77	1.15	1.40	1.88	2.18	2.55	2.93	3.25
78	1.13	1.38	1.86	2.16	2.53	2.90	3.22
79	1.12	1.37	1.84	2.14	2.50	2.88	3.19
80	1.11	1.36	1.82	2.12	2.48	2.85	3.16
81	1.10	1.34	1.81	2.10	2.46	2.82	3.13
82	1.09	1.33	1.79	2.08	2.43	2.79	3.10
83	1.08	1.32	1.77	2.06	2.41	2.76	3.07
84	1.07	1.31	1.75	2.04	2.39	2.74	3.04
85	1.06	1.30	1.74	2.02	2.37	2.71	3.01
86	1.05	1.28	1.72	2.00	2.34	2.69	2.99
87	1.04	1.27	1.71	1.99	2.32	2.66	2.96
88	1.03	1.26	1.69	1.97	2.30	2.64	2.93
89	1.02	1.25	1.68	1.95	2.28	2.62	2.91
90	1.01	1.24	1.66	1.93	2.26	2.59	2.88

ATTACHMENT A CONTINUED
Page 3

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
91	1.00	1.23	1.65	1.92	2.24	2.57	2.86
92	1.00	1.22	1.63	1.90	2.22	2.55	2.83
93	0.99	1.21	1.62	1.89	2.20	2.53	2.81
94	0.98	1.20	1.61	1.87	2.19	2.51	2.79
95	0.97	1.19	1.59	1.85	2.17	2.49	2.76
96	0.96	1.18	1.58	1.84	2.15	2.46	2.74
97	0.96	1.17	1.57	1.82	2.13	2.44	2.72
98	0.95	1.16	1.56	1.81	2.12	2.42	2.70
99	0.94	1.15	1.54	1.80	2.10	2.41	2.67
100	0.93	1.14	1.53	1.78	2.08	2.39	2.65
101	0.93	1.13	1.52	1.77	2.07	2.39	2.65
102	0.92	1.13	1.51	1.75	2.05	2.35	2.61
103	0.91	1.12	1.50	1.74	2.04	2.33	2.59
104	0.90	1.11	1.49	1.73	2.02	2.31	2.57
105	0.90	1.10	1.47	1.72	2.01	2.30	2.55
106	0.89	1.09	1.46	1.70	1.99	2.28	2.54
107	0.88	1.09	1.45	1.69	1.98	2.26	2.52
108	0.88	1.08	1.44	1.68	1.96	2.25	2.50
109	0.87	1.07	1.43	1.67	1.95	2.23	2.48
110	0.87	1.06	1.42	1.65	1.93	2.21	2.46
111	0.86	1.06	1.41	1.64	1.92	2.20	2.45
112	0.85	1.05	1.40	1.63	1.91	2.18	2.43
113	0.85	1.04	1.39	1.62	1.89	2.17	2.41
114	0.84	1.03	1.38	1.61	1.88	2.15	2.40
115	0.84	1.03	1.37	1.60	1.87	2.14	2.38
116	0.83	1.02	1.36	1.59	1.86	2.12	2.36
117	0.82	1.01	1.36	1.58	1.84	2.11	2.35
118	0.82	1.01	1.35	1.57	1.83	2.09	2.33
119	0.81	1.00	1.34	1.56	1.82	2.08	2.32
120	0.81	0.99	1.33	1.55	1.81	2.07	2.30

DURATION IN HOURS	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
2	0.81	0.99	1.33	1.55	1.81	2.07	2.30
3	0.59	0.72	0.97	1.13	1.32	1.51	1.68
4	0.47	0.58	0.78	0.91	1.06	1.21	1.35
5	0.40	0.49	0.66	0.77	0.89	1.02	1.14
6	0.35	0.42	0.57	0.67	0.78	0.89	0.99
8	0.28	0.34	0.46	0.53	0.62	0.71	0.79
10	0.23	0.29	0.39	0.45	0.52	0.60	0.67
12	0.20	0.25	0.33	0.39	0.45	0.52	0.58
18	0.15	0.18	0.24	0.28	0.33	0.38	0.42
24	0.12	0.15	0.20	0.23	0.27	0.31	0.34

ATTACHMENT E

DRAINAGE CRITERIA

CITY OF WICHITA, KANSAS

AVERAGE OVERLAND FLOW VELOCITY FOR USE WITH URBANIZED AREAS

Surface Type	VELOCITY IN FEET/SECOND FOR SLOPES IN PERCENT SHOWN																			
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	20.0
Forest with Heavy Ground Litter or Meadow	0.03	0.04	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.16	0.21	0.28	0.33	0.39	0.46	0.53	0.60	0.72	1.10
Fallow or Minimum Tillage Cultivation	0.06	0.08	0.10	0.12	0.13	0.14	0.16	0.17	0.18	0.19	0.29	0.40	0.51	0.66	0.78	0.91	1.05	1.20	1.44	2.10
Short Grass Pasture or Lawns	0.09	0.13	0.15	0.18	0.20	0.21	0.23	0.25	0.26	0.28	0.45	0.60	0.77	0.96	1.17	1.33	1.50	1.68	1.98	3.20
Almost Bare Ground	0.16	0.22	0.28	0.31	0.35	0.38	0.41	0.44	0.46	0.49	0.70	0.85	1.05	1.26	1.50	1.75	2.03	2.32	2.79	4.40
Grassed Waterway	0.35	0.48	0.58	0.67	0.77	0.84	0.91	0.98	1.05	1.12	1.54	1.82	2.10	2.38	2.78	3.20	3.66	4.14	4.56	7.00
Paved Areas (Sheet Flow) or Shallow Gutter Flow	0.44	0.62	0.77	0.91	1.05	1.12	1.19	1.26	1.33	1.40	2.00	2.55	3.20	3.83	4.41	5.04	5.70	6.00	6.20	9.00

18/18

PROJECT: WEST WICHITA RADICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-24-93

BY WDF CKD

JOB NO. _____ SHEET NO. 1 OF 28

OVERVIEW

DETENTION ANALYSIS WAS PERFORMED FOR THE DEVELOPMENT OF THIS SITE AND PRESENTED TO THE OWNER. THE OWNER DESIRED TO KNOW IF OTHER ALTERNATIVES WERE ALLOWED TO AVOID DETENTION/STORAGE ON THIS SITE. INCREASING THE SIZE OF THE STORM SEWER ON SOCORA AND CENTRAL AVENUE TO DRAIN THIS SITE WAS THE ALTERNATIVE CHOSEN BY THE OWNER. THE FOLLOWING COMPUTATIONS WERE USED IN THE DETENTION ANALYSIS WHICH WAS NOT IMPLEMENTED ON THIS SITE.

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 8-18-93
BY HOF CKD
JOB NO. ____ SHEET NO. 2 OF 28

DETENTION POND ANALYSIS

COMPUTE 100 YR. DISCHARGE FROM BASIN #5D & #6D

BASIN #5D

$Q_{100} = C_{100} i_{100} A$

$C_{100} = 0.2\left(\frac{.41+0.66}{2}\right) + 0.8(0.89)$

$= 0.82$

FOR t_c = 16 min., i_{100} = 8.76"/HR

$Q_{100} = 0.82(8.76)(4.5ac)$

$Q_{100} = 32.3$ CFS

BASIN #6D

$Q_{100} = C_{100} i_{100} A$

$C_{100} = 0.2\left(\frac{.41+.66}{2}\right) + .8(.89)$

$= 0.82$

$Q_{100} = .82(8.98)(1.7 AC.)$

FOR t_c = 15 min. i_{100} = 8.98"/HR

$Q_{100} = 12.52$ CFS

∴ PERMIT ONLY BASIN 5D TO DRAIN TO SOCORA STORM SEWER. ALL OTHER BASINS WILL BE DRAINED TO DETENTION POND.

COMPUTE 100 YR. DISCHARGE FOR BASINS DRAINING INTO DETENTION POND.

BASIN #1D

$C_{100} = 0.82$ $i_{100} = 8.98$"/HR

$Q_{100} = 0.82(8.98)(1.6 AC.) = 11.8$ CFS

BASIN #2D

$Q_{100} = 0.82(8.98)(5.5) = 40.5$ CFS

BASIN #3D

$Q_{100} = 0.82(8.98)(1.3) = 9.6$ CFS

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 8-18-93
BY HOF CKD
JOB NO. ____ SHEET NO. 3 OF 38

BASIN #4D

Q_{100} = 0.82(8.98)(2.5 AC) = 18.4 CFS

BASIN #6D

Q_{100} = 0.82(8.98)(1.7AC.) = 12.52 CFS

TOTAL INFLOW DISCHARGE INTO POND

BASIN	Q_{100}	AREA
#1D	11.8 CFS	1.6 AC
#2D	40.5 CFS	5.5 AC
#3D	9.6 CFS	1.3 AC
#4D	18.4 CFS	2.5 AC
#6D	12.5 CFS	1.7 AC.
	92.8 CFS	12.6 AC

ROUTE PEAK FLOW RATE THRU POND

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SASH ARCHITECTS

DATE 8-18-93

BY HOF CKD

JOB NO. ____ SHEET NO. 4 OF 28

DEVELOPED PROJECT SITE RUNOFF

Q_p = 57.3 CFS

DRAINAGE BASIN	AREA	PRECIP	VOL. RUNOFF (AC. FT)
1D	1.6	4.5	
2D	5.5		
3D	1.3		
4D	2.5		
5D	4.5		
6D	1.7		
	17.1*	× 3.71"/12 =	5.3 AC-FT.

*INCLUDES STREET RIGHT OF WAYS FOR SOCORA AND WOODCHUCK

FOR Q_{100} 17.1 × 6.97"/12 = 9.93 AC.FT

ESTIMATE RUNOFF VOLUME FOR UNDEVELOPED CONDITIONS

DRAINAGE BASIN	AREA	RUNOFF, Q	VOL. RUNOFF
1	4.5		
2	5.0		
3	3.4		
4	3.2		
	16.1	× 3.00"/12 =	4.0 AC-FT.

16.1 × 6.14"/12 = 8.20 AC-FT. ←

DETENTION POND IS TO BE DESIGNED TO REDUCE THE PROPOSED Q_5 = 57.3 CFS TO Q_5 = 15 CFS AND PROVIDE STORAGE OF APPROX 2.5 I AC-FT FROM SCS TR-55 WORKSHEET 6a.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SASH ARCHITECTS

DATE 8-18-93

BY HOF CKD

JOB NO. ____ SHEET NO. 5 OF 28

SUMMARY OF EXISTING PEAK DISCHARGES FOR DETERMINATION OF DETENTION STORAGE REQUIREMENTS

DRAINAGE BASIN	Q PEAK, CFS
#1	11.1
#2	4.2
#3	1.9
#4	1.9
	19.1 CFS ←

Worksheet 2: Runoff curve number and runoff

6/28

Project WEST WICHITA MEDICAL PARK By AOF Date 8-10-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed) BASIN 10, 20, 30, 40, 50, 60

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐acres ☐mi² ☐%	Product of CN x area
B	URBAN LAWN AREAS GOOD	61			.15	9
D	URBAN LAWN AREAS GOOD	80			.15	12
	DRIVE, PARKING LOTS, WALKS	98			1.3	127
					1.6	

1/ Use only one CN source per line. Totals =

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{148}{1.6} = 93$; Use CN = 93

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	5	100	
Rainfall, P (24-hour)	in	4.5	7.8	
Runoff, Q (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	in	3.71	6.97	

$S = \frac{1000}{93} - 10 = 0.75$

$Q = \frac{(P - .2S)^2}{(P + .8S)}$

Worksheet 2: Runoff curve number and runoff

7/28

Project WEST WICHITA MOBILE PARK By HOF Date 8-19-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: (Present) Developed BASIN 1, 2, 3, 4

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐ acres ☐ mi^2 ☐ %	Product of CN x area
B	CULTIVATED, ROW CROPS, SR+CR	79			13.1 / 2	517
D	CULTIVATED, ROW CROPS, SR+CR	88			13.1 / 2	576
	PARKING LOT, WALKS, DRIVE	98			30	294
1/ Use only one CN source per line.				Totals =	16.1	1387

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1387}{16.1} = 86$, Use CN = 86

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr	5	100	
Rainfall, P (24-hour)	in	4.5	7.8	
Runoff, Q (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	in	3.00	6.14	

$S = \frac{1000}{86} - 10 = 1.63$

$Q = \frac{(4.5 - .2(1.63))^2}{4.5 + .8(1.63)}$

$Q = \frac{(7.8 - .2(1.63))^2}{7.8 + .8(1.63)} = 6.14$

ESTIMATION OF STORAGE REQUIREMENTS

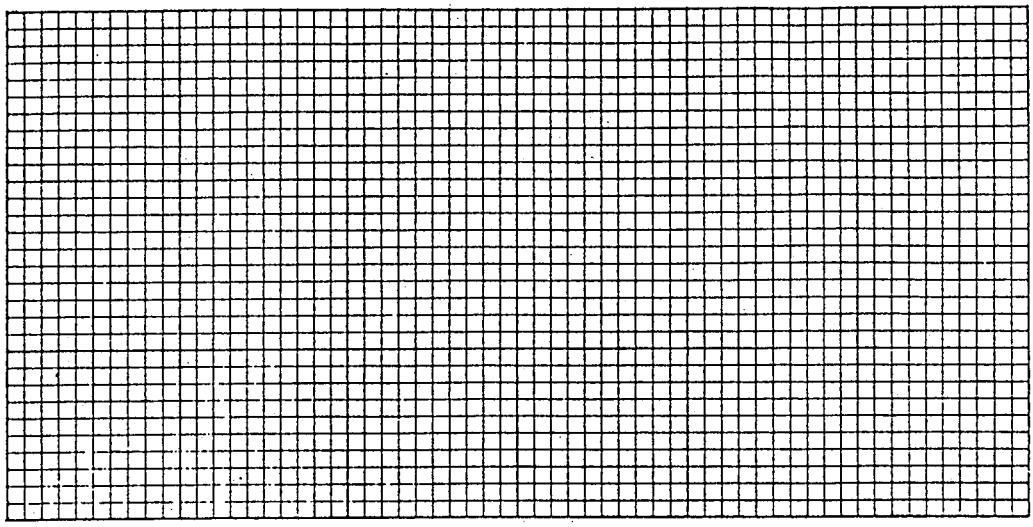
8/28

Worksheet 6a: Detention basin storage, peak outflow discharge (q_o) known

Project WEST WICHITA MEDICAL PARK By HOP Date 8-16-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed)



TOTAL 16 ACRE SITE INTO DETENTION
17.1 AC.

		1st stage	2nd stage
1.	Data: Drainage area ..... A_m = .027 mi^2; Rainfall distribution type (I, IA, II, III) = II		
2.	Frequency ..... yr	5.	100
3.	Peak inflow discharge, q_i .... cfs (From worksheet 4 or 5b)	66.1	113.6
4.	Peak outflow discharge, q_o .... cfs 1/	12	12
5.	Compute $\frac{q_o}{q_i}$	0.18	0.11
6.	$\frac{V_s}{V_r}$ ..... (Use $\frac{q_o}{q_i}$ with figure 6-1)	0.475	0.55
7.	Runoff, Q ..... in (From worksheet 2)	3.71	6.97
8.	Runoff volume, V_r ..... ac-ft ($V_r = QA_m 53.33$)	5.28	9.93
9.	Storage volume, V_s ..... ac-ft ($V_s = V_r(\frac{V_s}{V_r})$)	2.51	5.46
10.	Maximum stage, E_{max} (From plot)		

1/ 2nd stage q_o includes 1st stage q_o.

$q_i = (.74)(8.98)(17.1) = 113.6$ cfs

(150')(180') = 0.62 AC.

(200'x200') x 6.0' = 5.50 AC-FT.

(300'x300') x 2.64' = 5.95 AC-FT.

(250'x250') x 9.0' = 5.73 AC-FT

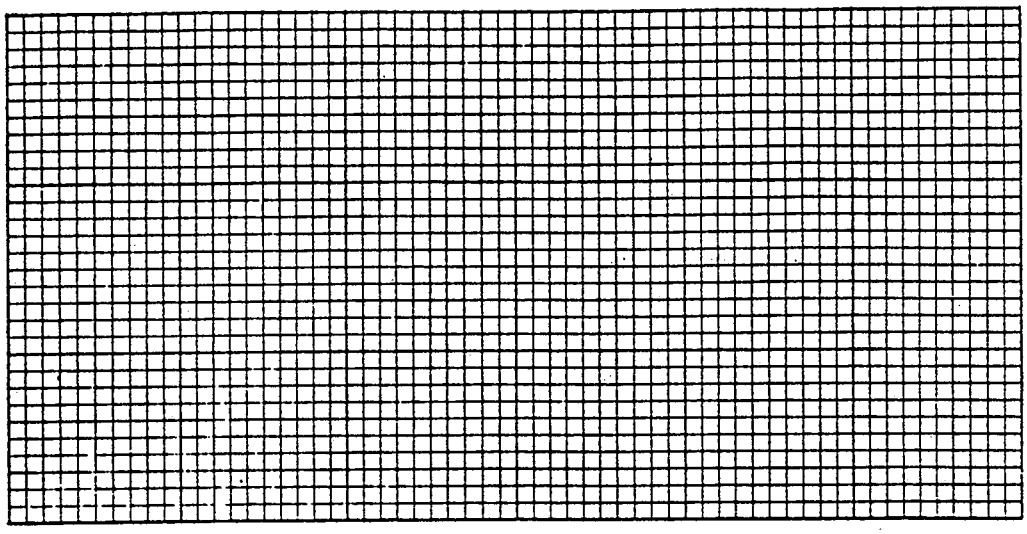
9/28

Worksheet 6a: Detention basin storage, peak outflow discharge (q_o) known

Project WEST WICHITA MEDICAL PARK By HOF Date 8-18-93

Location LOT 1, TYLEE ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed)



Detention basin storage

ALL BASINS EXCEPT #5D INTO DETENTION

		1st stage	2nd stage
1.	Data: Drainage area ..... A_m = .02 mi^2; Rainfall distribution type (I, IA, II, III) = II		
2.	Frequency ..... yr	100.	5
3.	Peak inflow discharge, q_i .... cfs (From worksheet 4 or 5b)	93	48.8
4.	Peak outflow discharge, q_o .... cfs 1/	15	15
5.	Compute $\frac{q_o}{q_i}$	0.16	0.31
6.	$\frac{V_s}{V_r}$ ..... (Use $\frac{q_o}{q_i}$ with figure 6-1)	0.49	0.37
7.	Runoff, Q ..... in (From worksheet 2)	7.0	3.71
8.	Runoff volume, V_r ..... ac-ft ($V_r = QA_m 53.33$)	7.47	3.96
9.	Storage volume, V_s ..... ac-ft ($V_s = V_r(\frac{V_s}{V_r})$)	3.66	1.47
10.	Maximum stage, E_{max} (From plot)		

366AC-FT

5FT DEPTH

159,430 ft^3 / 5 ft = 31,886 ft^2

1/ 2nd stage q_o includes 1st stage q_o.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SASH ARCHITECTS

DATE

BY CKD

JOB NO. SHEET NO. 10 OF 28

SCS DISTRIBUTION OF 24 HOUR STORM FOR WICHITA, KS

TIME	P_t/P_{24} *
0	0
0.5	0.0055
1.0	0.0011
1.5	0.017
2.0	0.022
2.5	0.029
3.0	0.035
3.5	0.042
4.0	0.048
4.5	0.056
5.0	0.064
5.5	0.072
6.0	0.080
6.5	0.090
7.0	0.100
7.5	0.110
8.0	0.120
8.5	0.133
9.0	0.147
9.5	0.163
10.0	0.181
10.5	0.204
11.0	0.235
11.5	0.283
12.0	0.663
12.5	0.735
13.0	0.772
13.5	0.799
14.0	0.820
14.5	0.835
15.0	0.850
15.5	0.865
16.0	0.880
16.5	0.890
17.0	0.900
17.5	0.910
18.0	0.916
18.5	0.925
19.0	0.934
19.5	0.943
20.0	0.952
20.5	0.958
21.0	0.964
21.5	0.970
22.0	0.976
22.5	0.982
23.0	0.988
23.5	0.994
24.0	1.000

* INPUT THESE VALUES INTO HEC-1.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 8-18-93

BY ADF CKD

JOB NO. _____ SHEET NO. 11 OF 28

STAGE VS STORAGE CURVE FOR PROPOSED POND.

STAGE	TOP SURFACE AREA (FT^2)	AVG. AREA FT^2	DEPTH	CUMULATIVE VOL. (FT^3)	AC-FT.
149	(240'X100') = 24,000	25,392	0'	0	0
150	(248)(108) = 26,784	28,240	1'	25,392	0.583
151	(256)(116) = 29,696	31,216	2'	53,632	1.231
152	(264)(124) = 32,736	34,320	3'	84,848	1.948
153	(272)(132) = 35,904	37,552	4'	119,168	2.736
154	(280X140) = 39,200	40,912	5'	156,720	3.598
155	(288)(148) = 42,624	44,400	6'	197,632	4.537
156	(296)(156) = 46,176		7'	242,032	5.556

STAGE VS. DISCHARGE CURVE (15" RCP OUTLET)

STAGE	HW/D (FROM HDS #5)	Q, CFS
149.0	0	0
149.63	0.5	1.35
150.0	0.8	3.0
150.25	1.0	4.5
150.88	1.5	7.0
151.50	2.0	9.0
152.75	3.0	12.0
150.0	4.0	15.0
155.0	4.8	17.5

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 01 JUN 88           *
*                                       *
*  RUN DATE  10/15/1993  TIME  09:00:51 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```


12/28

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

13/28

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1       ID  WEST WICHITA MEDICAL PARK
  2       ID  DETENTION POND ROUTING
  3       ID  CERTIFIED ENGINEERING DESIGN
  4       ID  BY HARLAN D. FORAKER, P.E. 8-20-93
  5       IT      5 20AUG93     600       0 20AUG93    1800
  6       IO      0       2       0
  7       IN     30 20AUG93     000

  8       KK  INFLOW  RUNOFF HYDROGRAPH FOR BASINS #1D, #2D, #3D, #4D, #6D FROM
  9       KM          SCS DISTRIBUTION FOR 100 YEAR-24 HOUR STORM FOR WICHITA, KS
 10       BA  .01969
 11       PB    7.8
 12       PC      0  0.0055   0.011   0.017   0.022   0.029   0.035   0.042   0.048   0.056
 13       PC  0.064   0.072   0.080   0.090   0.100   0.110   0.120   0.133   0.147   0.163
 14       PC  0.181   0.204   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835
 15       PC  0.850   0.865   0.880   0.890   0.910   0.916   0.925   0.934   0.943   0.952
 16       PC  0.958   0.964   0.970   0.976   0.982   0.988   0.994   1.000
 17       LS      0      86       0
 18       UD    .15

 19       KK    POND    PROPOSED DETENTION POND     15" RCP OUTLET PIPE
 20       RS       1    ELEV     149
 21       SV       0   0.524   1.111   1.768   2.495   3.294   4.144   5.117
 22       SQ       0       3     7.5    10.5      13    14.5      16      18
 23       SE     149     150     151     152     153     154     155     156
 24       ZZ
```

```
**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*           FEBRUARY 1981            *
*         REVISED 01 JUN 88          *
*                                    *
*  RUN DATE  10/15/1993  TIME  09:00:51 *
*                                    *
**************************************
```


```
**************************************
*                                    *
*    U.S. ARMY CORPS OF ENGINEERS    *
*  THE HYDROLOGIC ENGINEERING CENTER *
*         609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616      *
*          (916) 551-1748            *
*                                    *
**************************************
```


14/28

WEST WICHITA MEDICAL PARK
DETENTION POND ROUTING
CERTIFIED ENGINEERING DESIGN
BY HARLAN D. FORAKER, P.E. 8-20-93

6 IO OUTPUT CONTROL VARIABLES

IPRNT	0	PRINT CONTROL
IPLOT	2	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	20AUG93	STARTING DATE
ITIME	0600	STARTING TIME
NQ	145	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	20AUG93	ENDING DATE
NDTIME	1800	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 12.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** ***

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***************
*             *
*   INFLOW    *
*             *
***************
```

8 KK RUNOFF HYDROGRAPH FOR BASINS #1D, #2D, #3D, #4D, #6D FROM

SCS DISTRIBUTION FOR 100 YEAR-24 HOUR STORM FOR WICHITA, KS

7 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	30	TIME INTERVAL IN MINUTES
JXDATE	20AUG93	STARTING DATE
JXTIME	0	STARTING TIME

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS
TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

11 PB STORM 7.80 BASIN TOTAL PRECIPITATION

15/28

PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.06	.06	.06	.06
.06	.06	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00						

17 LS SCS LOSS RATE
STRTL .33 INITIAL ABSTRACTION
CRVNBR 86.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

18 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES

18. 49. 43. 22. 11. 5. 3. 1. 1. 0.
0.

****

HYDROGRAPH AT STATION INFLOW

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
20 AUG 0600	1	.00	.00	.00	0.	20 AUG 1205	74	.11	.01	.10	72.
20 AUG 0605	2	.02	.02	.00	0.	20 AUG 1210	75	.11	.01	.10	52.
20 AUG 0610	3	.02	.02	.00	0.	20 AUG 1215	76	.11	.01	.10	34.
20 AUG 0615	4	.02	.02	.00	0.	20 AUG 1220	77	.11	.01	.10	25.
20 AUG 0620	5	.02	.02	.00	0.	20 AUG 1225	78	.11	.01	.11	20.
20 AUG 0625	6	.02	.02	.00	0.	20 AUG 1230	79	.11	.01	.11	18.
20 AUG 0630	7	.02	.02	.00	0.	20 AUG 1235	80	.06	.00	.05	16.
20 AUG 0635	8	.02	.02	.00	0.	20 AUG 1240	81	.06	.00	.05	13.
20 AUG 0640	9	.02	.02	.00	0.	20 AUG 1245	82	.06	.00	.05	11.
20 AUG 0645	10	.02	.02	.00	0.	20 AUG 1250	83	.06	.00	.05	9.
20 AUG 0650	11	.02	.02	.00	0.	20 AUG 1255	84	.06	.00	.05	9.
20 AUG 0655	12	.02	.02	.00	0.	20 AUG 1300	85	.06	.00	.05	9.
20 AUG 0700	13	.02	.02	.00	0.	20 AUG 1305	86	.04	.00	.04	8.
20 AUG 0705	14	.02	.02	.00	0.	20 AUG 1310	87	.04	.00	.04	7.
20 AUG 0710	15	.02	.02	.00	0.	20 AUG 1315	88	.04	.00	.04	7.

20 AUG 0725	18	.02	.02	.00	0.	*	20 AUG 1330	91	.04	.00	.04	6.
20 AUG 0730	19	.02	.02	.00	0.	*	20 AUG 1335	92	.03	.00	.03	6.
20 AUG 0735	20	.02	.02	.00	0.	*	20 AUG 1340	93	.03	.00	.03	5.
20 AUG 0740	21	.02	.02	.00	0.	*	20 AUG 1345	94	.03	.00	.03	5.
20 AUG 0745	22	.02	.02	.00	0.	*	20 AUG 1350	95	.03	.00	.03	5.
20 AUG 0750	23	.02	.02	.00	0.	*	20 AUG 1355	96	.03	.00	.03	5.
20 AUG 0755	24	.02	.02	.00	0.	*	20 AUG 1400	97	.03	.00	.03	5.
20 AUG 0800	25	.02	.01	.00	0.	*	20 AUG 1405	98	.02	.00	.02	5.
20 AUG 0805	26	.02	.02	.00	0.	*	20 AUG 1410	99	.02	.00	.02	4.
20 AUG 0810	27	.02	.02	.00	0.	*	20 AUG 1415	100	.02	.00	.02	4.
20 AUG 0815	28	.02	.02	.00	0.	*	20 AUG 1420	101	.02	.00	.02	4.
20 AUG 0820	29	.02	.02	.00	0.	*	20 AUG 1425	102	.02	.00	.02	3.
20 AUG 0825	30	.02	.02	.00	0.	*	20 AUG 1430	103	.02	.00	.02	3.
20 AUG 0830	31	.02	.02	.00	0.	*	20 AUG 1435	104	.02	.00	.02	3.
20 AUG 0835	32	.02	.02	.00	0.	*	20 AUG 1440	105	.02	.00	.02	3.
20 AUG 0840	33	.02	.02	.00	1.	*	20 AUG 1445	106	.02	.00	.02	3.
20 AUG 0845	34	.02	.02	.00	1.	*	20 AUG 1450	107	.02	.00	.02	3.
20 AUG 0850	35	.02	.02	.01	1.	*	20 AUG 1455	108	.02	.00	.02	3.
20 AUG 0855	36	.02	.02	.01	1.	*	20 AUG 1500	109	.02	.00	.02	3.
20 AUG 0900	37	.02	.02	.01	1.	*	20 AUG 1505	110	.02	.00	.02	3.
20 AUG 0905	38	.02	.02	.01	1.	*	20 AUG 1510	111	.02	.00	.02	3.
20 AUG 0910	39	.02	.02	.01	1.	*	20 AUG 1515	112	.02	.00	.02	3.
20 AUG 0915	40	.02	.02	.01	1.	*	20 AUG 1520	113	.02	.00	.02	3.
20 AUG 0920	41	.02	.02	.01	1.	*	20 AUG 1525	114	.02	.00	.02	3.
20 AUG 0925	42	.02	.02	.01	1.	*	20 AUG 1530	115	.02	.00	.02	3.
20 AUG 0930	43	.02	.02	.01	1.	*	20 AUG 1535	116	.02	.00	.02	3.
20 AUG 0935	44	.03	.02	.01	1.	*	20 AUG 1540	117	.02	.00	.02	3.
20 AUG 0940	45	.03	.02	.01	1.	*	20 AUG 1545	118	.02	.00	.02	3.
20 AUG 0945	46	.03	.02	.01	2.	*	20 AUG 1550	119	.02	.00	.02	3.
20 AUG 0950	47	.03	.02	.01	2.	*	20 AUG 1555	120	.02	.00	.02	3.
20 AUG 0955	48	.03	.02	.01	2.	*	20 AUG 1600	121	.02	.00	.02	3.
20 AUG 1000	49	.03	.01	.01	2.	*	20 AUG 1605	122	.02	.00	.01	3.
20 AUG 1005	50	.04	.02	.02	2.	*	20 AUG 1610	123	.02	.00	.01	3.
20 AUG 1010	51	.04	.02	.02	2.	*	20 AUG 1615	124	.02	.00	.01	3.
20 AUG 1015	52	.04	.02	.02	2.	*	20 AUG 1620	125	.02	.00	.01	2.
20 AUG 1020	53	.04	.02	.02	3.	*	20 AUG 1625	126	.02	.00	.01	2.
20 AUG 1025	54	.04	.02	.02	3.	*	20 AUG 1630	127	.02	.00	.01	2.
20 AUG 1030	55	.04	.02	.02	3.	*	20 AUG 1635	128	.03	.00	.03	3.
20 AUG 1035	56	.05	.02	.03	3.	*	20 AUG 1640	129	.03	.00	.03	3.
20 AUG 1040	57	.05	.02	.03	3.	*	20 AUG 1645	130	.03	.00	.03	4.
20 AUG 1045	58	.05	.02	.03	4.	*	20 AUG 1650	131	.03	.00	.03	4.
20 AUG 1050	59	.05	.02	.03	4.	*	20 AUG 1655	132	.03	.00	.03	4.
20 AUG 1055	60	.05	.02	.03	4.	*	20 AUG 1700	133	.03	.00	.03	4.
20 AUG 1100	61	.05	.02	.03	4.	*	20 AUG 1705	134	.01	.00	.01	4.
20 AUG 1105	62	.07	.03	.05	5.	*	20 AUG 1710	135	.01	.00	.01	3.
20 AUG 1110	63	.07	.02	.05	6.	*	20 AUG 1715	136	.01	.00	.01	2.
20 AUG 1115	64	.07	.02	.05	7.	*	20 AUG 1720	137	.01	.00	.01	2.
20 AUG 1120	65	.07	.02	.05	7.	*	20 AUG 1725	138	.01	.00	.01	2.
20 AUG 1125	66	.07	.02	.05	8.	*	20 AUG 1730	139	.01	.00	.01	1.
20 AUG 1130	67	.07	.02	.05	8.	*	20 AUG 1735	140	.01	.00	.01	1.
20 AUG 1135	68	.58	.13	.45	15.	*	20 AUG 1740	141	.01	.00	.01	2.
20 AUG 1140	69	.58	.09	.49	36.	*	20 AUG 1745	142	.01	.00	.01	2.
20 AUG 1145	70	.58	.07	.51	55.	*	20 AUG 1750	143	.01	.00	.01	2.
20 AUG 1150	71	.58	.06	.53	67.	*	20 AUG 1755	144	.01	.00	.01	2.
20 AUG 1155	72	.58	.05	.54	74.	*	20 AUG 1800	145	.01	.00	.01	2.
20 AUG 1200	73	.58	.04	.55	78.	*						
						*						

16/28

TOTAL RAINFALL = 7.80, TOTAL LOSS = 1.66, TOTAL EXCESS = 6.14

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	12.00-HR
(CFS)	(HR)				
78.	6.00 (CFS)	12.	6.	6.	6.

CUMULATIVE AREA = .02 SQ MI

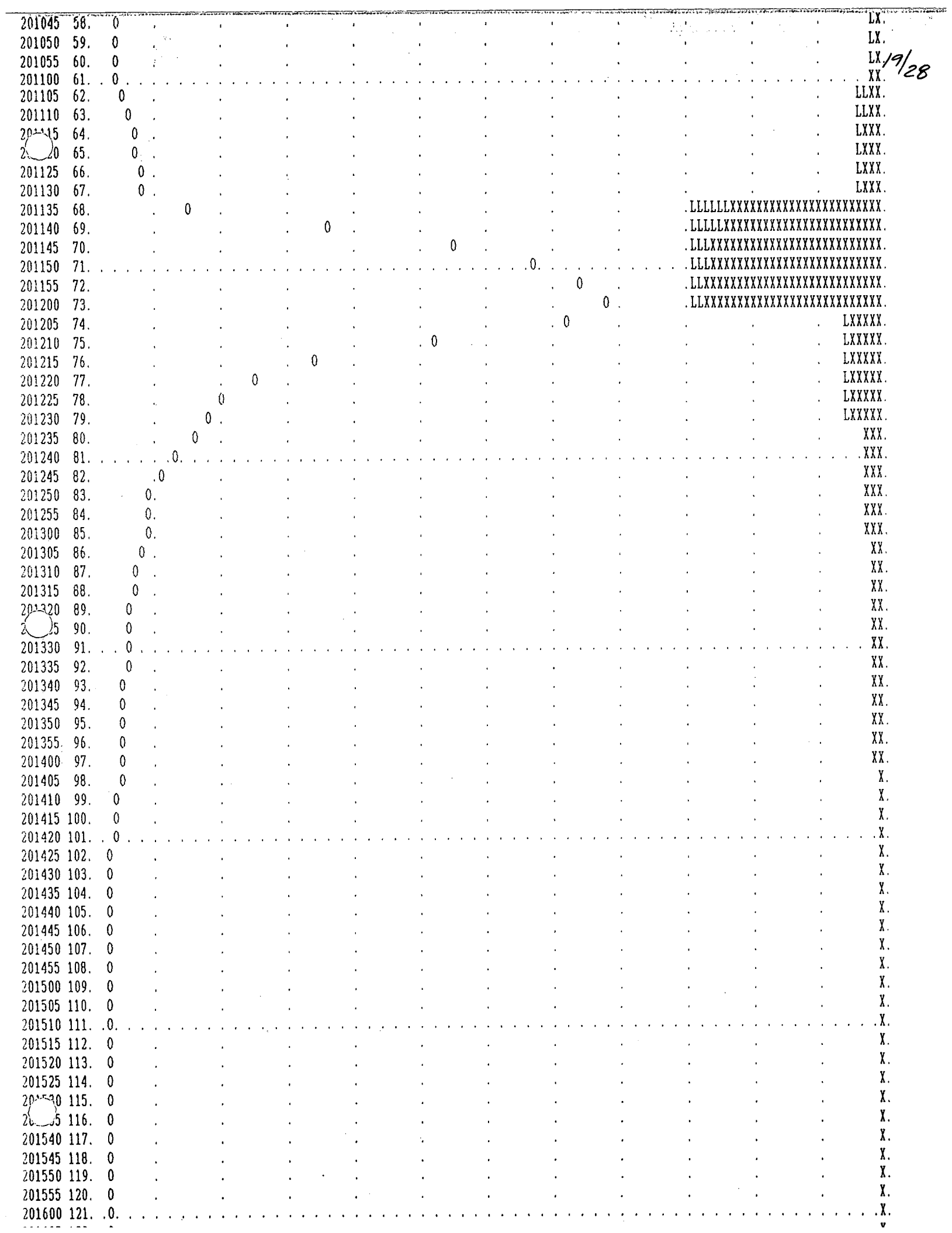
17/28

STATION INFLOW

18/28

(0) OUTFLOW

	0.	10.	20.	30.	40.	50.	60.	70.	80.	0.	0. (L) PRECIP,	0. (X) EXCESS	0.
	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	.4	.2	.0
DAHRMN	PER												
200600	10												
200605	20												L.
200610	30												L.
200615	40												L.
200620	50												L.
200625	60												L.
200630	70												L.
200635	80												L.
200640	90												L.
200645	100												L.
200650	110												L.
200655	120												L.
200700	130												L.
200705	140												L.
200710	150												L.
200715	160												L.
200720	170												L.
200725	180												L.
200730	190												L.
200735	200												L.
200740	210												L.
200745	220												L.
200750	230												L.
200755	240												L.
200800	250												L.
200805	260												L.
200810	270												L.
200815	280												L.
200820	290												L.
200825	300												L.
200830	310												L.
200835	320												L.
200840	33.0												L.
200845	34.0												L.
200850	35.0												L.
200855	36.0												L.
200900	37.0												L.
200905	38.0												L.
200910	39.0												L.
200915	40.0												L.
200920	41.0												L.
200925	42.0												L.
200930	43.0												L.
200935	44.0												X.
200940	45.0												X.
200945	46. 0												X.
200950	47. 0												X.
200955	48. 0												X.
201000	49. 0												X.
201005	50. 0												LX.
201010	51. 0												LX.
201015	52. 0												LX.
201020	53. 0												LX.
201025	54. 0												LX.
201030	55. 0												LX.
201035	56. 0												LX.


9/28

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201615 124.  0 . . . . . X.
201620 125. 0  . . . . . X.
201625 126. 0  . . . . . X.
201630 127. 0  . . . . . X.
201635 128.  0 . . . . . LX.
201640 129.  0 . . . . . LX.
201645 130.   0 . . . . . LX.
201650 131. . 0 . . . . . LX.
201655 132.   0 . . . . . LX.
201700 133.   0 . . . . . LX.
201705 134.   0 . . . . . .
201710 135.  0  . . . . . .
201715 136. 0  . . . . . .
201720 137. 0  . . . . . .
201725 138. 0  . . . . . .
201730 139.0   . . . . . .
201735 140.0   . . . . . X.
201740 141. 0 . . . . . X.
201745 142. 0  . . . . . X.
201750 143. 0  . . . . . X.
201755 144. 0  . . . . . X.
201800 145.-0-------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.--------X.
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20/28

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          **************
          *            *
 19 KK    *      POND  *        PROPOSED DETENTION POND     15" RCP OUTLET PIPE
          *            *
          **************

            HYDROGRAPH ROUTING DATA

 20 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC     149.00  INITIAL CONDITION
                         X         .00 WORKING R AND D COEFFICIENT

 21 SV            STORAGE          .0        .5       1.1       1.8       2.5       3.3       4.1       5.1

 22 SQ          DISCHARGE          0.        3.        8.       11.       13.       15.       16.       18.

 23 SE          ELEVATION      149.00    150.00    151.00    152.00    153.00    154.00    155.00    156.00

                                                        ***
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HYDROGRAPH AT STATION POND

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DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE
20 AUG 0600	1	0.	.0	149.0	20 AUG 1005	50	1.	.1	149.2	20 AUG 1410	99	13.	2.5	153.0
20 AUG 0605	2	0.	.0	149.0	20 AUG 1010	51	1.	.1	149.2	20 AUG 1415	100	13.	2.4	152.9
20 AUG 0610	3	0.	.0	149.0	20 AUG 1015	52	1.	.1	149.3	20 AUG 1420	101	13.	2.4	152.8
20 AUG 0615	4	0.	.0	149.0	20 AUG 1020	53	1.	.1	149.3	20 AUG 1425	102	12.	2.3	152.7
20 AUG 0620	5	0.	.0	149.0	20 AUG 1025	54	1.	.2	149.3	20 AUG 1430	103	12.	2.2	152.6
20 AUG 0625	6	0.	.0	149.0	20 AUG 1030	55	1.	.2	149.3	20 AUG 1435	104	12.	2.2	152.6
20 AUG 0630	7	0.	.0	149.0	20 AUG 1035	56	1.	.2	149.4	20 AUG 1440	105	12.	2.1	152.5
20 AUG 0635	8	0.	.0	149.0	20 AUG 1040	57	1.	.2	149.4	20 AUG 1445	106	11.	2.1	152.4
20 AUG 0640	9	0.	.0	149.0	20 AUG 1045	58	1.	.2	149.4	20 AUG 1450	107	11.	2.0	152.3
20 AUG 0645	10	0.	.0	149.0	20 AUG 1050	59	1.	.2	149.4	20 AUG 1455	108	11.	1.9	152.2
20 AUG 0650	11	0.	.0	149.0	20 AUG 1055	60	1.	.3	149.5	20 AUG 1500	109	11.	1.9	152.2
20 AUG 0655	12	0.	.0	149.0	20 AUG 1100	61	2.	.3	149.5	20 AUG 1505	110	11.	1.8	152.1
20 AUG 0700	13	0.	.0	149.0	20 AUG 1105	62	2.	.3	149.6	20 AUG 1510	111	11.	1.8	152.0
20 AUG 0705	14	0.	.0	149.0	20 AUG 1110	63	2.	.3	149.6	20 AUG 1515	112	10.	1.7	152.0
20 AUG 0710	15	0.	.0	149.0	20 AUG 1115	64	2.	.3	149.7	20 AUG 1520	113	10.	1.7	151.9
20 AUG 0715	16	0.	.0	149.0	20 AUG 1120	65	2.	.4	149.7	20 AUG 1525	114	10.	1.7	151.8
20 AUG 0720	17	0.	.0	149.0	20 AUG 1125	66	2.	.4	149.8	20 AUG 1530	115	10.	1.6	151.8
20 AUG 0725	18	0.	.0	149.0	20 AUG 1130	67	3.	.5	149.9	20 AUG 1535	116	10.	1.6	151.7
20 AUG 0730	19	0.	.0	149.0	20 AUG 1135	68	3.	.5	150.0	20 AUG 1540	117	9.	1.5	151.6
20 AUG 0735	20	0.	.0	149.0	20 AUG 1140	69	4.	.7	150.2	20 AUG 1545	118	9.	1.5	151.6
20 AUG 0740	21	0.	.0	149.0	20 AUG 1145	70	6.	.9	150.7	20 AUG 1550	119	9.	1.4	151.5
20 AUG 0745	22	0.	.0	149.0	20 AUG 1150	71	8.	1.3	151.3	20 AUG 1555	120	9.	1.4	151.4
20 AUG 0750	23	0.	.0	149.0	20 AUG 1155	72	10.	1.7	151.9	20 AUG 1600	121	9.	1.4	151.4
20 AUG 0755	24	0.	.0	149.0	20 AUG 1200	73	12.	2.2	152.6	20 AUG 1605	122	9.	1.3	151.3
20 AUG 0800	25	0.	.0	149.0	20 AUG 1205	74	13.	2.6	153.1	20 AUG 1610	123	8.	1.3	151.3

20 AUG 0815	28	0.	.0	149.0	*	20 AUG 1220	77	14.	3.2	153.9	*	20 AUG 1625	126	8.	1.2	151.1		
20 AUG 0820	29	0.	.0	149.0	*	20 AUG 1225	78	15.	3.3	154.0	*	20 AUG 1630	127	8.	1.1	151.0		
20 AUG 0825	30	0.	.0	149.0	*	20 AUG 1230	79	15.	3.3	154.0	*	20 AUG 1635	128	7.	1.1	151.0		
20 AUG 0830	31	0.	.0	149.0	*	20 AUG 1235	80	15.	3.4	154.1	*	20 AUG 1640	129	7.	1.1	150.9	22/28	
20 AUG 0835	32	0.	.0	149.0	*	20 AUG 1240	81	15.	3.4	154.1	*	20 AUG 1645	130	7.	1.1	150.9		
20 AUG 0840	33	0.	.0	149.0	*	20 AUG 1245	82	15.	3.3	154.0	*	20 AUG 1650	131	7.	1.0	150.9		
20 AUG 0845	34	0.	.0	149.0	*	20 AUG 1250	83	15.	3.3	154.0	*	20 AUG 1655	132	7.	1.0	150.8		
20 AUG 0850	35	0.	.0	149.0	*	20 AUG 1255	84	14.	3.3	154.0	*	20 AUG 1700	133	7.	1.0	150.8		
20 AUG 0855	36	0.	.0	149.0	*	20 AUG 1300	85	14.	3.2	153.9	*	20 AUG 1705	134	7.	1.0	150.8		
20 AUG 0900	37	0.	.0	149.1	*	20 AUG 1305	86	14.	3.2	153.9	*	20 AUG 1710	135	6.	1.0	150.7		
20 AUG 0905	38	0.	.0	149.1	*	20 AUG 1310	87	14.	3.1	153.8	*	20 AUG 1715	136	6.	.9	150.7		
20 AUG 0910	39	0.	.0	149.1	*	20 AUG 1315	88	14.	3.1	153.7	*	20 AUG 1720	137	6.	.9	150.7		
20 AUG 0915	40	0.	.0	149.1	*	20 AUG 1320	89	14.	3.0	153.7	*	20 AUG 1725	138	6.	.9	150.6		
20 AUG 0920	41	0.	.0	149.1	*	20 AUG 1325	90	14.	3.0	153.6	*	20 AUG 1730	139	6.	.9	150.6		
20 AUG 0925	42	0.	.1	149.1	*	20 AUG 1330	91	14.	2.9	153.5	*	20 AUG 1735	140	5.	.8	150.5		
20 AUG 0930	43	0.	.1	149.1	*	20 AUG 1335	92	14.	2.9	153.5	*	20 AUG 1740	141	5.	.8	150.5		
20 AUG 0935	44	0.	.1	149.1	*	20 AUG 1340	93	14.	2.8	153.4	*	20 AUG 1745	142	5.	.8	150.4		
20 AUG 0940	45	0.	.1	149.1	*	20 AUG 1345	94	14.	2.8	153.3	*	20 AUG 1750	143	5.	.8	150.4		
20 AUG 0945	46	0.	.1	149.2	*	20 AUG 1350	95	13.	2.7	153.3	*	20 AUG 1755	144	5.	.7	150.4		
20 AUG 0950	47	1.	.1	149.2	*	20 AUG 1355	96	13.	2.7	153.2	*	20 AUG 1800	145	5.	.7	150.3		
20 AUG 0955	48	1.	.1	149.2	*	20 AUG 1400	97	13.	2.6	153.1	*							
20 AUG 1000	49	1.	.1	149.2	*	20 AUG 1405	98	13.	2.5	153.1	*							
					*						*							

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	12.00-HR
15.	6.58	(CFS)	11.	6.	6.	6.
		(INCHES)	5.057	5.417	5.417	5.417
		(AC-FT)	5.	6.	6.	6.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	12.00-HR
3.	6.58	2.	1.	1.	1.

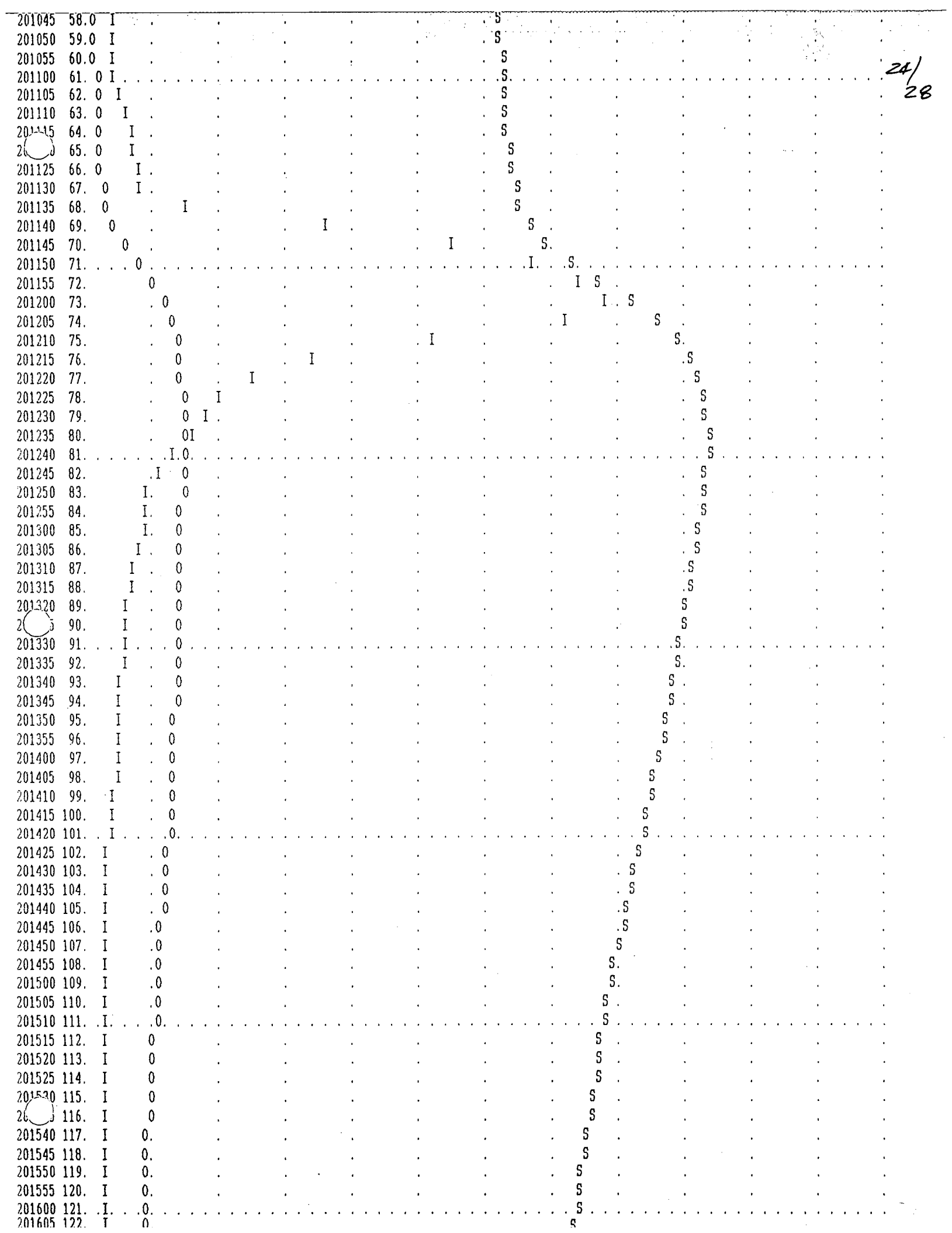
PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	12.00-HR
154.07	6.67	152.29	150.76	150.76	150.76

CUMULATIVE AREA = .02 SQ MI

STATION POND

(I) INFLOW, (O) OUTFLOW

	0.	10.	20.	30.	40.	50.	60.	70.	80.	0.	0.	0.	0.
									(S) STORAGE				
	0.	0.	0.	0.	0.	0.	0.	1.	2.	3.	4.	0.	0.
DAHRMN	PER												
200600	1I						S						
200605	2I						S						
200610	3I						S						
200615	4I						S						
200620	5I						S						
200625	6I						S						
200630	7I						S						
200635	8I						S						
200640	9I						S						
200645	10I						S						
200650	11I						S						
200655	12I						S						
200700	13I						S						
200705	14I						S						
200710	15I						S						
200715	16I						S						
200720	17I						S						
200725	18I						S						
200730	19I						S						
200735	20I						S						
200740	21I						S						
200745	22I						S						
200750	23I						S						
200755	24I						S						
200800	25I						S						
200805	26I						S						
200810	27I						S						
200815	28I						S						
200820	29I						S						
200825	30I						S						
200830	31I						S						
200835	32I						S						
200840	330I						S						
200845	340I						S						
200850	350I						S						
200855	360I						S						
200900	370I						S						
200905	380I						S						
200910	390I						S						
200915	400I						S						
200920	410I						S						
200925	420I						.S						
200930	430I						.S						
200935	440I						.S						
200940	450I						.S						
200945	460 I						.S						
200950	47.0I						.S						
200955	48.0I						.S						
201000	49.0I						.S						
201005	50.0I						.S						
201010	51.0I						.S						
201015	52.0I						.S						
201020	53.0 I						.S						
201025	54.0 I						. S						
201030	55.0 I						. S						
201035	56.0 I						. S						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201615 124.  I    0 .  .  .  
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	INFLOW	78.	6.00	12.	6.	6.	.02		
ROUTED TO	POND	15.	6.58	11.	6.	6.	.02	154.07	6.67

*** NORMAL END OF HEC-1 ***

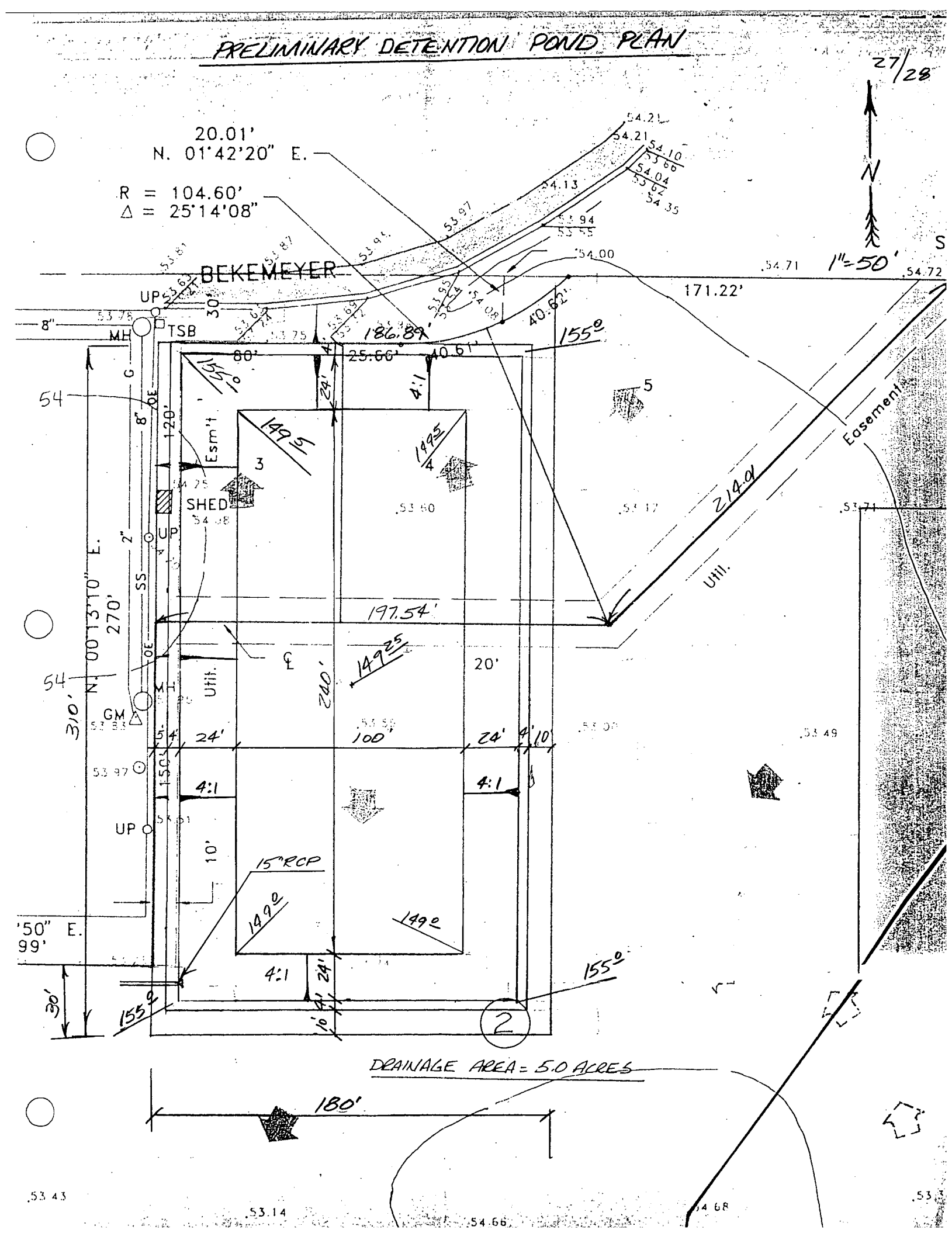
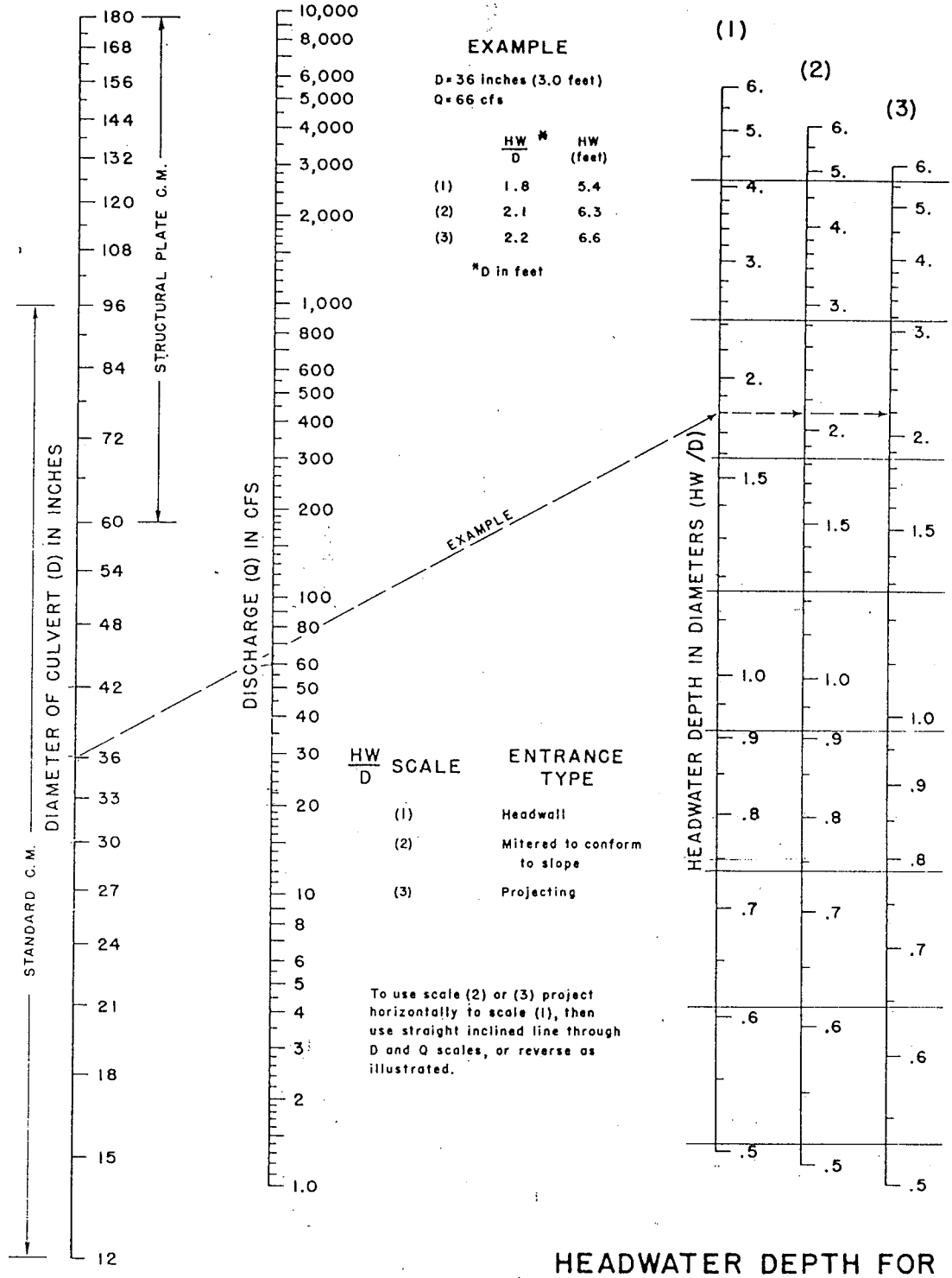

PRELIMINARY DETENTION POND PLAN
27/28
20.01'
N. 01°42'20" E.
R = 104.60'
Δ = 25°14'08"
BEKEMEYER
1"=50'
171.22'
186.89'
40.62'
155°
80'
25.66'
40.61'
24'
4:1
149.5
120'
Esm't
SHED
MH
TSB
UP
8"
OE
SS
2"
G
270'
N. 00°13'10" E.
310'
197.54'
214.9
Easement
Util.
20'
240'
100'
24'
4'
10'
15"RCP
10'
30'
DRAINAGE AREA = 5.0 ACRES
180'
5
3
2
54
53.97
54.21
54.10
54.04
54.13
54.00
54.71
54.72
53.60
53.17
53.71
53.49
53.43
53.14
54.66
54.68

CHART 2



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-16-93

BY HOF CKD

JOB NO. SHEET NO. 1 OF 23

DEVELOPED HYDROLOGY

THE PROPOSED DEVELOPMENT WILL BE DIVIDED INTO 16 DRAINAGE BASINS. THESE BASINS ARE IDENTIFIED ON THE ATTACHED SITE LAYOUT. A CITY OF WICHITA PRIVATE PROJECT IS PROPOSED FOR THE INSTALLATION OF A PUBLIC STORM SEWER SYSTEM TO SERVE THIS SITE. DRAINAGE FROM EACH OF THE DEVELOPED BASINS WILL BE COLLECTED IN AREA INLETS OR CURB INLETS AND CONVEYED IN STORM SEWER TO THE PROPOSED STORM SEWER SYSTEM ON THE EAST SIDE OF SOCORA. PLEASE REFER TO THE ATTACHED SITE LAYOUT FOR THE FOLLOWING ANALYSIS OF THE INDIVIDUAL DRAINAGE BASINS.

DRAINAGE BASINS #1D & #2D TOTAL DRAINAGE AREA = 1.77 ACRES

THIS BASIN CONSISTS OF A 6,000 SQUARE FOOT BUILDING, PARKING LOT AND LAWN AREA ADJACENT TO THE BUILDING. RUNOFF FROM THIS DRAINAGE BASIN WILL BE DIRECTED TO TWO AREA INLETS TO BE CONSTRUCTED EAST OF THE PROPOSED BUILDING SITE. THE PEAK RUNOFF FROM ALL BASINS WHICH COLLECT AT INLET #1D IS 29.7 CUBIC FEET PER SECOND. THIS FLOW DRAINS TO A CURB INLET ON THE NORTH SIDE OF THE MAIN ENTRY.

DRAINAGE BASINS #3D & #6D TOTAL DRAINAGE AREA = 1.86 ACRES

THESE BASINS ARE COMPRISED OF PARKING LOT AND LANDSCAPING. RUNOFF FROM THIS BASIN WILL BE COLLECTED IN ONE AREA INLET AT THE CENTER OF THIS BASIN AND CONNECTED TO AN AREA INLET IN BASIN #2D. THE PEAK RUNOFF FROM ALL BASINS WHICH DRAIN FROM INLET #3D IS 10.94 C.F.S.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-16-93

BY HOF CKD

JOB NO. _____ SHEET NO. 2 OF 23

DRAINAGE BASIN #4D, #5D & #7D DRAINAGE AREA = 1.70 ACRES

DRAINAGE BASINS #4D, #5D & #7D CONSIST OF A POCTION OF THE PROPOSED FITNESS CENTER, AN ACCESS ROAD AND PARKING WEST OF THE BUILDING. RUNOFF FROM THIS DRAINAGE BASIN WILL BE COLLECTED IN AREA INLETS NORTH AND WEST OF THE BUILDING AND CONNECTED TO THE STORM SEWER SYSTEM IN BASIN #3D. THE TOTAL DEVELOPED PEAK RUNOFF FOR THESE BASIN'S IS 6.64 CUBIC FEET PER SECOND.

DRAINAGE BASIN #8D, #9D & #10D DRAINAGE AREA = 2.98 ACRES

THESE DRAINAGE BASINS ARE COMPRISED OF ONE-HALF OF THE PROPOSED FITNESS CENTER, PARKING AREA AND MAIN ACCESS DRIVE. RUNOFF FROM THIS DRAINAGE BASIN WILL BE COLLECTED IN 3 AREA INLETS AS DEPICTED ON THE ATTACHED SITE SKETCH PLAN AND CONVEYED TO THE STORM SEWER SYSTEM IN BASIN #1D. THE DEVELOPED PEAK RUNOFF FOR THIS BASIN IS 11.8 CUBIC FEET PER SECOND.

DRAINAGE BASINS #11D, #12D & 13D DRAINAGE AREA = 3.4 ACRES

THESE DRAINAGE BASINS CONSIST OF BUILDING, PARKING AND LANDSCAPING SURROUNDING THE SPECIALISTS MEDICAL OFFICE BUILDING. RUNOFF FROM THIS AREA WILL BE DIRECTED TO 3 AREA INLETS NORTH AND EAST OF THE BUILDING AND BE CONNECTED TO A CURB INLET ON THE SOUTH SIDE OF THE MAIN ENTRY. THE PEAK RUNOFF FROM DEVELOPED BASINS #11D, #12D AND #13D IS 13.3 CUBIC FEET PER SECOND.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-16-93

BY HOF CKD

JOB NO. ____ SHEET NO. 3 OF 23

DRAINAGE BASIN #14D & #15D

DRAINAGE AREA = 1.4 ACRES

THIS DRAINAGE BASIN CONSISTS OF THE MAIN ACCESS DRIVE WHICH SERVES THIS SITE. RUNOFF WILL BE COLLECTED IN TWO CURB INLETS CONSTRUCTED ON THE NORTH AND SOUTH SIDES OF THE MAIN ACCESS DRIVE AT THE INTERSECTION OF SOCORA. RUNOFF FROM THESE INLETS WILL BE CONVEYED TO A CURB INLET ON SOCORA. THE DEVELOPED PEAK RUNOFF FOR BASINS #14D AND #15D IS 3.13 CFS AND 2.34 CFS RESPECTIVELY. THE TOTAL DISCHARGE FROM INLET #15D IS 99 CFS.

DRAINAGE BASIN #16D

DRAINAGE AREA = 9.5 ACRES

RUNOFF FROM THE EXISTING AREA OF THIS DRAINAGE BASIN WILL REMAIN AS IT IS PRESENTLY. A COMBINATION OF SURFACE DRAINAGE AND STORM SEWER IS USED TO CONVEY RUNOFF TO AN EXISTING CURB INLET ON SOCORA AT THE SOUTHWEST CORNER OF THIS BASIN. RUNOFF FROM A RECENTLY COMPLETED BUILDING AND PARKING LOT EXPANSION TO THE EAST SIDE OF THE WEST WICHITA FAMILY PHYSICIANS BUILDING IS COLLECTED IN STORM SEWER WHICH IS CONNECTED TO THE CURB INLET ON SOCORA. THE UNDEVELOPED PORTION OF THIS BASIN WILL BECOME ADDITIONAL PARKING FOR THE EXISTING BUILDING. THIS AREA WILL SURFACE DRAIN TO THE EXISTING PARKING LOT AND BE CONVEYED TO SOCORA. THE DEVELOPED PEAK RUNOFF FROM THE ENTIRE BASIN FOR THE FIVE YEAR RETURN PERIOD IS 17.2 CUBIC FEET PER SECOND.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-16-93

BY _____ CKD _____

JOB NO. _____ SHEET NO. 4 OF 23

COMPUTATION OF PEAK RUNOFF DISCHARGES FROM DEVELOPED BASINS

DRAINAGE BASIN #1D & #2D D.A. = 1.77 ACRES

USE RATIONAL METHOD $Q = ciA$

① DETERMINE 'C' FACTOR

FROM ATTACH. D, DRAINAGE CRITERIA, CITY OF WICHITA, KS
FOR TYPE B & TYPE D SOILS

LAND USE
80% DRIVE, PARKING LOTS, WALKS C = 0.87
20% URBAN LAWN AREAS C = 0.33
WEIGHTED C = 0.2(.33) + 0.8(.87) = 0.76

② DETERMINE TIME OF CONCENTRATION "Tc"

FROM WORKSHEET NO. 3, Tc = 4.8 minutes, HOWEVER USE
Tc min = 15 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KANSAS

$i_5 = 5.21$"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = ciA = 0.75(5.21)(1.77 ac.)$ 6.9 CFS ←

5/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 9-16-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present Developed BASIN #1D & #2D

Circle one: T_c T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)	Segment ID	BASIN #2D			
1. Surface description (table 3-1)		SOIL/ ASPHALT			
2. Manning's roughness coeff., n (table 3-1)		.011			
3. Flow length, L (total L ≤ 300 ft)	ft	240'			
4. Two-yr 24-hr rainfall, P_2	in	3.4			
5. Land slope, s	ft/ft	.005			
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	.007	+		= .007
Shallow concentrated flow	Segment ID				
7. Surface description (paved or unpaved)					
8. Flow length, L	ft				
9. Watercourse slope, s	ft/ft				
10. Average velocity, V (figure 3-1)	ft/s				
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+		= ____
Channel flow	Segment ID	STORM SEWER			
12. Cross sectional flow area, a	ft^2				
13. Wetted perimeter, p_w	ft				
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft				
15. Channel slope, s	ft/ft	.005			
16. Manning's roughness coeff., n					
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s	3.0			
18. Flow length, L	ft	140'			
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	.01	+		= .01
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr				.08

4.8 minutes

use T_c = 15 minutes

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 9-16-93
BY HOF CKD
JOB NO. SHEET NO. 6 OF 23

DRAINAGE BASIN #3D & #6D D.A. = 1.86 ACRES

USE RATIONAL METHOD Q = CiA

① DETERMINE 'C' FACTOR

FROM ATTACH. 'D', DRAINAGE CRITERIA, CITY OF WICHITA, KS
FOR TYPE B SOILS

LAND USE

80% DRIVE, PARKING LOTS, WALKS C = 0.87
20% URBAN LAWN AREAS C = 0.22

WEIGHTED 'C' = 0.2(.22) + .8(.87) = 0.74

② DETERMINE TIME OF CONCENTRATION 'Tc'

FROM WORKSHEET #3, USE MINIMUM Tc = 15 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KS

i_5 = 5.21"/HR

④ CALCULATE PEAK DISCHARGE

Q_5 = CiA = 0.75(5.21)(1.86 ACRES) = 7.3 CFS ←

7/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HDF Date 9-16-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed) BASIN # 3D & #6D

Circle one: (T_c) T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID		
1. Surface description (table 3-1)		PAVED		
2. Manning's roughness coeff., n (table 3-1)		.011		
3. Flow length, L (total L ≤ 300 ft)	ft	150		
4. Two-yr 24-hr rainfall, P_2	in	3.4		
5. Land slope, s	ft/ft	.005		
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$ Compute T_t	hr	0.05	+	= 0.05

Shallow concentrated flow		Segment ID		
7. Surface description (paved or unpaved)				
8. Flow length, L	ft			
9. Watercourse slope, s	ft/ft			
10. Average velocity, V (figure 3-1)	ft/s			
11. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr		+	=

Channel flow		Segment ID		
		STORM SEWER		
12. Cross sectional flow area, a	ft^2			
13. Wetted perimeter, P_w	ft			
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r	ft			
15. Channel slope, s	ft/ft			
16. Manning's roughness coeff., n		.013		
17. $V = \frac{1.49\, r^{2/3}\, s^{1/2}}{n}$ Compute V	ft/s	3		
18. Flow length, L	ft	120'		
19. $T_t = \frac{L}{3600\, V}$ Compute T_t	hr	.011	+	= .011
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr			.061

3.7 min.

Use T_c = 15 min.

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 9-16-93
BY HOF CKD
JOB NO. SHEET NO. 8 OF 23

DRAINAGE BASIN #4D, #5D & #7D D.A. = 1.70 ACRES

USE RATIONAL METHOD $Q = CiA$

① DETERMINE 'C' FACTOR

FROM ATTACH. 'D', DRAINAGE CRITERIA, CITY OF WICHITA, KS
FOR TYPE B SOILS

LAND USE
80% DRIVE, PARKING LOTS, WALKS C = 0.87
20% URBAN LAWN AREAS C = 0.22

WEIGHTED 'C' = .2(.22) + .8(.87) = 0.75

② DETERMINE TIME OF CONCENTRATION 'T_C'

FROM WORKSHEET NO. 3, T_C = 7.2 min HOWEVER
USE T_C = 15 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KS

i_5 = 5.21"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = CiA = 0.75(5.21)(1.70) =$ 6.6 CFS ←

9/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 9-16-93

Location LOT 1, TWELVE ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed) BASIN #4D, #5D, & #7D

Circle one: (T_c) T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID	BASIN #7D			
1. Surface description (table 3-1)			PAVED			
2. Manning's roughness coeff., n (table 3-1)			.011			
3. Flow length, L (total L ≤ 300 ft)	ft		300'			
4. Two-yr 24-hr rainfall, P_2	in		3.4			
5. Land slope, s	ft/ft		.005			
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$	hr	Compute T_t	0.08	+		= .08
Shallow concentrated flow		Segment ID				
7. Surface description (paved or unpaved)						
8. Flow length, L	ft					
9. Watercourse slope, s	ft/ft					
10. Average velocity, V (figure 3-1)	ft/s					
11. $T_t = \frac{L}{3600\ V}$	hr	Compute T_t		+		=
Channel flow		Segment ID	STORM SEWER			
12. Cross sectional flow area, a	ft^2					
13. Wetted perimeter, P_w	ft					
14. Hydraulic radius, $r = \frac{a}{P_w}$	ft	Compute r				
15. Channel slope, s	ft/ft					
16. Manning's roughness coeff., n			.013			
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$	ft/s	Compute V	3			
18. Flow length, L	ft		280'			
19. $T_t = \frac{L}{3600\ V}$	hr	Compute T_t	.03	+		= .03
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr					0.11

7.2 min.

Use Tc = 15 min.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-16-93

BY HLOF CKD

JOB NO. ____ SHEET NO. 10 OF 23

DRAINAGE BASIN #8D, #9D & #10D D.A. = 2.9 ACRES

USE RATIONAL METHOD $Q = CiA$

① DETERMINE 'C' FACTOR

FROM ATTACH 'D' DRAINAGE CRITERIA, CITY OF WICHITA, KS
FOR TYPE C SOILS & TYPE D SOILS

LAND USE 80% DRIVE, PARKING LOTS, WALKS $C_5 = 0.87$
20% URBAN LAWN AREAS $C_5 = 0.22$
$C_5 = 0.33$

weighted $C = 0.2\left(\frac{.22+.33}{2}\right) + .8(.87) = 0.75$

② DETERMINE TIME OF CONCENTRATION 'T_C'

USE MIN. T_C = 15 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KS

$i_5 = 5.21$"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = C_5 i A = 0.75(5.21)(2.9) = 11.3$ CFS ←

11/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 9-16-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present ~~Developed~~ BASIN # 8D, #9D & #10D

Circle one: T_c T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID	BASIN #8D	
1. Surface description (table 3-1)			PAVED	
2. Manning's roughness coeff., n (table 3-1)			.011	
3. Flow length, L (total L ≤ 300 ft)	ft		300	
4. Two-yr 24-hr rainfall, P_2	in		3.4	
5. Land slope, s	ft/ft		.005	
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$	hr	Compute T_t	0.08 +	= 0.08

Shallow concentrated flow		Segment ID		
7. Surface description (paved or unpaved)				
8. Flow length, L	ft			
9. Watercourse slope, s	ft/ft			
10. Average velocity, V (figure 3-1)	ft/s			
11. $T_t = \frac{L}{3600\ V}$	hr	Compute T_t	+	=

Channel flow		Segment ID	STORM SEWER	
12. Cross sectional flow area, a	ft^2			
13. Wetted perimeter, P_w	ft			
14. Hydraulic radius, $r = \frac{a}{P_w}$	ft	Compute r		
15. Channel slope, s	ft/ft			
16. Manning's roughness coeff., n			.013	
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$	ft/s	Compute V	3	
18. Flow length, L	ft		944	
19. $T_t = \frac{L}{3600\ V}$	hr	Compute T_t	.04 +	= 0.04
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr			0.12

7.2 minutes use Tc = 15 minutes

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Tyler Acres 6th Addition

CLIENT: SPSA Architects

DATE 9-16-93

BY HOF CKD

JOB NO. _____ SHEET NO. 12 OF 23

DRAINAGE BASIN #11D, #12D & #13D D.A. = 3.40 ACRES

USE RATIONAL METHOD Q = CiA

① DETERMINE 'C' FACTOR

FROM ATTACH D, DRAINAGE CRITERIA, CITY OF WICHITA, KS
FOR TYPE B & TYPE D SOILS

LAND USE 80% DRIVE, PARKING LOTS, WALKS C = 0.87
20% URBAN LAWN AREAS C = 0.33

weighted 'C' = 0.2(0.33) + 0.8(0.87) = 0.76

② DETERMINE TIME OF CONCENTRATION "Tc"

FROM WORKSHEET No. 3, Tc = 7 minutes
However use Tc = 15 minutes

③ FIND INTENSITY, i_5 From rainfall intensity table for Sedgwick County, Kansas

i_5 = 5.21"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = CiA = (0.75)(5.21)(3.4 AC.) = 13.3$ CFS ←

13/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By AOC Date 9-16-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed) BASIN #11D, #12D & #13D

Circle one: (T_c) T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID				
1. Surface description (table 3-1)			PAVED			
2. Manning's roughness coeff., n (table 3-1) ..			.011			
3. Flow length, L (total L ≤ 300 ft)	ft		150'			
4. Two-yr 24-hr rainfall, P_2	in		3.4'			
5. Land slope, s	ft/ft		.005			
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr		.091	+		= .05
Shallow concentrated flow		Segment ID				
7. Surface description (paved or unpaved)						
8. Flow length, L	ft					
9. Watercourse slope, s	ft/ft					
10. Average velocity, V (figure 3-1)	ft/s					
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr			+		= —
Channel flow		Segment ID	STORM SEWER			
12. Cross sectional flow area, a	ft^2					
13. Wetted perimeter, p_w	ft					
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft					
15. Channel slope, s	ft/ft					
16. Manning's roughness coeff., n			.013			
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s		3			
18. Flow length, L	ft		698			
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		.06	+		= .06
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr					0.11

7 minutes
use T_c = 15 minutes

PROJECT: WEST WICHITA MEDICAL PARK	DATE 9-16-93
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION	BY HOF CKD
CLIENT: SPSH ARCHITECTS	JOB NO. SHEET NO. 14 OF 23

DRAINAGE BASIN #10D & #15D D.A. = 1.4 ACRES

① DETERMINE 'C' FACTOR

FROM ATTACH. 'D' DRAINAGE CRITERIA, CITY OF WICHITA, KS FOR TYPE B & D SOILS

LAND USE 80% ORIG, PARKING LOTS, WALKS $C_5 = 0.87$
20% URBAN LAND AREA $C_5 = 0.22$ TYPE B
$C_5 = 0.33$ TYPE D

WEIGHTED 'C' = $0.2\left(\frac{.22+.33}{2}\right) + .8(.87) = 0.75$

② DETERMINE TIME OF CONCENTRATION 'Tc'

FROM WORKSHEET No. 3, Tc = 15 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KS

$i_5 = 5.21$"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = C_5 i_5 A = 0.75(5.21)(1.4 AC) = 5.5$ CFS

15/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 9-16-93

Location LOT 1, THREE ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed) BASINS #1 & #2 = #15D

Circle one: (T_c) T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID		
1. Surface description (table 3-1)		PAVD		
2. Manning's roughness coeff., n (table 3-1)		.011		
3. Flow length, L (total L ≤ 300 ft)	ft	200'		
4. Two-yr 24-hr rainfall, P_2	in	3.4		
5. Land slope, s	ft/ft	.005		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t	hr	.08	+	= .08

Shallow concentrated flow		Segment ID		
7. Surface description (paved or unpaved)				
8. Flow length, L	ft			
9. Watercourse slope, s	ft/ft			
10. Average velocity, V (figure 3-1)	ft/s			
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+	=

Channel flow		Segment ID		
		GUTTER FLOW		
12. Cross sectional flow area, a	ft^2			
13. Wetted perimeter, P_w	ft			
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r	ft			
15. Channel slope, s	ft/ft			
16. Manning's roughness coeff., n		.013		
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s	3		
18. Flow length, L	ft	550'		
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	.05	+	= .05
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr			.13

T_c = 7.8 min.

Use T_c = 15 min.

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSH ARCHITECTS

DATE 9-16-93
BY HOF CKD
JOB NO. SHEET NO. 16 OF 23

DRAINAGE BASIN #16D AREA = 4.5 ACRES

① DETERMINE 'C' FACTOR

FROM ATTACH. 'D' DRAINAGE CRITERIA, CITY OF WICHITA, KS FOR TYPE B & D SOILS

LAND USE 80% ROOF, PARKING LOTS, WALK ETC. $C_5 = 0.87$
20% URBAN LAWN AREAS $C_5 = 0.22$ TYPE B
$C_5 = 0.33$ TYPE D

weighted 'C' $= 0.2\left(\frac{.22+.33}{2}\right) + .8(.87) = 0.75$

② DETERMINE TIME OF CONCENTRATION 'Tc'

Use min. Tc = 15 minutes

③ FIND INTENSITY, i_5 FROM RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KS

$i_5 = 5.21$"/HR

④ CALCULATE PEAK DISCHARGE

$Q_5 = C_5 i_5 A = 0.75(5.21)(4.5 ac.) = \underline{17.6 \text{ CFS}}$ ←

17/23

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project WEST WICHITA MEDICAL PARK By HOF Date 9-16-93

Location LOT 1, TYLER ACRES 6TH ADDITION Checked ____ Date ____

Circle one: Present (Developed) BASIN #1 & D

Circle one: T_c T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)		Segment ID				
1. Surface description (table 3-1)		PAVED				
2. Manning's roughness coeff., n (table 3-1) ..		.011				
3. Flow length, L (total L ≤ 300 ft)	ft	150				
4. Two-yr 24-hr rainfall, P_2	in	3.4				
5. Land slope, s	ft/ft	.005				
6. $T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$ Compute T_t	hr	.08	+		=	.047
Shallow concentrated flow		Segment ID				
7. Surface description (paved or unpaved)		PAVED				
8. Flow length, L	ft	300'				
9. Watercourse slope, s	ft/ft	.005				
10. Average velocity, V (figure 3-1)	ft/s	1.0				
11. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr	.083	+		=	.083
Channel flow		Segment ID				
12. Cross sectional flow area, a	ft^2					
13. Wetted perimeter, p_w	ft					
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft					
15. Channel slope, s	ft/ft					
16. Manning's roughness coeff., n						
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V	ft/s					
18. Flow length, L	ft					
19. $T_t = \frac{L}{3600\ V}$ Compute T_t	hr		+		=	—
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr					013

7.8 minutes

Use T_c = 15 minutes

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SBA ARCHITECTS

DATE 9-16-93

BY HOP CKD

JOB NO. ____ SHEET NO. 18 OF 23

SUMMARY

EXISTING STORM SEWER SYSTEM LIMITS RUNOFF DISCHARGE FROM DEVELOPED PROJECT SITE

AN EXISTING 30"x19" RCPHE CROSSES SOCORA FROM A CURB INLET LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF SOCORA AND CENTRAL AVENUE. THE HYDRAULIC CAPACITY OF THIS STORM SEWER IS 15 CUBIC FEET PER SECOND. THIS IS THE MAXIMUM DISCHARGE WHICH CITY OF WICHITA ENGINEERING STAFF WILL PERMIT FOR THE FIVE YEAR DEVELOPED RUNOFF. FROM PREVIOUS COMPUTATIONS THE TOTAL PEAK DISCHARGE FROM THE DEVELOPED PROJECT SITE IS AS FOLLOWS:

DRAINAGE BASIN	DEVELOPED 5 YEAR PEAK DISCHARGE
#1D, #2D	6.9 CFS
#3D, #6D	7.3 CFS
#4D, #5D, #7D	6.6 CFS
#8D, #9D, #10D	11.3 CFS
#11D, #12D, #13D	13.3 CFS
#14D, #15D	5.5 CFS
#16D	17.6 CFS
	68.5 CFS

> EXISTING STORM SEWER 5 YEAR CAPACITY = 15 CFS

THE INFORMATION ON THE FOLLOWING SHEETS WAS OBTAINED FROM THE CITY OF WICHITA AND USED TO EVALUATE THE CAPACITY OF THE EXISTING STORM SEWER CROSSING SOCORA.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SOSH ARCHITECTS

DATE 9-16-93

BY HOF CKD

JOB NO. SHEET NO. 19 OF 23

SUMMARY (CON'T.)

SINCE THE DEVELOPED PEAK DISCHARGE FROM THIS SITE FOR THE FIVE YEAR STORM DESIGN EXCEEDS THE CAPACITY OF THE EXISTING STORM SEWER SYSTEM THE CITY OF WICHITA REQUIRES DETENTION STORAGE. AN ANALYSIS WAS MADE TO DETERMINE THE SIZE OF THE REQUIRED DETENTION FACILITY. THIS INFORMATION ALONG WITH A PRELIMINARY SKETCH PLAN FOR THE DETENTION FACILITY IS PRESENTED IN THE APPENDIX.

AS AN ALTERNATIVE TO CONSTRUCTION OF A DETENTION POND FOR THIS SITE THE CONSTRUCTION OF A STORM SEWER SYSTEM ADEQUATE TO HANDLE THE DEVELOPED FIVE YEAR PEAK DISCHARGE WAS STUDIED. AN EXISTING OPEN CHANNEL EXISTS ON THE SOUTH SIDE OF CENTRAL AVENUE APPROXIMATELY 700 FEET WEST OF THE INTERSECTION OF SOCORA AND CENTRAL AVENUE. THIS OPEN CHANNEL WOULD PROVIDE THE OUTLET FOR A STORM SEWER SYSTEM. THIS ALTERNATIVE WOULD REQUIRE THE INSTALLATION OF 700 FEET OF STORM SEWER ALONG THE SOUTH SIDE OF CENTRAL AVENUE RIGHT-OF-WAY TO A POINT ON THE EAST SIDE OF SOCORA. STORM SEWER WOULD THEN HAVE TO BE JACKED UNDER CENTRAL AVENUE FROM THE SOUTH SIDE TO THE NORTH SIDE. STORM SEWER WOULD THEN BE EXTENDED APPROXIMATELY 800 FEET NORTH ALONG THE EAST SIDE OF SOCORA. STORM SEWER FROM THE DEVELOPED SITE WOULD THEN BE CONNECTED WITH THE STORM SEWER IN SOCORA.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

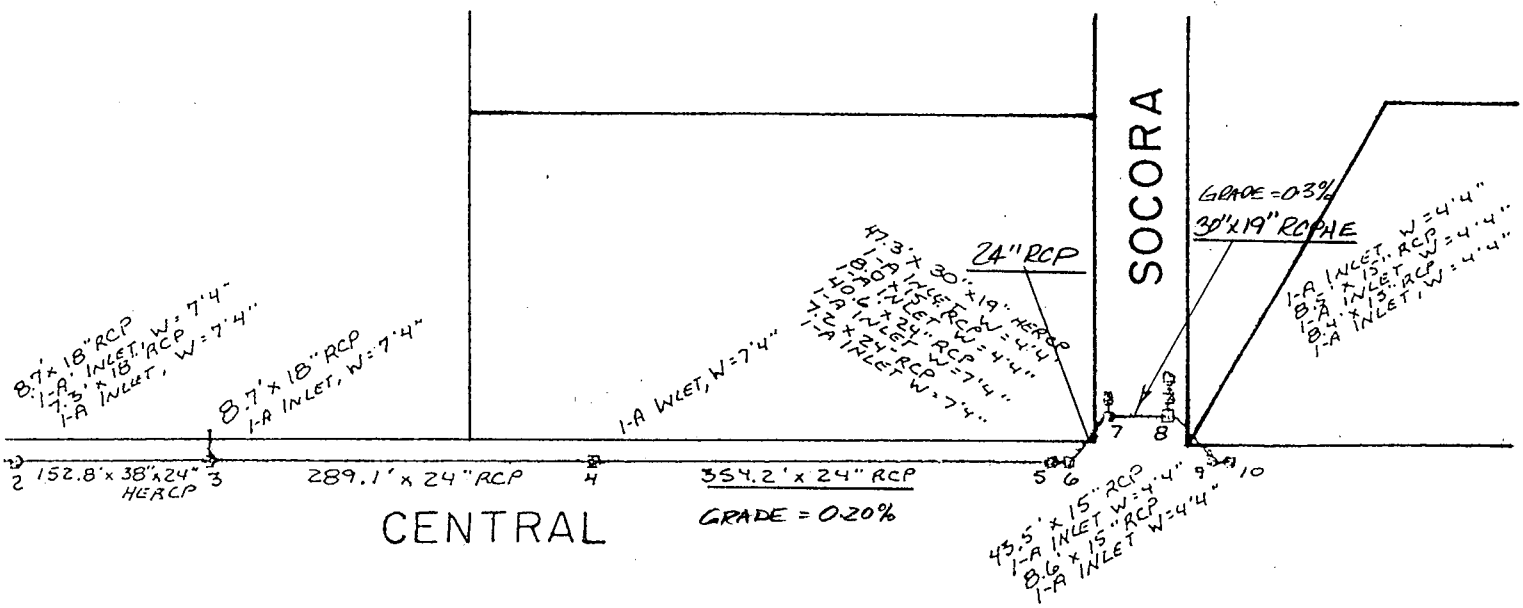
DATE 9-16-93

BY HOF CKD

JOB NO. ____ SHEET NO. 20 OF 23

SUMMARY (CONT.)

THE OWNER OF THIS SITE DETERMINED THAT THE ALTERNATIVE OF INSTALLING A NEW STORM SEWER SYSTEM IS THE MOST DESIRABLE SOLUTION. THEREFORE, THE DRAINAGE SYSTEM FOR THIS SITE WILL BE DIVIDED INTO TWO PARTS. STORM SEWER ON THE DEVELOPING SITE WILL BE CONSTRUCTED AS PART OF SITE IMPROVEMENTS. THE OWNER OF THIS SITE WILL ALSO PETITION THE CITY AND PROVIDE THE ENGINEERING PLANS FOR THE CONSTRUCTION OF THE NEW STORM SEWER SYSTEM PREVIOUSLY DESCRIBED. THIS PROJECT WILL BE UNDERTAKEN AS A PRIVATE IMPROVEMENT PROJECT WITH THE CITY FINANCING THE COST AND SPECIAL ASSESSING THIS COST TO THE OWNER OF LOT 1, TYLER ACRES 6TH ADDITION.



ID Cypress Ct. In Hedgecliff Fourth Addn.

=100'

472-76-245-81140-000-000-001

W.B. CARTER CONST. CO. INC.

BOOKED: 10-5-84, BOOK: BR 74

STREET	MANHOLES KIND	No.	GRADE	DEPTH	CATCH BASIN INLETS NORTHWEST SIZE	KIND	NORTHEAST SIZE	KIND	SOUTHWEST SIZE	KIND	SO SI
SWS 252											
	I-A INLET	1	146.51	142.9							
	I-A INLET	2	146.57	142.96							
	I-A INLET	3	146.41	143.26							
	I-A INLET	4	147.26	143.89							
	I-A INLET	5	147.78	144.48							
	I-A INLET	6	147.90	144.67							
	I-A INLET	7	148.47	144.67	4'4" A	I-A					
	I-A INLET	8	148.65	144.81	4'4" A	I-A	4'4" B	I-A			
	I-A INLET	9	148.77	146.02							
	I-A INLET	10	148.74	145.12							
I.D. Cypress Ct.	END SECTION	1		158.62							
	I-A INLET	2	166.25	160.07							

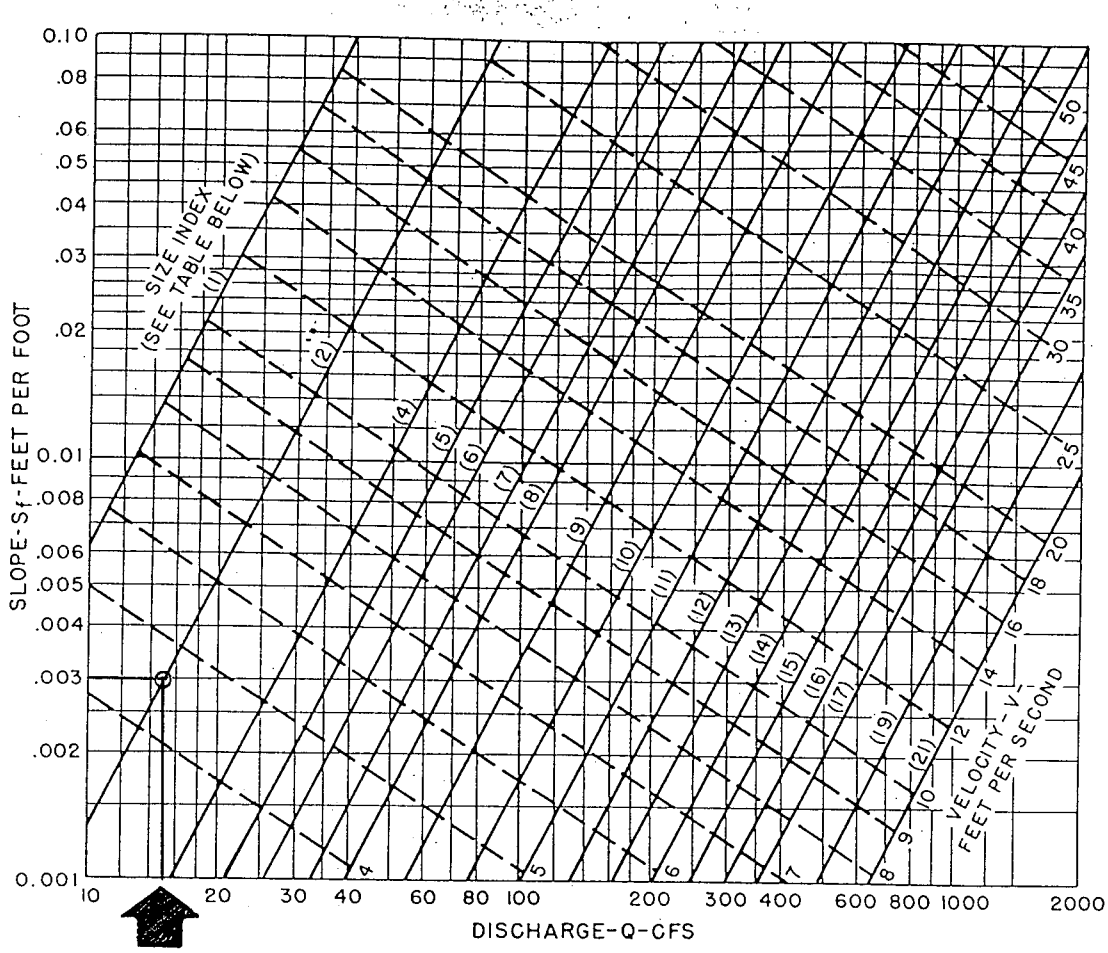
DROP=0.3' GRADE=0.3'/152.8' = .002
DROP=0.63' GRADE=.63'/269.1' = .002
DROP=0.59' GRADE=.59'/345' = .002
DROP=0.14' GRADE=0.14'/47.3' = .003

#20043 2/3/88 8304 to Central N/C Catch Basin S 9.7% No

NUMBER				
SWS 259				
Line 1	END SECTION	1		195.52
	REINF. CONC. MH	2	203.72	197.12
	AREA INLET 4'x2'	3	210.01	202.91
	I-A INLET, W=4'4"	4	210.12	204.29
	I-A INLET, W=4'4"	5	210.80	204.65

CHART 74

23/23



$Q_{CAP} = 15 CFS$

TABLE OF SIZES

(1) 23"x 14"	(8) 53"x 34"	(14) 98" x 63"
(2) 30"x 19"	(9) 60"x 38"	(15) 106" x 68"
(4) 38"x 24"	(10) 68"x 43"	(16) 113"x 72"
(5) 42"x 27"	(11) 76"x 48"	(17) 121" x 77"
(6) 45"x 29"	(12) 83"x 53"	(19) 136" x 87"
(7) 49"x 32"	(13) 91" x 58"	(21) 151" x 97"

OVAL CONCRETE PIPE
FRICTION SLOPE FLOWING FULL
n = 0.011

697083 O—61——7

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1 TYLER ACRES 1ST ADDITION

CLIENT: SOSH ARCHITECTS

DATE 9-24-93

BY HOF CKD

JOB NO. SHEET NO. 1 OF 22

DESIGN OF PRIVATE STORM SEWER FOR SITE DEVELOPMENT OF WEST WICHITA MEDICAL PARK AND DESIGN OF PUBLIC STORM SEWER FOR SOCORA AND CENTRAL AVENUE TO DRAIN THIS DEVELOPMENT

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-20-93

BY HOF CKD

JOB NO. ____ SHEET NO. 2 OF 22

ANALYSIS FOR AREA INLETS FOR ON SITE STORM SEWER

EVALUATE CAPACITY OF DROP INLET IN A SUMP

FOR DROP INLET w/ 2 - Deeter #2433 GRATES & Deeter #2439 FRAME

AREA OF OPENING = 184 sq.in x 2 = 368 sq.in

CALCULATE INTERCEPTION CAPACITY of grate inlet operating as a weir:

$Q_i = C_w P d^{1.5}$ $\quad P = \frac{21.75"}{12} + 4' + \frac{21.75"}{12} + 4' = 11.63'$

$= 3.0(11.63')d^{1.5}$

FOR depth = 6" $\quad Q_i = 3.0(11.63)(.5)^{1.5} = 12.34$ CFS

CALCULATE INT. CAPACITY OF grate inlet operating as an orifice

$Q_i = C_o A(2gd)^{0.5} =$

$= 0.67\left(\frac{368^{\square"}}{144}\right)(2(32.2)(.5))^{0.5} = 9.72$ CFS

USE THE SMALLER OF THESE $\therefore$ $Q_i = 9.72$ CFS

CHECK Q_i @ depth = 3"

$Q_i = 0.67\left(\frac{368^{\square"}}{144}\right)(2(32.2)(.25))^{0.5} = 6.9$ CFS

IF WE ASSUME 50% CLOGGING $Q_i = 3.5$ CFS

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Tyler Acres Commercial Addition

CLIENT: SFSH Architect

DATE 9-20-93

BY HDF CKD

JOB NO. _____ SHEET NO. 3 OF 22

Evaluate Interception Capacity of Inlet for Basin #6D

DRAINAGE AREA = 1.10

Assume t_c = 15 min
i_5 = 5.21"/Hr

$Q_5 = 0.75(5.21)(1.10 \text{ AC.}) = 4.30 \text{ CFS}$

Determine depth of ponding at Inlet #6D assuming 50% clogging

$Q_i = C_o A (2g d)^{0.5} = \frac{4.30}{0.5} = 0.67\left(\frac{368}{144}\right)(2(32.2)d)^{0.5}$

$d = 0.39' = 4.70"$

Evaluate Interception Capacity of Inlets for Basin #5D & #7D

D.A. = 1.10 ACRES Assume T_c = 15 min i_5 = 5.21"/Hr

$Q_5 = 0.75(5.21)(1.10) = 4.30 \text{ CFS}$

Determine Depth of Ponding at Inlet #5D & #7D assuming 50% clog

$Q_i = \frac{4.30}{0.5} = 0.67\left(\frac{368}{144}\right)(2(32.2)d)^{0.5}$

$d = 0.39' = 4.70"$

Evaluate Interception Capacity of Inlet for Basin #4D

D.A. = 0.60 AC.

$Q_5 = 0.75(5.21)(0.60) = 2.34 \text{ CFS}$

Determine Depth of Ponding at Inlet #4D assuming 50% clog

$Q_i = \frac{2.34}{0.5} = 0.67\left(\frac{368}{144}\right)(2(32.2)d)^{0.5}$

$d = 0.12' = 1.40"$

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Tyler Acres Low Addition

CLIENT: SBSH Architects

DATE 9-20-93

BY HDF CKD

JOB NO. ____ SHEET NO. 4 OF 22

Evaluate Interception Capacity of Inlet for Basin #3D

D.A. = 0.76 acres

$Q_5 = 0.75(5.21)(0.76) = 2.97$ cfs

Determine depth of ponding at Inlet #3D at 50% clogging

$Q_i = \frac{2.97}{0.5} = 0.67\left(\frac{36.8}{19.9}\right)(2(32.2)(d))^{0.5}$

$d = 0.187' = 2.25''$

Size storm sewer from Inlet #5D to Inlet #4D

Q @ #5D = 4.30 cfs

From HOS #3 Chart 53 Use 15" RCP @ 0.38%

Size storm sewer from Inlet #4D to Inlet #3D

$Q_T = 4.30 + 2.34 = 6.64$ cfs

From HOS #3 Chart 53 Use 18" RCP @ 0.33%

Size storm sewer from Inlet #6D to Inlet #3D

Q = 4.30 cfs

From HOS #3 Chart 53 Use 15" RCP @ 0.38%

Size storm sewer from Inlet #3D to Inlet #2D

Q = 4.30 + 2.34 + 4.30 = 10.94 cfs

From HOS #3 Chart 53 Use 21" @ 0.42%

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, True Acres 6th Addition

CLIENT: SPSH Architects

DATE 9.20-93

BY HOF CKD

JOB NO. SHEET NO. 5 OF 22

Evaluate Interception Capacity for Inlet for Basin #1D

D.A.= 0.83 Acres i_5 = 5.21"/Hr

Q_5 = 0.75(5.21)(0.83) = 3.24 cfs

Determine Depth of Ponding @ Inlet #1D

$Q_i = \frac{3.24}{0.5} = 0.67\left(\frac{3.68}{144}\right)(2132.2\,d)^{0.5}$

d = 2.68"

Evaluate Interception Capacity for Inlet #2D

D.A.= 0.94 Ac. i_5 = 5.21"/Hr

Q_5 = 0.75(5.21)(0.94) = 3.67 cfs

Determine Depth of Ponding @ Inlet #2D

$Q_i = \frac{3.67}{0.5} = 0.67\left(\frac{3.68}{144}\right)(2132.2\,d)^{0.5}$

d = 3.4"

Size storm sewer from Inlet #2D to #1D

Q = 3.67 cfs + 10.94 cfs = 14.61 cfs ← Use this to size storm sewer from Inlet #1D

From H.D.S #3 Chart 53 Use 24" RCP @ 0.40%

Size storm sewer from Inlet #1D to curb inlet on Socora

(For Inlet #10D see following calc's.)

Q = 14.61 cfs + 3.24 cfs (Inlet #1D) + 11.8 cfs (Inlet #10D) = 29.7 cfs

Use @ 30" @ 0.46% ← Use 30" Q_{cap} = 30 cfs

or

@ 33" @ 0.29%

PROJECT: West Wichita Family Physicians

LOCATION: Lot 1, Tyler Acres 6th Addition

CLIENT: SPSH Architects

DATE 9-20-93

BY HOF CKD

JOB NO. ____ SHEET NO. 6 OF 22

Area Inlet for Basin #8D

Compute Drainage Area for this Inlet

Use D.A. = 1.10 Acre

$Q_5 = CiA = 0.75(5.21"/hr)(1.10 AC) = 4.3$ cfs

At what depth will $Q_i = 4.3$ cfs

Try 5": Using orifice flow equation

$Q_i = C \cdot A (2gd)^{0.5} = 0.67\left(\frac{368}{144}\right)(2)(32.2)\left(\frac{5"}{12}\right)^{.5} = 8.9$ cfs

Assume 50% clogging $Q_i = 4.4$ cfs

Try 4.5"

$Q_i = 0.67\left(\frac{368}{144}\right)(2)(32.2)\left(\frac{4.5}{12}\right)^{.5} = 8.4$ cfs

Assume 50% clogging $Q_i = 4.2$ cfs

A ponding depth of approximately 4.75" will occur, therefore additional area inlet on the east side of the fitness center building to reduce this ponding depth.

Area Inlet for Basin #9D

Compute D.A. for this inlet

From AutoCAD drawing Area = 1.15 Acres

$Q_5 = 0.75(5.21)(1.15 AC) = 4.5$ cfs

At what depth will $Q_i = 4.5$ cfs w/ 50% clogging

$Q_i = 0.67\left(\frac{368}{144}\right)(2)(32.2)\left(\frac{d"}{12}\right)^{0.5} = (4.5 cfs)2$

$d = 5"$

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Three Acres 6th Addition

CLIENT:

DATE 9-20-93

BY HOL CKD

JOB NO. SHEET NO. 7 OF 22

Area Inlet for Basin #10D

D.A. = 0.73 Acres Assume t_c = 15 min, i_5 = 5.21"/Hr

Q_5 = 0.75(5.21)(0.73) = 2.85 cfs

Determine Depth of Ponding at Inlet Assuming 50% Clogging

$$Q_i = \frac{2.85}{0.5} = 0.67\left(\frac{3.48}{10.4}\right)\left(2(32.2)\left(\frac{d}{12}\right)\right)^{0.5}$$

d = 2.1"

Storm Sewer Design for Basin #8D, #9D & #10D

Size Storm Sewer from Inlet #8D

Q_5 = 4.3 cfs

From HDS #3 Chart #53 for 15" RCP min. rigid slope = 0.30% Use 15"

Size Storm Sewer from Inlet #9D

Q_5 = 4.3 cfs + 4.5 cfs = 8.8 cfs

From HDS #3, Chart #53, The Required RCP size =

18" RCP @ 0.6%

or

21" RCP @ 0.26% Use 21"

Size Storm Sewer from Inlet #10D

Q_5 = 8.8 cfs + 2.9 cfs = 11.8 cfs Use this to size storm sewer from Inlet #10D

From HDS #3, Chart #53, the rigid RCP size is:

21" RCP @ 0.55%

or

24" RCP @ 0.26% Use 24"

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Tyler Acres 6th Addition

CLIENT: SBH Architects

DATE 9-20-93

BY HOF CKD

JOB NO. SHEET NO. 8 OF 22

Evaluate Interception Capacity of Inlet for Basin #11D

D.A. = 1.05 acres C = 5.21"/Hr

$Q_5 = 0.75(5.21)(1.05) = 4.10$ cfs

Determine Depth of Ponding @ Inlet #11D assuming 50% Clogged

$$Q_i = \frac{4.10}{0.5} = 0.67\left(\frac{368}{144}\right)\left(2(32.2)(d)\right)^{0.5} =$$

$d = 0.36' = 4.3"$

Evaluate Interception Capacity for Inlet for Basin #12D

D.A. = 1.12 acres C = 5.21"/Hr

$Q_5 = 0.75(5.21)(1.12) = 4.38$ cfs

Determine Depth Ponding @ Inlet #12D assume 50% Clogged

$$Q_i = \frac{4.38}{0.5} = 0.67\left(\frac{368}{144}\right)\left(2(32.2)(d)\right)^{0.5} =$$

$d = 0.41' = 4.9"$

Evaluate Interception Capacity for Inlet for Basin #13D

D.A. = 1.23 ac. C = 5.21"/Hr

$Q_5 = 0.75(5.21)(1.23) = 4.81$ cfs

Determine Depth of Ponding @ Inlet #13D

$$Q_i = \frac{4.81}{0.5} = 0.67\left(\frac{368}{144}\right)\left(2(32.2)(d)\right)^{0.5}$$

$d = 0.49' = 5.9"$

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Tyler Acres 6th Addition

CLIENT: CPSH Architects

DATE 9-20-93

BY HOP CKD

JOB NO. SHEET NO. 9 OF 22

Evaluate Interception capacity for curb inlet for Basin #14D

D.A. = 0.80 Acres Assume Tc = 15 min i_5 = 5.21"/Hr

$Q_5 = 0.75(5.21)(0.80) = 3.13$ cfs $Q_n = (3.13)(.013) = 0.04$

Determine capacity of Type 1A Inlet in a Sag

For Q_n = 0.04 T/W = 35 T = 3.5(1.75') = 6.13'

For Q_5 & S_x T_5 = 7.6'

E_o = 0.68

$Q_s = Q(1-E_o) = (3.13)(1-0.68) = 1.00$ ft³/s

T = 5 D = 5'(.04167) = 0.21' @ Lip of Gutter

D @ 2 = 0.21' + 2"/12 = 0.38'

From HEC 12 Compute Inlet capacity of City Type 1A Inlet L = 6'-9"

$Q_i = C_w(L + 1.8W)d^{1.5}$

$= 2.3(5.0' + 1.8(1.75'))(0.38)^{1.5}$

Q_i = 4.39 cfs > 3.13 cfs ∴ 100 % Interception

Evaluate Interception capacity for curb inlet for Basin #15D

D.A. = 0.60 Acres Assume Tc = 15 minutes, i_5 = 5.21"/Hr

$Q_5 = 0.75(5.21)(0.60) = 2.34$ cfs

From previous computations a Type 1A curb Inlet with L. 6'-9" will have Q_i = 4.0-4.5 cfs for approach flow and will intercept 100% of flow to the inlet on grade. However, the inlet may be located on a grade so analyze the interception capacity of a Type 1A inlet on grade

PROJECT: West Wichita Medical Park

LOCATION: Lot 1, Tyler Acres 6th Addition

CLIENT: SOSH Architects

DATE 9-21-93

BY HOC CKD

JOB NO. SHEET NO. 10 OF 22

CAPACITY OF CURB INLET ON GRADE

Composite Length required for total interception of inlet on grade

$$L_T = K Q^{0.42} S^{0.3} \left(\frac{1}{n S_e}\right)^{0.6}$$

$$L_T = 0.6 (3.13)^{0.42} (.003)^{0.3} \left(\frac{1}{(.013)(.106)}\right)^{0.6} = 7.79 \text{ ft}$$

$E_o = 2.13 / 3.13 = 0.68$

$S_w' = 2"/12 (1.75') = 0.095$

$S_e = .04167 + .095(.68) = 0.106$

USE CITY OF WICHITA TYPE 1A INLET WITH 6" x 10'-0" OPENING

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-20-93

BY HOF CKD

JOB NO. ____ SHEET NO. 11 OF 22

SIZE STORM SEWER FROM INLET #11D

Q_5 = 4.10 CFS USE 15" RCP @ 0.35%

SIZE STORM SEWER FROM INLET #12D

Q_5 = 4.10 CFS + 4.38 CFS = 8.48 CFS

18" RCP @ 0.6%

OR

21" RCP @ 0.26%

SIZE STORM SEWER FROM INLET #13D

Q_5 = 4.10 + 4.38 + 4.81 = 13.29 CFS

USE 21" RCP @ 0.50%

OR

USE 24" RCP @ 0.30% ← USE 24" RCP

SIZE STORM SEWER FROM CURB INLET FOR D.A. #14D

Q_5 = 3.13 CFS + 29.7 CFS (FROM INLET #1D) = 32.8 CFS

USE 36" RCP @ 0.30%, Q_{CAP} = 40 CFS ← USE 36" RCP

SIZE STORM SEWER FROM CURB INLET FOR D.A. #15D

Q_5 = 32.8 CFS + 13.3 CFS (FROM INLET #13D) + 2.34 CFS (D.A. #15D) = 49 CFS

CHECK 36" RCP @ 0.50% Q_{CAP} = 51 CFS

OR

CHECK 42" RCP @ 0.24% Q_{CAP} = 50 CFS

THE SIZE REQUIRED WILL BE DETERMINED BY THE SLOPE WHICH CAN BE OBTAINED FOR THE STORM SEWER WHICH OUTLETS THE CURB INLET ON THE SOUTH SIDE OF THE MAIN ENTRY AND SOCORA INTERSECTION.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-24-93

BY _____ CKD _____

JOB NO. _____ SHEET NO. 12 OF 22

SIZE STORM SEWER REQUIRED FOR 5 YEAR DESIGN FLOW FROM CURB INLET AT N.E. CORNER OF SOCORA AND CENTRAL

Q_5 = 49 CFS + 17.2 CFS (BASIN #100) = 66.2 CFS

FROM HDS #5 CHART #53

48" RCP @ 0.18% REQUIRED SLOPE

OR

42" RCP @ 0.36% REQUIRED SLOPE ~~=~~ = USE 42" RCP TO CROSS CENTRAL AVE.

FL @ CHANNEL = 139.75
+ (33') (.0018'/') = 0.12
FL OUT M.H. = 139.87
+ 0.10' DROP = 0.10
FL IN M.H. = 139.97
+ (612') (0.18') = 1.08
FL OUT M.H. = 141.05
+ 0.4' DROP 0.40
FL IN M.H. = 141.45
+ (138') (.0036'/') = 0.50
FL OUT INLET = 141.95
+ 0.10' = 142.05
+ (523') (.0051) = 2.60
FL OUT INLET = 144.70
@ SOCORA = MAIN ENTRANCE

DETERMINE CLEARANCE FROM TOP OF 42" RCP STORM SEWER TO BOTTOM OF PAVEMENT AT NE COR. SOCORA & CENTRAL AVE.

TOP OF CURB EL. = 148.0 ±
- 1.0' (TO BOTTOM OF PAVEMENT) = 1.0'
TOP OF 42" STORM SEWER =
141.45 + 117' (.0036'/') + 3.88' =
(FL) + (SLOPE) + ('T') = 145.75

CLEARANCE = 1.69'

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: Lot 1, TYLER ACRES 6TH ADDITION

CLIENT: SASH ARCHITECTS

DATE 9-24-93

BY HOF CKD

JOB NO. SHEET NO. 13 OF 22

CHECK 100 YEAR DESIGN FLOW

SITE GRADING PLAN SHOULD ALLOW 100 YEAR RUNOFF TO BE DIRECTED TO THE MAIN ACCESS DRIVE AND BE CONVEYED TO SOCORA. THE 100 YEAR RUNOFF WOULD THEN FLOW SOUTH ON SOCORA TO CENTRAL. CITY OF WICHITA design criteria REQUIRE THAT THE 100 year runoff be contained within THE RIGHT OF WAY

COMPUTE 100 YEAR DESIGN FLOW

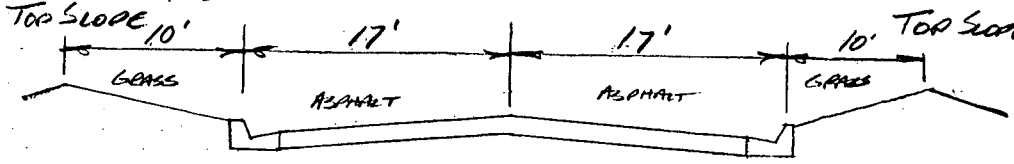
FROM DEVELOPED PEAK FLOW COMPUTATIONS

BASIN	Q PEAK (CFS)
#1D	11.8
#2D	40.5
#3D	9.6
#4D	18.4
#5D	32.3
#6D	12.5
	125.1 CFS*

*NOTE: BASIN #5D FLOWS DIRECTLY TO SOCORA AND WILL NOT BE INCLUDED IN CONVEYANCE COMPUTATIONS FOR MAIN ACCESS DRIVE TO THIS SITE.

COMPUTE CONVEYANCE OF MAIN ACCESS DRIVE

$Q_{100} = 125.1 - 32.3 = 92.8$ CFS



34' FACE TO FACE OF CURB

SURFACE	MANNING'S 'N'
GRASS	0.03
CONCRETE	0.013
ASPHALT	0.016

COMPUTE CONVEYANCE CAPACITY OF THIS SECTION

USE MANNING'S EQUATION

$$Q = \frac{1.486}{N} A R^{2/3} S^{1/2}$$

PROJECT: WEST WICHITA MEDICAL PARK
LOCATION: LOT 1, TYLER ACRES 6TH ADDITION
CLIENT: SPSA ARCHITECTS

DATE 9-24-93
BY HOF CKD
JOB NO. SHEET NO. 14 OF 22

WETTED PERIMETER, $P = 2(17' + .5' + 10') = 55'$

CROSS SECTION AREA $= 2\left(\frac{0.3' \times 15'}{2} + \frac{0.5' \times 17'}{2} + (0.05' \times 17') + (0.3' \times 17')\right)$

$= 2(2.25 + 4.25 + 0.85 + 5.1)$

$= 24.9$ SQ. FT.

COMPUTE THE HYDRAULIC RADIUS OF THIS SECTION

$R_h = A/P = \frac{24.9^{\square'}}{55'} = 0.4527$

$\therefore R_h^{2/3} = (0.4527)^{2/3} = 0.588$

ASSUME A CENTERLINE SLOPE FOR THIS DRIVE AND COMPUTE THE CONVEYANCE CAPACITY

WILL NEED TO COMPUTE AN AVERAGE MANNING'S 'N' FOR THIS SECTION

$'N' = \frac{2(10(.03) + 2.5(.013) + 15(.016))}{55}$

$= 0.0208$

FOR A SLOPE = 0.5%

$Q_{CAP} = \frac{1.486}{.0208}\left((24.9)(0.588)(S^{1/2})\right)$

$Q_{CAP} = 1046.0\, S^{1/2} = 1046.0(.005)^{1/2} = 74$ CFS

TRY SLOPE = 0.8%

$Q_{CAP} = 1046.0(0.008)^{1/2} = 93.6$ CFS

∴ A CENTERLINE SLOPE OF 0.8% FOR THE MAIN ACCESS DRIVE IS REQUIRED TO CONVEY THE 100 YEAR DESIGN RUNOFF OF 92.8 CFS.

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

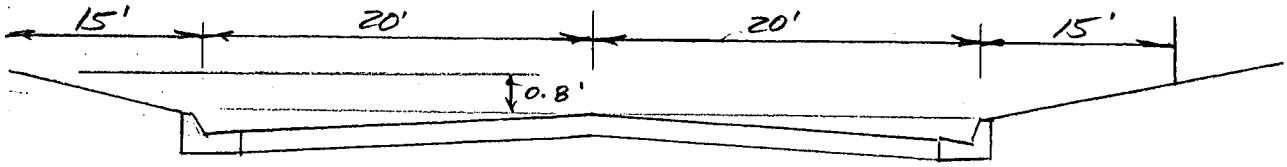
CLIENT: SASH ARCHITECTS

DATE 9-29-93

BY HOF CKD

JOB NO. SHEET NO. 15 OF 22

COMPUTE CONVEYANCE ON SOCORA



EXISTING SECTION

EXISTING SLOPE = 0.35%

AVERAGE

$$'N' = \frac{2((118 \times 0.016) + (2.5 \times .013) + (15 \times .030))}{2(20' + .5' + 15')}$$

$$= 0.0217$$

$$AREA = 2\left(\frac{.5' \times 20'}{2} + \frac{.8' \times 15'}{2} + .8' \times 20'\right)$$

$$= 54 \text{ SQ. FT.}$$

$$R_h^{2/3} = A/P = \frac{54 \text{ SF}}{71'} = 0.761^{2/3} = 0.833$$

$$Q_{CAD} = \frac{1.486}{.0217}(54)(0.833)(.0035)^{1/2}$$

$Q_{CAD} = 182.2$ CFS > Q_{100} (W/WMP SITE) = 125.1 CFS OK

∴ Q100 IS CONTAINED WITHIN SOCORA RIGHT OF WAY

PROJECT: WEST WICHITA MEDICAL PARK

LOCATION: LOT 1, TYLER ACRES 6TH ADDITION

CLIENT: SPSH ARCHITECTS

DATE 9-24-93

BY HOF CKD

JOB NO. SHEET NO. 16 OF 22

THE 42" RCP CROSSING CENTRAL AVENUE WILL CONNECT WITH A MANHOLE ON THE SOUTH SIDE OF CENTRAL. SIZE THE STORM SEWER OUTLETING FROM THIS MANHOLE

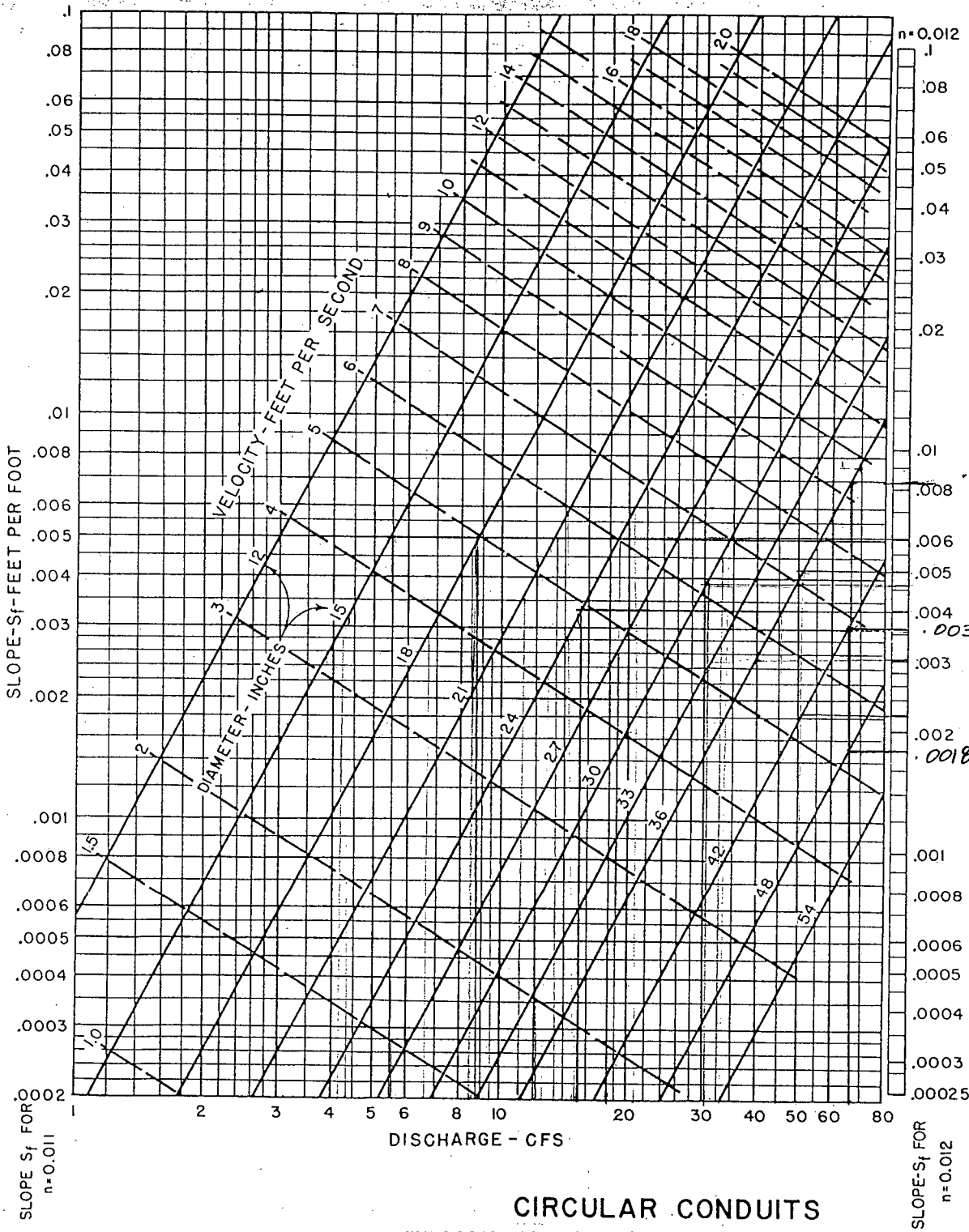
Q_5 = 66.2 CFS

FROM HDS #5 CHART #53:

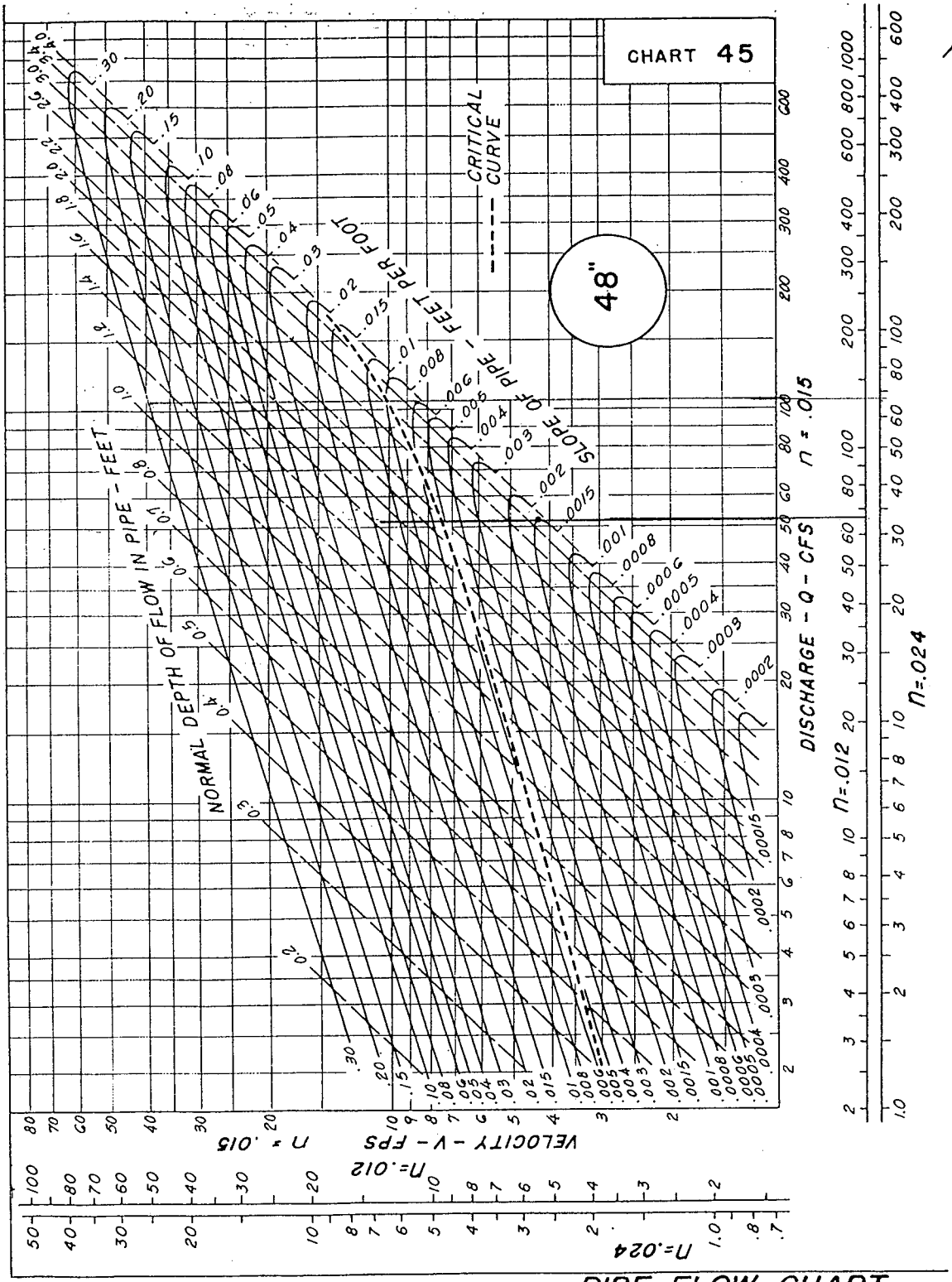
48" RCP @ 0.18% minimum SLOPE WILL BE REQUIRED TO ALLOW ADEQUATE COVER BENEATH CENTRAL AVENUE PAVEMENT AND PROVIDE REQUIRED MINIMUM SLOPE TO DRAINAGE CHANNEL.

CHART 53

17/22



CIRCULAR CONDUITS
FRICTION SLOPE FLOWING FULL
n=0.011 (and 0.012)



18/22

PIPE FLOW CHART
48-INCH DIAMETER

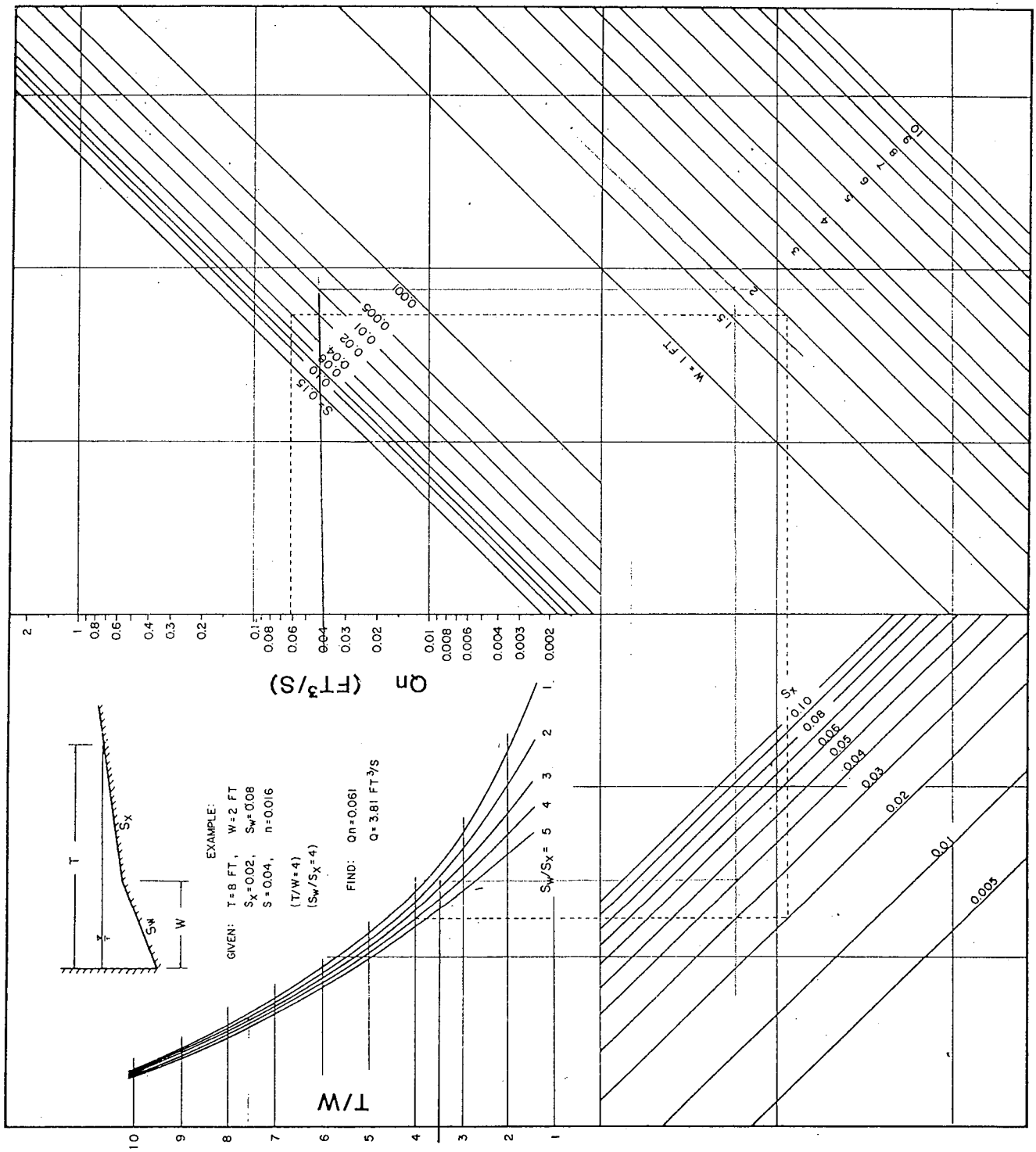
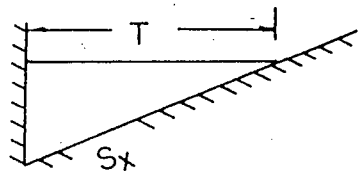


CHART 5. Flow in composite gutter sections.



$$Q = \frac{0.56}{n} S_x^{1.67} S^{0.5} T^{2.67}$$

EXAMPLE: GIVEN:

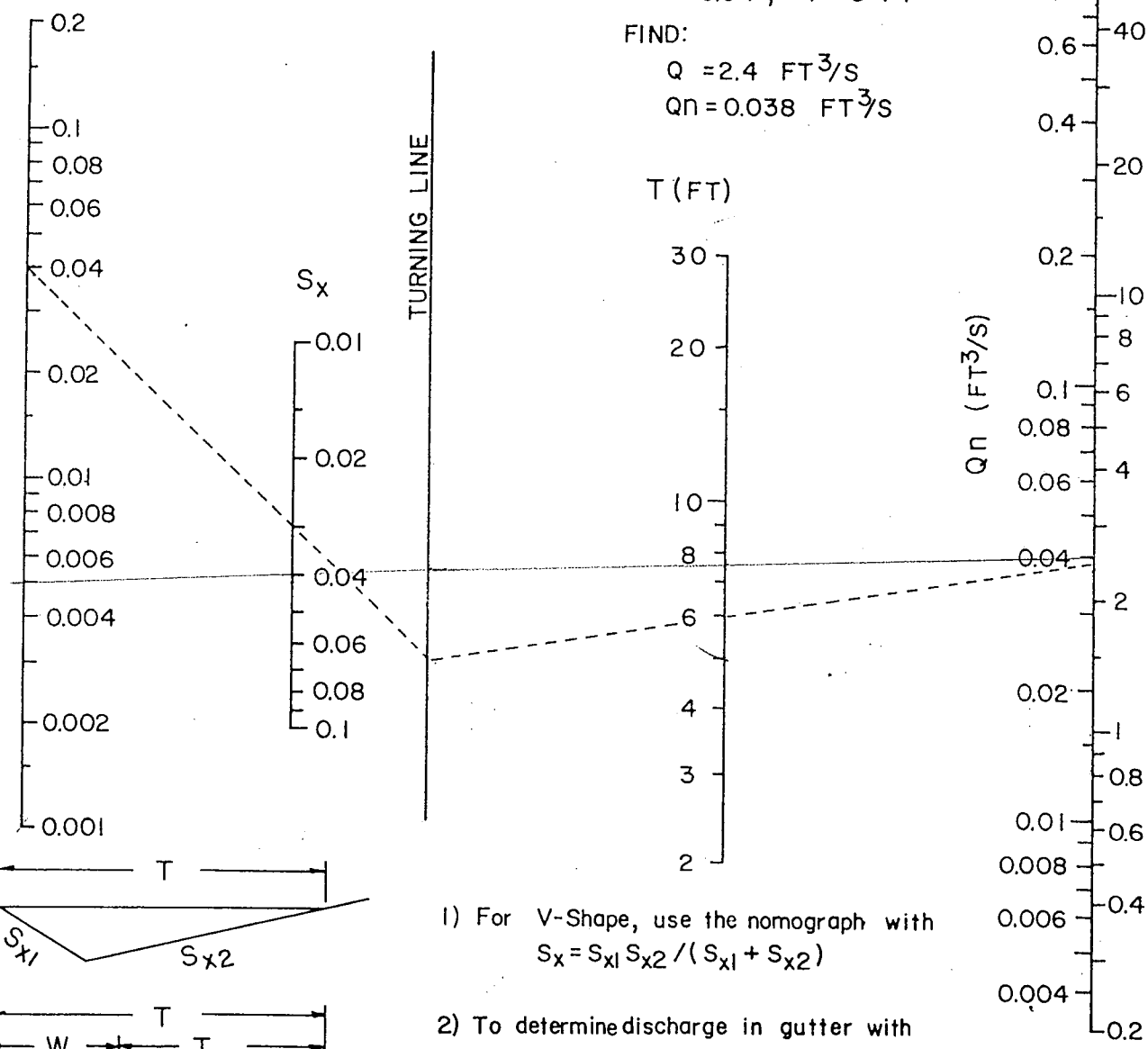
$n = 0.016$; $S_x = 0.03$

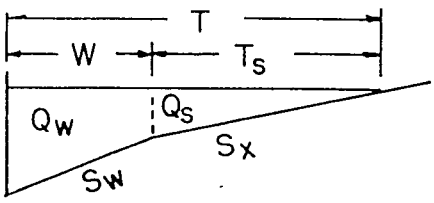
$S = 0.04$; $T = 6$ FT

FIND:

$Q = 2.4$ FT^3/S

$Qn = 0.038$ FT^3/S





1) For V-Shape, use the nomograph with $S_x = S_{x1} S_{x2} / (S_{x1} + S_{x2})$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use CHART 4 to find E_o. The total discharge is $Q = Q_s/(1 - E_o)$, and $Q_w = Q - Q_s$.

Q=

CHART 3. Flow in triangular gutter sections.

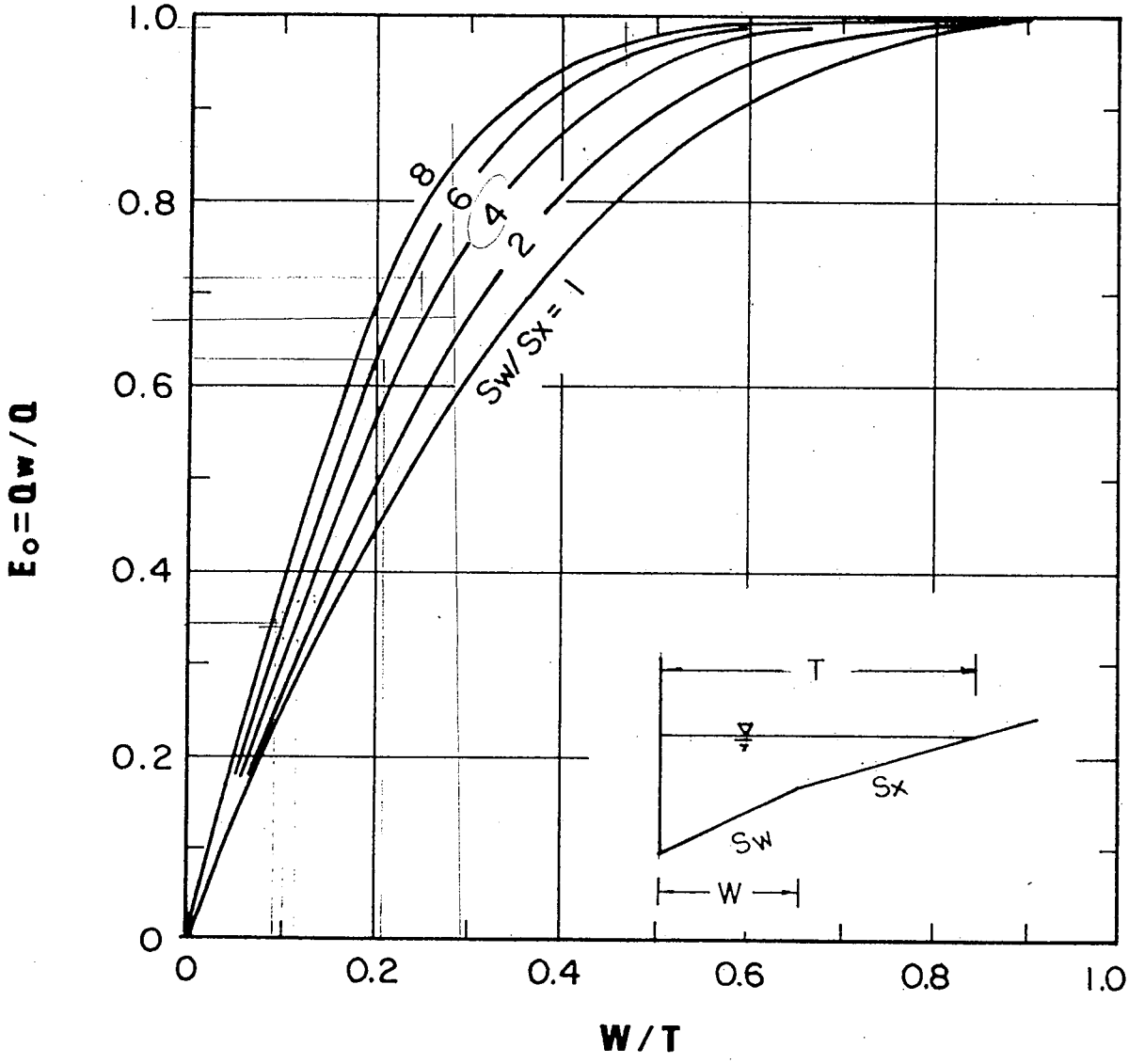
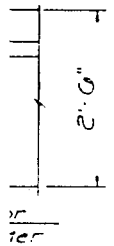
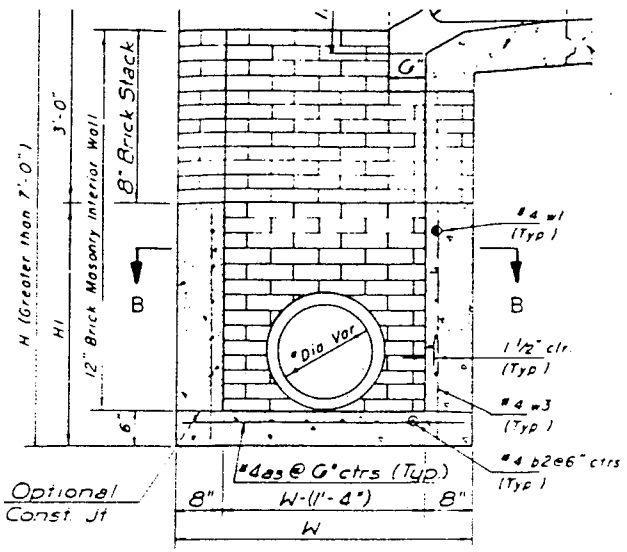


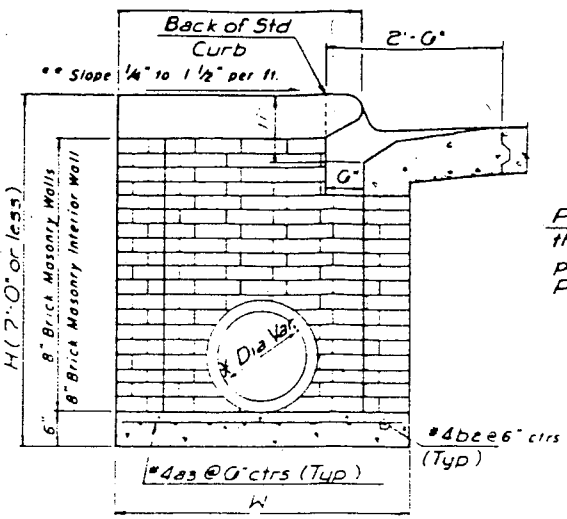
CHART 4. Ratio of frontal flow to total gutter flow.

tandard Combined
rb & Gutter (Typ)

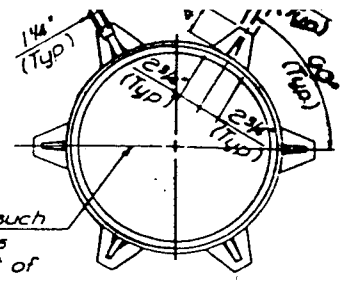




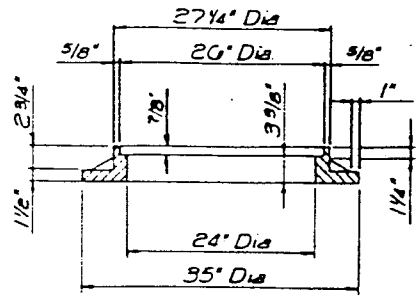
TYPICAL INLET SECTION AT CENTER WALL
(Reinforced Concrete Walls)



TYPICAL INLET SECTION AT CENTER WALL
(Masonry Walls)



Position Ring such that this line is parallel with ℄ of Pavement

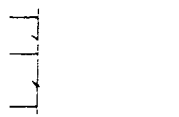


INLET FRAME (Weight = 180 LBS.)
(TYPE I)

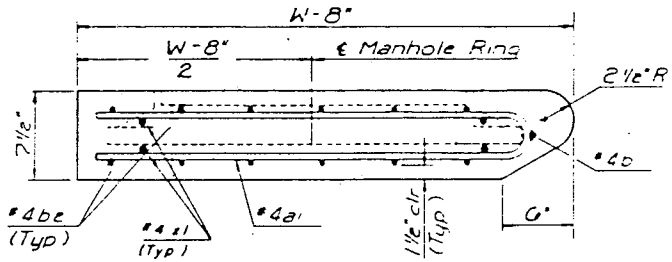
SEE CITY OF WICHITA STANDARD MANHOLE FRAME AND COVER DETAIL SHEET FOR COVER DETAILS TO BE USED WITH INLET FRAME.

tandard Pavement
ection (Typ)

Gutter ℄
Depressed

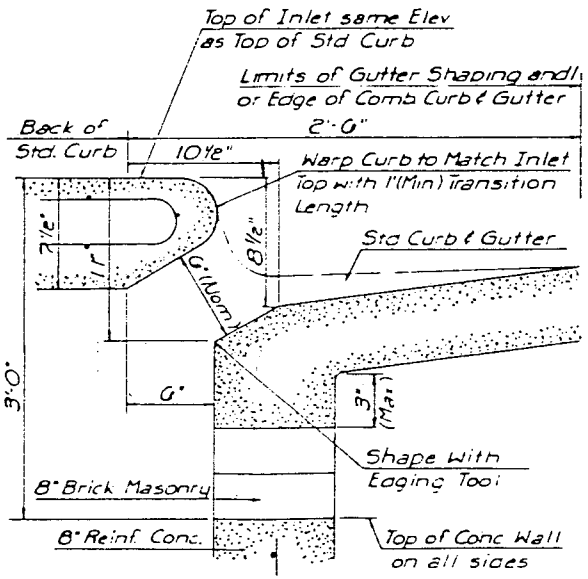


to be shaped
or depression
ent

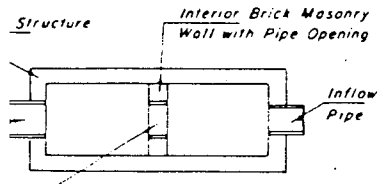


SECTION A-A

* A center wall opening shall be provided by means of a section of reinforced concrete pipe See Case I and Case II Below

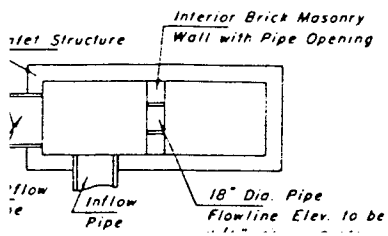


SECTION C-C



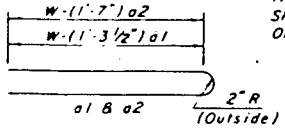
Pipe Size to be the same as Outlet Pipe Size. Flowline Elev. to be Average of Lowest Inflow Pipe Elev and Outflow Pipe Elev.

CASE I



STANDARD CURB INLET PRECAST TOPS			
W	PRE-CAST TOP SIZE	SIDE OR INTERIOR WALL PIPE SIZE	CU YD CONC
4'-4"	3'-8" x 11'-4" x 7 1/2"	21" & SMALLER	0.83
5'-4"	4'-8" x 11'-4" x 7 1/2"	24" & 30"	1.09
6'-4"	5'-8" x 11'-4" x 7 1/2"	36" & 42"	1.35
7'-4"	6'-8" x 11'-4" x 7 1/2"	48" & 54"	1.61
8'-4"	7'-8" x 11'-4" x 7 1/2"	60" & 66"	1.87

PRECAST SLAB AND FLOOR REINFORCING											
		W=4'-4"		W=5'-4"		W=6'-4"		W=7'-4"		W=8'-4"	
MARK	SIZE	NO.	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH
a1	#4	13	6'-7"	13	8'-7"	13	10'-7"	13	12'-7"	13	14'-7"
*a2	#4	4	6'-0"	4	8'-0"	4	10'-0"	4	12'-0"	4	14'-0"
a3	#4	23	4'-1"	23	5'-1"	23	6'-1"	23	7'-1"	23	8'-1"
b1	#4	1	9'-9"	1	9'-9"	1	9'-9"	1	9'-9"	1	9'-9"
*b2	#4	23	11'-1"	29	11'-1"	35	11'-1"	41	11'-1"	47	11'-1"
s1	#4	16	3'-10"	16	4'-2"	16	4'-6"	16	4'-10"	16	5'-2"
WALL REINFORCING											
		W=4'-4"		W=5'-4"		W=6'-4"		W=7'-4"		W=8'-4"	



BENDING DIAGRAM

GENERAL NOTES

Concrete shall be C.O.W. Standard Paving Mix. All exposed edges shall be finished with an edging tool. Reinforcing Bars shall be field bent or cut to clear pipes and inlet rings. All bars are #4 bars at 6" Spacing and shall have a minimum clearance of 1 1/2" unless otherwise noted. Floors of inlet shall be shaped with 8 Sack Sand Mix Concrete to increase hydraulic efficiency such that the inlet will be self cleaning between all inlet and/or outfall pipe(s). The Contractor will be required to construct 8" Brick Masonry Walls between the concrete inlet base and top on this inlet when H=7'-0" or less and W=6'-4" or less.

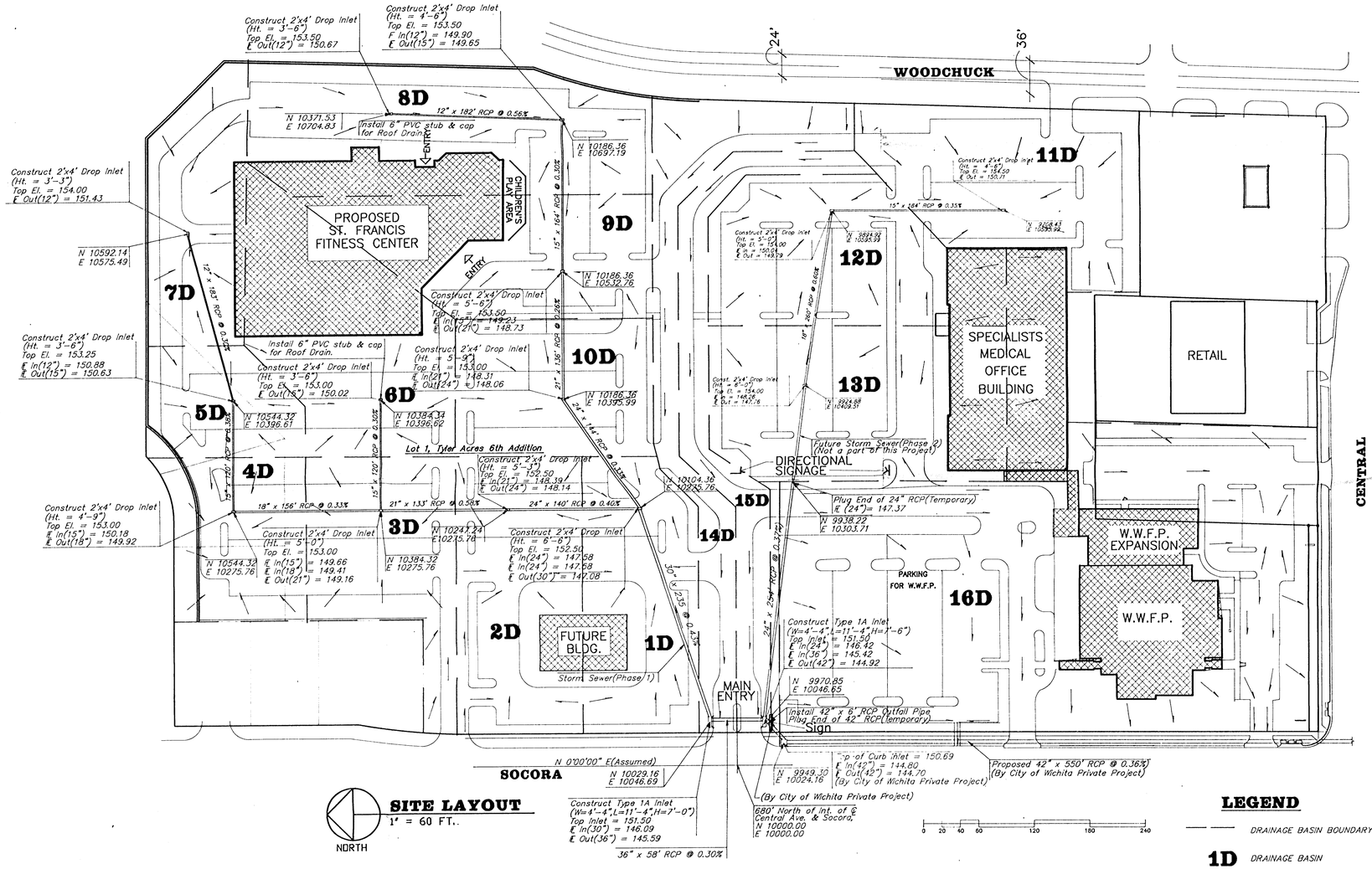
WHEN W IS GREATER THAN 6'-4" AND H IS LESS THAN 7'-0", THE OUTSIDE INLET WALLS BELOW THE BRICK STACK SHALL BE REINFORCED CONCRETE CONSTRUCTION.

CONCRETE TOPS TO BE INSTALLED ON THIN MORTAR CUSHION TO INSURE FULL SUPPORT ALONG BRICK WALLS. CONCRETE TOPS MAY BE CAST IN PLACE OR PRECAST.

THE ENDS OF ALL PIPES INSTALLED IN INLETS SHALL BE CUT OFF FLUSH WITH THE INSIDE FACE OF THE INLET WALL.

Revised 2-16-89

DETAIL STANDARD TYPE I CURB INLET



SITE LAYOUT
1" = 60 FT..

NORTH

LEGEND
- DRAINAGE BASIN BOUNDARY
- 1D DRAINAGE BASIN
- DRAINAGE DIRECTION

HARLAN DALE FORANER LICENSED 10891 KANSAS PROFESSIONAL ENGINEER
10-14-93

NOTES
1. FIELD VERIFY TOP ELEVATIONS OF DROP INLETS PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL CONFORM TO CITY OF WICHITA SPECIFICATIONS FOR STORM SEWER.
3. ALL OPENINGS TO CURB AND DROP INLETS SHALL BE PLUGGED IN AN APPROVED MANNER UNTIL SUCH TIME THAT THE CITY OF WICHITA STORM SEWER PROJECT ON SOCORA IS COMPLETED.

S P S H
ARCHITECTS/INTERIORS
SPANGENBERG PHILLIPS SHERMAN HARRISON INC.
224 E. DOUGLAS #500 WICHITA, KS 67202 (316) 267-4002

PROPOSED FITNESS CENTER AT THE WEST WICHITA MEDICAL PARK

SCHEMATIC DESIGN PHASE

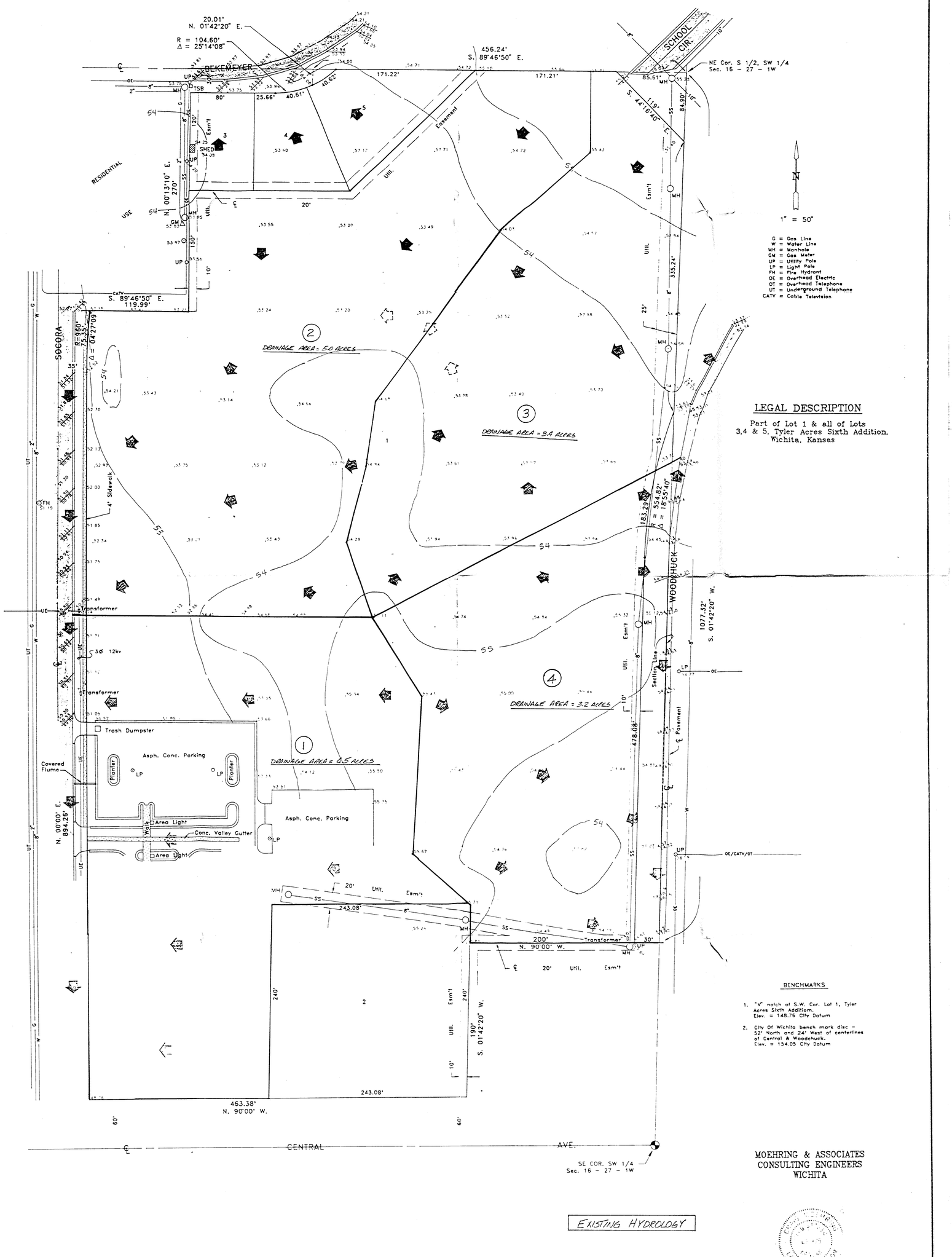
WEST WICHITA MEDICAL PARK
DRAINAGE PLAN
WICHITA, KANSAS

CERTIFIED ENGINEERING DESIGN
CIVIL ENGINEERING SERVICES
316-262-8808 • 1330 E. First, #113 • WICHITA, KS 67214

PROJECT NUMBER				SHEET
WWMP				1 OF 1
DESIGN	DRAWN	APPROVED	DATE	SCALE
HDF	HDF	HDF	9-93	NOTED

CED FILE:

ARCHITECTURAL SURVEY
OF
SFRMC – WEST WICHITA MEDICAL PARK

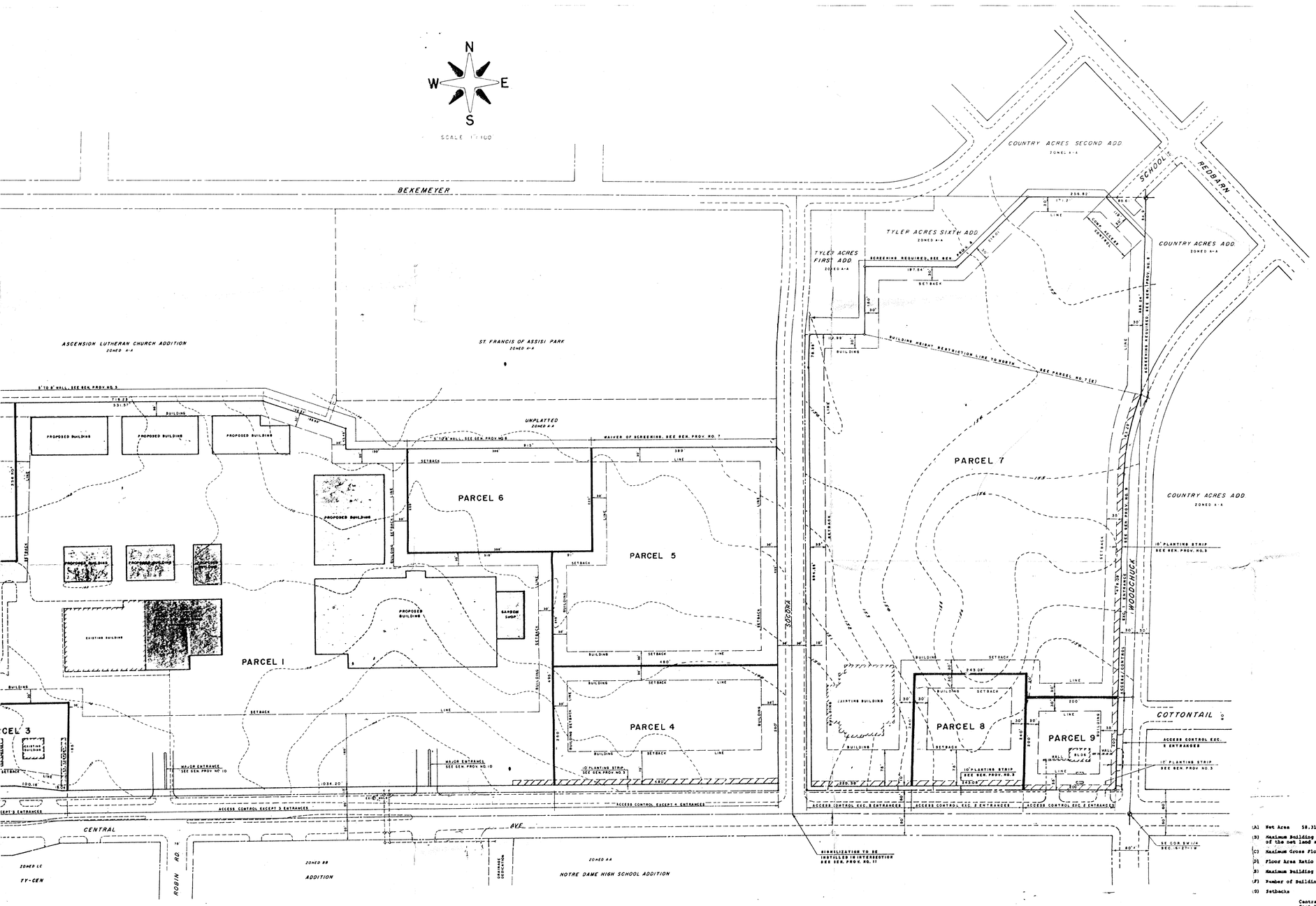


BENCHMARKS

1. "V" notch at S.W. Cor. Lot 1, Tyler Acres Sixth Addition. Elev. = 148.76 City Datum
2. City Of Wichita bench mark disc – 52' North and 24' West of centerlines of Central & Woodchuck. Elev. = 154.05 City Datum

MOEHRING & ASSOCIATES
CONSULTING ENGINEERS
WICHITA

EXISTING HYDROLOGY



GENERAL PROVISIONS

1. Total Net Land Area 2,185,430 Sq. Ft. or 50.17 Acres

2. Signs as permitted by zoning ordinance.

3. A planting strip no less than 10 feet in width as indicated, over the south 10 feet of the east 90 feet of Parcel 1, the south 10 feet of Parcels 4, 7, and 8, and the east 10 feet of Parcel 7 adjacent to Woodchuck. A landscape plan prepared by a landscape architect for the planting screen, indicating the type location and specification of plant material and method providing water to the plant material, shall be submitted to the planning department for their review and approval prior to the issuance of building permit(s) for Parcels 1, 4, 7, and 8. A financial guarantee for the plant materials approved in the landscape plan shall be required prior to the issuance of any occupancy permit if the required landscaping has not been planted.

   A waivor of the 10 foot planting strip along the east and south lines of Parcel 9 is requested until such time as Parcel 9 redevelops for other uses.

4. Six street trees, approved by the City Forester and the Department of Planning, shall be planted prior to occupancy of any building in Parcel 2. A planting strip no less than 10 feet in width, as indicated, over the west 10 feet of the north 250 feet of Parcel 2 is requested to be waived until such time as residential development occurs on the west side of Tyler opposite to said planting strip. A landscape plan prepared by a landscape architect for the planting strip, indicating the type location and specification of plant material and method of providing water to the plant material, shall be submitted to the planning department for their review and approval prior to the issuance of any building permits for Parcel 2.

5. A 5 to 8 foot high solid or semi-solid wall of brick, stone, masonry, architectural stone or similar materials, shall be constructed along the north line of Parcels 1, 2, and 6. Such wall will be reduced to 3 feet in height within 35 feet of Tyler Road. Construction of said wall shall be completed as follows:

   (a) With respect to Parcel 2, said wall shall be completed along the north line of Parcel 2 only, prior to a final certificate of occupancy for any new building within Parcel 2.

   (b) With respect to Parcel 1, the construction of said wall shall be completed as follows:

      (1) Along the north line of Parcels 1, 2, and 6, prior to a final certificate of occupancy for any new building or expansion being placed within the east 500 feet of Parcel 1.

      (2) Along the north line of Parcels 2 and 1, only to a point immediately adjacent to the north line of Parcel 6 in either of the following events:

         (a) Prior to the final certificate of occupancy for any new building along the northern boundary of Parcel 1; or

         (b) Prior to the final certificate of occupancy for any new building or the expansion of more than 30,000 square feet of existing buildings in any other area of Parcel 1 except the east 500 feet, which event has been provided for the above.

6. If Parcel 6 is developed for residential warehouse storage, a 25 foot landscaped yard shall be provided along the north property line with the 5 to 8 foot wall constructed along the south side of said landscaped yard.

7. The screening requirement along the north line of Parcel 5 shall be waived because of the institutional use adjacent thereto.

8. A fence, 6 to 8 feet in height, shall be constructed along the north and east side of Parcel 7 as shown on the plan, provided that a 25 foot landscape yard may be substituted if a landscape plan is submitted in accordance with General Provision No. 3. All loading docks, trash receptacles or similar uses shall be screened with a fence.

9. Access Controls shall be as follows:

   6 points of access to Tyler Road

      One of which shall be constructed to major entrance standards on Parcel 1.

   16 points of access to Central Avenue

      Two of which shall be constructed to major entrance standard on Parcel 1.

      The east major opening shall be guaranteed at the time of replatting.

   3 points of access to Woodchuck

      One point of access to Woodchuck from Parcel 7 upon determination by the Traffic Engineer that an additional access point is needed to reduce congestion in the area.

   2 points of access to Parcel 9

10. The construction of the deceleration and acceleration lanes along Central Avenue and along Tyler Road from Central Avenue north to the major entrance on Tyler Road, along with the major entrance and accompanying left turn lane on Central Avenue shall be guaranteed at the time of platting.

11. Signalization of the intersection of Socora and Central shall be guaranteed at the time of platting Parcel 7. The installation of the signalization will be determined by the Traffic Engineer based upon a Traffic Engineering study.

12. Minimum building setbacks shall be as indicated on the plan. In the event that Parcels are developed under the same ownership, the setback between Parcels will not be required.

13. Appropriate fire lane easements for Parcels 1, 2, 3, 4, and 6 will be considered at the time of platting and more specifically defined prior to the issuance of building permit(s). Said fire lanes shall be hard surfaced, and twenty-four (24) feet minimum in width, and constructed with a 9 inch asphalt base with 1-1/2 inch asphalt surface, or the equivalent thereof. No parking shall be allowed in said fire lane, although it may be used for passenger loading and unloading.

14. Utilities shall be installed underground on all Parcels.

15. Drainage shall be handled at the time of replatting.

16. The transfer of title of all or any portion of the land included within the Community Unit Plan (or any amendments thereto) does not constitute a termination of the plan or any portion thereof, but said plan shall run with the land and be binding upon present owners, their successors and assigns.

PARCEL # 1

(A) Net Area 205,205 Sq. Ft. or 4.71 Acres

(B) Maximum Land Coverage shall not exceed 30 per cent of the net land area or 61,560 Sq. Ft.

(C) Maximum Gross Floor Area 81,080 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Maximum Building Height 55 feet

(F) Number of buildings 6

(G) Building Setbacks

Socora	35 feet
North Line	30 feet
West Line	30 feet
South Line	30 feet

(H) Parking Ratio as per Zoning Ordinances

(I) Proposed Uses: Any use permitted in the "BB" Zoning District, except for boarding houses, lodging houses, boathouses, cemeteries, and any residential use.

PARCEL # 2

(A) Net Area 63,940 Sq. Ft. or 1.47 Acres

(B) Maximum Land Coverage shall not exceed 30 per cent of the net land area or 19,180 Sq. Ft.

(C) Maximum Gross Floor Area 25,575 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Maximum Building Height 35 feet

(F) Number of Buildings 3

(G) Building Setback

Tyler Road	75 feet

(H) Parking Ratio as per Zoning Ordinance

(I) Access Points

2 to Tyler Road

(J) Proposed General Uses: Retail Uses, Liquor Store, Financial Institutions (excluding main banks), Restaurant, Offices, Private Club.

PARCEL #3

(A) Net Area 51,620 Sq. Ft. or 1.18 Acres

(B) Maximum Building Coverage shall not exceed 30 per cent of the net land area or 15,485 Sq. Ft.

(C) Maximum Gross Floor Area 20,650 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Maximum Building Height 35 feet

(F) Existing Building Coverage 5,700 Sq. Ft.

(G) Number of Buildings 3 and 2 carports

(H) Setbacks

Central Avenue for new structures	35 Feet
Tyler Road	35 Feet

(I) Parking Ratio as per Zoning Ordinance

(J) Access Points

3 to Central Avenue
1 to Tyler Road

(K) Proposed General Uses: Retail Uses, Liquor Store, Financial Institutions (excluding main banks), Restaurant, Offices, Private Club.

PARCEL #4

(A) Net Area 120,130 Sq. Ft. or 2.76 Acres

(B) Maximum Land Coverage shall not exceed 30 per cent of the net land area or 36,040 Sq. Ft.

(C) Maximum Gross Floor Area 48,050 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Maximum Building Height 35 feet

(F) Number of buildings 4

(G) Building Setbacks

Central Avenue	75 feet
Socora	35 feet
North Line	30 feet
West Line	30 feet

(H) Parking Ratio as per Zoning Ordinances

(I) Access Points

4 to Central Avenue

(J) Proposed General Uses: Retail uses, Theatre, Liquor Store, Financial Institutions (excluding main banks, but including, but not limited to branch banks), Restaurant, Offices, Private Club.

PARCEL # 6

(A) Net Area 87,120 Sq. Ft. or 2.00 Acres

(B) Maximum Land Coverage shall not exceed 30 per cent of the net land area or 26,135 Sq. Ft.

(C) Maximum Gross Floor Area 34,850 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Number of Buildings 3

(F) If Parcel is developed with Residential Storage Warehouses, maximum land coverage shall not exceed 40 per cent of the net land area or 34,850 Sq. Ft. with no limit to number of buildings.

(G) Maximum Building Height 35 feet

(H) Building Setbacks

North Line	30 feet

(I) Parking Ratio as per Zoning Ordinance

(J) Proposed Uses: Residential Storage Warehouses, (subject to BZA approval), Retail Uses, Theatre, Restaurant, Offices, Private Club, Bowling Alley, Skating Rink.

PARCEL #7

(A) Net Area 701,465 Sq. Ft. or 16.10 Acres

(B) Maximum Land Coverage shall not exceed 23 per cent of the net land area or 160,000 Sq. Ft.

(C) Maximum Gross Floor Area 180,000 Sq. Ft.

(D) Floor Area Ratio 26%

(E) Maximum Building Heights as per Zoning Ordinances except that portion north of line as shown on the plan which shall not exceed 35 feet in height.

(F) Number of Buildings 10

(G) Building Setbacks

Central	75 Feet
Socora	35 Feet
Northerly Line	30 Feet
School Circle	30 Feet
East Line	30 Feet
Woodchuck	35 Feet
Southerly Line	30 Feet

(H) Parking Ratio as per Zoning Ordinances

(I) Access Points

2 to Central

1 to Woodchuck (See General Provision No. 9) Complete Access Control to School Circle

(J) Proposed Uses: General offices, professional offices, medical facilities, laboratories, optician, and other similar uses. Motel and motel as permitted in "BB" zoning district under city ordinance. No residential use is permitted except a retire-

PARCEL #8

(A) Net Area 58,310 Sq. Ft. or 1.34 Acres

(B) Maximum Building Coverage shall not exceed 30 per cent of the net land area or 17,493 Sq. Ft.

(C) Maximum Gross Floor Area 23,325 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Maximum Building Height 35 Feet

(F) Number of Buildings 2

(G) Setbacks

Central Avenue	75 Feet
East Line	30 Feet
North Line	30 Feet
West Line	30 Feet

(H) Parking ratio as per zoning ordinance

(I) Access Points

2 to Central Avenue

(J) Proposed General User: Retail uses, Theatre, Liquor Store, Financial Institutions (excluding main banks, but including, but not limited to branch banks), Restaurant, Offices, Private Club.

PARCEL #9

(A) Net Area 39,980 Sq. Ft. or 0.92 Acres

(B) Maximum Building Coverage shall not exceed 30 per cent of the net land area or 11,993 Sq. Ft.

(C) Maximum Gross Floor Area 15,990 Sq. Ft.

(D) Floor Area Ratio 40%

(E) Maximum Building Height 35 feet

(F) Existing Building Coverage 1260 Sq. Ft.

(G) Number of Buildings 2

(H) Setbacks

Central Avenue	35 Feet
Woodchuck Avenue	35 Feet
North Line	30 Feet
West Line	30 Feet

(I) Parking ratio as per zoning ordinance

(J) Access Points

3 to Woodchuck
2 to Central

(K) Proposed General Uses: Service Station, Retail Uses, Liquor Store, Financial Institutions, Offices, Private Club.

AMENDED COMMUNITY UNIT PLAN FOR TYLER ACRES

REVISED OCT 29, 1984
REVISED AUG 17, 1984