POND DESIGN

ABERDEEN 3RD ADDITION

FEBRUARY 16, 2000

POE AND ASSOCIATES OF KANSAS, INC.
5940 E. CENTRAL - WICHITA, KS 67208

SUMMARY OF POND DESIGN - 6HR 100 YEAR STORM
ABERDEEN 3RD ADDITION

TRIAL # 1 - FILE: ABERDN4
ALL FUTURE AREAS DEVELOPED
(2 - CHURCHES - REMAINDER .25AC LOTS)

POND 1 (EXIST CONTROL STRUCTURE) NWS 164.0
Q_{IN} = 489 cfs Q_{OUT} = 428 cfs DWS 166.75

POND 2 (22' WEIR W/3:1 SIDES) NWS 161.5

Q_{IN} = 468 cfs Q_{OUT} = 450 cfs DWS 164.33

POND 3 (PROPOSED DBL 8'x3' RCBC) NWS 159.24

Q_{IN} = 566 cfs Q_{OUT} = 408 cfs DWS 163.97
℄ 21ST ST. 165.0

TRIAL # 2 FILE: ABERDN 5
EXISTING CONDITION BEFORE ANY DEVELOPMENT

Q = 329 cfs @ DBL 6x3 RCBC ACROSS 21ST STREET

2-15-00

SUMMARY

TRIAL # 3 FILE: ABERDN 6

ALL OF ABERDEEN DEVELOPED AREAS — UNDEVELOPED AREAS NORTH AND WEST WERE ASSUMED TO BE AS THEY EXIST TODAY.

THE ASSUMPTION IS THAT WHEN THESE AREAS DEVELOP STORM WATER RUNOFF WILL BE REDUCED TO MATCH EXISTING CONDITIONS

POND 1 (EXIST. CONTROL STRUCTURE) NWS 164.0

Q_{IN} = 393 cfs Q_{OUT} = 361 cfs DWS = 166.51

POND 2 (22' WEIR W/3:1 SIDES) NWS = 161.5

DWS = 164.05

Q_{IN} = 381 cfs Q_{OUT} = 372 cfs

POND 3 (PROPOSED DBL 8'x3' RCBC) NWS = 159.24

Q_{IN} = 433 cfs Q_{OUT} = 357 cfs DWS = 163.49

SUMMARY

TRIAL # 4 FILE: ABERDN7

ADD 12" WALL ACROSS EXIST. CONTROL WEIR TO RAISE F.L. TO 165.0

SAME CONDITIONS AS TRIAL # 3

ALMOST NO CHANGE EXCEPT THAT POND 1 DWS WAS RAISED FROM 166.51 TO 167.23

↑ DO NOT USE THIS MODIFICATION ↑

TRIAL # 5 FILE: ABERDN8

LOWER POND 2 CONTROL STRUCTURE TO 161.0 REDUCE WIDTH TO 18'

SAME CONDITIONS AS TRIAL # 3

THE ONLY SIGNIFICANT CHANGE IS TO LOWER POND 2 DWS FROM 164.05 IN TRIAL # 3 TO 163.75

CONCLUSIONS:

CONSTRUCT 22' WEIR W/ 3:1 SIDE SLOPES FOR POND 2 CONTROL STRUCTURE NWS 161.5 @ STRUCTURE E.L.

ASSUME DWS @ 166.75 POND 1 TRIAL # 1
164.33 POND 2 "
163.97 POND 3 "

CONSTRUCT DBL '8x3' RCBC ACROSS 21ST STREET U.S. E.L. 159.24 (LOWER E.L. IF POSSIBLE)

NOTE: DISCHARGE THROUGH RCBC AT 21ST STREET INCREASED BY 28 cfs (TRIAL #2 VS TRIAL # 3)

THIS INCREASE SHOULD HAVE A VERY MINOR EFFECT ON THE U.S. OF THE DOWNSTREAM CHANNEL.

ABERDEEN 3RD ADDN - SOIL TYPES

Ta	D
Vb	B
Va	B
Db	D

FILE: ABERDN4

DA # 1 (POND 1) = 172.16 AC = 0.269 SQ. MI.

3.76	POND		100	376
16 AC	CHURCH	TYPE D	95	1520
49.24	S.F .25 AC LOTS	TYPE D	87	4284
103.16	AC SF .25 AC LOTS	TYPE B	75	7737
172.16				13917 ÷ 172.16

CN = 80.84

LENGTH OFF SITE 800' ELEV. 179.0
ON SITE TO POND 3150' ELEV 164.0
3950'

$S = \frac{1000}{80.84} - 10 = 2.37$

$SLOPE = \frac{15}{3950} = .0038 = .38\%$

$LAG = \frac{3950^{0.8}\ 3.37^{0.7}}{1900\sqrt{.38}} = 1.51$ HRS

% IMPERVIOUS

3.76 AC	100	376
16.0 AC	85	1360
152.4 AC	38	5791
		7527 ÷ 172.16

43.72% IMPERVIOUS

LAG FACTOR =

POND 1 (NORTH)

HYD. LENGTH MODIFIED 95% LAG FACTOR = .52

ADJUSTED LAG = 1.51 x .76 x .52 = .597 HRS

POND 2 (MIDDLE)

DA # 2 = 26.67 AC = 0.041672 SQ. MI.

2.16 AC POND				
8.0 AC	SF .125 AC LOTS	TYPE D	100	216
16.51 AC	SF .25 AC LOTS	TYPE B	87	696
26.67			75	1238
				2150

CN = 80.61

LENGTH = 1800' ELEV. 169.4

POND ELEV 162.0

SLOPE = $\frac{7.4}{1800}$ = .004 = 0.4%

$S = \frac{1000}{80.61} - 10 = 2.41$

LAG = $\frac{1800^{0.4} \; 2.41^{0.7}}{1900 \sqrt{0.4}}$ = 0.79 HRS

% IMPERVIOUS

2.16 AC	100	216
24.51	38	931
		1147

1147 ÷ 26.67 = 43% IMPERVIOUS

POND 2 MIDDLE

HYD. LENGTH MODIFIED 85% LAG FACTOR = .52

ADJUSTED LAG = 0.79 × .52 × .76 = 0.312 HRS

POND 3 SOUTH

DA # 3 = 65.66 AC = 0.102594 SQ. MI.

3.90 AC POND	TYPE B	100	390
8.9 AC CHURCH	4	92	819
3.2 AC LOT	4	68	218
49.66 AC .25 AC LOTS	4	75	3725
65.66			5152

LENGTH = 2300' ELEV. 166.0

POND 159.3

CN = 78.46

$S = \frac{1000}{78.46} - 10 = 2.75$

SLOPE = $\frac{6.7}{2300} = .0029 = 0.29\%$

$LAG = \frac{2300^{0.8}\ 3.75^{0.7}}{1900\sqrt{.29}} = 1.21$ HRS

% IMPERVIOUS

3.9 AC POND	100	390	
8.9 AC CHURCH	85	757	$\frac{3098}{65.66} = 47\%$
3.2 AC LOT	20	64	
49.66 AC .25 AC LOTS	20		IMP

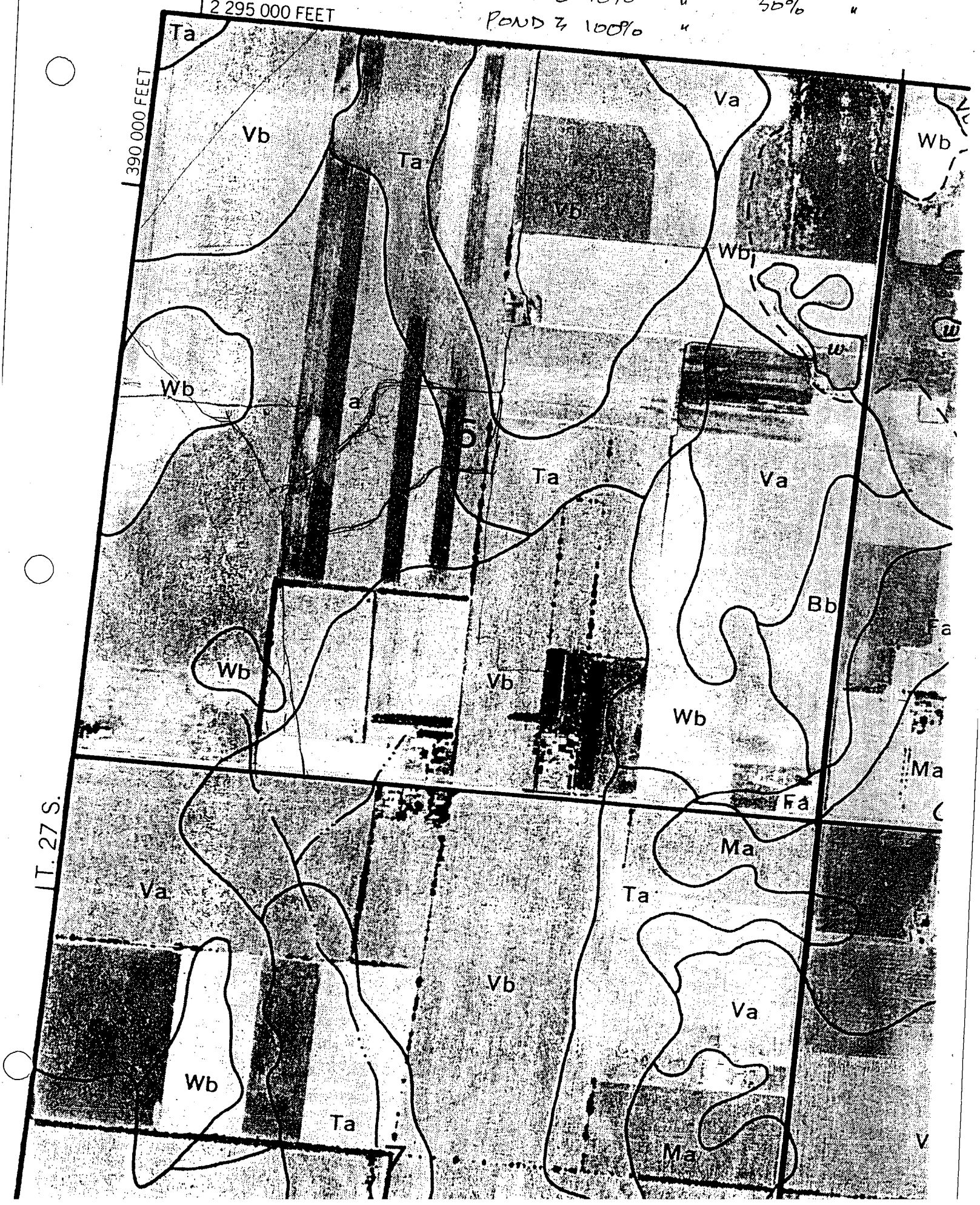
POND 3 SOUTH

47% IMPERVIOUS LAG FACTOR = 0.71

95% HYD LENGTH MODIFIED LAG FACTOR = 0.5

ADJUSTED LAG: 1.21 x 0.5 x 0.71 = 0.4296 HRS

POND 1 60% TYPE B – 40% TYPE D
POND 2 70% " 30% "
POND 3 100% "



SOUTH POND

ELEV (FT)	AREA (FT^2)	AREA (Ac.)	STORAGE (Ac-FT)	TOTAL STORAGE	
159.30	169,710.64	3.8960	0.0000	0.0000	DEPTH ELEV=154.00
160.00	180,824.72	4.1512	2.8165	2.8165	NORMAL WATER SURFACE
161.00	196,391.86	4.5085	4.3299	7.1464	
162.00	214,268.70	4.9189	4.7137	11.8601	
163.00	232,928.89	5.3473	5.1331	16.9932	
163.50	240,754.36	5.5270	2.7186	19.7118	
164.00	248,579.82	5.7066	2.8084	22.5202	
164.40	267,376.56	6.1381	2.3689	24.8891	DESIGN WATER SURFACE

MIDDLE POND

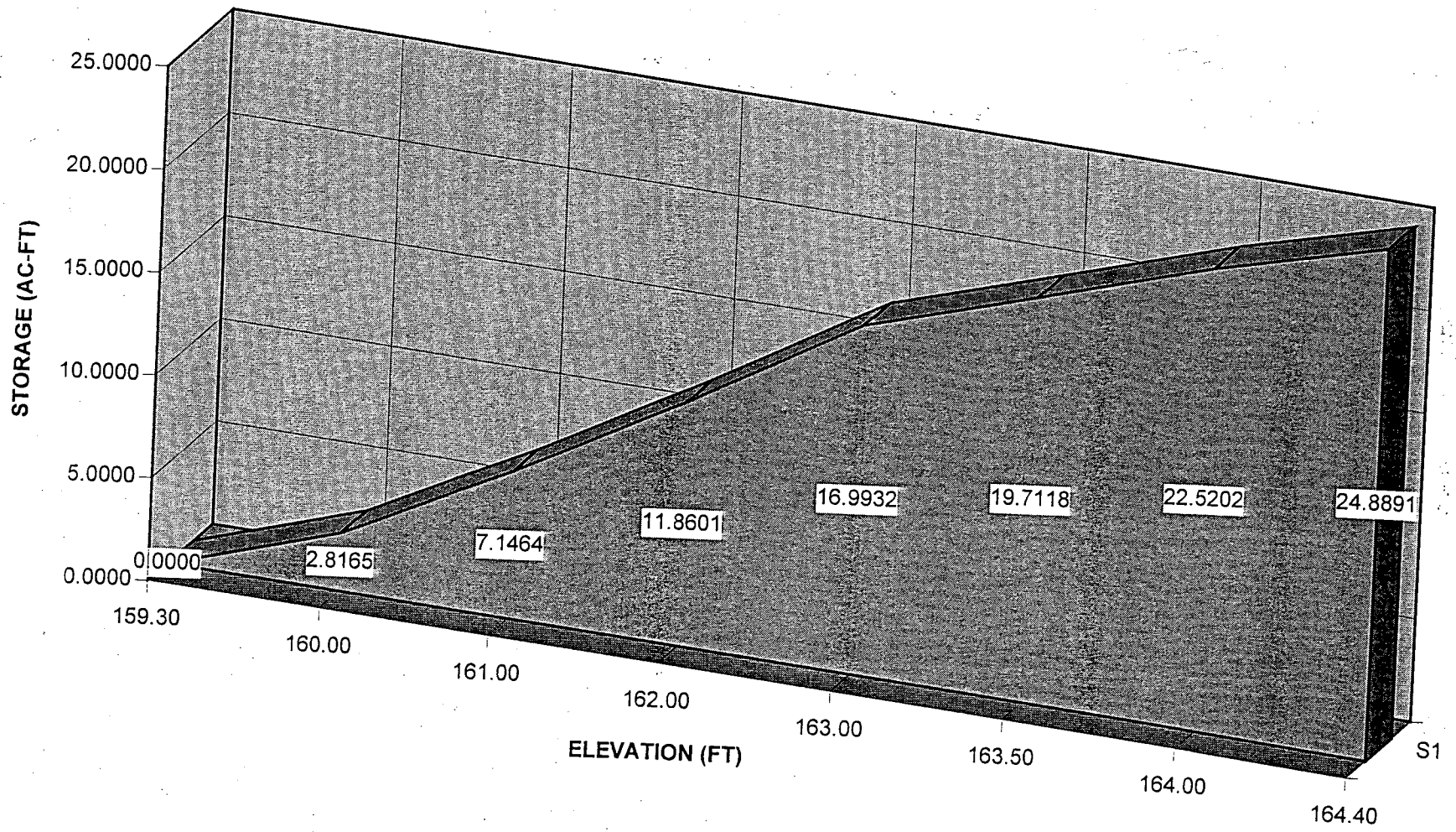
ELEV (FT)	AREA (FT^2)	AREA (Ac.)	STORAGE (Ac-FT)	TOTAL STORAGE	
161.50	94,235.59	2.1634	0.0000	0.0000	DEPTH ELEV=156.00
162.00	98,813.69	2.2685	1.1080	1.1080	NORMAL WATER SURFACE
163.00	107,885.41	2.4767	2.3726	3.4805	
164.00	118,078.19	2.7107	2.5937	6.0742	
164.50	130,827.28	3.0034	1.4285	7.5028	DESIGN WATER SURFACE
165.00	143,576.36	3.2961	1.5749	9.0776	

NORTH POND

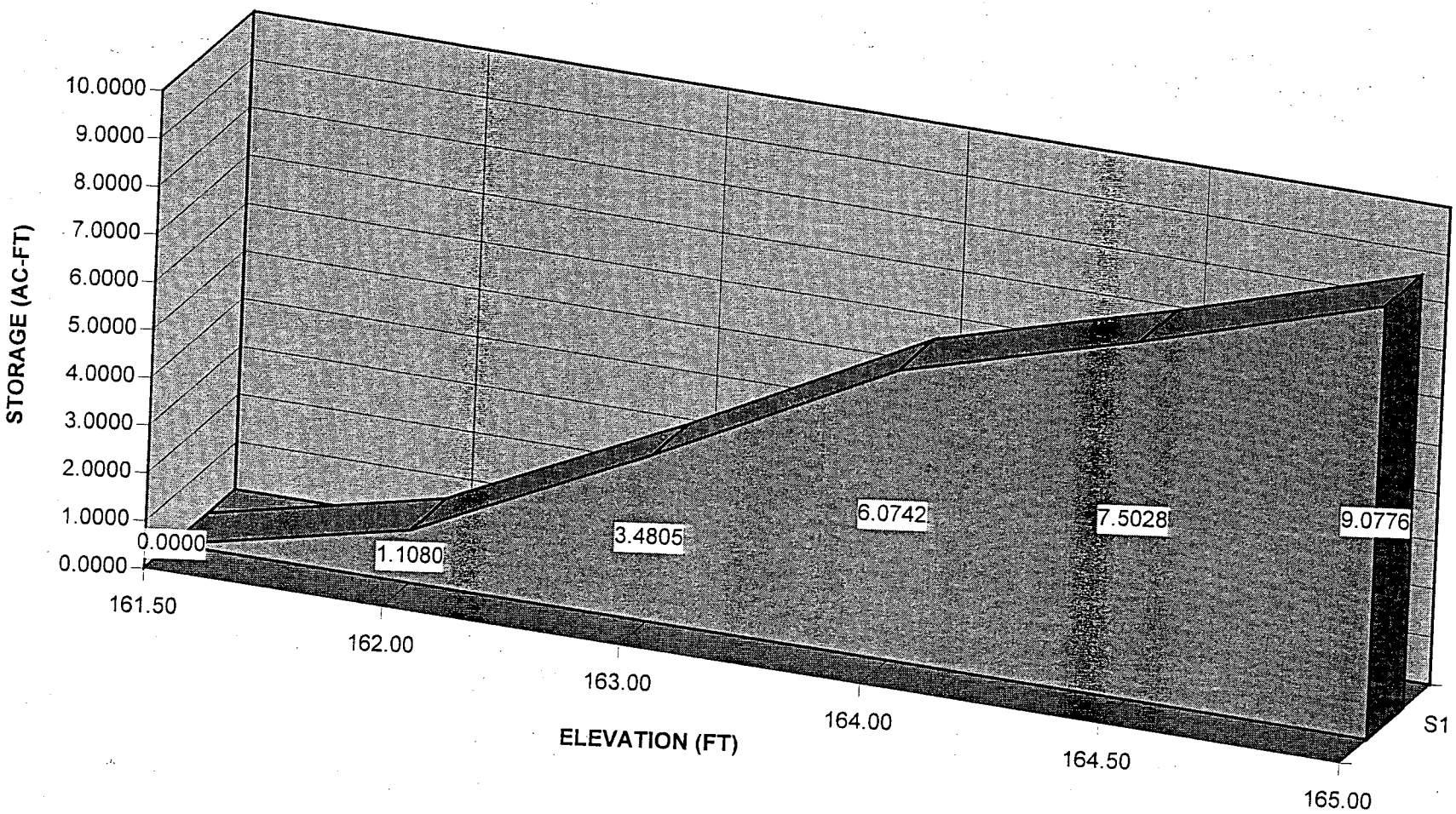
ELEV (FT)	AREA (FT^2)	AREA (Ac.)	STORAGE (Ac-FT)	TOTAL STORAGE	
164.00	163,923.10	3.7632	0.0000	0.0000	DEPTH ELEV=158.00
165.00	174,564.49	4.0074	3.8853	3.8853	NORMAL WATER SURFACE
165.50	179,928.40	4.1306	2.0345	5.9198	
166.00	185,321.31	4.2544	2.0962	8.0161	
166.60	191,831.39	4.4038	2.5975	10.6135	DESIGN WATER SURFACE
167.00	225,751.72	5.1825	1.9173	12.5308	

*G:\APPS\WPFILES\651-700\656\STORAGE CURVES

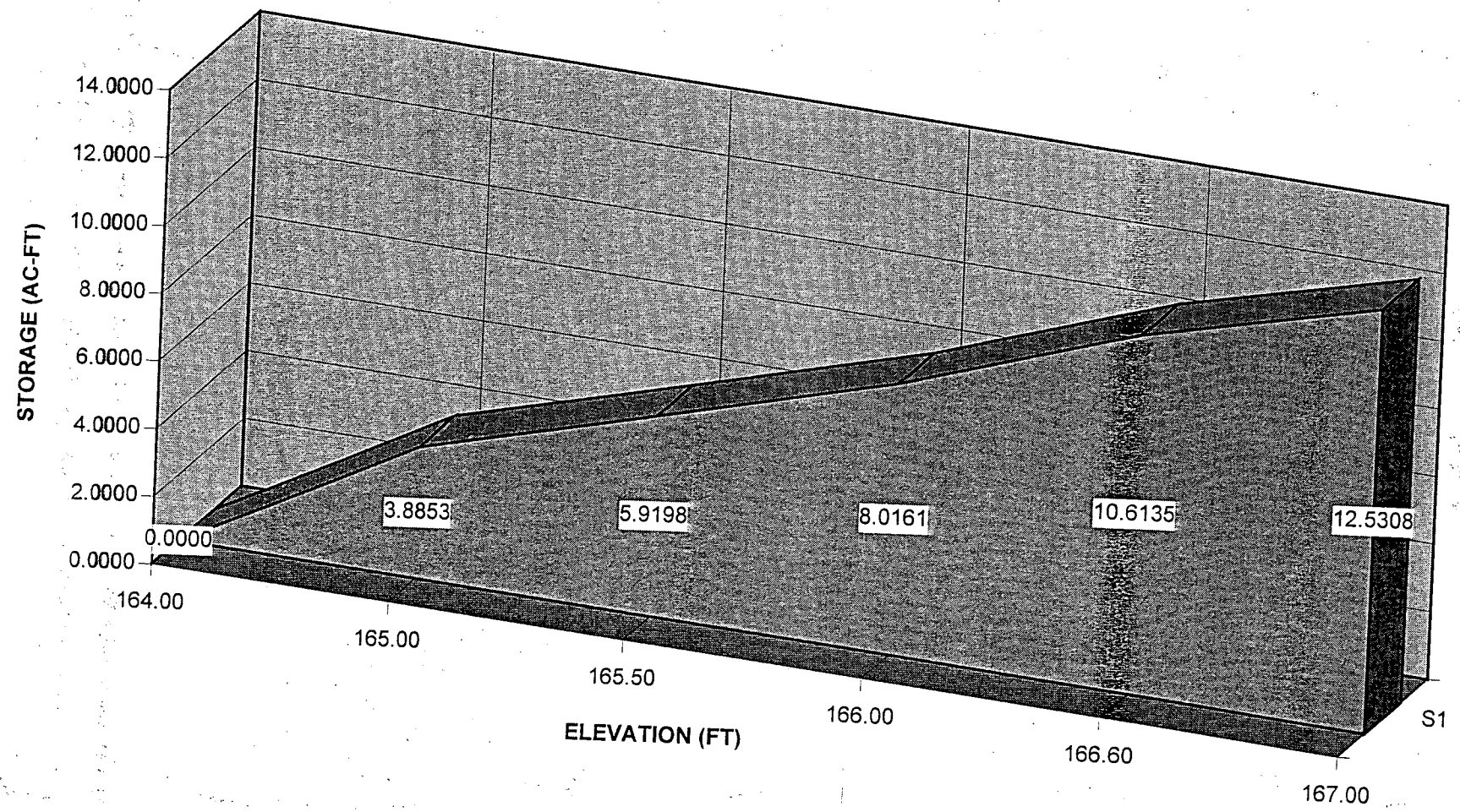
SOUTH POND STORAGE (NWS=159.30)



MIDDLE POND STORAGE (NWS=161.5)



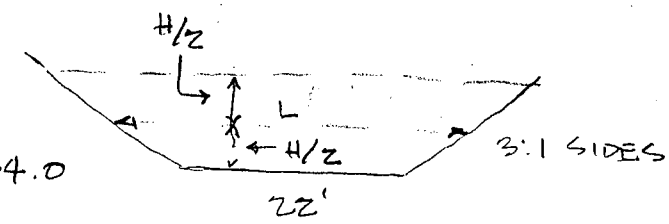
NORTH POND STORAGE (NWS=164.00)



2-15-00

POND 1 CONTROL STRUCTURE (EXISTING)

BROAD CRESTED WEIR $Q = C L H^{3/2}$ $C = 3.08$



CONCRETE

L = AVERAGE LENGTH

ELEV.	L	H	Q
164.0	22	0	0
164.5	23.5	0.5	25.6
165.0	25	1.0	77.0
165.5	26.5	1.5	149.9
166.0	28	2.0	243.9
166.5	29.5	2.5	359.2
167.0	31	3.0	496.1

POND 2 CONTROL STRUCTURE (SAME AS ABOVE)

FL 161.5

ELEV.	Q
161.5	0
162.0	25.6
162.5	77.0
163.0	149.9
163.5	243.9
164.0	359.2
164.5	496.1

2-12-00

ABERDEEN 3RD ADDN – POND 3 CONTROL STRUCTURE
DISCHARGE CURVE DBL 8'x3' RCBC (PROPOSED)
ACROSS 21ST STREET

F.L. 159.24 NORTH
158.96 SOUTH

ELEV	INLET CONTROL	OUTLET CONTROL
159.24	0	0
160.44	62.4	
160.74	88.0	
161.04	113.6	
161.34	144.0	
161.64	176.0	
161.94	208.0	
162.24	240.0	
162.54	272.0	
162.84	304.0	
163.14	320.0	162.96
163.44	352.0	163.21
163.74	384.0	163.56

ASSUMED TW @ TOP OF RCBC OR 161.96
LENGTH 1100' Ke = 0.2

Poe & Associates of Kansas, Inc.

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*      Lahey F77L-EM/32 version 5.01    *
*        Dodson & Associates, Inc.      *
*  RUN DATE  02/16/00  TIME  09:37:29   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    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
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
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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

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1     ID        ABERDEEN 3RD
    2     ID        DEVELOPED CONDITION      FINAL DESIGN
    3     ID        100 YEAR 6HR STORM
    4     ID        FILE NAME: ABERDN4
    5     IT      2              0     300
    6     IO      5      0

    7     KK     DA1   AREA NORTH TO POND 1 CONTROL STRUCTURE
    8     KM        COMPUTE HYDROGRAPH
    9     BA   0.269
   10     PH       1       0     .87    1.86     3.8     4.6     5.1     6.0
   11     LS       0   80.84
   12     UD   0.597

   13     KK      J1
   14     KM     ROUTE THROUGH EXIST. 22' WIDE STRUCTURE     W/3:1 SIDE SLOPES
   15     RS       1    STOR      -1
   16     SV       0    3.89    5.92    8.01   10.61   12.53
   17     SE     164     165   165.5     166   166.6     167
   18     SQ       0    25.6    77.0   149.9   243.9   359.2   496.1
   19     SE     164   164.5     165   165.5     166   166.5     167
   20     KO                                      21

   21     KK     DA2  AREA TO MIDDLE POND CONTROL STRUCTURE
   22     KM   COMPUTE HYDROGRAPH
   23     BA   .041672
   24     LS       0   80.61
   25     UD   0.312

   26     KK      J2
   27     KM    COMBINE J1 AND J2 AT J3
   28     HC       2
   29     KO                                      21

   30     KK      J3
   31     KM    ROUTE THROUGH POND 2 - 22' WIDE STRUCTURE W/3:1 SIDE SLOPES
   32     RS       1    STOR      -1
   33     SV       0    1.11    3.48    6.07    7.50    9.08
   34     SE   161.5     162     163     164   164.5     165
   35     SQ       0    25.6    77.0   149.9   243.9   359.2   496.1
   36     SE   161.5     162   162.5     163   163.5     164   164.5
   37     KO                                      21

   38     KK     DA3  AREA TO SOUTH POND CONTROL STRUCTURE
   39     KM     COMPUTE HYDROGRAPH
   40     BA  0.102594
   41     LS       0   78.46
   42     UD  0.4296

   43     KK      J4
   44     KM    COMBINE SB3 AND J4 AT J5
   45     HC       2
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LINE  ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  46  KK      J5
  47  KM    ROUTE THROUGH SOUTH POND - DBL 8'X3' RCBC AT 21ST STREET
  48  RS         1    STOR      -1
  49  SV         0    2.82    7.15   11.86   16.99   19.71   22.52   24.89
  50  SE    159.24     160     161     162     163   163.5     164   164.4
  51  SQ         0    62.4    88.0   113.6   144.0   176.0   208.0   240.0   272.0   304.0
  52  SQ     320.0   352.0   384.0
  53  SE    159.24  160.44  160.74  161.04  161.34  161.64  161.94  162.24  162.54  162.84
  54  SE    163.14  163.44  163.74
  55  KO
  56  ZZ                                    21
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 ****************************************                                              ***************************************
 *                                      *                                              *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                              *   U.S. ARMY CORPS OF ENGINEERS      *
 *            MAY   1991                *                                              *   HYDROLOGIC ENGINEERING CENTER     *
 *         VERSION 4.0.1E               *                                              *        609 SECOND STREET            *
 *     Lahey F77L-EM/32 version 5.01    *                                              *     DAVIS, CALIFORNIA 95616         *
 *       Dodson & Associates, Inc.      *                                              *          (916) 551-1748             *
 *  RUN DATE  02/16/00  TIME  09:37:29  *                                              *                                     *
 ****************************************                                              ***************************************




                                  ABERDEEN 3RD
                                  DEVELOPED CONDITION      FINAL DESIGN
                                  100 YEAR 6HR STORM
                                  FILE NAME: ABERDN4

   6 IO          OUTPUT CONTROL VARIABLES
                       IPRNT             5  PRINT CONTROL
                       IPLOT             0  PLOT CONTROL
                       QSCAL            0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN             2  MINUTES IN COMPUTATION INTERVAL
                       IDATE       1     0  STARTING DATE
                       ITIME          0000  STARTING TIME
                          NQ           300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE       1     0  ENDING DATE
                      NDTIME          0958  ENDING TIME
                       ICENT            19  CENTURY MARK

                  COMPUTATION INTERVAL     0.03 HOURS
                       TOTAL TIME BASE     9.97 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


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

            **************
            *            *
  13 KK     *      J1    *
            *            *
            **************

  20 KO          OUTPUT CONTROL VARIABLES
                       IPRNT             5  PRINT CONTROL
                       IPLOT             0  PLOT CONTROL
                       QSCAL            0.  HYDROGRAPH PLOT SCALE
                       IPNCH             0  PUNCH COMPUTED HYDROGRAPH
                        IOUT            21  SAVE HYDROGRAPH ON THIS UNIT
                       ISAV1             1  FIRST ORDINATE PUNCHED OR SAVED
                       ISAV2           300  LAST ORDINATE PUNCHED OR SAVED
                      TIMINT         0.033  TIME INTERVAL IN HOURS


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

            **************
            *            *
 26 KK      *      J2    *
            *            *
            **************
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29 KO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

*** *** *** *** *** *** *** *** *** *** ***,*** ***

30 KK

****
* *
* J3 *
* *
****

37 KO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

*** ***

46 KK

****
* *
* J5 *
* *
****

55 KO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

Poe & Associates of Kansas, Inc.

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	DA1	489.	3.70	112.	67.	67.	0.27		
ROUTED TO	J1	428.	3.90	111.	67.	67.	0.27	166.75	3.90
HYDROGRAPH AT	DA2	107.	3.37	17.	10.	10.	0.04		
2 COMBINED AT	J2	468.	3.87	128.	78.	78.	0.31		
ROUTED TO	J3	450.	4.00	127.	77.	77.	0.31	164.33	4.00
HYDROGRAPH AT	DA3	212.	3.50	40.	24.	24.	0.10		
2 COMBINED AT	J4	566.	3.90	167.	101.	101.	0.41		
ROUTED TO	J5	408.	4.40	164.	101.	101.	0.41	163.97	4.40

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

2-15-00

FILE: ABERDNS

ABERDEEN 3RD – DRAINAGE FROM 29TH TO 21ST

DA = 264.49 Ac = 0.41327 SQ. MI.

EXISTING CONDITION BEFORE DEVELOPMENT

CULTIVATED W/O CONSERVATION

187.63 Ac	TYPE B	91	15198
76.86 Ac	TYPE D	91	6994
			22192 ÷ 264.49

CN = 83.9

LENGTH OFF SITE 800' ELEV 179.0

LENGTH ON SITE 5300' ELEV 159.3

6100'

$S = \frac{1000}{83.9} - 10 = 1.92$

SLOPE $\frac{19.7}{6100} = .0032 = 0.32\%$

$LAG = \frac{6100^{0.8}\ 2.92^{0.7}}{1900\ \sqrt{.32}} = 2.10$ HRS

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             MAY  1991                *
*          VERSION 4.0.1E              *
*     Lahey F77L-EM/32 version 5.01    *
*        Dodson & Associates, Inc.     *
*  RUN DATE  02/15/00  TIME  15:27:18  *
****************************************
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****************************************
*                                      *
*     U.S. ARMY CORPS OF ENGINEERS     *
*     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
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
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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

Poe & Associates of Kansas, Inc.

HEC-1 INPUT


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

   1      ID        ABERDEEN  3RD
   2      ID        EXISTING CONDITION
   3      ID        100 YEAR 6 HOUR STORM
   4      ID        FILE NAME: ABERDN5
   5      IT      2                 0     300
   6      IO      5       0

   7      KK     SB1   DRAINAGE AREA TO 21ST
   8      KM         COMPUTE HYDROGRAPH
   9      BA  0.41327
  10      PH      1       0     .87    1.86     3.8     4.6     5.1     6.0
  11      LS      0    83.9
  12      UD   2.10
  13      ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*      Lahey F77L-EM/32 version 5.01    *
*        Dodson & Associates, Inc.      *
*  RUN DATE  02/15/00  TIME  15:27:18   *
*****************************************
```


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


ABERDEEN 3RD
EXISTING CONDITION
100 YEAR 6 HOUR STORM
FILE NAME: ABERDN5

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0958	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 9.97 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

*** WARNING *** UNIT HYDROGRAPH TRUNCATED FROM 317 TO 300 INTERVALS

Poe & Associates of Kansas, Inc.

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	329.	5.33	177.	109.	109.	0.41		

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

ABERDEEN 3RD ADDN. — FILE: ABERDN6
100 YEAR 6HR STORM DISCHARGE
UNDEVELOPED AREAS CALC. AS EXISTING

ASSUMPTION IS THAT FUTURE DEVELOPMENT WILL PROVIDE REDUCTION TO STORM WATER RUNOFF

DA #1 (POND 1) = 172.16 AC = 0.269 SQ MI.

				100	376
3.76 Ac	POND				
60.5 Ac	CULTIVATED w/o CONS.		TYPE B	81	4900
30.0 Ac	"	"	TYPE D	91	2730
46.7 Ac	0.25 AC LOTS		TYPE B	75	3503
31.2 Ac	0.25 AC LOTS		TYPE D	87	2714
172.16					14223

CN = 82.62

LENGTH 3950'

SLOPE $\frac{15}{3950} = .0038 = 0.38\%$ $\quad S = \frac{1000}{82.62} - 10 = 2.10$

$$LAG = \frac{3950^{0.8}\ 3.10^{0.7}}{1900\sqrt{.38}} = 1.421$$

% IMPERVIOUS

		100	376
3.76 Ac	POND		
77.9 Ac	S.F. LOTS	38	2960
90.5 Ac	UNDEVELOPED	—	—
172.16			3336 ÷ 172.16 = 19.4%

IN FAVOR ...

UNDEVELOPED AREAS CALC. AS EXISTING

HYD LENGTH MODIFIED

1700' UNDEVELOPED

$(3750 - 1700) \div 3750 = 54.6\%$

LAG FACTOR = 0.70

ADJUSTED LAG = $1.421 \times 0.90 \times 0.70 = 0.8952$ HR

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*     Lahey F77L-EM/32 version 5.01     *
*       Dodson & Associates, Inc.       *
*  RUN DATE  02/15/00  TIME  13:27:23   *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*     U.S. ARMY CORPS OF ENGINEERS      *
*     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

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1     ID        ABERDEEN 3RD
    2     ID        DEVELOPED CONDITION     FINAL DESIGN
    3     ID        100 YEAR 6HR STORM
    4     ID        FILE NAME: ABERDN6
    5     IT      2                 0     300
    6     IO      5       0

    7     KK     DA1   AREA NORTH TO POND 1 CONTROL STRUCTURE
    8     KM        COMPUTE HYDROGRAPH
    9     BA   0.269
   10     PH       1       0     .87    1.86     3.8     4.6     5.1     6.0
   11     LS       0   82.62
   12     UD  0.8952

   13     KK      J1
   14     KM     ROUTE THROUGH EXIST. 22' WIDE STRUCTURE     W/3:1 SIDE SLOPES
   15     RS       1    STOR      -1
   16     SV       0    3.89    5.92    8.01   10.61   12.53
   17     SE     164     165   165.5     166   166.6     167
   18     SQ       0    25.6    77.0   149.9   243.9   359.2   496.1
   19     SE     164   164.5     165   165.5     166   166.5     167
   20     KO                                      21

   21     KK     DA2  AREA TO MIDDLE POND CONTROL STRUCTURE
   22     KM   COMPUTE HYDROGRAPH
   23     BA  .041672
   24     LS       0   80.61
   25     UD   0.312

   26     KK      J2
   27     KM    COMBINE J1 AND J2 AT J3
   28     HC       2
   29     KO                                      21

   30     KK      J3
   31     KM    ROUTE THROUGH POND 2 - 22' WIDE STRUCTURE W/3:1 SIDE SLOPES
   32     RS       1    STOR      -1
   33     SV       0    1.11    3.48    6.07    7.50    9.08
   34     SE   161.5     162     163     164   164.5     165
   35     SQ       0    25.6    77.0   149.9   243.9   359.2   496.1
   36     SE   161.5     162   162.5     163   163.5     164   164.5
   37     KO                                      21

   38     KK     DA3  AREA TO SOUTH POND CONTROL STRUCTURE
   39     KM     COMPUTE HYDROGRAPH
   40     BA  0.102594
   41     LS       0   78.46
   42     UD  0.4296

   43     KK      J4
   44     KM    COMBINE SB3 AND J4 AT J5
   45     HC       2
```

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

  46      KK      J5
  47      KM     ROUTE THROUGH SOUTH POND - DBL 8'X3' RCBC AT 21ST STREET
  48      RS         1    STOR      -1
  49      SV         0    2.82     7.15    11.86    16.99    19.71    22.52    24.89
  50      SE    159.24     160      161      162      163    163.5      164    164.4
  51      SQ         0    62.4     88.0    113.6    144.0    176.0    208.0    240.0    272.0    304.0
  52      SQ     320.0   352.0    384.0
  53      SE    159.24  160.44   160.74   161.04   161.34   161.64   161.94   162.24   162.54   162.84
  54      SE    163.14  163.44   163.74
  55      KO
  56      ZZ                                          21
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*      Lahey F77L-EM/32 version 5.01    *
*        Dodson & Associates, Inc.      *
*   RUN DATE  02/15/00  TIME  13:27:23  *
*                                       *
*****************************************
```


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


ABERDEEN 3RD
DEVELOPED CONDITION FINAL DESIGN
100 YEAR 6HR STORM
FILE NAME: ABERDN6

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0958	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 9.97 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

** ***

```
**************
*            *
*     J1     *
*            *
**************
```

13 KK

20 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

* ***

```
**************
*            *
*     J2     *
*            *
**************
```

26 KK

```
 29 KO         OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.033  TIME INTERVAL IN HOURS


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

          **************
          *            *
 30 KK    *      J3    *
          *            *
          **************

 37 KO         OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.033  TIME INTERVAL IN HOURS


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

          **************
          *            *
 46 KK    *      J5    *
          *            *
          **************

 55 KO         OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.033  TIME INTERVAL IN HOURS
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

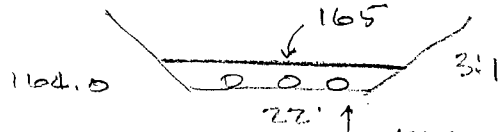
OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	DA1	393.	4.00	117.	71.	71.	0.27		
ROUTED TO	J1	361.	4.27	116.	70.	70.	0.27	166.51	4.27
HYDROGRAPH AT	DA2	107.	3.37	17.	10.	10.	0.04		
2 COMBINED AT	J2	381.	4.23	132.	81.	81.	0.31		
ROUTED TO	J3	372.	4.37	132.	80.	80.	0.31	164.05	4.37
HYDROGRAPH AT	DA3	212.	3.50	40.	24.	24.	0.10		
2 COMBINED AT	J4	433.	4.27	171.	104.	104.	0.41		
ROUTED TO	J5	357.	4.73	168.	103.	103.	0.41	163.49	4.73

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

2-15-00

FILE: ABERDN 7

TRY ADDING 12" WALL ACROSS POND 1 STRUCTURE (RAISE WEIR F.L. TO 165.0)



DRAIN HOLES TO MAINTAIN W.L. @ 164.0

BROAD CRESTED

ELEV.	Q	H	L
164.0	0		
165.0	0		
165.5	30.5	0.5	28.0
166.0	95.5	1.0	31.0
166.5	183.9	1.5	32.5
167.0	296.2	2.0	54.0
167.5	432.2	2.5	35.5

RAISE STORAGE CURVE TO 167.5

167.0 5.18 AC 12.53 AC/FT

2.59 AC VOLUME

167.5 5.18 AC 15.12 AC/FT

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*      Lahey F77L-EM/32 version 5.01    *
*        Dodson & Associates, Inc.      *
*  RUN DATE  02/15/00  TIME  14:06:22   *
*****************************************
```


```
*****************************************
*                                       *
*     U.S. ARMY CORPS OF ENGINEERS      *
*     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

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   1      ID        ABERDEEN 3RD
   2      ID        DEVELOPED CONDITION      FINAL DESIGN
   3      ID        100 YEAR 6HR STORM
   4      ID        FILE NAME: ABERDN7
   5      IT      2                 0     300
   6      IO      5       0

   7      KK     DA1   AREA NORTH TO POND 1 CONTROL STRUCTURE
   8      KM       COMPUTE HYDROGRAPH
   9      BA   0.269
  10      PH       1       0     .87    1.86     3.8     4.6     5.1     6.0
  11      LS       0   82.62
  12      UD  0.8952

  13      KK      J1
  14      KM     ROUTE THROUGH EXIST. 22' WIDE STRUCTURE     W/3:1 SIDE SLOPES
  15      RS       1    STOR      -1
  16      SV       0    3.89    5.92    8.01   10.61   12.53   15.12
  17      SE     164     165   165.5     166   166.6     167   167.5
  18      SQ       0       0    30.5    95.5   183.9   296.2   432.2
  19      SE     164     165   165.5     166   166.5     167   167.5
  20      KO                                      21

  21      KK     DA2  AREA TO MIDDLE POND CONTROL STRUCTURE
  22      KM   COMPUTE HYDROGRAPH
  23      BA  .041672
  24      LS       0   80.61
  25      UD   0.312

  26      KK      J2
  27      KM    COMBINE J1 AND J2 AT J3
  28      HC       2
  29      KO                                          21

  30      KK      J3
  31      KM    ROUTE THROUGH POND 2 - 22' WIDE STRUCTURE W/3:1 SIDE SLOPES
  32      RS       1    STOR      -1
  33      SV       0    1.11    3.48    6.07    7.50    9.08
  34      SE   161.5     162     163     164   164.5     165
  35      SQ       0    25.6    77.0   149.9   243.9   359.2   496.1
  36      SE   161.5     162   162.5     163   163.5     164   164.5
  37      KO                                      21

  38      KK     DA3  AREA TO SOUTH POND CONTROL STRUCTURE
  39      KM     COMPUTE HYDROGRAPH
  40      BA  0.102594
  41      LS       0   78.46
  42      UD  0.4296

  43      KK      J4
  44      KM    COMBINE SB3 AND J4 AT J5
  45      HC       2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  46      KK      J5
  47      KM     ROUTE THROUGH SOUTH POND - DBL 8'X3' RCBC AT 21ST STREET
  48      RS         1    STOR      -1
  49      SV         0    2.82    7.15   11.86   16.99   19.71   22.52   24.89
  50      SE    159.24     160     161     162     163   163.5     164   164.4
  51      SQ         0    62.4    88.0   113.6   144.0   176.0   208.0   240.0   272.0   304.0
  52      SQ     320.0   352.0   384.0
  53      SE    159.24  160.44  160.74  161.04  161.34  161.64  161.94  162.24  162.54  162.84
  54      SE    163.14  163.44  163.74
  55      KO
  56      ZZ                                    21
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                 *
*          VERSION 4.0.1E               *
*     Lahey F77L-EM/32 version 5.01     *
*       Dodson & Associates, Inc.       *
*  RUN DATE  02/15/00  TIME  14:06:22   *
*****************************************
```


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


ABERDEEN 3RD
DEVELOPED CONDITION FINAL DESIGN
100 YEAR 6HR STORM
FILE NAME: ABERDN7

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0958	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 9.97 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

** ***

```
**************
*            *
13 KK  *       J1  *
*            *
**************
```

20 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

* ***

```
**************
*            *
26 KK  *       J2  *
*            *
**************
```

```
 29 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.033  TIME INTERVAL IN HOURS


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

            **************
            *            *
 30 KK      *       J3   *
            *            *
            **************

 37 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.033  TIME INTERVAL IN HOURS


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

            **************
            *            *
 46 KK      *       J5   *
            *            *
            **************

 55 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       0.033  TIME INTERVAL IN HOURS
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	DA1	393.	4.00	117.	71.	71.	0.27		
ROUTED TO	J1	360.	4.27	116.	70.	70.	0.27	167.23	4.27
HYDROGRAPH AT	DA2	107.	3.37	17.	10.	10.	0.04		
2 COMBINED AT	J2	381.	4.23	133.	81.	81.	0.31		
ROUTED TO	J3	372.	4.37	132.	80.	80.	0.31	164.05	4.37
HYDROGRAPH AT	DA3	212.	3.50	40.	24.	24.	0.10		
2 COMBINED AT	J4	433.	4.27	171.	105.	105.	0.41		
ROUTED TO	J5	358.	4.73	168.	103.	103.	0.41	163.50	4.73

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

2-15-00

ABERDEEN FIRE – FILE ABERDN8

LOWER POND 2 FOR 0.5'

USE DEVELOPED / UNDEVELOPED RUN

STORAGE CURVE

ELEV.	VOLUME
161.0	0
161.5	1.04
162.0	2.19
163.0	4.56
164.0	7.15
164.5	9.56
165.0	10.16

DISCHARGE CURVE – TRY 18' WEIR W/ 3:1 SIDES

		H	L
161.0	0	0	18
161.5	21.2	0.5	19.5
162	64.7	1.0	21.0
162.5	127.3	1.5	22.5
163	209.1	2.0	24.0
163.5	310.5	2.5	25.5
164.0	432.1	3.0	27

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*     Lahey F77L-EM/32 version 5.01     *
*        Dodson & Associates, Inc.      *
*  RUN DATE  02/15/00  TIME  15:57:49   *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    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

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1     ID        ABERDEEN 3RD
    2     ID        DEVELOPED CONDITION      FINAL DESIGN
    3     ID        100 YEAR 6HR STORM
    4     ID        FILE NAME: ABERDN8
    5     IT      2                 0     300
    6     IO      5       0

    7     KK     DA1   AREA NORTH TO POND 1 CONTROL STRUCTURE
    8     KM        COMPUTE HYDROGRAPH
    9     BA   0.269
   10     PH       1       0     .87    1.86     3.8     4.6     5.1     6.0
   11     LS       0   82.62
   12     UD  0.8952

   13     KK      J1
   14     KM     ROUTE THROUGH EXIST. 22' WIDE STRUCTURE     W/3:1 SIDE SLOPES
   15     RS       1    STOR      -1
   16     SV       0    3.89    5.92    8.01   10.61   12.53
   17     SE     164     165   165.5     166   166.6     167
   18     SQ       0    25.6      77   149.9   243.9   359.2   496.1
   19     SE     164   164.5     165   165.5     166   166.5     167
   20     KO                                      21

   21     KK     DA2  AREA TO MIDDLE POND CONTROL STRUCTURE
   22     KM   COMPUTE HYDROGRAPH
   23     BA  .041672
   24     LS       0   80.61
   25     UD   0.312

   26     KK      J2
   27     KM    COMBINE J1 AND J2 AT J3
   28     HC       2
   29     KO                                      21

   30     KK      J3
   31     KM    ROUTE THROUGH POND 2 - 18' WIDE STRUCTURE W/3:1 SIDE SLOPES
   32     RS       1    STOR      -1
   33     SV       0    1.08    2.19    4.56    7.15    8.58   10.16
   34     SE   161.0   161.5     162     163     164   164.5     165
   35     SQ       0    21.2    64.7   127.3   209.1   310.5   432.1
   36     SE     161   161.5     162   162.5     163   163.5     164
   37     KO                                      21

   38     KK     DA3  AREA TO SOUTH POND CONTROL STRUCTURE
   39     KM     COMPUTE HYDROGRAPH
   40     BA  0.102594
   41     LS       0   78.46
   42     UD  0.4296

   43     KK      J4
   44     KM    COMBINE SB3 AND J4 AT J5
   45     HC       2
```

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

  46      KK      J5
  47      KM    ROUTE THROUGH SOUTH POND - DBL 8'X3' RCBC AT 21ST STREET
  48      RS        1    STOR      -1
  49      SV        0    2.82     7.15    11.86    16.99    19.71    22.52    24.89
  50      SE   159.24     160      161      162      163    163.5      164    164.4
  51      SQ        0    62.4     88.0    113.6    144.0    176.0    208.0    240.0    272.0    304.0
  52      SQ    320.0   352.0    384.0
  53      SE   159.24  160.44   160.74   161.04   161.34   161.64   161.94   162.24   162.54   162.84
  54      SE   163.14  163.44   163.74
  55      KO                                        21
  56      ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*     Lahey F77L-EM/32 version 5.01     *
*        Dodson & Associates, Inc.      *
*  RUN DATE  02/15/00  TIME  15:57:49   *
*                                       *
*****************************************
```


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


ABERDEEN 3RD
DEVELOPED CONDITION FINAL DESIGN
100 YEAR 6HR STORM
FILE NAME: ABERDN8

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	2	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1 0	ENDING DATE
NDTIME	0958	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 9.97 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

** ***

```
**************
*            *
*       J1   *
*            *
**************
```

13 KK

20 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

*** ***

```
**************
*            *
*       J2   *
*            *
**************
```

6 KK

29 KO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

*** ***

```
**************
*            *
*        J3  *
*            *
**************
```

37 KO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

** ***

```
**************
*            *
*        J5  *
*            *
**************
```

55 KO

OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	DA1	393.	4.00	117.	71.	71.	0.27		
ROUTED TO	J1	361.	4.27	116.	70.	70.	0.27	166.51	4.27
HYDROGRAPH AT	DA2	107.	3.37	17.	10.	10.	0.04		
2 COMBINED AT	J2	381.	4.23	132.	81.	81.	0.31		
ROUTED TO	J3	372.	4.37	131.	80.	80.	0.31	163.75	4.37
HYDROGRAPH AT	DA3	212.	3.50	40.	24.	24.	0.10		
2 COMBINED AT	J4	433.	4.27	171.	104.	104.	0.41		
ROUTED TO	J5	356.	4.73	167.	103.	103.	0.41	163.47	4.73

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

12-3-93

ABERDEAN ADDN

DA = 69.8 Ac

Soil		Type	CN Exist.	
Ya	55.8 Ac	B	81	4520
Wb	14 Ac	D	91	1274

5794 ÷ 69.8 = 83 CN EXISTING

FUTURE CONDITION

			CN		% IMP
10.0 Ac	Exist. - Type B		81	810	0
45.8	Residential	Type B	75	3435	17.4 Ac
14.0	Residential	Type D	87	1218	5.3 Ac

5463 ÷ 69.8 = 78 CN DEVELOPED

Ratio Impervious 0.32

$$LAG = 0.49 \left[\frac{0.57}{\sqrt{10.6}}\right]^{0.5} 0.32^{-0.57} = 0.39 \text{ HR} \quad \text{FUTURE CONDITION}$$

$$LAG = \frac{3000^{0.8} \cdot 3.05^{0.7}}{1900 \cdot 0.6^{0.5}} = 0.90 \text{ HR} \quad \text{Exist. Condition}$$

SUMMARY

TRIAL	RESULTS
#1	Q100 6HR PEAK FLOW PRESENT CONDITION 142 cfs
#2	Q100 6HR PEAK FLOW FUTURE CONDITION 236 cfs
#3	ROUGH STORAGE - ROUTE #2 127 cfs 165.6 MAX STAGE 7.6 AC/FT STORAGE
#4	ACTUAL POND STORAGE CURVE - ROUTE THROUGH 10' WEIR LOWER POND BEGIN W.L. @ 164 - 165 UPPER POND PEAK FLOW 96.0 cfs 166.1 MAX STAGE 9.4 AC. FT. DESIGN FOR Q100 6HR STORM

12-6-93

ABERDEAN - DETENTION STORAGE

POND AREAS AS SHOWN ON PREL. PLAT
LOWER POND NORMAL W.L. 164.0
UPPER POND NORMAL W.L. 165.0

LOWER POND			UPPER POND		
ELEV.	AREA	VOLUME			
164	1.84	0	165	2.72	0
165		2.5			
168	3.16	10.0 AC FT	168	4.72	11.2

TOTAL STORAGE

164	0
165	2.5
168	21.2

MAX STAGE 100 Co. 1 9.4 AC. FT.

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                 *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  12/06/93  TIME  08:14:39   *
*                                       *
*****************************************
```

TRIAL #1

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    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

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

   1      ID       ABERDEAN ADDN.
   2      ID       PEAK FLOW PRESENT CONDITION
   3      ID       Q100 - 6HR STORM
   4      ID       FILE: PROHEC1\ABERDN
   5      IT      2              0     181
   6      IO      5       0

   7      KK     SB1
   8      KM        COMPUTE RUNOFF HYDROGRAPH
   9      BA    0.11
  10      PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
  11      LS       0      78
  12      UD    0.90
  13      ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  12/06/93  TIME  08:14:39   *
*                                       *
*****************************************
```


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


ABERDEAN ADDN.
PEAK FLOW PRESENT CONDITION
Q100 - 6HR STORM
FILE: PROHEC1\ABERDN

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0600	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

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

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	142.	4.03	38.	38.	38.	0.11		

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

```
**********************************************
*                                            *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)        *
*             MAY  1991                      *
*           VERSION 4.0.1E                   *
*                                            *
*  RUN DATE  12/06/93  TIME  08:21:50        *
*                                            *
**********************************************
```

TRIAL #2

```
**************************************
*                                    *
*    U.S. ARMY CORPS OF ENGINEERS    *
*    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

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

   1      ID       ABERDEAN ADDN.  FUTURE
   2      ID       PEAK FLOW ~~PRESENT~~ CONDITION
   3      ID       Q100 - 6HR STORM
   4      ID       FILE: PROHEC1\ABERDN1
   5      IT      2              0     181
   6      IO      5       0

   7      KK     SB1
   8      KM        COMPUTE RUNOFF HYDROGRAPH
   9      BA    0.11
  10      PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
  11      LS       0      78
  12      UD    0.39
  13      ZZ
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY   1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  12/06/93  TIME  08:21:50   *
*                                       *
*****************************************
```


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


ABERDEAN ADDN.
PEAK FLOW PRESENT CONDITION
Q100 - 6HR STORM
FILE: PROHEC1\ABERDN1

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0600	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

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

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	236.	3.47	41.	41.	41.	0.11		

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

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
*  RUN DATE  12/06/93  TIME  08:47:52   *
*                                       *
*****************************************
```

TRIAL # 3

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    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

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   1      ID       ABERDEAN ADDN.
   2      ID       PEAK FLOW PRESENT CONDITION
   3      ID       Q100 - 6HR STORM
   4      ID       FILE: PROHEC1\ABERDN1
   5      IT     2                0     181
   6      IO     5       0

   7      KK    SB1
   8      KM       COMPUTE RUNOFF HYDROGRAPH
   9      BA   0.11
  10      PH    100       0     .87    1.86     3.8     4.6     5.1     6.0
  11      LS      0      78
  12      UD   0.39

  13      KK    RT1
  14      KM       ROUTE THROUGH 10' WEIR
  15      KO                                          21
  16      RS      1    STOR      -1
  17      SV      0     1.6     4.2     9.8    14.0
  18      SE    163     164     165     166     167
  19      SQ      0      31      87     160     246
  20      SE    163     164     165     166     167
  21      ZZ
```

```
**************************************
*                                    *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*             MAY  1991              *
*          VERSION 4.0.1E            *
*                                    *
*  RUN DATE  12/06/93  TIME  08:47:52*
*                                    *
**************************************
```


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


ABERDEAN ADDN.
PEAK FLOW PRESENT CONDITION
Q100 - 6HR STORM
FILE: PROHEC1\ABERDN1

6 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		2	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		181	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		0600	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.03 HOURS
TOTAL TIME BASE 6.00 HOURS

ENGLISH UNITS

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

*** ***

```
**************
*            *
13 KK   *  RT1  *
*            *
**************
```

15 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL

QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	181	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	236.	3.47	41.	41.	41.	0.11		
ROUTED TO	RT1	127.	3.90	38.	38.	38.	0.11	165.55	3.90

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

Rough Storage

Elev	Volume
63	0
64	1.6
65	4.2
66	9.8
67	14.0

Lower Pond W.L. @ 63

Upper Pond WL @ 64

Elev.	Vol
65.6	7.6 Ac Ft

Out Flow Weir 10'

63	0
64	31
65	87
66	160
67	246

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                 *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  12/06/93  TIME  16:07:43   *
*                                       *
*****************************************
```

TRIAL # 4

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    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

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   1      ID       ABERDEAN ADDN.
   2      ID       ROUTED FLOW - FUTURE CONDITION
   3      ID       Q100 - 6HR STORM
   4      ID       FILE: PROHEC1\ABERDN1
   5      IT      2              0     181
   6      IO      5       0

   7      KK     SB1
   8      KM        COMPUTE RUNOFF HYDROGRAPH
   9      BA    0.11
  10      PH     100       0     .87    1.86     3.8     4.6     5.1     6.0
  11      LS       0      78
  12      UD    0.39

  13      KK     RT1
  14      KM        ROUTE THROUGH 10' WEIR
  15      KO                                          21
  16      RS       1    STOR      -1
  17      SV       0     2.5    21.2
  18      SE     164     165     168
  19      SQ       0      31      87     160     246
  20      SE     164     165     166     167     168
  21      ZZ
```

```
*****************************************                                               ***************************************
*                                       *                                               *                                     *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                               *   U.S. ARMY CORPS OF ENGINEERS      *
*              MAY   1991               *                                               *   HYDROLOGIC ENGINEERING CENTER     *
*           VERSION 4.0.1E              *                                               *          609 SECOND STREET          *
*                                       *                                               *      DAVIS, CALIFORNIA 95616        *
* RUN DATE  12/06/93  TIME  16:07:43    *                                               *          (916) 551-1748             *
*                                       *                                               *                                     *
*****************************************                                               ***************************************




                                    ABERDEAN ADDN.
                                    ROUTED FLOW - FUTURE CONDITION
                                    Q100 - 6HR STORM
                                    FILE: PROHEC1\ABERDN1

   6 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT           HYDROGRAPH TIME DATA
                        NMIN          2  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1   0  STARTING DATE
                       ITIME       0000  STARTING TIME
                          NQ        181  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      1   0  ENDING DATE
                      NDTIME       0600  ENDING TIME
                       ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL   0.03 HOURS
                       TOTAL TIME BASE   6.00 HOURS

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


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

          **************
          *            *
  13 KK   *      RT1   *
          *            *
          **************

  15 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
```

QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	181	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.033	TIME INTERVAL IN HOURS

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SB1	236.	3.47	41.	41.	41.	0.11		
ROUTED TO	RT1	96.	4.03	33.	33.	33.	0.11	166.12	4.03

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