

2.4 Cálculo de transporte y balance de sedimento

----- NKASYO.FOR -----

4.

C *****
 C PROGRAM : KASYO-DAILY (9 YEARS CONTINUOUS 1967-1975)
 C MODIFIED IN JULY 1989, CHAMA RIVER - VENEZUELA
 C *****

C
 C INTEGER*2 STA, DATA, KADO, BP, KK, ICASE
 C PARAMETER (STA=33, DATA=31,
 * KADO=12, BP=33)
 C INTEGER*2 CASE, ORDER(BP), BASE(KADO), NBASE(21)
 C REAL*4 A(BP), B(BP), Q(STA, 12, DATA), QMAX(STA, 12)
 C REAL*4 QW(STA, 12), QSUM(12), PS(12), S(21)
 C REAL*4 W(KADO), QC(BP), QS(STA, 12), SP(21), L(KADO)
 C REAL*4 AL(STA), SEDI(STA, 12), H(STA, 12), E(STA, 12)
 C REAL*4 FK(21), F(STA, 12)
 C CHARACTER NAME(STA)*9
 C CHARACTER RNAME*80

C DATA ORDER
 * / 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,
 * 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,
 * 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 /

C DATA BASE
 * / 3, 5, 9, 12, 14, 17, 20, 24, 27, 30, 31, 33 /

C DATA NBASE
 * / 1, 2, 4, 6, 7, 8, 13, 10, 11, 15, 16, 18,
 * 19, 21, 22, 23, 25, 26, 29, 28, 32 /

C DATA A
 * / 2.4, 2113.0, 1315.0, 2113.0, 1304.0, 845.0, 2113.0,
 * 674.0, 497.0, 1232.0, 2905.0, 1640.0, 1128.0, 662.0,
 * 559.0, 559.0, 575.0, 2829.0, 2878.0, 575.0, 559.0,
 * 2878.0, 2878.0, 746.0, 844.0, 1277.0, 714.0, 169.0,
 * 2961.0, 501.0, 224.0, 1243.0, 0.18 /

流量の算出式
 $Q_w = A * Q^B$

C DATA B
 * / 1.16, 1.01, 1.01, 1.01, 0.99, 1.06, 1.01,
 * 1.07, 1.03, 0.98, 0.90, 0.99, 1.05, 1.01,
 * 1.13, 1.13, 1.00, 0.96, 0.88, 1.00, 1.13,
 * 0.88, 0.88, 0.96, 1.00, 0.97, 1.01, 1.07,
 * 0.90, 1.00, 1.04, 1.07, 2.62 /

Ashida, BMS
 流量

C DATA SP
 * / 0.031, 0.007, 0.001, 0.001, 0, 0,
 * 0.010, 0.073, 0.154, 0.013, 0, 0.127,
 * 0.054, 0.120, 0.153, 0.249, 0.013, 0,
 * 0, 0, 0 /

C DATA PS
 * / 4722., 3932., 3256., 7782., 2599., 10036.,
 * 4248., 4403., 2713., 3703., 3178., 3174 /

C DATA QC
 * / 0.0, 4.2, 7.6, 15.2, 7.9, 26.9, 4.2,
 * 41.8, 30.9, 51.4, 4.2, 6.6, 15.6, 21.7,
 * 50.2, 31.8, 3.9, 2.1, 0.7, 3.9, 31.8,
 * 1.5, 1.5, 3.9, 26.6, 9.3, 15.9, 58.7,
 * 1.0, 83.9, 2.1, 1.8, 0.0 /

Q_c ... 流量係数 (m³/s)

C DATA L
 * / 12.0, 7.75, 13.26, 16.25, 12.75, 10.5, 10.25,
 * 9.75, 14.63, 13.5, 6.88, 11.5 /

Table VI-23

C DATA W
 * / 38.0, 78.0, 105.0, 66.0, 93.0, 116.0, 210.0,
 * 138.0, 18.0, 38.0, 75.0, 210.0 /

C ICASE=0
 KK = 67
 9000 IF (KK.LE.75) THEN
 GO TO 200

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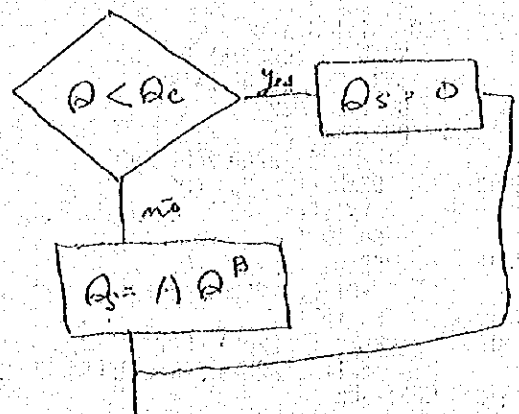
ELSE
GO TO 222
END IF
200 CONTINUE
ICASE = ICASE+1
CALL INPUT ( ICASE, Q )
C
CALL KEISAN ( PS, Q, QM, QSUM, QMAX, W, A, B,
*          QC, QS, AL, SEDI, H, SP, S, E, F, ORDER,
*          BASE, NBASE, L, SDM, SDP )
C
CALL OUTPUT ( ICASE, S, E, F, SEDI, H, AL, QS, ORDER,
*          QC, QMAX, QM, QSUM, KK, SDM, SDP, NBASE )
C
211 FORMAT(13)
KK = KK+1
GO TO 9000
222 STOP
END
C
C
SUBROUTINE INPUT ( ICASE, Q )
C
INTEGER*2      STA, DATA, KADO, BP, ICASE
PARAMETER ( STA=33, DATA=31,
*          KADO=12, BP=33 )
CHARACTER      DEL(5)*80
CHARACTER      S_NAME(STA)*9, RNAME*80
INTEGER*2      CASE
REAL*4         Q(STA, 12, DATA)
DIMENSION      FDUM(10, 10)
CHARACTER      INFIL(9)*12
CHARACTER      INF1LE*20
C
100 CONTINUE
DATA INFILE
* / 'QP670002.DAT', 'QP680002.DAT', 'QP690002.DAT',
*   'QP700002.DAT', 'QP710002.DAT', 'QP720002.DAT',
*   'QP730002.DAT', 'QP740002.DAT', 'QP750002.DAT' /
INFILE = 'A' // INFIL(ICASE)
OPEN (1, FILE=INFILE, ACCESS='SEQUENTIAL', STATUS='OLD')
C
DO 19 ID=1, 5
READ (1, 2000) DEL(ID)
WRITE(*, 2000) DEL(ID)
19 CONTINUE
DO 29 JD=1, 10
READ (1, 2010) (FDUM(JD, KD), KD=1, 10)
WRITE(*, 2010) (FDUM(JD, KD), KD=1, 10)
29 CONTINUE
C
DO 1 I=1, STA
READ (1, 2000) RNAME
WRITE(*, 2000) RNAME
DO 1 J=1, 12
DO 1 K=1, 3
IF (K-2) 3000, 3001, 3002
3000 READ (1, 2220) (Q(I, J, LL), LL=1, 10)
WRITE(*, 2220) (Q(I, J, LL), LL=1, 10)
GO TO 1
3001 READ (1, 2220) (Q(I, J, LL), LL=11, 20)
WRITE(*, 2220) (Q(I, J, LL), LL=11, 20)
GO TO 1
3002 READ (1, 2222) (Q(I, J, LL), LL=21, 31)
WRITE(*, 2222) (Q(I, J, LL), LL=21, 31)
1 CONTINUE
CLOSE(1, STATUS='KEEP')
-- MODIFING THE INPUT DISCHARGE --
DO 101 I = 1, STA
DO 101 J = 1, 12
DO 101 K = 1, 31
Q(I, J, K) = 1.0*Q(I, J, K)

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101 CONTINUE
C
1000 FORMAT (A64)
2000 FORMAT (A80)
2010 FORMAT (10F8.3)
2220 FORMAT (10F7.2)
2222 FORMAT (11F7.2)
3333 FORMAT (13)
3334 FORMAT (F10.3)
C
RETURN
END
C
SUBROUTINE KEISAN ( PS, Q, QM, QSUM, QMAX, W,
* A, B, QC, QS, AL, SEDI, H, SP, S, E, F,
* ORDER, BASE, NBASE, L, SDM, SDP )
C
INTEGER*2 STA, DATA, KADO, BP
PARAMETER ( STA=33, DATA=31,
* KADO=12, BP=33 )
REAL*4 Q(STA, 12, DATA), QMAX(STA), W(KADO)
REAL*4 A(BP), B(BP), W_QS, QC(BP), QS(STA)
REAL*4 AL(STA), SEDI(STA), H(STA), SP(21)
REAL*4 E(STA), F(STA), L(KADO), PS(12), RC(12)
REAL*4 QM(STA), QSUM, SDM, SDP, S(21)
INTEGER*2 ORDER(BP), BASE(KADO), NBASE(21)
C
OPEN(3, FILE='PRN', STATUS='NEW')
QSUM=0.0
DO 2 I=1, STA
  QM(I)=0.0
  DO 3 J=1, BP
    IF(I.EQ.ORDER(J)) GOTO 100
3 CONTINUE
  GOTO 200
100 CONTINUE
  QMAX(I)=0.0
  DO 4 K=1, 12
    DO 4 J=1, DATA
      IF(QMAX(I).LE.Q(I, K, J)) QMAX(I)=Q(I, K, J)
      QM(I)=QM(I)+Q(I, K, J)
4 CONTINUE
98 CONTINUE
200 CONTINUE
  QSUM=QM(33)/365
2 CONTINUE
C
DO 5 I=1, BP
  DO 6 J=1, KADO
    IF(I.EQ.BASE(J)) GOTO 500
6 CONTINUE
  GOTO 600
500 CONTINUE
  AL(I)=W(J)*L(J)+1000
600 CONTINUE
5 CONTINUE
C
DO 7 I=1, STA
  QS(I) = 0.0
  DO 8 J=1, BP
    IF(I.EQ.ORDER(J)) GOTO 300
8 CONTINUE
  GOTO 400
300 CONTINUE
  DO 9 LL=1, 12
    DO 9 JJ=1, 31
      IF(Q(I, LL, JJ).LT.QC(JJ)) W_QS=0.0
      IF(Q(I, LL, JJ).GE.QC(JJ)) W_QS=A(J)*Q(I, LL, JJ)+B(J)
      QS(I)=QS(I)+W_QS
9 CONTINUE
99 CONTINUE
400 CONTINUE

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7 CONTINUE
WRITE(3,3000) (QS(JJ),JJ=1,STA)
C --- INITIALIZING SEDIMENT VOLUME E(NBASE(1)) ---
DO 21 J=1,21
E(NBASE(1)) = 0.0
21 CONTINUE
C
DO 10 I=1,21
S(I) = SP(I)*PSC(IK)*1000.0
IF (QS(NBASE(1)).GE.S(I)) QS(NBASE(1)) = S(I)
E(NBASE(1))=S(I)
10 CONTINUE
C --- INITIALIZING SEDIMENT VOLUME E(BASE(J)) ---
DO 22 J=1,12
E(BASE(J)) = 0.0
22 CONTINUE
C
E(BASE(1)) = ( QS(ORDER(1))+QS(ORDER(2)) )
IF ( E(BASE(1)).LT.QS(ORDER(3)) ) GO TO 350
E(BASE(1)) = QS(ORDER(3))
350 E(BASE(2)) = ( E(BASE(1))+QS(ORDER(4)) )
IF ( E(BASE(2)).LT.QS(ORDER(5)) ) GO TO 351
E(BASE(2)) = QS(ORDER(5))
351 E(BASE(3)) = ( E(BASE(2))+QS(ORDER(6))
* +QS(ORDER(7))+QS(ORDER(8)) )
IF ( E(BASE(3)).LT.QS(ORDER(9)) ) GO TO 352
E(BASE(3)) = QS(ORDER(9))
352 E(BASE(4)) = ( QS(ORDER(10))+QS(ORDER(11)) )
E(BASE(5)) = ( E(BASE(3))+QS(ORDER(12))+QS(ORDER(13)) )
E(BASE(6)) = ( QS(ORDER(14))+QS(ORDER(15))
* +QS(ORDER(16)) )
E(BASE(7)) = ( QS(ORDER(17))+QS(ORDER(18))
* +QS(ORDER(19)) )
E(BASE(8)) = ( QS(ORDER(20))+QS(ORDER(21))
* +QS(ORDER(22))+QS(ORDER(23)) )
E(BASE(9)) = QS(ORDER(26))
IF ( E(BASE(9)).LT.QS(ORDER(27)) ) GO TO 353
E(BASE(9)) = QS(ORDER(27))
353 E(BASE(10)) = ( E(BASE(9))+QS(ORDER(28))+QS(ORDER(29)) )
IF ( E(BASE(10)).LT.QS(ORDER(30)) ) GO TO 354
E(BASE(10)) = QS(ORDER(30))
354 E(BASE(11)) = ( QS(ORDER(24))+QS(ORDER(25))
* +E(BASE(10)) )
E(BASE(12)) = ( QS(ORDER(31))+QS(ORDER(32)) )
C
DO 11 I=1,BP
F(I)= QS(ORDER(I))
11 CONTINUE
C ---- CHANNELS OF FIXED BED ----
F(3) = E(3)
F(5) = E(5)
F(9) = E(9)
F(27) = E(27)
F(30) = E(30)
C
-----
DO 12 II=1,BP
SEDI(II) = E(II) - F(II)
IF(AL(II).EQ.0) GOTO 2100
H(II)=1/AL(II)*SEDI(II)
2100 CONTINUE
12 CONTINUE
C ---- SUMMATION ----
SDM = 0.0
SDP = 0.0
DO 13 I=1,BP
IF (SEDI(I)) 361,362,363
361 SDM = SDM + SEDI(I)
GO TO 13
362 SDP = SDP + SEDI(I)
363
13 CONTINUE
3000 FORMAT(4F20.1)

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C      RETURN
      END
C
      SUBROUTINE      OUTPUT
*      ( ICASE, S, E, F, SEDI, H, AI, QS, ORDER,
*      QC, QMAX, QM, QSUM, KK, SDM, SDP, NBASE )
C
      INTEGER*2      STA, DATA, KADO, BP, KK, ICASE
      PARAMETER      ( STA=33, DATA=31,
*                    KADO=12, BP=33 )
      INTEGER*2      CASE, BASE(KADO), ORDER(STA), NBASE(21)
      REAL*4         S(21), SP(21), L(KADO), AI(STA)
      REAL*4         E(STA), F(STA), SEDI(STA), H(STA)
      REAL*4         QS(STA), QC(BP), QMAX(STA)
      REAL*4         QM(STA), QSUM, SDM, SDP
      CHARACTER      OUTF(9)*8
      DATA          OUTF
*      / 'QS67.OUT', 'QS68.OUT', 'QS69.OUT',
*      'QS70.OUT', 'QS71.OUT', 'QS72.OUT',
*      'QS73.OUT', 'QS74.OUT', 'QS75.OUT' /
      OPEN(2, FILE=OUTF(ICASE), ACCESS='SEQUENTIAL', STATUS='NEW')

      WRITE(2, 1000)
      WRITE(2, 1100)
      WRITE(2, 1200)
      WRITE(2, 1300) KK
      WRITE(2, 1200)
      WRITE(2, 1100)
      WRITE(2, 1400)
      WRITE(2, 1405)
      WRITE(2, 1500)
      DO 1 I=1, 21
        WRITE(2, 1600) I, (S(I)/1000), (QM(NBASE(I))/365)
1      CONTINUE
      WRITE(2, 1500)
      WRITE(2, 1505) QSUM
      WRITE(2, 1000)
      WRITE(2, 2199)
      WRITE(2, 1100)
      WRITE(2, 1200)
      WRITE(2, 2200)
      WRITE(2, 1200)
      WRITE(2, 1100)
      WRITE(2, 2300)
      WRITE(2, 2400)
      WRITE(2, 2500)
      K=1
      DO 2 I=1, STA
        DO 3 J=1, BP
          IF(I.EQ.ORDER(J)) GOTO 4000
3        CONTINUE
        GOTO 4100
4000      CONTINUE
        WRITE(2, 2600) K, QS(ORDER(K)), QC(K), QMAX(ORDER(K))
        K=K+1
4100      CONTINUE
2      CONTINUE
      WRITE(2, 2500)
      WRITE(2, 1000)
      WRITE(2, 1001)
      WRITE(2, 1100)
      WRITE(2, 1200)
      WRITE(2, 1700)
      WRITE(2, 1200)
      WRITE(2, 1100)
      WRITE(2, 1800)
      WRITE(2, 1900)
      WRITE(2, 1901)
      WRITE(2, 2000)
      DO 4 I=1, BP
        WRITE(2, 2100) I, INT((E(I)/1000)), INT((F(I)/1000)),

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*          INT((SEDI(1)/1000)),
*          H(1), INT((AL(1)/1000))
4 CONTINUE
WRITE(2, 2000)
WRITE(2, 2150) INT(SDM/1000)
WRITE(2, 2151) INT(SDP/1000)
CLOSE(2, STATUS='KEEP')
C
2009 FORMAT (A64)
1000 FORMAT (////////)
1001 FORMAT (////////)
1100 FORMAT (25X, 34(' '))
1200 FORMAT (25X, '**', 30X, '**')
1300 FORMAT (25X, '**', Sediment Discharge ('', 13, ')', '**')
1400 FORMAT (////////20X, 'Sub-basin No.', 2X, 'Sediment', 2X,
          FLOW)
1405 FORMAT (35X, 'Discharge (10^3m3)', 5X, 'Discharge (m3/s)')
1500 FORMAT (19X, 58(' '))
1505 FORMAT (25X, 'Monthly Average Discharge =', F10:1, '(m3/s)')
1600 FORMAT (25X, 12, 10X, F10:1, 5X, F10:1)
1700 FORMAT (25X, '**', Sediment Balance '**')
1800 FORMAT (////////7X, 'Base', 6X, 5('Sediment', 5X))
1900 FORMAT (7X, 'Point', 6X, 'Inflow', 6X, 'Transport', 4X, 'Balance',
          7X, 'Depth', 8X, 'Width')
*
1901 FORMAT (17X, 3('10^3m3)', 5X), 2X, '(m)', 8X, '(10^3m3)')
2000 FORMAT (6X, 71(' '))
2100 FORMAT (8X, 12, 3(8X, 15), 8X, F5:2, 8X, 15)
2150 FORMAT (6X, 'VOLUME OF SCoured SEDIMENT =', 18, '(10^3m3)')
2151 FORMAT (3X, 'VOLUME OF DEPOSITED SEDIMENT =', 18, '(10^3m3)')
2199 FORMAT (////////)
2200 FORMAT (25X, '**', Bed Load Transport '**')
2300 FORMAT (////////10X, 'Base Point', Sediment,
          'Critical', Max Discharge)
*
2400 FORMAT (10X, 'Transport (10^3m3)',
          Discharge (m3/sec) (m3/sec) )
*
2500 FORMAT (9X, 71(' '))
2600 FORMAT (15X, 12, 2X, F20:1, 7X, F10:2, 8X, F10:2)
RETURN
END

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Venezuela
Chama
QP670002 1967 Daily Discharge for 33-Point
m3/s

1967.000	1967.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

POINT- 1

4.62	4.20	3.81	3.49	3.20	2.94	2.68	2.49	2.29	2.10		
1.94	1.81	1.68	1.55	1.45	1.36	1.26	1.16	1.10	1.03		
0.97	1.07	1.97	1.65	1.49	1.36	1.26	1.20	2.42	5.56	4.33	
3.46	2.94	2.65	2.42	2.26	2.13	2.00	1.87	1.78	1.68		
1.58	1.52	1.42	1.36	1.29	1.26	1.20	1.16	1.55	2.26		
1.78	1.58	1.45	1.36	1.29	1.23	1.16	1.13	0.00	0.00	0.00	
1.07	1.03	1.00	0.94	0.90	0.87	0.84	0.81	0.78	0.74		
0.97	0.90	0.84	0.81	0.78	0.74	0.81	1.52	1.36	1.32		
1.45	1.39	1.32	1.29	1.23	1.20	1.13	1.10	1.58	1.45	1.68	
2.55	2.23	2.03	1.87	1.78	1.91	2.26	2.45	3.20	4.04		
3.68	4.33	5.17	6.49	5.59	5.39	5.85	6.33	8.50	8.11		
6.65	5.72	6.01	8.11	7.01	6.20	10.59	11.95	18.86	20.74	0.00	
18.12	14.96	22.35	17.35	15.05	18.93	49.42	38.05	55.49	33.98		
24.03	19.06	16.31	14.63	13.31	12.21	11.56	11.95	10.72	9.79		
9.14	8.43	7.78	7.20	6.69	6.20	5.78	5.39	5.56	7.36	6.27	
5.43	4.91	4.49	4.17	3.91	3.65	3.46	3.23	3.07	3.00		
2.81	2.65	2.49	2.52	3.55	3.07	4.13	3.49	3.55	5.68		
4.13	3.36	2.94	2.68	2.75	2.65	2.87	3.04	2.75	2.52	0.00	
2.39	2.29	2.23	2.36	5.81	5.20	3.71	4.43	7.78	4.97		
3.65	3.00	3.88	13.08	8.30	7.85	5.78	4.78	29.20	18.02		
11.01	7.82	6.36	5.91	8.53	7.49	6.43	5.85	5.43	5.17	5.23	
4.88	4.55	4.30	4.07	3.84	3.65	3.46	3.36	3.33	3.20		
4.20	3.65	3.36	3.42	4.20	3.94	3.52	3.49	3.10	3.04		
6.14	5.07	3.94	3.36	3.04	2.84	3.17	2.87	2.65	2.52	2.36	
2.26	2.16	2.07	1.97	1.94	2.52	8.27	7.53	8.56	14.21		
10.17	8.01	9.30	8.40	7.59	6.40	5.72	5.30	4.94	4.65		
4.43	4.17	3.94	3.75	3.71	5.72	5.30	4.62	6.91	9.59	0.00	
7.88	6.20	5.33	4.81	4.49	4.20	4.55	5.56	8.75	7.43		
6.43	13.82	9.27	6.82	5.65	5.01	4.59	4.39	7.95	14.63		
9.95	9.27	27.39	18.67	32.30	20.19	15.60	15.47	13.08	11.95	12.27	
13.79	19.03	19.51	14.89	13.89	12.24	10.98	10.01	9.43	11.76		
11.47	10.34	9.37	8.59	11.66	9.66	8.17	7.27	7.14	19.93		
21.93	24.10	17.02	13.44	11.50	10.30	9.43	9.01	8.40	7.78	0.00	
7.24	6.72	6.27	5.85	5.33	5.10	5.04	6.88	6.82	7.91		
5.88	4.85	4.26	3.88	3.59	3.36	3.17	2.97	2.81	2.71		
2.84	2.65	2.45	2.33	2.26	4.52	8.53	6.07	4.65	3.78	3.39	

POINT- 2

1.70	1.54	1.40	1.28	1.18	1.08	0.99	0.91	0.84	0.77		
0.71	0.67	0.62	0.57	0.53	0.50	0.46	0.43	0.40	0.38		
0.36	0.39	0.72	0.61	0.55	0.50	0.46	0.44	0.89	2.04	1.59	
1.27	1.08	0.97	0.89	0.83	0.78	0.74	0.69	0.65	0.62		
0.58	0.56	0.52	0.50	0.48	0.46	0.44	0.43	0.57	0.83		
0.65	0.58	0.53	0.50	0.48	0.45	0.43	0.42	0.00	0.00	0.00	
0.39	0.38	0.37	0.34	0.33	0.32	0.31	0.30	0.29	0.27		
0.36	0.33	0.31	0.30	0.29	0.27	0.30	0.56	0.50	0.49		
0.53	0.51	0.49	0.48	0.45	0.44	0.42	0.40	0.58	0.53	0.62	
0.94	0.82	0.75	0.69	0.65	0.70	0.83	0.90	1.18	1.82		
1.35	1.59	1.90	2.39	2.05	1.98	2.15	2.33	3.12	2.98		
2.45	2.10	2.21	2.98	2.58	2.28	3.90	4.39	6.94	7.62	0.00	
6.66	5.50	8.22	6.38	5.53	6.96	18.17	13.99	20.40	12.49		
8.84	7.01	6.00	5.38	4.89	4.49	4.25	4.39	3.94	3.60		
3.36	3.10	2.86	2.65	2.46	2.28	2.13	1.98	2.04	2.71	2.30	
2.00	1.81	1.65	1.53	1.44	1.34	1.27	1.19	1.13	1.10		
1.03	0.97	0.91	0.93	1.31	1.13	1.52	1.28	1.31	2.09		
1.52	1.24	1.08	0.99	1.01	0.97	1.06	1.12	1.01	0.93	0.00	
0.88	0.84	0.82	0.87	2.14	1.91	1.37	1.63	2.86	1.83		

1.34	1.10	1.43	4.81	3.05	2.89	2.13	1.76	10.74	6.63	
4.05	2.87	2.34	2.17	3.14	2.76	2.36	2.15	2.00	1.90	1.92
1.79	1.67	1.58	1.50	1.41	1.34	1.27	1.24	1.22	1.18	
1.54	1.34	1.24	1.26	1.54	1.45	1.29	1.28	1.14	1.12	
2.26	1.86	1.45	1.24	1.12	1.05	1.16	1.06	0.97	0.93	0.87
0.83	0.80	0.76	0.72	0.71	0.93	3.04	2.77	3.15	5.23	
3.74	2.95	3.42	3.09	2.79	2.35	2.10	1.95	1.82	1.71	
1.63	1.53	1.45	1.38	1.37	2.10	1.95	1.70	2.54	3.53	0.00
2.90	2.28	1.96	1.77	1.65	1.54	1.67	2.04	3.22	2.73	
2.36	5.08	3.41	2.51	2.08	1.84	1.69	1.62	2.92	5.38	
3.66	3.41	10.07	6.86	11.88	7.42	5.74	5.69	4.81	4.39	4.51
5.07	7.00	7.17	5.47	5.11	4.50	4.04	3.68	3.47	4.32	
4.22	3.80	3.44	3.16	4.29	3.55	3.00	2.67	2.62	7.33	
8.06	8.86	6.26	4.94	4.23	3.79	3.47	3.31	3.09	2.86	0.00
2.66	2.47	2.30	2.15	1.96	1.88	1.85	2.53	2.51	2.91	
2.16	1.78	1.57	1.43	1.32	1.24	1.16	1.09	1.03	1.00	
1.05	0.97	0.90	0.86	0.83	1.66	3.14	2.23	1.67	1.39	1.25
POINT- 3										
6.32	5.74	5.21	4.77	4.38	4.02	3.67	3.40	3.13	2.87	
2.65	2.48	2.30	2.12	1.98	1.86	1.72	1.59	1.50	1.41	
1.33	1.46	2.69	2.26	2.04	1.86	1.72	1.64	3.31	7.60	5.92
4.73	4.02	3.62	3.31	3.09	2.91	2.74	2.56	2.43	2.30	
2.16	2.08	1.94	1.86	1.77	1.72	1.64	1.59	2.12	3.09	
2.43	2.16	1.98	1.86	1.77	1.68	1.59	1.55	0.00	0.00	0.00
1.46	1.41	1.37	1.28	1.23	1.19	1.15	1.11	1.07	1.01	
1.33	1.23	1.15	1.11	1.07	1.01	1.11	2.08	1.86	1.81	
1.98	1.90	1.81	1.77	1.68	1.64	1.55	1.50	2.16	1.98	2.30
3.49	3.05	2.78	2.56	2.43	2.61	3.09	3.35	4.38	6.76	
5.03	5.92	7.07	8.88	7.64	7.37	8.00	8.66	11.62	11.09	
9.10	7.82	8.22	11.09	9.59	8.48	14.49	16.34	25.80	28.36	0.00
24.78	20.46	30.57	23.73	20.58	25.89	67.59	52.04	75.89	46.47	
32.87	26.07	22.31	20.01	18.20	16.70	15.81	16.34	14.66	13.39	
12.50	11.53	10.64	9.85	9.15	8.48	7.91	7.37	7.60	10.07	8.57
7.43	6.72	6.14	5.70	5.35	4.99	4.73	4.42	4.20	4.10	
3.84	3.62	3.40	3.45	4.86	4.20	5.65	4.77	4.86	7.77	
5.65	4.60	4.02	3.67	3.76	3.62	3.93	4.16	3.76	3.45	0.00
3.27	3.13	3.05	3.23	7.95	7.11	5.08	6.06	10.64	6.80	
4.99	4.10	5.31	17.89	11.35	10.74	7.91	6.54	39.94	24.65	
15.06	10.69	8.70	8.08	11.67	10.25	8.79	8.00	7.43	7.07	7.15
6.67	6.22	5.88	5.57	5.25	4.99	4.73	4.60	4.55	4.38	
5.74	4.99	4.60	4.68	5.74	5.39	4.81	4.77	4.24	4.16	
8.40	6.93	5.39	4.60	4.16	3.89	4.33	3.93	3.62	3.45	3.23
3.09	2.96	2.83	2.69	2.65	3.45	11.31	10.30	11.71	19.44	
13.91	10.96	12.72	11.49	10.38	8.75	7.82	7.25	6.76	6.36	
6.06	5.70	5.39	5.13	5.08	7.82	7.25	6.32	9.45	13.12	0.00
10.78	8.48	7.29	6.58	6.14	5.74	6.22	7.60	11.97	10.16	
8.79	18.90	12.68	9.33	7.73	6.85	6.28	6.01	10.87	20.01	
13.61	12.68	37.46	25.53	44.18	27.61	21.34	21.16	17.89	16.34	16.78
18.86	26.03	26.68	20.36	19.00	16.74	15.02	13.69	12.90	16.08	
15.69	14.14	12.81	11.75	15.95	13.21	11.17	9.94	9.76	27.26	
29.99	32.96	23.28	18.38	15.73	14.09	12.90	12.32	11.49	10.64	0.00
9.90	9.19	8.57	8.00	7.29	6.98	6.89	9.41	9.33	10.82	
8.04	6.63	5.83	5.31	4.91	4.60	4.33	4.06	3.84	3.71	
3.89	3.62	3.35	3.19	3.09	6.18	11.67	8.30	6.22	5.17	4.64
POINT- 4										
1.30	1.18	1.07	0.98	0.90	0.82	0.75	0.70	0.64	0.59	
0.54	0.51	0.47	0.43	0.41	0.38	0.35	0.33	0.31	0.29	
0.27	0.30	0.55	0.46	0.42	0.38	0.35	0.34	0.68	1.56	1.21
0.97	0.82	0.74	0.68	0.63	0.60	0.56	0.53	0.50	0.47	
0.44	0.43	0.40	0.38	0.36	0.35	0.34	0.33	0.43	0.63	
0.50	0.44	0.41	0.38	0.36	0.34	0.33	0.32	0.00	0.00	0.00
0.30	0.29	0.28	0.26	0.25	0.24	0.24	0.23	0.22	0.21	
0.27	0.25	0.24	0.23	0.22	0.21	0.23	0.43	0.38	0.37	
0.41	0.39	0.37	0.36	0.34	0.34	0.32	0.31	0.44	0.41	0.47
0.72	0.63	0.57	0.53	0.50	0.53	0.63	0.69	0.90	1.39	
1.03	1.21	1.45	1.82	1.57	1.51	1.64	1.78	2.38	2.27	
1.87	1.60	1.69	2.27	1.97	1.74	2.97	3.35	5.29	5.82	0.00
5.08	4.20	6.27	4.87	4.22	5.31	13.86	10.67	15.57	9.53	
6.74	5.35	4.58	4.11	3.73	3.43	3.24	3.35	3.01	2.75	
2.56	2.37	2.18	2.02	1.88	1.74	1.62	1.51	1.56	2.07	1.76
1.52	1.38	1.26	1.17	1.10	1.02	0.97	0.91	0.86	0.84	
0.79	0.74	0.70	0.71	1.00	0.86	1.16	0.98	1.00	1.59	

1.16	0.94	0.82	0.75	0.77	0.74	0.81	0.85	0.77	0.71	0.00
0.67	0.64	0.63	0.66	1.63	1.46	1.04	1.24	2.18	1.40	
1.02	0.84	1.09	3.67	2.33	2.20	1.62	1.34	8.19	5.06	
3.09	2.19	1.79	1.66	2.39	2.10	1.80	1.64	1.52	1.45	1.47
1.37	1.28	1.21	1.14	1.08	1.02	0.97	0.94	0.93	0.90	
1.18	1.02	0.94	0.96	1.18	1.11	0.99	0.98	0.87	0.85	
1.72	1.42	1.11	0.94	0.85	0.80	0.89	0.81	0.74	0.71	0.66
0.63	0.61	0.58	0.55	0.54	0.71	2.32	2.11	2.40	3.99	
2.85	2.25	2.61	2.36	2.13	1.70	1.60	1.49	1.39	1.30	
1.24	1.17	1.11	1.05	1.04	1.60	1.49	1.30	1.94	2.69	0.00
2.21	1.74	1.50	1.35	1.26	1.18	1.28	1.56	2.46	2.08	
1.80	3.88	2.60	1.91	1.59	1.40	1.29	1.23	2.23	4.11	
2.79	2.60	7.68	5.24	9.06	5.66	4.38	4.34	3.67	3.35	3.44
3.87	5.34	5.47	4.18	3.90	3.43	3.08	2.81	2.65	3.30	
3.22	2.90	2.63	2.41	3.27	2.71	2.29	2.04	2.00	5.59	
6.15	6.76	4.78	3.77	3.23	2.89	2.65	2.53	2.36	2.18	0.00
2.03	1.88	1.76	1.64	1.50	1.43	1.41	1.93	1.91	2.22	
1.65	1.36	1.20	1.09	1.01	0.94	0.89	0.83	0.79	0.76	
0.80	0.74	0.69	0.65	0.63	1.27	2.39	1.70	1.28	1.06	0.95
POINT- 5										
7.62	6.92	6.28	5.75	5.28	4.84	4.42	4.10	3.77	3.46	
3.19	2.99	2.77	2.55	2.39	2.24	2.07	1.92	1.81	1.70	
1.60	1.76	3.24	2.72	2.46	2.24	2.07	1.98	3.99	9.16	7.13
5.70	4.84	4.36	3.99	3.72	3.51	3.30	3.09	2.93	2.77	
2.60	2.51	2.34	2.24	2.13	2.07	1.98	1.92	2.55	3.72	
2.93	2.60	2.39	2.24	2.13	2.02	1.92	1.87	0.00	0.00	0.00
1.76	1.70	1.65	1.54	1.48	1.43	1.39	1.34	1.29	1.22	
1.60	1.48	1.39	1.34	1.29	1.22	1.34	2.51	2.24	2.18	
2.39	2.29	2.18	2.13	2.02	1.98	1.87	1.81	2.60	2.39	2.77
4.21	3.68	3.35	3.09	2.93	3.14	3.72	4.04	5.28	8.15	
6.06	7.13	8.52	10.70	9.21	8.88	9.64	10.44	14.00	13.36	
10.97	9.42	9.91	13.36	11.56	10.22	17.46	19.69	31.09	34.18	0.00
29.86	24.66	36.84	28.60	24.80	31.20	81.45	62.71	91.46	56.00	
39.61	31.42	26.89	24.12	21.93	20.13	19.05	19.69	17.67	16.14	
15.06	13.90	12.82	11.87	11.03	10.22	9.53	8.88	9.16	12.14	10.33
8.95	8.10	7.40	6.87	6.45	6.01	5.70	5.33	5.06	4.94	
4.63	4.36	4.10	4.16	5.86	5.06	6.81	5.75	5.86	9.36	
6.81	5.54	4.84	4.42	4.53	4.36	4.74	5.01	4.53	4.16	0.00
3.94	3.77	3.68	3.89	3.58	8.57	6.12	7.30	12.82	8.20	
6.01	4.94	6.40	21.56	13.68	12.94	9.53	7.88	48.13	29.71	
18.15	12.88	10.49	9.74	14.06	12.35	10.59	9.64	8.95	8.52	8.62
8.04	7.50	7.09	6.71	6.33	6.01	5.70	5.54	5.48	5.28	
6.92	6.01	5.54	5.64	6.92	6.50	5.80	5.75	5.11	5.01	
10.12	8.35	6.50	5.54	5.01	4.69	5.22	4.74	4.36	4.16	3.89
3.72	3.57	3.41	3.24	3.19	4.16	13.63	12.41	14.11	23.43	
16.76	13.21	15.33	13.85	12.51	10.54	9.42	8.74	8.15	7.66	
7.30	6.87	6.50	6.18	6.12	9.42	8.74	7.62	11.39	15.81	0.00
12.99	10.22	8.79	7.93	7.40	6.92	7.50	9.16	14.43	12.24	
10.59	22.78	15.28	11.24	9.32	8.25	7.57	7.24	13.10	24.12	
16.40	15.28	45.14	30.77	53.24	33.27	25.72	25.50	21.56	19.69	20.22
22.73	31.37	32.15	24.54	22.90	20.17	18.10	16.50	15.55	19.38	
18.91	17.04	15.44	14.16	19.22	15.92	13.46	11.98	11.76	32.85	
36.14	39.72	28.06	22.15	18.96	16.98	15.55	14.85	13.85	12.82	0.00
11.93	11.07	10.33	9.64	8.79	8.41	8.30	11.34	11.24	13.04	
9.69	7.99	7.03	6.40	5.92	5.54	5.22	4.89	4.63	4.47	
4.69	4.36	4.04	3.84	3.72	7.45	14.06	10.00	7.50	6.23	5.59
POINT- 6										
2.60	2.37	2.15	1.97	1.80	1.66	1.51	1.40	1.29	1.18	
1.09	1.02	0.95	0.87	0.82	0.76	0.71	0.66	0.62	0.58	
0.55	0.60	1.11	0.93	0.84	0.76	0.71	0.67	1.37	3.13	2.44
1.95	1.66	1.49	1.37	1.27	1.20	1.13	1.06	1.00	0.95	
0.89	0.86	0.80	0.76	0.73	0.71	0.67	0.66	0.87	1.27	
1.00	0.89	0.82	0.76	0.73	0.69	0.66	0.64	0.00	0.00	0.00
0.60	0.58	0.56	0.53	0.51	0.49	0.47	0.46	0.44	0.42	
0.55	0.51	0.47	0.46	0.44	0.42	0.46	0.86	0.76	0.75	
0.82	0.78	0.75	0.73	0.69	0.67	0.64	0.62	0.89	0.82	0.95
1.44	1.26	1.15	1.06	1.00	1.07	1.27	1.38	1.80	2.79	
2.08	2.44	2.91	3.66	3.15	3.04	3.29	3.57	4.70	4.57	
3.75	3.22	3.39	4.57	3.95	3.50	5.97	6.74	10.63	11.69	0.00
10.21	8.43	12.60	9.78	8.48	10.67	27.85	21.44	31.27	19.15	
13.54	10.74	9.19	8.25	7.50	6.88	6.52	6.74	6.04	5.52	
5.15	4.75	4.39	4.06	3.77	3.50	3.26	3.04	3.13	4.15	3.53

3.06	2.77	2.53	2.35	2.20	2.06	1.95	1.82	1.73	1.69	
1.58	1.49	1.40	1.42	2.00	1.73	2.33	1.97	2.00	3.20	
2.33	1.89	1.66	1.51	1.55	1.49	1.62	1.71	1.55	1.42	0.00
1.35	1.29	1.26	1.33	3.28	2.93	2.09	2.49	4.39	2.80	
2.06	1.69	2.18	7.37	4.68	4.42	3.26	2.69	16.46	10.16	
6.21	4.41	3.59	3.33	4.81	4.22	3.62	3.29	3.06	2.91	2.95
2.75	2.57	2.42	2.29	2.17	2.06	1.95	1.89	1.87	1.80	
2.37	2.06	1.89	1.93	2.37	2.22	1.98	1.97	1.75	1.71	
3.46	2.86	2.22	1.89	1.71	1.60	1.78	1.62	1.49	1.42	1.33
1.27	1.22	1.17	1.11	1.09	1.42	4.66	4.24	4.82	8.01	
5.73	4.51	5.24	4.73	4.28	3.60	3.22	2.99	2.79	2.62	
2.49	2.35	2.22	2.11	2.09	3.22	2.99	2.60	3.90	5.41	0.00
4.44	3.50	3.00	2.71	2.53	2.37	2.57	3.13	4.93	4.19	
3.62	7.79	5.22	3.84	3.19	2.82	2.58	2.48	4.48	8.25	
5.61	5.22	15.44	10.52	18.20	11.38	8.79	8.72	7.37	6.74	6.92
7.77	10.72	10.99	8.39	7.83	6.90	6.19	5.64	5.32	6.63	
6.46	5.83	5.28	4.84	6.57	5.44	4.61	4.10	4.02	11.23	
12.36	13.58	9.59	7.57	6.48	5.81	5.32	5.08	4.73	4.39	0.00
4.08	3.79	3.53	3.29	3.00	2.88	2.84	3.88	3.84	4.46	
3.31	2.73	2.40	2.18	2.02	1.89	1.78	1.67	1.58	1.53	
1.60	1.49	1.38	1.31	1.27	2.55	4.81	3.42	2.57	2.13	1.91
POINT- 7										
2.44	2.22	2.01	1.84	1.69	1.55	1.42	1.31	1.21	1.11	
1.02	0.95	0.89	0.82	0.77	0.72	0.67	0.61	0.58	0.55	
0.51	0.56	1.04	0.87	0.78	0.72	0.67	0.63	1.28	2.93	2.29
1.82	1.55	1.40	1.28	1.19	1.13	1.06	0.99	0.94	0.89	
0.84	0.80	0.75	0.72	0.68	0.67	0.63	0.61	0.82	1.19	
0.94	0.84	0.77	0.72	0.68	0.65	0.61	0.60	0.00	0.00	0.00
0.56	0.55	0.53	0.49	0.48	0.46	0.44	0.43	0.41	0.39	
0.51	0.48	0.44	0.43	0.41	0.39	0.43	0.80	0.72	0.70	
0.77	0.73	0.70	0.68	0.65	0.63	0.60	0.58	0.84	0.77	0.89
1.35	1.18	1.07	0.99	0.94	1.01	1.19	1.30	1.69	2.61	
1.94	2.29	2.73	3.43	2.95	2.85	3.09	3.34	4.48	4.28	
3.51	3.02	3.17	4.28	3.70	3.27	5.59	6.31	9.96	10.95	0.00
9.57	7.90	11.80	9.16	7.95	9.99	26.09	20.09	29.30	17.94	
12.69	10.06	8.61	7.73	7.03	6.45	6.11	6.31	5.66	5.17	
4.83	4.45	4.11	3.80	3.53	3.27	3.05	2.85	2.93	3.89	3.31
2.86	2.59	2.37	2.20	2.06	1.93	1.82	1.71	1.62	1.59	
1.48	1.40	1.31	1.33	1.88	1.62	2.18	1.84	1.88	3.00	
2.18	1.77	1.55	1.42	1.45	1.40	1.52	1.60	1.45	1.33	0.00
1.26	1.21	1.18	1.24	3.07	2.75	1.96	2.34	4.11	2.63	
1.93	1.59	2.05	6.91	4.38	4.14	3.05	2.52	15.42	9.52	
5.82	4.13	3.36	3.12	4.50	3.96	3.39	3.09	2.86	2.73	2.76
2.58	2.40	2.27	2.15	2.03	1.93	1.82	1.77	1.76	1.69	
2.22	1.93	1.77	1.81	2.22	2.08	1.86	1.84	1.64	1.60	
3.24	2.68	2.08	1.77	1.60	1.50	1.67	1.52	1.40	1.33	1.24
1.19	1.14	1.09	1.04	1.02	1.33	4.37	3.97	4.52	7.50	
5.37	4.23	4.91	4.43	4.01	3.38	3.02	2.80	2.61	2.46	
2.34	2.20	2.08	1.98	1.96	3.02	2.80	2.44	3.65	5.06	0.00
4.16	3.27	2.81	2.54	2.37	2.22	2.40	2.93	4.62	3.92	
3.39	7.30	4.89	3.60	2.98	2.64	2.42	2.32	4.20	7.73	
5.25	4.89	14.46	9.86	17.05	10.66	8.24	8.17	6.91	6.31	6.48
7.28	10.04	10.30	7.86	7.33	6.46	5.80	5.29	4.98	6.21	
6.05	5.46	4.95	4.54	6.16	5.10	4.31	3.84	3.77	10.52	
11.58	12.72	8.99	7.09	6.07	5.44	4.98	4.76	4.43	4.11	0.00
3.82	3.55	3.31	3.09	2.81	2.69	2.66	3.63	3.60	4.18	
3.10	2.56	2.25	2.05	1.89	1.77	1.67	1.57	1.48	1.43	
1.50	1.40	1.30	1.23	1.19	2.39	4.50	3.21	2.40	2.00	1.79
POINT- 8										
1.65	1.50	1.36	1.24	1.14	1.05	0.95	0.89	0.82	0.75	
0.69	0.64	0.60	0.55	0.52	0.48	0.45	0.41	0.39	0.37	
0.35	0.38	0.70	0.59	0.53	0.48	0.45	0.43	0.86	1.98	1.54
1.23	1.05	0.94	0.86	0.81	0.76	0.71	0.67	0.63	0.60	
0.56	0.54	0.51	0.48	0.46	0.45	0.43	0.41	0.55	0.81	
0.63	0.56	0.52	0.48	0.46	0.44	0.41	0.40	0.00	0.00	0.00
0.38	0.37	0.36	0.33	0.32	0.31	0.30	0.29	0.28	0.26	
0.35	0.32	0.30	0.29	0.28	0.26	0.29	0.54	0.48	0.47	
0.52	0.49	0.47	0.46	0.44	0.43	0.40	0.39	0.56	0.52	0.60
0.91	0.79	0.72	0.67	0.63	0.68	0.81	0.87	1.14	1.76	
1.31	1.54	1.84	2.31	1.99	1.02	2.08	2.25	3.03	2.89	
2.37	2.04	2.14	2.89	2.50	2.21	3.77	4.26	6.72	7.39	0.00
6.45	5.33	7.96	6.18	5.36	6.74	17.60	13.55	19.76	12.10	

8.56	6.79	5.81	5.21	4.74	4.35	4.12	4.26	3.82	3.49	
3.26	3.00	2.77	2.57	2.38	2.21	2.06	1.92	1.98	2.62	2.23
1.93	1.75	1.60	1.48	1.39	1.30	1.23	1.15	1.09	1.07	
1.00	0.94	0.89	0.90	1.27	1.09	1.47	1.24	1.27	2.02	
1.47	1.20	1.05	0.95	0.98	0.94	1.02	1.08	0.08	0.90	0.00
0.85	0.82	0.79	0.84	2.07	1.85	1.32	1.58	2.77	1.77	
1.30	1.07	1.38	4.66	2.96	2.80	2.06	1.70	10.40	6.42	
3.92	2.78	2.27	2.11	3.04	2.67	2.29	2.08	1.93	1.84	1.86
1.74	1.62	1.53	1.45	1.37	1.30	1.23	1.20	1.18	1.14	
1.50	1.30	1.20	1.22	1.50	1.40	1.25	1.24	1.10	1.08	
2.19	1.81	1.40	1.20	1.08	1.01	1.13	1.02	0.94	0.90	0.84
0.81	0.77	0.74	0.70	0.69	0.90	2.95	2.68	3.05	5.06	
3.62	2.85	3.31	2.99	2.70	2.28	2.04	1.80	1.76	1.66	
1.58	1.48	1.40	1.33	1.32	2.04	1.89	1.65	2.46	3.42	0.00
2.81	2.21	1.90	1.71	1.60	1.50	1.62	1.98	3.12	2.65	
2.29	4.92	3.30	2.43	2.01	1.78	1.63	1.56	2.83	5.21	
3.54	3.30	9.76	6.65	11.50	7.19	5.56	5.51	4.66	4.26	4.37
4.91	6.78	6.95	5.30	4.95	4.36	3.91	3.57	3.36	4.19	
4.08	3.68	3.34	3.06	4.15	3.44	2.91	2.59	2.54	7.10	
7.81	8.58	6.06	4.79	4.10	3.67	3.36	3.21	2.99	2.77	0.00
2.58	2.39	2.23	2.08	1.90	1.82	1.79	2.45	2.43	2.82	
2.09	1.73	1.52	1.38	1.28	1.20	1.13	1.06	1.00	0.97	
1.01	0.94	0.87	0.83	0.81	1.61	3.04	2.16	1.62	1.35	1.21

POINT- 9

14.31	13.01	11.80	10.80	9.91	9.10	8.30	7.70	7.09	6.50	
5.99	5.60	5.21	4.79	4.50	4.20	3.90	3.60	3.40	3.20	
3.01	3.30	6.09	5.11	4.61	4.20	3.90	3.71	7.50	17.20	13.40
10.70	9.10	8.19	7.50	6.99	6.60	6.20	5.81	5.50	5.21	
4.89	4.71	4.40	4.20	4.00	3.90	3.71	3.60	4.79	6.99	
5.50	4.89	4.50	4.20	4.00	3.80	3.60	3.51	0.00	0.00	0.00
3.30	3.20	3.10	2.89	2.79	2.69	2.60	2.52	2.42	2.29	
3.01	2.79	2.60	2.52	2.42	2.29	2.52	4.71	4.20	4.10	
4.50	4.29	4.10	4.00	3.80	3.71	3.51	3.40	4.89	4.50	5.21
7.91	6.91	6.29	5.81	5.50	5.90	6.99	7.59	9.91	15.31	
11.39	13.40	16.00	20.10	17.30	16.69	18.10	19.60	26.30	25.10	
20.60	17.70	18.61	25.10	21.71	19.20	32.79	37.00	58.40	64.21	0.00
56.09	46.32	69.20	53.72	46.59	58.60	152.99	117.79	171.79	105.19	
74.40	59.01	50.50	45.31	41.20	37.81	35.80	37.00	33.19	30.32	
28.30	26.10	24.09	22.30	20.71	19.20	17.90	16.69	17.20	22.80	19.40
16.80	15.21	13.90	12.90	12.10	11.30	10.70	10.01	9.50	9.29	
8.69	8.19	7.70	7.81	11.01	9.50	12.79	10.80	11.01	17.58	
12.79	10.40	9.10	8.30	8.51	8.19	8.90	9.40	8.51	7.81	0.00
7.40	7.09	6.91	7.30	18.00	16.10	11.49	13.71	24.09	15.40	
11.30	9.29	12.01	40.50	25.70	24.30	17.90	14.79	90.41	55.81	
34.10	24.20	19.71	18.30	26.41	23.20	19.89	18.10	16.80	16.00	16.19
15.11	14.09	13.31	12.60	11.90	11.30	10.70	10.40	10.29	9.91	
13.01	11.30	10.40	10.60	13.01	12.20	10.89	10.80	9.60	9.40	
19.01	15.70	12.20	10.40	9.40	8.80	9.80	8.90	8.19	7.81	7.30
6.99	6.70	6.41	6.09	5.99	7.81	25.61	23.30	26.50	44.00	
31.48	24.80	28.79	26.00	23.50	19.80	17.70	16.42	15.31	14.40	
13.71	12.90	12.20	11.60	11.49	17.70	16.42	14.31	21.40	29.70	0.00
24.40	19.20	16.50	14.89	13.90	13.01	14.09	17.20	27.10	23.00	
19.89	42.79	28.69	21.11	17.50	15.49	14.20	13.60	24.61	45.31	
30.80	28.69	84.80	57.80	99.99	62.50	48.31	47.90	40.50	37.00	37.99
42.69	58.91	60.39	46.09	43.01	37.89	34.00	31.00	29.21	36.41	
35.50	32.01	29.01	26.60	36.10	29.90	25.29	22.51	22.09	61.70	
67.89	74.60	52.70	41.60	35.61	31.90	29.21	27.90	26.00	24.09	0.00
22.41	20.80	19.40	18.10	16.50	15.80	15.59	21.30	21.11	24.50	
18.19	15.01	13.20	12.01	11.11	10.40	9.80	9.19	8.69	8.40	
8.80	8.19	7.59	7.21	6.99	14.00	26.41	18.79	14.09	11.71	10.50

POINT- 10

2.12	1.93	1.75	1.60	1.47	1.35	1.23	1.14	1.05	0.96	
0.89	0.83	0.77	0.71	0.67	0.62	0.58	0.53	0.50	0.47	
0.45	0.49	0.90	0.76	0.68	0.62	0.58	0.55	1.11	2.55	1.99
1.59	1.35	1.22	1.11	1.04	0.98	0.92	0.86	0.82	0.77	
0.73	0.70	0.65	0.62	0.59	0.58	0.55	0.53	0.71	1.04	
0.82	0.73	0.67	0.62	0.59	0.56	0.53	0.52	0.00	0.00	0.00
0.49	0.47	0.46	0.43	0.42	0.40	0.39	0.37	0.36	0.34	
0.45	0.42	0.39	0.37	0.36	0.34	0.37	0.37	0.62	0.61	
0.67	0.64	0.61	0.59	0.56	0.55	0.52	0.50	0.73	0.67	0.77
1.17	1.02	0.93	0.86	0.82	0.88	1.04	1.13	1.47	2.27	
1.69	1.99	2.37	2.98	2.57	2.48	2.69	2.91	3.90	3.72	

3.06	2.63	2.76	3.72	3.22	2.85	4.87	5.49	8.66	9.52	0.00
8.32	6.87	10.27	7.97	6.91	8.69	22.70	17.48	25.49	15.61	
11.04	8.75	7.49	6.72	6.11	5.61	5.31	5.49	4.93	4.50	
4.20	3.87	3.58	3.31	3.07	2.85	2.66	2.48	2.55	3.38	2.88
2.49	2.25	2.06	1.91	1.80	1.68	1.59	1.48	1.41	1.38	
1.29	1.22	1.14	1.16	1.63	1.41	1.90	1.60	1.63	2.61	
1.90	1.54	1.35	1.23	1.26	1.22	1.32	1.39	1.26	1.16	0.00
1.10	1.05	1.02	1.08	2.67	2.39	1.71	2.03	3.58	2.28	
1.68	1.38	1.78	6.01	3.81	3.61	2.66	2.20	13.41	8.28	
5.06	3.59	2.92	2.71	3.92	3.44	2.95	2.69	2.49	2.37	2.40
2.24	2.09	1.97	1.87	1.77	1.68	1.59	1.54	1.53	1.47	
1.93	1.68	1.54	1.57	1.93	1.81	1.62	1.60	1.42	1.39	
2.82	2.33	1.81	1.54	1.39	1.31	1.45	1.32	1.22	1.16	1.08
1.04	0.99	0.95	0.90	0.89	1.16	3.80	3.46	3.93	6.53	
4.67	3.68	4.27	3.86	3.49	2.94	2.63	2.43	2.27	2.14	
2.03	1.91	1.81	1.72	1.71	2.63	2.43	2.12	3.17	4.41	0.00
3.62	2.85	2.45	2.21	2.06	1.93	2.09	2.55	4.02	3.41	
2.95	6.35	4.26	3.13	2.60	2.30	2.11	2.02	3.65	6.72	
4.57	4.26	12.58	8.57	14.84	9.27	7.17	7.11	6.01	5.49	5.64
6.33	8.74	8.96	6.84	6.38	5.62	5.04	4.60	4.33	5.40	
5.27	4.75	4.30	3.95	5.36	4.44	3.75	3.34	3.28	9.15	
10.07	11.07	7.82	6.17	5.28	4.73	4.33	4.14	3.86	3.58	0.00
3.32	3.09	2.88	2.69	2.45	2.34	2.31	3.16	3.13	3.63	
2.70	2.23	1.96	1.78	1.65	1.54	1.45	1.36	1.29	1.25	
1.31	1.22	1.13	1.07	1.04	2.08	3.92	2.79	2.09	1.74	1.56
POINT- 11										
2.35	2.14	1.94	1.78	1.63	1.50	1.37	1.27	1.17	1.07	
0.99	0.92	0.86	0.79	0.74	0.69	0.64	0.59	0.56	0.53	
0.49	0.54	1.00	0.84	0.76	0.69	0.64	0.61	1.23	2.83	2.20
1.76	1.50	1.35	1.23	1.15	1.09	1.02	0.95	0.90	0.86	
0.81	0.77	0.72	0.69	0.66	0.64	0.61	0.59	0.79	1.15	
0.90	0.81	0.74	0.69	0.66	0.63	0.59	0.58	0.00	0.00	0.00
0.54	0.53	0.51	0.48	0.46	0.44	0.43	0.41	0.39	0.38	
0.49	0.46	0.43	0.41	0.39	0.38	0.41	0.77	0.69	0.67	
0.74	0.71	0.67	0.66	0.63	0.61	0.58	0.56	0.81	0.74	0.86
1.30	1.14	1.04	0.95	0.90	0.97	1.15	1.25	1.63	2.52	
1.88	2.20	2.63	3.31	2.85	2.75	2.98	3.22	4.33	4.13	
3.39	2.91	3.06	4.13	3.57	3.16	5.40	6.09	9.61	10.56	0.00
9.23	7.62	11.38	8.83	7.67	9.64	25.17	19.38	28.26	17.31	
12.24	9.71	8.31	7.45	6.78	6.22	5.89	6.09	5.46	4.98	
4.66	4.29	3.96	3.67	3.41	3.16	2.91	2.75	2.83	3.75	3.19
2.76	2.50	2.29	2.12	1.99	1.86	1.76	1.65	1.56	1.53	
1.43	1.35	1.27	1.28	1.81	1.56	2.11	1.78	1.81	2.00	
2.11	1.71	1.50	1.37	1.40	1.35	1.16	1.55	1.40	1.28	0.00
1.22	1.17	1.14	1.20	2.96	2.65	1.89	2.25	3.96	2.53	
1.86	1.53	1.97	6.66	4.23	4.00	2.91	2.43	14.87	9.18	
5.61	3.98	3.24	3.01	4.31	3.82	3.27	2.98	2.76	2.63	2.67
2.48	2.32	2.19	2.07	1.96	1.86	1.76	1.71	1.69	1.63	
2.14	1.86	1.71	1.71	2.11	2.01	1.79	1.78	1.58	1.55	
3.13	2.58	2.01	1.71	1.55	1.15	1.61	1.46	1.35	1.28	1.20
1.15	1.10	1.05	1.00	0.99	1.28	4.21	3.83	4.36	7.24	
5.18	4.08	4.74	4.28	3.87	3.26	2.91	2.70	2.52	2.37	
2.25	2.12	2.01	1.91	1.89	2.91	2.70	2.35	3.52	4.89	0.00
4.01	3.16	2.71	2.45	2.29	2.11	2.32	2.83	4.46	3.78	
3.27	7.04	4.72	3.47	2.88	2.55	2.31	2.24	4.05	7.45	
5.07	4.72	13.95	9.51	16.15	10.28	7.95	7.88	6.66	6.09	6.25
7.02	9.69	9.94	7.58	7.07	6.24	5.59	5.10	4.80	5.99	
5.84	5.26	4.77	4.38	5.91	4.92	4.16	3.70	3.64	10.15	
11.17	12.27	8.67	6.84	5.86	5.25	4.80	4.59	4.28	3.96	0.00
3.69	3.42	3.19	2.98	2.71	2.60	2.57	3.50	3.47	4.03	
2.99	2.47	2.17	1.97	1.83	1.71	1.61	1.51	1.43	1.38	
1.45	1.35	1.25	1.18	1.15	2.30	4.34	3.09	2.32	1.92	1.73
POINT- 12										
4.47	4.07	3.69	3.38	3.10	2.85	2.60	2.41	2.22	2.03	
1.88	1.75	1.63	1.50	1.41	1.31	1.22	1.12	1.06	1.00	
0.94	1.03	1.00	1.60	1.44	1.31	1.22	1.16	2.34	5.38	4.19
3.35	2.85	2.57	2.34	2.19	2.07	1.94	1.81	1.72	1.63	
1.54	1.47	1.37	1.31	1.25	1.22	1.16	1.12	1.50	2.19	
1.72	1.54	1.41	1.31	1.25	1.19	1.12	1.10	0.00	0.00	0.00
1.03	1.00	0.97	0.91	0.88	0.84	0.82	0.78	0.75	0.72	
0.94	0.88	0.82	0.78	0.75	0.72	0.78	1.47	1.31	1.28	
1.41	1.35	1.28	1.25	1.19	1.16	1.10	1.06	1.54	1.41	1.63

2.47	2.16	1.97	1.81	1.72	1.85	2.19	2.38	3.10	4.79	
3.57	4.19	5.00	6.29	5.42	5.23	5.67	6.13	8.23	7.85	
6.45	5.54	6.82	7.85	6.79	6.01	10.27	11.58	18.27	20.08	0.00
17.55	14.49	21.65	16.80	14.58	18.33	47.87	36.86	53.75	32.92	
23.28	18.46	15.80	14.17	12.89	11.83	11.20	11.58	10.39	9.48	
8.86	8.16	7.54	6.08	6.48	6.01	5.60	5.23	5.38	7.13	6.07
5.25	4.75	4.35	4.03	3.79	3.54	3.35	3.13	2.97	2.91	
2.72	2.57	2.41	2.44	3.44	2.97	4.01	3.38	3.44	5.51	
4.01	3.25	2.85	2.60	2.66	2.57	2.78	2.94	2.66	2.44	0.00
2.32	2.22	2.16	2.28	5.63	5.04	3.60	4.28	7.54	4.81	
3.54	2.91	3.75	12.67	8.04	7.61	5.60	4.63	28.28	17.46	
10.67	7.57	6.16	5.72	8.26	7.26	6.22	5.67	5.25	5.00	5.07
4.72	4.41	4.16	3.94	3.73	3.54	3.35	3.25	3.22	3.10	
4.07	3.54	3.25	3.31	4.07	3.82	3.41	3.38	3.00	2.94	
5.95	4.91	3.82	3.25	2.94	2.76	3.06	2.78	2.57	2.44	2.28
2.19	2.09	2.00	1.90	1.88	2.44	8.01	7.29	8.29	13.77	
9.85	7.76	9.01	8.14	7.36	6.20	5.54	5.13	4.79	4.51	
4.28	4.03	3.82	3.63	3.60	5.54	5.13	4.47	6.69	9.30	0.00
7.63	6.01	5.16	4.66	4.35	4.07	4.41	5.38	8.48	7.19	
6.22	13.39	8.98	6.60	5.48	4.85	4.45	4.26	7.70	14.17	
9.64	8.98	26.53	18.08	31.29	19.55	15.12	14.99	12.67	11.58	11.89
13.35	18.43	18.90	14.42	13.45	11.86	10.63	9.70	9.13	11.39	
11.11	10.01	9.07	8.33	11.30	9.36	7.91	7.04	6.92	19.30	
21.24	23.34	16.49	13.01	11.14	9.98	9.13	8.73	8.14	7.54	0.00
7.01	6.51	6.07	5.67	5.16	4.94	4.88	6.66	6.60	7.66	
5.69	4.70	4.13	3.75	3.48	3.25	3.06	2.87	2.72	2.63	
2.76	2.57	2.38	2.25	2.19	4.38	8.26	5.88	4.41	3.66	3.29
POINT- 13										
1.24	1.13	1.02	0.94	0.86	0.79	0.72	0.67	0.62	0.56	
0.52	0.49	0.45	0.42	0.39	0.36	0.34	0.31	0.29	0.28	
0.26	0.29	0.53	0.44	0.40	0.36	0.34	0.32	0.65	1.49	1.16
0.93	0.79	0.71	0.65	0.61	0.57	0.54	0.50	0.48	0.45	
0.42	0.41	0.38	0.36	0.35	0.34	0.32	0.31	0.42	0.61	
0.48	0.42	0.39	0.36	0.35	0.33	0.31	0.30	0.00	0.00	0.00
0.29	0.28	0.27	0.25	0.24	0.23	0.23	0.22	0.21	0.20	
0.26	0.24	0.23	0.22	0.21	0.20	0.22	0.41	0.36	0.36	
0.39	0.37	0.36	0.35	0.33	0.32	0.30	0.29	0.42	0.39	0.45
0.69	0.60	0.55	0.50	0.48	0.51	0.61	0.66	0.86	1.33	
0.99	1.16	1.39	1.74	1.50	1.45	1.57	1.70	2.28	2.18	
1.79	1.54	1.61	2.18	1.88	1.67	2.84	3.21	5.06	5.57	0.00
4.87	4.02	6.00	4.66	4.04	5.08	13.27	10.22	14.90	9.12	
6.45	5.12	4.38	3.93	3.57	3.28	3.10	3.21	2.88	2.63	
2.45	2.26	2.09	1.93	1.80	1.67	1.55	1.45	1.49	1.98	1.68
1.46	1.32	1.21	1.12	1.05	0.98	0.93	0.87	0.82	0.81	
0.75	0.71	0.67	0.68	0.95	0.82	1.11	0.94	0.95	1.53	
1.11	0.90	0.79	0.72	0.74	0.71	0.77	0.82	0.74	0.68	0.00
0.64	0.62	0.60	0.63	1.56	1.40	1.00	1.19	2.09	1.34	
0.98	0.81	1.04	3.51	2.23	2.11	1.55	1.28	7.84	4.84	
2.96	2.10	1.71	1.59	2.29	2.01	1.73	1.57	1.46	1.39	1.40
1.31	1.22	1.15	1.09	1.03	0.98	0.93	0.90	0.89	0.86	
1.13	0.98	0.90	0.92	1.13	1.06	0.95	0.94	0.83	0.82	
1.65	1.36	1.06	0.90	0.82	0.76	0.85	0.77	0.71	0.68	0.63
0.61	0.58	0.56	0.53	0.52	0.68	2.22	2.02	2.30	3.82	
2.73	2.15	2.50	2.25	2.04	1.72	1.54	1.42	1.33	1.25	
1.19	1.12	1.06	1.01	1.00	1.54	1.42	1.24	1.86	2.58	0.00
2.12	1.67	1.43	1.29	1.21	1.13	1.22	1.49	2.35	1.99	
1.73	3.71	2.49	1.83	1.52	1.34	1.23	1.18	2.13	3.93	
2.67	2.49	7.35	5.01	8.67	5.42	4.19	4.15	3.51	3.21	3.30
3.70	5.11	5.24	4.00	3.73	3.29	2.95	2.69	2.53	3.16	
3.08	2.78	2.52	2.31	3.13	2.59	2.19	1.95	1.92	5.35	
5.89	6.47	4.57	3.61	3.09	2.77	2.53	2.42	2.25	2.09	0.00
1.94	1.80	1.68	1.57	1.43	1.37	1.35	1.85	1.83	2.12	
1.58	1.30	1.14	1.04	0.96	0.90	0.85	0.80	0.75	0.73	
0.76	0.71	0.66	0.62	0.61	1.21	2.29	1.63	1.22	1.01	0.91
POINT- 14										
20.02	18.21	16.51	15.12	13.87	12.74	11.62	10.78	9.93	9.09	
8.39	7.84	7.29	6.71	6.30	5.87	5.46	5.03	4.75	4.48	
4.21	4.62	8.52	7.15	6.45	5.87	5.46	5.19	10.49	24.07	18.75
14.98	12.74	11.47	10.49	9.79	9.24	8.68	8.12	7.70	7.29	
6.85	6.59	6.15	5.87	5.60	5.46	5.19	5.03	6.71	9.79	
7.70	6.85	6.30	5.87	5.60	5.32	5.03	4.91	0.00	0.00	0.00
4.62	4.48	4.34	4.05	3.91	3.76	3.65	3.52	3.38	3.21	

4.21	3.91	3.65	3.52	3.38	3.21	3.52	6.59	5.87	5.74	
6.30	6.01	5.74	5.60	5.32	5.19	4.91	4.75	6.85	6.30	7.29
11.07	9.67	8.81	8.12	7.70	8.26	9.79	10.63	13.87	21.43	
15.95	18.75	22.39	28.13	24.22	23.37	25.34	27.43	36.81	35.13	
28.84	24.78	26.04	35.13	30.38	26.88	45.90	51.79	81.73	89.86	0.00
78.51	64.83	96.85	75.18	65.21	82.01	214.13	164.87	240.44	147.23	
104.13	82.59	70.68	63.41	57.66	52.92	50.10	51.79	46.46	42.43	
39.61	36.52	33.72	31.21	28.99	26.88	25.05	23.37	24.07	31.91	27.15
23.51	21.28	19.46	18.05	16.94	15.82	14.98	14.01	13.29	13.01	
12.16	11.47	10.78	10.93	15.40	13.29	17.91	15.12	15.40	24.62	
17.91	14.55	12.74	11.62	11.91	11.47	12.45	13.16	11.91	10.93	0.00
10.36	9.93	9.67	10.21	25.19	22.54	16.09	19.18	33.72	21.55	
15.82	13.01	16.80	56.68	35.97	34.02	25.05	20.70	126.53	78.11	
47.73	33.87	27.58	25.61	36.96	32.47	27.84	25.34	23.51	22.39	22.66
21.14	19.72	18.62	17.63	16.66	15.82	14.98	14.55	14.40	13.87	
18.21	15.82	14.55	14.83	18.21	17.08	15.25	15.12	13.43	13.16	
26.61	21.97	17.08	14.55	13.16	12.32	13.71	12.45	11.47	10.93	10.21
9.79	9.37	8.97	8.52	8.39	10.93	35.84	32.61	37.09	61.59	
44.06	34.71	40.30	36.39	32.90	27.72	24.78	22.97	21.43	20.16	
19.18	18.05	17.08	16.24	16.09	24.78	22.97	20.02	29.95	41.58	0.00
34.15	26.88	23.09	20.84	19.46	18.21	19.72	24.07	37.93	32.18	
27.84	59.89	40.16	29.54	24.50	21.68	19.88	19.04	34.44	63.41	
43.11	40.16	118.68	80.89	139.95	87.47	67.62	67.04	56.68	51.79	53.18
59.74	82.45	84.53	64.51	60.19	53.04	47.58	43.39	40.87	50.96	
49.69	44.80	40.60	37.24	50.53	41.85	35.39	31.50	30.93	86.35	
95.02	104.41	73.76	58.22	49.84	44.65	40.87	39.05	36.39	33.72	0.00
31.36	29.11	27.15	25.34	23.09	22.11	21.82	29.81	29.54	34.28	
25.46	21.01	18.47	16.80	15.55	14.55	13.71	12.86	12.16	11.76	
12.32	11.47	10.63	10.08	9.79	19.59	36.96	26.30	19.72	16.38	14.70
POINT- 15										
1.50	1.36	1.24	1.13	1.04	0.96	0.87	0.81	0.75	0.68	
0.63	0.59	0.55	0.50	0.47	0.44	0.41	0.38	0.36	0.34	
0.31	0.35	0.64	0.54	0.48	0.44	0.41	0.39	0.79	1.81	1.41
1.12	0.96	0.86	0.79	0.73	0.69	0.65	0.61	0.58	0.55	
0.51	0.49	0.46	0.44	0.42	0.41	0.39	0.38	0.50	0.73	
0.58	0.51	0.47	0.44	0.42	0.40	0.38	0.37	0.00	0.00	0.00
0.35	0.34	0.33	0.30	0.29	0.28	0.27	0.26	0.25	0.24	
0.31	0.29	0.27	0.26	0.25	0.24	0.26	0.49	0.44	0.43	
0.47	0.45	0.43	0.42	0.40	0.39	0.37	0.36	0.51	0.47	0.55
0.83	0.72	0.66	0.61	0.58	0.62	0.73	0.80	1.04	1.61	
1.20	1.41	1.68	2.11	1.82	1.75	1.90	2.06	2.76	2.63	
2.16	1.86	1.95	2.63	2.28	2.02	3.44	3.88	6.13	6.74	0.00
5.89	4.86	7.26	5.64	4.89	6.15	16.06	12.36	18.03	11.04	
7.81	6.19	5.30	4.75	4.32	3.97	3.76	3.88	3.48	3.18	
2.97	2.74	2.53	2.34	2.17	2.02	1.88	1.75	1.81	2.39	2.04
1.76	1.60	1.46	1.35	1.27	1.19	1.12	1.05	1.00	0.98	
0.91	0.86	0.81	0.82	1.15	1.00	1.34	1.13	1.15	1.85	
1.34	1.09	0.96	0.87	0.89	0.86	0.93	0.99	0.89	0.82	0.00
0.78	0.75	0.72	0.77	1.89	1.69	1.21	1.44	2.53	1.62	
1.19	0.98	1.26	4.25	2.70	2.55	1.88	1.55	9.49	5.86	
3.58	2.54	2.07	1.92	2.77	2.43	2.09	1.90	1.76	1.68	1.70
1.58	1.48	1.40	1.32	1.25	1.19	1.12	1.09	1.08	1.04	
1.36	1.19	1.09	1.11	1.36	1.28	1.14	1.13	1.01	0.99	
1.99	1.65	1.28	1.09	0.99	0.92	1.03	0.93	0.86	0.82	0.77
0.73	0.70	0.67	0.64	0.63	0.82	2.69	2.45	2.78	4.62	
3.31	2.60	3.02	2.73	2.47	2.08	1.86	1.72	1.61	1.51	
1.44	1.35	1.28	1.22	1.21	1.86	1.72	1.50	2.25	3.12	0.00
2.56	2.02	1.73	1.56	1.46	1.36	1.48	1.81	2.84	2.41	
2.09	4.49	3.01	2.21	1.84	1.63	1.49	1.43	2.58	4.75	
3.23	3.01	8.90	6.07	10.50	6.56	5.07	5.03	4.25	3.88	3.99
4.48	6.18	6.34	4.84	4.51	3.98	3.57	3.25	3.06	3.82	
3.73	3.36	3.04	2.79	3.79	3.14	2.66	2.36	2.32	6.48	
7.13	7.83	5.53	4.37	3.74	3.35	3.06	2.93	2.73	2.53	0.00
2.35	2.18	2.04	1.90	1.73	1.66	1.64	2.24	2.21	2.57	
1.91	1.57	1.39	1.26	1.17	1.09	1.03	0.97	0.91	0.88	
0.92	0.86	0.80	0.76	0.73	1.47	2.77	1.97	1.48	1.23	1.10
POINT- 16										
0.80	0.73	0.66	0.60	0.55	0.51	0.46	0.43	0.40	0.36	
0.34	0.31	0.29	0.27	0.25	0.23	0.22	0.20	0.19	0.18	
0.17	0.18	0.34	0.29	0.26	0.23	0.22	0.21	0.42	0.96	0.75
0.60	0.51	0.46	0.42	0.39	0.37	0.35	0.32	0.31	0.29	
0.27	0.26	0.25	0.23	0.22	0.22	0.21	0.20	0.27	0.39	

0.31	0.27	0.25	0.23	0.22	0.21	0.20	0.20	0.00	0.00	0.00
0.18	0.18	0.17	0.16	0.16	0.15	0.15	0.14	0.13	0.13	
0.17	0.16	0.15	0.14	0.13	0.13	0.14	0.14	0.23	0.23	
0.25	0.24	0.23	0.22	0.21	0.21	0.20	0.19	0.27	0.25	0.29
0.44	0.39	0.35	0.32	0.31	0.33	0.39	0.43	0.55	0.86	
0.64	0.75	0.89	1.12	0.97	0.93	1.01	1.10	1.47	1.40	
1.15	0.99	1.04	1.40	1.21	1.07	1.83	2.07	3.27	3.59	0.00
3.14	2.59	3.87	3.00	2.61	3.28	8.56	6.59	9.61	5.88	
4.16	3.30	2.82	2.53	2.30	2.11	2.00	2.07	1.86	1.69	
1.58	1.46	1.35	1.25	1.16	1.07	1.00	0.93	0.96	1.28	1.09
0.94	0.85	0.78	0.72	0.68	0.63	0.60	0.56	0.53	0.52	
0.49	0.46	0.43	0.44	0.62	0.53	0.72	0.60	0.62	0.98	
0.72	0.58	0.51	0.46	0.48	0.46	0.50	0.53	0.48	0.44	0.00
0.41	0.40	0.39	0.41	1.01	0.90	0.64	0.77	1.35	0.86	
0.63	0.52	0.67	2.27	1.44	1.36	1.00	0.83	5.06	3.12	
1.91	1.35	1.10	1.02	1.48	1.30	1.11	1.01	0.94	0.89	0.91
0.84	0.79	0.74	0.70	0.67	0.63	0.60	0.58	0.58	0.55	
0.73	0.63	0.58	0.59	0.73	0.68	0.61	0.60	0.54	0.53	
1.06	0.88	0.68	0.58	0.53	0.49	0.55	0.50	0.46	0.44	0.41
0.39	0.37	0.36	0.34	0.34	0.44	1.43	1.30	1.48	2.46	
1.76	1.39	1.61	1.45	1.31	1.11	0.99	0.92	0.86	0.81	
0.77	0.72	0.68	0.65	0.64	0.99	0.92	0.80	1.20	1.66	0.00
1.36	1.07	0.92	0.83	0.78	0.73	0.79	0.96	1.52	1.29	
1.11	2.39	1.61	1.18	0.98	0.87	0.79	0.76	1.38	2.53	
1.72	1.61	4.74	3.23	5.59	3.50	2.70	2.68	2.27	2.97	2.13
2.39	3.29	3.38	2.58	2.40	2.12	1.90	1.73	1.63	2.04	
1.99	1.79	1.62	1.49	2.02	1.67	1.42	1.26	1.24	3.45	
3.80	4.17	2.95	2.33	1.99	1.78	1.63	1.56	1.45	1.35	0.00
1.25	1.16	1.09	1.01	0.92	0.88	0.87	1.19	1.18	1.37	
1.02	0.84	0.74	0.67	0.62	0.58	0.55	0.51	0.49	0.47	
0.49	0.46	0.43	0.40	0.39	0.78	1.48	1.05	0.79	0.65	0.59
POINT- 17										
22.32	20.30	18.41	16.85	15.46	14.21	12.95	12.02	11.08	10.13	
9.36	8.74	8.13	7.48	7.02	6.54	6.09	5.61	5.30	5.00	
4.69	5.15	9.50	7.98	7.19	6.54	6.09	5.79	11.70	26.84	20.91
16.70	14.21	12.79	11.70	10.91	10.30	9.68	9.05	8.59	8.13	
7.63	7.34	6.86	6.54	6.24	6.09	5.79	5.61	7.48	10.91	
8.59	7.63	7.02	6.54	6.24	5.93	5.61	5.48	0.00	0.00	0.00
5.15	5.00	4.84	4.51	4.36	4.19	4.07	3.92	3.76	3.58	
4.69	4.36	4.07	3.92	3.76	3.58	3.92	7.34	6.54	6.40	
7.02	6.70	6.40	6.24	5.93	5.79	5.48	5.30	7.63	7.02	8.13
12.34	10.78	9.82	9.05	8.59	9.21	10.91	11.86	15.46	23.90	
17.79	20.91	24.96	31.36	27.01	26.05	28.25	30.59	41.04	39.16	
32.15	27.63	29.03	39.16	33.87	29.97	51.17	57.74	91.13	100.19	0.00
87.54	72.28	107.98	83.82	72.71	91.44	238.75	183.82	268.08	164.15	
116.10	92.08	78.80	70.69	64.28	59.00	55.86	57.74	51.80	47.30	
44.16	40.72	37.60	31.80	32.32	29.97	27.93	26.05	26.84	35.58	30.28
26.21	23.73	21.70	20.12	18.89	17.64	16.70	15.62	14.82	14.51	
13.56	12.79	12.02	12.19	17.17	11.82	19.97	16.85	17.17	27.45	
19.97	16.22	14.21	12.95	13.28	12.79	13.88	14.68	13.28	12.19	0.00
11.55	11.08	10.78	11.39	28.09	25.13	17.91	21.39	37.60	24.03	
17.64	14.51	18.73	63.20	40.11	37.93	27.93	23.08	141.08	87.09	
53.22	37.76	30.75	28.55	41.21	36.20	31.01	28.25	26.21	24.96	25.27
23.56	21.99	20.76	19.65	18.58	17.61	16.70	16.22	16.06	15.46	
20.30	17.64	16.22	16.53	20.30	19.01	17.00	16.85	14.98	14.68	
29.66	24.50	19.04	16.22	14.68	13.73	15.29	13.88	12.79	12.19	11.39
10.91	10.44	10.00	9.50	9.36	12.19	39.96	36.36	41.35	68.67	
49.13	38.70	44.93	40.57	36.68	30.91	27.63	25.61	23.90	22.48	
21.39	20.12	19.04	18.11	17.91	27.63	25.61	22.32	33.40	46.36	0.00
38.07	29.97	25.74	23.23	21.70	20.30	21.99	25.84	42.29	35.88	
31.04	66.77	44.78	32.93	27.32	24.18	22.16	21.23	38.40	70.69	
48.06	44.78	132.32	90.19	156.04	97.53	75.39	74.75	63.20	57.74	59.30
66.61	91.92	94.25	71.93	67.10	59.14	53.05	48.37	45.56	56.82	
55.41	49.95	45.26	41.52	56.34	46.66	39.47	35.12	34.49	96.28	
105.95	116.41	82.24	64.92	55.57	49.78	45.56	43.54	40.57	37.60	0.00
34.96	32.45	30.28	28.25	25.74	24.65	24.33	33.24	32.93	38.22	
28.39	23.42	20.60	18.73	17.34	16.22	15.29	14.34	13.56	13.11	
13.73	12.79	11.86	11.24	10.91	21.84	41.21	29.32	21.99	18.26	16.39
POINT- 18										
0.41	0.37	0.34	0.31	0.28	0.26	0.24	0.22	0.20	0.19	
0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.09	
0.09	0.09	0.17	0.15	0.13	0.12	0.11	0.11	0.21	0.49	0.38

0.31	0.26	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	
0.14	0.13	0.13	0.12	0.11	0.11	0.11	0.10	0.14	0.20	
0.16	0.14	0.13	0.12	0.11	0.11	0.10	0.10	0.00	0.00	0.00
0.09	0.09	0.09	0.08	0.08	0.08	0.07	0.07	0.07	0.07	
0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.13	0.12	0.12	
0.13	0.12	0.12	0.11	0.11	0.11	0.10	0.10	0.14	0.13	0.15
0.23	0.20	0.18	0.17	0.16	0.17	0.20	0.22	0.28	0.44	
0.33	0.38	0.46	0.58	0.50	0.48	0.52	0.56	0.75	0.72	
0.59	0.51	0.53	0.72	0.62	0.55	0.94	1.06	1.67	1.84	0.00
1.61	1.33	1.98	1.54	1.33	1.68	4.88	3.37	4.92	3.01	
2.13	1.69	1.45	1.30	1.18	1.08	1.02	1.06	0.95	0.87	
0.81	0.75	0.69	0.64	0.59	0.55	0.51	0.48	0.49	0.65	0.56
0.48	0.44	0.40	0.37	0.35	0.32	0.31	0.29	0.27	0.27	
0.25	0.23	0.22	0.22	0.31	0.27	0.37	0.31	0.31	0.50	
0.37	0.30	0.26	0.24	0.24	0.23	0.25	0.27	0.24	0.22	0.00
0.21	0.20	0.20	0.21	0.52	0.46	0.33	0.39	0.69	0.44	
0.32	0.27	0.34	1.16	0.74	0.70	0.51	0.42	2.59	1.60	
0.98	0.69	0.56	0.52	0.76	0.66	0.57	0.52	0.48	0.46	0.46
0.43	0.40	0.38	0.36	0.34	0.32	0.31	0.30	0.29	0.28	
0.37	0.32	0.30	0.30	0.37	0.35	0.31	0.31	0.27	0.27	
0.54	0.45	0.35	0.30	0.27	0.25	0.28	0.25	0.23	0.22	0.21
0.20	0.19	0.18	0.17	0.17	0.22	0.73	0.67	0.76	1.26	
0.90	0.71	0.82	0.74	0.67	0.57	0.51	0.47	0.44	0.41	
0.39	0.37	0.35	0.33	0.33	0.51	0.47	0.41	0.61	0.85	0.00
0.70	0.55	0.47	0.43	0.40	0.37	0.40	0.49	0.78	0.66	
0.57	1.22	0.82	0.60	0.50	0.44	0.41	0.39	0.70	1.30	
0.88	0.82	2.43	1.65	2.86	1.79	1.38	1.37	1.16	1.06	1.09
1.22	1.69	1.73	1.32	1.23	1.08	0.97	0.89	0.84	1.04	
1.02	0.92	0.83	0.76	1.03	0.86	0.72	0.64	0.63	1.77	
1.94	2.14	1.51	1.19	1.02	0.91	0.84	0.80	0.74	0.69	0.00
0.64	0.60	0.56	0.52	0.47	0.45	0.45	0.61	0.60	0.70	
0.52	0.43	0.38	0.34	0.32	0.30	0.28	0.26	0.25	0.24	
0.25	0.23	0.22	0.21	0.20	0.40	0.76	0.54	0.40	0.33	0.30
POINT- 19										
0.95	0.86	0.78	0.72	0.66	0.61	0.55	0.51	0.47	0.43	
0.40	0.37	0.35	0.32	0.30	0.28	0.26	0.24	0.23	0.21	
0.20	0.22	0.41	0.34	0.31	0.28	0.26	0.25	0.50	1.14	0.89
0.71	0.61	0.55	0.50	0.47	0.44	0.41	0.39	0.37	0.35	
0.33	0.31	0.29	0.28	0.27	0.26	0.25	0.24	0.32	0.47	
0.37	0.33	0.30	0.28	0.27	0.25	0.24	0.23	0.00	0.00	0.00
0.22	0.21	0.21	0.19	0.19	0.18	0.17	0.17	0.16	0.15	
0.20	0.19	0.17	0.17	0.16	0.15	0.17	0.31	0.28	0.27	
0.30	0.29	0.27	0.27	0.25	0.25	0.23	0.23	0.33	0.30	0.35
0.53	0.46	0.42	0.39	0.37	0.39	0.47	0.51	0.66	1.02	
0.76	0.89	1.06	1.34	1.15	1.11	1.20	1.30	1.75	1.67	
1.37	1.18	1.24	1.67	1.44	1.28	2.18	2.46	3.88	4.27	0.00
3.73	3.08	4.60	3.57	3.10	3.90	10.17	7.83	11.42	6.99	
4.95	3.92	3.36	3.01	2.74	2.51	2.38	2.46	2.21	2.01	
1.88	1.74	1.60	1.48	1.38	1.28	1.19	1.11	1.14	1.52	1.29
1.12	1.01	0.92	0.86	0.80	0.75	0.71	0.66	0.63	0.62	
0.58	0.55	0.51	0.52	0.73	0.63	0.85	0.72	0.73	1.17	
0.85	0.69	0.61	0.55	0.57	0.55	0.59	0.62	0.57	0.52	0.00
0.49	0.47	0.46	0.49	1.20	1.07	0.76	0.91	1.60	1.02	
0.75	0.62	0.80	2.69	1.71	1.62	1.19	0.98	6.01	3.71	
2.27	1.61	1.31	1.22	1.76	1.54	1.32	1.20	1.12	1.06	1.08
1.00	0.94	0.88	0.84	0.79	0.75	0.71	0.69	0.68	0.66	
0.86	0.75	0.69	0.70	0.86	0.81	0.72	0.72	0.64	0.62	
1.26	1.04	0.81	0.69	0.62	0.59	0.65	0.59	0.55	0.52	0.49
0.47	0.45	0.43	0.41	0.40	0.52	1.70	1.55	1.76	2.93	
2.09	1.65	1.91	1.73	1.56	1.32	1.18	1.09	1.02	0.96	
0.91	0.86	0.81	0.77	0.76	1.18	1.09	0.95	1.42	1.97	0.00
1.62	1.28	1.10	0.99	0.92	0.86	0.94	1.14	1.80	1.53	
1.32	2.85	1.91	1.40	1.16	1.03	0.94	0.90	1.64	3.01	
2.05	1.91	5.64	3.84	6.65	4.16	3.21	3.18	2.69	2.46	2.53
2.84	3.92	4.02	3.07	2.86	2.52	2.26	2.06	1.94	2.42	
2.36	2.13	1.93	1.77	2.40	1.99	1.68	1.50	1.47	4.10	
4.51	4.96	3.50	2.77	2.37	2.12	1.94	1.85	1.73	1.60	0.00
1.49	1.38	1.29	1.20	1.10	1.05	1.04	1.42	1.40	1.63	
1.21	1.00	0.88	0.80	0.74	0.69	0.65	0.61	0.58	0.56	
0.59	0.55	0.51	0.48	0.47	0.93	1.76	1.25	0.94	0.78	0.70
POINT- 20										
23.68	21.53	19.53	17.88	16.40	15.08	13.74	12.75	11.75	10.75	

9.93	9.27	8.63	7.94	7.45	6.94	6.46	5.95	5.63	5.30	
4.98	5.46	10.08	8.47	7.63	6.94	6.46	6.15	12.41	28.47	22.18
17.72	15.08	13.57	12.41	11.58	10.93	10.27	9.61	9.12	8.63	
8.10	7.78	7.28	6.94	6.62	6.46	6.15	5.95	7.94	11.58	
9.12	8.10	7.45	6.94	6.62	6.29	5.95	5.81	0.00	0.00	0.00
5.46	5.30	5.14	4.78	4.63	4.45	4.31	4.16	3.99	3.80	
4.98	4.63	4.31	4.16	3.99	3.80	4.16	4.16	7.78	6.94	6.79
7.45	7.11	6.79	6.62	6.29	6.15	5.81	5.63	8.10	7.45	8.63
13.10	11.44	10.42	9.61	9.12	9.77	11.58	12.59	16.40	25.36	
18.88	22.18	26.48	33.28	28.66	27.64	29.97	32.45	43.54	41.55	
34.11	29.32	30.80	41.55	35.93	31.80	54.29	61.26	96.68	106.30	0.00
92.88	76.69	114.56	88.93	77.14	97.02	253.30	195.02	284.42	174.15	
123.18	97.69	83.61	75.00	68.20	62.59	59.26	61.26	54.96	50.18	
46.85	43.21	39.89	36.92	34.29	31.80	29.63	27.64	28.47	37.75	32.13
27.81	25.18	23.02	21.35	20.04	18.71	17.72	16.57	15.72	15.40	
14.39	13.57	12.75	12.93	18.21	16.72	21.19	17.88	18.21	29.12	
21.19	17.21	15.08	13.74	14.09	13.67	14.72	15.57	14.09	12.03	0.00
12.25	11.75	11.44	12.09	29.81	26.66	19.03	22.69	39.89	25.49	
18.71	15.40	19.87	67.05	42.56	40.25	29.63	24.48	149.68	92.40	
56.47	40.06	32.62	30.29	43.73	38.40	32.93	29.97	27.81	26.48	26.81
24.99	23.33	22.02	20.85	19.71	18.71	17.72	17.21	17.03	16.40	
21.53	18.71	17.21	17.53	21.53	20.20	18.03	17.88	15.89	15.57	
31.46	25.99	20.20	17.21	15.57	14.57	16.22	14.72	13.57	12.93	12.09
11.58	11.08	10.61	10.08	9.93	12.93	42.39	38.58	43.87	72.86	
52.12	41.06	47.66	43.04	38.91	32.80	29.32	27.17	25.36	23.85	
22.69	21.35	20.20	19.21	19.03	29.32	27.17	23.68	35.43	49.18	0.00
40.39	31.80	27.31	24.65	23.02	21.53	23.33	28.47	44.87	38.07	
32.93	70.84	47.51	34.93	28.98	25.65	23.51	22.52	40.74	75.00	
50.99	47.51	140.39	95.68	165.55	103.48	79.98	79.30	67.05	61.26	62.92
70.67	97.53	100.00	76.32	71.19	62.74	56.28	51.32	48.34	60.28	
58.79	53.00	48.02	44.05	59.77	49.51	41.87	37.26	36.59	102.15	
112.40	123.51	87.25	68.88	58.96	52.81	48.34	46.19	43.04	39.89	0.00
37.09	34.43	32.13	29.97	27.31	26.15	25.82	35.27	34.93	40.55	
30.12	24.85	21.86	19.87	18.40	17.21	16.22	15.21	14.39	13.91	
14.57	13.57	12.59	11.93	11.58	23.17	43.73	31.11	23.33	19.37	17.39
POINT- 21										
1.33	1.21	1.10	1.01	0.92	0.85	0.77	0.72	0.66	0.61	
0.56	0.52	0.48	0.45	0.42	0.39	0.36	0.34	0.32	0.30	
0.28	0.31	0.57	0.48	0.43	0.39	0.36	0.34	0.70	1.60	1.25
1.00	0.85	0.76	0.70	0.65	0.62	0.58	0.54	0.51	0.48	
0.46	0.44	0.41	0.39	0.37	0.36	0.34	0.34	0.45	0.65	
0.51	0.46	0.42	0.39	0.37	0.35	0.34	0.33	0.00	0.00	0.00
0.31	0.30	0.29	0.27	0.26	0.25	0.24	0.23	0.22	0.21	
0.28	0.26	0.24	0.23	0.22	0.21	0.23	0.44	0.39	0.38	
0.42	0.40	0.38	0.37	0.35	0.34	0.33	0.32	0.46	0.42	0.48
0.74	0.64	0.59	0.54	0.51	0.55	0.65	0.71	0.92	1.43	
1.06	1.25	1.49	1.87	1.61	1.56	1.60	1.83	2.45	2.34	
1.92	1.65	1.73	2.34	2.02	1.79	3.06	3.45	5.44	5.98	0.00
5.23	4.32	6.45	5.01	4.34	5.46	14.26	10.98	16.01	9.81	
6.93	5.50	4.71	4.22	3.84	3.52	3.34	3.45	3.09	2.82	
2.64	2.43	2.25	2.08	1.93	1.79	1.67	1.56	1.60	2.13	1.81
1.57	1.42	1.30	1.20	1.13	1.05	1.00	0.93	0.89	0.87	
0.81	0.76	0.72	0.73	1.03	0.89	1.19	1.01	1.03	1.64	
1.19	0.97	0.85	0.77	0.79	0.76	0.83	0.88	0.79	0.73	0.00
0.69	0.66	0.64	0.68	1.68	1.50	1.07	1.28	2.25	1.44	
1.05	0.87	1.12	3.77	2.40	2.26	1.67	1.38	8.43	5.20	
3.18	2.26	1.84	1.71	2.46	2.16	1.85	1.69	1.57	1.49	1.51
1.41	1.31	1.24	1.17	1.11	1.05	1.00	0.97	0.96	0.92	
1.21	1.05	0.97	0.99	1.21	1.14	1.02	1.01	0.89	0.88	
1.77	1.46	1.14	0.97	0.88	0.82	0.91	0.83	0.76	0.73	0.68
0.65	0.62	0.60	0.57	0.56	0.73	2.39	2.17	2.47	4.10	
2.94	2.31	2.68	2.42	2.19	1.85	1.65	1.53	1.43	1.34	
1.28	1.20	1.14	1.08	1.07	1.65	1.53	1.33	1.99	2.77	0.00
2.27	1.79	1.54	1.39	1.30	1.21	1.31	1.60	2.53	2.14	
1.85	3.99	2.68	1.97	1.63	1.44	1.32	1.27	2.29	4.22	
2.87	2.68	7.90	5.39	9.32	5.83	4.50	4.46	3.77	3.45	3.54
3.98	5.49	5.63	4.30	4.01	3.53	3.17	2.89	2.72	3.39	
3.31	2.98	2.70	2.48	3.36	2.79	2.36	2.10	2.06	5.75	
6.33	6.95	4.91	3.88	3.32	2.97	2.72	2.60	2.42	2.25	0.00
2.09	1.94	1.81	1.69	1.54	1.47	1.45	1.99	1.97	2.28	
1.70	1.40	1.23	1.12	1.03	0.97	0.91	0.86	0.81	0.78	
0.82	0.76	0.71	0.67	0.65	1.30	2.46	1.75	1.31	1.09	0.98

POINT- 22

0.32	0.29	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14	
0.13	0.12	0.11	0.11	0.10	0.09	0.09	0.08	0.08	0.07	
0.07	0.07	0.13	0.11	0.10	0.09	0.09	0.08	0.17	0.38	0.30
0.24	0.20	0.18	0.17	0.15	0.15	0.14	0.13	0.12	0.11	
0.11	0.10	0.10	0.09	0.09	0.09	0.08	0.08	0.11	0.15	
0.12	0.11	0.10	0.09	0.09	0.08	0.08	0.08	0.00	0.00	0.00
0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	
0.07	0.06	0.06	0.06	0.05	0.05	0.06	0.10	0.09	0.09	
0.10	0.10	0.09	0.09	0.08	0.08	0.08	0.08	0.11	0.10	0.11
0.17	0.15	0.14	0.13	0.12	0.13	0.15	0.17	0.22	0.34	
0.25	0.30	0.35	0.44	0.38	0.37	0.40	0.43	0.58	0.55	
0.46	0.39	0.41	0.55	0.48	0.42	0.72	0.82	1.29	1.42	0.00
1.24	1.02	1.53	1.19	1.03	1.29	3.38	2.60	3.80	2.32	
1.64	1.30	1.12	1.00	0.91	0.84	0.79	0.82	0.73	0.67	
0.63	0.58	0.53	0.49	0.46	0.42	0.40	0.37	0.38	0.50	0.43
0.37	0.34	0.31	0.29	0.27	0.25	0.24	0.22	0.21	0.21	
0.19	0.18	0.17	0.17	0.24	0.21	0.28	0.24	0.24	0.39	
0.28	0.23	0.20	0.18	0.19	0.18	0.20	0.21	0.19	0.17	0.00
0.16	0.16	0.15	0.16	0.40	0.36	0.25	0.30	0.53	0.34	
0.25	0.21	0.27	0.89	0.57	0.54	0.40	0.33	2.00	1.23	
0.75	0.53	0.44	0.40	0.58	0.51	0.44	0.40	0.37	0.35	0.36
0.33	0.31	0.29	0.28	0.26	0.25	0.24	0.23	0.23	0.22	
0.29	0.25	0.23	0.23	0.29	0.27	0.24	0.24	0.21	0.21	
0.42	0.35	0.27	0.23	0.21	0.19	0.22	0.20	0.18	0.17	0.16
0.15	0.15	0.14	0.13	0.13	0.17	0.57	0.51	0.59	0.97	
0.70	0.55	0.64	0.57	0.52	0.44	0.39	0.36	0.34	0.32	
0.30	0.29	0.27	0.26	0.25	0.39	0.36	0.32	0.47	0.66	0.00
0.54	0.42	0.36	0.33	0.31	0.29	0.31	0.38	0.60	0.51	
0.44	0.95	0.63	0.47	0.39	0.34	0.31	0.30	0.54	1.00	
0.68	0.63	1.87	1.28	2.21	1.38	1.07	1.06	0.89	0.82	0.84
0.94	1.30	1.33	1.02	0.95	0.84	0.75	0.69	0.65	0.80	
0.78	0.71	0.64	0.59	0.80	0.66	0.56	0.50	0.49	1.36	
1.50	1.65	1.16	0.92	0.79	0.70	0.65	0.62	0.57	0.53	0.00
0.49	0.46	0.43	0.40	0.36	0.35	0.34	0.47	0.47	0.54	
0.40	0.33	0.29	0.27	0.25	0.23	0.22	0.20	0.19	0.19	
0.19	0.18	0.17	0.16	0.15	0.31	0.58	0.42	0.31	0.26	0.23

POINT- 23

6.14	5.74	5.40	5.08	8.09	5.70	5.08	4.66	4.32	4.04	
3.81	3.64	3.43	3.28	3.13	3.01	2.88	2.75	2.65	2.56	
2.46	2.37	2.88	2.82	2.63	2.50	2.39	2.31	2.37	5.12	4.38
3.60	3.35	3.09	2.90	2.75	2.65	2.52	2.41	2.33	2.24	
2.16	2.07	1.99	1.95	1.97	2.39	1.91	1.80	1.82	2.43	
2.20	2.01	1.88	1.82	1.76	1.69	1.63	1.59	0.00	0.00	0.00
1.55	1.48	1.44	1.42	1.38	1.33	1.29	1.25	1.23	1.21	
1.25	1.31	1.25	1.21	1.16	1.14	1.12	1.44	1.55	1.46	
1.52	1.52	1.46	1.42	1.38	1.33	1.29	1.27	1.40	1.59	2.20
2.39	2.24	1.99	1.86	1.99	2.12	2.86	2.33	2.24	4.02	
3.11	3.37	3.49	5.31	4.49	4.28	4.40	5.10	8.13	7.41	
6.78	5.80	6.42	6.88	6.31	5.61	9.04	9.04	13.97	16.13	0.00
14.08	12.60	16.03	14.04	12.03	11.22	34.26	25.73	38.79	25.22	
18.12	14.55	12.47	11.22	10.31	9.55	8.94	9.23	8.51	7.81	
7.33	6.84	6.37	5.99	5.59	5.25	4.95	4.66	4.57	6.14	5.42
4.72	4.32	4.02	3.77	3.58	3.41	3.22	3.09	2.94	2.88	
2.73	2.63	2.50	2.41	2.96	2.94	3.68	3.37	3.37	5.61	
3.98	3.28	2.92	2.71	2.82	3.09	2.79	2.92	2.77	2.60	0.00
2.46	2.35	2.33	2.24	4.34	4.87	3.51	3.43	6.73	4.59	
3.49	2.96	2.84	8.87	6.80	6.75	5.02	4.17	17.43	13.95	
8.68	6.29	5.21	4.91	6.33	6.16	5.21	4.74	4.45	4.21	4.26
4.02	3.81	3.62	3.45	3.30	3.13	3.03	2.88	2.88	2.75	
3.24	3.18	3.01	2.90	3.24	3.35	2.94	2.94	2.71	2.50	
4.13	4.17	3.37	2.88	2.60	2.43	2.54	2.50	2.31	2.18	2.10
2.01	1.93	1.86	1.80	2.67	2.05	5.31	5.34	6.18	8.96	
7.92	5.57	6.73	6.06	5.59	4.81	4.28	3.98	3.73	3.54	
3.37	3.18	3.05	2.88	2.77	3.87	3.94	3.51	4.62	11.41	0.00
6.63	5.21	4.38	3.98	3.71	3.47	3.41	4.40	6.99	7.30	
5.12	9.40	7.52	5.59	4.68	4.17	3.85	3.66	4.89	10.27	
7.79	6.01	17.89	12.62	21.77	14.84	12.09	11.65	9.72	8.77	9.76
10.86	12.64	14.76	12.62	11.41	9.59	8.55	7.81	7.81	8.58	
9.36	8.24	7.41	6.86	8.43	7.81	6.58	5.91	5.46	12.96	
14.99	19.95	13.57	10.61	9.13	8.22	7.56	7.18	6.78	6.35	0.00
5.97	5.59	5.25	4.95	4.68	4.55	4.87	5.46	5.21	6.54	

5.10	4.28	3.83	3.54	3.32	3.15	2.99	2.86	2.73	2.63		
2.90	2.71	2.50	2.37	2.29	3.66	9.95	5.91	4.45	3.75	3.37	
POINT- 24											
31.47	28.77	26.29	24.21	25.63	21.83	19.77	18.30	16.89	15.54		
14.43	13.55	12.65	11.78	11.10	10.43	9.79	9.12	8.68	8.23		
7.79	8.21	13.66	11.88	10.79	9.92	9.30	8.88	15.66	35.57	28.11	
22.56	19.48	17.60	16.18	15.13	14.35	13.51	12.69	12.08	11.46		
10.83	10.39	9.78	9.37	9.05	9.30	8.48	8.17	10.32	14.81		
11.95	10.68	9.85	9.24	8.84	8.41	8.00	7.81	0.00	0.00	0.00	
7.39	7.15	6.94	6.53	6.33	6.09	5.90	5.70	5.49	5.27		
6.58	6.26	5.86	5.66	5.42	5.20	5.57	9.76	8.97	8.72		
9.49	9.13	8.72	8.50	8.10	7.90	7.51	7.30	10.07	9.56	11.42	
16.40	14.47	13.14	12.14	11.74	12.57	15.24	15.80	19.78	31.15		
23.30	27.10	31.81	40.90	35.14	33.85	36.46	39.81	54.70	51.85		
43.27	37.16	39.36	51.32	44.74	39.62	67.11	74.57	117.38	129.83	0.00	
113.43	94.63	138.57	109.17	94.54	114.99	305.20	234.33	343.02	211.50		
149.87	119.04	101.91	91.44	83.26	76.50	72.33	74.76	67.29	61.48		
57.45	53.06	49.04	45.48	42.27	39.26	36.65	34.23	35.02	46.52	39.79	
34.47	31.26	28.65	26.61	25.02	23.42	22.18	20.81	19.76	19.36		
18.12	17.14	16.14	16.24	22.44	19.76	26.34	22.50	22.85	36.76		
26.64	21.69	19.05	17.40	17.89	17.60	18.54	19.58	17.84	16.43	0.00	
15.56	14.92	14.56	15.17	36.23	33.39	23.86	27.70	49.40	31.86		
23.50	19.44	24.10	80.58	52.33	49.80	36.72	30.36	177.54	112.78		
69.08	49.14	40.11	37.31	53.10	47.23	40.43	36.80	34.20	32.53	32.94	
30.75	28.76	27.17	25.75	24.38	23.14	21.99	21.29	21.10	20.29		
26.27	23.19	21.42	21.65	26.27	24.96	22.23	22.07	19.70	19.16		
37.78	31.97	24.98	21.29	19.26	18.01	19.89	18.25	16.82	16.01	15.03	
14.39	13.78	13.21	12.58	13.29	15.88	50.66	46.60	53.11	86.89		
63.68	49.49	57.71	52.09	47.21	39.90	35.64	33.04	30.86	29.05		
27.64	26.02	24.66	23.43	23.12	35.23	33.00	28.84	42.51	64.02	0.00	
49.83	39.22	33.59	30.35	28.34	26.50	28.36	34.85	54.99	48.02		
40.34	85.18	58.34	42.96	35.68	31.60	28.99	27.75	48.46	90.49		
62.33	56.83	168.05	114.97	198.85	125.53	97.64	96.47	81.43	74.30	77.06	
86.45	116.96	121.72	94.26	87.56	76.70	68.75	62.71	59.52	73.05		
72.24	64.93	58.77	53.98	72.36	60.77	51.37	45.77	44.60	122.22		
135.22	152.06	106.89	84.29	72.20	64.70	59.27	56.59	52.81	49.02	0.00	
45.64	42.42	39.62	37.01	33.89	32.52	32.48	43.19	42.58	49.91		
37.32	30.86	27.21	24.80	23.00	21.56	20.34	19.13	18.12	17.51		
18.48	17.22	15.97	15.13	14.67	28.44	56.72	39.19	29.40	24.47	21.97	

POINT- 25											
1.69	1.58	1.49	1.40	2.23	1.57	1.40	1.29	1.19	1.12		
1.05	1.00	0.95	0.91	0.86	0.83	0.79	0.76	0.73	0.71		
0.68	0.65	0.79	0.78	0.72	0.69	0.66	0.64	0.65	1.41	1.21	
0.99	0.92	0.85	0.80	0.76	0.73	0.70	0.67	0.64	0.62		
0.60	0.57	0.55	0.54	0.54	0.66	0.53	0.50	0.50	0.67		
0.61	0.56	0.52	0.50	0.48	0.47	0.45	0.44	0.00	0.00	0.00	
0.43	0.41	0.40	0.39	0.38	0.37	0.36	0.34	0.34	0.33		
0.34	0.36	0.34	0.33	0.32	0.32	0.31	0.40	0.43	0.40		
0.42	0.42	0.40	0.39	0.38	0.37	0.36	0.35	0.39	0.44	0.61	
0.66	0.62	0.55	0.51	0.55	0.58	0.79	0.64	0.62	1.11		
0.86	0.93	0.96	1.47	1.24	1.18	1.22	1.41	2.24	2.04		
1.87	1.60	1.77	1.90	1.74	1.55	2.49	2.49	3.86	4.45	0.00	
3.89	3.48	4.42	3.87	3.32	3.10	9.45	7.10	10.70	6.96		
5.00	4.01	3.44	3.10	2.85	2.64	2.47	2.55	2.35	2.16		
2.02	1.89	1.76	1.65	1.54	1.45	1.37	1.29	1.26	1.69	1.50	
1.30	1.19	1.11	1.04	0.99	0.94	0.89	0.85	0.81	0.79		
0.75	0.72	0.69	0.67	0.82	0.81	1.02	0.93	0.93	1.55		
1.10	0.91	0.81	0.75	0.78	0.85	0.77	0.81	0.77	0.72	0.00	
0.68	0.65	0.64	0.62	1.20	1.34	0.97	0.95	1.86	1.27		
0.96	0.82	0.78	2.45	1.88	1.86	1.38	1.15	4.81	3.85		
2.40	1.74	1.44	1.36	1.75	1.70	1.44	1.31	1.23	1.16	1.17	
1.11	1.05	1.00	0.95	0.91	0.86	0.84	0.79	0.79	0.76		
0.89	0.88	0.83	0.80	0.89	0.92	0.81	0.81	0.75	0.69		
1.14	1.15	0.93	0.79	0.72	0.67	0.70	0.69	0.64	0.60	0.58	
0.56	0.53	0.51	0.50	0.74	0.57	1.47	1.47	1.71	2.47		
2.19	1.54	1.86	1.67	1.54	1.33	1.18	1.10	1.03	0.98		
0.93	0.88	0.84	0.79	0.77	1.07	1.09	0.97	1.27	3.15	0.00	
1.83	1.44	1.21	1.10	1.02	0.96	0.94	1.22	1.93	2.02		
1.41	2.59	2.07	1.54	1.29	1.15	1.06	1.01	1.35	2.83		
2.15	1.66	4.94	3.48	6.01	4.10	3.34	3.21	2.68	2.42	2.69	
3.00	3.49	4.07	3.48	3.15	2.65	2.36	2.16	2.16	2.37		
2.58	2.27	2.04	1.89	2.33	2.16	1.82	1.63	1.51	3.58		

4.14	5.50	3.75	2.93	2.52	2.27	2.09	1.98	1.87	1.75	0.00
1.65	1.54	1.45	1.37	1.29	1.26	1.34	1.51	1.44	1.81	
1.41	1.18	1.06	0.98	0.92	0.87	0.82	0.79	0.75	0.72	
0.80	0.75	0.69	0.65	0.63	1.01	2.75	1.63	1.23	1.03	0.93
POINT- 26										
5.47	5.11	4.81	4.52	7.20	5.07	4.52	4.15	3.85	3.60	
3.39	3.24	3.05	2.92	2.79	2.68	2.56	2.45	2.36	2.28	
2.19	2.11	2.56	2.51	2.34	2.22	2.13	2.05	2.11	4.56	3.90
3.20	2.98	2.75	2.58	2.45	2.36	2.24	2.15	2.07	2.00	
1.92	1.85	1.77	1.73	1.75	2.13	1.70	1.60	1.62	2.17	
1.96	1.79	1.68	1.62	1.56	1.51	1.45	1.41	0.00	0.00	0.00
1.38	1.32	1.28	1.26	1.23	1.19	1.15	1.11	1.09	1.07	
1.11	1.17	1.11	1.07	1.04	1.02	1.00	1.28	1.38	1.30	
1.36	1.36	1.30	1.26	1.23	1.19	1.15	1.13	1.24	1.41	1.96
2.13	2.00	1.77	1.66	1.77	1.89	2.54	2.07	2.00	3.58	
2.77	3.00	3.11	4.73	4.00	3.81	3.92	4.54	7.24	6.60	
6.03	5.16	5.71	6.13	5.62	5.00	8.05	8.05	12.44	14.36	0.00
12.54	11.22	14.27	12.50	10.71	9.99	30.50	22.90	34.53	22.45	
16.14	12.95	11.10	9.99	9.18	8.50	7.95	8.22	7.58	6.96	
6.52	6.09	5.67	5.33	4.98	4.67	4.41	4.15	4.07	5.47	4.83
4.20	3.85	3.58	3.36	3.19	3.03	2.87	2.75	2.62	2.56	
2.43	2.34	2.22	2.15	2.64	2.62	3.28	3.00	3.00	5.00	
3.54	2.92	2.60	2.41	2.51	2.75	2.49	2.60	2.47	2.32	0.00
2.19	2.09	2.07	2.00	3.86	4.34	3.13	3.05	5.99	4.09	
3.11	2.64	2.53	7.90	6.05	6.01	4.47	3.71	15.51	12.42	
7.73	5.60	4.64	4.37	5.64	5.40	4.64	4.22	3.96	3.75	3.79
3.58	3.39	3.22	3.07	2.94	2.79	2.70	2.56	2.56	2.45	
2.88	2.83	2.68	2.58	2.88	2.98	2.62	2.62	2.41	2.22	
3.68	3.71	3.00	2.56	2.32	2.17	2.26	2.22	2.05	1.94	1.87
1.79	1.72	1.66	1.60	2.38	1.83	4.73	4.75	5.50	7.97	
7.05	4.96	5.99	5.39	4.98	4.28	3.81	3.54	3.32	3.15	
3.00	2.83	2.71	2.56	2.47	3.45	3.51	3.13	4.11	10.16	0.00
5.90	4.64	3.90	3.54	3.30	3.09	3.03	3.92	6.22	6.50	
4.56	8.37	6.69	4.98	4.17	3.71	3.43	3.26	4.35	9.14	
6.94	5.35	15.93	11.23	19.38	13.21	10.76	10.37	8.65	7.80	8.69
9.67	11.25	13.14	11.23	10.16	8.54	7.62	6.96	6.96	7.63	
8.33	7.33	6.60	6.11	7.50	6.96	5.86	5.26	4.86	11.54	
13.35	17.76	12.08	9.44	8.12	7.31	6.73	6.39	6.03	5.66	0.00
5.32	4.98	4.67	4.41	4.17	4.05	4.34	4.86	4.64	5.82	
4.54	3.81	3.41	3.15	2.96	2.81	2.66	2.54	2.43	2.34	
2.58	2.41	2.22	2.11	2.04	3.26	8.86	5.26	3.96	3.34	3.00
POINT- 27										
5.47	5.11	4.81	4.52	7.20	5.07	4.52	4.15	3.85	3.60	
3.39	3.24	3.05	2.92	2.79	2.68	2.56	2.45	2.36	2.28	
2.19	2.11	2.56	2.51	2.34	2.22	2.13	2.05	2.11	4.56	3.90
3.20	2.98	2.75	2.58	2.45	2.36	2.24	2.15	2.07	2.00	
1.92	1.85	1.77	1.73	1.75	2.13	1.70	1.60	1.62	2.17	
1.96	1.79	1.68	1.62	1.56	1.51	1.45	1.41	0.00	0.00	0.00
1.38	1.32	1.28	1.26	1.23	1.19	1.15	1.11	1.09	1.07	
1.11	1.17	1.11	1.07	1.04	1.02	1.00	1.28	1.38	1.30	
1.36	1.36	1.30	1.26	1.23	1.19	1.15	1.13	1.24	1.41	1.96
2.13	2.00	1.77	1.66	1.77	1.89	2.54	2.07	2.00	3.58	
2.77	3.00	3.11	4.73	4.00	3.81	3.92	4.54	7.24	6.60	
6.03	5.16	5.71	6.13	5.62	5.00	8.05	8.05	12.44	14.36	0.00
12.54	11.22	14.27	12.50	10.71	9.99	30.50	22.90	34.53	22.45	
16.14	12.95	11.10	9.99	9.18	8.50	7.95	8.22	7.58	6.96	
6.52	6.09	5.67	5.33	4.98	4.67	4.41	4.15	4.07	5.47	4.83
4.20	3.85	3.58	3.36	3.19	3.03	2.87	2.75	2.62	2.56	
2.43	2.34	2.22	2.15	2.64	2.62	3.28	3.00	3.00	5.00	
3.54	2.92	2.60	2.41	2.51	2.75	2.49	2.60	2.47	2.32	0.00
2.19	2.09	2.07	2.00	3.86	4.34	3.13	3.05	5.99	4.09	
3.11	2.64	2.53	7.90	6.05	6.01	4.47	3.71	15.51	12.42	
7.73	5.60	4.64	4.37	5.64	5.49	4.64	4.22	3.96	3.75	3.79
3.58	3.39	3.22	3.07	2.94	2.79	2.70	2.56	2.56	2.45	
2.88	2.83	2.68	2.58	2.88	2.98	2.62	2.62	2.41	2.22	
3.68	3.71	3.00	2.56	2.32	2.17	2.26	2.22	2.05	1.94	1.87
1.79	1.72	1.66	1.60	2.38	1.83	4.73	4.75	5.50	7.97	
7.05	4.96	5.99	5.39	4.98	4.28	3.81	3.54	3.32	3.15	
3.00	2.83	2.71	2.56	2.47	3.45	3.51	3.13	4.11	10.16	0.00
5.90	4.64	3.90	3.54	3.30	3.09	3.03	3.92	6.22	6.50	
4.56	8.37	6.69	4.98	4.17	3.71	3.43	3.26	4.35	9.14	
6.94	5.35	15.93	11.23	19.38	13.21	10.76	10.37	8.65	7.80	8.69

9.67	11.25	13.14	11.23	10.16	8.54	7.62	6.96	6.96	7.03	
8.33	7.33	6.60	6.11	7.50	6.96	5.86	5.26	4.86	11.54	
13.35	17.76	12.08	9.44	8.12	7.31	6.73	6.39	6.03	5.66	0.00
5.32	4.98	4.67	4.41	4.17	4.05	4.34	4.86	4.64	5.82	
4.54	3.81	3.41	3.15	2.96	2.81	2.66	2.54	2.43	2.34	
2.58	2.41	2.22	2.11	2.04	3.26	8.86	5.26	3.96	3.34	3.00
POINT- 28										
2.72	2.54	2.39	2.25	3.58	2.52	2.25	2.06	1.91	1.79	
1.69	1.61	1.52	1.45	1.39	1.33	1.28	1.22	1.17	1.13	
1.09	1.05	1.28	1.25	1.16	1.11	1.06	1.02	1.05	2.27	1.94
1.59	1.48	1.37	1.28	1.22	1.17	1.12	1.07	1.03	0.99	
0.96	0.92	0.88	0.86	0.87	1.06	0.84	0.80	0.81	1.08	
0.98	0.89	0.83	0.81	0.78	0.75	0.72	0.70	0.00	0.00	0.00
0.68	0.66	0.64	0.63	0.61	0.59	0.57	0.55	0.54	0.53	
0.55	0.58	0.55	0.53	0.52	0.51	0.50	0.64	0.68	0.65	
0.68	0.68	0.65	0.63	0.61	0.59	0.57	0.56	0.62	0.70	0.98
1.06	0.99	0.88	0.83	0.88	0.94	1.27	1.03	0.99	1.78	
1.38	1.49	1.55	2.35	1.99	1.89	1.95	2.26	3.60	3.28	
3.00	2.57	2.84	3.05	2.79	2.49	4.00	4.00	6.19	7.15	0.00
6.24	5.58	7.10	6.22	5.33	4.97	15.17	11.30	17.18	11.17	
8.03	6.44	5.52	4.97	4.57	4.23	3.96	4.09	3.77	3.46	
3.24	3.03	2.82	2.65	2.48	2.33	2.19	2.06	2.03	2.72	2.40
2.09	1.91	1.78	1.67	1.58	1.51	1.43	1.37	1.30	1.28	
1.21	1.16	1.11	1.07	1.31	1.30	1.63	1.49	1.49	2.49	
1.76	1.45	1.29	1.20	1.25	1.37	1.24	1.29	1.23	1.15	0.00
1.09	1.04	1.03	0.99	1.92	2.16	1.56	1.52	2.98	2.04	
1.55	1.31	1.26	3.93	3.01	2.99	2.22	1.85	7.72	6.18	
3.85	2.79	2.31	2.18	2.80	2.73	2.31	2.10	1.97	1.87	1.89
1.78	1.69	1.60	1.53	1.46	1.39	1.34	1.28	1.28	1.22	
1.43	1.41	1.33	1.28	1.43	1.48	1.30	1.30	1.20	1.11	
1.83	1.85	1.49	1.28	1.15	1.08	1.13	1.11	1.02	0.97	0.93
0.89	0.85	0.83	0.80	1.18	0.91	2.35	2.36	2.74	3.97	
3.51	2.47	2.98	2.68	2.48	2.13	1.89	1.76	1.65	1.57	
1.49	1.41	1.35	1.28	1.23	1.72	1.74	1.56	2.04	5.05	0.00
2.94	2.31	1.94	1.76	1.64	1.54	1.51	1.95	3.09	3.24	
2.27	4.16	3.33	2.48	2.07	1.85	1.71	1.62	2.17	4.55	
3.45	2.66	7.92	5.59	9.64	6.57	5.35	5.16	4.30	3.88	4.32
4.81	5.60	6.54	5.59	5.05	4.25	3.79	3.46	3.46	3.80	
4.15	3.65	3.28	3.04	3.73	3.46	2.92	2.62	2.42	5.74	
6.64	8.83	6.01	4.70	4.04	3.64	3.35	3.18	3.00	2.81	0.00
2.64	2.48	2.33	2.19	2.07	2.02	2.16	2.42	2.31	2.90	
2.26	1.89	1.70	1.57	1.47	1.40	1.32	1.27	1.21	1.16	
1.28	1.20	1.11	1.05	1.01	1.62	4.41	2.62	1.97	1.66	1.49
POINT- 29										
3.94	3.68	3.46	3.26	5.18	3.65	3.26	2.99	2.77	2.59	
2.44	2.33	2.20	2.10	2.01	1.93	1.85	1.76	1.70	1.64	
1.57	1.52	1.85	1.80	1.68	1.60	1.53	1.48	1.52	3.28	2.81
2.31	2.14	1.98	1.86	1.76	1.70	1.61	1.55	1.49	1.44	
1.38	1.33	1.28	1.25	1.26	1.53	1.22	1.15	1.17	1.56	
1.41	1.29	1.21	1.17	1.13	1.09	1.04	1.02	0.00	0.00	0.00
0.99	0.95	0.92	0.91	0.88	0.85	0.83	0.80	0.79	0.77	
0.80	0.84	0.80	0.77	0.75	0.73	0.72	0.92	0.99	0.94	
0.98	0.98	0.94	0.91	0.88	0.85	0.83	0.81	0.90	1.02	1.41
1.53	1.44	1.28	1.19	1.28	1.36	1.83	1.49	1.44	2.58	
1.99	2.16	2.24	3.41	2.88	2.74	2.82	3.27	5.21	4.75	
4.34	3.72	4.11	4.41	4.04	3.60	5.79	5.79	8.96	10.34	0.00
9.02	8.07	10.27	9.00	7.71	7.19	21.96	16.49	24.86	16.16	
11.62	9.32	7.99	7.19	6.61	6.12	5.73	5.92	5.46	5.01	
4.70	4.38	4.08	3.84	3.58	3.37	3.18	2.99	2.93	3.94	3.47
3.03	2.77	2.58	2.42	2.29	2.18	2.06	1.98	1.89	1.85	
1.75	1.68	1.60	1.55	1.90	1.89	2.36	2.16	2.16	3.60	
2.55	2.10	1.87	1.74	1.80	1.98	1.79	1.87	1.78	1.67	0.00
1.57	1.51	1.49	1.44	2.78	3.12	2.25	2.20	4.32	2.94	
2.24	1.90	1.82	5.69	4.36	4.33	3.22	2.67	11.17	8.94	
5.56	4.03	3.34	3.15	4.06	3.95	3.34	3.04	2.85	2.70	2.73
2.58	2.44	2.32	2.21	2.12	2.01	1.94	1.85	1.85	1.76	
2.08	2.04	1.93	1.86	2.08	2.14	1.89	1.89	1.74	1.60	
2.65	2.67	2.16	1.85	1.67	1.56	1.63	1.60	1.48	1.40	1.34
1.29	1.23	1.19	1.15	1.71	1.32	3.41	3.42	3.96	5.74	
5.08	3.57	4.32	3.88	3.58	3.08	2.74	2.55	2.39	2.27	
2.16	2.04	1.95	1.85	1.78	2.48	2.52	2.25	2.96	7.31	0.00
4.25	3.34	2.81	2.55	2.37	2.23	2.18	2.82	4.48	4.68	

3.28	6.03	4.82	3.58	3.00	2.67	2.47	2.35	3.13	6.58	
4.99	3.85	11.47	8.09	13.95	9.51	7.75	7.46	6.23	5.62	6.26
6.96	8.10	9.46	8.09	7.31	6.15	5.48	5.01	5.01	5.50	
6.00	5.28	4.75	4.40	5.40	5.01	4.22	3.79	3.50	8.31	
9.61	12.78	8.70	6.80	5.85	5.27	4.84	4.60	4.34	4.07	0.00
3.83	3.58	3.37	3.18	3.00	2.92	3.12	3.50	3.34	4.19	
3.27	2.74	2.46	2.27	2.13	2.02	1.91	1.83	1.75	1.68	
1.86	1.74	1.60	1.52	1.47	2.35	6.38	3.79	2.85	2.40	2.16
POINT- 30										
12.13	11.33	10.66	10.03	15.96	11.24	10.03	9.20	8.53	7.98	
7.52	7.18	6.77	6.47	6.19	5.94	5.69	5.43	5.23	5.05	
4.85	4.68	5.69	5.56	5.18	4.93	4.72	4.55	4.68	10.11	8.65
7.10	6.60	6.10	5.72	5.43	5.23	4.97	4.77	4.59	4.43	
4.26	4.10	3.93	3.84	3.88	4.72	3.76	3.55	3.60	4.81	
4.35	3.97	3.72	3.60	3.47	3.35	3.21	3.13	0.00	0.00	0.00
3.05	2.93	2.84	2.80	2.72	2.63	2.55	2.46	2.42	2.37	
2.46	2.59	2.46	2.37	2.31	2.26	2.22	2.84	3.05	2.89	
3.02	3.02	2.89	2.80	2.72	2.63	2.55	2.50	2.76	3.13	4.35
4.72	4.43	3.93	3.68	3.93	4.19	5.64	4.59	4.43	7.94	
6.14	6.65	6.90	10.49	8.87	8.44	8.69	10.07	16.05	14.63	
13.37	11.45	12.66	13.59	12.45	11.09	17.84	17.84	27.59	31.85	0.00
27.80	24.87	31.64	27.72	23.75	22.15	67.63	50.78	76.57	49.78	
35.79	28.71	24.61	22.15	20.36	18.85	17.64	18.23	16.81	15.43	
14.46	13.50	12.57	11.82	11.04	10.37	9.78	9.20	9.03	12.13	10.70
9.32	8.53	7.94	7.45	7.06	6.72	6.36	6.10	5.81	5.69	
5.39	5.18	4.93	4.77	5.85	5.81	7.27	6.65	6.65	11.09	
7.85	6.47	5.76	5.35	5.56	6.10	5.52	5.76	5.48	5.14	0.00
4.85	4.64	4.59	4.43	8.56	9.62	6.94	6.77	13.29	9.07	
6.90	5.85	5.61	17.52	13.42	13.33	9.91	8.23	34.40	27.54	
17.14	12.42	10.29	9.70	12.50	12.17	10.29	9.36	8.78	8.32	8.41
7.94	7.52	7.14	6.81	6.52	6.19	5.98	5.69	5.69	5.43	
6.39	6.28	5.94	5.72	6.39	6.60	5.81	5.81	5.35	4.93	
8.16	8.23	6.65	5.69	5.14	4.81	5.02	4.93	4.55	4.31	4.14
3.97	3.80	3.68	3.55	5.27	4.06	10.49	10.53	12.20	17.68	
15.64	11.00	13.29	11.95	11.04	9.49	8.44	7.85	7.36	6.99	
6.65	6.28	6.01	5.69	5.48	7.65	7.77	6.94	9.11	22.52	0.00
13.09	10.29	8.65	7.85	7.31	6.86	6.72	8.69	13.79	14.42	
10.11	18.56	14.84	11.04	9.24	8.23	7.61	7.23	9.65	20.27	
15.38	11.86	35.32	24.91	42.97	29.29	23.86	22.99	19.18	17.30	19.27
21.44	24.95	29.14	24.91	22.52	18.94	16.89	15.43	15.43	16.93	
18.48	16.26	14.63	13.55	16.63	15.43	13.00	11.67	10.78	25.59	
29.60	39.37	26.79	20.94	18.01	16.22	14.92	14.17	13.37	12.54	0.00
11.79	11.04	10.37	9.78	9.24	8.99	9.62	10.78	10.29	12.91	
10.07	8.44	7.57	6.99	6.56	6.23	5.89	5.64	5.39	5.18	
5.72	5.35	4.93	4.68	4.52	7.23	19.65	11.67	8.78	7.40	6.65
POINT- 31										
45.29	41.68	38.44	35.64	43.82	34.64	31.20	28.79	26.61	24.64	
23.00	21.73	20.37	19.16	18.15	17.20	16.27	15.31	14.64	13.99	
13.32	13.54	20.14	18.22	16.69	15.54	14.68	14.07	20.98	47.09	37.97
30.65	27.00	24.55	22.70	21.32	20.31	19.18	18.13	17.31	16.51	
15.69	15.06	14.26	13.75	13.47	14.68	12.77	12.22	14.42	20.29	
16.91	15.21	14.09	13.34	12.79	12.23	11.66	11.38	0.00	0.00	0.00
10.87	10.49	10.18	9.72	9.43	9.09	8.81	8.50	8.25	7.97	
9.38	9.21	8.66	8.36	8.05	7.78	8.10	13.00	12.45	12.01	
12.93	12.57	12.01	11.69	11.20	10.90	10.42	10.15	13.22	13.13	16.38
21.78	19.52	17.62	16.33	16.22	17.34	21.67	21.03	24.83	40.20	
30.30	34.68	39.67	52.86	45.25	43.47	46.37	51.29	72.99	68.52	
58.51	50.21	53.79	66.81	58.93	52.26	87.44	94.90	148.83	166.13	0.00
145.12	122.98	174.63	140.76	121.61	140.24	382.28	292.21	430.29	268.24	
190.66	151.76	129.96	116.69	106.47	97.99	92.44	95.54	86.45	79.07	
73.93	68.45	63.37	58.95	54.85	51.08	47.80	44.72	45.31	60.34	51.99
45.09	40.98	37.70	35.10	33.07	31.08	29.43	27.76	26.38	25.84	
24.26	23.04	21.76	21.68	29.11	26.38	34.63	30.08	30.43	49.40	
35.59	29.07	25.62	23.50	24.23	24.55	24.83	26.15	24.09	22.29	0.00
21.09	20.21	19.79	20.22	45.99	44.35	31.77	35.42	64.55	42.20	
31.36	26.11	30.49	100.55	67.63	64.99	48.01	39.74	216.75	144.17	
88.62	63.30	51.84	48.37	67.35	61.10	52.16	47.47	44.21	42.01	42.52
39.80	37.33	35.31	33.51	31.81	30.19	28.81	27.77	27.58	26.48	
33.55	30.35	28.19	28.17	33.55	32.48	28.85	28.69	25.80	24.78	
47.08	41.35	32.56	27.77	25.12	23.49	25.61	23.87	22.01	20.92	19.75
18.92	18.11	17.40	16.63	19.30	20.51	62.62	58.60	67.02	107.04	
81.51	62.03	72.86	65.71	59.79	50.72	45.26	41.99	39.25	37.02	

35.22	33.18	31.51	29.91	29.37	43.95	41.86	36.75	52.89	80.69	0.00
64.75	50.95	43.45	39.30	36.67	34.32	36.02	44.76	70.71	64.46	
51.86	106.33	75.25	55.54	46.21	40.98	37.66	95.99	59.46	113.59	
79.86	70.35	208.31	143.36	247.83	158.92	124.84	122.67	103.29	94.02	99.02
110.89	145.40	154.93	122.65	113.23	98.29	88.00	80.30	77.11	92.35	
93.30	83.46	75.44	69.42	91.32	78.36	66.19	59.07	56.89	151.39	
168.96	196.93	137.43	108.16	92.73	89.19	76.28	72.74	68.05	63.31	0.00
59.08	55.00	51.44	48.16	44.42	42.77	43.44	55.48	54.31	64.63	
48.80	40.48	35.84	32.77	30.48	28.66	27.05	25.56	24.26	23.41	
25.00	23.32	21.50	20.46	19.82	36.68	79.12	52.49	89.41	32.90	29.55

POINT- 32

3.45	3.23	3.04	2.86	4.55	3.20	2.86	2.62	2.43	2.28	
2.14	2.05	1.93	1.85	1.76	1.69	1.62	1.55	1.49	1.44	
1.38	1.33	1.62	1.58	1.48	1.41	1.35	1.30	1.33	2.88	2.47
2.03	1.88	1.74	1.63	1.55	1.49	1.42	1.36	1.31	1.26	
1.22	1.17	1.12	1.10	1.11	1.35	1.07	1.01	1.02	1.37	
1.24	1.13	1.06	1.02	0.99	0.95	0.92	0.89	0.00	0.00	0.00
0.87	0.83	0.81	0.80	0.77	0.75	0.73	0.70	0.69	0.68	
0.70	0.74	0.70	0.68	0.66	0.64	0.63	0.81	0.87	0.82	
0.86	0.86	0.82	0.80	0.77	0.75	0.73	0.71	0.79	0.89	1.24
1.35	1.26	1.12	1.05	1.12	1.19	1.61	1.31	1.26	2.25	
1.75	1.89	1.97	2.99	2.53	2.41	2.48	2.87	4.57	4.17	
3.81	3.26	3.61	3.87	3.55	3.16	5.09	5.09	7.86	9.08	0.00
7.92	7.09	9.02	7.90	6.77	6.31	19.27	14.47	21.82	14.19	
10.20	8.18	7.02	6.31	5.80	5.37	5.03	5.19	4.79	4.40	
4.12	3.85	3.59	3.37	3.14	2.95	2.79	2.62	2.57	3.45	3.05
2.66	2.43	2.26	2.12	2.01	1.92	1.81	1.74	1.66	1.62	
1.54	1.48	1.41	1.36	1.67	1.66	2.07	1.89	1.89	3.16	
2.24	1.85	1.64	1.52	1.58	1.74	1.57	1.64	1.56	1.47	0.00
1.38	1.32	1.31	1.26	2.44	2.74	1.98	1.93	3.79	2.58	
1.97	1.67	1.60	4.99	3.82	3.80	2.82	2.35	9.80	7.85	
4.88	3.54	2.93	2.76	3.56	3.47	2.93	2.67	2.50	2.37	2.39
2.26	2.14	2.04	1.94	1.86	1.76	1.70	1.62	1.62	1.55	
1.82	1.79	1.69	1.63	1.82	1.88	1.66	1.66	1.52	1.41	
2.32	2.35	1.89	1.62	1.47	1.37	1.43	1.41	1.30	1.23	1.18
1.13	1.08	1.05	1.01	1.50	1.16	2.99	3.00	3.48	5.04	
4.46	3.13	3.79	3.41	3.14	2.70	2.41	2.24	2.10	1.99	
1.89	1.79	1.72	1.62	1.56	2.18	2.22	1.98	2.60	6.42	0.00
3.73	2.93	2.47	2.24	2.08	1.95	1.92	2.48	3.93	4.11	
2.88	5.29	4.23	3.14	2.63	2.35	2.17	2.06	2.75	5.78	
4.38	3.38	10.07	7.10	12.25	8.35	6.80	6.55	5.47	4.93	5.49
6.11	7.11	8.30	7.10	6.42	5.40	4.81	4.40	4.40	4.82	
5.27	4.63	4.17	3.86	4.74	4.40	3.70	3.32	3.07	7.29	
8.43	11.22	7.64	5.97	5.13	4.62	4.25	4.04	3.81	3.57	0.00
3.36	3.14	2.95	2.79	2.63	2.56	2.74	3.07	2.93	3.68	
2.87	2.41	2.16	1.99	1.87	1.77	1.68	1.61	1.54	1.48	
1.63	1.52	1.41	1.33	1.29	2.06	5.60	3.32	2.50	2.11	1.89

POINT- 33

48.74	44.91	41.48	38.50	48.37	37.84	34.06	31.41	29.04	26.92	
25.14	23.78	22.30	21.01	19.91	18.89	17.89	16.86	16.13	15.43	
14.70	14.87	21.76	19.80	18.17	16.95	16.03	15.37	22.31	49.97	40.44
32.68	28.88	26.29	24.33	22.87	21.80	20.60	19.49	18.62	17.77	
16.91	16.23	15.38	14.85	14.58	16.03	13.84	13.23	15.44	21.66	
18.15	16.34	15.15	14.36	13.78	13.18	12.58	12.27	0.00	0.00	0.00
11.74	11.32	10.99	10.52	10.20	9.84	9.54	9.20	8.94	8.65	
10.08	9.95	9.36	9.04	8.71	8.42	8.73	13.81	13.32	12.83	
13.79	13.43	12.83	12.49	11.97	11.65	11.15	10.86	14.01	14.02	17.62
23.13	20.78	18.74	17.38	17.34	18.53	23.28	22.34	26.09	42.46	
32.05	36.57	41.64	55.85	47.78	45.88	48.85	54.16	77.56	72.69	
62.32	53.47	57.40	70.68	62.48	55.42	92.53	99.99	156.69	175.21	0.00
153.04	130.07	183.65	148.66	128.38	146.55	401.55	306.68	452.11	282.43	
200.86	159.94	136.98	123.00	112.27	103.36	97.47	100.73	91.24	83.47	
78.05	72.30	66.96	62.32	57.99	54.03	50.59	47.34	47.88	63.79	55.04
47.75	43.41	39.96	37.22	35.08	33.00	31.24	29.50	28.04	27.46	
25.80	24.52	23.17	23.04	30.78	28.04	36.70	31.97	32.32	52.56	
37.83	30.92	27.26	25.02	25.81	26.29	26.40	27.79	25.65	23.76	0.00
22.47	21.53	21.10	21.48	48.43	47.09	33.75	37.35	68.34	44.78	
33.33	27.78	32.09	105.54	71.45	68.79	50.83	42.09	226.55	152.02	
93.50	66.84	54.77	51.13	70.91	64.57	55.09	50.14	46.71	44.38	44.91
42.06	39.47	37.35	35.45	33.67	31.95	30.51	29.39	29.20	28.03	
35.37	32.14	29.88	29.80	35.37	34.36	30.51	30.35	27.32	26.19	
49.40	43.70	34.45	29.39	26.59	24.86	27.04	25.28	23.31	22.15	20.93

20.05	19.19	18.45	17.64	20.80	21.67	65.61	61.60	70.50	112.08	
85.97	65.16	76.65	69.12	62.93	53.42	47.67	44.23	41.35	39.01	
37.11	34.97	33.23	31.53	30.93	46.13	44.08	38.73	55.49	96.11	0.00
68.48	53.88	45.92	41.54	38.75	36.27	37.94	47.24	74.64	68.57	
54.74	111.62	79.48	58.68	48.84	43.33	39.83	38.05	62.21	119.37	
84.24	73.73	218.38	150.46	260.08	167.27	131.64	129.22	108.76	98.95	104.51
117.00	152.51	163.23	129.75	119.65	103.69	92.81	84.70	81.51	97.17	
98.57	88.09	79.61	73.28	96.06	82.76	69.89	62.39	59.96	158.68	
177.39	208.15	145.07	114.13	97.86	87.81	80.53	76.78	71.86	66.88	0.00
62.44	58.14	54.39	50.95	47.05	45.33	46.18	58.55	57.24	68.31	
51.67	42.89	38.00	34.76	32.35	30.43	28.73	27.17	25.80	24.89	
26.63	24.84	23.00	21.79	21.11	38.74	84.72	55.81	41.91	35.01	31.44

 ** Sediment Discharge (67) **

Sub-basin No.	Sediment Discharge (10 ³ m ³)	FLOW Discharge (m ³ /s)
1	.0	6.3
2	.0	2.3
3	.0	1.8
4	.0	3.5
5	.0	3.3
6	.0	2.2
7	.0	1.7
8	.0	2.9
9	.0	3.2
10	.0	2.0
11	.0	1.1
12	.0	.6
13	.0	1.3
14	.0	1.8
15	.0	.4
16	.0	5.2
17	.0	1.4
18	.0	4.7
19	.0	3.4
20	.0	2.3
21	.0	3.0
Monthly Average Discharge =		54.3(m ³ /s)

NEAS'RO -

 ** Bed Load Transport **
 ** *****

Base Point	Sediment Transport (10 ³ m ³)	Critical Discharge (m ³ /sec)	Max Discharge (m ³ /sec)
1	.0	.00	55.49
2	.0	4.20	20.40
3	3067262.0	7.60	75.89
4	.0	15.20	15.57
5	3698796.0	7.90	91.46
6	.0	26.90	31.27
7	.0	4.20	29.30
8	.0	41.80	19.76
9	1825075.0	30.90	171.79
10	.0	51.40	25.49
11	.0	4.20	28.26
12	2243211.0	6.60	53.75
13	.0	15.60	14.90
14	5182327.0	21.70	240.44
15	.0	50.20	18.03
16	.0	31.80	9.61
17	6339395.0	3.90	268.08
18	.0	2.10	4.92
19	.0	.70	11.42
20	6730404.0	3.90	284.42
21	.0	31.80	16.01
22	.0	1.50	3.80
23	.0	1.50	38.79
24	9171918.0	3.90	343.02
25	.0	26.60	10.70
26	.0	9.30	34.53
27	132330.6	15.90	34.53
28	.0	58.70	17.18
29	.0	1.00	24.86
30	.0	83.90	76.57
31	4987795.0	2.10	430.29
32	.0	1.80	21.82
33	7849431.0	.00	452.11

3.2-9 Overflow

 ** Sediment Balance **
 **

Base Point	Sediment Inflow (10 ³ m ³)	Sediment Transport (10 ³ m ³)	Sediment Balance (10 ³ m ³)	Sediment Depth (m)	Sediment Width (10 ³ m ³)
1	0	0	0	.00	0
2	0	0	0	.00	0
3	0	0	0	.00	456
4	0	0	0	.00	0
5	0	0	0	.00	604
6	0	0	0	.00	0
7	0	0	0	.00	0
8	0	0	0	.00	0
9	0	0	0	.00	1392
10	0	0	0	.00	0
11	0	0	0	.00	0
12	0	2243	-2243	-2.09	1072
13	0	0	0	.00	0
14	2243	5182	-2939	-2.48	1185
15	0	0	0	.00	0
16	0	0	0	.00	0
17	5182	6339	-1157	-.95	1218
18	0	0	0	.00	0
19	0	0	0	.00	0
20	6339	6730	-391	-.18	2152
21	0	0	0	.00	0
22	0	0	0	.00	0
23	0	0	0	.00	0
24	6730	9171	-2441	-1.81	1345
25	0	0	0	.00	0
26	0	0	0	.00	0
27	0	0	0	.00	263
28	0	0	0	.00	0
29	0	0	0	.00	0
30	0	0	0	.00	513
31	9171	4987	4184	8.11	516
32	0	0	0	.00	0
33	4987	7849	-2861	-1.18	2415

VOLUME OF SCOURED SEDIMENT = -12033(10³m³)
 VOLUME OF DEPOSITED SEDIMENT = 4184(10³m³)

THE REPUBLIC OF VENEZUELA

STUDY
ON
COMPREHENSIVE IMPROVEMENT
OF
THE APURE RIVER BASIN

USER'S MANUAL
OF
COMPUTER PROGRAM

NON-UNIFORM FLOW CALCULATION

JANUARY 1993

JAPAN INTERNATIONAL COOPERATION AGENCY

USER'S MANUAL
NON-UNIFORM FLOW MODEL: VFLOW

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USER'S MANUAL

NON-UNIFORM FLOW MODEL: VFLOW

I. METHOD OF CALCULATION

1.1 Fundamental Formula

$$H_i = H_{i-1} + \frac{\alpha Q^2}{2g} \left(\frac{1}{A_{i-1}^2} - \frac{1}{A_i^2} \right) + \frac{Q^2}{2} \left(\frac{n_{i-1}^2}{R_{i-1}^4/3A_{i-1}^2} + \frac{n_i^2}{R_i^4/3A_i^2} \right) \Delta X$$

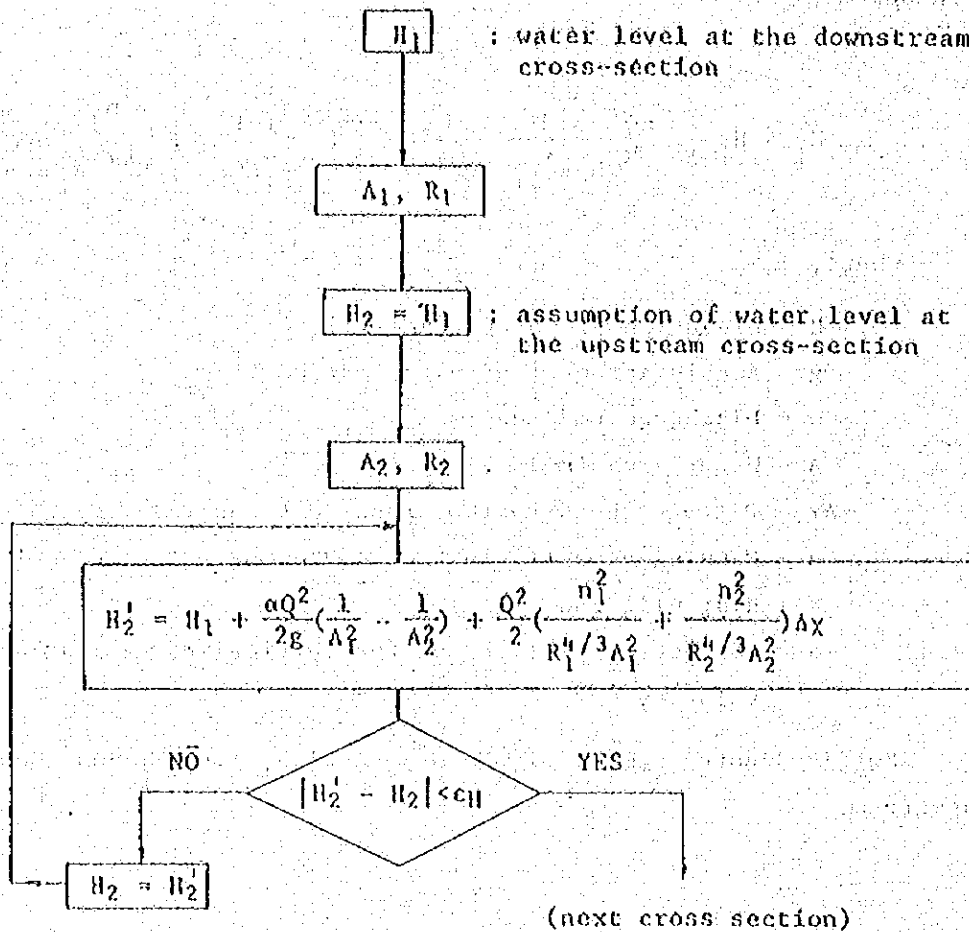
where,

- H = Elevation of water level (m)
- g = Acceleration of gravity (m³/sec²)
- Q = Discharge (m³/sec)
- A = Water area (m²)
- ΔX = Distance between two cross-sections (m)
- n = Manning's coefficient of roughness
- R = Hydraulic radius (m)
- α = Correction coefficient for vertical distribution of velocity

Suffix denotes number of a cross-section, from downstream to upstream.

1.2 Conceptual Computation Flow

Conceptual flow for the calculation of non-uniform flow is shown below.



ϵ_H : given tolerance in water level

II. FORMAT OF INPUT DATA

2.1 General

- 1) All the data shall be put within the specified column enclosed with thick solid line aligning to the right.
- 2) The input data shall be numerical value with or without decimal point and string of letters.
- 3) In case scaling factors (SF and SF1) accompany, the input value is to be converted as follows:
 $SF \times (\text{input value}) + SF1$, in case MC2 = 0
 $SF \times (\text{input value} + SF1)$, in case MC2 = 1
- 4) Sectional data shall be arranged orderly from lower end to upstream.
下流から上流へ
- 5) Input values are of metric system as specified. m 単位
- 6) Left and right of river are always those facing toward downstream.
左岸、右岸は下流を向いて左、右。

2.2 Input Data and Explanation

DATA SHEET

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No							
1							
2							
3	KC	KC1	KC2				
4	KC : Identification code for arrangement of input data						
5	KC1 : Numerical codes to show kinds of data to be input.						
6	Data shall be input in the order of KC-data.						
7	0 or blank : No data and ignore						
8	1: Input of title for output						
9	2: Input of channel section data						
10	3: Input of commands for output of sectional data.						
11	4: Input of flow configuration						
12	5: Input of H(stage) vs. Q(discharge) relationship						
13	6: Input of constants and factors for calculation						
14	9: Input of boundary conditions and commands to execute the computation						
15	10 or 99: Command to end the computation and return to DOS						
17							
18							
19	DI: INPUT OF TITLE FOR OUTPUT (KC=1)						
20	TITLE						
21	TITLE						
22							
23	TITLE: Title to be put at the top of each output page, 80 letters						
24	at maximum						
25							

(2) 流量計算
5. 河床断面入力

DATA SHEET

PROBLEM _____ WRITTEN BY _____ PAGE _____ OF _____

No					
1					
2	D2. INPUT OF CHANNEL SECTION DATA (KCI=2)				
3	5700 100 5700 100				
4	N1	N2	KPR		
5					
6	N1, N2 : Serial section No. starting from N1 (normally N1=1) to N2 (N2=100 at maximum) to show quantity of input sections.				
7					
8	KPR : Numerical code for output control.				
9			0: No output (0) 出力なし		
10			1: Output of section characteristic tables (1) 断面特性表		
11			2: Output of input data and section characteristics (2) 断面特性と入力データ		
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

DATA SHEET

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PROBLEM _____

No	1	2	3	4	5						
	SC	SC	SP	n	dx	mCd	ibed	nIS	DRS	Ndiv	XL XR

*) : When 0 or no data is input, value of the previous section will be used for these items.

**) : Value for the stretch between lower section shall be input. Therefore, the first (lowest) section shall be blank.

SC : Identification code for section data.

MC1=0, if SF1=0 or will not be used.
 In this case, SF1-data is not necessary.
 MC1=1, if SF1 is adopted and the data are input in the next data row.

MC2=0, if SF1-data will not be used as input.
 MC2=1, if the input SF1-data will be multiplied by SF.

SF, SF1 : Scaling factors to modify the input values.

NAME : Name of channel section; 10 letters at maximum.
 Data shall be input for all sections (MZ-NI-1 rows).

n : Manning's coefficient of roughness. (**) /

dx : Distance between adjacent sections (m). (**) /

mCd : Drag coefficient of bridge piers, etc. (**)

ibed : Code No. of bed material. (*)

nIS : Lowest elevation for output of section characteristics in case XPR=1 or 2.

DRS : Interval of elevation for the above output (m). (*)

Ndiv : Quantity of divisions of the lower stretch of the section under consideration for interpolation of river sections. (*)

XL, XR : Left and right boundaries of a river section effective to water flow in horizontal coordinate (m).

2.4 1

See p. 2.1

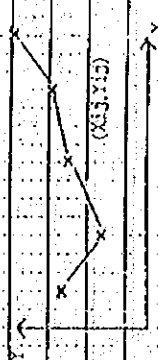
DATA SHEET

PAGE OF

PROBLEM WRITTEN BY

No						
1	NAME(N1)	Xn1	Yn1	Xn1-1	Yn1-1	DXMAX
2	XV	SFX	SFY	DXMAX	DXMIN	
3	XV	SFX	SFY			
4	NAME(N1)	Xn1	Yn1	Xn1-1	Yn1-1	
5	NAME(N2)	Xn2	Yn2	Xn2-1	Yn2-1	
6	NAME(N3)	Xn3	Yn3	Xn3-1	Yn3-1	
7	X=Y=0 or blank denotes the end of data of a section					
8	NAME(N1-1)	Xn1-1	Yn1-1	Xn1-2	Yn1-2	
9	NAME(N1-1)	Xn1-1	Yn1-1	Xn1-2	Yn1-2	
10	NAME(N1-1)	Xn1-1	Yn1-1	Xn1-2	Yn1-2	
11	NAME(N1-1)	Xn1-1	Yn1-1	Xn1-2	Yn1-2	
12	END					
13						
14	XV : Identification code for sectional coordinate data.					
15	KCH : Numerical code to specify method of checks. NAME					
16	0: Check from 1st to 10th columns of NAME.					
17	1: Check from 3rd to 10th columns of NAME.					
18	2: Check from 6th to 10th columns of NAME.					
19	3: No check.					
20	MC1, MC2 : Control of scaling factor (Same function as data-2)					
21	SFX, SFY: Scaling factors for X (horizontal coordinate)					
22	SFY, SFY: Scaling factors for Y (vertical coordinate)					
23	DXMAX : Critical max. interval of adjacent horizontal coordinates.					
24	If $(X_i, j - X_{i-1}, j) > DXMAX$, the data includes error.					
25	DXMAX=50 m. if no value is input.					

記入 検査あり



DXMAX : Critical max. interval of adjacent vertical coordinates.
 If $ABS(Y_{i,j} - Y_{i,j-1}) > DXMAX$, the data includes error.
 DXMAX=10 m. if no value is input.
 DXMIN : Critical min. interval of adjacent horizontal coordinates.
 If $(X_{i,j} - X_{i,j-1}) < DXMIN$, the data includes error.
 DXMIN=0.5 m. if no value is input.
 NAME : Name of channel section (same as data-2), which shall be put at the head of every data rows.
 Xi, j and Yi, j: Horizontal and vertical coordinates (m).
 END : Fixed code to denote end of channel section data.

DATA SHEET

PROBLEM _____

WRITTEN BY _____

PAGE _____

OF _____

No		
1		
2	D3. INPUT OF COMMAND FOR OUTPUT OF SECTIONAL DATA (XC1=3)	
3		
4	NN1	NN2
5	NN1, NN2: Number of the first and last sections to be output, i.e. from NN1-th to NN2-th sections. Serial numbers shall be put incorporating the interpolated sections. In case NN2=0 or blank, all sections will be output.	
6		
7		
8		
9		
10		
11		
12	D4. INPUT OF FLOW CONFIGURATION (XC1=4)	
13	(1) In case KX = 0 or blank	
14	(KDX)	KPR
15	INQ1	INQ2
16		INQ3
17		
18	NO : Number of inflow points from tributaries: NO=30 at maximum. 1936	
19	XPR : Numerical code for output control. 791-791-1	
20	INQ : Input data will not be output. NO	
21	INQ : Input data will be output.	
22	INQ : Section No. of nearest upstream section of the inflow point. NO	
23	The section number correspond to those of data-5.	
24		
25		

DATA SHEET

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PROBLEM _____

No	1	2	3	4	5	6
	(2) In case KDX = 1	(KDX) ¹ KPR	INI ¹ IIN ² IIN ³		XIN ¹ XIN ² XIN ³	

- 1) Place of inflow from tributary is specified by the number (INI) of the nearest lower section and distance (XINI in meter) from the section toward upstream. The section IIN¹ corresponds to N of Data-2.
- 2) NO and KPR are same with those of (1).

No	8	9	10	11	12	13
	(3) In case KDX = 2	(KDX) ² KPR	XINI ¹ XINI ² XINI ³			

- 1) Place of inflow from tributary is specified by the distance (XINI in meter) from the section at the lowest and.
- 2) NO and KPR are same with those of (1).

No	14	15	16	17	18	19	20	21	22	23	24	25
----	----	----	----	----	----	----	----	----	----	----	----	----



DATA SHEET

PAGE _____ OF _____

WRITTEN BY _____

PROBLEM _____

No								
1								
2	D5. INPUT OF H-Q RELATIONSHIP (NC15)							
3								
4	NN	KPR	SFH	SFH1	SFO	SFO1		
5	H1	H2	H3	Hn	Q1	Q2	Q3	Qnn
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

NN : Number of points of H-Q relationship to be input for the lowest section.

KPR : Numerical code for output control.
 0: Input data will not be output.
 1: Input data will be output.

SFH, SFH1: Scaling factor for H (water level).
 SFO, SFO1: Scaling factors for Q (discharge).

H : Water level (m)
 Q : Discharge (m³/s) corresponding to H.



D6, D7 Z ← 37FLOW

DATA SHEET

PROBLEM _____ WRITTEN BY _____ PAGE _____ OF _____

No.	ALPH	Frc	SIG	LAMB	eH	NU	GAMM
1							
2	D8. INPUT OF CONSTANTS AND FACTORS FOR CALCULATION (KCI=8)						
3							
4							
5							
6	ALPH : Correction factor for vertical velocity distribution (ALPH=1.0).						
7	Frc : Limit of Froude number for subcritical flow (Frc=0.9).						
8	SIG : Density of bed material (SIG=2.65 g/cm ³).						
9	LAMB : Porosity which is defined as a percentage of porosity in z soil mass (LAMB=0 %).						
10	eH : Allowable error of water level calculations (eH=12-4 %).						
11	NU : Kinematic viscosity (=0.009 cm ² /s).						
12	GAMM : Adjustment factor of sediment volume (GAMM=1.0).						
13	Value in () will be used, when no value is input.						
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

DATA SHEET

PROBLEM _____ WRITTEN BY _____ PAGE _____ OF _____

No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25																																																																																																																																																															
<p>1. 1.2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.</p>																																																																																																																																																																																								
<p>2. DS. INPUT OF BOUNDARY CONDITIONS AND EXECUTION OF CALCULATION (AC1-9)</p>																																																																																																																																																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">4</td> <td style="width: 5%;">BC</td> <td style="width: 5%;">NC</td> <td style="width: 5%;">KPR</td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> <td style="width: 5%;"></td> </tr> <tr> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> </tr> <tr> <td colspan="5"></td> <td colspan="2">SF00</td> <td colspan="2">SF01</td> <td colspan="2">SF02</td> <td colspan="2">SF03</td> <td colspan="2">SF04</td> <td colspan="2">SF05</td> <td colspan="2">SF06</td> <td colspan="2">SF07</td> <td colspan="2">SF08</td> <td colspan="2">SF09</td> <td colspan="2">SF10</td> </tr> <tr> <td colspan="5"></td> <td colspan="2">SF01</td> <td colspan="2">SF02</td> <td colspan="2">SF03</td> <td colspan="2">SF04</td> <td colspan="2">SF05</td> <td colspan="2">SF06</td> <td colspan="2">SF07</td> <td colspan="2">SF08</td> <td colspan="2">SF09</td> <td colspan="2">SF10</td> <td colspan="2">SF11</td> </tr> <tr> <td colspan="5"></td> <td colspan="2">HQ1</td> <td colspan="2">HQ2</td> <td colspan="2">HQ3</td> <td colspan="2">HQ4</td> <td colspan="2">HQ5</td> <td colspan="2">HQ6</td> <td colspan="2">HQ7</td> <td colspan="2">HQ8</td> <td colspan="2">HQ9</td> <td colspan="2">HQ10</td> <td colspan="2">HQ11</td> </tr> <tr> <td colspan="5"></td> <td colspan="2">Q01</td> <td colspan="2">Q02</td> <td colspan="2">Q03</td> <td colspan="2">Q04</td> <td colspan="2">Q05</td> <td colspan="2">Q06</td> <td colspan="2">Q07</td> <td colspan="2">Q08</td> <td colspan="2">Q09</td> <td colspan="2">Q10</td> <td colspan="2">Q11</td> </tr> </table>																									4	BC	NC	KPR																																																						SF00		SF01		SF02		SF03		SF04		SF05		SF06		SF07		SF08		SF09		SF10							SF01		SF02		SF03		SF04		SF05		SF06		SF07		SF08		SF09		SF10		SF11							HQ1		HQ2		HQ3		HQ4		HQ5		HQ6		HQ7		HQ8		HQ9		HQ10		HQ11							Q01		Q02		Q03		Q04		Q05		Q06		Q07		Q08		Q09		Q10		Q11	
4	BC	NC	KPR																																																																																																																																																																																					
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					Q01		Q02		Q03		Q04		Q05		Q06		Q07		Q08		Q09		Q10		Q11																																																																																																																																																															
<p>10. CASE2</p>																																																																																																																																																																																								
<p>14. BC : Identification code for boundary condition data.</p>																																																																																																																																																																																								
<p>15. NC : Number of calculation cases; NT=20 at maximum.</p>																																																																																																																																																																																								
<p>16. KPR : Numerical code for output control. <i>0 0</i></p>																																																																																																																																																																																								
<p>17. 0: Input data will not be output.</p>																																																																																																																																																																																								
<p>18. 1: Input data will be output.</p>																																																																																																																																																																																								
<p>19. MC1,MC2: Control of scaling factors (Same function as data-2).</p>																																																																																																																																																																																								
<p>20. CASE : Code of calculation case; 10_letters at maximum.</p>																																																																																																																																																																																								
<p>21. HQ : Water level at the lowest section (m)</p>																																																																																																																																																																																								
<p>22. QN : Discharge (m³/s) at the uppermost section.</p>																																																																																																																																																																																								
<p>23. Q0i : Inflow (m³/s) from tributaries in the same order as data-4.</p>																																																																																																																																																																																								
<p>24.</p>																																																																																																																																																																																								
<p>25.</p>																																																																																																																																																																																								

III. SAMPLE INPUT DATA AND OUTPUT

3.1 Sample Input Data

KC	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
KC	1	NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)																		
KC	2																			
SC	0	1E+0	1E+0			1E+0	1E+0	1E+0												
		SAMAN	.030			56	61													
		312-4		16120		58		6												
		296-7		16500		62		7												
		CHNAL		16330		66		7												
		258-8		15840		67		6												
		244-9	.035	14160		71		6												
		BRZAL		15070		66		6												
XY	2	0	1E-1	1E-2	75															
XY		OSAMAN	-200	6110	500	6000	1060	5969	1070	5906	1260	5771	11460	5550	1510	5660				
XY		1SAMAN	1561	5705	1636	5727	1811	5693	1936	5727	2061	5648	2386	5669	2536	5982				
XY		2SAMAN	2962	5638	3212	5969	3260	6034	3300	6120	3328	6247	3346	6437	3376	6510				
XY		3SAMAN	3466	6497	3556	6557														
XY		0312-4	00	6419	650	6409	1000	6419	1350	6369	1650	6249	2050	6259	2400	6229				
XY		1312-4	2650	6079	3000	5939	3250	5849	3550	5789	3900	5839	4000	6419						
XY		0296-7	00	6538	200	6638	500	6488	700	6438	1000	6398	1300	6348	1600	6288				
XY		1296-7	1950	6268	2150	6248	2450	6188	2750	6288	3000	6438	3100	6538						
XY		0CHNAL	00	7400	40	7395	65	7171	90	7066	100	6900	110	6765	262	6777				
XY		1CHNAL	293	6650	445	6570	750	6673	1086	6754	1452	6788	1787	6823	1970	6880				
XY		2CHNAL	2000	6900	2140	7064	2180	7367												
XY		0258-8	00	7055	50	6985	200	6985	400	6955	650	7005	1050	7055	1450	7025				
XY		1258-8	1800	7015	2250	6905	2700	6985	3100	6885	3500	6855	3850	6785	4200	6735				
XY		2258-8	4500	6785	4600	6675	4700	6935	4900	7055										
XY		0244-9	00	7358	50	7358	350	7048	600	7048	900	7048	1150	7078	1450	7108				
XY		1244-9	1750	7148	2100	7128	2500	7148	2800	7088	3200	7058	3450	7068	3600	7148				
XY		2244-9	3650	7358																
XY		0BRZAL	00	7805	30	7613	35	7394	80	7303	170	7121	215	7189	230	7076				
XY		1BRZAL	260	7098	290	6962	350	6848	471	6758	501	6553	606	6644	666	6712				
XY		2BRZAL	711	6644	816	6780	996	6848	1191	6871	1251	6894	1357	6871	1522	6917				
XY		3BRZAL	1657	6962	1822	7098	1897	7348	2182	7417	2333	7439	2483	7162	2618	7485				
XY		4BRZAL	2620	7613	2890	7774	2980	7727	2992	7789	3006	7888	3021	8001	3030	7967				
XY		5BRZAL	3156	7994	3226	8004	3231	8103												
XY		END																		
KC	4	1	0																	
		2																		
		6740																		
KC	5	9	1E-158	.02	1E+0															
			16	18	22	28	36	46	58	73	80									
			215	256	359	570	957	1610	2640	4308	5231									
KC	8																			
KC	9																			
BC	1	1																		
	0		1E-2	1E+0	1E+0															
CASE	1			927	116															
KC	9																			
BC	1																			
	0		1E-2	1E+0	1E+0															
CASE	2			885	72															
KC	99																			

3.2 Sample of Output

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

1		2		3		4		5		6		7			
SARAY		312-4		296-7		NDIV 6		NDIV 6		NDIV 7		NDIV 7			
ZS	N	DX	MCD	BEDM	ZS	N	DX	MCD	BEDM	ZS	N	DX	MCD	BEDM	
55.490	.0300	.0	.0000	0	57.290	.0300	16120.0	.0000	0	61.880	.0300	16500.0	.0000	0	
R		A		B		A		R		H		A		R	
56.000	23.69	3.3	.137		58.000	13.20	.7	.055		62.000	9.60	.6	.050		
57.000	132.27	82.5	.623		59.000	89.22	58.3	.725		63.000	123.00	59.8	.485		
58.000	185.53	254.5	1.361		60.000	108.03	152.8	1.408		64.000	195.17	217.5	1.114		
59.000	208.28	451.9	2.164		61.000	133.00	274.0	2.048		65.000	253.40	450.6	1.710		
60.000	271.74	673.7	2.472		62.000	151.39	416.2	2.730		66.000	310.00	749.0	2.412		
61.000	339.33	980.1	2.881		63.000	245.70	613.8	2.485		67.000	310.00	1058.0	3.411		
62.000	351.32	1329.8	3.773		64.000	285.37	875.0	3.038		68.000	310.00	1368.0	4.411		
63.000	352.80	1881.9	4.748		65.000	400.00	1259.8	3.135		69.000	310.00	1678.0	5.410		
64.000	354.11	2035.3	5.719		66.000	400.00	1659.8	4.132		70.000	310.00	1988.0	6.410		
65.000	359.72	2390.7	6.609		67.000	400.00	2059.8	5.128		71.000	310.00	2298.0	7.409		
66.000	375.60	2763.5	7.318		68.000	400.00	2459.8	6.124		72.000	310.00	2608.0	8.409		
67.000	375.60	3139.1	8.313		69.000	400.00	2859.8	7.119		73.000	310.00	2918.0	9.408		
68.000	375.60	3514.7	9.307		70.000	400.00	3259.8	8.115		74.000	310.00	3228.0	10.408		
69.000	375.60	3890.3	10.302		71.000	400.00	3659.8	9.111		75.000	310.00	3538.0	11.408		

4		5		6		7		8		9		10			
CHNAL		238-8		244-9		NDIV 6		NDIV 6		NDIV 6		NDIV 6			
ZS	N	DX	MCD	BEDM	ZS	N	DX	MCD	BEDM	ZS	N	DX	MCD	BEDM	
65.700	.0300	16330.0	.0000	0	66.750	.0300	15840.0	.0000	0	70.480	.0350	14160.0	.0000	0	
R		A		B		A		R		H		A		R	
66.000	14.58	2.2	.150		67.000	3.23	.4	.123		71.000	184.03	62.9	.342		
67.000	58.12	39.4	.677		68.000	87.31	36.6	.418		72.000	340.95	333.0	1.035		
68.000	145.93	130.8	.893		69.000	164.65	158.2	.955		73.000	333.01	700.0	1.980		
69.000	190.00	305.8	1.601		70.000	353.27	407.1	1.151		74.000	365.00	1050.1	2.899		
70.000	199.14	500.4	2.192		71.000	490.00	858.0	1.748		75.000	365.00	1425.1	3.898		
71.000	206.28	703.7	3.375		72.000	490.00	1346.0	2.748		76.000	365.00	1750.1	4.896		
72.000	209.52	911.6	4.292		73.000	490.00	1836.0	3.747		77.000	365.00	2155.1	5.894		
73.000	212.05	1122.6	5.207		74.000	490.00	2328.0	4.745		78.000	365.00	2520.1	6.893		
74.000	218.00	1335.9	6.015		75.000	490.00	2818.0	5.745		79.000	365.00	2885.1	7.891		
75.000	218.00	1553.9	6.995		76.000	490.00	3308.0	6.744		80.000	365.00	3250.1	8.889		
76.000	218.00	1771.9	7.977		77.000	490.00	3798.0	7.743		81.000	365.00	3615.1	9.887		
77.000	218.00	1989.9	8.959		78.000	490.00	4288.0	8.741		82.000	365.00	3980.1	10.885		
78.000	218.00	2207.9	9.940		79.000	490.00	4778.0	9.740		83.000	365.00	4345.1	11.884		
79.000	218.00	2425.9	10.922		80.000	490.00	5268.0	10.739		84.000	365.00	4710.1	12.882		

NON-UNIFORM CALCULATION OF APORE RIVER (SAMPLE)

7 BRZAL NDIV 6

ZS	N	DX	MCD	SEDM
65.530	.0350	15070.0	.0000	0
H	B	A	R	
55.000	5.11	1.4	.229	
67.000	25.62	15.9	.605	
68.000	45.44	49.3	1.064	
69.000	113.84	122.3	1.065	
70.000	142.15	253.2	1.767	
71.000	139.58	402.9	2.502	
72.000	172.17	563.2	3.261	
73.000	180.11	744.3	4.080	
74.000	207.69	933.6	4.441	
75.000	253.57	1169.7	4.464	
76.000	253.95	1428.5	5.409	
77.000	274.95	1694.4	6.039	
78.000	299.28	1982.9	6.492	
79.000	300.76	2263.0	7.431	

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

32 CROSS SECTIONS ARE INSERTED.
 NEW CROSSSECTION NUMBERS ARE 1 - 39.

INFLOW PNT. NQ = 1
 NO X NO SECT. INQ
 2 +6740.0 ----> 2 312-4 (7) +3 = 10

MAIN RIVER 1 - 39
 INFLOW PNT. NQ = 10

H-Q CURVE

H	Q
59.620	215.0
59.820	256.0
60.220	355.0
60.820	570.0
61.620	957.0
62.620	1610.0
63.820	2540.0
65.320	4368.0
66.020	5231.0

ALPHA = 1.0000 CR FR = .80000 SIGMA = 2.65000 VOID = .00000
 EPS H = .00010 GAMMA = 1.00000

BOUNDARY CONDITIONS

NO	Q0	DQ
1 SE 1	.000	927.0 116.0

CALCULATION OF NON-UNIFORM FLOW PROFILE. 1 39

CASE	NO	Q0	QN
1 SE 1	61.752	1043.0	927.0

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

1	SAMAN	Q	H	B	A	R	V	FR
		1043.0	61.752	350.9	1242.6	3.530	.839	.142
		SX = 2686.7 N = .030						
2	SAMAN -1 (2686.7)	Q	H	B	A	R	V	FR
		1043.0	62.234	344.6	1082.6	3.078	.922	.179
		SX = 5373.3 N = .030						
3	SAMAN -2 (5373.3)	Q	H	B	A	R	V	FR
		1043.0	62.939	375.0	999.4	2.662	1.044	.204
		SX = 8060.0 N = .030						
4	SAMAN -3 (8060.0)	Q	H	B	A	R	V	FR
		1043.0	63.698	387.3	1061.4	2.756	.983	.189
		SX = 10746.7 N = .030						
5	SAMAN -4 (10746.7)	Q	H	B	A	R	V	FR
		1043.0	64.381	391.1	1149.0	2.916	.913	.171
		SX = 13433.3 N = .030						
6	SAMAN -5 (13433.3)	Q	H	B	A	R	V	FR
		1043.0	64.838	395.9	1239.3	3.120	.842	.152
		SX = 16120.0 N = .030						
7	S12-2	Q	H	B	A	R	V	FR
		1043.0	55.283	400.0	1353.1	3.368	.771	.134
		SX = 19477.1 N = .030						
8	S12-4 -1 (2357.1)	Q	H	B	A	R	V	FR
		1043.0	65.538	387.1	1332.4	3.430	.783	.135
		SX = 20834.3 N = .030						
9	S12-4 -2 (4714.3)	Q	H	B	A	R	V	FR
		1043.0	65.847	374.3	1311.2	3.494	.795	.136
		SX = 23191.4 N = .030						
10	S12-4 -3 (7071.4)	Q	H	B	A	R	V	FR
		927.0	66.135	361.4	1281.0	3.537	.794	.123
		SX = 25548.6 N = .030						
11	S12-4 -4 (9428.6)	Q	H	B	A	R	V	FR
		927.0	66.396	348.6	1239.9	3.551	.748	.127

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

12	312-4	-5 (11785.7)	SX = 27905.7	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	66.671	336.7	1203.1	3.580	.771	.130											
13	312-4	-6 (14142.9)	SX = 30262.9	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	66.960	322.9	1169.6	3.621	.792	.133											
14	296-7		SX = 22620.0	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	67.262	310.0	1139.0	3.673	.814	.136											
15	256-7	-1 (2332.9)	SX = 31952.9	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	67.641	296.9	971.7	3.271	.954	.168											
16	296-7	-2 (4655.7)	SX = 37285.7	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	66.184	263.7	873.3	3.076	1.061	.193											
17	296-7	-3 (6968.6)	SX = 39618.6	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	68.827	253.7	821.7	3.244	1.124	.199											
18	296-7	-4 (9331.4)	SX = 41951.4	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	55.195	237.2	803.0	3.375	1.154	.200											
19	296-7	-5 (11664.3)	SX = 44284.3	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	70.162	225.1	793.9	3.514	1.168	.199											
20	296-7	-6 (13987.1)	SX = 46617.1	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	70.611	215.7	791.5	3.651	1.171	.195											
21	CRNAL		SX = 48850.0	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	73.436	207.9	794.1	3.775	1.167	.191											
22	CRNAL	-1 (2640.0)	SX = 51590.0	N = .030															
	1	Q	H	B	A	R	V	FR											
		927.0	71.964	253.2	1039.3	4.091	.892	.141											

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

23 CENAL -2 (5280.0) SX = 54230.0 N = .030
Q 927.0 H 72.304 B 301.9 A 1241.2 R 4.102 V .747 FR .118

24 CENAL -3 (7920.0) SX = 58870.0 N = .030
Q 927.0 H 72.536 B 351.0 A 1421.7 R 4.010 V .652 FR .104

25 CENAL -4 (10560.0) SX = 59310.0 N = .030
Q 927.0 H 72.720 B 398.3 A 1582.1 R 3.957 V .586 FR .094

26 CENAL -5 (13200.0) SX = 62150.0 N = .030
Q 927.0 H 72.873 B 444.7 A 1721.7 R 3.958 V .538 FR .087

27 258-2 SX = 64750.0 N = .030

Q 927.0 H 73.008 B 490.0 A 1842.1 R 3.755 V .502 FR .083

28 258-3 -1 (2360.0) SX = 67150.0 N = .035

Q 927.0 H 73.173 B 489.2 A 1701.1 R 3.823 V .545 FR .091

29 258-2 -2 (4720.0) SX = 69510.0 N = .035

Q 927.0 H 73.358 B 448.3 A 1579.4 R 3.520 V .587 FR .100

30 258-3 -3 (7080.0) SX = 71870.0 N = .035

Q 927.0 H 73.502 B 427.5 A 1475.8 R 3.450 V .628 FR .108

31 258-3 -4 (9440.0) SX = 74230.0 N = .035

Q 927.0 H 73.673 B 406.7 A 1388.3 R 3.411 V .668 FR .115

32 258-3 -5 (11800.0) SX = 76590.0 N = .035

Q 927.0 H 74.180 B 385.8 A 1314.0 R 3.402 V .705 FR .122

33 244-9 SX = 78950.0 N = .035

Q 927.0 H 74.920 B 365.0 A 1249.9 R 3.419 V .742 FR .128

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

34	244-9	-1	(2511.7)	SX = 31451.6	N = .035														
		1	927.0	74.956	358.0	1118.7	3.115	.929	.150										
35	244-9	-2	(5023.3)	SX = 83973.3	N = .035														
		1	927.0	75.500	349.9	1099.8	3.130	.843	.152										
36	244-9	-3	(7535.0)	SX = 86485.0	N = .035														
		1	927.0	76.004	341.7	1151.3	3.350	.805	.140										
37	244-9	-4	(10046.7)	SX = 88995.6	N = .035														
		1	927.0	75.377	282.5	1261.6	4.426	.735	.111										
38	244-9	-5	(12558.3)	SX = 91508.3	N = .035														
		1	927.0	75.515	277.5	1491.9	5.098	.647	.091										
39	BRZAL		SX = 94020.0		N = .035														
	1	SE	2	927.0	76.774	270.8	1632.7	5.508	.568	.074									

BOUNDARY CONDITIONS

1	SE	2	.000	885.0	72.0
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CALCULATION OF NON-UNIFORM FLOW PROFILE. 1 39

1	SE	2	61.620	957.0	895.0
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NON-UNIFORM CALCULATION OF APORE RIVER (SAMPLE)

1	SAMAN		SX =	.0	N =	.030														
		Q	H	B	A	R	V	FR												
	1	957.0	61.620	350.7	1196.4	3.401	.800	.138												
2	SAMAN	-1	(2685.7)	SX =	2685.7	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	62.086	344.0	1011.8	2.937	.946	.176												
3	SAMAN	-2	(5373.3)	SX =	5373.3	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	62.788	374.4	943.2	2.516	1.015	.204												
4	SAMAN	-3	(8060.0)	SX =	8060.0	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	55.592	383.9	1005.1	2.515	.952	.188												
5	SAMAN	-4	(10746.7)	SX =	10746.7	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	64.182	390.8	1084.7	2.759	.882	.169												
6	SAMAN	-5	(13433.3)	SX =	13433.3	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	64.683	395.9	1178.1	2.965	.812	.150												
7	312-4			SX =	15120.0	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	65.072	400.0	1288.7	3.202	.743	.132												
8	312-4	-1	(2357.1)	SX =	18477.1	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	65.371	387.1	1267.8	3.263	.755	.153												
9	312-4	-2	(4714.3)	SX =	20834.3	N =	.030													
		Q	H	B	A	R	V	FR												
	1	957.0	55.575	374.3	1246.8	3.322	.768	.134												
10	312-4	-3	(7071.4)	SX =	23191.4	N =	.030													
		Q	H	B	A	R	V	FR												
	1	885.0	65.956	381.4	1215.8	3.358	.726	.126												
11	312-4	-4	(9428.6)	SX =	25548.6	N =	.030													
		Q	H	B	A	R	V	FR												
	1	885.0	66.240	348.5	1195.7	3.396	.746	.129												

NON-UNIFORM CALCULATION OF AFURE RIVER (SAMPLE)

12	312-4	-5 (11785.7)	SX =	27905.7	N =	.030							
			Q	H	B	A	R	V	FR				
		1	885.0	66.527	335.7	1154.8	3.436	.786	.132				
13	312-4	-6 (14142.9)	SX =	30262.9	N =	.030							
		1	885.0	66.825	322.9	1126.2	3.486	.786	.134				
14	296-7		SX =	32620.0	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	985.0	67.133	310.0	1099.1	3.544	.805	.137				
15	296-7	-1 (23321.9)	SX =	34952.5	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	67.520	296.9	936.0	3.150	.946	.170				
16	296-7	-2 (4665.7)	SX =	27285.7	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	66.076	283.7	843.0	2.968	1.050	.195				
17	296-7	-3 (8998.5)	SX =	39618.6	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	68.725	241.8	798.6	3.166	1.108	.199				
18	296-7	-4 (9331.4)	SX =	41951.4	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	68.381	235.9	778.5	3.251	1.137	.200				
19	296-7	-5 (11664.3)	SX =	44284.3	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	70.056	224.2	770.0	3.422	1.149	.198				
20	296-7	-6 (13997.1)	SX =	46617.1	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	70.703	215.1	768.3	3.554	1.152	.195				
21	CHVAL		SX =	48950.0	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	71.326	207.5	771.1	3.674	1.148	.190				
22	CHVAL	-1 (2640.0)	SX =	51590.0	N =	.030							
	1		Q	H	B	A	R	V	FR				
		1	885.0	71.870	252.7	1010.8	3.986	.876	.140				

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

23	CRNAL -2 (5280.0)	SX = 54230.0	N = .030						
		Q	H	B	A	R	V	FR	
		885.0	72.185	300.9	1205.8	3.998	.731	.117	
24	CRNAL -3 (7920.0)	SX = 56870.0	N = .030						
		Q	H	B	A	R	V	FR	
		885.0	72.417	354.0	1379.6	3.891	.641	.104	
25	CRNAL -4 (10560.0)	SX = 59510.0	N = .030						
		Q	H	B	A	R	V	FR	
		885.0	72.601	399.3	1534.6	3.838	.577	.091	
26	CRNAL -5 (13200.0)	SX = 62150.0	N = .030						
		Q	H	B	A	R	V	FR	
		885.0	72.755	444.7	1688.9	3.749	.530	.087	
27	258-8		SX = 64790.0	N = .030					
		Q	H	B	A	R	V	FR	
		885.0	72.890	490.0	1784.2	3.637	.496	.083	
28	258-9 -1 (2360.0)	SX = 57150.0	N = .035						
		Q	H	B	A	R	V	FR	
		885.0	73.055	469.2	1645.4	3.506	.538	.092	
29	258-8 -2 (4720.0)	SX = 59510.0	N = .035						
		Q	H	B	A	R	V	FR	
		885.0	73.354	518.3	1828.0	3.406	.579	.100	
30	258-8 -3 (7080.0)	SX = 71870.0	N = .035						
		Q	H	B	A	R	V	FR	
		885.0	73.490	527.5	1428.0	3.338	.620	.108	
31	258-8 -4 (9440.0)	SX = 74230.0	N = .035						
		Q	H	B	A	R	V	FR	
		885.0	73.764	406.7	1344.0	3.302	.658	.116	
32	258-8 -5 (11800.0)	SX = 76590.0	N = .035						
		Q	H	B	A	R	V	FR	
		885.0	74.074	385.8	1273.0	3.296	.695	.122	
33	244-9		SX = 78950.0	N = .035					
		Q	H	B	A	R	V	FR	
		885.0	74.418	365.0	1211.9	3.315	.750	.128	

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

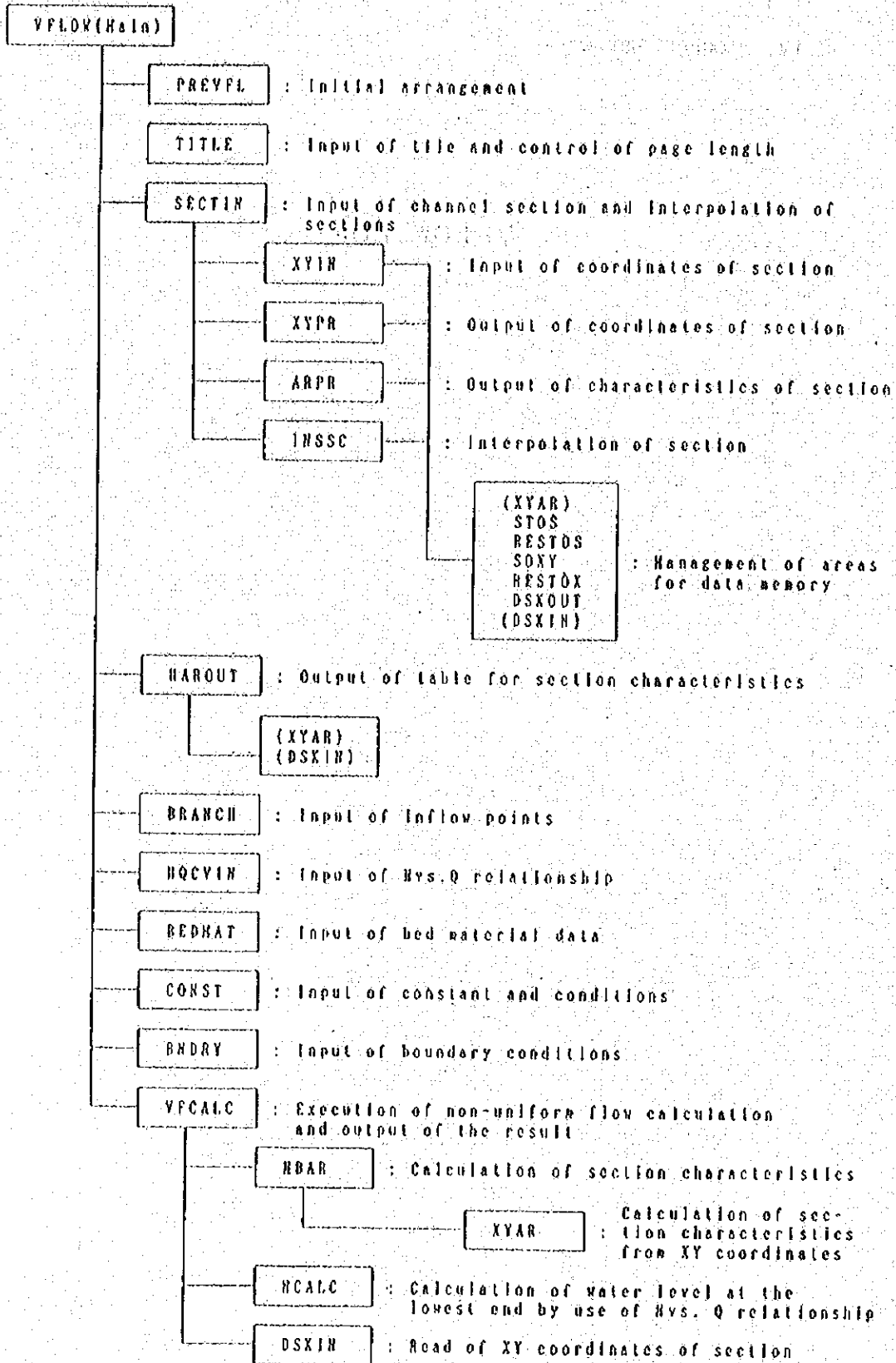
34	244-9	-1 (2511.7)	SX = 31461.6	N = .035								
		Q	H	B	A	R	V	FR				
	1	885.0	74.866	358.0	1082.8	3.015	.817	.150				
35	244-9	-2 (5023.3)	SX = 82973.3	N = .035								
		Q	H	B	A	R	V	FR				
	1	885.0	75.404	349.7	1066.3	3.036	.830	.152				
36	244-9	-3 (7535.0)	SX = 86485.0	N = .035								
		Q	H	B	A	R	V	FR				
	1	885.0	75.908	341.6	1118.8	3.257	.792	.140				
37	244-9	-4 (10046.7)	SX = 89996.6	N = .035								
		Q	H	B	A	R	V	FR				
	1	885.0	76.277	280.2	1233.5	4.362	.717	.109				
38	244-9	-5 (12558.3)	SX = 91508.3	N = .035								
		Q	H	B	A	R	V	FR				
	1	885.0	76.506	271.8	1402.0	5.095	.681	.089				
39	382AL		SX = 24020.0	N = .035								
		Q	H	B	A	R	V	FR				
	1	885.0	76.657	268.7	1601.3	5.840	.653	.072				

NON-UNIFORM CALCULATION OF APURE RIVER (SAMPLE)

***** END OF CALCULATION.

IV. SOURCE PROGRAM

VFLOW.FOR



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PROGRAM VFLOW

VFLOW

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-----
Computation of
Gradually-Varied-Steady-Flow Profiles
in an Open Channel
by H. Hamuro, 1992.10.30.
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All rights reserved.
-----

```

```

CALL PREVPF
JC=0
WRITE (*,'(1H)')
C
000 CALL CONTRL(JC)
IF ((JC-11)*JC.GE.0) GOTO 900
WRITE (*,'(13X,4HK *,12)') JC
GOTO (1,2,3,4,5,6,7,8,9,10),JC
C
1 CALL TITLE(000)
2 CALL SECTIN GOTO 900
3 CALL HAROUT GOTO 000
4 CALL BRANCH GOTO 900
5 CALL HQCVIN GOTO 900
6 CONTINUE GOTO 000
7 CONTINUE GOTO 900
8 CALL CONST(1) GOTO 900
9 CALL BNDRY
CALL VFCALC GOTO 900
10 WRITE (6,2010)
2010 FORMAT (1H),4X,'END OF CALCULATION')
STOP
END

```

```

45      SUBROUTINE PREVFL                                PREVFL...      2
46
47      CHARACTER*10 LCASE,PIU,TMP*20
48      C
49      COMMON /CBRC/  HQ,HQ1,INQ(31)
50      COMMON /MISC/  NS1,NS2,NERR
51      COMMON /CINS/  NDS1,NDS2,DL,101V
52      COMMON /HQCV/  NHQ,II(50),Q(50)
53      COMMON /CBNO/  NC,II(10),QO(31,10),LCASE(10)
54      COMMON /FNAM/  FIL,TMP
55      C
56      CALL IOFILE('VFLOW ')
57      CALL TITLE(888)
58      CALL CONST(0)
59      FILTMP='C:VFLOW.TMP '
60      C
61      HQ=-1
62      HQ1=0
63      NS1=1
64      NS2=0
65      NDS1=1
66      NDS2=0
67      NHQ=0
68      NC =0
69      C
70      DO 11 I=1,31
71      11 INQ(I)=0
72      C
73      RETURN
74      END

```

```

74 SUBROUTINE TITLE(LLP)
75 CHARACTER*80 MTITLE
76 COMMON /MTITL/ MTITLE
77 COMMON /CTITL/ LP,LPSR
78 C
79 LPSR=0
80 IF (LLP.EQ.999) THEN
81 READ (6, '(A80)') MTITLE
82 LP=0
83 ELSEIF (LLP.EQ.888) THEN
84 MTITLE = ' '
85 LP=0
86 ELSE
87 L=IABS(LLP)
88 IF (LLP.EQ.0) LP=0
89 IF (LLP.LT.0.OR.LP.LT.L) THEN
90 LP=58
91 WRITE (6,2000) MTITLE
92 2000 FORMAT ('(H1,4X,A80)')
93 LPSR=L
94 ENDIF
95 LP=LP-L
96 ENDIF
97 C
98 RETURN
99 ENO

```

```

100 SUBROUTINE SECTIN
101
102 CHARACTER*10 NAME
103 CHARACTER*2 MX
104 COMMON /MISC/ NS1,RS2,HERR
105 COMMON /SECT/ S(14),NAME
106 COMMON /NSCT/ NDIV,IBED
107 C
108 DIMENSION SF(14),SP(14),TS(14),SI(14)
109
110 HERR=0
111 READ (6,1000) N1,N2,KPR,NDI
112 1000 FORMAT (4I6)
113 IF (N1.GT.N2) THEN
114 NN=N1
115 N1=N2
116 N2=NN
117 ENDIF
118 N1=MAX0(N1,1)
119 NS1=MIN0(NS1,N1)
120 NS2=MAX0(NS2,N2)
121 ND1=MAX0(ND1,1)
122 C
123 READ (6,1010) MX,MC,SP
124 1010 FORMAT (A2,2X,I1,6X,14F6.0)
125 DO 11 J=1,14
126 IF (SP(J).EQ.0.0) SF(J)=1.0
127 SF1(J)=0.0
128 11 S(J)=0.0
129 IF (MC.GT.0) THEN
130 READ (6,1010) MX,MC,SP
131 IF (MC.GT.0) THEN
132 DO 12 J=1,14
133 SF1(J)=SF1(J)+SF(J)
134 ENDIF
135 ENDIF
136 IF (MX.NE.'SC') THEN
137 HERR=HERR+1
138 WRITE (6,8010) 'SC',MX
139 8010 FORMAT (1H /10X,'LABEL MUST BE ('A2,') INSTEAD OF ('A2,').')
140 ENDIF
141 C
142 DO 22 I=N1,N2
143 READ (6,1020) NAME,TS
144 1020 FORMAT (A10,14F6.0)
145 DO 21 J=1,12
146 IF (TS(J).NE.0.0) S(J)=TS(J)+SF(J)+SF1(J)
147 21 CONTINUE
148 S(3)=TS(3)+SF(3)+SF1(3)
149 S(5)=TS(5)+SF(5)+SF1(5)
150 S(13)=TS(13)+SF(13)+SF1(13)
151 S(14)=TS(14)+SF(14)+SF1(14)
152 IDED=S(4)
153 NDIV=S(7)
154 NDIV=MAX0(NDIV,1)
155 S(4)=0.0
156 S(7)=0.0
157 22 CALL STOS(I)
158 C
159 CALL XYIN(N1,N2)
160 C
161 IF (KPR.GT.1) CALL XYPR(N1,N2)
162 IF (KPR.GT.0) CALL ARPR(N1,N2)
163 C
164 IF (HERR.GT.0) THEN
165 CALL TITLE(-1)
166 WRITE (6,8080) HERR
167 8080 FORMAT (1H /' ***** CROSS SECTION ',16,' ERROR(S), '//
168 28X,' CALCULATION SUSPENDED.')
169 STOP
170 ENDIF
171 C
172 CALL INSSC(N1,N2,ND1)
173 C
174 RETURN
175 END

```

```

175      SUBROUTINE XYIN(N1,N2)
176
177      CHARACTER*10 NAME,NAMT,NAM
178      CHARACTER*2  MX
179
180      C
181      COMMON /MISC/ NS1,NS2,NERR
182      COMMON /CXY / X(100),Y(100),N
183      COMMON /SECT/ S(14),NAME
184      DIMENSION TS(14)
185      EQUIVALENCE (S(7),ZS),(S(13),XL),(S(14),XR)
186
187      C
188      READ (5,1000) MX,KCH,MC,SPX,SPY ,DXMAX,DYMAX,DXMIN
189      1000 FORMAT (A2,11,1X,11,5X,5F5.0)
190      KCH=MAX0(MIN0(KCH,3),0)
191      IF (KCH.LT.3) THEN
192          IF (KCH.EQ.0) ICH=1
193          IF (KCH.EQ.1) ICH=3
194          IF (KCH.EQ.2) ICH=6
195      ELSE
196          ICH=1
197      ENDIF
198      IF (SPX.EQ.0.0) SPX=1.0
199      IF (SPY.EQ.0.0) SPY=1.0
200      SPX1=0.0
201      SPY1=0.0
202      IF (DXMAX.LE.0.0) DXMAX=50.0
203      IF (DYMAX.LE.0.0) DYMAX=10.0
204      IF (MX.NE.'XY') THEN
205          NERR=NERR+1
206          WRITE (6,8000) 'XY',MX
207      8000 FORMAT (1H /10X,'LABEL MUST BE ('A2,') INSTEAD OF ('A2,').')
208      ENDIF
209      IF (MC.GT.0) THEN
210          READ (5,1000) MX1,KCH1,MC,SPX1,SPY1
211          IF (MC.GT.0) THEN
212              SPX1=SPX1*SPX
213              SPY1=SPY1*SPY
214          ENDIF
215      ENDIF
216
217      C
218      READ (5,1010) NAMT,TS
219      1010 FORMAT (A10,14F5.0)
220      I=N1
221
222      C
223      10 CALL RESTOS(I)
224      K0=0
225      J=0
226
227      C
228      11 IF (NAMT(ICH:10).NE.NAME(ICH:10)) THEN
229          IF (KCH.LT.3) NERR=NERR+1
230          WRITE (6,8010) NAMT(ICH:10),NAME,K0+1
231      8010 FORMAT (6X,'XY ERROR ---> ('A10,')'S DATA EXIST IN ('A10,')'S ('I5,').')
232      ENDIF
233      NAM=NAMT
234
235      C
236      20 J0=K0+7
237      JE=0
238      DO 21 JJ=7,1,-1
239          J2=JJ+2
240          J1=J2-1
241          J=JJ+J0
242          IF (TS(J1).NE.0.0.OR.TS(J2).NE.0.0) THEN
243              JE=JJ
244              GOT0 22
245          ENDIF
246      21 CONTINUE
247      DO 23 JJ=1,JE
248          J2=JJ+2
249          J1=J2-1
250          J=JJ+J0
251          X(J)=TS(J1)+SPX+SPX1
252          Y(J)=TS(J2)+SPY+SPY1
253          K0=K0+1
254
255      C
256      READ (5,1010) NAMT,TS
257      IF (NAMT(ICH:10).NE.NAM(ICH:10)) GOT0 30
258      IF (J.GE.J0+7) GOT0 11
259
260      C
261      30 IF (J.LT.1) GOT0 90
262      N=J
263      XMAX=X(1)

```

```

255     XMIN=X(I)
256     ZS=Y(I)
257 C
258     DO 31 J=2,N
259     J1=J-1
260     XD=X(J)-X(J1)
261     YD=Y(J)-Y(J1)
262     IF (XD.LT.DXMIN.OR.XD.GT.DXMAX) THEN
263         NERR=NERR+1
264         WRITE (6,8030) NAME,'X',J1,X(J1),'X',J,X(J),'DX',XD
265 8030     FORMAT (1H /10X,'XY ',A10,2(5X,A1,'('),13,')',F10.2),
266             *                                     5X,A2,'-',F10.2)
267     *
268     ENDDIF
269     IF ((J-N)*(J-2).LT.0.AND.ABS(YD).GT.DYMAX) THEN
270         NERR=NERR+1
271         WRITE (6,8030) NAME,'Y',J1,Y(J1),'Y',J,Y(J),'DY',YD
272     ENDDIF
273     XMAX=AMAX1(X(J),XMAX)
274     XMIN=AMIN1(X(J),XMIN)
275 31 ZS=AMIN1(Y(J),ZS)
276     IF (XR.LE.XL) THEN
277         XL=XMIN
278         XR=XMAX
279     ENDDIF
280     CALL STOS(I)
281     CALL STOXY(I)
282     I=I+1
283     IF (I.LE.N2)      GOTO 10
284 C
285 90 RETURN
286 END

```



```

286 SUBROUTINE XYPR(N1,N2) CHARACTER*10 NAME XYPR... 7
287
288 C
289 COMMON /CXY / X(100),Y(100),N
290 COMMON /SECT/ S(14),NAME
291 C
292 CALL TITLE(0)
293 C
294 DO 12 J=N1,N2
295 CALL RESTOS(1)
296 CALL RESTOX(1)
297 CALL TITLE((N+8)/7+1)
298 WRITE (6,2010)
299 2010 FORMAT (1H )
300 C
301 DO 11 J1=1,N,7
302 J2=MIN0(J1+6,N)
303 JJ=(J1+6)/7
304 IF (J1.EQ.1) THEN
305 WRITE (6,2011) 1,NAME,JJ,(X(J),Y(J),J=J1,J2)
306 2011 FORMAT (1H ,14,A10,15,7(F9.1,' ',F8.2))
307 ELSE
308 WRITE (6,2012) JJ,(X(J),Y(J),J=J1,J2)
309 2012 FORMAT (1H ,14X,15,7(F9.1,' ',F8.2))
310 ENDIF
311 11 CONTINUE
312 12 CONTINUE
313 C
314 RETURN
315 END

```

```

316 SUBROUTINE ARPR(N1,N2)
317 CHARACTER*10 NAM(3),NAME
318 CHARACTER*4 LBL(5;2)
319 C
320 COMMON /SECT/ S(14),NAME
321 COMMON /NSCT/ NDIY,IBED
322 DIMENSION TS(14,3),TSS(14,5,3),NO(3),IBEDT(3),NDIVT(3)
323 EQUIVALENCE (S(5),NIS), (S(6),DNS)
324 DATA LBL / ' ZS', ' H', ' DX', ' MCD', ' BEDM',
325 * ' H', ' B', ' A', ' R', ' B' /
326 C
327 I2=N1-1
328 KT=2
329 C
330 10 KT=3-KT
331 IF (KT.EQ.1) CALL TITLE(-1)
332 I0=I2
333 I2=MIN0(I0+3,N2)
334 I1=I0+1
335 I3=I2-I0
336 C
337 DO 15 L=1,I3
338 I=L+I0
339 CALL RESTOS(I)
340 CALL RESTOX(I)
341 NO(L)=1
342 NAM(L)=NAME
343 DO 12 J=1,I4
344 12 TS(J,L)=S(J)
345 IBEDT(L)=IBED
346 NDIVT(L)=NDIV
347 IF (DNS.LE.0.0) DNS=1.0
348 HH=NIS-DNS
349 C
350 DO 14 J=1,I4
351 13 HH=HH+DNS
352 CALL XYAR(HH,D,A,R,P,HH)
353 IF (A.LE.0.0) GOTO 13
354 TSS(J,1,L)=HH
355 TSS(J,2,L)=B
356 TSS(J,3,L)=A
357 TSS(J,4,L)=R
358 14 CONTINUE
359 15 CONTINUE
360 C
361 WRITE (6,2021) (' ',NO(L),NAM(L),L=1,I3)
362 2021 FORMAT (1H //3(3X,A1,14,A10,18X,'NDIV',3X))
363 WRITE (6,2022) (NDIVT(L),L=1,I3)
364 2022 FORMAT (3(34X,16,3X))
365 WRITE (6,2023) ((LBL(J,1),J=1,5),L=1,I3)
366 2023 FORMAT (1H /3(6(4X,A4),3X))
367 WRITE (6,2024) (TS(J,L), (TS(J,L),J=1,3),IBEDT(L),L=1,I3)
368 2024 FORMAT (3(2X,F8.3,F8.4,F8.1,F8.4,16,3X))
369 WRITE (6,2025) ((LBL(J,2),J=1,4),L=1,I3)
370 2025 FORMAT (1H /3(4(4X,A4),11X))
371 DO 21 J=1,I4
372 21 WRITE (6,2026) ((TSS(J,K,L),K=1,4),L=1,I3)
373 2026 FORMAT (3(2X,F8.3,F8.3,F8.2,F8.1,F8.3,9X))
374 IF (I2.LT.N2) GOTO 10
375 CALL TITLE(0)
376 C
377 RETURN
378 END

```

```

379 SUBROUTINE INSSC(N1,N2,ND1) CHARACTER*10 NAME,NAME1,NAME2 INSSC... 0
380
381 C
382 COMMON /SECT/ S(14),NAME
383 COMMON /NSCT/ NDIV,IREO
384 COMMON /CXY / X(100),Y(100),N
385 COMMON /CINS/ NDS1,NDS2,DL,IDIV
386 COMMON /HISC/ HSI,NS2,HERR
387 DIMENSION S(14),S2(14),X(100),Y(100),X2(100),Y2(100)
388
389 C
390 CALL DSKOUT(0)
391 IF (ND1.LT.1) ND1=1
392 ID=ND1-1
393
394 C
395 DO 33 I=1,N2
396 CALL RESTOS(I)
397 CALL RESTOX(I)
398 NAME2=NAME
399 DO 11 J=1,14
400 11 S2(J)=S(J)
401 NP2=N
402 DO 12 J=1,N
403 12 X2(J)=X(J)
404 Y2(J)=Y(J)
405 DL=0.0
406 IDIV=0
407 IF (I.EQ.N1) GOTO 30
408
409 C
410 IF (NDIV.LS.1) GOTO 30
411 NPNT=MAX0(NP1,NP2)
412 NP1H=(NP1+1)/2
413 NP2H=(NP2+1)/2
414 N=NPNT
415 NAME=NAME1
416
417 C
418 DO 26 L=1,NDIV-1
419 DO 21 J=1,10
420 21 S(J)=S2(J)
421 IDIV=L
422 S(2)=S2(2)/NDIV
423 DL=S(2)*DL
424 DXX=DL/S2(2)
425 S(3)=0.0
426 S(6)=(S2(6)-S1(6))*DXX+S1(6)
427 DO 22 J=1,14
428 22 S(J)=(S2(J)-S1(J))*DXX+S1(J)
429
430 C
431 DO 23 JL=1,NP1H
432 J=JL
433 J1=MIN0(J,NP1H)
434 J2=MIN0(J,NP2H)
435 X(J)=(X2(J2)-X1(J1))*DXX+X1(J1)
436 Y(J)=(Y2(J2)-Y1(J1))*DXX+Y1(J1)
437 J=N+1-JL
438 J1=MAX0(NP1+1-JL,NP1H)
439 J2=MAX0(NP2+1-JL,NP2H)
440 X(J)=(X2(J2)-X1(J1))*DXX+X1(J1)
441 Y(J)=(Y2(J2)-Y1(J1))*DXX+Y1(J1)
442 S(7)=Y(1)
443 DO 24 J=2,N
444 24 S(7)=AMIN1(Y(J),S(7))
445
446 C
447 ID=ID+1
448 CALL DSKOUT(ID)
449
450 C
451 IDIV=0
452 DL=0.0
453 NAME=NAME2
454 DO 26 J=1,14
455 26 S(J)=S2(J)
456 S(2)=S2(2)/NDIV
457 N=NP2
458 DO 27 J=1,N
459 27 X(J)=X2(J)
460 Y(J)=Y2(J)
461
462 C
463 30 ID=ID+1
464 CALL DSKOUT(ID)
465
466 C

```

```

459      NAME1=NAME2
460      DO 31 J=1,14
461 31    S1(J)=S2(J)
462      NP1=NP2
463      DO 32 J=1,N
464      X1(J)=X2(J)
465 32    Y1(J)=Y2(J)
466 C
467 33 CONTINUE
468 C
469      NDS1=MIN0(ND1,NDS1)
470      NDS2=MAX0(1D,NDS2)
471      CALL DSKOUT(0000)
472 C
473      CALL TITLE(3)
474      NINS=NDS2-NDS1-NDS2+NS1
475      WRITE (6,2000) NINS,NDS1,NDS2
476 2000 FORMAT (1H //6X,15,' CROSS SECTIONS ARE INSERTED.'/
477 *          ' FOX.' NEW CROSSSECTION NUMBERS ARE',15,'-',14,')
478 C
479      RETURN
480      END

```

```

481 SUBROUTINE HAROUT
482 CHARACTER*10 NAM(3),NAME
483 CHARACTER*4 LBL(5,2),NOS(3)
484 C
485 COMMON /SECT/ S(14),NAME
486 COMMON /NSCT/ NDIV,IBED
487 COMMON /CINS/ NDS1,NDS2,DL,IDIY
488 DIMENSION TS(14,3),TSS(14,8,3),NO(3),IDEDT(3)
489 EQUIVALENCE (S(6),HIS),(S(8),DHS)
490 DATA LBL / ' ZS', ' N', ' DX', ' MCD', ' BEDN',
491 * ' H', ' B', ' A', ' R', ' B' /
492 C
493 READ (5,1000) NN1,NN2
494 1000 FORMAT (2I5)
495 IF (NDS2.LT.NDS1) THEN
496 WRITE (6,8000)
497 8000 FORMAT (1H /' ***** HAROUT (XC = 3) NO DATA TO PRINT.' )
498 GOTO 90
499 ENDIF
500 NN1=MAX0(NN1,NDS1)
501 IF (NN2.LT.NN1) NN2=NDS2
502 I2=NN1-1
503 KT=2
504 CALL DSKIN(0)
505 C
506 10 KT=3-KT
507 IF (KT.EQ.1) CALL TITLE(-1)
508 I0=I2
509 I2=MIN0(I0+3,NN2)
510 I1=I0+10
511 I3=I2-10
512 C
513 DO 16 L=1,I3
514 I=L+10
515 CALL DSKIN(I)
516 NO(L)=I
517 NAM(L)=NAME
518 NOS(L)=' '
519 IF (IDIY.GT.0) WRITE (NOS(L),'(14)') -IDIY
520 IBEDT(L)=IBED
521 DO 12 J=1,I4
522 12 TS(J,L)=S(J)
523 IF (DHS.LE.0.0) DHS=1.0
524 HH=HIS-DHS
525 C
526 DO 14 J=1,I4
527 13 HH=HH+DHS
528 CALL XYAR(HH,B.A.R.P.RH)
529 IF (A.LE.0.0) GOTO 13
530 TSS(J,1,L)=HH
531 TSS(J,2,L)=0
532 TSS(J,3,L)=A
533 TSS(J,4,L)=R
534 14 CONTINUE
535 15 CONTINUE
536 C
537 WRITE (6,2021) (' ',NO(L),NAM(L),NOS(L),L=1,I3)
538 2021 FORMAT (1H ///3(3X,A1,14,A10,1X,A4,20X))
539 WRITE (6,2022) ((LBL(I,J),J=1,5),L=1,I3)
540 2022 FORMAT (1H //3(5(4X,A4),3X))
541 WRITE (6,2023) (TS(I,L),(TS(J,L),J=1,3),IBEDT(L),L=1,I3)
542 2023 FORMAT (3(2X,F8.3,F8.4,F8.1,F8.4,16,3X))
543 WRITE (6,2024) ((LBL(J,2),J=1,4),L=1,I3)
544 2024 FORMAT (1H //3(4(4X,A4),11X))
545 DO 21 J=1,I4
546 21 WRITE (6,2025) ((TSS(J,K,L),K=1,4),L=1,I3)
547 2025 FORMAT (3(2X,F8.3,F8.2,F8.1,F8.3,0X))
548 IF (I2.LT.NN2) GOTO 10
549 CALL TITLE(0)
550 CALL DSKIN(0000)
551 C
552 90 RETURN
553 END

```

```

554 SUBROUTINE BRANCH
555 C
556 CHARACTER*10 NAMS
557 COMMON /CBRC/ NQ,NQ1,INQ(31)
558 COMMON /CIRS/ NDS1,NDS2,DL,101V
559 COMMON /MISC/ NS1,NS2,NERR
560 COMMON /DSKS/ SS(14,101),NDIVS(101),10EDS(101)
561 COMMON /DSKN/ NAMS(101)
562 DIMENSION XIR(31),IIR(31),SDX(101),ISS(101)
563 C
564 READ (5,1010) NQ,KDX,KPR
565 1010 FORMAT (316)
566 NQ1=NQ+1
567 IF (KDX.EQ.0) THEN
568 IF (NQ.GT.0) THEN
569 READ (5,1011) (INQ(J),J=1,16)
570 1011 FORMAT (1616)
571 IF (NQ.GT.16) THEN
572 READ (5,1012) (INQ(J),J=17,31)
573 1012 FORMAT (5X,1515)
574 ENDIF
575 ELSEIF (NQ.GT.0) THEN
576 IF (KDX.EQ.1) READ (5,1012) (IIR(J),J=2,NQ1)
577 READ (5,1013) (XIR(J),J=2,NQ1)
578 1013 FORMAT (5X,15P6,0)
579 IF (NS2.LT.NS1) THEN
580 WRITE (6,8010)
581 8010 FORMAT (1H /' ***** BRANCH (KC = 4) MISSING SECT. DATA.'
582 * '(KC=2)')
583 NERR=NERR+1
584 GOTO 00
585 ENDF
586 C
587 ISS(NS1)=NDS1
588 SDX(NS1)=0.0
589 DO 11 I=NS1+1,NS2
590 ISS(I)=NDIVS(I)+ISS(I-1)
591 11 SDX(I)=SS(2,I)+SDX(I-1)
592 IF (KPR.LE.0) THEN
593 CALL TITLE(NQ+4)
594 WRITE (6,2010) NQ
595 2010 FORMAT (1H /2X,'INFLOW PNT. NQ =',14//
596 * 23X,'NO',7X,'X',12X,'NO',5X,'SECT.',16X,'INQ')
597 ENDF
598 C
599 DO 16 J=2,NQ1
600 SXJ=XIR(J)
601 IF (KDX.EQ.1) SXJ=SXJ+SDX(IIR(J))
602 IF (SXJ.LE.0.0.OR.SXJ.GT.SDX(NS2)+1E-2) THEN
603 INQ(J)=0
604 GOTO 15
605 ENDF
606 DO 12 I=NS1+1,NS2
607 L=1
608 IF (SDX(I).GE.SXJ) GOTO 13
609 12 CONTINUE
610 L=NS2
611 L=L-1
612 III=NDIVS(NS2)
613 GOTO 14
614 13 L=L-1
615 DXI=SS(2,L)/NDIVS(L)
616 DD1=(SXJ-SDX(III))/DXI
617 III=DD1
618 IF ((DD1-III).GT.1E-6) III=(III+1)
619 14 INQ(J)=III+ISS(L)
620 IF (KPR.LE.0) THEN
621 WRITE (6,2011) IIR(J),XIR(J),L,NAMS(L),ISS(L),III,INQ(J)
622 2011 FORMAT (18X,17,SP,10,' -->'
623 * 5,17,1X,A10,' (',14,')',SP,14,' =',S,16)
624 ENDF
625 15 CONTINUE
626 ENDF
627 C
628 IF (KPR.LE.0) THEN
629 CALL TITLE((NQ+14)/15+5)
630 WRITE (6,2021) NDS1,NDS2,NQ
631 2021 FORMAT (1H //2X,'MAIN RIVER',4X,13,' -',14//
632 * 2X,'INFLOW PNT. NQ =',14)
633

```

```
634      IF (RQ.GT.0) WRITE (6,2022) (INQ(I),1-2,RQI)
635      2022      FORMAT (10X,16I6)
636      ENDIF
637      C
638      DO RETURN
639      END
```

13


```

688      SUBROUTINE CONST(KSW)                                CONST...    15
689      CHARACTER*8 LBL(8)
690      C
691      COMMON /CHST/ CONS(8),G,G0
692      DIMENSION CON(8),S(8)
693      DATA CON / 1.0, 0.0, 2.05, 0.0, 1E-4, 0.009, 1.0, 0.0 /
694      DATA LBL / 'ALPHA', 'CR FR', 'SIGMA', 'VOID',
695      * 'EPS II', 'NU', 'GAMMA', ' ' /
696      C
697      IF (KSW.GT.0) GOTO 20
698      DO 11 I=1,8
699      11 CONS(I)=CON(I)
700      G=0.8
701      G0=G*100.0
702      GOTO 90
703      C
704      20 READ (6,1020) S
705      1020 FORMAT (8F10.0)
706      DO 21 I=1,8
707      IF (S(I).GT.0.0) CONS(I)=S(I)
708      IF (S(I).LT.0.0) CONS(I)=CON(I)
709      21 CONTINUE
710      C
711      CALL TITLE(4)
712      WRITE (6,2020) (LBL(I),CONS(I),I=1,5),(LBL(I),CONS(I),I=7,8)
713      2020 FORMAT (1H // (5X,4(3X,A8,' '),F8.5))
714      C
715      90 RETURN
716      END

```

```

717 SUBROUTINE BNDRY CHARACTER*10 LCASE,L0L*2 BNDRY_ 16
718
719 C
720 COMMON /CDND/ NC,H0(10),Q0(31,10),LCASE(10)
721 COMMON /CDRC/ NQ,NQ1,IRQ(31)
722 DIMENSION SF(3),SF1(3)
723 C
724 READ (6,1000) L0L,NC,KPR
725 1000 FORMAT (A2,3X,2I6)
726 IF (L0L.NE.'BC') THEN
727 WRITE (6,8000) 'BC',L0L
728 8000 FORMAT ('IH /' ***** BNDRY COND 1,2 COLS. MUST BE ('A2,
729 * '): INSTEAD OF ('A2,')')
730 *
731 ENDIF
732 NC=MAX0(NC,1)
733 IF (NQ.LT.0) THEN
734 NQ=0
735 NQ1=1
736 CALL TITLE(3)
737 WRITE (6,8001)
738 8001 FORMAT ('IH /' ----- BNDRY (KC = 0) MISSING FLOW-NET DATA.
739 * '(KC+4)'/25X,'WARNING:')
740 *
741 C
742 READ (5,1010) NC,SF
743 1010 FORMAT (4X,11,10X,3F5,0)
744 DO 11 L=1,3
745 IF (SF(L).EQ.0.0) SF(L)=1.0
746 11 SF1(L)=0.0
747 IF (NC.GT.0) THEN
748 READ (5,1010) NC,SF1
749 IF (NC.GT.0) THEN
750 DO 12 L=1,3
751 SF1(L)=SF(L)*SF(L)
752 12 ENDOF
753 ENDOF
754 C
755 DO 22 K=1,NC
756 READ (6,1020) LCASE(K),H0(K), (Q0(L,K),L=1,11)
757 1020 FORMAT (A12,3X,12F5,0)
758 IF (NQ1.GT.1) READ (5,1021) (Q0(L,K),L=12,NQ1)
759 1021 FORMAT (25X,10F5,0)
760 H0(K)=H0(K)*SF(1)+SF1(1)
761 Q0(1,K)=Q0(1,K)*SF(2)+SF1(2)
762 DO 21 L=2,NQ1
763 Q0(L,K)=Q0(L,K)*SF(3)+SF1(3)
764 21 CONTINUE
765 22 CONTINUE
766 C
767 IF (KPR.GT.0) THEN
768 CALL TITLE((NQ1+9)/10)*NC+5)
769 WRITE (6,2030)
770 2030 FORMAT ('IH //' BOUNDARY CONDITIONS'/25X,'H0',10X,'Q0',6X,'DQ'/1X)
771 NP=NIN0(NQ1,11)
772 DO 31 K=1,NC
773 WRITE (6,2031) K,LCASE(K),H0(K), (Q0(L,K),L=1,NP)
774 2031 FORMAT (4X,14,2X,A10,F10.3,F10.1,10F8.1)
775 IF (NQ1.GT.1) WRITE (6,2032) (Q0(L,K),L=11,NQ1)
776 2032 FORMAT (40X,10F8.1)
777 31 CONTINUE
778 ENDOF
779 C
780 RETURN
781 END

```

```

780 SUBROUTINE VFCALC CHARACTER*10 NAME,LCASE,NCH#2 VFCALC 17
781
782
783 C
784 COMMON /CINS/ NDS1,NDS2,DI,IDIY
785 COMMON /CBHD/ HC,H0(10),Q0(3,10),LCASE(10)
786 COMMON /SECT/ S(14),NAME
787 COMMON /CBRC/ NQ,NQ1,INQ(31)
788 COMMON /HQCV/ HHQ,HHQ(60,2)
789 COMMON /CNST/ CONS(8),G,G0
790 COMMON /GRES/ Q,H,B,A,R,V,FR,RH,GRAD,RF
791 DIMENSION HE1(10),QQ1(10),VV1(10),HH1(10),HH2(10),RH1(10),
792 * RF1(10),GRAD1(10),Q1(10)
793 EQUIVALENCE (S(1),EN),(S(2),DX),(S(7),ZS)
794 EQUIVALENCE (CONS(1),ALPHA),(CONS(2),FRCR),(CONS(2),CDM),
795 * (CONS(5),EPSH)
796 C
797 NERR=0
798 IF (NDS2.LT.NDS1) THEN
799 NERR=NERR+1
800 WRITE (0,8010) NDS1,NDS2
801 8010 FORMAT (' ***** NDS1 =',14,' NDS2 =',14,
802 * ' MISSING CROSS-SECTIONAL DATA. ')
803 ENDIF
804 IF (NQ.LT.0) THEN
805 NQ=0
806 NQ1=1
807 CALL TITLE(3)
808 WRITE (6,8011)
809 8011 FORMAT (1H /' ----- MISSING FLOW-NET DATA. (WARNING)')
810 ENDIF
811 IF (NC.LT.1) THEN
812 NERR=NERR+1
813 WRITE (0,8012)
814 8012 FORMAT (' ***** MISSING BOUNDARY CONDITIONS. ')
815 ENDIF
816 IF (NERR.GT.0) THEN
817 CALL TITLE(3)
818 WRITE (0,8090)
819 8090 FORMAT (1H //' ***** CALCULATION SUSPENDED. *****')
820 STOP
821 ENDIF
822 C
823 DO 12 J=1,NC
824 Q1(J)=Q0(1,J)
825 DO 11 L=2,NQ1
826 IF ((INQ(L)-NDS1-1)*(INQ(L)-NDS2).LE.0) Q1(J)=Q1(J)+Q0(L,J)
827 11 CONTINUE
828 IF (HHQ.GT.0.AND.H0(J).EQ.0.0) CALL HCALC(H0(J),Q1(J))
829 12 CONTINUE
830 CALL TITLE(NC+5)
831 WRITE (0,2010) NDS1,NDS2
832 2010 FORMAT (1H //' CALCULATION OF NON-UNIFORM FLOW PROFILE. ',14,14//
833 * 14X,'CASE',8X,'H0',8X,'Q0',8X,'QH')
834 WRITE (0,2011) (J,LCASE(J),H0(J),Q1(J),Q0(1,J),J=1,NC)
835 2011 FORMAT (4X,14,1X,A10,1X,F10.3,F10.1,F10.1)
836 CALL TITLE(10)
837 CALL DSKIN(0)
838 G2=G+2.0
839 C
840 C
841 DO 52 I=NDS1,NDS2
842 CALL DSKIN(1)
843 IF (.EQ.NDS1) XXX=-DX
844 XXX=XXX+DX
845 CALL TITLE(NC+4)
846 IF (JDIV.LE.0) THEN
847 XL=0.0
848 WRITE (0,2021) I,NAME,XXX,EN
849 2021 FORMAT (1H /1X,14,1X,A10,16X,' SX =',F10.1,' N =',F8.3)
850 ELSE
851 XL=XL+DX
852 WRITE (0,2022) I,NAME,-IDIV,XL,XXX,EN
853 2022 FORMAT (1H /1X,14,1X,A10,1X,14,' ('F8.1,') SX =',F9.1,
854 * ' N =',F6.3)
855 ENDIF
856 WRITE (0,2023)
857 2023 FORMAT (1H /25X,'Q',7X,'H',9X,'B',7X,'A',6X,'R',6X,'V',6X,'FR')
858 C
859 DO 51 J=1,NC

```

```

860 C
861
862 MCH=
863 IF (I.EQ.NDS1) THEN
864 H=H0(J)
865 IF (H.LE.ZS) H=ZS+0.01
866 Q=Q0(J)
867 CALL HBAR
868 HA1=H
869 HH1(J)=H
870
871 GOTO 40
872
873 ENDIF
874 C
875 Q=Q01(J)
876 DO 22 L=2,NQ1
877 IF ((INQ(L).EQ.1) Q=Q-Q0(L,J)
878 22 CONTINUE
879 IF (I.EQ.NDS1+1) THEN
880 HA1=HH1(J)+GRAD1(J)*DX
881 ELSE
882 HA1=(HH1(J)-HH2(J))*DX/DX1+HH1(J)
883 ENDIF
884 IF (HA1.LT.ZS) HA1=HH1(J)+ZS
885 HEE=HE1(J)+RF1(J)*EN*EN+DX*0.5*(CDH+VVI(J)*VVI(J)/G2
886 HA=HA1
887 DO 31 NU=1,50
888 H=HA
889 CALL HBAR
890 HH=HEE+RF*EN*EN+DX*0.5*(ALPHA-CDH)*V*V/G2
891 EPS=HH-H
892 DH=EPS*0.1
893 IF (ABS(EPS).LT.EPSH) GOTO 40
894 CALL REGF1(H, EPS, DH, HA, ZS, NU, KNU)
895 IF (ABS(HA-H).LT.EPSH*0.1) GOTO 40
896 31 CONTINUE
897 IF (ABS(HA-H).GE.EPSH*0.5) THEN
898 MCH='-'
899 GOTO 41
900 ENDIF
901 C
902 40 IF (FR.LE.FRCR) GOTO 50
903 41 MCH(2:2)='*'
904 HA=HA1
905 DO 42 NU=1,50
906 H=HA
907 CALL HBAR
908 EPS=FR-FRCR
909 IF (ABS(EPS/FRCR).LT.1E-6) GOTO 60
910 DH=AMAX1(AMIN1(EPS*R/1.6/FRCR,0.5),-0.5)
911 CALL REGF1(H, EPS, DH, HA, ZS, NU, KNU)
912 IF (ABS(HA-H).LT.EPSH*0.1) GOTO 50
913 42 CONTINUE
914 MCH(2:2)='x'
915 C
916 60 HE=H+ALPHA*V*V/G2
917 GRAD=RF*EN*EN
918 HH2(J)=HH1(J)
919 QQ1(J)=Q
920 HH1(J)=H
921 VVI(J)=V
922 HE1(J)=HE
923 RF1(J)=RF
924 RH1(J)=RH
925 GRAD1(J)=GRAD
926 ZS1=ZS
927 DX1=DX
928 C
929 51 WRITE (6,2050) J,MCH,Q,H,D,A,R,V,FR
930 2050 FORMAT (1H,12X,13,1X,A2,F9.1,F9.3,F9.1,F8.1,F7.3,F7.3)
931 52 CONTINUE
932 C
933 CALL DSKIN(0000)
934 RETURN
935 END

```

```

033      SUBROUTINE HDAR
034      C
035      COMMON /CRES/ Q,H,B,A,R,V,FR,RH,GRAD,RF
036      COMMON /CNST/ CONS(8),G,GO
037      C
038      CALL XYAR(H,B,A,R,P,RH)
039      V = 1E+0
040      RF = 1E+0
041      FR = 1E+0
042      IF (A.GT.0.0) V = 0.7A
043      IF (R.GT.0.0) RF = ABS(R+(-1.333333)*V)*V
044      IF (RH.GT.0.0) FR = V/SQRT(G+RH)
045      C
046      RETURN
047      END

```

HDAR----

10

```

048 SUBROUTINE XYAR(H,D,A,R,P,RH) CHARACTER*10 NAME XYAR... 20
049
050 C
051 COMMON /CXY / X(100),Y(100),N
052 COMMON /SECT/ S(14),NAME
053 EQUIVALENCE (S(13),XL),(S(14),XR)
054 C
055 B=0.0
056 A=0.0
057 P=0.0
058 R=0.0
059 RH=0.0
060 IF (XR.LE.XL) GOTO 00
061 C
062 DO 30 I=2,N
063 I1=I-1
064 X1=AMAX1(X(I1),XL)
065 X2=AMIN1(X(I1),XR)
066 IF (I.LE.2.AND.X(I).GT.X(I1)) X1=XI
067 IF (I.GE.N.AND.X(I).GT.X(I1)) X2=XR
068 IF (X2.LT.X1) GOTO 30
069 IF (X(I)-X(I1)) 30,10,20
070 C
071 10 IF (X1.GE.X(I)) THEN
072 Y2=AMIN1(Y(I1),H)
073 Y1=AMIN1(Y(I1),H)
074 ELSE
075 IF (X2.LE.X(I)) THEN
076 Y2=AMIN1(Y(I1),H)
077 Y1=AMIN1(Y(I1),H)
078 ELSE
079 Y2=AMIN1(AMAX1(Y(I),Y(I1)),H)
080 Y1=AMIN1(AMIN1(Y(I),Y(I1)),H)
081 ENDIF
082 ENDIF
083 P=ABS(Y2-Y1)*P
084 GOTO 30
085 C
086 20 DD=(Y(I)-Y(I1))/(X(I)-X(I1))
087 Y1=(X1-X(I1))*DD+Y(I1)
088 Y2=(X2-X(I1))*DD+Y(I1)
089 Z1=H-Y1
090 Z2=H-Y2
091 IF (Z1.LE.0.0.AND.Z2.LE.0.0) GOTO 30
092 IF (Z1.LT.0.0) THEN
093 X1=(X1-X2)*Z2/(Z2-Z1)+X2
094 Z1=0.0
095 ELSEIF (Z2.LT.0.0) THEN
096 X2=(X2-X1)*Z1/(Z1-Z2)+X1
097 Z2=0.0
098 ENDIF
099 DB=X2-X1
1000 B=DB*B
1001 A=(Z1+Z2)*DD*0.5+A
1002 P=SQRT((Z2-Z1)**2+DD**2)*P
1003 30 CONTINUE
1004 C
1005 IF (P.GT.0.0) R=A/P
1006 IF (B.GT.0.0) RH=A/B
1007 C
1008 90 RETURN
1009 END

```

```

1010      SUBROUTINE HCALC(RH,RQ)
1011      C
1012      COMMON /HQCVC/ RHQ,II(50),Q(50)
1013      C
1014      DO 11 I=2,NHQ
1015      I2=I
1016      IF (RQ.LE.Q(I))      GOTO 12
1017      11 CONTINUE
1018      12 L1=L2-1
1019      RH=(II(L2)-II(L1))*(RQ-Q(L1))/(Q(L2)-Q(L1))*II(L1)
1020      C
1021      90 RETURN
1022      END

```

```

1023 SUBROUTINE STOS(I)
1024 CHARACTER*10 NAME,NAHS
1025 C
1026 COMMON /SECT/ S(14),NAME
1027 COMMON /RSCT/ RDIY,IBED
1028 COMMON /PSKS/ SS(14,101),NDIYS(101),IDEOS(101)
1029 COMMON /DSKN/ NAHS(101)
1030 C
1031 NAME(I)=NAME
1032 NDIYS(I)=NDIY
1033 IDEOS(I)=IBED
1034 DO 11 J=1,14
1035 11 SS(J,I)=S(J)
1036 C
1037 RETURN
1038 END

```



```

1039 SUBROUTINE RESTOS(I)
1040 CHARACTER*10 NAME,NAHS RESTOS_ 23
1041 C
1042 COMMON /SECT/ S(14),NAME
1043 COMMON /RSCT/ NDIV,IBED
1044 COMMON /DSKS/ SS(14,101),NDIVS(101),IBEDS(101)
1045 COMMON /DSKH/ NAHS(101)
1046 C
1047 NAME=NAHS(I)
1048 NDIV=NDIVS(I)
1049 IBED=IBEDS(I)
1050 DO 11 J=1,14
1051 11 S(J)=SS(J,I)
1052 C
1053 RETURN
1054 END

```

```

1055 SUBROUTINE STOXY(I)
1056 C
1057 COMMON /CXY / X(100),Y(100),N
1058 COMMON /DSKX/ XX(100,101),YY(100,101),HXY(101)
1059 C
1060 HXY(I)=N
1061 DO 11 J=1,N
1062 XX(J,I)=X(J)
1063 11 YY(J,I)=Y(J)
1064 C
1065 RETURN
1066 END

```

```
1067 SUBROUTINE RESTOX(I)                                RESTOX.      25
1068 C
1069 COMMON /CXY / X(100),Y(100),N
1070 COMMON /DSKX/ XX(100,101),YY(100,101),NXY(101)
1071 C
1072 N=NXY(I)
1073 DO 11 J=1,N
1074 X(J)=XX(J,I)
1075 11 Y(J)=YY(J,I)
1076 C
1077 RETURN
1078 END
```

```

1079 SUBROUTINE DSKOUT(ID)                                DSKOUT..      20
1080 CHARACTER*10 NAME,FILTMP*20
1081 C
1082 COMMON /SECT/ S(14),NAME
1083 COMMON /CXY / X(100),Y(100),N
1084 COMMON /NSCT/ NDIV,IBED
1085 COMMON /CINS/ NDS1,NDS2,DI,IDIY
1086 COMMON /PHAW/ FILTMP
1087 C
1088 IF (ID.EQ.0) THEN
1089   OPEN (3,FILE=FILTMP,ACCESS='DIRECT',RECL=1024)
1090 ELSEIF (ID.EQ.0999) THEN
1091   CLOSE (3)
1092 ELSEIF ((ID-1001)*ID.LT.0) THEN
1093   WRITE (3,REC=ID) N.S.DI,IDIY,NDIV,IBED,
1094   *      (X(J),J=1,N),(Y(J),J=1,N),NAME
1095 *      ENDIF
1096 C
1097 RETURN
1098 END

```

```

1000      SUBROUTINE DSKIN(ID)                                DSKIN_ 27
1001      CHARACTER*10 NAME,FILTYP*20
1002      C
1003      COMMON /SECT/ S(14),NAME
1004      COMMON /CXY / X(100),Y(100),N
1005      COMMON /NSCT/ NDIV,IBED
1006      COMMON /CINS/ NDS1,NDS2,DL,1DIV
1007      COMMON /FNAM/ FILTYP
1008      C
1009      IF (ID.EQ.0) THEN
1010          OPEN (3,FILE=FILTYP,ACCESS='DIRECT',RECL=1024)
1011      ELSEIF (ID.EQ.9999) THEN
1012          CLOSE (3)
1013      ELSEIF ((ID-1001)*ID.LT.0) THEN
1014          READ (3,REC=1D) N,S,DL,1DIV,NDIV,IBED,
1015              *(X(J),J=1,N),(Y(J),J=1,N),NAME
1016      *
1017      ENDIF
1018      C
1019      RETURN
1020      ERD

```