BAUGHMAN COMPANY, P.A.

Arlington Place II Drainage:

Proposed Pond - Reserve A

Soil Type From "Soil Survey of Sedgwick Co. KS" SCS Publication

Type Bo soil → Hydrological Soil Group "C"

Existing Use: Farm Ground - Use Small Grain Crops For Cover

From TR-55 (SCS) Small Grain - Straight Row
Type C Soil → Good condition
CN = 83

Existing Area Draining to Pond Location = 40.4 Ac

Find Existing Runoff to Pond Location (100yr-24hr) And Limit Pond outflow to same.

Time of Concentration: Length of Basin = 1550 feet

Use 300' sheet flow; V = 0.5 f/sec = $^{300}/_{0.5(60)}$ = 10 min

ΔZ = 6 feet Average Slope = 0.006 ft/ft

Assume Shallow Concentrated Flow For Length = 1000'

From TR-55 (SCS); Velocity @ Slope = 1.25 f/sec (Unpaved) Fig 3-1

T_{c_2} = $^{1000}/_{1.25(60)}$ = 13.3 Minutes

Balance Channel Flow = 4 feet/sec = $^{250'}/_{4(60)}$ = 1.0 min

Tc = 10 + 13.3 + 1 = 24.1 min; Use Tc = 24 min = **0.4 hrs**

Travel Time = 0 hours (outlet @ study point)

Using HEC-1 w/ SCS Loss Rate Option:

A = 40.4 Ac; T_c = 0.40 hrs; T_t = 0 hrs; CN = 83

Rainfall Event: 100yr - 24 hr from Sedgwick County IDF Curves = 7.8"

Use SCS Type II Distribution

Results: Existing 100yr - 24 hr Peak Discharge

Q_{100} = 78 cfs @ Pond Site (see Computer Output)

= Maximum Peak Discharge From Pond (100yr - 24 hour)

Drainage Area to New Pond (Developed) = 42.2 Ac

Time of Concentration:

Length = 620' Lawn Areas
530' Curb: SWS
770' Channel flow: through Pond

Lawn Areas: L_T = 620'

Assume Velocity = 0.5 f/sec for first 300 feet (Non Concentrated Flow)

$T_c = 300/0.5(60) = 10$ min

After 300' use Shallow Concentrated Flow @ 0.6% Ground Slope → From TR-55

$V = 1.25$ f/sec $T_c = \frac{620' - 300'}{1.25(60)} = 4.3$ min

Curb: SWS: Assume Velocity (Avg) = 2.5 f/sec

$T_c = 530'/2.5(60) = 3.5$ min

Channel Flow to Pond: Assume triangular section

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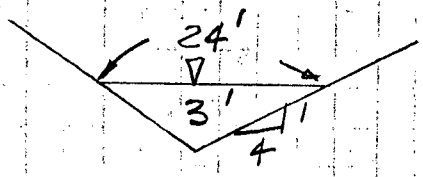

Assume 3' Depth
$n = 0.03$ (grass)
$S = 0.005$
Slope = 4:1

$$V = \frac{1.49}{0.03}\left(\frac{36}{24.7}\right)^{0.67}(0.005)^{1/2}$$

Area = $(3/2)(24) = 36\ ft^2$
wp = 24.7 ft

$V = 4.5$ f/sec ; $Q = 162$ → fairly close

Channel Flow: $\frac{770 \text{ feet}}{4.5 \text{ f/s}(60)} = 3$ min.

Tc total = 4.3 min + 3.5 min + 10 min + 3 min = 20.8 min
Use 21 min. Time of Concentration.

Travel Time = 0 hours (outlet @ Pond)

Curve Number (All Developed)

Type C soil: Typical lot size = 0.2 Ac

From SCS TR-55

$$0.125\left[\begin{array}{l} 0.125 \text{ Ac lot} \quad CN = 90 \\ 0.075\left[\begin{array}{l} \\ 0.2 \text{ Ac. Lot} \end{array}\right]_x \\ 0.25 \text{ Ac lot} \quad CN = 83 \end{array}\right]_7 \text{ (Type C soil)}$$

$\frac{0.125}{7} = \frac{0.075}{x}$ $x = 4.2$ Use CN = 90 − 4 = **86 CN**
For Residential Areas

Use 6.2 Ac Commerical Area When Developed
CN = 94 for Type C soil

Assume 2.5 Ac Pond Surface
% Imp. = 2.5/42.2 = 6% Impervious

Composite Curve Number For Developed Condition to Pond:

Total Area = 42.2 Ac

Residential Area = 42.2 - 6.2 Ac = 36 Acres

Commercial Area = 6.2 Ac

Composite CN = 36 Ac (86) = 3096
+ 6.2 Ac (94) = 582.8

3678.8/42.2 = 87.2

Adjust for 6% Impervious (Fig 2-3 TR-55)

For Perv. CN = 87, 6% Imp; $CN_{composite}$ = 88

Use CN = 88 For New Basin to Pond

BASIN B (New Area, Developed, to Pond)

Area = 42.2 Ac
TC = 21 min = 0.35 hours
CN = 88
TT = 0 hours
100yr-24 hr rainfall = 7.8" (SCS type II dist.)

Results From HEC-1 "Army Corps of Engineers" Hydrograph Program:

Qmax = 85 cfs Developed Condition 100yr-24hr.

Limit Pond outflow to 78 cfs Maximum

Pond to Be Designed @ time of storm Water Drain Plan Preparation.

```
1.                                                    ****
                                 FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
                   U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616
                                                      ****




                 THIS HEC-1 VERSION CONTAINS ALL OPTIONS EXCEPT ECONOMICS, AND THE NUMBER OF PLANS ARE REDUCED TO 3


1                                                  HEC-1 INPUT                                                PAGE  1

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

 *** FREE ***
                       *DIAGRAM
            1          ID   ARLINGTON PLACE 2ND ADDITION EXISTING CONDITIONS
            2          ID   100 YR - 24 HR. STORM (UNDEVELOPED CONDITION)
            3          ID
            4          IO       3       0       0
            5          IT       5       0       0     289
            6          IO       1       0

            7          KK  AREA-1
            8          KM   COMPUTING RUNOFF HYDROGRAPH FOR THE WATERSHED
            9          PB       0
           10          IN      60
           11          PC    0.00  0.0585  0.1287   0.126   0.312   0.419   0.566   0.712   0.858   1.053
           12          PC   1.297   1.641   3.705   5.811   6.201   6.503   6.747   6.937   7.108   7.250
           13          PC   7.371   7.487   7.600   7.703   7.800
           14          BA  0.0631
           15          LS       0      83       0
           16          UD    0.24
           17          ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    7       AREA-1

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1                                                     ****
                                 FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
                   U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616
                                                      ****



                       ARLINGTON PLACE 2ND ADDITION EXISTING CONDITIONS
                       100 YR - 24 HR. STORM (UNDEVELOPED CONDITION)


    4 IO         OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
```

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  6 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          1  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT         HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1    0  STARTING DATE
                   ITIME         0000  STARTING TIME
                      NQ          289  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2    0  ENDING DATE
                   NDTIME         0000  ENDING TIME

                  (COMPUTATION INTERVAL      .08 HOURS  )
                   (TOTAL TIME BASE   24.00 HOURS  )

        ENGLISH UNITS


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


          ##############
          #            #
  7 KK    #   AREA-1   #
          #            #
          ##############
                      COMPUTING RUNOFF HYDROGRAPH FOR THE WATERSHED

  10 IN         TIME DATA FOR INPUT TIME SERIES
                    JXMIN         60  TIME INTERVAL IN MINUTES
                   JXDATE      1    0  STARTING DATE
                   JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

  14 BA         SUBBASIN CHARACTERISTICS
                   (TAREA         .06  SUBBASIN AREA  )

              PRECIPITATION DATA

  9 PB             (STORM        7.80  BASIN TOTAL PRECIPITATION  )

  11 PI          INCREMENTAL PRECIPITATION PATTERN
                    .00     .00     .00     .00     .00     .00     .00     .00     .00     .00
                    .00     .00     .01     .01     .01     .01     .01     .01     .01     .01
                    .01     .01     .01     .01     .00     .00     .00     .00     .00     .00
                    .00     .00     .00     .00     .00     .00     .02     .02     .02     .02
                    .02     .02     .02     .02     .02     .02     .02     .02     .01     .01
                    .01     .01     .01     .01     .01     .01     .01     .01     .01     .01
                    .01     .01     .01     .01     .01     .01     .01     .01     .01     .01
                    .01     .01     .01     .01     .01     .01     .01     .01     .01     .01
                    .01     .01     .01     .01     .01     .01     .01     .01     .01     .01
                    .01     .01     .01     .01     .01     .01     .02     .02     .02     .02
                    .02     .02     .02     .02     .02     .02     .02     .02     .02     .02
                    .02     .02     .02     .02     .02     .02     .02     .02     .02     .02
                    .03     .03     .03     .03     .03     .03     .03     .03     .03     .03
                    .03     .03     .17     .17     .17     .17     .17     .17     .17     .17
                    .17     .17     .17     .17     .18     .18     .18     .18     .18     .18
                    .18     .18     .18     .18     .18     .18     .03     .03     .03     .03
                    .03     .03     .03     .03     .03     .03     .03     .03     .03     .03
```

.02	.02	.02	.02	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01		

```
15 LS        SCS LOSS RATE
                 STRTL          .41  INITIAL ABSTRACTION
                 CRVNBR       83.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

16 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG           .24  LAG
```

***

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

UNIT HYDROGRAPH
16 END-OF-PERIOD ORDINATES

20.	70.	106.	102.	76.	44.	27.	17.	11.	6.
4.	2.	2.	1.	1.	0.				

****

HYDROGRAPH AT STATION AREA-1

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1205	146	.18	.02	.15	69.
1		0005	2	.00	.00	.00	0.	*	1		1210	147	.18	.02	.15	70.
1		0010	3	.00	.00	.00	0.	*	1		1215	148	.18	.02	.15	71.
1		0015	4	.00	.00	.00	0.	*	1		1220	149	.18	.02	.15	72.
1		0020	5	.00	.00	.00	0.	*	1		1225	150	.18	.02	.16	74.
1		0025	6	.00	.00	.00	0.	*	1		1230	151	.18	.02	.16	74.
1		0030	7	.00	.00	.00	0.	*	1		1235	152	.18	.02	.16	75.
1		0035	8	.00	.00	.00	0.	*	1		1240	153	.18	.02	.16	76.
1		0040	9	.00	.00	.00	0.	*	1		1245	154	.18	.02	.16	76.
1		0045	10	.00	.00	.00	0.	*	1		1250	155	.18	.01	.16	77.
1		0050	11	.00	.00	.00	0.	*	1		1255	156	.18	.01	.16	77.
1		0055	12	.00	.00	.00	0.	*	1		1300	157	.18	.01	.16	78.
1		0100	13	.00	.00	.00	0.	*	1		1305	158	.03	.00	.03	76.
1		0105	14	.01	.01	.00	0.	*	1		1310	159	.03	.00	.03	67.
1		0110	15	.01	.01	.00	0.	*	1		1315	160	.03	.00	.03	53.
1		0115	16	.01	.01	.00	0.	*	1		1320	161	.03	.00	.03	40.
1		0120	17	.01	.01	.00	0.	*	1		1325	162	.03	.00	.03	30.
1		0125	18	.01	.01	.00	0.	*	1		1330	163	.03	.00	.03	24.
1		0130	19	.01	.01	.00	0.	*	1		1335	164	.03	.00	.03	20.
1		0135	20	.01	.01	.00	0.	*	1		1340	165	.03	.00	.03	18.
1		0140	21	.01	.01	.00	0.	*	1		1345	166	.03	.00	.03	17.
1		0145	22	.01	.01	.00	0.	*	1		1350	167	.03	.00	.03	16.
1		0150	23	.01	.01	.00	0.	*	1		1355	168	.03	.00	.03	16.
1		0155	24	.01	.01	.00	0.	*	1		1400	169	.03	.00	.03	15.
1		0200	25	.01	.01	.00	0.	*	1		1405	170	.03	.00	.02	15.
1		0205	26	.00	.00	.00	0.	*	1		1410	171	.03	.00	.02	14.
1		0210	27	.00	.00	.00	0.	*	1		1415	172	.03	.00	.02	13.
1		0215	28	.00	.00	.00	0.	*	1		1420	173	.03	.00	.02	13.
1		0220	29	.00	.00	.00	0.	*	1		1425	174	.03	.00	.02	12.

1	0235	32	.00	.00	.00	0.	#	1	1440	177	.03	.00	.02	12.
1	0240	33	.00	.00	.00	0.	#	1	1445	178	.03	.00	.02	12.
1	0245	34	.00	.00	.00	0.	#	1	1450	179	.03	.00	.02	12.
1	0250	35	.00	.00	.00	0.	#	1	1455	180	.03	.00	.02	12.
1	0255	36	.00	.00	.00	0.	#	1	1500	181	.03	.00	.02	12.
1	0300	37	.00	.00	.00	0.	#	1	1505	182	.02	.00	.02	11.
1	0305	38	.02	.02	.00	0.	#	1	1510	183	.02	.00	.02	11.
1	0310	39	.02	.02	.00	0.	#	1	1515	184	.02	.00	.02	11.
1	0315	40	.02	.02	.00	0.	#	1	1520	185	.02	.00	.02	10.
1	0320	41	.02	.02	.00	0.	#	1	1525	186	.02	.00	.02	10.
1	0325	42	.02	.02	.00	0.	#	1	1530	187	.02	.00	.02	10.
1	0330	43	.02	.02	.00	0.	#	1	1535	188	.02	.00	.02	10.
1	0335	44	.02	.02	.00	0.	#	1	1540	189	.02	.00	.02	9.
1	0340	45	.02	.02	.00	0.	#	1	1545	190	.02	.00	.02	9.
1	0345	46	.02	.02	.00	0.	#	1	1550	191	.02	.00	.02	9.
1	0350	47	.02	.02	.00	0.	#	1	1555	192	.02	.00	.02	9.
1	0355	48	.02	.02	.00	0.	#	1	1600	193	.02	.00	.02	9.
1	0400	49	.02	.02	.00	0.	#	1	1605	194	.02	.00	.01	9.
1	0405	50	.01	.01	.00	0.	#	1	1610	195	.02	.00	.01	9.
1	0410	51	.01	.01	.00	0.	#	1	1615	196	.02	.00	.01	9.
1	0415	52	.01	.01	.00	0.	#	1	1620	197	.02	.00	.01	8.
1	0420	53	.01	.01	.00	0.	#	1	1625	198	.02	.00	.01	8.
1	0425	54	.01	.01	.00	0.	#	1	1630	199	.02	.00	.01	8.
1	0430	55	.01	.01	.00	0.	#	1	1635	200	.02	.00	.01	7.
1	0435	56	.01	.01	.00	0.	#	1	1640	201	.02	.00	.01	7.
1	0440	57	.01	.01	.00	0.	#	1	1645	202	.02	.00	.01	7.
1	0445	58	.01	.01	.00	0.	#	1	1650	203	.02	.00	.01	7.
1	0450	59	.01	.01	.00	0.	#	1	1655	204	.02	.00	.01	7.
1	0455	60	.01	.01	.00	0.	#	1	1700	205	.02	.00	.01	7.
1	0500	61	.01	.01	.00	0.	#	1	1705	206	.01	.00	.01	7.
1	0505	62	.01	.01	.00	0.	#	1	1710	207	.01	.00	.01	7.
1	0510	63	.01	.01	.00	0.	#	1	1715	208	.01	.00	.01	7.
1	0515	64	.01	.01	.00	0.	#	1	1720	209	.01	.00	.01	7.
1	0520	65	.01	.01	.00	0.	#	1	1725	210	.01	.00	.01	7.
1	0525	66	.01	.01	.00	0.	#	1	1730	211	.01	.00	.01	7.
1	0530	67	.01	.01	.00	0.	#	1	1735	212	.01	.00	.01	7.
1	0535	68	.01	.01	.00	0.	#	1	1740	213	.01	.00	.01	7.
1	0540	69	.01	.01	.00	0.	#	1	1745	214	.01	.00	.01	7.
1	0545	70	.01	.01	.00	0.	#	1	1750	215	.01	.00	.01	7.
1	0550	71	.01	.01	.00	0.	#	1	1755	216	.01	.00	.01	7.
1	0555	72	.01	.01	.00	1.	#	1	1800	217	.01	.00	.01	7.
1	0600	73	.01	.01	.00	1.	#	1	1805	218	.01	.00	.01	7.
1	0605	74	.01	.01	.00	1.	#	1	1810	219	.01	.00	.01	6.
1	0610	75	.01	.01	.00	1.	#	1	1815	220	.01	.00	.01	6.
1	0615	76	.01	.01	.00	1.	#	1	1820	221	.01	.00	.01	6.
1	0620	77	.01	.01	.00	1.	#	1	1825	222	.01	.00	.01	6.
1	0625	78	.01	.01	.00	1.	#	1	1830	223	.01	.00	.01	6.
1	0630	79	.01	.01	.00	1.	#	1	1835	224	.01	.00	.01	6.
1	0635	80	.01	.01	.00	1.	#	1	1840	225	.01	.00	.01	6.
1	0640	81	.01	.01	.00	1.	#	1	1845	226	.01	.00	.01	6.
1	0645	82	.01	.01	.00	1.	#	1	1850	227	.01	.00	.01	5.
1	0650	83	.01	.01	.00	1.	#	1	1855	228	.01	.00	.01	5.
1	0655	84	.01	.01	.00	1.	#	1	1900	229	.01	.00	.01	5.
1	0700	85	.01	.01	.00	1.	#	1	1905	230	.01	.00	.01	5.
1	0705	86	.01	.01	.00	1.	#	1	1910	231	.01	.00	.01	5.
1	0710	87	.01	.01	.00	1.	#	1	1915	232	.01	.00	.01	5.
1	0715	88	.01	.01	.00	1.	#	1	1920	233	.01	.00	.01	5.
1	0720	89	.01	.01	.00	1.	#	1	1925	234	.01	.00	.01	5.
1	0725	90	.01	.01	.00	1.	#	1	1930	235	.01	.00	.01	5.
1	0730	91	.01	.01	.00	2.	#	1	1935	236	.01	.00	.01	5.
1	0735	92	.01	.01	.00	2.	#	1	1940	237	.01	.00	.01	5.
1	0740	93	.01	.01	.00	2.	#	1	1945	238	.01	.00	.01	5.
1	0745	94	.01	.01	.00	2.	#	1	1950	239	.01	.00	.01	5.

1	0805	98	.02	.01	.01	2.	*	1	2010	243	.01	.00	.01	5.
1	0810	99	.02	.01	.01	2.	*	1	2015	244	.01	.00	.01	5.
1	0815	100	.02	.01	.01	2.	*	1	2020	245	.01	.00	.01	5.
1	0820	101	.02	.01	.01	2.	*	1	2025	246	.01	.00	.01	5.
1	0825	102	.02	.01	.01	3.	*	1	2030	247	.01	.00	.01	5.
1	0830	103	.02	.01	.01	3.	*	1	2035	248	.01	.00	.01	4.
1	0835	104	.02	.01	.01	3.	*	1	2040	249	.01	.00	.01	4.
1	0840	105	.02	.01	.01	3.	*	1	2045	250	.01	.00	.01	4.
1	0845	106	.02	.01	.01	3.	*	1	2050	251	.01	.00	.01	4.
1	0850	107	.02	.01	.01	3.	*	1	2055	252	.01	.00	.01	4.
1	0855	108	.02	.01	.01	3.	*	1	2100	253	.01	.00	.01	4.
1	0900	109	.02	.01	.01	3.	*	1	2105	254	.01	.00	.01	4.
1	0905	110	.02	.01	.01	3.	*	1	2110	255	.01	.00	.01	4.
1	0910	111	.02	.01	.01	3.	*	1	2115	256	.01	.00	.01	4.
1	0915	112	.02	.01	.01	4.	*	1	2120	257	.01	.00	.01	4.
1	0920	113	.02	.01	.01	4.	*	1	2125	258	.01	.00	.01	4.
1	0925	114	.02	.01	.01	4.	*	1	2130	259	.01	.00	.01	4.
1	0930	115	.02	.01	.01	4.	*	1	2135	260	.01	.00	.01	4.
1	0935	116	.02	.01	.01	4.	*	1	2140	261	.01	.00	.01	4.
1	0940	117	.02	.01	.01	4.	*	1	2145	262	.01	.00	.01	4.
1	0945	118	.02	.01	.01	5.	*	1	2150	263	.01	.00	.01	4.
1	0950	119	.02	.01	.01	5.	*	1	2155	264	.01	.00	.01	4.
1	0955	120	.02	.01	.01	5.	*	1	2200	265	.01	.00	.01	4.
1	1000	121	.02	.01	.01	5.	*	1	2205	266	.01	.00	.01	4.
1	1005	122	.03	.01	.01	5.	*	1	2210	267	.01	.00	.01	4.
1	1010	123	.03	.01	.02	5.	*	1	2215	268	.01	.00	.01	4.
1	1015	124	.03	.01	.02	6.	*	1	2220	269	.01	.00	.01	4.
1	1020	125	.03	.01	.02	6.	*	1	2225	270	.01	.00	.01	4.
1	1025	126	.03	.01	.02	7.	*	1	2230	271	.01	.00	.01	4.
1	1030	127	.03	.01	.02	7.	*	1	2235	272	.01	.00	.01	4.
1	1035	128	.03	.01	.02	7.	*	1	2240	273	.01	.00	.01	4.
1	1040	129	.03	.01	.02	8.	*	1	2245	274	.01	.00	.01	4.
1	1045	130	.03	.01	.02	8.	*	1	2250	275	.01	.00	.01	4.
1	1050	131	.03	.01	.02	8.	*	1	2255	276	.01	.00	.01	4.
1	1055	132	.03	.01	.02	8.	*	1	2300	277	.01	.00	.01	4.
1	1100	133	.03	.01	.02	8.	*	1	2305	278	.01	.00	.01	4.
1	1105	134	.17	.06	.11	10.	*	1	2310	279	.01	.00	.01	4.
1	1110	135	.17	.06	.11	17.	*	1	2315	280	.01	.00	.01	4.
1	1115	136	.17	.05	.12	27.	*	1	2320	281	.01	.00	.01	4.
1	1120	137	.17	.05	.12	37.	*	1	2325	282	.01	.00	.01	4.
1	1125	138	.17	.04	.13	46.	*	1	2330	283	.01	.00	.01	4.
1	1130	139	.17	.04	.13	52.	*	1	2335	284	.01	.00	.01	4.
1	1135	140	.17	.04	.13	56.	*	1	2340	285	.01	.00	.01	4.
1	1140	141	.17	.03	.14	59.	*	1	2345	286	.01	.00	.01	4.
1	1145	142	.17	.03	.14	62.	*	1	2350	287	.01	.00	.01	4.
1	1150	143	.17	.03	.14	64.	*	1	2355	288	.01	.00	.01	4.
1	1155	144	.17	.03	.14	66.	*	2	0000	289	.01	.00	.01	4.
1	1200	145	.17	.03	.15	67.	*							
							*							

****

TOTAL RAINFALL = 7.80, TOTAL LOSS = 2.01, TOTAL EXCESS = 5.79

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)				
		(CFS)			
+ 78.	13.00	31.	10.	10.	10.
		(INCHES) 4.519	5.759	5.759	5.759
		(AC-FT) 15.	19.	19.	19.

CUMULATIVE AREA = .06 SQ MI

TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	AREA-1	78.	13.00	31.	10.	10.	.06		

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

1. .

****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985

U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616

****

THIS HEC-1 VERSION CONTAINS ALL OPTIONS EXCEPT ECONOMICS, AND THE NUMBER OF PLANS ARE REDUCED TO 3

1 HEC-1 INPUT PAGE 1

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

*** FREE ***
                       *DIAGRAM
             1         ID   ARLINGTON PLACE 2ND ADDITION DEVELOPED CONDITIONS
             2         ID   100 YR - 24 HR. STORM (TO POND SITE)
             3         ID
             4         ID     3      0      0
             5         IT     5      0      0     289
             6         ID     1      0

             7         KK  AREA-1
             8         KM   COMPUTING RUNOFF HYDROGRAPH FOR THE WATERSHED
             9         PB      0
            10         IN     60
            11         PC   0.00  0.0585  0.1287  0.126  0.312  0.419  0.566  0.712  0.858  1.053
            12         PC  1.297  1.641   3.705   5.811  6.201  6.503  6.747  6.937  7.108  7.250
            13         PC  7.371  7.487   7.600   7.703  7.800
            14         BA  0.0659
            15         LS     0     88      0
            16         UD  0.35
            17         ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    7      AREA-1
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1

****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985

U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616

****

ARLINGTON PLACE 2ND ADDITION DEVELOPED CONDITIONS

100 YR - 24 HR. STORM (TO POND SITE)

```
    4 IO          OUTPUT CONTROL VARIABLES
                    IPRNT         3  PRINT CONTROL
```

```
. 6 IO .        OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT           HYDROGRAPH TIME DATA
                     NMIN           5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1    0  STARTING DATE
                    ITIME        0000  STARTING TIME
                       NQ         289  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     2    0  ENDING DATE
                    NDTIME       0000  ENDING TIME

                  COMPUTATION INTERVAL      .08 HOURS
                     (TOTAL TIME BASE    24.00 HOURS

        ENGLISH UNITS


*** *** ***-*** *** ***-*** *** *** *** *** *** *** *** ***-*** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          ***************
          *             *
 7 KK     *    AREA-1   *
          *             *
          ***************
                    COMPUTING RUNOFF HYDROGRAPH FOR THE WATERSHED

 10 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          60  TIME INTERVAL IN MINUTES
                    JXDATE      1    0  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 14 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .07  SUBBASIN AREA

              PRECIPITATION DATA

  9 PB              (STORM        7.80  BASIN TOTAL PRECIPITATION

 11 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                    .00    .00    .01    .01    .01    .01    .01    .01    .01    .01
                    .01    .01    .01    .01    .00    .00    .00    .00    .00    .00
                    .00    .00    .00    .00    .00    .00    .02    .02    .02    .02
                    .02    .02    .02    .02    .02    .02    .02    .02    .01    .01
                    .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
                    .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
                    .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
                    .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
                    .01    .01    .01    .01    .01    .01    .02    .02    .02    .02
                    .02    .02    .02    .02    .02    .02    .02    .02    .02    .02
                    .02    .02    .02    .02    .02    .02    .02    .02    .02    .02
                    .03    .03    .03    .03    .03    .03    .03    .03    .03    .03
                    .03    .03    .17    .17    .17    .17    .17    .17    .17    .17
                    .17    .17    .17    .17    .18    .18    .18    .18    .18    .18
                    .18    .18    .18    .18    .18    .18    .03    .03    .03    .03
                    .03    .03    .03    .03    .03    .03    .03    .03    .03    .03
                    .03    .03    .03    .03    .03    .03    .03    .03    .03    .03
```

.02	.02	.02	.02	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01		

```
15 LS          SCS LOSS RATE
                     STRTL          .27  INITIAL ABSTRACTION
                    CRVNBR        88.00  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

16 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .35  LAG
```

***

UNIT HYDROGRAPH
23 END-OF-PERIOD ORDINATES

9.	29.	59.	78.	81.	71.	56.	37.	26.	19.
13.	9.	7.	5.	3.	2.	2.	1.	1.	1.
0.	0.	0.							

***

HYDROGRAPH AT STATION AREA-1

***

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1205	146	.18	.01	.16	75.
1		0005	2	.00	.00	.00	0.	*	1		1210	147	.18	.01	.16	77.
1		0010	3	.00	.00	.00	0.	*	1		1215	148	.18	.01	.16	78.
1		0015	4	.00	.00	.00	0.	*	1		1220	149	.18	.01	.16	79.
1		0020	5	.00	.00	.00	0.	*	1		1225	150	.18	.01	.17	80.
1		0025	6	.00	.00	.00	0.	*	1		1230	151	.18	.01	.17	81.
1		0030	7	.00	.00	.00	0.	*	1		1235	152	.18	.01	.17	82.
1		0035	8	.00	.00	.00	0.	*	1		1240	153	.18	.01	.17	83.
1		0040	9	.00	.00	.00	0.	*	1		1245	154	.18	.01	.17	83.
1		0045	10	.00	.00	.00	0.	*	1		1250	155	.18	.01	.17	84.
1		0050	11	.00	.00	.00	0.	*	1		1255	156	.18	.01	.17	84.
1		0055	12	.00	.00	.00	0.	*	1		1300	157	.18	.01	.17	85.
1		0100	13	.00	.00	.00	0.	*	1		1305	158	.03	.00	.03	84.
1		0105	14	.01	.01	.00	0.	*	1		1310	159	.03	.00	.03	80.
1		0110	15	.01	.01	.00	0.	*	1		1315	160	.03	.00	.03	72.
1		0115	16	.01	.01	.00	0.	*	1		1320	161	.03	.00	.03	62.
1		0120	17	.01	.01	.00	0.	*	1		1325	162	.03	.00	.03	51.
1		0125	18	.01	.01	.00	0.	*	1		1330	163	.03	.00	.03	41.
1		0130	19	.01	.01	.00	0.	*	1		1335	164	.03	.00	.03	33.
1		0135	20	.01	.01	.00	0.	*	1		1340	165	.03	.00	.03	28.
1		0140	21	.01	.01	.00	0.	*	1		1345	166	.03	.00	.03	25.
1		0145	22	.01	.01	.00	0.	*	1		1350	167	.03	.00	.03	22.
1		0150	23	.01	.01	.00	0.	*	1		1355	168	.03	.00	.03	20.
1		0155	24	.01	.01	.00	0.	*	1		1400	169	.03	.00	.03	19.
1		0200	25	.01	.01	.00	0.	*	1		1405	170	.03	.00	.02	18.
1		0205	26	.00	.00	.00	0.	*	1		1410	171	.03	.00	.02	17.
1		0210	27	.00	.00	.00	0.	*	1		1415	172	.03	.00	.02	16.
1		0215	28	.00	.00	.00	0.	*	1		1420	173	.03	.00	.02	15.
1		0220	29	.00	.00	.00	0.	*	1		1425	174	.03	.00	.02	15.
1		0225	30	.00	.00	.00	0.	*	1		1430	175	.03	.00	.02	14.

1	0240	33	.00	.00	.00	0.	*	1	1445	178	.03	.00	.02	13.
1	0245	34	.00	.00	.00	0.	*	1	1450	179	.03	.00	.02	13.
1	0250	35	.00	.00	.00	0.	*	1	1455	180	.03	.00	.02	13.
1	0255	36	.00	.00	.00	0.	*	1	1500	181	.03	.00	.02	13.
1	0300	37	.00	.00	.00	0.	*	1	1505	182	.02	.00	.02	12.
1	0305	38	.02	.02	.00	0.	*	1	1510	183	.02	.00	.02	12.
1	0310	39	.02	.02	.00	0.	*	1	1515	184	.02	.00	.02	12.
1	0315	40	.02	.02	.00	0.	*	1	1520	185	.02	.00	.02	12.
1	0320	41	.02	.02	.00	0.	*	1	1525	186	.02	.00	.02	11.
1	0325	42	.02	.02	.00	0.	*	1	1530	187	.02	.00	.02	11.
1	0330	43	.02	.02	.00	0.	*	1	1535	188	.02	.00	.02	11.
1	0335	44	.02	.02	.00	0.	*	1	1540	189	.02	.00	.02	10.
1	0340	45	.02	.02	.00	0.	*	1	1545	190	.02	.00	.02	10.
1	0345	46	.02	.02	.00	0.	*	1	1550	191	.02	.00	.02	10.
1	0350	47	.02	.02	.00	0.	*	1	1555	192	.02	.00	.02	10.
1	0355	48	.02	.02	.00	0.	*	1	1600	193	.02	.00	.02	10.
1	0400	49	.02	.01	.00	0.	*	1	1605	194	.02	.00	.02	10.
1	0405	50	.01	.01	.00	0.	*	1	1610	195	.02	.00	.02	10.
1	0410	51	.01	.01	.00	0.	*	1	1615	196	.02	.00	.02	10.
1	0415	52	.01	.01	.00	0.	*	1	1620	197	.02	.00	.02	9.
1	0420	53	.01	.01	.00	0.	*	1	1625	198	.02	.00	.02	9.
1	0425	54	.01	.01	.00	0.	*	1	1630	199	.02	.00	.02	9.
1	0430	55	.01	.01	.00	0.	*	1	1635	200	.02	.00	.02	8.
1	0435	56	.01	.01	.00	0.	*	1	1640	201	.02	.00	.02	8.
1	0440	57	.01	.01	.00	0.	*	1	1645	202	.02	.00	.02	8.
1	0445	58	.01	.01	.00	0.	*	1	1650	203	.02	.00	.02	8.
1	0450	59	.01	.01	.00	0.	*	1	1655	204	.02	.00	.02	8.
1	0455	60	.01	.01	.00	1.	*	1	1700	205	.02	.00	.02	8.
1	0500	61	.01	.01	.00	1.	*	1	1705	206	.01	.00	.01	8.
1	0505	62	.01	.01	.00	1.	*	1	1710	207	.01	.00	.01	8.
1	0510	63	.01	.01	.00	1.	*	1	1715	208	.01	.00	.01	8.
1	0515	64	.01	.01	.00	1.	*	1	1720	209	.01	.00	.01	8.
1	0520	65	.01	.01	.00	1.	*	1	1725	210	.01	.00	.01	7.
1	0525	66	.01	.01	.00	1.	*	1	1730	211	.01	.00	.01	7.
1	0530	67	.01	.01	.00	1.	*	1	1735	212	.01	.00	.01	7.
1	0535	68	.01	.01	.00	1.	*	1	1740	213	.01	.00	.01	7.
1	0540	69	.01	.01	.00	1.	*	1	1745	214	.01	.00	.01	7.
1	0545	70	.01	.01	.00	1.	*	1	1750	215	.01	.00	.01	7.
1	0550	71	.01	.01	.00	1.	*	1	1755	216	.01	.00	.01	7.
1	0555	72	.01	.01	.00	2.	*	1	1800	217	.01	.00	.01	7.
1	0600	73	.01	.01	.00	2.	*	1	1805	218	.01	.00	.01	7.
1	0605	74	.01	.01	.00	2.	*	1	1810	219	.01	.00	.01	7.
1	0610	75	.01	.01	.00	2.	*	1	1815	220	.01	.00	.01	7.
1	0615	76	.01	.01	.00	2.	*	1	1820	221	.01	.00	.01	7.
1	0620	77	.01	.01	.00	2.	*	1	1825	222	.01	.00	.01	6.
1	0625	78	.01	.01	.00	2.	*	1	1830	223	.01	.00	.01	6.
1	0630	79	.01	.01	.00	2.	*	1	1835	224	.01	.00	.01	6.
1	0635	80	.01	.01	.00	2.	*	1	1840	225	.01	.00	.01	6.
1	0640	81	.01	.01	.00	2.	*	1	1845	226	.01	.00	.01	6.
1	0645	82	.01	.01	.00	2.	*	1	1850	227	.01	.00	.01	6.
1	0650	83	.01	.01	.00	2.	*	1	1855	228	.01	.00	.01	6.
1	0655	84	.01	.01	.01	2.	*	1	1900	229	.01	.00	.01	6.
1	0700	85	.01	.01	.01	2.	*	1	1905	230	.01	.00	.01	6.
1	0705	86	.01	.01	.01	2.	*	1	1910	231	.01	.00	.01	6.
1	0710	87	.01	.01	.01	2.	*	1	1915	232	.01	.00	.01	6.
1	0715	88	.01	.01	.01	3.	*	1	1920	233	.01	.00	.01	6.
1	0720	89	.01	.01	.01	3.	*	1	1925	234	.01	.00	.01	5.
1	0725	90	.01	.01	.01	3.	*	1	1930	235	.01	.00	.01	5.
1	0730	91	.01	.01	.01	3.	*	1	1935	236	.01	.00	.01	5.
1	0735	92	.01	.01	.01	3.	*	1	1940	237	.01	.00	.01	5.
1	0740	93	.01	.01	.01	3.	*	1	1945	238	.01	.00	.01	5.
1	0745	94	.01	.01	.01	3.	*	1	1950	239	.01	.00	.01	5.
1	0750	95	.01	.01	.01	3.	*	1	1955	240	.01	.00	.01	5.
1	0755	96	.01	.01	.01	3.	*	1	2000	241	.01	.00	.01	5.

1	0810	99	.02	.01	.01	3.	*	1	2015	244	.01	.00	.01	5.
1	0815	100	.02	.01	.01	3.	*	1	2020	245	.01	.00	.01	5.
1	0820	101	.02	.01	.01	3.	*	1	2025	246	.01	.00	.01	5.
1	0825	102	.02	.01	.01	4.	*	1	2030	247	.01	.00	.01	5.
1	0830	103	.02	.01	.01	4.	*	1	2035	248	.01	.00	.01	5.
1	0835	104	.02	.01	.01	4.	*	1	2040	249	.01	.00	.01	5.
1	0840	105	.02	.01	.01	4.	*	1	2045	250	.01	.00	.01	5.
1	0845	106	.02	.01	.01	4.	*	1	2050	251	.01	.00	.01	5.
1	0850	107	.02	.01	.01	4.	*	1	2055	252	.01	.00	.01	5.
1	0855	108	.02	.01	.01	5.	*	1	2100	253	.01	.00	.01	5.
1	0900	109	.02	.01	.01	5.	*	1	2105	254	.01	.00	.01	5.
1	0905	110	.02	.01	.01	5.	*	1	2110	255	.01	.00	.01	5.
1	0910	111	.02	.01	.01	5.	*	1	2115	256	.01	.00	.01	5.
1	0915	112	.02	.01	.01	5.	*	1	2120	257	.01	.00	.01	5.
1	0920	113	.02	.01	.01	5.	*	1	2125	258	.01	.00	.01	5.
1	0925	114	.02	.01	.01	6.	*	1	2130	259	.01	.00	.01	5.
1	0930	115	.02	.01	.01	6.	*	1	2135	260	.01	.00	.01	5.
1	0935	116	.02	.01	.01	6.	*	1	2140	261	.01	.00	.01	5.
1	0940	117	.02	.01	.01	6.	*	1	2145	262	.01	.00	.01	5.
1	0945	118	.02	.01	.01	6.	*	1	2150	263	.01	.00	.01	5.
1	0950	119	.02	.01	.01	6.	*	1	2155	264	.01	.00	.01	5.
1	0955	120	.02	.01	.01	7.	*	1	2200	265	.01	.00	.01	5.
1	1000	121	.02	.01	.01	7.	*	1	2205	266	.01	.00	.01	5.
1	1005	122	.03	.01	.02	7.	*	1	2210	267	.01	.00	.01	5.
1	1010	123	.03	.01	.02	7.	*	1	2215	268	.01	.00	.01	5.
1	1015	124	.03	.01	.02	7.	*	1	2220	269	.01	.00	.01	5.
1	1020	125	.03	.01	.02	8.	*	1	2225	270	.01	.00	.01	4.
1	1025	126	.03	.01	.02	8.	*	1	2230	271	.01	.00	.01	4.
1	1030	127	.03	.01	.02	9.	*	1	2235	272	.01	.00	.01	4.
1	1035	128	.03	.01	.02	9.	*	1	2240	273	.01	.00	.01	4.
1	1040	129	.03	.01	.02	10.	*	1	2245	274	.01	.00	.01	4.
1	1045	130	.03	.01	.02	10.	*	1	2250	275	.01	.00	.01	4.
1	1050	131	.03	.01	.02	10.	*	1	2255	276	.01	.00	.01	4.
1	1055	132	.03	.01	.02	10.	*	1	2300	277	.01	.00	.01	4.
1	1100	133	.03	.01	.02	10.	*	1	2305	278	.01	.00	.01	4.
1	1105	134	.17	.04	.13	12.	*	1	2310	279	.01	.00	.01	4.
1	1110	135	.17	.04	.14	15.	*	1	2315	280	.01	.00	.01	4.
1	1115	136	.17	.03	.14	22.	*	1	2320	281	.01	.00	.01	4.
1	1120	137	.17	.03	.14	31.	*	1	2325	282	.01	.00	.01	4.
1	1125	138	.17	.03	.15	40.	*	1	2330	283	.01	.00	.01	4.
1	1130	139	.17	.02	.15	49.	*	1	2335	284	.01	.00	.01	4.
1	1135	140	.17	.02	.15	56.	*	1	2340	285	.01	.00	.01	4.
1	1140	141	.17	.02	.15	62.	*	1	2345	286	.01	.00	.01	4.
1	1145	142	.17	.02	.15	66.	*	1	2350	287	.01	.00	.01	4.
1	1150	143	.17	.02	.16	69.	*	1	2355	288	.01	.00	.01	4.
1	1155	144	.17	.02	.16	72.	*	2	0000	289	.01	.00	.01	4.
1	1200	145	.17	.01	.16	74.	*							

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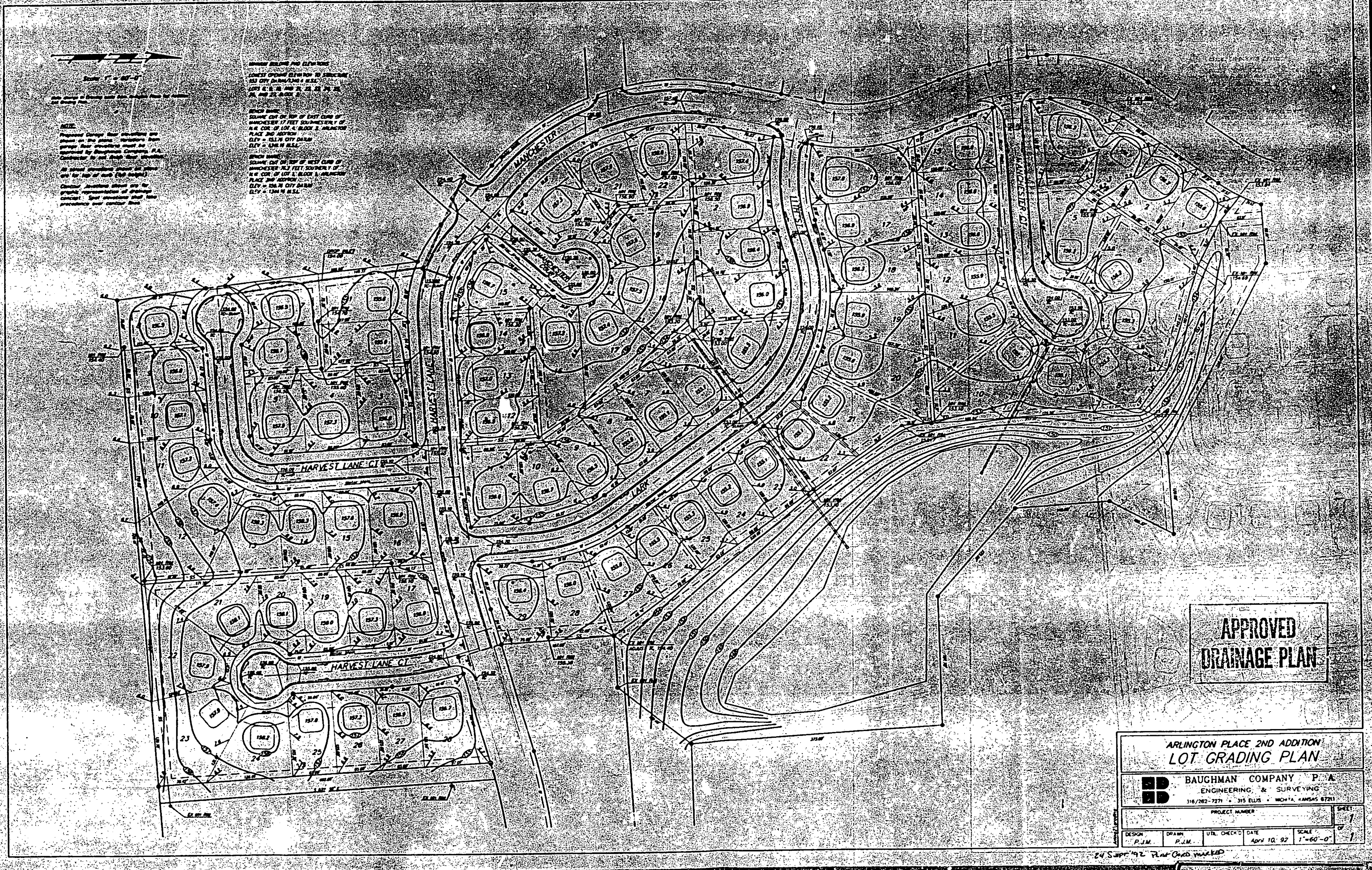
TOTAL RAINFALL = 7.80, TOTAL LOSS = 1.42, TOTAL EXCESS = 6.38

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.00-HR
(CFS)	(HR)				
		(CFS)			
85.	13.00	35.	11.	11.	11.
		(INCHES) 4.897	6.331	6.331	6.331
		(AC-FT) 17.	22.	22.	22.

CUMULATIVE AREA = .07 SQ MI

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	AREA-1	85.	13.00	35.	11.	11.	.07		

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



APPROVED DRAINAGE PLAN

ARLINGTON PLACE 2ND ADDITION LOT GRADING PLAN					
BAUGHMAN COMPANY P. A. ENGINEERING & SURVEYING 316/262-7271 • 315 ELLIS • WICHITA, KANSAS 67211					
PROJECT NUMBER					SHEET 1 OF 1
DESIGN P.J.M.	DRAWN P.J.M.	UTIL. CHECK'D	DATE April 10, 92	SCALE 1"=60'-0"	

24 Sept '92 Plat Card marked