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Prairie Pointe
Wichita, Sedgwick County, Kansas
4/28/03

Prairie Pointe is a residential development in northwest Wichita. Development consists of single-family, ¼ acre lots, utilities, and two ponds. The drainage plan and supporting calculations for Prairie Pointe are presented herein.

Hydrology

The proposed plat lies in the S ½, SE ¼, Section 30, T26S, R1W of the 6th P.M. The soils on-site consist of Vanoss silt loam, Farnum loam, Milan loam (all hydrologic group B), Blanket silt loam (hydrologic group C), Waurika silt loam, and Carwile fine sandy loam (both hydrologic group D). The existing landscape is vacant posture save an existing house at the south end of the site whose lot is lined with trees. The plat generally drains to the south end.

This hydrologic study analyzes the Prairie Pointe site along with the land between it and Maize Road. This additional area is planned for future commercial use. For runoff calculations under existing conditions, the site plus the additional area was divided into 3 major basins, each with its own discharge. The site also accepts runoff from approximately 116 acres to the north. (See existing conditions calculations.)

Under developed conditions, Basin 1 and the minor storm runoff from offsite will drain to Pond 1. Note that the inlets in the back of the lots at the north end of the site are designed to handle the 2-year storm runoff from the offsite basin and then discharge to Pond 1. The backs of the lots are graded to have a 0.3% slope from high point to high point in order to carry overflow to Pond 2. Pond 2 is designed to accept overflow from the offsite basin, Basin 2 runoff, and future developed conditions runoff from the commercial area. Pond 1 discharges to Pond 2, and Pond 2 discharges to 37th Street North via a weir. (See calculations.)

Using the Army Corp of Engineer's program HEC-1, all systems were modeled with runoff based on the Rational Method. The minimum time of concentration was assumed for all basins, so the basins could be combined with negligible lag

time. The ponds were included to determine water elevations in the 100-year design storm and to determine the outfall from the ponds via weirs. A 2-year storm model of the system is enclosed which shows the minor storm runoff from offsite draining to Pond 1. A 100-year storm model of the system is also enclosed, and it shows the overflow from the offsite basin draining to pond 2. The pond elevations in the 100-year design storm eventually equalize and reach maximum stage at 1357.9.

Runoff coefficients were estimated based on existing land use and the tables presented in the Design Aids section. A map showing the basin boundaries, drainage calculations, and HEC-1 model are included. The analysis made is based on the available site data which includes the following: 1"=100' topographic map with 1' contours of the site and adjacent areas, USGS topographic map, Sedgwick County Soil Survey Map, and references noted herein.

Storm Sewer Design

For the storm sewer hydrologic analysis, the Rational Method was again used. Runoff coefficients were estimated using the charts in the design aids section of this report. For this development, a uniform assumption of the minimum time of concentration of 15 minutes was deemed appropriate. Travel time for flow through defined channels, pipes, etc, for these basins was estimated on the basis of Manning's Equation.

In the hydraulic analysis, the storm sewers are designed for the minor storm, with major storm overflows to be routed through easements and rights-of-way to an appropriate outlet. The minor storm has a recurrence interval of two years. The major storm evaluated has a recurrence interval of one hundred years. To simplify this analysis, the time of concentration is identical for both the major and the minor storms.

For each inlet, street flooding and inlet capacity were checked for the minor storm. Conveyance in the street is based on the Modified Manning's Equation, as expressed in the Design of Urban Highway Drainage-The State of the Art, Equation (5-1), page 5-9. It has been assumed that Tc for street flow is equal to Tc for pipe flow. This is a simplifying, but conservative, assumption, since pipe flow velocities generally exceed street flow velocities.

Inlet capacities were determined by the methods described in Drainage of Highway Pavements, Hydraulic Engineering Circular #12, using Chart #12 as found in the Design Aids section. City of Wichita Type 1A inlets and 3/8 inch per foot cross slopes have been assumed. Streets have been assumed to have 6-5/8 inch standard curb, unless otherwise noted.

Hydraulic computation for the pipe system was performed using PEC's STORM computer program. This program uses Manning's Equation to calculate friction losses for pipes flowing full. Minor losses are computed by momentum principles at each structure. All pipe area is assumed to be reinforced concrete with a Manning's "n" of 0.013. It is desirable to keep the hydraulic grade line at least one foot below the top of curb for the minor storm. The STORM analyses for the storm sewer systems are included in this report. Note that the inlets in the back of the lots at the north end of the site are designed to handle the 2-year storm runoff from the offsite basin and then discharge to Pond 1. The backs of the lots are graded to have a 0.3% slope from high point to high point in order to carry overflow to Pond 2. See Plan Map.

Design Aids

This section includes material used to assist in designing the drainage system. A 1"=100' scale drainage plan map is enclosed in the pocket.

References

Design of Urban Highway Drainage – The State of the Art, by Reitz & Jens, Inc., April 1980.

Drainage of Highway Pavements, Hydraulic Engineering Circular #12, by Tye Engineering, Inc., March 1984.

Interim Drainage and Storm Sewer Policy for Design Criteria and Documentation, City of Wichita, Kansas, 1985.

Soil Survey of Sedgwick County, Kansas, US Department of Agriculture, Soil Conservation Service, 1979.

Prairie Pointe

Existing Conditions Hydrology

Rational Method, Q=ciA

Offsite Basin to the North

Runoff Coefficients

Agricultural pasture areas, S<1%

	Gr. B	Gr. D
c_2=	0.28	0.30
c_{100}=	0.39	0.65

Intensity

Velocity: Attachment E. Short grass pasture or lawns @ S=0.3%

Vel=0.38 f/s

L=3075'

T_c= 3075' | sec | 1 min = 135 MIN

0.38f | 60 sec

T_c= 2:15

i_2= 0.90 in/hr

i_{100}= 2.10 in/hr

Basin	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}
offsite	B	94.7	116	0.28	0.44	29.2	107.2
	D	21.3					

Results

The runoff from offsite enters the from the north and is carried through the site to 37th Street North at the south end of the site.

Site Analysis

*The Prairie Pointe site combined with the area to the east between the site and Maize Road was divided into three existing conditions basins (Basins 1-3) for analysis.

Runoff Coefficients

Agricultural pasture areas, S<1%

	Gr. B	Gr. C	Gr. D
c_2=	0.28	0.26	0.30
c_{100}=	0.39	0.53	0.65

Intensity

Velocity: Attachment E. Short grass pasture or lawns

Basin	L (ft)	S (%)	Vel (f/s)	T_c (hr:min)	i_2 (in/hr)	i_{100} (in/hr)
1	2440	0.25	0.35	1:55	1.04	2.38
2	1135	0.62	0.54	0:35	2.41	5.1
3	1275	0.63	0.55	0:39	2.25	4.8

Sample Calculation

Vel=0.35 f/s

L=2440'

T_c= 2440' / 0.35f sec | 1 min = 60 sec = 116 MIN

Basin	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}
1	B	15.1	41.6	0.27	0.48	11.7	47.5
	C	25.6					
	D	0.9					
2	B	11.5	18.1	0.27	0.44	11.8	40.6
	C	6.6					
3	B	8.5	17.2	0.29	0.52	11.2	42.9
	D	8.7					

Results

Basin 1 runoff discharges to the southeast corner of the site by the intersection of 37th Street North and Maize Road. Basin 2 discharges to the south end of the site to 37th Street. Basin 3 runoff flows to a depression at the southwest end of the site then overflows to the 37th Street ditch.

Runoff from Basin 1 and Basin 2 flows east along 37th Street to Maize Road.

$Q_{100exist}$=47.5 cfs + 40.6 cfs=88.1 cfs

Runoff from Basin 3 flows west along 37th Street and enters a swale that runs along the west end of the site and continues south.

$Q_{100exist}$=42.9 cfs

Basin north of site draining to Maize Road culverts at the 37th Street intersection

(runoff does not pass through site.)

Runoff Coefficients

Agricultural pasture areas, S<1%

	Gr. B
c_2=	0.28
c_{100}=	0.39

Intensity

Velocity: Attachment E. Short grass pasture or lawns @ S=0.3%

Vel=0.38 f/s

L=2960'

T_c= 2960' / 0.38f sec | 1 min = 60 sec = 130 MIN

T_c= 2:10

i_2= 0.93 in/hr

i_{100}= 2.16 in/hr

Basin	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}
Maize	B	24.3	24.3	0.28	0.39	6.3	20.5

Prairie Pointe

Developed Conditions Hydrology

Rational Method, Q=ciA

Runoff Coefficients

Single Family Residential, 1/4 Acre Lots

	Gr. B	Gr. C	Gr. D
c_2=	0.44	0.48	0.50
c_{100}=	0.61	0.68	0.76

Intensity

Assume minimum time of concentration for all basins

T_c= 15 Min

i_2= 3.8 in/hr

i_{100}= 7.4 in/hr

* Runoff from offsite can be found in existing conditions calculations

Basin 1 Analysis

Basin	Node	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}	Offsite Q_2	Offsite Q_{100}	Total Q_2	Total Q_{100}
1A		B	7.08	9.05	0.45	0.64	15.5	42.9			15.5	42.9
		C	0.56									
		D	1.41									
1B	110	B	0.33	0.33	0.44	0.61	0.6	1.5	2.4	8.9	3.0	10.4
1C	120	B	0.19	0.27	0.46	0.65	0.5	1.3	2.4	8.8	2.9	10.1
		D	0.08									
1D	130	B	0.26	0.51	0.47	0.68	0.9	2.6	4.8	17.7	5.7	20.3
		D	0.25									
1E	140	B	0.31	0.31	0.44	0.61	0.5	1.4	2.2	8	2.7	9.4
1F	210	B	1.77	2.01	0.45	0.62	3.4	9.2			3.4	9.2
		C	0.21									
		D	0.03									
1G	220	B	1.86	2.11	0.44	0.62	3.5	9.7			3.5	9.7
		C	0.25									
1H	230	B	0.36	0.36	0.44	0.61	0.6	1.6	2.5	9.3	3.1	10.9
1I	240	B	0.39	0.39	0.44	0.61	0.7	1.8	2.8	10.4	3.5	12.2
1J	250	B	0.03	0.21	0.49	0.73	0.4	1.1	1.4	5.1	1.8	6.2
		C	0.03									
		D	0.15									
1K	310	B	1.3	1.3	0.44	0.61	2.2	5.9			2.2	5.9
1L	320	B	3.19	3.95	0.45	0.62	6.8	18.1			6.8	18.1
		C	0.76									
1M	330	B	0.46	0.46	0.44	0.61	0.8	2.1			0.8	2.1
1N	410	B	0.15	0.15	0.44	0.61	0.3	0.7			0.3	0.7

Basin	Node	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}	Offsite Q_2	Offsite Q_{100}	Total Q_2	Total Q_{100}
1O	420	B	0.43	0.43	0.44	0.61	0.7	1.9			0.7	1.9
1P	510	B	0.77	1.23	0.46	0.67	2.2	6.1			2.2	6.1
		D	0.46									
1Q	520	B	1.8	2.28	0.45	0.64	3.9	10.8			3.9	10.8
		D	0.48									
1R	530	B	0.48	0.48	0.44	0.61	0.8	2.2			0.8	2.2
1S	540	B	0.56	1	0.47	0.68	1.8	5.0			1.8	5
		D	0.44									
1T	610	D	1.36	1.36	0.5	0.76	2.6	7.6			2.6	7.6
1U	620	B	0.84	2.23	0.48	0.7	4.1	11.6			4.1	11.6
		D	1.39									
1V	710	B	0.07	1.15	0.48	0.68	2.1	5.8			2.1	5.8
		C	1.08									
1W	720	C	1.44	1.44	0.48	0.68	2.6	7.2			2.6	7.2

Results

Runoff from Basin 1 enters Pond 1. Pond 1 then discharges to Pond 2 via a 15" RCP. Runoff not picked up by the SWS which is designed for the 2-year storm in Basins 1B-1E and 1H-1J will overflow along the north property line of the site and enter Pond 2.

Basin 2 Analysis

Basin	Node	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}	Offsite Q_2	Offsite Q_{100}	Total Q_2	Total Q_{100}
2		B	0.84	9.03	0.48	0.68	16.5	45.4	7.1	26.2	15.5	42.9
		C	7.43									
		D	0.76									

Results

Runoff from Basin 2 enters Pond 2 along with outflow from Pond 1 and overflow from Basins 1B-1E and 1H-1J. Pond 2 then discharges from the site via a 2' weir at the south end of the pond. (Q_{100}=49 cfs. See HEC-1 Analysis.)

Basin 3 Analysis

Basin	Node	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}	Offsite Q_2	Offsite Q_{100}	Total Q_2	Total Q_{100}
3		B	3.36	5.99	0.47	0.68	10.7	30.1	0	0	10.7	30.1
		D	2.63									

Results

Runoff discharges to the southwest corner of the site.

Q_{100DEV}=30.1<$Q_{100EXIST}$=42.9 cfs

Basin 4 Analysis

Basin	Node	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}	Offsite Q_2	Offsite Q_{100}	Total Q_2	Total Q_{100}
4		B	1.97	4.55	0.46	0.65	8.0	21.9	0	0	8	21.9
		C	2.58									

Results

Runoff discharges south to 37th Street North and is then carried east to Maize Road.

Basin 5 Analysis

Basin 5 is the area between the Prairie Pointe site and Maize Road. Future development is proposed to be commercial. The Prairie Pointe pond system has been designed to handle this future development of Basin 5.

Runoff Coefficients

Commercial Area (80% impervious)

c_2= 0.76

c_{100}= 0.86

Basin	Node	Soil Group	Area (Ac.)	Total Area	c_2	c_{100}	Q_2	Q_{100}	Offsite Q_2	Offsite Q_{100}	Total Q_2	Total Q_{100}
5		B,C	23.6	23.6	0.76	0.86	68.2	150.2	3.5	12.8	71.7	163.0

Results

Runoff from Basin 5 enters Pond 2 along with Basin 2 runoff, Pond 1 outflow, and Basin 1B-1E and 1H-1J overflow. Pond 2 then discharges from the site via a 2' weir at the south end of the pond. (Q_{100}=49 cfs. See HEC-1 Analysis.)

The discharge enters a channel along 37th Street North, joins runoff from Basin 4, and is carried east to Maize Road. The combined 100-year runoff from Pond 2 and Basin 4 is approximately 70 cfs. The overall developed conditions runoff is less than the existing conditions runoff at this location. (Q_{100DEV}=88 cfs<$Q_{100EXIST}$=70 cfs.) However, in order to be conservative, this study assumes that future development will occur in the area south of 37th Street. In keeping with this assumption, the combined outflow from Pond 2 and Basin 4 travels east to Maize Road and is picked up by Maize Road drainage structures. At this intersection, three culverts run parallel to Maize Road. (See Maize Road excerpts in the Design Aids Section.) Prairie Pointe drainage was designed in accordance with and to match design flows of the culverts. Runoff from the north in the amount of 20 cfs flows to these culverts without passing through the Prairie Pointe site. (See existing conditions calculations.) Therefore, a total of 90 cfs will reach the culverts in a 100-year storm. At this flow rate, the culverts are designed to have a head water elevation of 1355.21. The centerline of Maize Road is 1355.5. Therefore, the runoff from the 100-year storm should not overtop Maize Road.

Prairie Pointe

Street Flow

2-Year Storm

Node	Q_2	Street Slope	d	d_{max}	Comment
320	6.8	0.5	0.40'	0.55'	ok

*by inspection, all nodes are ok

100-Year Storm

Location	Q_{100}	Q_{pipe}	Q_{street}	S	Q_{max}	Comment
approaching nodes 310 and 320	24	9	15	0.5	61.3	ok

*By inspection, all nodes are ok.

Prairie Pointe

Inlet Sizing

*All inlets in sump

Curb Inlet Sizing

Node	Q_2	Q_{max} L=5'	Q_{max} L=10'	Q_{in}	Use L=
210	3.4	11	22	3.4	5
220	3.5	11	22	3.5	5
310	2.2	11	22	2.2	5
320	6.8	11	22	6.8	5
510	2.2	11	22	2.2	5
520	3.9	11	22	3.9	5
610	2.6	11	22	2.6	5
620	4.1	11	22	4.1	5
710	2.1	11	22	2.1	5
720	2.6	11	22	2.6	5

Area Inlet Sizing

Node	Q_{100}	Size	Ponding Depth
110	10.4	2'x2'	0.59'
120	10.1	2'x2'	0.57'
130	20.3	2'x4'	0.75'
140	9.4	2'x2'	0.55'
230	10.9	2'x2'	0.60'
240	12.2	2'x2'	0.65'
250	6.2	2'x2'	0.42'
330	2.1	2'x2'	0.2'
410	0.7	2'x2'	0'
420	1.9	2'x2'	0.19'
530	2.2	2'x2'	0.2'
540	5.0	2'x2'	0.36'

Area inlets were sized as follows:

2'x2' Area Inlet--Neenah Grate R4826
1.3 SF of open area
8 F Perimeter

2'x4' Area Inlet--Neenah Grate R4853A
3.1 SF of open area
11.5 F Perimeter

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*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  04/24/2003  TIME  15:44:21 *
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*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER  *
*         609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 551-1748            *
*                                   *
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
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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

1 HEC-1 INPUT PAGE 1

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

   1          ID        Prairie Pointe
   2          ID   2-YEAR STORM ANALYSIS
   3          ID        2 year storm
   4          ID        Professional Engineering Consultants
   5          ID        Wichita, Ks
   6          ID        SPL 3/25/03
   7          ID        File:  X:\HEC1\PP2:IH1
   8          IT      15 12DEC97    0000     300
   9          IN      30 12DEC97    0600
  10          IO       3       0
  11          JR    PREC .448718
              *
              *DIAGRAM
              *

  12          KK    OFF1
  13          KM    OFFSITE TO BACKYARD NORTH LINE SWS CARRIED TO POND 1
  14          BA  .11547
  15          PB     7.8
  16          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
  17          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
  18          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
  19          PC    .964     .970    .976    .982    .988    .994   1.000
  20          LS       0       70       0
  21          UD    1.35
              *

  22          KK    BAS1
  23          KM    BASIN 1 TO POND 1 INCLUDING NORTH LINE SWS
  24          BA  .05158
  25          PB     7.8
  26          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
  27          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
  28          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
  29          PC    .964     .970    .976    .982    .988    .994   1.000
  30          LS       0       84       0
  31          UD     .15
              *

  32          KK   COMB1
  33          KO       5
  34          HC       2
              *

  35          KK   POND1
  36          KM   15" RCP CULVERT FROM POND 1 TO POND 2
  37          RS       1    ELEV 1354.00
  38          SA    4.05    4.98
  39          SE  1354.0 1358.00
  40          SQ       0    1.00    2.00    3.00    4.00
  41          SE  1354.0 1354.73 1356.36 1358.52 1359.45
              *
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1 HEC-1 INPUT PAGE 2

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

  42          KK    OFF2
  43          KM    OFFSITE TO POND 2
  44          BA  .04422
  45          PB     7.8
  46          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
  47          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
  48          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
  49          PC    .964     .970    .976    .982    .988    .994   1.000
  50          LS       0       70       0
  51          UD    1.35
              *

  52          KK   BAS2
  53          KM   BASIN DIRECTLY TO POND 2
  54          BA  .01411
  55          PB     7.8
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 56          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 57          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 58          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 59          PC    .964     .970    .976    .982    .988    .994   1.000
 60          LS       0       86       0
 61          UD     .15
             *

 62          KK   COMB2
 63          KO       5
 64          HC       2
             *

 65          KK   COMB3
 66          KO       5
 67          HC       2
             *

 68          KK    OFF3
 69          KM    OFFSITE TO COMMERCIAL
 70          BA  .02172
 71          PB     7.8
 72          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 73          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 74          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 75          PC    .964     .970    .976    .982    .988    .994   1.000
 76          LS       0       69       0
 77          UD    1.35
             *

 78          KK   BAS3
 79          KM   COMMERCIAL BASIN DIRECTLY TO POND 2
 80          BA  .03688
 81          PB     7.8
 82          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 83          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 84          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 85          PC    .964     .970    .976    .982    .988    .994   1.000
1                                    HEC-1 INPUT                                          PAGE  3

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

 86          LS       0       98       0
 87          UD     .15
             *

 88          KK   COMB4
 89          KO       5
 90          HC       2
             *

 91          KK   COMB5
 92          KO       5
 93          HC       2
             *

 94          KK   POND2
 95          RS       1    ELEV    1354
 96          SA    5.47    6.63
 97          SE    1354    1358
 98          SS    1354     3.5     3.2     1.5
             *
 99          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
 LINE     (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW

  12       OFF1
             .
             .
  22         .         BAS1
             .           .
             .           .
  32       COMB1.............
             V
             V
  35       POND1
             .
             .
  42         .         OFF2
             .           .
             .           .
  52         .           .         BAS2
             .           .           .
             .           .           .
  62         .         COMB2.............
             .           .
             .           .
  65       COMB3.............
             .
             .
  68         .         OFF3
             .           .
             .           .
  78         .           .         BAS3
             .           .           .
             .           .           .
  88         .         COMB4.............
             .           .
             .           .
  91       COMB5.............
             V
             V
  94       POND2

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1**************************************                **************************************
 *                                    *                *                                    *
```

```
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*         FEBRUARY 1981                  *
*       REVISED 02 AUG 88                *
*                                        *
*  RUN DATE  04/24/2003  TIME  15:44:21  *
*                                        *
******************************************

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

```
                    Prairie Pointe
                   2-YEAR STORM ANALYSIS
                    2 year storm
                    Professional Engineering Consultants
                    Wichita, Ks
                    SPL 3/25/03
                    File:  X:\HEC1\PP2.IH1

 10 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN          15  MINUTES IN COMPUTATION INTERVAL
                      IDATE     12DEC97  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     15DEC97  ENDING DATE
                     NDTIME        0245  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .25 HOURS
                      TOTAL TIME BASE   74.75 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

    JP          MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

    JR          MULTI-RATIO OPTION
                    RATIOS OF PRECIPITATION
                     .45

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
 12 KK        *    OFF1    *
              *            *
              **************

                       OFFSITE TO BACKYARD NORTH LINE SWS CARRIED TO POND 1

  9 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          30  TIME INTERVAL IN MINUTES
                     JXDATE     12DEC97  STARTING DATE
                     JXTIME         600  STARTING TIME

              SUBBASIN RUNOFF DATA

 14 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .12  SUBBASIN AREA

                PRECIPITATION DATA

 15 PB                STORM        7.80  BASIN TOTAL PRECIPITATION

 16 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      .01      .01      .01      .00      .01      .00
                   .01      .00      .01      .01      .01      .01      .01      .01      .01      .01
                   .01      .01      .02      .02      .02      .02      .19      .19      .04      .04
                   .02      .02      .01      .01      .01      .01      .01      .01      .01      .01
                   .01      .01      .01      .01      .00      .00      .00      .00      .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

 20 LS          SCS LOSS RATE
                     STRTL          .86  INITIAL ABSTRACTION
                    CRVNBR        70.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

 21 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         1.35  LAG

                                                  ***

                                         UNIT HYDROGRAPH
                                    29 END-OF-PERIOD ORDINATES
          3.        9.       18.       30.       36.       38.       36.       31.       25.       18.
         13.       10.        8.        6.        4.        3.        3.        2.        1.        1.
          1.        1.        0.        0.        0.        0.        0.        0.        0.

     ***       ***       ***       ***       ***

                   HYDROGRAPH AT STATION      OFF1
                      FOR PLAN 1, RATIO =  .00
```

TOTAL RAINFALL = 7.80, TOTAL LOSS = 3.51, TOTAL EXCESS = 4.29

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
		(CFS) 42.	13.	4.	4.
90.	13.25	(INCHES) 3.390	4.293	4.293	4.293
		(AC-FT) 21.	26.	26.	26.

CUMULATIVE AREA = .12 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION OFF1
FOR PLAN 1, RATIO = .45

TOTAL RAINFALL = 3.50, TOTAL LOSS = 2.49, TOTAL EXCESS = 1.01

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
		(CFS) 9.	3.	1.	1.
18.	13.50	(INCHES) .740	1.008	1.008	1.008
		(AC-FT) 5.	6.	6.	6.

CUMULATIVE AREA = .12 SQ MI

*** ***

```
22 KK      **************
           *            *
           *    BAS1    *
           *            *
           **************
```

BASIN 1 TO POND 1 INCLUDING NORTH LINE SWS

```
 9 IN      TIME DATA FOR INPUT TIME SERIES
             JXMIN        30  TIME INTERVAL IN MINUTES
           JXDATE   12DEC97  STARTING DATE
           JXTIME       600  STARTING TIME

           SUBBASIN RUNOFF DATA

24 BA      SUBBASIN CHARACTERISTICS
             TAREA       .05  SUBBASIN AREA

           PRECIPITATION DATA

25 PB          STORM    7.80  BASIN TOTAL PRECIPITATION

26 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  .01  .01  .01  .00  .01  .00
             .01  .00  .01  .01  .01  .01  .01  .01  .01  .01
             .01  .01  .02  .02  .02  .02  .19  .19  .04  .04
             .02  .02  .01  .01  .01  .01  .01  .01  .01  .01
             .01  .01  .01  .01  .00  .00  .00  .00  .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

30 LS      SCS LOSS RATE
             STRTL     .38  INITIAL ABSTRACTION
            CRVNBR   84.00  CURVE NUMBER
             RTIMP     .00  PERCENT IMPERVIOUS AREA

31 UD      SCS DIMENSIONLESS UNITGRAPH
             TLAG      .15  LAG
```

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

89. 34. 8. 2. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION BAS1
FOR PLAN 1, RATIO = .00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 1.90, TOTAL EXCESS = 5.90

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
		(CFS) 27.	8.	3.	3.
170.	12.00	(INCHES) 4.838	5.903	5.903	5.903
		(AC-FT) 13.	16.	16.	16.

CUMULATIVE AREA = .05 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION BAS1
FOR PLAN 1, RATIO = .45

TOTAL RAINFALL = 3.50, TOTAL LOSS = 1.56, TOTAL EXCESS = 1.94

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.75-HR

```
+   (CFS)      (HR)
                       (CFS)
+      56.    12.00               9.          3.         1.          1.
                     (INCHES)   1.591       1.936      1.936       1.936
                      (AC-FT)     4.          5.         5.          5.

                     CUMULATIVE AREA =      .05 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  32 KK       *   COMB1    *
              *            *
              **************

  33 KO         OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  35 KK       *   POND1    *
              *            *
              **************

                       15" RCP CULVERT FROM POND 1 TO POND 2

              HYDROGRAPH ROUTING DATA

  37 RS         STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC    1354.00  INITIAL CONDITION
                          X        .00  WORKING R AND D COEFFICIENT

  38 SA              AREA        4.1        5.0

  39 SE         ELEVATION    1354.00    1358.00

  40 SQ         DISCHARGE         0.         1.         2.         3.         4.

  41 SE         ELEVATION    1354.00    1354.73    1356.36    1358.52    1359.45

                                        ***

                               COMPUTED STORAGE-ELEVATION DATA

        STORAGE        .00      18.03
      ELEVATION    1354.00    1358.00

                               COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

        STORAGE        .00       3.02      10.19      18.03      20.65      25.51
        OUTFLOW        .00       1.00       2.00       2.76       3.00       4.00
      ELEVATION    1354.00    1354.73    1356.36    1358.00    1358.52    1359.45

     ***         ***         ***         ***         ***

                    HYDROGRAPH AT STATION     POND1
                      FOR PLAN 1, RATIO =   .45

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR     74.75-HR
+   (CFS)       (HR)
                        (CFS)
+       2.     24.50                   2.          2.          1.          1.
                     (INCHES)        .106        .400        .882        .882
                      (AC-FT)          1.          4.          8.          8.

 PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
                                     6-HR        24-HR       72-HR     74.75-HR
+  (AC-FT)      (HR)
       10.     24.75                   9.          9.          6.          6.

  PEAK STAGE    TIME                         MAXIMUM AVERAGE STAGE
                                     6-HR        24-HR       72-HR     74.75-HR
+   (FEET)      (HR)
   1356.23     24.75             1356.20     1356.03     1355.37     1355.32

                    CUMULATIVE AREA =      .17 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  42 KK       *    OFF2    *
              *            *
              **************
                       OFFSITE TO POND 2

   9 IN         TIME DATA FOR INPUT TIME SERIES
                     JXMIN          30  TIME INTERVAL IN MINUTES
                    JXDATE     12DEC97  STARTING DATE
                    JXTIME         600  STARTING TIME

             SUBBASIN RUNOFF DATA
```

```
 44 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .04  SUBBASIN AREA

                PRECIPITATION DATA

 45 PB               STORM         7.80  BASIN TOTAL PRECIPITATION

 46 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    .01    .01    .01    .00    .01    .00
                   .01    .00    .01    .01    .01    .01    .01    .01    .01    .01
                   .01    .01    .02    .02    .02    .02    .19    .19    .04    .04
                   .02    .02    .01    .01    .01    .01    .01    .01    .01    .01
                   .01    .01    .01    .01    .00    .00    .00    .00    .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

 50 LS          SCS LOSS RATE
                     STRTL          .86  INITIAL ABSTRACTION
                    CRVNBR        70.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

 51 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG         1.35  LAG

                                                 ***

                                                UNIT HYDROGRAPH
                                            29 END-OF-PERIOD ORDINATES
                    1.     3.     7.    11.    14.    14.    14.    12.     9.     7.
                    5.     4.     3.     2.     2.     1.     1.     1.     1.     0.
                    0.     0.     0.     0.     0.     0.     0.     0.     0.

    ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION     OFF2
                          FOR PLAN 1, RATIO =  .00

     TOTAL RAINFALL =    7.80, TOTAL LOSS =    3.51, TOTAL EXCESS =    4.29

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR         24-HR         72-HR      74.75-HR
+    (CFS)       (HR)
                  (CFS)
+      35.     13.25                16.           5.            2.            2.
                (INCHES)          3.390         4.293         4.293         4.293
                (AC-FT)             8.           10.           10.           10.

                CUMULATIVE AREA =     .04 SQ MI

    ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION     OFF2
                          FOR PLAN 1, RATIO =  .45

     TOTAL RAINFALL =    3.50, TOTAL LOSS =    2.49, TOTAL EXCESS =    1.01

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR         24-HR         72-HR      74.75-HR
+    (CFS)       (HR)
                  (CFS)
+       7.     13.50                 4.           1.            0.            0.
                (INCHES)          .740         1.008         1.008         1.008
                (AC-FT)             2.           2.            2.            2.

                CUMULATIVE AREA =     .04 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                **************
                *            *
 52 KK          *    BAS2    *
                *            *
                **************
                     BASIN DIRECTLY TO POND 2

  9 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          30  TIME INTERVAL IN MINUTES
                    JXDATE    12DEC97  STARTING DATE
                    JXTIME         600  STARTING TIME

                SUBBASIN RUNOFF DATA

 54 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .01  SUBBASIN AREA

                PRECIPITATION DATA

 55 PB               STORM         7.80  BASIN TOTAL PRECIPITATION

 56 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    .01    .01    .01    .00    .01    .00
                   .01    .00    .01    .01    .01    .01    .01    .01    .01    .01
                   .01    .01    .02    .02    .02    .02    .19    .19    .04    .04
                   .02    .02    .01    .01    .01    .01    .01    .01    .01    .01
                   .01    .01    .01    .01    .00    .00    .00    .00    .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

 60 LS          SCS LOSS RATE
                     STRTL          .33  INITIAL ABSTRACTION
```

```
                CRVNBR        86.00  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

 61 UD      SCS DIMENSIONLESS UNITGRAPH
                TLAG          .15  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                              5 END-OF-PERIOD ORDINATES
              24.        9.        2.        0.        0.

    ***             ***             ***             ***             ***

                  HYDROGRAPH AT STATION    BAS2
                    FOR PLAN 1, RATIO =  .00

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

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     74.75-HR
+   (CFS)        (HR)
                              (CFS)
+      48.     12.00           8.          2.          1.          1.
                        (INCHES)     5.019       6.138       6.138       6.138
                        (AC-FT)          4.          5.          5.          5.

                  CUMULATIVE AREA =     .01 SQ MI

    ***             ***             ***             ***             ***

                  HYDROGRAPH AT STATION    BAS2
                    FOR PLAN 1, RATIO =  .45

   TOTAL RAINFALL =    3.50, TOTAL LOSS =    1.40, TOTAL EXCESS =    2.10

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     74.75-HR
+   (CFS)        (HR)
                              (CFS)
+      17.     12.00           3.          1.          0.          0.
                        (INCHES)     1.725       2.098       2.098       2.098
                        (AC-FT)          1.          2.          2.          2.

                  CUMULATIVE AREA =     .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 62 KK      *     COMB2  *
            *            *
            **************

 63 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 65 KK      *     COMB3  *
            *            *
            **************

 66 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 68 KK      *      OFF3  *
            *            *
            **************
                        OFFSITE TO COMMERCIAL

  9 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          30  TIME INTERVAL IN MINUTES
                    JXDATE     12DEC97  STARTING DATE
                    JXTIME         600  STARTING TIME

             SUBBASIN RUNOFF DATA

 70 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .02  SUBBASIN AREA

                PRECIPITATION DATA

 71 PB               STORM        7.80  BASIN TOTAL PRECIPITATION

 72 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       .01       .01       .01       .00       .01       .00
                   .01       .00       .01       .01       .01       .01       .01       .01       .01       .01
```

.01	.01	.02	.02	.02	.02	.19	.19	.04	.04
.02	.02	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.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				

76 LS SCS LOSS RATE

STRTL	.90	INITIAL ABSTRACTION
CRVNBR	69.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

77 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	1.35	LAG

***

UNIT HYDROGRAPH
29 END-OF-PERIOD ORDINATES

1.	2.	3.	6.	7.	7.	7.	6.	5.	3.
3.	2.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	

*** *** *** *** ***

HYDROGRAPH AT STATION OFF3
FOR PLAN 1, RATIO = .45

TOTAL RAINFALL = 7.80, TOTAL LOSS = 3.62, TOTAL EXCESS = 4.18

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
16.	13.25	8.	2.	1.	1.
		(CFS)			
		(INCHES) 3.294	4.180	4.180	4.180
		(AC-FT) 4.	5.	5.	5.

CUMULATIVE AREA = .02 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION OFF3
FOR PLAN 1, RATIO = .45

TOTAL RAINFALL = 3.50, TOTAL LOSS = 2.55, TOTAL EXCESS = .95

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
3.	13.50	2.	1.	0.	0.
		(CFS)			
		(INCHES) .696	.954	.954	.954
		(AC-FT) 1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

*** ***

78 KK BAS3

COMMERCIAL BASIN DIRECTLY TO POND 2

9 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	30	TIME INTERVAL IN MINUTES
JXDATE	12DEC97	STARTING DATE
JXTIME	600	STARTING TIME

SUBBASIN RUNOFF DATA

80 BA SUBBASIN CHARACTERISTICS

TAREA	.04	SUBBASIN AREA

PRECIPITATION DATA

81 PB

STORM	7.80	BASIN TOTAL PRECIPITATION

82 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	.01	.01	.01	.00	.01	.00
.01	.00	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.02	.02	.02	.02	.19	.19	.04	.04
.02	.02	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.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				

86 LS SCS LOSS RATE

STRTL	.04	INITIAL ABSTRACTION
CRVNBR	98.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

87 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.15	LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

64.	24.	6.	1.	0.

HYDROGRAPH AT STATION BAS3
FOR PLAN 1, RATIO = .00

TOTAL RAINFALL = 7.80, TOTAL LOSS = .24, TOTAL EXCESS = 7.56

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.75-HR
143.	12.00	23. (CFS)	7.	2.	2.
		5.909 (INCHES)	7.560	7.560	7.560
		12. (AC-FT)	15.	15.	15.

CUMULATIVE AREA = .04 SQ MI

HYDROGRAPH AT STATION BAS3
FOR PLAN 1, RATIO = .45

TOTAL RAINFALL = 3.50, TOTAL LOSS = .23, TOTAL EXCESS = 3.27

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	74.75-HR
63.	12.00	10. (CFS)	3.	1.	1.
		2.596 (INCHES)	3.266	3.266	3.266
		5. (AC-FT)	6.	6.	6.

CUMULATIVE AREA = .04 SQ MI

88 KK COMB4

89 KO OUTPUT CONTROL VARIABLES
IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

91 KK COMB5

92 KO OUTPUT CONTROL VARIABLES
IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

94 KK POND2

HYDROGRAPH ROUTING DATA

95 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP ELEV TYPE OF INITIAL CONDITION
RSVRIC 1354.00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

96 SA AREA 5.5 6.6

97 SE ELEVATION 1354.00 1358.00

98 SS SPILLWAY
CREL 1354.00 SPILLWAY CREST ELEVATION
SPWID 3.50 SPILLWAY WIDTH
COQW 3.20 WEIR COEFFICIENT
EXPW 1.50 EXPONENT OF HEAD

COMPUTED STORAGE-ELEVATION DATA

STORAGE	.00	24.16
ELEVATION	1354.00	1358.00

COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	.02	.12	.41	.98	1.92	3.32	5.27	7.87
ELEVATION	1354.00	1354.00	1354.01	1354.05	1354.11	1354.20	1354.31	1354.44	1354.60	1354.79
OUTFLOW	11.20	15.36	20.45	26.55	33.75	42.16	51.85	62.93	75.48	89.60
ELEVATION	1355.00	1355.23	1355.49	1355.78	1356.09	1356.42	1356.78	1357.16	1357.57	1358.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.27	.61	1.09	1.70	2.46	3.36	4.41	5.61
OUTFLOW	.00	.02	.12	.41	.98	1.92	3.32	5.27	7.87	11.20
ELEVATION	1354.00	1354.01	1354.05	1354.11	1354.20	1354.31	1354.44	1354.60	1354.79	1355.00
STORAGE	6.97	8.48	10.17	12.02	14.06	16.28	18.70	21.33	24.16	
OUTFLOW	15.36	20.45	26.55	33.75	42.16	51.85	62.93	75.48	89.60	
ELEVATION	1355.23	1355.49	1355.78	1356.09	1356.42	1356.78	1357.16	1357.57	1358.00	

*** *** *** *** ***

HYDROGRAPH AT STATION POND2
FOR PLAN 1, RATIO = .45

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
+ (CFS)	(HR)				
		(CFS)			
+ 12.	14.50	11.	6.	3.	3.
		(INCHES) .351	.845	1.196	1.196
		(AC-FT) 5.	13.	18.	18.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	74.75-HR
+ (AC-FT)	(HR)				
6.	14.50	5.	4.	2.	2.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	74.75-HR
+ (FEET)	(HR)				
1355.03	14.50	1354.97	1354.67	1354.38	1354.36

CUMULATIVE AREA = .28 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .45
HYDROGRAPH AT					
+	OFF1	.12	1	FLOW	18.
				TIME	13.50
HYDROGRAPH AT					
	BAS1	.05	1	FLOW	56.
				TIME	12.00
2 COMBINED AT					
+	COMB1	.17	1	FLOW	57.
				TIME	12.00
ROUTED TO					
+	POND1	.17	1	FLOW	2.
				TIME	24.50
			** PEAK STAGES IN FEET **		
			1	STAGE	1356.23
				TIME	24.75
HYDROGRAPH AT					
+	OFF2	.04	1	FLOW	7.
				TIME	13.50
HYDROGRAPH AT					
+	BAS2	.01	1	FLOW	17.
				TIME	12.00
2 COMBINED AT					
+	COMB2	.06	1	FLOW	17.
				TIME	12.00
2 COMBINED AT					
+	COMB3	.23	1	FLOW	18.
				TIME	12.00
HYDROGRAPH AT					
+	OFF3	.02	1	FLOW	3.
				TIME	13.50
HYDROGRAPH AT					
+	BAS3	.04	1	FLOW	63.
				TIME	12.00
2 COMBINED AT					
+	COMB4	.06	1	FLOW	63.
				TIME	12.00
2 COMBINED AT					
+	COMB5	.28	1	FLOW	81.
				TIME	12.00
ROUTED TO					
	POND2	.28	1	FLOW	12.
				TIME	14.50
			** PEAK STAGES IN FEET **		
			1	STAGE	1355.03
				TIME	14.50

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

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  04/24/2003  TIME  15:45:15 *
*                                       *
*****************************************
```


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


```
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

1 HEC-1 INPUT PAGE 1

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

    1         ID        Prairie Pointe
    2         ID    100-YEAR STORM ANALYSIS
    3         ID        100 year storm
    4         ID        Professional Engineering Consultants
    5         ID        Wichita, Ks
    6         ID        SPL 3/25/03
    7         ID        File:  X:\HEC1\PP100.IH1
    8         IT      15 12DEC97    0000     300
    9         IN      30 12DEC97    0600
   10         IO       3       0
   11         JR    PREC1.000
              *
              *DIAGRAM
              *

   12         KK    OFF1
   13         KM    BACKYARD NORTH LINE SWS CARRIED TO POND 1 VIA SWS (Q2) BOTH OFF AND ON SITE
   14         BA  .03258
   15         PB     7.8
   16         PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
   17         PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
   18         PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
   19         PC    .964     .970    .976    .982    .988    .994   1.000
   20         LS       0       66       0
   21         UD    1.35
              *

   22         KK    BAS1
   23         KM    BASIN 1 TO POND 1 EXCLUDING NORTH LINE SWS OVERFLOW
   24         BA  .04786
   25         PB     7.8
   26         PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
   27         PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
   28         PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
   29         PC    .964     .970    .976    .982    .988    .994   1.000
   30         LS       0       78       0
   31         UD     .15
              *

   32         KK    COMB1
   33         KO        5
   34         HC        2
              *

   35         KK    POND1
   36         KM    15" RCP CULVERT FROM POND 1 TO POND 2
   37         RS        1    ELEV 1354.00
   38         SA     4.05    4.98
   39         SE   1354.0 1358.00
   40         SQ        0    1.00    2.00    3.00    4.00
   41         SE   1354.0 1354.73 1356.36 1358.52 1359.45
              *
```

1 HEC-1 INPUT PAGE 2

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

   42         KK    CHANN
   43         KM    OVERFLOW FROM NORTH SWS TO POND 2
   44         BA  .09605
   45         PB     7.8
   46         PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
   47         PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
   48         PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
   49         PC    .964     .970    .976    .982    .988    .994   1.000
   50         LS       0       61       0
   51         UD    1.35
              *

   52         KK    OFF2
   53         KM    OFFSITE TO POND 2
   54         BA  .04422
   55         PB     7.8
```

```
 56          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 57          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 58          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 59          PC    .964     .970    .976    .982    .988    .994   1.000
 60          LS       0       62       0
 61          UD    1.35
             *

 62          KK   COMB2
 63          KO       5
 64          HC       2
             *

 65          KK   BAS2
 66          KM   BASIN DIRECTLY TO POND 2
 67          BA  .01411
 68          PB     7.8
 69          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 70          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 71          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 72          PC    .964     .970    .976    .982    .988    .994   1.000
 73          LS       0       81       0
 74          UD     .15
             *

 75          KK   COMB3
 76          KO       5
 77          HC       2
             *

 78          KK   COMB4
 79          KO       5
 80          HC       2
             *
```

1 HEC-1 INPUT PAGE 3

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

 81          KK    OFF3
 82          KM    OFFSITE TO COMMERCIAL
 83          BA  .02172
 84          PB     7.8
 85          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 86          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 87          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 88          PC    .964     .970    .976    .982    .988    .994   1.000
 89          LS       0       62       0
 90          UD    1.35
             *

 91          KK   BAS3
 92          KM   COMMERCIAL BASIN DIRECTLY TO POND 2
 93          BA  .03688
 94          PB     7.8
 95          PC    0.08     .09     .10     .11     .12     .133    .147    .163    .181    .204
 96          PC    .235     .283    .663    .735    .772    .799    .820    .835    .850    .865
 97          PC    .880     .890    .900    .910    .916    .925    .934    .943    .952    .958
 98          PC    .964     .970    .976    .982    .988    .994   1.000
 99          LS       0       98       0
100          UD     .15
             *

101          KK   COMB5
102          KO       5
103          HC       2
             *

104          KK   COMB6
105          KO       5
106          HC       2
             *

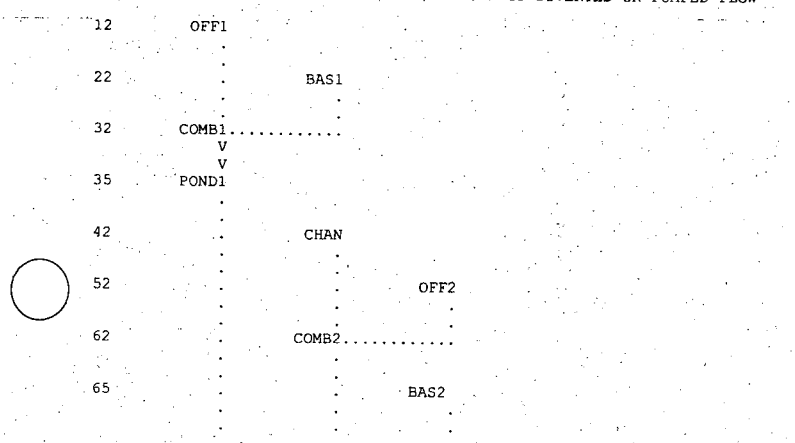
107          KK   POND2
108          RS       1    ELEV    1354
109          SA    5.47    6.63
110          SE    1354    1358
111          SS    1354     2.0     3.2     1.5
             *
112          ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING (---->) DIVERSION OR PUMP FLOW

(.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW



```
 75          .       COMB3............
             .                .
 78     COMB4............     .
             .
 81          .         OFF3
             .            .
 91          .            .         BAS3
             .            .            .
101          .       COMB5............
             .            .
104     COMB6............
             V
             V
107     POND2
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1***************************************
 *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *          FEBRUARY 1981              *
 *        REVISED 02 AUG 88            *
 *                                     *
 * RUN DATE  04/24/2003  TIME  15:45:15 *
 *                                     *
 ***************************************
```

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

Prairie Pointe
100-YEAR STORM ANALYSIS
100 year storm
Professional Engineering Consultants
Wichita, Ks
SPL 3/25/03
File: X:\HEC1\PP100.IH1

```
 10 IO       OUTPUT CONTROL VARIABLES
                   IPRNT          3  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT       HYDROGRAPH TIME DATA
                    NMIN         15  MINUTES IN COMPUTATION INTERVAL
                   IDATE    12DEC97  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE    15DEC97  ENDING DATE
                  NDTIME       0245  ENDING TIME
                   ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL      .25 HOURS
                   TOTAL TIME BASE    74.75 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

    JP       MULTI-PLAN OPTION
                   NPLAN          1  NUMBER OF PLANS

    JR       MULTI-RATIO OPTION
                 RATIOS OF PRECIPITATION
               1.00
```

*** ***

```
            **************
            *            *
 12 KK      *    OFF1    *
            *            *
            **************
```

BACKYARD NORTH LINE SWS CARRIED TO POND 1 VIA SWS (Q2) BOTH OFF AND ON SITE

```
  9 IN      TIME DATA FOR INPUT TIME SERIES
                 JXMIN        30  TIME INTERVAL IN MINUTES
                JXDATE   12DEC97  STARTING DATE
                JXTIME       600  STARTING TIME

          SUBBASIN RUNOFF DATA

 14 BA      SUBBASIN CHARACTERISTICS
                 TAREA       .03  SUBBASIN AREA

            PRECIPITATION DATA

 15 PB           STORM      7.80  BASIN TOTAL PRECIPITATION

 16 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	.01	.01	.01	.00	.01	.00
.01	.00	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.02	.02	.02	.02	.19	.19	.04	.04
.02	.02	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.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

20 LS SCS LOSS RATE
STRTL 1.03 INITIAL ABSTRACTION
CRVNBR 66.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

21 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 1.35 LAG

***

UNIT HYDROGRAPH
29 END-OF-PERIOD ORDINATES

1. 3. 5. 8. 10. 11. 10. 9. 7. 5.
4. 3. 2. 2. 1. 1. 1. 1. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION OFF1
FOR PLAN 1, RATIO = .00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 3.96, TOTAL EXCESS = 3.84

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
22.	13.25	11.	3.	1.	1.
		(CFS)			
		(INCHES) 3.005	3.844	3.844	3.844
		(AC-FT) 5.	7.	7.	7.

CUMULATIVE AREA = .03 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION OFF1
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 3.96, TOTAL EXCESS = 3.84

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)				
22.	13.25	11.	3.	1.	1.
		(CFS)			
		(INCHES) 3.005	3.844	3.844	3.844
		(AC-FT) 5.	7.	7.	7.

CUMULATIVE AREA = .03 SQ MI

*** ***

****
* *
22 KK * BAS1 *
* *
****

BASIN 1 TO POND 1 EXCLUDING NORTH LINE SWS OVERFLOW

9 IN TIME DATA FOR INPUT TIME SERIES
JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 12DEC97 STARTING DATE
JXTIME 600 STARTING TIME

SUBBASIN RUNOFF DATA

24 BA SUBBASIN CHARACTERISTICS
TAREA .05 SUBBASIN AREA

PRECIPITATION DATA

25 PB STORM 7.80 BASIN TOTAL PRECIPITATION

26 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 .01 .01 .01 .00 .01 .00
.01 .00 .01 .01 .01 .01 .01 .01 .01 .01
.01 .01 .02 .02 .02 .02 .19 .19 .04 .04
.02 .02 .01 .01 .01 .01 .01 .01 .01 .01
.01 .01 .01 .01 .00 .00 .00 .00 .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

30 LS SCS LOSS RATE
STRTL .56 INITIAL ABSTRACTION
CRVNBR 78.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

31 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

83. 32. 7. 2. 0.

*** *** *** *** ***

HYDROGRAPH AT STATION BAS1
FOR PLAN 1, RATIO = .00

```
          TOTAL RAINFALL =    7.80, TOTAL LOSS =    2.59, TOTAL EXCESS =    5.21

        PEAK FLOW      TIME                             MAXIMUM AVERAGE FLOW
                                            6-HR         24-HR        72-HR      74.75-HR
   +     (CFS)         (HR)
                                  (CFS)
   +      140.        12.00                  22.           7.           2.           2.
                                (INCHES)    4.278        5.206        5.206        5.206
                                 (AC-FT)      11.          13.          13.          13.

                                CUMULATIVE AREA =     .05 SQ MI

          ***            ***            ***            ***            ***

                                HYDROGRAPH AT STATION      BAS1
                                  FOR PLAN 1, RATIO = 1.00

          TOTAL RAINFALL =    7.80, TOTAL LOSS =    2.59, TOTAL EXCESS =    5.21

        PEAK FLOW      TIME                             MAXIMUM AVERAGE FLOW
                                            6-HR         24-HR        72-HR      74.75-HR
   +     (CFS)         (HR)
                                  (CFS)
   +      140.        12.00                  22.           7.           2.           2.
                                (INCHES)    4.278        5.206        5.206        5.206
                                 (AC-FT)      11.          13.          13.          13.

                                CUMULATIVE AREA =     .05 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                 **************
                 *            *
   32 KK         *    COMB1   *
                 *            *
                 **************

   33 KO             OUTPUT CONTROL VARIABLES
                           IPRNT           5  PRINT CONTROL
                           IPLOT           0  PLOT CONTROL
                           QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                 **************
                 *            *
   35 KK         *    POND1   *
                 *            *
                 **************
                              15" RCP CULVERT FROM POND 1 TO POND 2

                   HYDROGRAPH ROUTING DATA

   37 RS             STORAGE ROUTING
                          NSTPS           1  NUMBER OF SUBREACHES
                           ITYP        ELEV  TYPE OF INITIAL CONDITION
                         RSVRIC     1354.00  INITIAL CONDITION
                              X         .00  WORKING R AND D COEFFICIENT

   38 SA                   AREA          4.1          5.0

   39 SE              ELEVATION      1354.00      1358.00

   40 SQ              DISCHARGE           0.           1.           2.           3.           4.

   41 SE              ELEVATION      1354.00      1354.73      1356.36      1358.52      1359.45

                                                             ***

                                                   COMPUTED STORAGE-ELEVATION DATA

                STORAGE         .00        18.03
              ELEVATION     1354.00      1358.00

                                                COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

                STORAGE         .00         3.02        10.19        18.03        20.65        25.51
                OUTFLOW         .00         1.00         2.00         2.76         3.00         4.00
              ELEVATION     1354.00      1354.73      1356.36      1358.00      1358.52      1359.45

          ***            ***            ***            ***            ***

                                HYDROGRAPH AT STATION      POND1
                                  FOR PLAN 1, RATIO = 1.00

        PEAK FLOW      TIME                             MAXIMUM AVERAGE FLOW
                                            6-HR         24-HR        72-HR      74.75-HR
   +     (CFS)         (HR)
                                  (CFS)
   +        3.        24.25                    3.           3.           2.           2.
                                (INCHES)     .308        1.183        2.735        2.735
                                 (AC-FT)       1.           5.          12.          12.

        PEAK STORAGE   TIME                             MAXIMUM AVERAGE STORAGE
                                            6-HR         24-HR        72-HR      74.75-HR
   +     (AC-FT)       (HR)
            17.       24.25                   17.          16.          11.          11.

        PEAK STAGE     TIME                             MAXIMUM AVERAGE STAGE
                                            6-HR         24-HR        72-HR      74.75-HR
   +     (FEET)        (HR)
         1357.84      24.25              1357.79      1357.57      1356.56      1356.46
```

CUMULATIVE AREA = .08 SQ MI

*** ***

42 KK CHAN N

OVERFLOW FROM NORTH SWS TO POND 2

9 IN TIME DATA FOR INPUT TIME SERIES
JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 12DEC97 STARTING DATE
JXTIME 600 STARTING TIME

SUBBASIN RUNOFF DATA

44 BA SUBBASIN CHARACTERISTICS
TAREA .10 SUBBASIN AREA

PRECIPITATION DATA

45 PB STORM 7.80 BASIN TOTAL PRECIPITATION

46 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	.01	.01	.01	.00	.01	.00
.01	.00	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.02	.02	.02	.02	.19	.19	.04	.04
.02	.02	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.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				

50 LS SCS LOSS RATE
STRTL 1.28 INITIAL ABSTRACTION
CRVNBR 61.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

51 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 1.35 LAG

***

UNIT HYDROGRAPH
29 END-OF-PERIOD ORDINATES

2.	7.	15.	25.	30.	31.	30.	26.	20.	15.
11.	8.	6.	5.	4.	3.	2.	2.	1.	1.
1.	1.	0.	0.	0.	0.	0.	0.	0.	

*** *** *** *** ***

HYDROGRAPH AT STATION CHAN
FOR PLAN 1, RATIO = .00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 4.51, TOTAL EXCESS = 3.29

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)	(CFS)			
54.	13.50	26.	9.	3.	3.
		(INCHES) 2.531	3.293	3.293	3.293
		(AC-FT) 13.	17.	17.	17.

CUMULATIVE AREA = .10 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION CHAN
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 4.51, TOTAL EXCESS = 3.29

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	74.75-HR
(CFS)	(HR)	(CFS)			
54.	13.50	26.	9.	3.	3.
		(INCHES) 2.531	3.293	3.293	3.293
		(AC-FT) 13.	17.	17.	17.

CUMULATIVE AREA = .10 SQ MI

*** ***

52 KK OFF2

OFFSITE TO POND 2

9 IN TIME DATA FOR INPUT TIME SERIES
JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 12DEC97 STARTING DATE
JXTIME 600 STARTING TIME

PP100A.OH1

SUBBASIN RUNOFF DATA

54 BA   SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

55 PB   STORM 7.80 BASIN TOTAL PRECIPITATION

56 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	.01	.01	.01	.00	.01	.00
.01	.00	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.02	.02	.02	.02	.19	.19	.04	.04
.02	.02	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.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				

60 LS   SCS LOSS RATE
STRTL 1.23 INITIAL ABSTRACTION
CRVNBR 62.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

61 UD   SCS DIMENSIONLESS UNITGRAPH
TLAG 1.35 LAG

***

UNIT HYDROGRAPH
29 END-OF-PERIOD ORDINATES

1.	3.	7.	11.	14.	14.	14.	12.	9.	7.
5.	4.	3.	2.	2.	1.	1.	1.	1.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	

*** *** *** *** ***

HYDROGRAPH AT STATION OFF2
FOR PLAN 1, RATIO = .00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 4.40, TOTAL EXCESS = 3.40

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 26.	13.25		12.	4.	1.	1.
		(INCHES)	2.625	3.402	3.402	3.402
		(AC-FT)	6.	8.	8.	8.

CUMULATIVE AREA = .04 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION OFF2
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 7.80, TOTAL LOSS = 4.40, TOTAL EXCESS = 3.40

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	74.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 26.	13.25		12.	4.	1.	1.
		(INCHES)	2.625	3.402	3.402	3.402
		(AC-FT)	6.	8.	8.	8.

CUMULATIVE AREA = .04 SQ MI

*** ***

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        **************
        *            *
62 KK   *   COMB2    *
        *            *
        **************
```

63 KO   OUTPUT CONTROL VARIABLES
IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

*** ***

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        **************
        *            *
65 KK   *   BAS2     *
        *            *
        **************
```

BASIN DIRECTLY TO POND 2

9 IN   TIME DATA FOR INPUT TIME SERIES
JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 12DEC97 STARTING DATE
JXTIME 600 STARTING TIME

SUBBASIN RUNOFF DATA

67 BA   SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

```
                  PRECIPITATION DATA

   68 PB              STORM          7.80  BASIN TOTAL PRECIPITATION

   69 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      .01      .01      .01      .00      .01      .00
                        .01      .00      .01      .01      .01      .01      .01      .01      .01      .01
                        .01      .01      .02      .02      .02      .02      .19      .19      .04      .04
                        .02      .02      .01      .01      .01      .01      .01      .01      .01      .01
                        .01      .01      .01      .01      .00      .00      .00      .00      .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

   73 LS           SCS LOSS RATE
                       STRTL          .47  INITIAL ABSTRACTION
                      CRVNBR        81.00  CURVE NUMBER
                       RTIMP          .00  PERCENT IMPERVIOUS AREA

   74 UD           SCS DIMENSIONLESS UNITGRAPH
                       TLAG           .15  LAG

                                                       ***

                                                UNIT HYDROGRAPH
                                             5 END-OF-PERIOD ORDINATES
                 24.        9.        2.        0.        0.

          ***          ***          ***          ***          ***

                        HYDROGRAPH AT STATION     BAS2
                          FOR PLAN 1, RATIO = 1.00

         TOTAL RAINFALL =      7.80, TOTAL LOSS =      2.25, TOTAL EXCESS =      5.55

      PEAK FLOW       TIME                              MAXIMUM AVERAGE FLOW
                                              6-HR        24-HR        72-HR      74.75-HR
   +    (CFS)         (HR)
                                   (CFS)
   +      44.        12.00                      7.          2.           1.           1.
                                 (INCHES)     4.560       5.554        5.554        5.554
                                  (AC-FT)        3.          4.           4.           4.

                        CUMULATIVE AREA =       .01 SQ MI

          ***          ***          ***          ***          ***

                        HYDROGRAPH AT STATION     BAS2
                          FOR PLAN 1, RATIO = 1.00

         TOTAL RAINFALL =      7.80, TOTAL LOSS =      2.25, TOTAL EXCESS =      5.55

      PEAK FLOW       TIME                              MAXIMUM AVERAGE FLOW
                                              6-HR        24-HR        72-HR      74.75-HR
   +    (CFS)         (HR)
                                   (CFS)
   +      44.        12.00                      7.          2.           1.           1.
                                 (INCHES)     4.560       5.554        5.554        5.554
                                  (AC-FT)        3.          4.           4.           4.

                        CUMULATIVE AREA =       .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
   75 KK      *   COMB3    *
              *            *
              **************

   76 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
   78 KK      *   COMB4    *
              *            *
              **************

   79 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
   81 KK      *    OFF3    *
              *            *
              **************
                         OFFSITE TO COMMERCIAL

    9 IN          TIME DATA FOR INPUT TIME SERIES
```

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                JXMIN          30  TIME INTERVAL IN MINUTES
                JXDATE     12DEC97  STARTING DATE
                JXTIME         600  STARTING TIME

          SUBBASIN RUNOFF DATA

 83 BA     SUBBASIN CHARACTERISTICS
             TAREA          .02  SUBBASIN AREA

           PRECIPITATION DATA

 84 PB         STORM        7.80  BASIN TOTAL PRECIPITATION

 85 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   .01   .01   .00   .01   .00   .00
              .01   .00   .01   .01   .01   .01   .01   .01   .01   .01
              .01   .01   .02   .02   .02   .02   .19   .19   .04   .04
              .02   .02   .01   .01   .01   .01   .01   .01   .01   .01
              .01   .01   .01   .01   .00   .00   .00   .00   .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

 89 LS     SCS LOSS RATE
             STRTL          1.23  INITIAL ABSTRACTION
            CRVNBR         62.00  CURVE NUMBER
             RTIMP           .00  PERCENT IMPERVIOUS AREA

 90 UD     SCS DIMENSIONLESS UNITGRAPH
             TLAG          1.35  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          29 END-OF-PERIOD ORDINATES
              1.    2.    3.    6.    7.    7.    7.    6.    5.    3.
              3.    2.    1.    1.    1.    1.    0.    0.    0.    0.
              0.    0.    0.    0.    0.    0.    0.    0.    0.

   ***           ***           ***           ***           ***

                HYDROGRAPH AT STATION     OFF3
                  FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =    7.80, TOTAL LOSS =    4.40, TOTAL EXCESS =    3.40

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR         24-HR         72-HR      74.75-HR
+  (CFS)       (HR)
                (CFS)
    13.      13.25              6.            2.            1.            1.
             (INCHES)       2.625         3.402         3.402         3.402
             (AC-FT)            3.            4.            4.            4.

             CUMULATIVE AREA =     .02 SQ MI

   ***           ***           ***           ***           ***

                HYDROGRAPH AT STATION     OFF3
                  FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =    7.80, TOTAL LOSS =    4.40, TOTAL EXCESS =    3.40

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR         24-HR         72-HR      74.75-HR
+  (CFS)       (HR)
                (CFS)
+     13.      13.25              6.            2.            1.            1.
             (INCHES)       2.625         3.402         3.402         3.402
             (AC-FT)            3.            4.            4.            4.

             CUMULATIVE AREA =     .02 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
 91 KK    *     BAS3   *
          *            *
          **************
                COMMERCIAL BASIN DIRECTLY TO POND 2

  9 IN       TIME DATA FOR INPUT TIME SERIES
                JXMIN          30  TIME INTERVAL IN MINUTES
                JXDATE     12DEC97  STARTING DATE
                JXTIME         600  STARTING TIME

          SUBBASIN RUNOFF DATA

 93 BA     SUBBASIN CHARACTERISTICS
             TAREA          .04  SUBBASIN AREA

           PRECIPITATION DATA

 94 PB         STORM        7.80  BASIN TOTAL PRECIPITATION

 95 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   .01   .01   .01   .00   .01   .00
              .01   .00   .01   .01   .01   .01   .01   .01   .01   .01
              .01   .01   .02   .02   .02   .02   .19   .19   .04   .04
              .02   .02   .01   .01   .01   .01   .01   .01   .01   .01
              .01   .01   .01   .01   .00   .00   .00   .00   .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

   99 LS        SCS LOSS RATE
                      STRTL         .04  INITIAL ABSTRACTION
                      CRVNBR      98.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

  100 UD        SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .15  LAG

                                                                       ***

                                                            UNIT HYDROGRAPH
                                                        5 END-OF-PERIOD ORDINATES
               64.       24.        6.        1.        0.

      ***           ***           ***           ***           ***

                           HYDROGRAPH AT STATION    BAS3
                             FOR PLAN 1, RATIO =  .00

      TOTAL RAINFALL =    7.80, TOTAL LOSS =      .24, TOTAL EXCESS =     7.56

    PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR       72-HR      74.75-HR
+     (CFS)        (HR)
                           (CFS)
+      143.       12.00                    23.          7.          2.          2.
                         (INCHES)        5.909       7.560       7.560       7.560
                          (AC-FT)          12.         15.         15.         15.

                        CUMULATIVE AREA =      .04 SQ MI

      ***           ***           ***           ***           ***

                           HYDROGRAPH AT STATION    BAS3
                             FOR PLAN 1, RATIO = 1.00

      TOTAL RAINFALL =    7.80, TOTAL LOSS =      .24, TOTAL EXCESS =     7.56

    PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR       72-HR      74.75-HR
+     (CFS)        (HR)
                           (CFS)
+      143.       12.00                    23.          7.          2.          2.
                         (INCHES)        5.909       7.560       7.560       7.560
                          (AC-FT)          12.         15.         15.         15.

                        CUMULATIVE AREA =      .04 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  101 KK      *   COMB5    *
              *            *
              **************

  102 KO        OUTPUT CONTROL VARIABLES
                      IPRNT            5  PRINT CONTROL
                      IPLOT            0  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  104 KK      *   COMB6    *
              *            *
              **************

  105 KO        OUTPUT CONTROL VARIABLES
                      IPRNT            5  PRINT CONTROL
                      IPLOT            0  PLOT CONTROL
                      QSCAL           0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
  107 KK      *   POND2    *
              *            *
              **************

              HYDROGRAPH ROUTING DATA

  108 RS        STORAGE ROUTING
                      NSTPS            1  NUMBER OF SUBREACHES
                      ITYP          ELEV  TYPE OF INITIAL CONDITION
                      RSVRIC     1354.00  INITIAL CONDITION
                      X              .00  WORKING R AND D COEFFICIENT

  109 SA              AREA        5.5         6.6

  110 SE        ELEVATION     1354.00     1358.00

  111 SS        SPILLWAY
                      CREL       1354.00  SPILLWAY CREST ELEVATION
```

SPWID	2.00	SPILLWAY WIDTH
COQW	3.20	WEIR COEFFICIENT
EXPW	1.50	EXPONENT OF HEAD

***

COMPUTED STORAGE-ELEVATION DATA

STORAGE	.00	24.16
ELEVATION	1354.00	1358.00

COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	.01	.07	.24	.56	1.10	1.90	3.01	4.50
ELEVATION	1354.00	1354.00	1354.01	1354.05	1354.11	1354.20	1354.31	1354.44	1354.60	1354.79
OUTFLOW	6.40	8.78	11.68	15.17	19.29	24.09	29.63	35.96	43.13	51.20
ELEVATION	1355.00	1355.23	1355.49	1355.78	1356.09	1356.42	1356.78	1357.16	1357.57	1358.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.27	.61	1.09	1.70	2.46	3.36	4.41	5.61
OUTFLOW	.00	.01	.07	.24	.56	1.10	1.90	3.01	4.50	6.40
ELEVATION	1354.00	1354.01	1354.05	1354.11	1354.20	1354.31	1354.44	1354.60	1354.79	1355.00
STORAGE	6.97	8.48	10.17	12.02	14.06	16.28	18.70	21.33	24.16	
OUTFLOW	8.78	11.68	15.17	19.29	24.09	29.63	35.96	43.13	51.20	
ELEVATION	1355.23	1355.49	1355.78	1356.09	1356.42	1356.78	1357.16	1357.57	1358.00	

*** *** *** *** ***

HYDROGRAPH AT STATION POND2
FOR PLAN 1, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)
49.	15.25

MAXIMUM AVERAGE FLOW

	6-HR	24-HR	72-HR	74.75-HR
(CFS)	43.	24.	10.	9.
(INCHES)	1.373	3.013	3.649	3.649
(AC-FT)	21.	47.	57.	57.

PEAK STORAGE (AC-FT)	TIME (HR)
23.	15.25

MAXIMUM AVERAGE STORAGE

6-HR	24-HR	72-HR	74.75-HR
21.	13.	6.	6.

PEAK STAGE (FEET)	TIME (HR)
1357.87	15.25

MAXIMUM AVERAGE STAGE

6-HR	24-HR	72-HR	74.75-HR
1357.57	1356.30	1355.10	1355.06

CUMULATIVE AREA = .29 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00
HYDROGRAPH AT	OFF1	.03	1	FLOW	22.
				TIME	13.25
HYDROGRAPH AT	BAS1	.05	1	FLOW	140.
				TIME	12.00
2 COMBINED AT	COMB1	.08	1	FLOW	143.
				TIME	12.00
ROUTED TO	POND1	.08	1	FLOW	3.
				TIME	24.25
			** PEAK STAGES IN FEET **		
			1	STAGE	1357.84
				TIME	24.25
HYDROGRAPH AT	CHAN	.10	1	FLOW	54.
				TIME	13.50
HYDROGRAPH AT	OFF2	.04	1	FLOW	26.
				TIME	13.25
2 COMBINED AT	COMB2	.14	1	FLOW	80.
				TIME	13.50
HYDROGRAPH AT	BAS2	.01	1	FLOW	44.
				TIME	12.00
2 COMBINED AT	COMB3	.15	1	FLOW	84.
				TIME	13.25
2 COMBINED AT	COMB4	.23	1	FLOW	86.
				TIME	13.25

HYDROGRAPH AT

+	OFF3	.02	1	FLOW	13.
				TIME	13.25

HYDROGRAPH AT

+	BAS3	.04	1	FLOW	143.
				TIME	12.00

2 COMBINED AT

+	COMB5	.06	1	FLOW	144.
				TIME	12.00

2 COMBINED AT

+	COMB6	.29	1	FLOW	198.
				TIME	12.00

ROUTED TO

+	POND2	.29	1	FLOW	49.
				TIME	15.25

** PEAK STAGES IN FEET **

1	STAGE	1357.87
	TIME	15.25

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

Date: 03-27-2003
Time: 09:39:05

Input File: pp1.inp

PRAIRIE POINTE 1
Flow rate includes undeveloped runoff from north offsite basin

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area									Hydrology Summation				Conduit Data				
Node	to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
140	110	.44	.31	.00	.0	15.00	3.83	2.70	15.00	3.83	2.70	2.70	15"	2.20	165.00	1.25	16.25
130	120	.47	.51	.00	.0	15.00	3.83	5.70	15.00	3.83	5.70	5.70	18"	3.23	173.50	.90	15.90
120	110	.46	.27	.00	.0	15.00	3.83	2.90	15.90	3.73	2.82	8.52	24"	2.71	171.75	1.06	16.95
110	100	.44	.33	.00	.0	15.00	3.83	3.00	16.95	3.62	2.83	14.00	24"	4.46	340.00	1.27	18.22

Date: 03-27-2003
Time: 09:39:05

Input File: pp1.inp

PRAIRIE POINTE 1
Flow rate includes undeveloped runoff from north offsite basin

Storm Frequency = 2-Year

* * * HYDRAULICS * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
100	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
110	.00227	.7710	.0000	.0194	.0000	.3321	.3461	1.4686	1357.4690	1359.0000	1.53
120	.00084	.1443	.0000	.0094	.0000	.0216	.0666	.2419	1357.7110	1359.3000	1.59
130	.00174	.3023	.0000	.0000	.0000	.0000	.0000	.3023	1358.0130	1359.6000	1.59
140	.00103	.1706	.0000	.0000	.0000	.0000	.0000	.1706	1357.6390	1359.3000	1.66

Date: 03-27-2003
Time: 09:48:09

Input File: pp2.inp

PRAIRIE POINTE 2
Flow rates (230-250) include undeveloped runoff from north offsite b

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area									Hydrology Summation				Conduit Data				
Node	to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
250	230	.49	.21	.00	.0	15.00	3.83	1.80	15.00	3.83	1.80	1.80	18"	1.02	124.00	2.03	17.03
240	230	.44	.39	.00	.0	15.00	3.83	3.50	15.00	3.83	3.50	3.50	18"	1.98	204.00	1.72	16.72
230	220	.44	.36	.00	.0	15.00	3.83	3.10	17.03	3.61	2.92	8.19	24"	2.61	149.90	.96	17.99
220	210	.44	2.11	.00	.0	15.00	3.83	3.50	17.99	3.51	3.21	11.41	24"	3.63	44.00	.20	18.19
210	200	.45	2.01	.00	.0	15.00	3.83	3.40	18.19	3.50	3.10	14.51	24"	4.62	146.00	.53	18.72

STORM OUT

Date: 03-27-2003
Time: 09:48:09

Input File: pp2.inp

PRAIRIE POINTE 2
Flow rates (230-250) include undeveloped runoff from north offsite b

Storm Frequency = 2-Year

* * * H Y D R A U L I C S * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
200	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
210	.00243	.3554	.0000	.0127	.0000	.0274	.2635	.6589	1356.6590	1361.0000	4.34
220	.00150	.0662	.0000	.0099	.0000	.0141	.2042	.2944	1356.9530	1361.0000	4.05
230	.00078	.1163	.0000	.0045	.0000	.1770	.1663	.4641	1357.4170	1359.0000	1.58
240	.00066	.1340	.0000	.0000	.0000	.0000	.0000	.1340	1357.5520	1359.3000	1.75
250	.00017	.0215	.0000	.0000	.0000	.0000	.0000	.0215	1357.4390	1359.3000	1.86

STORM OUT

Date: 03-27-2003
Time: 10:00:35

PRAIRIE POINTE 3

Input File: pp3.inp

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area									Hydrology Summation				Conduit Data				
Node	to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
330	320	.44	.46	.00	.0	15.00	3.83	.80	15.00	3.83	.80	.80	15"	.65	111.00	2.84	17.84
320	310	.45	3.95	.00	.0	15.00	3.83	6.80	15.00	3.83	6.80	7.47	18"	4.23	44.00	.17	15.17
310	300	.44	1.30	.00	.0	15.00	3.83	2.20	15.17	3.81	2.19	9.66	24"	3.08	146.00	.79	15.96

Date: 03-27-2003
Time: 10:00:35

PRAIRIE POINTE 3

Input File: pp3.inp

Storm Frequency = 2-Year

* * * H Y D R A U L I C S * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
300	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
310	.00108	.1576	.0000	.0262	.0000	.6243	-.0137	.7943	1356.7940	1360.6000	3.81
320	.00299	.1318	.0000	.0271	.0000	.0151	.6535	.8275	1357.6220	1360.6000	2.98
330	.00009	.0101	.0000	.0000	.0000	.0000	.0000	.0101	1357.6320	1359.2000	1.57

Date: 03-27-2003
Time: 10:08:09

PRAIRIE POINTE 4

Input File: pp4.inp

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area									Hydrology Summation				Conduit Data				
Node	to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
420	410	.44	.43	.00	.0	15.00	3.83	1.90	15.00	3.83	1.90	1.90	15"	1.55	62.70	.67	15.67
410	400	.44	.15	.00	.0	15.00	3.83	.30	15.67	3.75	.29	2.19	15"	1.79	116.00	1.08	16.76

Date: 03-27-2003
Time: 10:08:09

Input File: pp4.inp

PRAIRIE POINTE 4

Storm Frequency = 2-Year

* * * H Y D R A U L I C S * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
400	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
410	.00068	.0792	.0000	.0012	.0000	.0933	.0279	.2016	1356.2020	1359.7000	3.50
420	.00051	.0321	.0000	.0000	.0000	.0000	.0000	.0321	1356.2340	1359.0000	2.77

STORM OUT

Date: 03-27-2003
Time: 10:21:20

Input File: pp5.inp

PRAIRIE POINTE 5

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area								Hydrology Summation				Conduit Data				
Node	to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
540	530	.47	1.00	.00	.0	15.00	3.83	1.80	15.00	3.83	1.80	1.80	15"	1.47	216.80	2.46	17.46
530	520	.44	.48	.00	.0	15.00	3.83	.80	17.46	3.57	.75	2.55	15"	2.07	92.50	.74	18.21
520	510	.45	2.28	.00	.0	15.00	3.83	3.90	18.21	3.49	3.56	6.10	15"	4.97	45.00	.15	18.36
510	500	.46	1.23	.00	.0	15.00	3.83	2.20	18.36	3.48	2.00	8.10	18"	4.59	150.50	.55	18.90

Date: 03-27-2003
Time: 10:21:20

PRAIRIE POINTE 5

Input File: pp5.inp

Storm Frequency = 2-Year

* * * H Y D R A U L I C S * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
500	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
510	.00352	.5301	.0000	.0115	.0000	.0514	.1634	.7564	1356.7560	1361.0000	4.24
520	.00528	.2378	.0000	.0317	.0000	.0089	.6516	.9300	1357.6860	1361.0000	3.31
530	.00092	.0850	.0000	.0033	.0000	.0794	.0703	.2381	1357.9240	1359.7000	1.78
540	.00046	.0996	.0000	.0000	.0000	.0000	.0000	.0996	1358.0240	1359.5000	1.48

STORM OUT

Date: 03-27-2003
Time: 10:36:49

PRAIRIE POINTE 6

Input File: pp6.inp

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area									Hydrology Summation				Conduit Data				
Node	to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
620	610	.48	2.23	.00	.0	15.00	3.83	4.10	15.00	3.83	4.10	4.10	18"	2.32	44.00	.32	15.32
610	600	.50	1.36	.00	.0	15.00	3.83	2.60	15.32	3.79	2.58	6.68	18"	3.78	146.00	.64	15.96

PRAIRIE POINTE 6

Input File: pp6.inp

Storm Frequency = 2-Year

* * * H Y D R A U L I C S * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
600	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
610	.00239	.3489	.0000	.0138	.0000	.0112	.2847	.6586	1356.6590	1361.0000	4.34
620	.00090	.0397	.0000	.0000	.0000	.0000	.0000	.0397	1356.6980	1361.0000	4.30

PRAIRIE POINTE 7

Input File: pp7.inp

Date: 03-27-2003
Time: 10:41:37

Storm Frequency = 2-Year

* * * H Y D R O L O G Y * * *

Tributary Area								Hydrology Summation				Conduit Data				
Node to Node		C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
720	710	.48	1.44	.00	.0	15.00	3.83	2.60	15.00	3.83	2.60	2.60					
													18"	1.47	44.00	.50	15.50
710	700	.48	1.15	.00	.0	15.00	3.83	2.10	15.50	3.77	2.07	4.67					
													18"	2.64	145.00	.91	16.41

Date: 03-27-2003
Time: 10:41:37

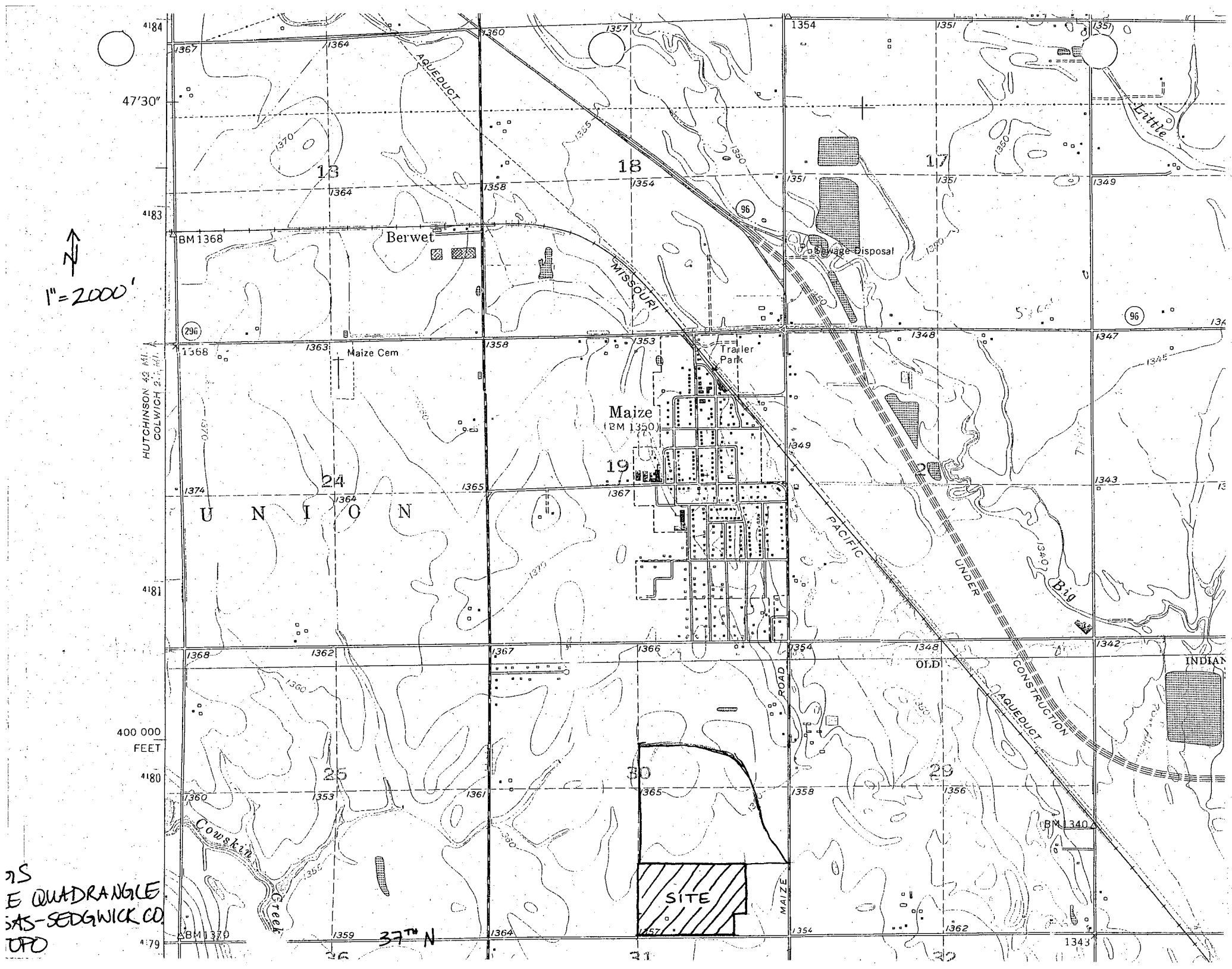
PRAIRIE POINTE 7

Input File: pp7.inp

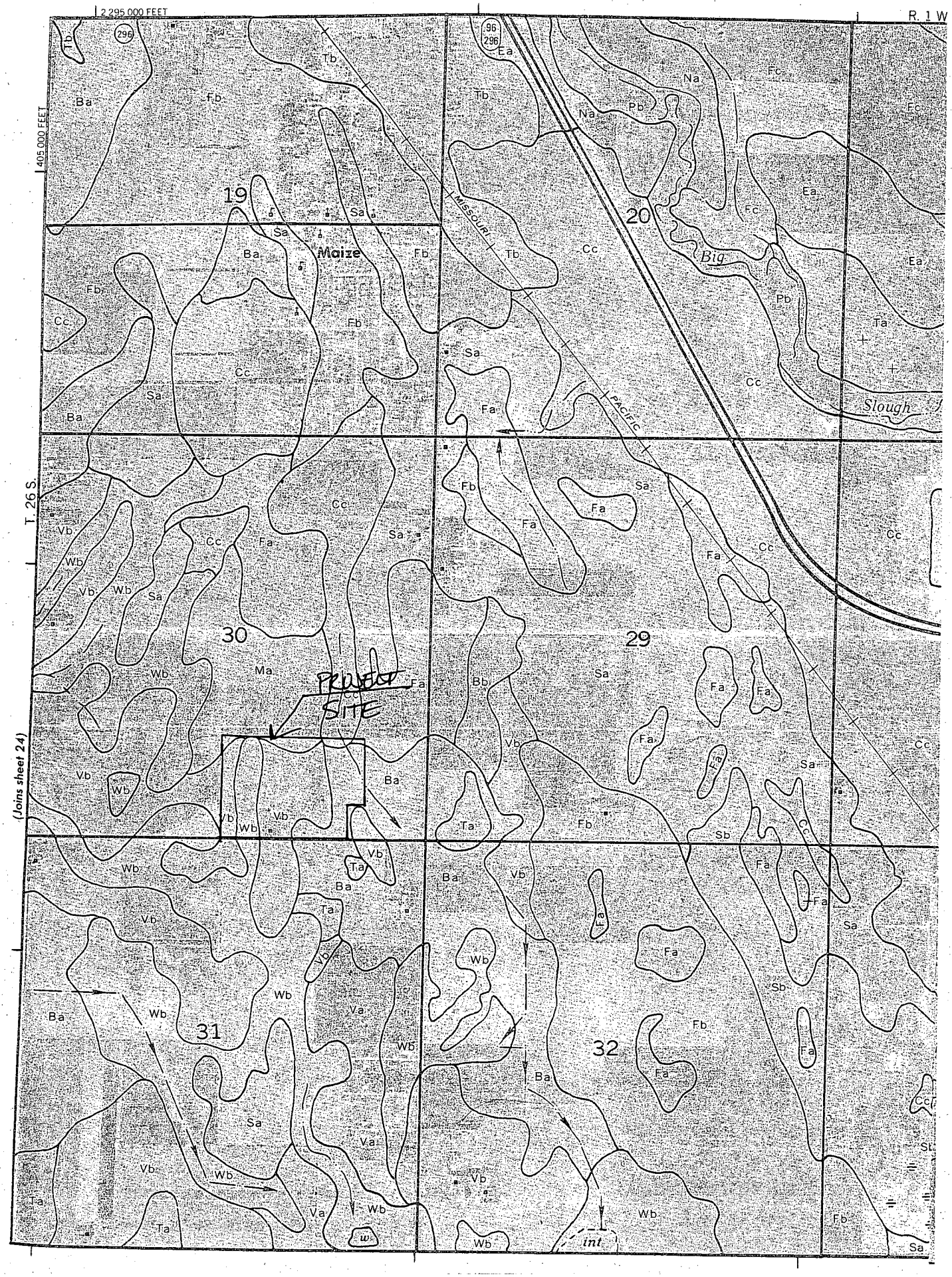
Storm Frequency = 2-Year

* * * H Y D R A U L I C S * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
700	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1356.0000	1356.0000	.00
710	.00117	.1695	.0000	.0075	.0000	.0045	.1537	.3351	1356.3350	1361.0000	4.66
720	.00036	.0160	.0000	.0000	.0000	.0000	.0000	.0160	1356.3510	1361.0000	4.65



7.5
E QUADRANGLE
SAS-SEDGWICK CO
TOPO


2 295 000 FEET
R. 1 W
405 000 FEET
T. 26 S.
(Joins sheet 24)
MISSOURI PACIFIC
Big Slough
Maize
PROPOSED SITE
19
20
29
30
31
32
Ba
Bb
Cc
Ea
Fa
Fb
Fc
Na
Pb
Sa
Sb
Ta
Tb
Va
Vb
Wb
296
96
int

SOIL LEGEND

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

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Project 37TH AND MAIZE PLAT Date 1/29/03

Item _____ By _____

SOIL TYPE		HYDROLOGIC GROUP
Vb:	VANOSS SILT LOAM, 1-3% SLOPES	B
Wb:	WAURIKA SILT LOAM	D
Ba:	BLANKET SILT LOAM, 0-1% SLOPES	C
Cc:	CARWILE FINE SANDY LOAM	D
Fa:	FARNUM LOAM, 0-1% SLOPES	B
Ma:	MILAN LOAM, 1-3% SLOPES	B

County	Expected 24-hour Storm Rainfall in Inches — Storm Frequency in Years						Normal Annual Precipitation
	100	50	25	10	5	2	Inches
Pawnee	6.6	6.0	5.2	4.5	3.7	2.8	23.3
Phillips	6.0	5.5	4.8	4.1	3.4	2.5	23.6
Pottawatomie	7.5	6.6	5.9	5.1	4.3	3.4	33.6
Pratt	7.2	6.4	5.6	4.8	4.1	3.0	24.6
Rawlins	5.5	5.0	4.3	3.6	3.1	2.3	21.0
Reno	7.4	6.6	5.8	5.0	4.2	3.2	27.7
Republic	6.8	6.0	5.4	4.6	3.9	2.9	28.6
Rice	7.3	6.4	5.6	4.8	4.1	3.0	26.6
Riley	7.4	6.5	5.8	5.1	4.3	3.3	33.5
Rooks	6.1	5.7	4.9	4.1	3.4	2.5	23.9
Rush	6.5	5.9	5.0	4.3	3.6	2.7	23.3
Russell	6.7	5.9	5.2	4.4	3.7	2.8	26.8
Saline	7.3	6.4	5.7	4.9	4.1	3.1	28.4
Scott	5.7	5.3	4.5	3.8	3.2	2.4	20.2
Sedgwick	7.8	7.0	6.1	5.3	4.5	3.5	30.6
Seward	6.0	5.7	4.8	4.2	3.5	2.6	19.8
Shawnee	7.8	6.8	6.1	5.3	4.5	3.5	34.7
Sheridan	5.7	5.3	4.5	3.8	3.2	2.4	21.3
Sherman	5.3	4.8	4.2	3.5	3.0	2.2	16.7
Smith	6.3	5.7	5.0	4.2	3.5	2.6	24.4
Stafford	7.1	6.2	5.5	4.7	4.0	2.9	25.1
Stanton	5.6	5.2	4.5	3.8	3.2	2.4	15.8
Stevens	5.9	5.5	4.7	4.1	3.4	2.5	19.7
Sumner	8.0	7.1	6.2	5.4	4.6	3.6	34.0

ATTACHMENT D (3 pages)

DRAINAGE CRITERIA

CITY OF WICHITA, KANSAS

RECOMMENDED RUNOFF COEFFICIENTS FOR RATIONAL METHOD
AND PERCENT IMPERVIOUS FOR UNIT HYDROGRAPH METHOD

Land Use or Surface Characteristics	Percent Impervious	Frequency 2	5	10	100
1. Business:					
Downtown Areas	95	0.84	0.85	0.87	0.91
Neighborhood Areas	70	0.68	0.69	0.73	0.80
2. Residential:					
Single Family (Soil Group D)					
1/8 Acre	50	0.57	0.61	0.66	0.79
1/4 Acre	38	0.50	0.54	0.62	0.76
1/3 Acre	30	0.46	0.50	0.59	0.73
1/2 Acre	25	0.42	0.48	0.56	0.72
3/4 Acre	22	0.42	0.46	0.55	0.71
1 Acre	20	0.41	0.45	0.54	0.71
Multi-Family (Soil Group D)					
Multi-Unit (detached)	60	0.62	0.66	0.72	0.82
Multi-Unit (attached)	65	0.64	0.68	0.73	0.83
Apartments	75	0.70	0.73	0.79	0.86
Single Family (Soil Group C)					
1/8 Acre	50	0.55	0.58	0.64	0.73
1/4 Acre	38	0.48	0.51	0.57	0.68
1/3 Acre	30	0.43	0.46	0.53	0.65
1/2 Acre	25	0.40	0.43	0.50	0.63
3/4 Acre	22	0.39	0.42	0.49	0.62
1 Acre	20	0.37	0.40	0.48	0.61
Multi-Family (Soil Group C)					
Multi-Unit (detached)	60	0.60	0.63	0.69	0.77
Multi-Unit (attached)	65	0.63	0.66	0.71	0.79
Apartments	75	0.68	0.72	0.77	0.83
Single-Family (Soil Group B)					
1/8 Acre	50	0.52	0.54	0.59	0.67
1/4 Acre	38	0.44	0.46	0.52	0.61
1/3 Acre	30	0.39	0.41	0.47	0.57
1/2 Acre	25	0.36	0.38	0.44	0.54
3/4 Acre	22	0.34	0.36	0.42	0.52
1 Acre	20	0.33	0.35	0.40	0.51
Multi-Family (Soil Group B)					
Multi-Unit (detached)	60	0.58	0.60	0.65	0.72
Multi-Unit (attached)	65	0.61	0.64	0.68	0.75
Apartments	75	0.67	0.70	0.74	0.80

Land Use or Surface Characteristics	Percent Impervious	Frequency 2	5	10	25	100
Single Family (Soil Group A)						
1/8 Acre	50	0.47	0.50	0.54		0.60
1/4 Acre	38	0.39	0.41	0.45		0.52
1/3 Acre	30	0.33	0.35	0.39		0.47
1/2 Acre	25	0.30	0.31	0.35		0.44
3/4 Acre	22	0.28	0.29	0.33		0.42
1 Acre	20	0.26	0.28	0.32		0.40
Multi-Family (Soil Group A)						
Multi-Unit (detached)	60	0.55	0.57	0.61		0.67
Multi-Unit (attached)	65	0.58	0.60	0.64		0.70
Apartments	75	0.65	0.68	0.72		0.77
3. Industrial:						
Light Areas	70	0.68	0.69	0.73		0.80
Heavy Areas	80	0.74	0.76	0.79		0.84
4. Playgrounds:	15	0.33	0.35	0.42		0.55
Schools:	40	0.49	0.51	0.56		0.66
Railroad Yard Areas:	30	0.43	0.45	0.50		0.62
7. Undeveloped Urban Areas: Offsite Flow Analysis (when land use not defined)	45	0.52	0.54	0.59		0.68
8. Streets:						
Paved	99	0.87	0.88	0.90		0.93
Gravel	00	0.24	0.26	0.33		0.48
9. Drive, Parking Lots and Walks:	96	0.87	0.87	0.88		0.89
10. Roofs:	90	0.80	0.85	0.90		0.93
11. Urban Lawn Areas (See Note No. 1 below):						
Soil Group A						
Slope less than 1%	00	0.08	0.09	0.13		0.23
Slope 1% to 4%	00	0.12	0.13	0.17		0.27
Slope more than 4%	00	0.16	0.17	0.21		0.31
Soil Group B						
Slope less than 1%	00	0.16 0.26	0.18	0.24		0.37
Slope 1% to 4%	00	0.20	0.22	0.28		0.41
Slope more than 4%	00	0.24	0.26	0.32		0.45
Soil Group C						
Slope less than 1%	00	0.24	0.27	0.35		0.51
Slope 1% to 4%	00	0.26	0.29	0.37	040	0.53
Slope more than 4%.	00	0.28	0.31	0.39		0.55

Land Use or Surface Characteristics	Percent Impervious	Frequency 2	5	10	100
Soil Group D					
Slope less than 1%	00	0.28	0.33	0.43	0.63
Slope 1% to 4%	00	0.30	0.35	0.45	0.65
Slope more than 4%	00	0.32	0.37	0.47	0.67

Note No. 1: Coefficients shown in the above table are for pervious open space areas with thick turf which includes pervious areas in parks and cemeteries. Coefficients shown above must be increased 0.02 for use with agricultural pasture areas. Coefficients shown above must be reduced by 0.04 for use with agricultural cultivated areas. Group A soils are well-drained, coarse textured sands with high infiltration rates. Group B soils are moderately well-drained, moderately coarse textured soils with moderate infiltration rates. Group C soils are moderately poor-drained, moderately fine textured soils with slow infiltration rates. Group D soils are poor-drained, fine textured soils with very slow infiltration rates.

GENERAL NOTE: These Rational Formula Coefficients may not be valid for large basins.

RAINFALL INTENSITY TABLE

SEDGWICK COUNTY KANSAS
(revised June 1997)

This table contains average rainfall intensities in inches per hour.

DURATION, HR:MIN	RETURN PERIOD 1 YR	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
0:05	4.91	5.64	6.64	7.38	8.48	9.34	10.20
0:06	4.62	5.34	6.33	7.07	8.15	9.00	9.84
0:07	4.38	5.09	6.08	6.80	7.86	8.69	9.52
0:08	4.17	4.87	5.85	6.56	7.60	8.41	9.22
0:09	4.00	4.68	5.63	6.33	7.34	8.14	8.93
0:10	3.84	4.50	5.43	6.11	7.10	7.87	8.64
0:11	3.70	4.34	5.25	5.90	6.86	7.61	8.36
0:12	3.56	4.19	5.07	5.71	6.64	7.36	8.09
0:13	3.44	4.05	4.91	5.53	6.43	7.14	7.84
0:14	3.33	3.92	4.76	5.36	6.24	6.92	7.61
0:15	3.22	3.80	4.62	5.21	6.06	6.73	7.40
0:16	3.12	3.69	4.49	5.07	5.91	6.56	7.21
0:17	3.03	3.58	4.37	4.94	5.76	6.40	7.04
0:18	2.94	3.48	4.26	4.82	5.63	6.26	6.88
0:19	2.85	3.39	4.16	4.71	5.50	6.12	6.74
0:20	2.77	3.30	4.06	4.60	5.38	5.99	6.60
0:21	2.70	3.22	3.97	4.50	5.27	5.87	6.47
0:22	2.63	3.14	3.88	4.41	5.17	5.76	6.35
0:23	2.56	3.07	3.80	4.32	5.07	5.65	6.23
0:24	2.50	3.00	3.72	4.23	4.97	5.54	6.12
0:25	2.44	2.93	3.64	4.15	4.88	5.44	6.01
0:26	2.38	2.87	3.57	4.07	4.79	5.35	5.90
0:27	2.33	2.81	3.50	4.00	4.70	5.26	5.80
0:28	2.27	2.75	3.44	3.92	4.62	5.17	5.71
0:29	2.23	2.69	3.37	3.86	4.54	5.08	5.61
0:30	2.18	2.64	3.31	3.79	4.47	4.99	5.52
0:31	2.14	2.59	3.26	3.72	4.39	4.91	5.43
0:32	2.09	2.54	3.20	3.66	4.32	4.83	5.34
0:33	2.05	2.50	3.14	3.60	4.25	4.76	5.26
0:34	2.02	2.45	3.09	3.54	4.18	4.68	5.18
0:35	1.98	2.41	3.04	3.48	4.12	4.61	5.10
0:36	1.94	2.37	2.99	3.43	4.05	4.54	5.02
0:37	1.91	2.33	2.94	3.38	3.99	4.47	4.95
0:38	1.88	2.29	2.90	3.32	3.93	4.40	4.87
0:39	1.85	2.25	2.85	3.27	3.87	4.34	4.80
0:40	1.82	2.22	2.81	3.23	3.82	4.28	4.73
0:41	1.79	2.18	2.77	3.18	3.76	4.22	4.67
0:42	1.76	2.15	2.73	3.13	3.71	4.16	4.60
0:43	1.73	2.12	2.69	3.09	3.66	4.10	4.54
0:44	1.71	2.09	2.65	3.05	3.61	4.04	4.48
0:45	1.68	2.06	2.62	3.01	3.56	3.99	4.42
0:46	1.66	2.03	2.58	2.96	3.51	3.94	4.36
0:47	1.63	2.00	2.55	2.93	3.47	3.89	4.30
0:48	1.61	1.97	2.51	2.89	3.42	3.84	4.25
0:49	1.59	1.95	2.48	2.85	3.38	3.79	4.20
0:50	1.57	1.92	2.45	2.81	3.34	3.74	4.15

RAINFALL INTENSITY TABLE

SEDGWICK COUNTY KANSAS
(revised June 1997)

This table contains average rainfall intensities in inches per hour.

DURATION, HR:MIN	RETURN PERIOD 1 YR	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
0:51	1.55	1.90	2.42	2.78	3.30	3.70	4.10
0:52	1.53	1.87	2.39	2.75	3.26	3.65	4.05
0:53	1.51	1.85	2.36	2.71	3.22	3.61	4.00
0:54	1.49	1.83	2.33	2.68	3.18	3.57	3.95
0:55	1.47	1.80	2.30	2.65	3.14	3.53	3.91
0:56	1.45	1.78	2.28	2.62	3.11	3.49	3.86
0:57	1.43	1.76	2.25	2.59	3.07	3.45	3.82
0:58	1.41	1.74	2.22	2.56	3.04	3.41	3.78
0:59	1.40	1.72	2.20	2.53	3.01	3.37	3.74
1:00	1.38	1.70	2.17	2.50	2.97	3.34	3.70
1:05	1.30	1.61	2.06	2.38	2.82	3.17	3.52
1:10	1.23	1.53	1.96	2.26	2.69	3.02	3.35
1:15	1.17	1.45	1.87	2.16	2.57	2.89	3.20
1:20	1.11	1.38	1.79	2.06	2.46	2.77	3.07
1:25	1.06	1.32	1.71	1.98	2.36	2.65	2.95
1:30	1.01	1.27	1.64	1.90	2.27	2.55	2.83
1:35	0.97	1.21	1.58	1.83	2.18	2.46	2.73
1:40	0.93	1.16	1.52	1.76	2.10	2.37	2.63
1:45	0.89	1.12	1.46	1.70	2.03	2.29	2.54
1:50	0.86	1.08	1.41	1.64	1.96	2.21	2.46
1:55	0.82	1.04	1.36	1.58	1.89	2.13	2.38
2:00	0.79	1.00	1.31	1.53	1.83	2.07	2.30
2:05	0.76	0.97	1.27	1.48	1.77	2.00	2.23
2:10	0.74	0.93	1.23	1.43	1.72	1.94	2.16
2:15	0.71	0.90	1.19	1.39	1.67	1.88	2.10
2:20	0.69	0.87	1.15	1.35	1.62	1.83	2.04
2:25	0.66	0.85	1.12	1.31	1.57	1.78	1.98
2:30	0.64	0.82	1.09	1.27	1.53	1.73	1.93
2:35	0.62	0.80	1.06	1.24	1.49	1.68	1.88
2:40	0.61	0.78	1.03	1.21	1.45	1.64	1.83
2:45	0.59	0.75	1.01	1.18	1.42	1.60	1.79
2:50	0.57	0.74	0.98	1.15	1.38	1.56	1.74
2:55	0.56	0.72	0.96	1.12	1.35	1.53	1.70
3:00	0.55	0.70	0.94	1.10	1.32	1.49	1.67
3:15	0.51	0.66	0.88	1.03	1.24	1.40	1.57
3:30	0.48	0.62	0.83	0.97	1.17	1.32	1.48
3:45	0.45	0.59	0.78	0.92	1.11	1.26	1.40
4:00	0.43	0.56	0.75	0.88	1.06	1.20	1.34
4:15	0.41	0.53	0.71	0.84	1.01	1.14	1.28
4:30	0.40	0.51	0.68	0.80	0.97	1.10	1.22
4:45	0.38	0.49	0.66	0.77	0.93	1.05	1.17
5:00	0.37	0.47	0.63	0.74	0.89	1.01	1.13
5:15	0.36	0.46	0.61	0.72	0.86	0.98	1.09
5:30	0.35	0.44	0.59	0.69	0.83	0.94	1.05
5:45	0.34	0.43	0.57	0.67	0.81	0.91	1.02
6:00	0.33	0.42	0.55	0.65	0.78	0.88	0.98

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
Forrest with Heavy Ground Litter or Meadow	0.08	0.11	0.14	0.16	0.18	0.19	0.20	0.22	0.23	0.25	0.35	0.42	0.50	0.55	0.60	0.66	0.70	0.75	0.80	1.10
Fallow or Minimum Tillage Cultivation	0.15	0.21	0.26	0.29	0.33	0.35	0.39	0.41	0.44	0.46	0.65	0.80	0.92	1.10	1.20	1.30	1.40	1.50	1.60	2.10
Short Grass Pasture or Lawns	0.23	0.32	0.38	0.44	0.50	0.53	0.58	0.62	0.66	0.70	1.00	1.20	1.40	1.60	1.80	1.90	2.00	2.10	2.20	3.20
Almost Bare Ground	0.32	0.44	0.53	0.62	0.69	0.75	0.82	0.87	0.92	0.98	1.40	1.70	1.90	2.10	2.30	2.50	2.70	2.90	3.10	4.40
Grassed Waterway	0.50	0.68	0.83	0.95	1.10	1.20	1.30	1.40	1.50	1.60	2.20	2.60	3.00	3.40	3.70	4.00	4.30	4.60	4.80	7.00
Paved Areas (Sheet Flow) or Shallow Gutter Flow	0.63	0.89	1.10	1.30	1.50	1.60	1.70	1.80	1.90	2.00	2.80	3.40	4.00	4.50	4.90	5.30	5.70	6.00	6.20	9.00

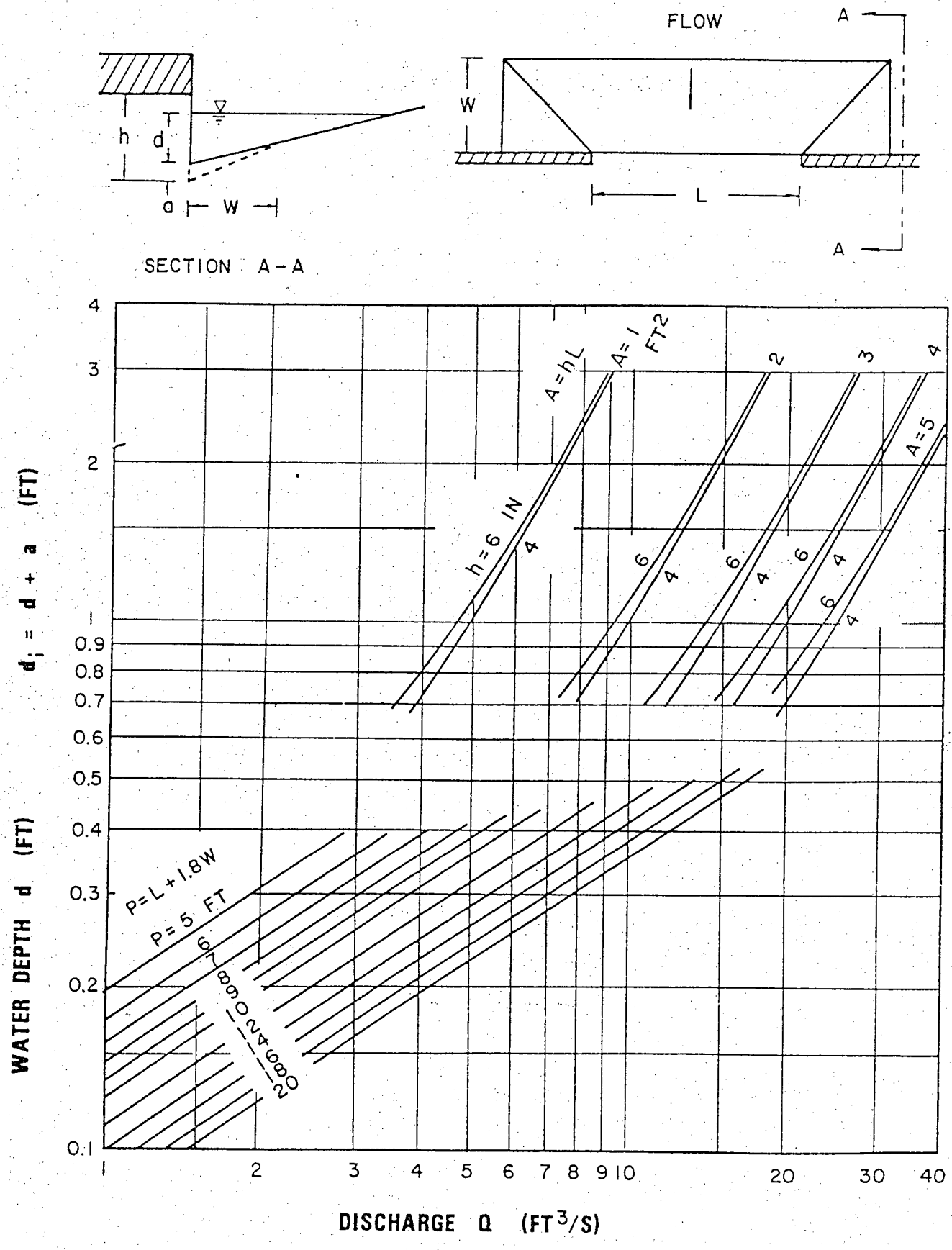


CHART 12. Depressed curb-opening inlet capacity in sump locations.

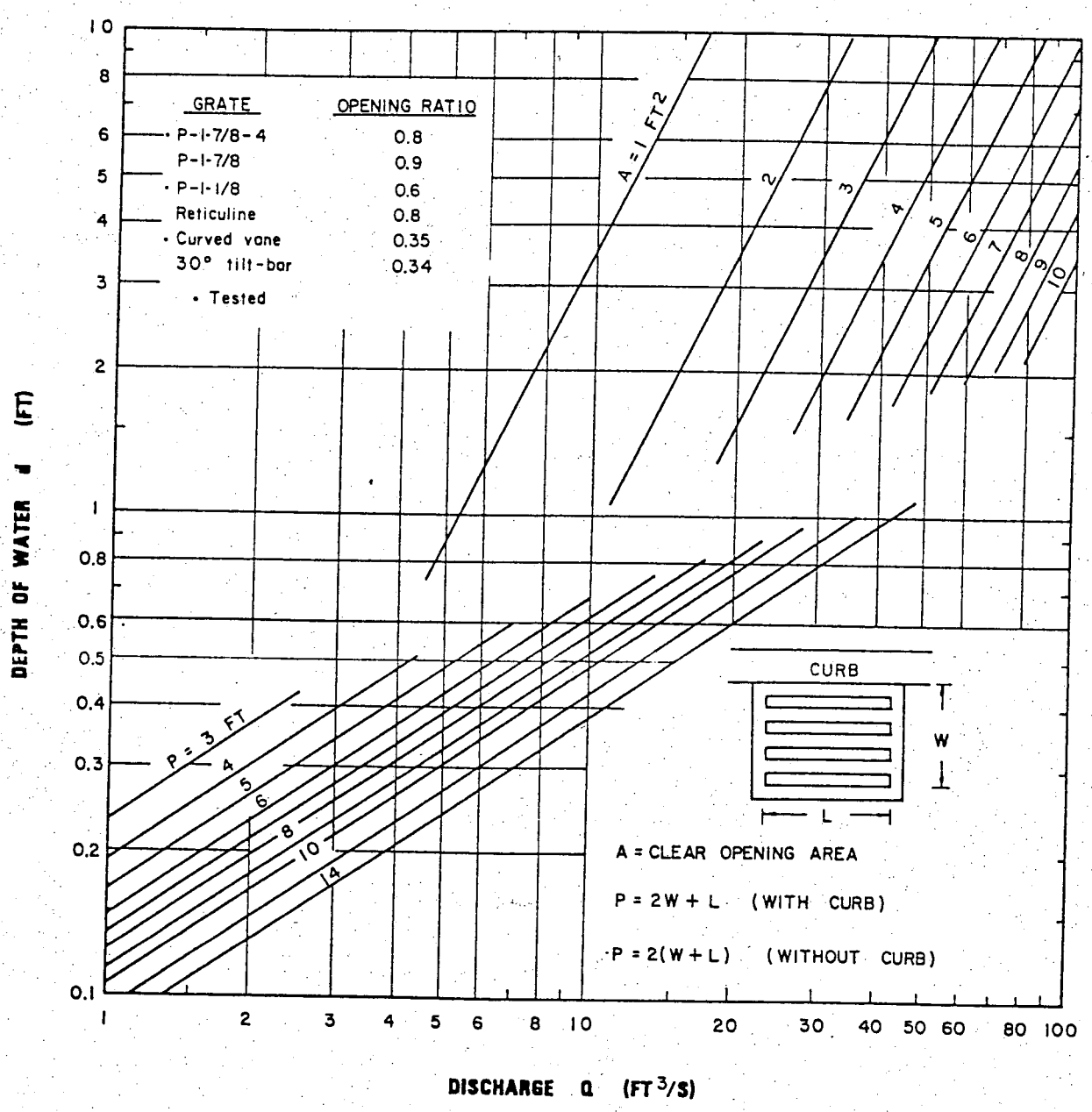


CHART 11. Grate inlet capacity in sump conditions.

n=0.016

z = 1/.031 = 32.26

z/n = 2016

@ N320 Q_2 = 6.8

S = 0.5%

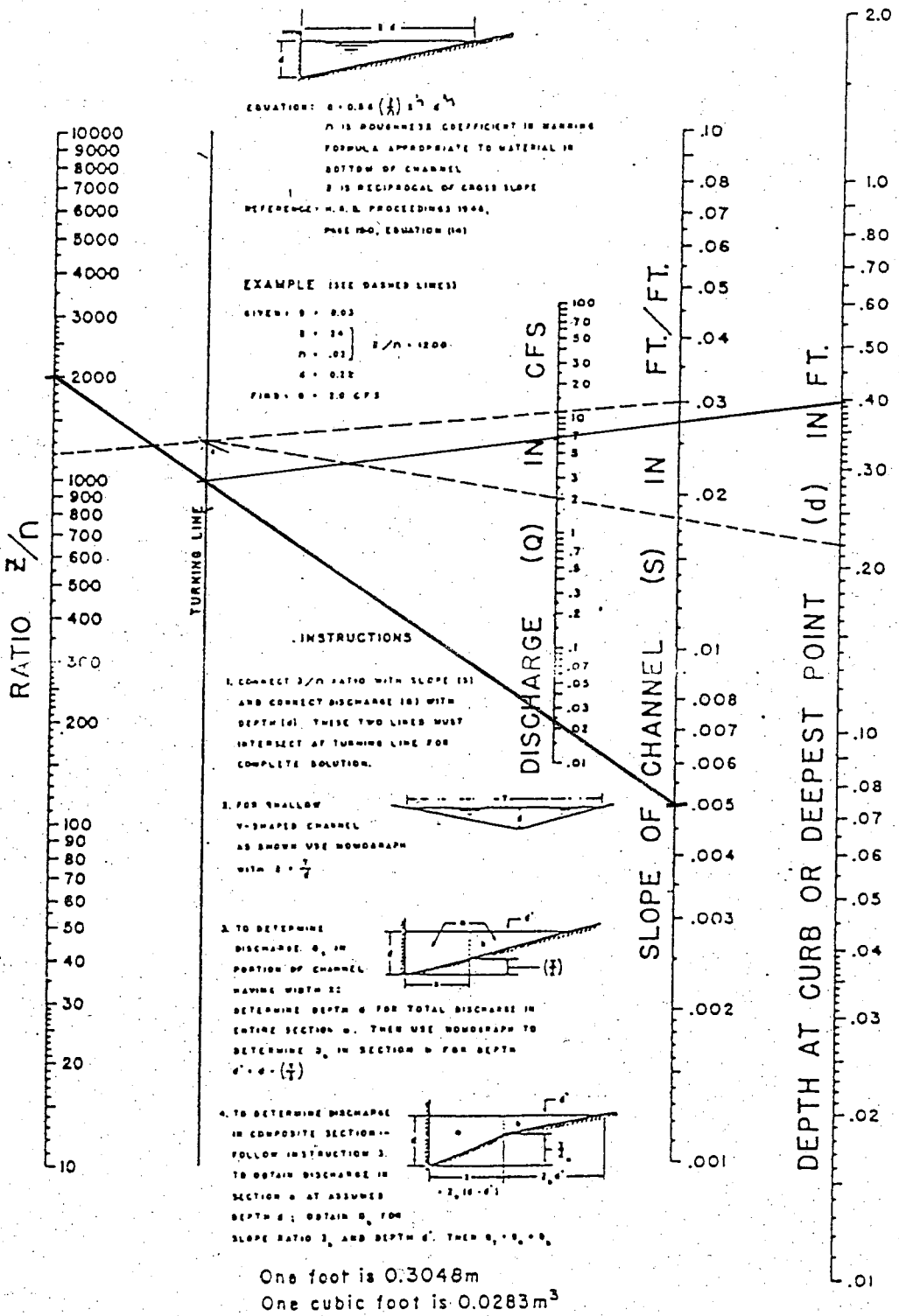
0.4' < 0.55' so OK

- By inspection all nodes OK

PRAIRIE POINTE

3/25/03

NOMOGRAPH FOR FLOW IN TRIANGULAR CHANNELS



One foot is 0.3048m

One cubic foot is 0.0283m^3

Professional Engineering Consultants, P.A.
203 S. TOPEKA ▪ WICHITA, KANSAS 67202
316-262-2691 ▪ FAX 316-262-3003
www.pec1.com ▪ designers@pec1.com

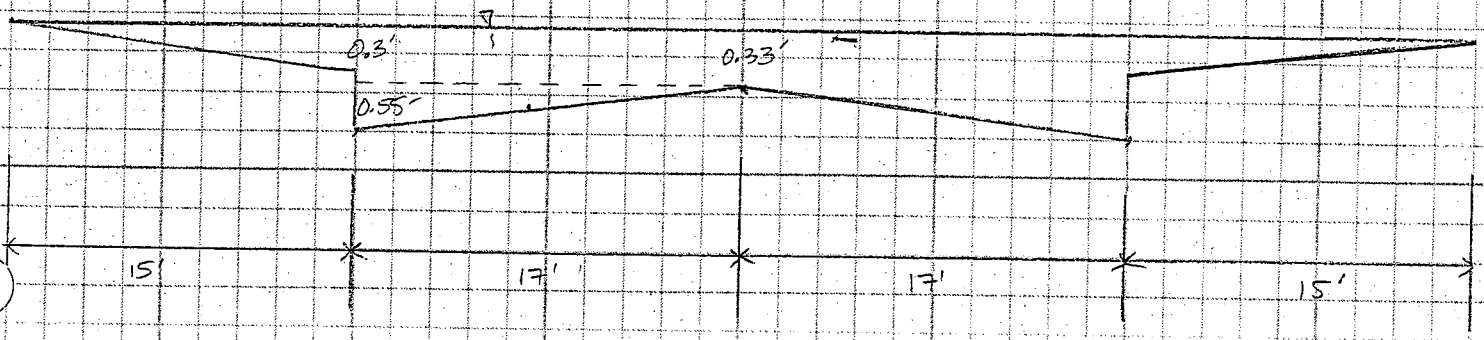
Project _____ Date _____

Item _____ By _____

DETERMINE CAPACITIES OF STANDARD CURB STREETS W/ VARIOUS WORK GRADES FOR 100-YR STORM ANALYSIS

(64' R.O.W.)

0.3' WORK GRADE



$$n = \frac{(2 \times 14.5 \times 0.03) + (2 \times 3.05 \times 0.013) + (2 \times 15 \times 0.016)}{65.1} = 0.02196$$

$$A = (2 \times \tfrac{1}{2} \times 15 \times 0.3) + (34 \times 0.33) + (2 \times \tfrac{1}{2} \times 17 \times 0.52) = 24.56\ SF$$

$$P = 65.1'$$

$$R = \frac{A}{P} = \frac{24.56\ SF}{65.1} = 0.377$$

$$R^{2/3} = (0.377)^{2/3} = 0.522$$

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

$$Q = \frac{1.486}{0.02196} (24.56)(0.522)(S^{1/2})$$

$$Q = 867.5 (S^{1/2})$$

CURRENT DATE: 04-24-2003
CURRENT TIME: 15:45:54

FILE DATE: 04-24-2003
FILE NAME: PP

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.1

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	1350.75	1350.60	370.00	1 RCP	1.25	1.25	.012	CONVENTIONAL
2								
3								
4								
5								
6								

15" RCP FROM POND 1 TO POND 2

SUMMARY OF CULVERT FLOWS (cfs) FILE: PP DATE: 04-24-2003

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1354.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1354.73	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1356.36	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1358.52	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1359.45	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1360.27	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1361.26	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1362.44	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1363.80	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1365.34	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1367.06	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: PP DATE: 04-24-2003

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
1354.00	0.000	0.00	0.00	0.00
1354.73	0.000	1.00	0.00	0.00
1356.36	0.000	2.00	0.00	0.00
1358.52	0.000	3.00	0.00	0.00
1359.45	0.000	4.00	0.00	0.00
1360.27	0.000	5.00	0.00	0.00
1361.26	0.000	6.00	0.00	0.00
1362.44	0.000	7.00	0.00	0.00
1363.80	0.000	8.00	0.00	0.00
1365.34	0.000	9.00	0.00	0.00
1367.06	0.000	10.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

RUN DATE: 04-24-2003
RUN TIME: 15:45:54

FILE DATE: 04-24-2003
FILE NAME: PP

PERFORMANCE CURVE FOR CULVERT 1 - 1(1.25 (ft) BY 1.25 (ft)) RCP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	1354.00	0.00	3.25	0-NF	0.00	0.00	0.00	3.40	0.00	0.00
1.00	1354.73	0.53	3.98	4-FFt	0.78	0.39	1.25	4.04	0.81	0.00
2.00	1356.36	0.82	5.61	4-FFt	1.25	0.56	1.25	5.40	1.63	0.00
3.00	1358.52	1.05	7.77	4-FFt	1.25	0.69	1.25	7.10	2.44	0.00
4.00	1359.45	1.26	8.70	4-FFt	1.25	0.81	1.25	7.40	3.26	0.00
5.00	1360.27	1.50	9.52	4-FFt	1.25	0.90	1.25	7.40	4.07	0.00
6.00	1361.26	1.78	10.51	4-FFt	1.25	0.99	1.25	7.40	4.89	0.00
7.00	1362.44	2.12	11.69	4-FFt	1.25	1.05	1.25	7.40	5.70	0.00
8.00	1363.80	2.51	13.05	4-FFt	1.25	1.11	1.25	7.40	6.52	0.00
9.00	1365.34	2.97	14.59	4-FFt	1.25	1.17	1.25	7.40	7.33	0.00
10.00	1367.06	3.47	16.31	4-FFt	1.25	1.23	1.25	7.40	8.15	0.00

El. inlet face invert 1350.75 ft El. outlet invert 1350.60 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	1350.75 ft
OUTLET STATION	370.00 ft
OUTLET ELEVATION	1350.60 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0004
CULVERT LENGTH ALONG SLOPE	370.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	1.25 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE WITH HEADWALL
INLET DEPRESSION	NONE

RRENT DATE: 04-24-2003
RENT TIME: 15:45:54

FILE DATE: 04-24-2003
FILE NAME: PP

TAILWATER

TAILWATER RATING CURVE

FLOW (cfs)	W.S.E.(ft)	DEPTH (ft)
0	1354.00	3.40
1	1354.64	4.04
2	1356.00	5.40
3	1357.70	7.10
4	1358.00	7.40
5	1358.00	7.40
6	1358.00	7.40
7	1358.00	7.40
8	1358.00	7.40
9	1358.00	7.40
10	1358.00	7.40

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	64.00 ft
CREST LENGTH	300.00 ft
OVERTOPPING CREST ELEVATION	1360.17 ft

CURRENT DATE: 04-24-2003
CURRENT TIME: 13:50:59

FILE DATE: 04-24-2003
FILE NAME: POINT

CULVERT UNDER EAST ENTRANCE

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.1

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	1354.00	1353.80	85.00	1 RCPE	1.92	1.17	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: POINT DATE: 04-24-2003

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1354.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1354.66	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1355.01	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1355.30	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1355.68	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1356.28	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1356.92	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1357.63	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1358.44	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1359.36	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
1360.40	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0
0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: POINT DATE: 04-24-2003

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
1354.00	0.000	0.00	0.00	0.00
1354.66	0.000	2.00	0.00	0.00
1355.01	0.000	4.00	0.00	0.00
1355.30	0.000	6.00	0.00	0.00
1355.68	0.000	8.00	0.00	0.00
1356.28	0.000	10.00	0.00	0.00
1356.92	0.000	12.00	0.00	0.00
1357.63	0.000	14.00	0.00	0.00
1358.44	0.000	16.00	0.00	0.00
1359.36	0.000	18.00	0.00	0.00
1360.40	0.000	20.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

RUN DATE: 04-24-2003
RUN TIME: 13:50:59

FILE DATE: 04-24-2003
FILE NAME: POINT

PERFORMANCE CURVE FOR CULVERT 1 - 1(1.92 (ft) BY 1.17 (ft)) RCPE

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	1354.00	0.00	0.00	0-NF	0.00	0.00	0.00	0.10	0.00	0.00
2.00	1354.66	0.59	0.66	2-M2c	0.48	0.42	0.42	0.10	3.27	0.00
4.00	1355.01	0.91	1.01	2-M2c	0.74	0.62	0.62	0.10	4.05	0.00
6.00	1355.30	1.21	1.30	2-M2c	1.04	0.78	0.78	0.10	4.79	0.00
8.00	1355.67	1.55	1.67	2-M2c	1.17	0.91	0.91	0.10	5.43	0.00
10.00	1356.28	1.98	2.28	2-M2c	1.17	1.00	1.00	0.10	6.19	0.00
12.00	1356.92	2.50	2.92	2-M2c	1.17	1.09	1.09	0.10	6.90	0.00
14.00	1357.63	3.13	3.63	6-FFc	1.17	1.17	1.17	0.10	7.87	0.00
16.00	1358.44	3.88	4.44	6-FFc	1.17	1.17	1.17	0.10	8.99	0.00
18.00	1359.37	4.75	5.37	6-FFc	1.17	1.17	1.17	0.10	10.12	0.00
20.00	1360.40	5.73	6.40	6-FFc	1.17	1.17	1.17	0.10	11.24	0.00

El. inlet face invert 1354.00 ft El. outlet invert 1353.80 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	1354.00 ft
OUTLET STATION	85.00 ft
OUTLET ELEVATION	1353.80 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0024
CULVERT LENGTH ALONG SLOPE	85.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	ELLIPTICAL
BARREL SPAN	1.92 ft
BARREL RISE	1.17 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQ. EDGE WITH HEADWALL
INLET DEPRESSION	NONE

ENT DATE: 04-24-2003
CURRENT TIME: 13:50:59

FILE DATE: 04-24-2003
FILE NAME: POINT

TAILWATER

CONSTANT WATER SURFACE ELEVATION
1353.90

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	70.00 ft
CREST LENGTH	300.00 ft
OVERTOPPING CREST ELEVATION	1356.30 ft

MAIZE ROAD CULVERTS

CURRENT DATE: 08-26-1999
CURRENT TIME: 09:45:29

FILE DATE: 08-26-1999
FILE NAME: 37MZW

West

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CULV	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	52.19	52.11	80.00	3 RCPE	2.50	1.58	.012	CONVENTIONAL
2								
3								
4								
5								
6								

A = 140 acres

10 yr. Q = 55 cfs

overlaps @ 54.

By putting in 3-30" RCPE

I am increasing the area

from 5.6 ft² to 9.9 ft²

There is a pipe sticking out of the intersection but the north end of the pipe is out of the ground and it is not really in a ditch. I ignored it.

SUMMARY OF CULVERT FLOWS (CFS) FILE: 37MZW DATE: 08-26-1999

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
52.19	0	0	0	0	0	0	0	0	1
53.08	12	12	0	0	0	0	0	0	1
53.53	24	24	0	0	0	0	0	0	1
53.93	36	36	0	0	0	0	0	0	1
54.41	48	48	0	0	0	0	0	0	1
54.84	60	57	0	0	0	0	0	3	6
55.01	72	60	0	0	0	0	0	12	4
55.15	84	62	0	0	0	0	0	22	4
55.27	96	64	0	0	0	0	0	31	3
55.38	108	66	0	0	0	0	0	41	3
55.49	120	68	0	0	0	0	0	51	3
54.72	54	54	0	0	0	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 37MZW DATE: 08-26-1999

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
52.19	0.00	0	0	0.00
53.08	0.00	12	0	0.00
53.53	0.00	24	0	0.00
53.93	0.00	36	0	0.00
54.41	0.00	48	0	0.00
54.84	-0.00	60	0	0.73
55.01	-0.00	72	0	0.58
55.15	-0.01	84	0	0.23
55.27	-0.00	96	1	0.61
55.38	-0.00	108	1	0.48
55.49	-0.00	120	0	0.35

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 08-26-1999
CURRENT TIME: 09:45:29

FILE DATE: 08-26-1999
FILE NAME: 37MZW

CULVERT # 1

PERFORMANCE CURVE FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	52.19	52.11	0.00	-0.08	0-NF	0.00	52.19	0.00	0.00
12	53.08	52.69	0.79	0.89	3-M2	0.00	0.00	0.00	3.66
24	53.53	52.90	1.22	1.34	2-M2	0.00	0.00	0.00	4.70
36	53.93	53.05	1.61	1.74	2-M2	0.00	0.00	0.00	5.46
48	54.41	53.17	2.05	2.22	7-FF	0.00	0.00	0.00	6.19
57	54.84	53.27	2.42	2.65	7-FF	0.00	0.00	0.00	6.72
60	55.01	53.37	2.58	2.82	7-FF	0.00	0.00	0.00	6.99
62	55.15	53.45	2.71	2.96	7-FF	0.00	0.00	0.00	7.18
64	55.26	53.52	2.82	3.07	7-FF	0.00	0.00	0.00	7.13
66	55.38	53.59	2.93	3.19	7-FF	0.00	0.00	0.00	7.15
68	55.49	53.66	3.04	3.30	7-FF	0.00	0.00	0.00	7.19

El. inlet face invert 52.19 ft El. outlet invert 52.11 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	52.19
OUTLET STATION (FT)	80.00
OUTLET ELEVATION (FT)	52.11
NUMBER OF BARRELS	3.00
SLOPE (V-FT/H-FT)	0.0010
CULVERT LENGTH ALONG SLOPE (FT)	80.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	ELLIPTICAL
BARREL SPAN	30.00 FT
BARREL RISE	19.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQ. EDGE WITH HEADWALL
INLET DEPRESSION	NONE

CURRENT DATE: 08-26-1999
CURRENT TIME: 09:45:29

FILE DATE: 08-26-1999
FILE NAME: 37MZW

TAILWATER

******* REGULAR CHANNEL CROSS SECTION **********

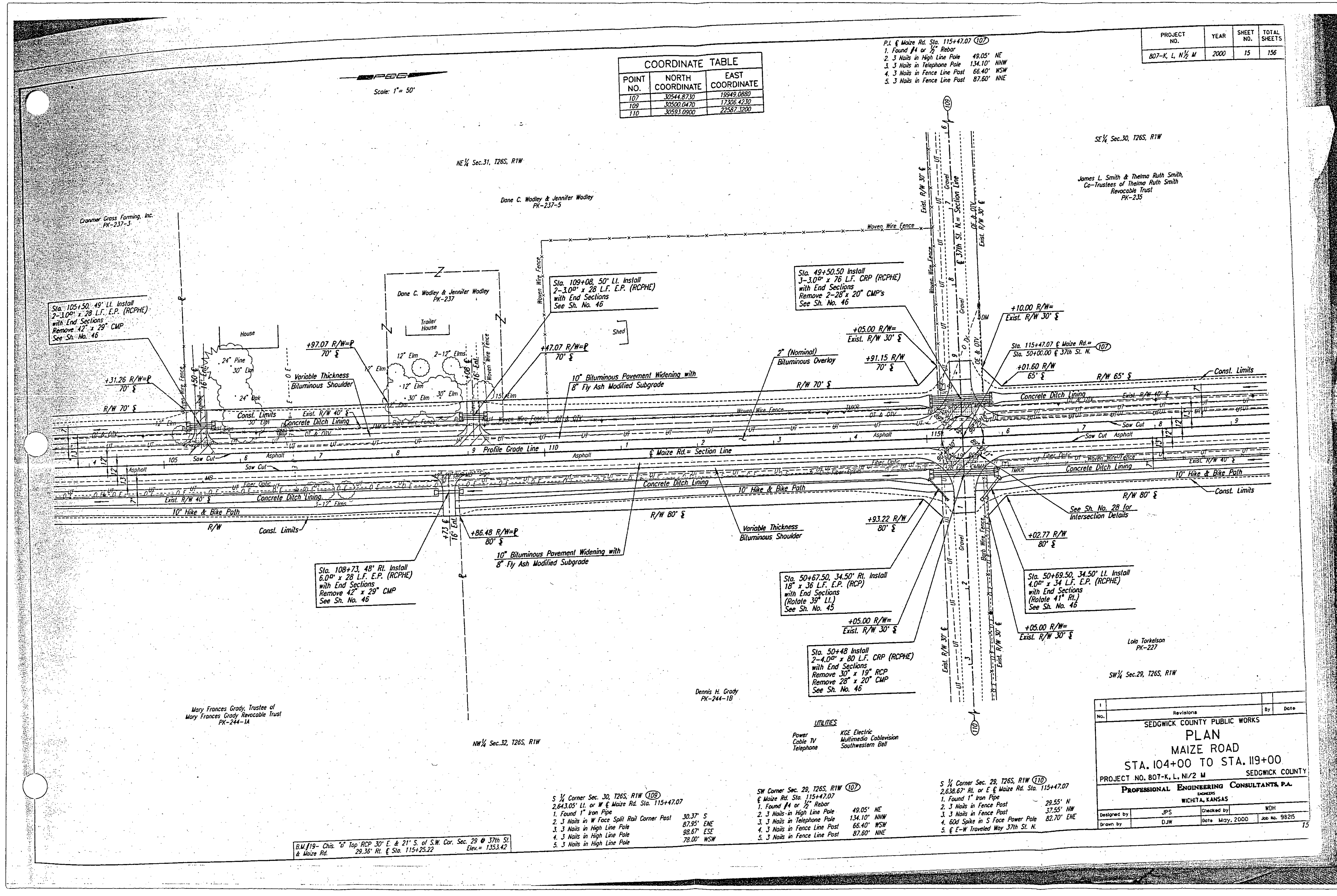
BOTTOM WIDTH (FT)	6.00
SIDE SLOPE H/V (X:1)	%20.0
CHANNEL SLOPE V/H (FT/FT)	0.001
MANNING'S N (.01-0.1)	0.020
CHANNEL INVERT ELEVATION (FT)	52.11
CULVERT NO.1 OUTLET INVERT ELEVATION	52.11 FT

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

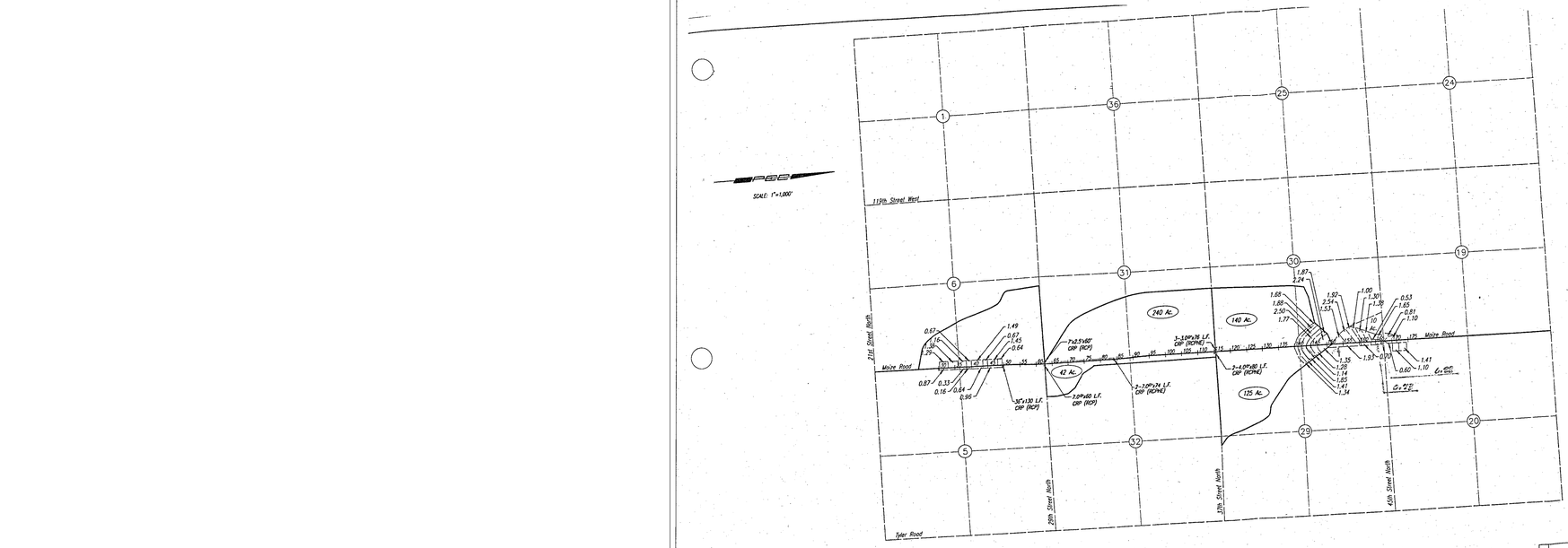
FLOW (CFS)	W.S.E. (FT)	FROUDE NUMBER	VEL. (FPS)	SHEAR (PSF)
0.00	52.11	0.000	0.00	0.00
12.00	52.69	0.270	1.17	0.04
24.00	52.90	0.277	1.39	0.05
36.00	53.05	0.281	1.55	0.06
48.00	53.17	0.284	1.66	0.07
60.00	53.27	0.287	1.76	0.07
72.00	53.37	0.290	1.84	0.08
84.00	53.45	0.292	1.91	0.08
96.00	53.52	0.293	1.98	0.09
108.00	53.59	0.295	2.04	0.09
120.00	53.66	0.297	2.09	0.10

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	28.00
CREST LENGTH (FT)	25.00
OVERTOPPING CREST ELEVATION (FT)	54.72



COORDINATE TABLE		
POINT NO.	NORTH COORDINATE	EAST COORDINATE
107	30544.8730	19949.0880
109	30500.0470	17306.4230
110	30593.0900	22587.3200


SCALE: 1"=1,000'
119th Street West
21st Street North
Maize Road
Tyler Road
23th Street North
37th Street North
45th Street North
240 Ac.
140 Ac.
42 Ac.
125 Ac.
7-2.5'x60' CBP (RCP)
7-2.0'x90 L.F. CBP (RCP)
30"x130 L.F. CBP (RCP)
3-3.0'x78 L.F. CBP (RCPHE)
3-2.5'x74 L.F. CBP (RCPHE)
3-4.0'x80 L.F. CBP (RCPHE)
6'x 10'
6'x 6'
LEGEND
22 Ac. Total Basin Area to Cross Road Structure.
1.00 Ac. Sub-basin Area to Storm Sewer Inlet.
Major Basin Crest
Minor Basin
No. Revisions By Date
SEDGWICK COUNTY PUBLIC WORKS
DRAINAGE MAP
PROJECT NO. 807-K, L, N/2 M
SEDGWICK COUNTY
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
WICHITA, KANSAS
Designed by RCH
Checked by JPS
Drawn by CLW
Date May, 2000
Job No. 98215
99

DRAINAGE PLAN
PRAIRIE POINTE
AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

Center of Sec. 30, T26S, R1W Found Stone 30" Deep Reset 3/4" Pipe w/PEC Cap

BENCHMARKS:

BM 21-A CHISELED SQUARE ON NORTH END 30"X19" RCP ON WEST SIDE OF TRIPLE PIPE AT THE NORTHWEST CORNER OF 37TH ST. NORTH AND MAIZE ROAD.
ELEV. = 1354.18 N.G.V.D. (166.78 CITY DATUM)

BM 21-C STEP NAILS ON NORTH FACE OF CORNER POST ON SOUTH SIDE OF 37TH ST. NORTH 950'± WEST OF 37TH ST. NORTH AND MAIZE ROAD.
ELEV. = 1356.24 N.G.V.D. (168.84 CITY DATUM)

BM 21-D CHISELED SQUARE ON CONCRETE BASE OF BRICK FENCE POST ON SOUTH SIDE OF 37TH ST. NORTH 1070'± EAST OF 1/2 MILE LINE.
ELEV. = 1355.56 N.G.V.D. (168.16 CITY DATUM)

BM 21-E CHISELED SQUARE ON CONCRETE BASE OF BRICK FENCE POST ON SOUTH SIDE OF 37TH ST. NORTH 440'± EAST OF 1/2 MILE LINE.
ELEV. = 1357.01 N.G.V.D. (169.61 CITY DATUM)

BM 21-F 1" PIPE AT ℄ OF 37TH ST. NORTH = 1/4 CORNER 1/2 MILE WEST OF 37TH ST. NORTH AND MAIZE ROAD.
ELEV. = 1357.24 N.G.V.D. (169.84 CITY DATUM)

MINIMUM OPENINGS	ELEVATION (N.G.V.D.)	CITY DATUM
BLOCK 1		
LOTS 4–6, 13–16, 40–42	1359.0	171.6
LOT 39	1360.0	172.6
LOTS 1–3, 7, 17, 24	1360.5	173.1
LOTS 8–12, 18–23	1361.9	174.5
LOT 25	1361.6	174.2
LOTS 28–30	1362.3	174.9
LOTS 26–27, 31–37	1362.6	175.2
BLOCK 2		
LOTS 1–6	1359.0	171.6
LOTS 7–10	1360.0	172.6
LOTS 11–12	1361.0	173.6
LOTS 27–30	1361.6	174.2
LOTS 13–14, 24–26	1362.0	174.6
LOTS 20–23	1362.7	175.3
LOTS 15–19	1363.8	176.4
BLOCK 3		
LOTS 1–10	1360.5	173.1
BLOCK 4		
LOTS 1–33	1360.5	173.1

E 1/4 Corner, Sec. 30 Twp. 26S, R1W Found ∫4 Bar w/ Moehring Cap

N.E. Cor., SE 1/4, SE 1/4 Sec. 30, T26S, R1W No Monument Found

HAVENHURST

STONEY POINT

PRAIRIE POINTE CT.

RUTGERS

RUTGERS CT.

POND #1

Static=1354.0
DWS100 =1357.9

POND #2

Static=1354.0
DWS100 =1357.9

PRAIRIE POINTE

37TH STREET NORTH - SECTION LINE

MAIZE ROAD

PARK

FUTURE COMMERCIAL AREA

SEE SUPPORTING CALCULATIONS FOR HYDROLOGY

LEGEND

- 3A — BASIN IDENTIFIER
- MINOR BASIN BOUNDARY
- MAJOR BASIN BOUNDARY
- MAJOR STORM WATER OVERFLOW (Q100)
- MINOR STORM WATER FLOW (Q2)
- 300 — NODE IDENTIFIER
- STORM SEWER AND INLET
- 1358.0 — SPOT ELEVATION
- 1360.0 HP — HIGH POINT ELEVATION
- 1356.04 — MATCH EXISTING ELEVATION

SCALE: 1" = 100'

R1W

45TH STREET NORTH

T26S

119TH WEST

30

PROJECT AREA

MAIZE ROAD

37TH STREET NORTH

VICINITY MAP

DAVID D. CRANMER ZONED: RR

JAMES M. & TERRIE M. RAMSEY ZONED: RR

DAVID D. CRANMER ZONED: SF-20

ANGELA A. & KELLY E. KENDALL ZONED: SF-20

MARY GRADY REV. TRUST ZONED: SF-20

MUNIR & BARBARA RAZZAQ ZONED: SF-20

DANE & JENNIFER WADLEY ZONED: SF-20

S.W. Cor. SE1/4 of Sec. 30, Twp. 26S, R1W Found 1" Iron Pipe

S.E. Corner Sec. 30, T26S, R1W Found 1/2" Rebar w/ Moehring Cap

Professional Engineering Consultants, P.A.
303 S. TOPEKA • WICHITA, KANSAS 67202
316-262-2691 • FAX 316-262-3003