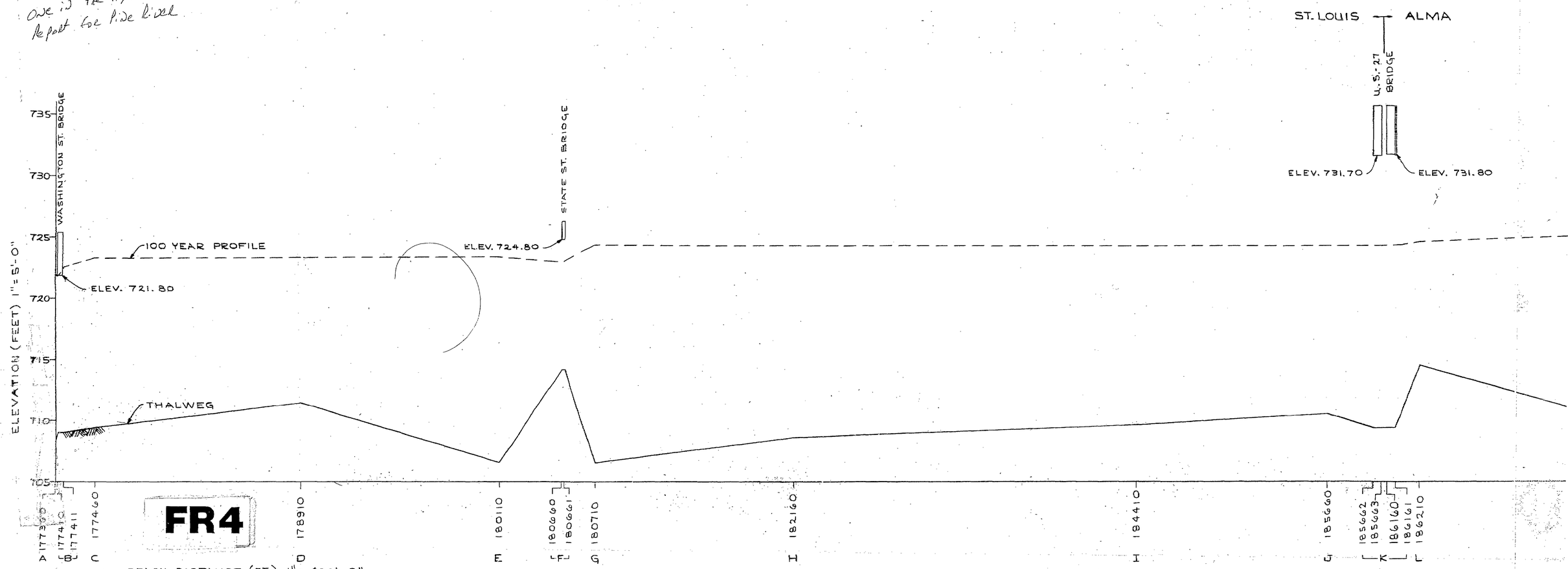
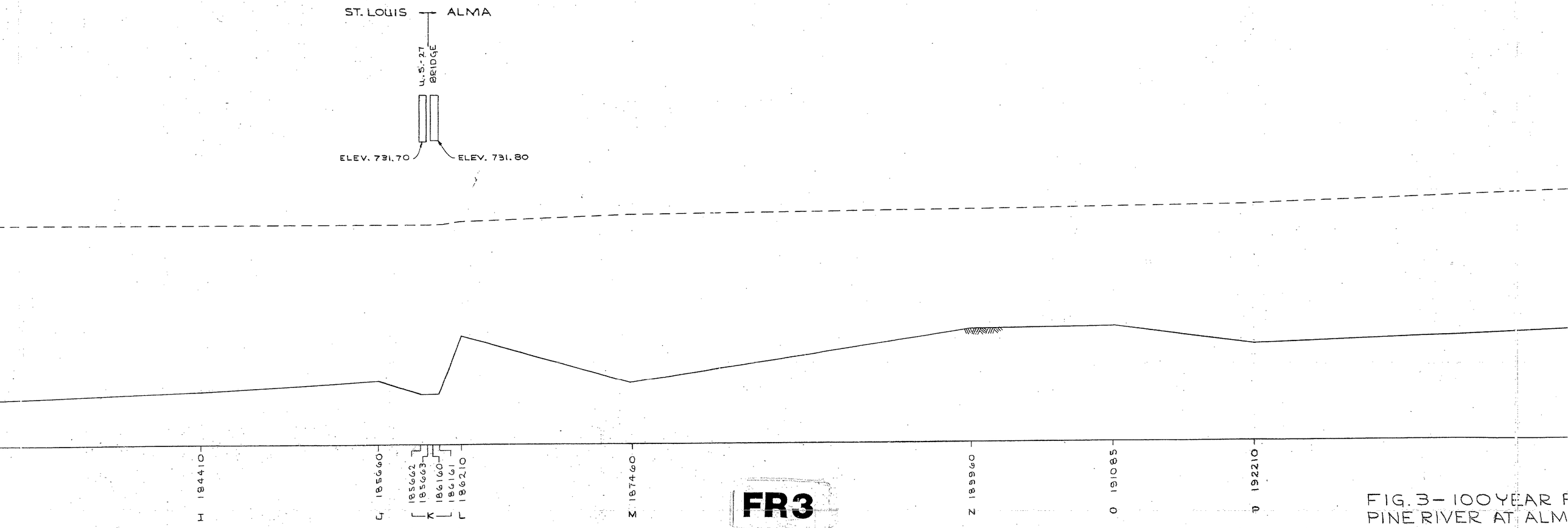
Same as the one in the Hydraulic Analysis Report for Pine River



FR4

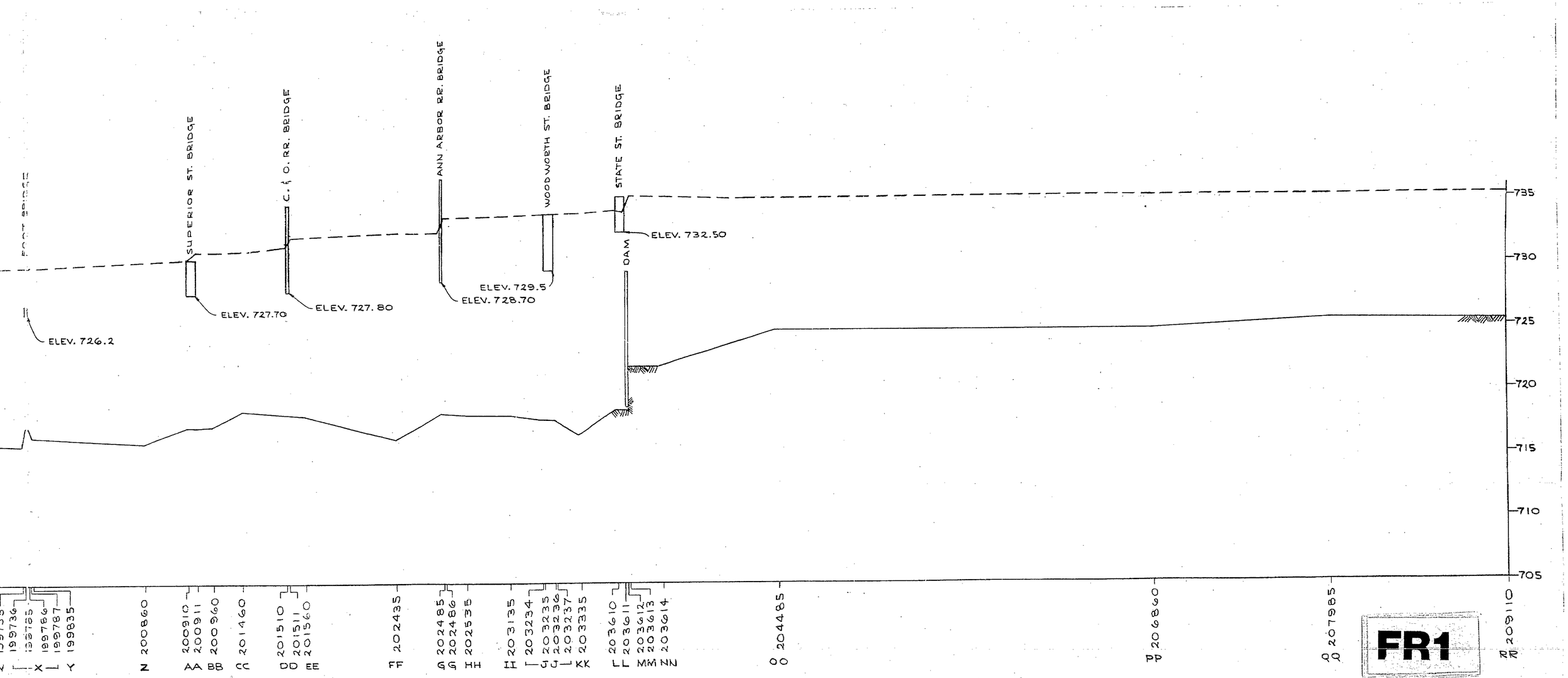


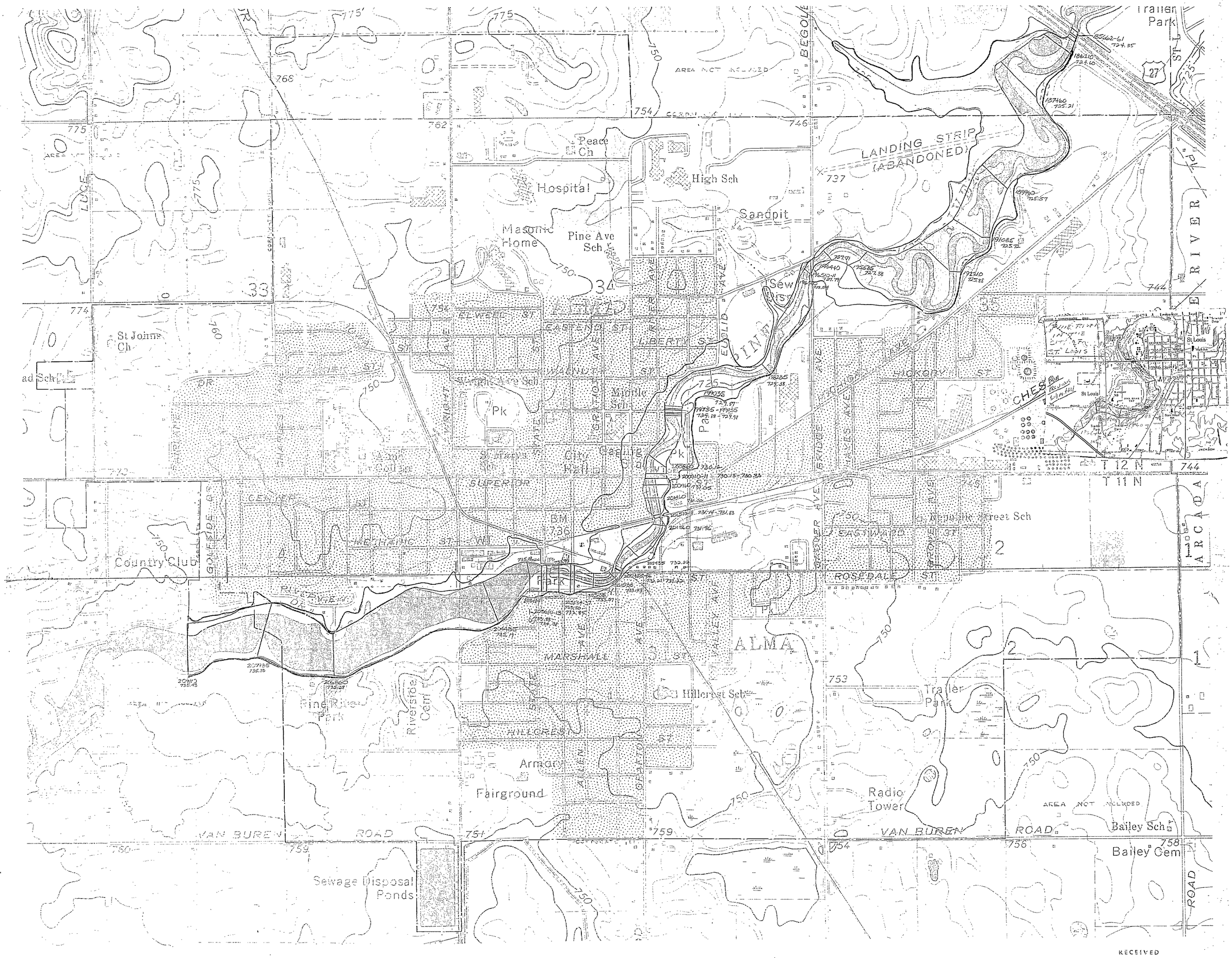
FR3

FIG. 3 – 100 YEAR F
PINE RIVER AT ALM

FIG. 3 – 100 YEAR PROFILE
PINE RIVER AT ALMA - 8546

FR2


SUPERIOR ST. BRIDGE
C. & O. RR. BRIDGE
ANN ARBOR RR. BRIDGE
WOODWORTH ST. BRIDGE
STATE ST. BRIDGE
DAM
ELEV. 726.2
ELEV. 727.70
ELEV. 727.80
ELEV. 728.70
ELEV. 729.5
ELEV. 732.50
735
730
725
720
715
710
705
199734
199765
199766
199787
199835
200860
200910
200911
200960
201460
201510
201511
201560
202435
202485
202486
202535
203135
203234
203235
203236
203237
203335
203610
203611
203612
203613
203614
204485
206860
207985
209110
X
Y
Z
AA
BB
CC
DD
EE
FF
GG
HH
II
JJ
KK
LL
MM
NN
OO
PP
QQ
RR
FR1



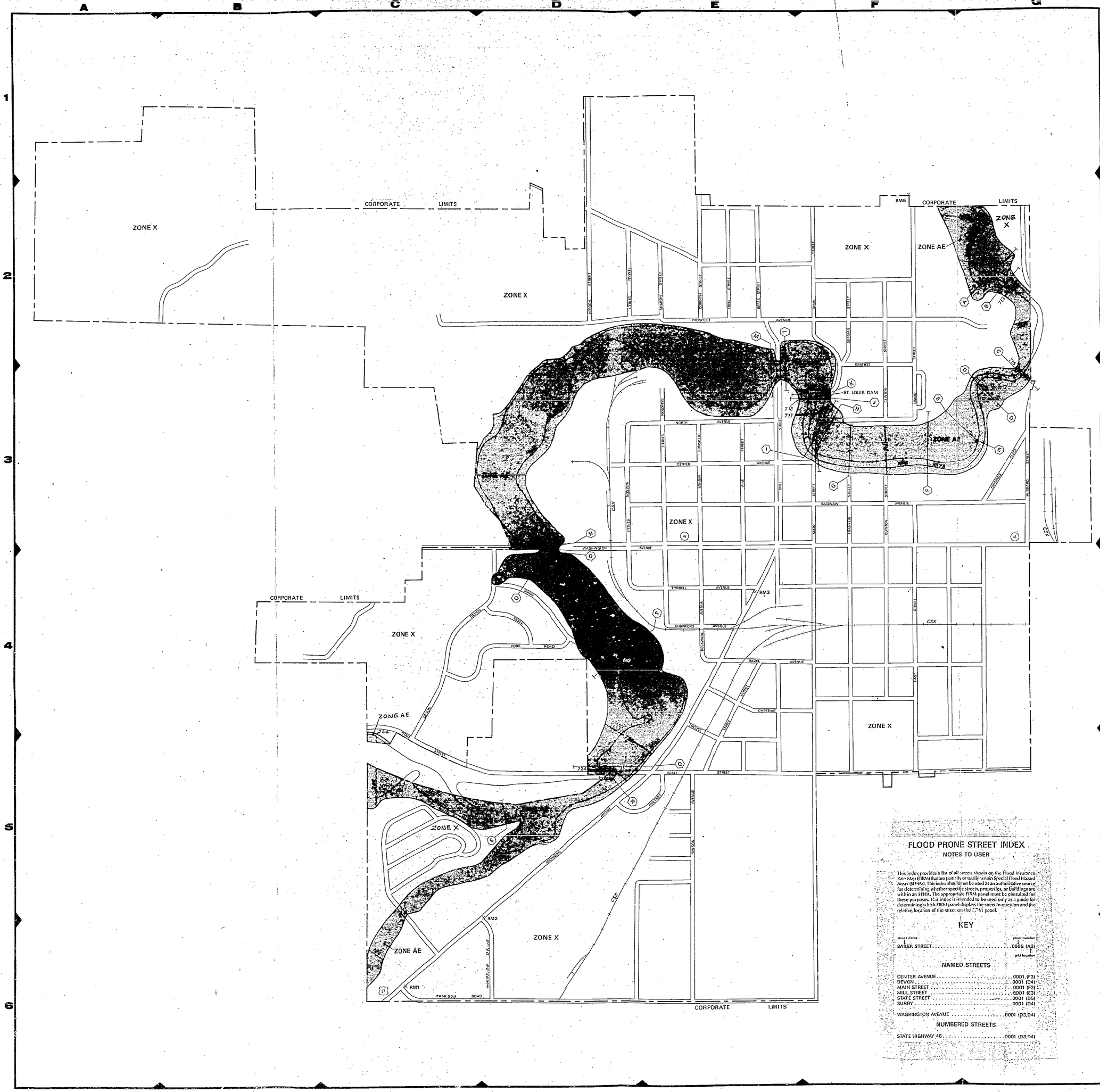
RECEIVED
JAN 31 1980
WATER MANAGEMENT

SCALE IN FEET

0 500 1000

N

ALMA
GRATIOT COUNTY, MICHIGAN



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** — No base flood elevations determined.
- **ZONE AE** — Base flood elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** — To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- **ZONE V** — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside 500-year flood plain.
- **ZONE D** — Areas in which flood hazards are undetermined.

- Flood Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
- 513 — Base Flood Elevation Line; Elevation in Feet*
- D — D — Cross Section Line
- (EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*
- RM7 X — Elevation Reference Mark
- •M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Certain areas not in the Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Coastal base flood elevations apply only landward of the shoreline.

Elevation reference marks are described in the Flood Insurance Study Report.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

MAP REPOSITORY

INITIAL IDENTIFICATION:
JUNE 14, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 12, 1977

FLOOD INSURANCE RATE MAP EFFECTIVE:

FLOOD INSURANCE RATE MAP REVISIONS:

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

N

APPROXIMATE SCALE IN FEET
500 0 500

FLOOD PRONE STREET INDEX

NOTES TO USER

This index provides a list of all streets shown on the Flood Insurance Rate Map (FIRM) that are partially or totally within Special Flood Hazard Areas (SFHAs). This index should not be used as an authoritative source for determining whether specific streets, properties, or buildings are within an SFHA. The appropriate FIRM panel must be consulted for these purposes. This index is intended to be used only as a guide for determining which FIRM panel displays the street in question and the relative location of the street on the FIRM panel.

KEY

street name — panel number
BAKER STREET 0005 (A2)
grid location

NAMED STREETS

CENTER AVENUE	0001 (F3)
DEVON	0001 (D4)
MAIN STREET	0001 (F3)
MILL STREET	0001 (E3)
STATE STREET	0001 (D5)
SURRY	0001 (D4)
WASHINGTON AVENUE	0001 (D3,D4)

NUMBERED STREETS

STATE HIGHWAY 46	0001 (D3,D4)

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ST. LOUIS,
MICHIGAN
GRATIOT COUNTY

(ONLY PANEL PRINTED)

PRELIMINARY

COMMUNITY-PANEL NUMBER
260085 0001 B

EFFECTIVE DATE:

Federal Emergency Management Agency

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	7.	0.	0.	0.0	0.0	0.0	0.	722.100	0.0
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*PROF 2

CCHV    0.300 CEHV    0.500
*SECNO 177360.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS       480.0      620.0  TYPE      1  TARGET       140.000
 ELENCL      725.00  ELENCR      725.00
177360.00    13.70   722.10      0.0     722.00    722.36      0.26      0.0       0.0     713.90
    5300.       0.    5300.       0.        0.     1292.       0.        0.        0.     725.00
     0.0       0.0     4.10      0.0      0.030    0.035     0.030     0.0     708.40     480.00
 0.000535       0.       0.       0.         0        0         0      0.0     140.00     620.00


*SECNO 177410.000

3470 ENCROACHMENT STATIONS       503.0      589.0  TYPE      1  TARGET        86.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.00 ELREA       725.00


        WASHINGTON ST. BRIDGE -ST. LOUIS , LENGTH 92 FT WIDTH 41 FT

177410.00    12.94   721.94      0.0     721.84    722.54      0.60      0.01      0.17     725.40
    5300.       0.    5300.       0.        0.      853.       0.        0.        0.  100000.00
     0.00       0.0     6.21      0.0      0.030    0.035     0.030     0.032   709.00     503.00
 0.001244       10.      10.      10.         2        0         0      0.0      86.00     589.00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.90      1.76      2.50      0.0      86.00      3.50    784.00      0.0     712.00    712.00

*SECNO 177411.000
PRESSURE FLOW


 EGPRS      EGLWC      H3        QWEIR     QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                              AREA
   723.19    722.57    0.04        0.     5300.      784.     809.      721.80    725.40


3470 ENCROACHMENT STATIONS       503.0      589.0  TYPE      1  TARGET        86.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.40 ELREA       725.40

177411.00    13.67   722.67      0.0     722.55    723.19      0.52      0.65      0.0     725.40
    5300.       0.    5300.       0.        0.      916.       0.        1.        0.  100000.00
     0.00       0.0     5.78      0.0      0.030    0.035     0.030     0.034   709.00     503.00
 0.001000       40.      40.      40.         2        0         0      0.0      86.00     589.00


*SECNO 177460.000
```

```
3470 ENCROACHMENT STATIONS        162.0      621.0  TYPE        1  TARGET        459.000
177460.00     13.94    723.34      0.0     723.24    723.36      0.02      0.02      0.15    722.30
    5300.        0.     5300.       0.         0.     4280.        0.       13.        1. 100000.00
     0.05       0.0      1.24      0.0      0.030     0.035     0.030     0.035    709.40    162.00
 0.000044      200.      200.     200.          2         0         0       0.0    457.98    619.98


CCHV     0.100 CEHV     0.300
*SECNO 178910.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLDSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS        300.0      940.0  TYPE        1  TARGET        640.000
178910.00     12.00    723.40      0.0     723.30    723.42      0.02      0.06      0.00    719.30
    5300.      183.     5117.       0.      533.     4299.        0.      154.       18. 100000.00
     0.37      0.34      1.19      0.0      0.060     0.040     0.070     0.039    711.40    300.00
 0.000048     1350.     1350.    1350.          2         0         0       0.0    617.54    917.53


*SECNO 180110.000
180110.00     16.87    723.47      0.0     723.37    723.50      0.04      0.08      0.00    721.30
    5300.       53.     5247.       0.      237.     3384.        0.      280.       36.    726.10
     0.61      0.22      1.55      0.0      0.060     0.035     0.060     0.037    706.60    412.98
 0.000074     1300.     1300.    1300.          0         0         0       0.0    601.28   1014.24


CCHV     0.300 CEHV     0.500
*SECNO 180660.000

3301 HV CHANGED MORE THAN HVINS


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.60 ELREA       727.80


        STATE ST. BRIDGE-ST.LOUIS ,LENGTH 122 FT WIDTH 20 FT


        SKEWED BY A FACTOR OF 0.87

180660.00      8.91    723.11      0.0     723.00    724.04      0.93      0.09      0.45    720.40
    5300.        0.     5300.       0.         0.      685.        0.      300.       39.    727.80
     0.62       0.0      7.74      0.0      0.060     0.035     0.060     0.037    714.20    876.09
 0.002808      400.      400.     400.          2         0         0       0.0    100.05    976.14


SPECIAL BRIDGE

S8  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      1.50      2.50       0.0    115.00      2.00    870.00      0.0     717.00    717.00

*SECNO 180661.000
CLASS A LOW FLOW

3420 BRIDGE W.S.     723.06 BRIDGE VELOCITY ,      7.74     CALCULATED CHANNEL AREA ,      685.

 EGPRS     EGLWC      H3        QWEIR     QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                            AREA
     0.0    724.10    0.09        0.     5300.      870.     881.      724.80    724.50
```

```
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.60 ELREA       728.70

180661.00      8.99    723.19      0.0    723.09    724.10      0.91      0.06      0.0    720.40
    5300.        0.     5300.       0.       0.      693.        0.     300.       39.    727.80
     0.62       0.0      7.65      0.0     0.060     0.035     0.060     0.037   714.20    875.09
 0.002699       20.       20.      20.         0         0         0       0.0   100.05    976.14


*SECNO 180710.000

3301 HV CHANGED MORE THAN HVINS

180710.00     17.87    724.37      0.0    724.31    724.38      0.01      0.01      0.27    719.00
    5300.       64.     5236.       0.      319.     6056.        0.     317.       41.    726.80
     0.69       0.20     0.86      0.0     0.060     0.035     0.060     0.037   706.50    263.85
 0.000017      200.      200.     200.         2         0         0       0.0   677.51    941.35


CCHV     0.100 CEHV     0.300
*SECNO 182160.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS       300.0      833.0  TYPE       1  TARGET       533.000
182160.00     15.79    724.39      0.0    724.33    724.41      0.02      0.02      0.00    719.90
    5300.       33.     5267.       0.      128.     5102.        0.     490.       59. 100000.00
     1.04       0.26     1.03      0.0     0.060     0.030     0.060     0.035   708.60    300.00
 0.000020      1300.     1300.    1300.         2         0         0       0.0   530.41    830.41


*SECNO 184410.000

3470 ENCROACHMENT STATIONS        32.0      808.0  TYPE       1  TARGET       776.000
184410.00     14.73    724.43      0.0    724.36    724.43      0.01      0.02      0.00    724.20
    5300.        0.     5300.       0.        0.     8356.        0.     841.       93. 100000.00
     2.02       0.0      0.63      0.0     0.060     0.030     0.060     0.033   709.70     32.00
 0.000007     2250.     2250.    2250.         0         0         0       0.0   776.00    803.00


CCHV     0.200 CEHV     0.400
1490 NH CARD USED
*SECNO 185660.000

3470 ENCROACHMENT STATIONS       700.0      993.0  TYPE       1  TARGET       293.000
185660.00     13.78    724.38      0.0    724.32    724.51      0.13      0.03      0.05    724.00
    5300.        0.     5300.       0.        0.     1859.        0.     987.      108. 100000.00
     2.14       0.0      2.85      0.0     0.060     0.098     0.060     0.034   710.60    700.00
 0.000381     1250.     1250.    1250.         2         0         0       0.0   293.00    993.00


CCHV     0.300 CEHV     0.500
*SECNO 185662.000

3470 ENCROACHMENT STATIONS       610.0      760.0  TYPE       1  TARGET       150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.00 ELREA       735.00


        US-27 NORTHBOUND BRIDGE,LENGTH 150 FT WIDTH 48 FT
```

```
185662.00     15.02    724.42      0.0     724.35    724.79      0.37      0.16      0.12    727.70
    5300.        0.    5300.       0.        0.     1085.        0.      997.       110. 100000.00
     2.15       0.0      4.88      0.0     0.050     0.035     0.050     0.034    709.40    629.32
 0.000742      300.      300.      300.         2         0         0       0.0    118.19    747.51


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.90      1.50      2.50      0.0      77.00      4.00   2081.30     1.90    713.00    713.00

*SECNO 185663.000
CLASS A LOW FLOW

3420 BRIDGE W.S.      724.38 BRIDGE VELOCITY ,      4.92      CALCULATED CHANNEL AREA ,     1077.

 EGPRS      EGLWC       H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
     0.0    724.80      0.02        0.     5300.     2081.     2030.      731.70    735.80


3470 ENCROACHMENT STATIONS      610.0     760.0  TYPE      1  TARGET      150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.80 ELREA       735.80

185663.00     15.03    724.43      0.0     724.37    724.80      0.37      0.02      0.0    727.70
    5300.        0.    5300.       0.        0.     1087.        0.      999.       110. 100000.00
     2.16       0.0      4.88      0.0     0.050     0.035     0.050     0.034    709.40    629.30
 0.000738       50.       50.       50.         0         0         0       0.0    118.26    747.56


*SECNO 186160.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IOC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS      610.0     760.0  TYPE      1  TARGET      150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.00 ELREA       735.00


        US-27 SOUTHBOUND BRIDGE,LENGTH 150 FT WIDTH 48 FT

186160.00     15.06    724.46      0.0     724.39    724.82      0.37      0.02      0.00    727.70
    5300.        0.    5300.       0.        0.     1090.        0.      999.       110. 100000.00
     2.17       0.0      4.86      0.0     0.050     0.035     0.050     0.034    709.40    629.28
 0.000733       30.       30.       30.         0         0         0       0.0    118.35    747.63


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.90      1.50      2.50      0.0      77.00      4.00   2081.30     1.90    713.00    713.00

*SECNO 186161.000
CLASS A LOW FLOW

3420 BRIDGE W.S.      724.43 BRIDGE VELOCITY ,      4.90      CALCULATED CHANNEL AREA ,     1082.

 EGPRS      EGLWC       H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
```

```
                                                                    AREA
     0.0      724.84      0.02        0.      5300.     2081.     2044.     731.80    735.80


3470 ENCROACHMENT STATIONS        610.0      760.0  TYPE       1  TARGET       150.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        735.80 ELREA        735.80

186161.00     15.07    724.47      0.0     724.41    724.84      0.37      0.01      0.0    727.70
    5300.        0.    5300.       0.        0.     1092.        0.     1001.      110. 100000.00
     2.17       0.0      4.85      0.0     0.050     0.035     0.050     0.034    709.40    629.26
 0.000729       50.       50.      50.         0         0         0       0.0    118.43    747.59


*SECNO 186210.000

3470 ENCROACHMENT STATIONS        600.0      955.0  TYPE       1  TARGET       356.000
186210.00     10.07    724.67      0.0     724.63    724.97      0.30      0.11      0.02    718.90
    5300.       691.    4609.       0.       481.     981.        0.     1005.      111. 100000.00
     2.18       1.44      4.70      0.0     0.050     0.035     0.050     0.034    714.60    600.00
 0.000744      150.      150.     150.         2         0         0       0.0    352.86    952.86


CCHV     0.100 CEHV     0.300
1490 NH CARD USED
*SECNO 187460.000

3470 ENCROACHMENT STATIONS        634.0     1325.0  TYPE       1  TARGET       691.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        724.90 ELREA     100000.00

187460.00     14.86    725.26      0.0     725.21    725.28      0.02      0.29      0.03    724.90
    5300.        0.    5300.       0.        0.     4415.        0.     1086.      125. 100000.00
     2.45       0.0      1.20      0.0     0.050     0.086     0.050     0.035    710.40    634.00
 0.000117     1150.     1200.     900.         2         0         0       0.0    666.45   1300.45


1490 NH CARD USED
*SECNO 189960.000

3470 ENCROACHMENT STATIONS        140.0      650.0  TYPE       1  TARGET       510.000
189960.00     10.61    725.61      0.0     725.57    725.65      0.03      0.36      0.00    725.90
    5300.        0.    5250.      50.        0.     3546.       91.     1307.      157.    723.30
     2.91       0.0      1.48     0.54     0.050     0.088     0.060     0.036    715.00    141.34
 0.000203     1900.     2400.    2000.         2         0         0       0.0    508.66    650.00


1490 NH CARD USED
*SECNO 191085.000
   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS    BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST


3470 ENCROACHMENT STATIONS        800.0     1529.0  TYPE       1  TARGET       729.000
191085.00     10.56    725.76      0.0     725.72    725.79      0.03      0.14      0.00    721.60
    5300.       297.    5003.       0.       608.     3681.        0.     1397.      171. 100000.00
     3.12       0.49      1.36      0.0     0.070     0.070     0.060     0.037    715.20    800.00
 0.000104       800.     1000.     850.         0         0         0       0.0    714.98   1514.98


1490 NH CARD USED
*SECNO 192210.000
```

```
3470 ENCROACHMENT STATIONS        100.0      850.0  TYPE       1  TARGET        750.000
192210.00     12.42    725.92      0.0     725.88    725.95      0.03      0.16      0.00    728.20
    5300.        0.     5258.      42.        0.     3496.       51.     1484.      186.    721.00
     3.30       0.0      1.50     0.82     0.070     0.054     0.070     0.037    713.50    120.01
 0.000303       600.     1000.     700.         2         0         0       0.0    729.99    850.00


1490 NH CARD USED
CCHV     0.300 CEHV     0.500
*SECNO 195585.000

3470 ENCROACHMENT STATIONS         31.0      400.0  TYPE       1  TARGET        369.000
195585.00     12.35    727.45      0.0     727.38    727.71      0.27      1.64      0.12    722.50
    5300.        0.     3974.    1326.        0.      845.      952.     1677.      225.    724.00
     3.53       0.0      4.70     1.39     0.080     0.042     0.080     0.038    715.10     31.00
 0.001028       800.     3375.    2200.         2         0         0       0.0    369.00    400.00


*SECNO 196440.000

3470 ENCROACHMENT STATIONS          0.0      350.0  TYPE       1  TARGET        349.999
196440.00     14.97    727.77      0.0     727.71    728.27      0.50      0.44      0.12    722.40
    5300.       252.     4818.     229.      200.      815.      230.     1695.      229.    724.20
     3.56       1.26      5.92     1.00     0.070     0.034     0.060     0.038    712.80     74.06
 0.000758       500.      500.     500.         0         0         0       0.0    275.93    350.00


CCHV     0.300 CEHV     0.500
*SECNO 196510.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA        735.00 ELREA        735.00


        BRIDGE ST. BRIDGE,LENGTH 150 FT WIDTH 35 FT


        SKEWED BY A FACTOR OF 0.77

196510.00     14.04    727.84      0.0     727.79    728.72      0.88      0.27      0.19    723.60
    5300.        0.     5300.       0.        0.      705.        0.     1701.      230.    724.50
     3.57       0.0      7.52      0.0     0.050     0.030     0.050     0.038    713.80    162.47
 0.001221       280.     280.     280.         2         0         0       0.0     72.38    234.85


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.00      1.50      2.50      0.0       80.00     2.50      1253.20   0.60      718.00    718.00

*SECNO 196511.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IOC       ICONT     CORAR     TOPWID      ENDST


CLASS A LOW FLOW

3420 BRIDGE W.S.     727.80 BRIDGE VELOCITY ,      6.49     CALCULATED CHANNEL AREA ,      817.

 EGPRS      EGLWC      H3        QWEIR     QPR       BAREA     TRAPEZOID      ELLC      ELTRD
                                                                AREA
     0.0    728.78     0.07        0.     5300.     1253.     1221.      732.20    735.00
```

```
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.00 ELREA       735.00

196511.00     14.11    727.91      0.0     727.86    728.78      0.87      0.05      0.0    723.60
    5300.        0.     5300.       0.        0.      710.        0.     1701.      230.    724.50
     3.57       0.0      7.47      0.0     0.050     0.030     0.050     0.038   713.80    162.47
 0.001195       40.       40.      40.         0         0         0       0.0    72.38    234.85


1490 NH CARD USED
*SECNO 196560.000

3470 ENCROACHMENT STATIONS        155.0      270.0  TYPE       1  TARGET       115.000
196560.00     14.08    728.58      0.0     728.54    728.99      0.42      0.08      0.13   722.40
    5300.       135.     5063.     103.       63.      961.       44.     1703.      230.    722.80
     3.57       2.15      5.27     2.35     0.035     0.034     0.034     0.038   714.50    155.00
 0.000593       100.      100.     100.         2         0         0       0.0   115.00    270.00


CCHV     0.100 CEHV     0.300
1490 NH CARD USED
*SECNO 198285.000

3470 ENCROACHMENT STATIONS        313.0      480.0  TYPE       1  TARGET       167.000
198285.00     13.22    729.42      0.0     729.38    729.57      0.15      0.55      0.03   723.10
    5300.        0.     5300.       0.        0.     1701.        0.     1758.      236. 100000.00
     3.73       0.0      3.12      0.0     0.035     0.100     0.034     0.038   716.20    313.00
 0.000203      1700.     1700.    1700.         2         0         0       0.0   163.83    476.83


CCHV     0.200 CEHV     0.400
1490 NH CARD USED
*SECNO 199035.000

3470 ENCROACHMENT STATIONS          0.0      300.0  TYPE       1  TARGET       299.999
199035.00     13.31    729.61      0.0     729.57    729.81      0.21      0.22      0.02   726.70
    5300.       160.     3156.    1984.      101.      728.      840.     1787.      239.    723.20
     3.79       1.59      4.33     2.36     0.034     0.040     0.040     0.037   716.30      5.63
 0.000483       750.      750.     750.         2         0         0       0.0   294.36    300.00


CCHV     0.200 CEHV     0.400
*SECNO 199735.000

3470 ENCROACHMENT STATIONS        450.0      700.0  TYPE       1  TARGET       250.000
199735.00     14.01    729.91      0.0     729.88    730.08      0.17      0.26      0.01   727.80
    5300.        95.     3782.    1423.       93.     1043.      645.     1815.      244.    722.30
     3.85       1.03      3.63     2.21     0.035     0.033     0.035     0.037   715.90    450.00
 0.000269       725.      725.     725.         2         0         0       0.0   250.00    700.00


CCHV     0.100 CEHV     0.300
*SECNO 199736.000
   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS    BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN       SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID      ENDST


3470 ENCROACHMENT STATIONS        450.0      700.0  TYPE       1  TARGET       250.000
199736.00     12.55    729.85      0.0     729.82    730.11      0.26      0.01      0.03   726.90
    5300.       191.     4426.     682.      143.      999.      420.     1816.      244.    726.90
     3.85       1.34      4.43     1.62     0.045     0.032     0.045     0.037   717.30    450.00
 0.000437        20.       20.      20.         2         0         0       0.0   250.00    700.00
```

```
*SECNO 199785.000

3370 NORMAL BRIDGE,NRD  12 MIN ELTRD   725.30 MAX ELLC   732.50


3470 ENCROACHMENT STATIONS      450.0     700.0  TYPE      1  TARGET      250.000

        HASTINGS ST. FOOT BRIDGE,LENGTH 100 FT WIDTH 5 FT

199785.00    12.62   729.92     0.0    729.88   730.12     0.20     0.00     0.01   726.90
    5300.      354.    3692.   1254.     146.     943.     427.    1816.     244.    726.90
     3.85     2.43     3.92    2.93    0.045    0.032    0.045    0.037   717.30   450.00
 0.001398       1.       1.      1.        2        0        0   -61.60   250.00   700.00


*SECNO 199786.000

3370 NORMAL BRIDGE,NRD  12 MIN ELTRD   725.30 MAX ELLC   732.50


3470 ENCROACHMENT STATIONS      450.0     700.0  TYPE      1  TARGET      250.000
199786.00    12.62   729.92     0.0    729.89   730.13     0.20     0.01     0.00   726.90
    5300.      355.    3690.   1255.     146.     943.     428.    1816.     244.    726.90
     3.85     2.43     3.91    2.93    0.045    0.032    0.045    0.037   717.30   450.00
 0.001395       5.       5.      5.        0        0        0   -61.60   250.00   700.00


*SECNO 199787.000

3470 ENCROACHMENT STATIONS      450.0     700.0  TYPE      1  TARGET      250.000
199787.00    12.58   729.89     0.0    729.85   730.14     0.26     0.00     0.02   726.90
    5300.      193.    4419.    688.     144.    1002.     424.    1816.     244.    726.90
     3.85     1.34     4.41    1.62    0.045    0.032    0.045    0.037   717.30   450.00
 0.000432       1.       1.      1.        2        0        0      0.0   250.00   700.00


*SECNO 199835.000

3470 ENCROACHMENT STATIONS        0.0     700.0  TYPE      1  TARGET      699.999
199835.00    13.51   730.01     0.0    729.98   730.16     0.15     0.01     0.01   726.50
    5300.      338.    4173.    789.     372.    1220.     537.    1817.     244.    722.30
     3.85     0.91     3.42    1.47    0.045    0.032    0.045    0.037   716.50   340.00
 0.000225      20.      20.     20.        2        0        0      0.0   360.00   700.00


CCHV    0.100 CEHV    0.300
*SECNO 200860.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS      489.0     800.0  TYPE      1  TARGET      311.000

        GAGE LOCATION ON RIGHT BANK 270 FT DOWNSTREAM


        FROM SUPERIOR ST. BRIDGE

200860.00    14.15   730.15     0.0    730.12   730.40     0.25     0.21     0.03   729.30
    5300.        0.    5055.    245.       0.    1228.     285.    1848.     250.    729.60
     3.90      0.0     4.12    0.86    0.045    0.033    0.045    0.037   716.00   489.00
```

```
 0.000396     800.     700.     300.        2        0        0     0.0    311.00    800.00


*SECNO 200910.000

3470 ENCROACHMENT STATIONS       450.0      800.0  TYPE       1  TARGET       350.000

        SUPERIOR ST. BRIDGE,LENGTH 123 FT WIDTH 59 FT

200910.00    12.85   730.15      0.0    730.13   730.58     0.43     0.13     0.05   722.40
    5300.      135.    5009.     156.      78.     929.      98.    1856.      252.   722.40
     3.92     1.73     5.39     1.60    0.045    0.033    0.045    0.037   717.30   450.00
 0.000599     270.     270.     270.        2        0        0     0.0    350.00   800.00


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHG     ELCHD
     1.25      1.89      2.80      0.0       85.00     7.00    728.90      1.07    718.50    718.50

*SECNO 200911.000
PRESSURE AND WEIR FLOW


 EGPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                              AREA
   731.70    730.66    0.08      983.     4330.      729.      808.      727.70    729.30


3470 ENCROACHMENT STATIONS       450.0      850.0  TYPE       1  TARGET       400.000
200911.00    13.55   730.85      0.0    730.83   731.19     0.34     0.61     0.0    722.40
    5300.      179.    4845.     276.     125.     987.     265.    1858.      253.   722.40
     3.92     1.43     4.91     1.04    0.045    0.033    0.045    0.037   717.30   450.00
 0.000457      60.      60.      60.        2        0        2     0.0    400.00   850.00


*SECNO 200960.000

3470 ENCROACHMENT STATIONS       400.0      800.0  TYPE       1  TARGET       400.000
200960.00    13.67   731.07      0.0    731.05   731.24     0.17     0.03     0.02   728.70
    5300.       87.    4772.     441.     124.    1363.     428.    1861.      254.   726.60
     3.93     0.70     3.50     1.03    0.045    0.033    0.045    0.037   717.40   440.00
 0.000253     100.     100.     100.        2        0        0     0.0    360.00   800.00


CCHV    0.100 CEHV    0.300
*SECNO 201460.000

3470 ENCROACHMENT STATIONS       500.0      820.0  TYPE       1  TARGET       320.000
201460.00    12.42   731.02      0.0    731.00   731.35     0.33     0.07     0.05   729.80
    5300.       65.    5211.      25.      97.    1119.      47.    1868.      255.   729.70
     3.94     0.67     4.66     0.52    0.050    0.033    0.050    0.037   718.60   500.00
 0.000530     185.     185.     185.        2        0        0     0.0    284.84   784.83


CCHV    0.300 CEHV    0.500
*SECNO 201510.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST
```

```
3470 ENCROACHMENT STATIONS        450.0      800.0  TYPE        1  TARGET        350.000

        C&O R.R. BRIDGE,LENGTH 101 FT,WIDTH 14 FT

201510.00     12.85    731.15      0.0     731.14    731.53      0.38      0.16      0.02    734.60
    5300.        0.     5300.       0.         0.     1070.        0.     1876.      256.    734.80
     3.96       0.0      4.95      0.0      0.050     0.033     0.050     0.037    718.30    605.00
 0.000594      280.      280.     280.          2         0         0       0.0     39.00    594.00


SPECIAL BRIDGE

SB  XK        XKOR       COFQ      RDLEN      BWC       BWP      BAREA       SS      ELCHU     ELCHD
     0.90      1.51       2.50       0.0     96.00      4.50    796.70      0.0     719.00    719.00

*SECND 201511.000
PRESSURE FLOW


 EGPRS      EGLWC        HB       QWEIR       QPR      BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
   732.19    731.55      0.02         0.     5300.      797.      805.      727.80    733.30


3470 ENCROACHMENT STATIONS        450.0      800.0  TYPE        1  TARGET        350.000
201511.00     13.55    731.85      0.0     731.83    732.19      0.34      0.66      0.0     734.60
    5300.        0.     5300.       0.         0.     1132.        0.     1876.      256.    734.80
     3.96       0.0      4.68      0.0      0.050     0.033     0.050     0.037    718.30    605.00
 0.000501       14.       14.      14.          2         0         0       0.0     89.00    694.00


1490 NH CARD USED
*SECNO 201560.000

3470 ENCROACHMENT STATIONS        580.0      780.0  TYPE        1  TARGET        200.000
201560.00     13.78    731.98      0.0     731.96    732.25      0.27      0.04      0.02    722.60
    5300.      503.     4791.       6.       423.     1088.       20.     1879.      257.    731.30
     3.96      1.19      4.40     0.28      0.100     0.033     0.050     0.037    718.20    580.00
 0.000387      100.      100.     100.          2         0         0       0.0    192.83    772.83


CCHV    0.100 CEHV    0.300
*SECNO 202435.000

3470 ENCROACHMENT STATIONS        420.0      700.0  TYPE        1  TARGET        280.000
202435.00     15.84    732.24      0.0     732.22    732.44      0.20      0.18      0.01    723.00
    5300.      634.     4543.     123.       557.     1186.      192.     1901.      259.    726.80
     4.01      1.14      3.83     0.64      0.080     0.035     0.080     0.037    716.40    420.00
 0.000264      555.      555.     555.          1         0         0       0.0    229.75    649.75


CCHV    0.300 CEHV    0.500
*SECNO 202485.000

3470 ENCROACHMENT STATIONS        420.0      700.0  TYPE        1  TARGET        280.000

        ANN ARBOR R.R. BRIDGE,LENGTH 70 FT,WIDTH 9.75 FT

202485.00     13.92    732.22      0.0     732.21    732.68      0.46      0.11      0.13    720.10
    5300.      114.     5041.     145.        91.      905.     115.     1912.      260.    721.40
     4.02      1.25      5.57     1.26      0.080     0.035     0.080     0.037    718.30    484.94
 0.000569      300.      300.     300.          2         0         0       0.0    106.27    591.22
```

```
SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       1.45      2.50      0.0      70.00      0.0     670.00      0.0     719.00    719.00

*SECNO 202486.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       ARCB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


PRESSURE FLOW

 EGPRS     EGLWC     HB        QWEIR     QPR       BAREA   TRAPEZOID     ELLC      ELTRD
                                                             AREA
  733.63    733.33    0.0        0.      5300.     670.      679.      728.70    734.40


3470 ENCROACHMENT STATIONS      420.0     700.0  TYPE      1  TARGET      280.000
202486.00    14.94   733.24     0.0     733.22    733.63    0.39      0.95      0.0     720.10
   5300.     124.    5015.     162.      107.      977.     137.     1912.     260.     721.40
    4.02     1.15     5.13     1.18     0.080     0.035    0.080     0.037   718.30    483.68
 0.000437     10.      10.      10.        2         0        0       0.0    109.54    593.22


*SECNO 202535.000

3470 ENCROACHMENT STATIONS      420.0     700.0  TYPE      1  TARGET      280.000
202535.00    15.25   733.45     0.0     733.43    733.72    0.27      0.05      0.04    729.00
   5300.     228.    5072.       0.      275.     1191.      0.      1915.     261.     734.40
    4.03     0.83     4.26     0.0      0.080     0.035    0.080     0.037   718.20    420.00
 0.000406    120.     120.     120.        2         0        0       0.0    178.41    598.41


CCHV    0.200 CEHV    0.400
*SECNO 203135.000

3470 ENCROACHMENT STATIONS      400.0     750.0  TYPE      1  TARGET      350.000
203135.00    15.38   733.58     0.0     733.57    733.84    0.25      0.12      0.00    729.00
   5300.     287.    5013.       0.      349.     1203.      0.      1926.     262.     734.40
    4.05     0.82     4.17     0.0      0.080     0.035    0.080     0.037   718.20    400.00
 0.000384    300.     300.     300.        0         0        0       0.0    198.62    598.62


CCHV    0.200 CEHV    0.400
1490 NH CARD USED
*SECNO 203234.000

3265 DIVIDED FLOW

3280 CROSS SECTION 203234.00 EXTENDED      2.32 FEET


3470 ENCROACHMENT STATIONS      100.0     520.0  TYPE      1  TARGET      420.000
203234.00    16.02   733.82     0.0     733.80    733.91    0.10      0.05      0.03    730.40
   5300.     576.    4031.     694.      387.     1439.     713.     1935.     264.     730.80
    4.08     1.49     2.80     0.97     0.030     0.035    0.042     0.037   717.80    100.00
 0.000157    200.     200.     200.        2         0        0       0.0    420.00    520.00


*SECNO 203235.000
```

```
3265 DIVIDED FLOW

3280 CROSS SECTION 203235.00 EXTENDED      2.32 FEET


3370 NORMAL BRIDGE,NRD  14 MIN ELTRD   729.50 MAX ELLC   731.50


3470 ENCROACHMENT STATIONS      100.0      520.0  TYPE      1  TARGET      420.000

        HOODWORTH ST. BRIDGE,LENGTH 107.5 FT,WIDTH 64 FT

203235.00     16.03    733.83      0.0    733.81    733.92      0.09      0.00      0.00    730.40
    5300.     1115.     2840.    1345.      387.     1160.      714.     1936.      264.    730.80
     4.08      2.88      2.45     1.88     0.030     0.035     0.042     0.037    717.80    100.00
 0.000590       10.       10.      10.         0         0         0   -279.28    420.00    520.00

*SECNO 203236.000

3265 DIVIDED FLOW

3280 CROSS SECTION 203236.00 EXTENDED      2.36 FEET

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3370 NORMAL BRIDGE,NRD  14 MIN ELTRD   729.50 MAX ELLC   731.50


3470 ENCROACHMENT STATIONS      100.0      520.0  TYPE      1  TARGET      420.000
203236.00     16.07    733.87      0.0    733.85    733.96      0.09      0.04      0.00    730.40
    5300.     1120.     2822.    1357.      391.     1164.      723.     1939.      264.    730.80
     4.09      2.87      2.42     1.88     0.030     0.035     0.042     0.037    717.80    100.00
 0.000576       64.       64.      64.         1         0         0   -279.28    420.00    520.00

*SECNO 203237.000

3265 DIVIDED FLOW

3280 CROSS SECTION 203237.00 EXTENDED      2.37 FEET


3470 ENCROACHMENT STATIONS      100.0      520.0  TYPE      1  TARGET      420.000
203237.00     16.06    733.86      0.0    733.85    733.96      0.10      0.00      0.00    730.40
    5300.      583.     4011.     707.      392.     1445.      725.     1940.      264.    730.80
     4.09      1.49      2.78     0.97     0.030     0.035     0.042     0.037    717.80    100.00
 0.000154       10.       10.      10.         0         0         0       0.0    420.00    520.00

*SECNO 203335.000

3470 ENCROACHMENT STATIONS      200.0      620.0  TYPE      1  TARGET      420.000
203335.00     17.22    733.92      0.0    733.90    733.98      0.07      0.02      0.01    730.40
    5300.      123.     4305.     871.      179.     1897.      731.     1949.      266.    730.30
     4.11      0.69      2.27     1.19     0.030     0.035     0.030     0.037    716.70    205.22
 0.000091      150.      150.     150.         0         0         0       0.0    414.77    620.00
```

```
CCHV    0.300 CEHV    0.500
*SECNO 203610.000

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000

        STATE ST. BRIDGE,LENGTH 106 FT,WIDTH 42.5 FT

203610.00     15.30    733.90      0.0     733.88    734.06      0.17      0.03      0.05    735.40
    5300.        0.    5116.      184.        0.    1539.      210.    1961.      268.    735.30
     4.13       0.0      3.33      0.88     0.030     0.035     0.030     0.037    718.60    302.00
 0.000233      230.      230.      230.         2         0         0       0.0    294.15    700.00


SPECIAL BRIDGE

SB  XK        XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS        ELCHU      ELCHD
     0.90      1.20       2.90       0.0      102.00      5.00     1278.40      0.0      718.90     718.90

*SECNO 203611.000

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW


 EGPRS       EGLWC       H3        QWEIR       QPR        BAREA    TRAPEZOID      ELLC      ELTRD
                                                                      AREA
   734.14     734.07     0.01       681.      4627.      1278.      1319.       732.50    732.00


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000
203611.00     15.38    733.98      0.0     733.97    734.14      0.16      0.08      0.0     735.40
    5300.        0.    5099.      201.        0.    1547.      226.    1963.      268.    735.30
     4.13       0.0      3.30      0.89     0.030     0.035     0.030     0.037    718.60    302.00
 0.000227       42.       42.       42.         2         0         4       0.0    300.40    700.00


*SECNO 203612.000

3265 DIVIDED FLOW

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        QLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IOC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000

        DAM UPSTREAM OF STATE ST. BRIDGE

203612.00     15.38    733.98      0.0     733.97    734.15      0.17      0.00      0.00    735.40
    5300.        0.    5199.      101.        0.    1573.      157.    1963.      268.    735.30
     4.13       0.0      3.30      0.64     0.030     0.035     0.030     0.037    718.60    302.00
 0.000225       13.       13.       13.         0         0         0       0.0    301.65    700.00
```

```
SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       1.50      3.10      0.0       102.00    0.0       1.00      0.0       718.70    718.70

*SECNO 203613.000

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

 EGPRS      EGLWC      H3        QWEIR     QPR       BAREA     TRAPEZOID     ELLC      ELTRD
                                                                  AREA
655004.12   734.25     0.0       5244.     7.        1.        1.        718.71    729.50


3470 ENCROACHMENT STATIONS      250.0     700.0  TYPE      1  TARGET      450.000
203613.00   16.37     734.97    0.0       734.98    735.10    0.13      0.95      0.0       735.40
   5300.     1.       4952.     347.      4.        1675.     389.      1964.     268.      735.30
    4.13     0.19     2.96      0.89      0.030     0.035     0.030     0.037     718.60    250.00
 0.000169    12.      12.       12.       2         0         18        0.0       396.73    700.00


CCHV    0.300 CEHV    0.500
*SECNO 203614.000

3470 ENCROACHMENT STATIONS      374.0     815.0  TYPE      1  TARGET      441.000
203614.00   13.09     735.09    0.0       735.09    735.15    0.06      0.03      0.02      730.70
   5300.     0.       4569.     731.      0.        2211.     736.      1975.     270.      730.70
    4.16     0.0      2.07      0.99      0.040     0.035     0.040     0.037     722.00    374.00
 0.000128    200.     200.      200.      2         0         0         0.0       441.00    815.00


*SECNO 204485.000

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS      500.0     1368.0 TYPE      1  TARGET     -500.000
204485.00   10.39     735.19    0.0       735.19    735.20    0.02      0.04      0.01      730.70
   5300.     70.      5216.     15.       140.      5250.     43.       2045.     280.      730.70
    4.37     0.50     0.99      0.34      0.040     0.035     0.040     0.037     724.80    500.00
 0.000032    725.     725.      725.      0         0         0         0.0       690.72    1256.68


CCHV    0.100 CEHV    0.300
*SECNO 206860.000

3470 ENCROACHMENT STATIONS      460.0     1150.0 TYPE      1  TARGET     -460.000
206860.00    9.87     735.27    0.0       735.28    735.29    0.02      0.09      0.00      731.50
   5300.    107.      5170.     24.       238.      4475.     58.       2323.     317.      731.00
    4.95     0.45     1.16      0.41      0.040     0.035     0.040     0.037     725.40    460.00
 0.000045   2375.     2375.     2375.     2         0         0         0.0       677.13    1137.13


*SECNO 207985.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


207985.00    9.93     735.33    0.0       735.33    735.37    0.05      0.07      0.01      730.70
   5300.     94.      4726.     480.      197.      2638.     669.      2430.     336.      730.70
```

```
     5.13      0.43      1.79      0.72     0.040     0.035     0.040     0.036    725.40    105.97
 0.000107    1125.     1125.     1125.         1         0         0       0.0    829.54    935.50


*SECND 209110.000
209110.00     10.03    735.43       0.0    735.43    735.45      0.02      0.07      0.00    730.50
    5300.      295.     4992.       13.      586.     4597.       32.     2543.      357.    730.50
     5.43      0.50      1.09      0.40     0.040     0.035     0.040     0.036    725.40    143.69
 0.000038    1125.     1125.     1125.         1         0         0       0.0    767.18    910.87
```

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*************************************************
```

NOTE- ASTERISK * AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

PINE RIVER

SUMMARY PRINTOUT TABLE 110

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
177360.000	722.00	0.0	722.27	140.00	0.0	5300.00	0.0	140.00	480.00	480.00	620.00	620.00
177360.000	722.10	0.10	722.36	140.00	0.0	5300.00	0.0	140.00	480.00	480.00	620.00	620.00
177410.000	721.84	0.0	722.45	86.00	0.0	5300.00	0.0	0.0	0.0	503.00	589.00	0.0
177410.000	721.94	0.10	722.54	86.00	0.0	5300.00	0.0	86.00	503.00	503.00	589.00	589.00
177411.000	722.55	0.0	723.08	86.00	0.0	5300.00	0.0	0.0	0.0	503.00	589.00	0.0
177411.000	722.67	0.11	723.19	86.00	0.0	5300.00	0.0	86.00	503.00	503.00	589.00	589.00
177460.000	723.24	0.0	723.26	689.70	7.48	5263.50	29.02	0.0	0.0	162.00	621.00	0.0
177460.000	723.34	0.10	723.36	457.98	0.0	5300.00	0.0	459.00	162.00	162.00	621.00	621.00
178910.000	723.30	0.0	723.32	732.98	188.79	5111.20	0.0	0.0	0.0	487.00	940.00	0.0
178910.000	723.40	0.10	723.42	617.54	183.10	5116.90	0.0	640.00	300.00	487.00	940.00	940.00
180110.000	723.37	0.0	723.41	591.29	47.82	5252.18	0.0	0.0	0.0	632.49	1018.77	0.0
180110.000	723.47	0.10	723.50	601.28	53.02	5246.98	0.0	0.0	0.0	632.49	1018.77	0.0
180660.000	723.00	0.0	723.96	100.05	0.0	5300.00	0.0	0.0	0.0	876.09	976.14	0.0
180660.000	723.11	0.11	724.04	100.05	0.0	5300.00	0.0	0.0	0.0	876.09	976.14	0.0
180661.000	723.09	0.0	724.03	100.05	0.0	5300.00	0.0	0.0	0.0	876.09	976.14	0.0
180661.000	723.19	0.10	724.10	100.05	0.0	5300.00	0.0	0.0	0.0	876.09	976.14	0.0
180710.000	724.31	0.0	724.32	675.93	62.32	5237.68	0.0	0.0	0.0	382.80	945.69	0.0
180710.000	724.37	0.07	724.38	677.51	63.74	5236.26	0.0	0.0	0.0	382.80	945.69	0.0
182160.000	724.33	0.0	724.34	600.02	74.92	5225.08	0.0	0.0	0.0	331.00	833.00	0.0
182160.000	724.39	0.07	724.41	530.41	33.36	5266.63	0.0	533.00	300.00	331.00	833.00	833.00
184410.000	724.36	0.0	724.37	993.53	0.00	5287.26	12.74	0.0	0.0	32.00	808.00	0.0
184410.000	724.43	0.07	724.43	776.00	0.0	5300.00	0.0	776.00	32.00	32.00	808.00	808.00
185660.000	724.32	0.0	724.44	345.53	0.86	5290.51	8.62	0.0	0.0	700.00	993.00	0.0
185660.000	724.38	0.07	724.51	293.00	0.0	5300.00	0.0	293.00	700.00	700.00	993.00	993.00
185662.000	724.35	0.0	724.73	117.92	0.0	5300.00	0.0	0.0	0.0	610.00	760.00	0.0
185662.000	724.42	0.06	724.79	118.19	0.0	5300.00	0.0	150.00	610.00	610.00	760.00	760.00

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
185663.000	724.37	0.0	724.74	117.99	0.0	5300.00	0.0	0.0	0.0	610.00	760.00	0.0
185663.000	724.43	0.06	724.80	118.26	0.0	5300.00	0.0	150.00	610.00	610.00	760.00	760.00
186160.000	724.39	0.0	724.77	118.09	0.0	5300.00	0.0	0.0	0.0	610.00	760.00	0.0
186160.000	724.46	0.06	724.82	118.35	0.0	5300.00	0.0	150.00	610.00	610.00	760.00	760.00
186161.000	724.41	0.0	724.78	118.17	0.0	5300.00	0.0	0.0	0.0	610.00	760.00	0.0
186161.000	724.47	0.06	724.84	118.43	0.0	5300.00	0.0	150.00	610.00	610.00	760.00	760.00
186210.000	724.60	0.0	724.91	413.16	676.92	4623.07	0.0	0.0	0.0	835.00	956.00	0.0
186210.000	724.67	0.06	724.97	352.86	690.55	4609.45	0.0	356.00	600.00	835.00	956.00	956.00
187460.000	725.21	0.0	725.23	690.37	0.23	5299.77	0.0	0.0	0.0	634.00	1325.00	0.0
187460.000	725.26	0.05	725.28	666.45	0.0	5299.99	0.0	691.00	634.00	634.00	1325.00	1325.00
189960.000	725.57	0.0	725.61	568.10	0.0	5222.59	77.41	0.0	0.0	140.00	604.00	0.0
189960.000	725.61	0.04	725.65	509.66	0.0	5250.28	49.71	510.00	140.00	140.00	604.00	650.00
191085.000	725.72	0.0	725.75	835.52	338.55	4961.45	0.0	0.0	0.0	976.00	1529.00	0.0
191085.000	725.76	0.04	725.79	714.98	297.46	5002.54	0.0	729.00	800.00	976.00	1529.00	1529.00
192210.000	725.88	0.0	725.91	756.70	0.0	5200.68	99.31	0.0	0.0	100.00	839.00	0.0
192210.000	725.92	0.04	725.95	729.99	0.0	5258.14	41.85	750.00	100.00	100.00	839.00	850.00
195585.000	727.38	0.0	727.66	383.17	24.85	4011.23	1263.92	0.0	0.0	31.00	124.00	0.0
195585.000	727.45	0.06	727.71	369.00	0.0	3974.38	1325.62	369.00	31.00	31.00	124.00	400.00
196440.000	727.71	0.0	728.21	275.55	246.54	4836.14	217.32	350.00	0.00	141.00	211.00	350.00
196440.000	727.77	0.06	728.27	275.93	252.32	4818.46	229.22	350.00	0.00	141.00	211.00	350.00
196510.000	727.79	0.0	728.68	72.38	0.0	5300.00	0.0	0.0	0.0	162.47	234.85	0.0
196510.000	727.84	0.06	728.72	72.38	0.0	5300.00	0.0	0.0	0.0	162.47	234.85	0.0
196511.000	727.86	0.0	728.73	72.38	0.0	5300.00	0.0	0.0	0.0	162.47	234.85	0.0
196511.000	727.91	0.05	728.78	72.38	0.0	5300.00	0.0	0.0	0.0	162.47	234.85	0.0
196560.000	728.54	0.0	728.95	121.89	131.63	5035.64	132.73	0.0	0.0	175.00	260.00	0.0
196560.000	728.58	0.04	728.99	115.00	134.65	5062.56	102.78	115.00	155.00	175.00	260.00	270.00
198285.000	729.38	0.0	729.53	175.61	2.97	5297.02	0.0	0.0	0.0	313.00	480.00	0.0
198285.000	729.42	0.04	729.57	163.83	0.0	5299.99	0.0	167.00	313.00	313.00	480.00	480.00
199035.000	729.57	0.0	729.78	293.94	157.07	3165.29	1977.64	300.00	0.00	59.00	130.00	300.00
199035.000	729.61	0.04	729.81	294.36	160.04	3155.75	1984.21	300.00	0.00	59.00	130.00	300.00
199735.000	729.88	0.0	730.05	250.00	93.18	3787.60	1419.22	250.00	450.00	500.00	590.00	700.00
199735.000	729.91	0.03	730.08	250.00	95.28	3781.64	1423.08	250.00	450.00	500.00	590.00	700.00
199736.000	729.82	0.0	730.08	250.00	188.82	4434.11	677.07	250.00	450.00	500.00	588.00	700.00
199736.000	729.85	0.03	730.11	250.00	191.16	4426.41	682.43	250.00	450.00	500.00	588.00	700.00
199785.000	729.88	0.0	730.09	250.00	350.72	3702.40	1246.88	250.00	450.00	500.00	588.00	700.00
199785.000	729.92	0.03	730.12	250.00	354.23	3691.56	1254.21	250.00	450.00	500.00	588.00	700.00
199786.000	729.89	0.0	730.10	250.00	351.24	3700.80	1247.96	250.00	450.00	500.00	588.00	700.00
199786.000	729.92	0.03	730.13	250.00	354.72	3690.05	1255.23	250.00	450.00	500.00	588.00	700.00

SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
199787.000	729.35	0.0	730.11	250.00	191.22	4426.23	682.55	250.00	450.00	500.00	588.00	700.00
199787.000	729.39	0.03	730.14	250.00	193.47	4418.82	687.71	250.00	450.00	500.00	588.00	700.00
199835.000	729.98	0.0	730.13	360.00	333.13	4180.33	786.53	700.00	0.00	488.00	598.00	700.00
199835.000	730.01	0.03	730.16	360.00	337.81	4173.14	789.04	700.00	0.00	488.00	598.00	700.00
200860.000	730.12	0.0	730.37	311.00	0.0	5061.41	238.59	311.00	489.00	489.00	608.00	800.00
200860.000	730.15	0.03	730.40	311.00	0.0	5055.16	244.84	311.00	489.00	489.00	608.00	800.00
200910.000	730.13	0.0	730.56	350.00	133.53	5012.62	153.85	350.00	450.00	518.00	603.00	800.00
200910.000	730.15	0.03	730.58	350.00	134.95	5008.84	156.21	350.00	450.00	518.00	603.00	800.00
200911.000	730.83	0.0	731.17	400.00	177.68	4850.39	271.92	400.00	450.00	518.00	503.00	850.00
200911.000	730.85	0.02	731.19	400.00	179.07	4844.52	276.40	400.00	450.00	518.00	503.00	850.00
200960.000	731.05	0.0	731.22	360.00	85.77	4776.52	437.71	400.00	400.00	519.00	636.00	800.00
200960.000	731.07	0.02	731.24	360.00	87.08	4772.03	440.89	400.00	400.00	519.00	636.00	800.00
201460.000	731.00	0.0	731.34	283.87	63.10	5213.07	23.83	320.00	500.00	600.00	713.00	820.00
201460.000	731.02	0.02	731.35	284.84	64.84	5210.53	24.63	320.00	500.00	600.00	713.00	820.00
201510.000	731.14	0.0	731.52	89.00	0.0	5300.00	0.0	350.00	450.00	605.00	694.00	800.00
201510.000	731.15	0.02	731.53	89.00	0.0	5300.00	0.0	350.00	450.00	605.00	694.00	800.00
201511.000	731.83	0.0	732.17	89.00	0.0	5300.00	0.0	350.00	450.00	605.00	694.00	800.00
201511.000	731.85	0.02	732.19	89.00	0.0	5300.00	0.0	350.00	450.00	605.00	694.00	800.00
201560.000	731.96	0.0	732.24	191.37	502.96	4791.79	5.25	200.00	580.00	623.00	715.00	780.00
201560.000	731.98	0.02	732.25	192.83	503.08	4791.31	5.60	200.00	580.00	623.00	715.00	780.00
202435.000	732.22	0.0	732.42	229.52	633.47	4543.93	122.59	280.00	420.00	489.00	576.00	700.00
202435.000	732.24	0.02	732.44	229.75	634.04	4542.68	123.28	280.00	420.00	489.00	576.00	700.00
202485.000	732.21	0.0	732.67	106.22	113.60	5041.55	144.84	280.00	420.00	500.00	570.00	700.00
202485.000	732.22	0.02	732.68	106.27	113.75	5041.15	145.09	280.00	420.00	500.00	570.00	700.00
202486.000	733.22	0.0	733.61	109.49	123.53	5015.01	161.46	280.00	420.00	500.00	570.00	700.00
202486.000	733.24	0.02	733.63	109.54	123.69	5014.58	161.73	280.00	420.00	500.00	570.00	700.00
202535.000	733.43	0.0	733.70	178.38	227.26	5072.73	0.0	280.00	420.00	500.00	600.00	700.00
202535.000	733.45	0.02	733.72	178.41	228.48	5071.52	0.0	280.00	420.00	500.00	600.00	700.00
203135.000	733.57	0.0	733.82	198.59	285.88	5014.12	0.0	350.00	400.00	500.00	600.00	750.00
203135.000	733.58	0.02	733.84	198.62	287.32	5012.68	0.0	350.00	400.00	500.00	600.00	750.00
203234.000	733.80	0.0	733.90	420.00	573.59	4036.01	690.40	420.00	100.00	200.00	298.80	520.00
203234.000	733.82	0.01	733.91	420.00	575.53	4030.59	693.89	420.00	100.00	200.00	298.80	520.00
203235.000	733.81	0.0	733.90	420.00	1112.96	2847.08	1339.96	420.00	100.00	200.00	298.80	520.00
203235.000	733.83	0.01	733.92	420.00	1115.01	2840.33	1344.65	420.00	100.00	200.00	298.80	520.00
203236.000	733.85	0.0	733.94	420.00	1118.47	2828.97	1352.56	420.00	100.00	200.00	298.80	520.00
203236.000	733.87	0.01	733.96	420.00	1120.46	2822.43	1357.11	420.00	100.00	200.00	298.80	520.00
203237.000	733.85	0.0	733.95	420.00	580.74	4015.95	703.31	420.00	100.00	200.00	298.80	520.00
203237.000	733.86	0.01	733.96	420.00	582.52	4010.93	706.55	420.00	100.00	200.00	298.80	520.00

SECNO	CWSEL	DIFKWS	EG	TOP.WID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
203335.000	733.90	0.0	733.97	414.37	122.29	4309.21	868.50	420.00	200.00	307.00	440.00	620.00
203335.000	733.92	0.01	733.98	414.77	123.28	4305.45	871.26	420.00	200.00	307.00	440.00	620.00
203610.000	733.88	0.0	734.05	293.14	0.0	5118.56	181.44	450.00	250.00	302.00	404.00	700.00
203610.000	733.90	0.01	734.06	294.15	0.0	5115.87	184.13	450.00	250.00	302.00	404.00	700.00
203611.000	733.97	0.0	734.13	299.35	0.0	5101.77	198.23	450.00	250.00	302.00	404.00	700.00
203611.000	733.98	0.01	734.14	300.40	0.0	5098.86	201.14	450.00	250.00	302.00	404.00	700.00
203612.000	733.97	0.0	734.13	300.58	0.0	5201.52	98.47	450.00	250.00	302.00	405.00	700.00
203612.000	733.98	0.01	734.15	301.65	0.0	5199.07	100.92	450.00	250.00	302.00	405.00	700.00
203613.000	734.98	0.0	735.10	397.69	0.78	4950.15	349.06	450.00	250.00	302.00	405.00	700.00
203613.000	734.97	-0.01	735.10	396.73	0.74	4952.21	347.04	450.00	250.00	302.00	405.00	700.00
203614.000	735.09	0.0	735.15	445.92	0.0	4584.86	715.15	0.0	0.0	374.00	605.00	0.0
203614.000	735.09	-0.01	735.15	441.00	0.0	4568.53	731.47	441.00	374.00	374.00	605.00	815.00
204485.000	735.19	0.0	735.21	690.96	69.56	5215.46	14.98	-500.00	500.00	535.00	1158.00	1368.00
204485.000	735.19	-0.01	735.20	690.72	69.51	5215.53	14.96	-500.00	500.00	535.00	1158.00	1368.00
206860.000	735.28	0.0	735.30	677.16	106.82	5169.37	23.30	-460.00	460.00	563.00	1110.00	1150.00
206860.000	735.27	-0.01	735.29	677.13	106.58	5169.67	23.75	-460.00	460.00	563.00	1110.00	1150.00
207985.000	735.33	0.0	735.38	830.16	94.81	4724.18	481.02	0.0	0.0	276.00	595.00	0.0
207985.000	735.33	-0.01	735.37	829.54	94.34	4725.66	480.00	0.0	0.0	275.00	595.00	0.0
209110.000	735.43	0.0	735.45	767.36	295.31	4991.96	12.72	0.0	0.0	350.00	898.00	0.0
209110.000	735.43	-0.00	735.45	767.18	294.96	4992.34	12.70	0.0	0.0	350.00	898.00	0.0

SUMMARY OF ERRORS

FLOODWAY DATA. PINE RIVER
PROFILE NO. 2

STATION	FLOODWAY WIDTH FT	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
177360.000	140.	1292.	4.1	722.1	722.0	0.1
177410.000	86.	853.	6.2	721.9	721.8	0.1
177411.000	86.	916.	5.8	722.7	722.6	0.1
177460.000	458.	4280.	1.2	723.3	723.2	0.1
178910.000	618.	4832.	1.1	723.4	723.3	0.1
180110.000	601.	3622.	1.5	723.5	723.4	0.1
180660.000	100.	685.	7.7	723.1	723.0	0.1
180661.000	100.	693.	7.6	723.2	723.1	0.1
180710.000	678.	6376.	0.8	724.4	724.3	0.1
182160.000	530.	5230.	1.0	724.4	724.3	0.1
184410.000	776.	8356.	0.6	724.5	724.4	0.1
185660.000	293.	1859.	2.9	724.4	724.3	0.1
185662.000	118.	1085.	4.9	724.5	724.4	0.1
185663.000	118.	1087.	4.9	724.5	724.4	0.1
186160.000	118.	1090.	4.9	724.5	724.4	0.1
186161.000	118.	1092.	4.9	724.5	724.4	0.1
186210.000	353.	1462.	3.6	724.7	724.6	0.1
187460.000	666.	4415.	1.2	725.2	725.2	0.0
189960.000	509.	3638.	1.5	725.6	725.6	0.0
191085.000	715.	4289.	1.2	725.7	725.7	0.0
192210.000	730.	3547.	1.5	725.9	725.9	0.0
195585.000	369.	1797.	2.9	727.5	727.4	0.1
196440.000	276.	1245.	4.3	727.8	727.7	0.1
196510.000	72.	705.	7.5	727.9	727.8	0.1
196511.000	72.	710.	7.5	728.0	727.9	0.1
196560.000	115.	1067.	5.0	728.5	728.5	0.0
198285.000	164.	1701.	3.1	729.4	729.4	0.0
199035.000	294.	1669.	3.2	729.6	729.6	0.0
199735.000	250.	1780.	3.0	729.9	729.9	0.0
199736.000	250.	1562.	3.4	729.8	729.8	0.0
199785.000	250.	1516.	3.5	729.9	729.9	0.0
199786.000	250.	1517.	3.5	729.9	729.9	0.0
199787.000	250.	1570.	3.4	729.9	729.9	0.0
199835.000	360.	2128.	2.5	730.0	730.0	0.0
200860.000	311.	1513.	3.5	730.1	730.1	0.0
200910.000	350.	1104.	4.8	730.1	730.1	0.0
200911.000	400.	1378.	3.8	730.8	730.8	0.0
200960.000	360.	1915.	2.8	731.0	731.0	0.0
201460.000	285.	1264.	4.2	731.0	731.0	0.0
201510.000	89.	1070.	5.0	731.1	731.1	0.0
201511.000	89.	1132.	4.7	731.8	731.8	0.0
201560.000	193.	1531.	3.5	732.0	732.0	0.0
202435.000	230.	1934.	2.7	732.2	732.2	0.0
202485.000	106.	1111.	4.8	732.2	732.2	0.0
202486.000	110.	1222.	4.3	733.2	733.2	0.0
202535.000	178.	1465.	3.6	733.4	733.4	0.0
203135.000	199.	1552.	3.4	733.6	733.6	0.0
203234.000	420.	2539.	2.1	733.8	733.8	0.0
203235.000	420.	2261.	2.3	733.8	733.8	0.0
203236.000	420.	2277.	2.3	733.9	733.9	0.0

FLOODWAY DATA, PINE RIVER
PROFILE NO. 2

STATION	FLOODWAY WIDTH FT	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WATER SURFACE ELEVATION WITHOUT FLOODWAY	DIFFERENCE
203237.000	420.	2562.	2.1	733.9	733.9	0.0
203335.000	415.	2808.	1.9	733.9	733.9	0.0
203610.000	398.	1749.	3.0	733.9	733.9	0.0
203611.000	398.	1773.	3.0	734.0	734.0	0.0
203612.000	398.	1730.	3.1	734.0	734.0	0.0
203613.000	450.	2068.	2.6	735.0	735.0	0.0
203614.000	441.	2946.	1.8	735.1	735.1	0.0
204485.000	757.	5433.	1.0	735.2	735.2	0.0
206860.000	677.	4771.	1.1	735.3	735.3	0.0
207985.000	830.	3504.	1.5	735.3	735.3	0.0
209110.000	767.	5215.	1.0	735.4	735.4	0.0

GOVEA	JGOVEDSS	1932	GO.FT06F001	15.05.04	24 JAN 80	ALMA GOVE	GOVE
GOVEA	JGOVEDSS	1932	GO.FT06F001	15.05.04	24 JAN 80	ALMA GOVE	GOVE
GOVEA	JGOVEDSS	1932	GO.FT06F001	15.05.04	24 JAN 80	ALMA GOVE	GOVE

MCGRAE BUSINESS FORMS, INC. 27

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*************************************************

C
T1      CITY OF ALMA, PROJECT NO. 8546
T2      PINE RIVER
T3      PINE RIVER

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.        4.        0.        0.   0.0        0.0       0.0       0.     722.100    0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1.000     0.0      -1.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0

J5  LPRNT     NUMSEC                      ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000    0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
NC      0.030     0.030     0.035     0.300     0.500     0.0       0.0       0.0       0.0       0.0
QT      6.000  2990.000  4580.000  5300.000  7110.000  5300.000  5300.000  0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       1.500     9.100     0.0     480.000   620.000

X1 177360.000    14.000   480.000   620.000     0.0       0.0       0.0       0.0       0.0       0.0
X3      0.0       0.0       0.0     480.000   725.000   620.000   725.000     0.0       0.0       0.0
GR    722.500     0.0     720.600   200.000   718.100   214.000   714.600   280.000   710.800   350.000
GR    710.800   415.000   713.900   480.000   712.200   545.000   708.400   570.000   712.600   590.000
GR    718.100   614.000   721.100   620.000   721.800   700.000   727.000  1100.000     0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0     503.000   589.000

        WASHINGTON ST. BRIDGE -ST. LOUIS , LENGTH 92 FT WIDTH 41 FT

X1 177410.000    14.000   503.000   589.000    10.000    10.000    10.000     0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     725.000   725.000     0.0
GR    726.000     0.0     725.400   200.000   725.400   500.000   725.400   503.000   713.000   503.000
GR    712.200   523.000   711.500   545.000   711.700   548.500   709.000   570.000   718.100   589.000
GR    725.400   589.000   725.400   592.000   725.700   700.000   727.200  1100.000     0.0       0.0
SB      0.900     1.760     2.500     0.0      86.000     3.500   784.000     0.0     712.000   712.000
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0     503.000   589.000

X1 177411.000     0.0       0.0       0.0      40.000    40.000    40.000     0.0       0.0       0.0
X2      0.0       0.0       1.000   721.800   725.400     0.0       0.0       0.0       0.0       0.0
X3     10.000     0.0       0.0       0.0       0.0       0.0       0.0     725.400   725.400     0.0
BT     12.000     0.0     726.000     0.0     200.000   725.400     0.0     500.000   725.400     0.0
BT    503.000   725.400     0.0     523.000   725.400     0.0     545.000   725.400     0.0     548.500
BT    725.400     0.0     570.000   725.400     0.0     589.000   725.400     0.0     592.000   725.400
BT      0.0     700.000   725.400     0.0    1100.000   727.200     0.0       0.0       0.0       0.0
ET      0.0       0.0       0.0       0.0       0.0       0.0       9.100     0.0     162.000   621.000

X1 177460.000    14.000   162.000   621.000   200.000   200.000   200.000     0.0       0.0       0.0
GR    724.200     0.0     722.300   162.000   718.100   168.000   714.400   245.000   715.800   320.000
```

GR	712.500	395.000	714.300	470.000	710.600	545.000	709.700	565.000	709.400	590.000
GR	718.100	613.000	724.100	621.000	721.800	700.000	727.400	1100.000	0.0	0.0
NC	0.060	0.070	0.040	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	300.000	940.000
X1	178910.000	12.000	487.000	940.000	1350.000	1350.000	1350.000	0.0	0.0	0.0
GR	725.500	0.0	724.400	100.000	721.600	300.000	719.300	487.000	717.800	497.000
GR	712.000	565.000	711.400	635.000	712.000	705.000	712.000	775.000	713.800	840.000
GR	717.800	910.000	740.100	940.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.035	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	180110.000	15.000	727.000	1171.000	1300.000	1300.000	1300.000	0.870	0.0	0.0
GR	727.500	0.0	724.200	300.000	724.100	400.000	721.300	727.000	719.000	733.000
GR	715.800	800.000	715.000	865.000	715.300	935.000	711.200	1000.000	706.600	1015.000
GR	708.200	1035.000	719.000	1157.000	726.100	1171.000	728.400	1200.000	730.100	1300.000
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STATE ST. BRIDGE-ST.LOUIS ,LENGTH 122 FT WIDTH 20 FT

SKEWED BY A FACTOR OF 0.87

X1	180660.000	16.000	1007.000	1122.000	400.000	400.000	400.000	0.870	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	725.600	727.800	0.0
GR	727.700	0.0	724.800	300.000	724.500	400.000	725.600	1000.000	720.400	1007.000
GR	720.400	1010.000	719.000	1010.000	715.600	1030.000	714.600	1050.000	714.200	1070.000
GR	714.200	1092.000	719.000	1101.000	720.200	1122.000	727.800	1122.000	728.700	1200.000
GR	730.400	1300.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB	1.250	1.500	2.500	0.0	115.000	2.000	870.000	0.0	717.000	717.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	180661.000	0.0	0.0	0.0	20.000	20.000	20.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	724.800	724.500	0.0	0.0	0.0	0.870	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	725.600	728.700	0.0
BT	14.000	0.0	727.700	0.0	300.000	724.800	0.0	400.000	724.500	0.0
BT	1000.000	725.600	0.0	1007.000	725.700	0.0	1010.000	725.800	0.0	1030.000
BT	726.100	0.0	1050.000	726.300	0.0	1070.000	726.300	0.0	1092.000	727.000
BT	0.0	1101.000	727.200	0.0	1122.000	727.800	0.0	1200.000	728.700	0.0
BT	1300.000	730.400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	180710.000	14.000	440.000	1087.000	200.000	200.000	200.000	0.870	0.0	0.0
GR	728.200	0.0	724.500	300.000	719.000	440.000	714.200	550.000	716.200	665.000
GR	715.400	775.000	709.100	890.000	706.500	1000.000	709.200	1025.000	715.100	1048.000
GR	719.000	1071.000	726.800	1087.000	728.800	1200.000	730.200	1300.000	0.0	0.0
NC	0.060	0.060	0.030	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	300.000	833.000
X1	182160.000	15.000	331.000	833.000	1300.000	1300.000	1300.000	0.0	0.0	0.0
GR	732.700	0.0	730.600	200.000	722.100	241.000	719.900	331.000	718.200	343.000
GR	714.100	420.000	714.200	500.000	714.900	580.000	708.600	660.000	713.400	740.000
GR	718.200	819.000	725.800	833.000	725.900	933.000	727.000	1133.000	726.400	1333.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	32.000	808.000
X1	184410.000	13.000	32.000	808.000	2250.000	2250.000	2250.000	0.0	0.0	0.0
GR	737.100	0.0	737.200	5.000	724.200	32.000	718.000	46.000	709.700	155.000
GR	714.100	260.000	713.600	370.000	712.500	480.000	713.600	585.000	712.700	695.000
GR	718.000	800.000	722.500	808.000	727.000	1331.000	0.0	0.0	0.0	0.0
NC	0.050	0.050	0.035	0.200	0.400	0.0	0.0	0.0	0.0	0.0
NH	5.000	0.050	744.000	0.100	794.000	0.035	988.000	0.100	993.000	0.050

NH	1305.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	700.000	993.000
X1	185660.000	17.000	700.000	993.000	1250.000	1250.000	1250.000	0.0	0.0	0.0
GR	731.800	0.0	727.700	200.000	725.700	400.000	725.000	600.000	724.000	700.000
GR	721.100	744.000	718.900	794.000	717.600	880.000	716.600	890.000	710.600	900.000
GR	714.700	940.000	718.900	988.000	722.700	993.000	724.400	1015.000	726.700	1100.000
GR	728.300	1200.000	730.000	1300.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.050	0.050	0.035	0.300	0.500	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	610.000	760.000

US-27 NORTHBOUND BRIDGE,LENGTH 150 FT WIDTH 48 FT

X1	185662.000	19.000	610.000	760.000	300.000	300.000	300.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	735.000	735.000	0.0
GR	735.400	0.0	735.100	200.000	735.000	400.000	735.000	570.000	727.700	610.000
GR	725.700	628.000	718.900	635.000	713.800	645.000	711.800	658.000	709.400	662.000
GR	714.300	685.000	713.200	708.000	714.400	712.000	715.700	725.000	718.900	730.000
GR	725.200	750.000	727.700	760.000	735.400	800.000	735.600	1000.000	0.0	0.0
SB	0.900	1.500	2.500	0.0	77.000	4.000	2081.300	1.900	713.000	713.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	610.000	760.000
X1	185663.000	0.0	0.0	0.0	50.000	50.000	50.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	731.700	735.800	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	735.800	735.800	0.0
BT	9.000	0.0	735.400	0.0	200.000	735.100	0.0	400.000	735.000	0.0
BT	610.000	735.800	0.0	658.000	735.800	0.0	708.000	735.900	0.0	760.000
BT	735.900	0.0	800.000	735.400	0.0	1000.000	735.600	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	610.000	760.000

US-27 SOUTHBOUND BRIDGE,LENGTH 150 FT WIDTH 48 FT

X1	186160.000	0.0	0.0	0.0	30.000	30.000	30.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	735.000	735.000	0.0
SB	0.900	1.500	2.500	0.0	77.000	4.000	2081.300	1.900	713.000	713.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	610.000	760.000
X1	186161.000	0.0	0.0	0.0	50.000	50.000	50.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	731.800	735.800	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	735.800	735.800	0.0
BT	9.000	0.0	735.400	0.0	200.000	735.100	0.0	400.000	735.000	0.0
BT	610.000	735.800	0.0	658.000	735.800	0.0	708.000	735.900	0.0	760.000
BT	735.900	0.0	800.000	735.400	0.0	1000.000	735.600	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	600.000	956.000
X1	186210.000	14.000	835.000	956.000	150.000	150.000	150.000	0.0	0.0	0.0
GR	732.100	0.0	729.100	200.000	726.000	400.000	724.000	600.000	722.000	800.000
GR	718.900	835.000	714.600	865.000	715.000	890.000	714.600	915.000	718.900	943.000
GR	726.500	956.000	727.000	1000.000	731.400	1200.000	732.800	1300.000	0.0	0.0
NC	0.080	0.080	0.042	0.100	0.300	0.0	0.0	0.0	0.0	0.0
NH	6.000	0.080	634.000	0.100	644.000	0.042	727.000	0.100	761.000	0.050
NH	1185.000	0.080	1420.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	634.000	1325.000
X1	187460.000	21.000	634.000	1325.000	1150.000	900.000	1200.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GR	731.700	0.0	727.700	234.000	727.400	434.000	724.900	634.000	719.900	644.000
GR	713.900	665.000	710.400	685.000	713.900	705.000	719.900	727.000	720.800	729.000
GR	720.800	736.000	719.900	761.000	716.900	820.000	717.000	880.000	717.300	940.000

```
GR     717.900    1000.000     713.700    1060.000     719.000    1120.000     719.900    1185.000     726.400    1325.000
GR     730.100    1420.000       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
NH       5.000       0.060     140.000       0.100     240.000       0.042     480.000       0.100     580.000       0.060
NH     800.000       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
ET       0.0        0.0        0.0        0.0        0.0        0.0        9.100      0.0      140.000     650.000

X1 189960.000      16.000     140.000     604.000    1900.000    2000.000    2400.000       0.0        0.0        0.0
GR     728.300       0.0      725.900     140.000     717.400     180.000     717.200     240.000     716.900     300.000
GR     717.600     360.000     718.000     420.000     718.300     480.000     715.000     518.000     717.800     550.000
GR     719.900     580.000     720.100     594.000     723.300     604.000     724.300     674.000     724.500     700.000
GR     735.600     800.000       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
NH       3.000       0.070     990.000       0.040    1502.000       0.070    1561.000       0.0        0.0        0.0
ET       0.0        0.0        0.0        0.0        0.0        0.0        9.100      0.0      800.000    1529.000

X1 191085.000      18.000     976.000    1529.000     800.000     850.000    1000.000       0.0        0.0        0.0
GR     732.700       0.0      730.800     100.000     729.100     200.000     730.000     400.000     727.500     600.000
GR     723.000     800.000     721.600     976.000     720.900     990.000     718.300    1150.000     717.900    1200.000
GR     719.800    1300.000     718.000    1400.000     715.200    1435.000     718.000    1470.000     720.900    1502.000
GR     731.000    1529.000     730.100    1545.000     735.500    1561.000       0.0        0.0        0.0        0.0
NH       4.000       0.070     100.000       0.060     750.000       0.042     837.000       0.070     918.000       0.0
ET       0.0        0.0        0.0        0.0        0.0        0.0        9.100      0.0      100.000     850.000

X1 192210.000      14.000     100.000     839.000     600.000     700.000    1000.000       0.0        0.0        0.0
GR     733.900       0.0      728.200     100.000     722.500     150.000     722.100     338.000     721.400     538.000
GR     720.200     739.000     720.000     750.000     714.500     770.000     713.500     793.000     717.100     810.000
GR     720.000     837.000     721.000     839.000     721.900     856.000     733.600     918.000       0.0        0.0
NH       3.000       0.070      31.000       0.035     121.000       0.060     418.000       0.0        0.0        0.0
NC       0.0        0.0        0.0        0.300       0.500       0.0        0.0        0.0        0.0        0.0
ET       0.0        0.0        0.0        0.0        0.0        0.0        9.100      0.0       31.000     400.000

X1 195585.000      10.000      31.000     124.000     800.000    2200.000    3375.000       0.0        0.0        0.0
GR     737.300       0.0      722.500      31.000     715.100      53.000     716.200      75.000     718.500      95.000
GR     722.500     121.000     724.000     124.000     724.000     138.000     723.000     318.000     728.100     418.000
NC       0.070       0.060       0.034       0.0        0.0        0.0        0.0        0.0        0.0        0.0
ET       0.0        0.0        0.0        0.0        0.0        0.0        9.100      0.0       80.000     350.000

X1 196440.000      14.000     141.000     211.000     500.000     500.000     500.000       0.0        0.0        0.0
X3       0.0        0.0        0.0        0.0        0.0      350.000       0.0        0.0        0.0        0.0
GR     738.700      14.000     726.700      80.000     722.400     141.000     715.400     157.000     712.800     176.000
GR     714.800     196.000     722.400     210.000     724.200     211.000     725.800     234.000     726.800     311.000
GR     723.900     465.000     720.900     619.000     728.400     773.000     729.600     850.000       0.0        0.0
NC       0.050       0.050       0.030       0.300       0.500       0.0        0.0        0.0        0.0        0.0
ET       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0

BRIDGE ST. BRIDGE,LENGTH 150 FT WIDTH 35 FT

SKEWED BY A FACTOR OF 0.77

X1 196510.000      15.000     211.000     305.000     280.000     280.000     280.000       0.770      0.0        0.0
X3      10.000       0.0        0.0        0.0        0.0        0.0        0.0      735.000     735.000       0.0
GR     736.400       0.0      735.200     100.000     735.700     208.000     723.600     211.000     722.400     217.000
GR     716.600     240.000     714.800     254.000     713.800     262.000     716.600     280.000     722.400     300.000
GR     724.500     305.000     735.000     308.000     733.200     400.000     731.600     600.000     729.300     800.000
SB       1.000       1.500       2.500       0.0        80.000       2.500    1253.200       0.600     718.000     718.000
ET       0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0

X1 196511.000       0.0        0.0        0.0        40.000      40.000      40.000       0.0        0.0        0.0
X2       0.0        0.0       1.000     732.200     735.000       0.0        0.0        0.0        0.770      0.0
X3      10.000       0.0        0.0        0.0        0.0        0.0        0.0      735.000     735.000       0.0
```

BT	8.000	0.0	736.400	0.0	100.000	735.200	0.0	205.000	735.700	0.0
BT	254.000	735.300	0.0	308.000	735.000	0.0	400.000	733.200	0.0	500.000
BT	731.600	0.0	800.000	729.300	0.0	0.0	0.0	0.0	0.0	0.0
NH	3.000	0.035	196.000	0.034	338.000	0.035	600.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	155.000	270.000
X1	196560.000	10.000	175.000	260.000	100.000	100.000	100.000	0.0	0.0	0.0
GR	735.000	100.000	730.000	150.000	722.400	175.000	715.300	193.000	714.500	208.000
GR	714.700	216.000	717.300	239.000	722.800	260.000	725.600	270.000	730.000	280.000
NC	0.040	0.040	0.033	0.100	0.300	0.0	0.0	0.0	0.0	0.0
NH	4.000	0.040	322.000	0.033	464.000	0.100	480.000	0.040	1350.000	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	313.000	480.000
X1	198285.000	20.000	313.000	480.000	1700.000	1700.000	1700.000	0.0	0.0	0.0
GR	732.000	0.0	731.100	100.000	730.100	200.000	729.500	300.000	728.100	313.000
GR	723.000	322.000	717.200	350.000	716.500	380.000	716.200	405.000	716.900	435.000
GR	723.000	464.000	731.000	480.000	732.500	600.000	732.700	700.000	732.300	800.000
GR	733.100	900.000	733.200	1000.000	733.500	1200.000	734.700	1300.000	735.000	1350.000
NC	0.040	0.040	0.034	0.200	0.400	0.0	0.0	0.0	0.0	0.0
NH	3.000	0.034	127.000	0.040	200.000	0.040	950.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	30.000	300.000
X1	199035.000	18.000	59.000	130.000	750.000	750.000	750.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	0.0	0.0	300.000	0.0	0.0	0.0	0.0
GR	730.100	0.0	727.300	32.000	726.700	59.000	722.200	68.000	716.300	85.000
GR	716.700	100.000	718.700	115.000	722.200	127.000	723.200	130.000	724.600	200.000
GR	725.800	300.000	726.700	400.000	728.300	500.000	730.500	600.000	731.100	700.000
GR	731.600	800.000	731.800	900.000	732.100	950.000	0.0	0.0	0.0	0.0
NC	0.035	0.035	0.033	0.200	0.400	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	450.000	700.000
X1	199735.000	14.000	500.000	590.000	725.000	725.000	725.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	700.000	0.0	0.0	0.0	0.0
GR	732.600	0.0	730.900	200.000	727.800	500.000	722.300	501.000	718.500	520.000
GR	715.900	540.000	716.600	565.000	722.300	590.000	725.800	700.000	725.500	800.000
GR	731.100	1100.000	731.700	1300.000	732.400	1500.000	733.000	1700.000	0.0	0.0
NC	0.045	0.045	0.032	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	450.000	700.000
X1	199736.000	14.000	500.000	588.000	20.000	20.000	20.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	700.000	0.0	0.0	0.0	0.0
GR	731.900	0.0	729.200	200.000	727.300	400.000	726.900	500.000	721.400	500.000
GR	718.400	530.000	717.300	560.000	718.100	588.000	726.900	588.000	725.300	700.000
GR	725.800	900.000	730.800	1100.000	731.700	1300.000	732.500	1500.000	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	450.000	700.000

HASTINGS ST. FOOT BRIDGE,LENGTH 100 FT WIDTH 5 FT

X1	199785.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	700.000	0.0	0.0	0.0	0.0
BT	12.000	0.0	731.900	731.900	200.000	729.200	729.200	400.000	727.300	727.300
BT	500.000	726.900	726.200	530.000	726.900	726.200	560.000	726.900	726.200	588.000
BT	726.700	726.000	700.000	725.300	725.300	900.000	725.800	725.800	1100.000	730.800
BT	730.800	1300.000	731.700	731.700	1500.000	732.500	732.500	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	450.000	700.000
X1	199786.000	0.0	0.0	0.0	5.000	5.000	5.000	0.0	0.0	0.0
X2	0.0	0.0	0.0	0.0	0.0	0.0	1.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	700.000	0.0	0.0	0.0	0.0

ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	450.000	700.000
X1	199787.000	0.0	0.0	0.0	1.000	1.000	1.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	700.000	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	340.000	700.000
X1	199835.000	10.000	488.000	598.000	20.000	20.000	20.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	0.0	0.0	700.000	0.0	0.0	0.0	0.0
GR	728.500	340.000	726.500	488.000	722.300	497.000	718.300	525.000	716.500	550.000
GR	716.500	575.000	722.300	598.000	727.200	700.000	726.400	900.000	731.400	1100.000
NC	0.045	0.045	0.033	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	489.000	800.000

GAGE LOCATION ON RIGHT BANK 270 FT DOWNSTREAM

FROM SUPERIOR ST. BRIDGE

X1	200860.000	13.000	489.000	608.000	800.000	800.000	700.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	489.000	0.0	800.000	0.0	0.0	0.0	0.0
GR	730.300	180.000	728.300	300.000	729.000	400.000	729.300	489.000	722.400	503.000
GR	716.600	530.000	716.000	550.000	716.600	570.000	722.400	596.000	729.600	608.000
GR	728.200	700.000	728.700	800.000	732.000	900.000	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	500.000	800.000

SUPERIOR ST. BRIDGE,LENGTH 123 FT WIDTH 59 FT

X1	200910.000	17.000	518.000	603.000	270.000	270.000	270.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	800.000	0.0	0.0	0.0	0.0
GR	732.400	0.0	731.400	100.000	730.300	200.000	729.300	300.000	729.700	400.000
GR	730.100	500.000	722.400	518.000	718.900	540.000	718.400	549.000	717.300	574.000
GR	717.700	580.000	722.400	603.000	730.000	623.000	730.000	630.000	730.100	800.000
GR	730.600	900.000	731.100	1000.000	0.0	0.0	0.0	0.0	0.0	0.0
SB	1.250	1.890	2.800	0.0	85.000	7.000	728.900	1.070	718.500	718.500
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	450.000	800.000
X1	200911.000	0.0	0.0	0.0	60.000	60.000	60.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	727.700	729.300	0.0	0.0	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	850.000	0.0	0.0	0.0	0.0
BT	17.000	0.0	750.000	0.0	100.000	750.000	0.0	200.000	750.000	0.0
BT	450.000	750.000	0.0	450.000	729.800	0.0	500.000	730.100	0.0	518.000
BT	730.600	0.0	540.000	730.600	0.0	549.000	730.700	0.0	574.000	730.700
BT	0.0	580.000	730.700	0.0	603.000	730.500	0.0	623.000	730.000	0.0
BT	630.000	730.000	0.0	800.000	730.100	0.0	800.000	750.000	0.0	1000.000
BT	750.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	440.000	800.000
X1	200960.000	15.000	519.000	636.000	100.000	100.000	100.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	400.000	0.0	800.000	0.0	0.0	0.0	0.0
GR	730.300	440.000	728.700	519.000	722.400	519.000	720.000	520.000	718.300	550.000
GR	717.500	580.000	717.400	600.000	722.400	620.000	726.600	636.000	728.600	700.000
GR	729.400	800.000	731.000	900.000	731.900	1000.000	731.800	1100.000	733.100	1200.000
NC	0.050	0.050	0.033	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	500.000	780.000
X1	201460.000	15.000	600.000	713.000	185.000	185.000	185.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	500.000	0.0	820.000	0.0	0.0	0.0	0.0
GR	730.700	0.0	730.400	100.000	729.900	300.000	730.300	500.000	729.800	600.000
GR	722.600	611.000	718.600	630.000	718.900	650.000	718.700	675.000	722.600	699.000
GR	729.700	713.000	731.300	800.000	732.600	900.000	733.200	1000.000	734.700	1100.000

NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	605.000	694.000

C&O R.R. BRIDGE,LENGTH 101 FT,WIDTH 14 FT

X1	201510.000	16.000	605.000	694.000	280.000	280.000	280.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	800.000	0.0	0.0	0.0	0.0
GR	733.300	0.0	733.500	100.000	733.600	300.000	733.900	500.000	733.900	600.000
GR	734.600	605.000	721.000	605.000	718.300	647.000	718.800	653.000	718.600	575.000
GR	718.700	694.000	734.300	694.000	734.800	701.000	734.500	800.000	735.100	900.000
GR	735.400	1000.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB	0.900	1.510	2.500	0.0	96.000	4.500	796.700	0.0	719.000	719.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	605.000	694.000

X1	201511.000	0.0	0.0	0.0	14.000	14.000	14.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	727.800	733.300	0.0	0.0	0.0	0.0	0.0
X3	0.0	0.0	0.0	450.000	0.0	800.000	0.0	0.0	0.0	0.0
BT	12.000	0.0	733.300	0.0	100.000	733.500	0.0	300.000	733.600	0.0
BT	500.000	733.900	0.0	600.000	734.600	0.0	605.000	734.600	0.0	547.000
BT	734.700	0.0	694.000	734.800	0.0	701.000	734.800	0.0	800.000	734.600
BT	0.0	900.000	735.100	0.0	1000.000	735.400	0.0	0.0	0.0	0.0
NH	3.000	0.100	623.000	0.033	715.000	0.050	1000.000	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	580.000	715.000

X1	201560.000	14.000	623.000	715.000	100.000	100.000	100.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	580.000	0.0	780.000	0.0	0.0	0.0	0.0
GR	727.900	0.0	725.000	100.000	723.800	300.000	721.600	500.000	722.000	500.000
GR	722.600	623.000	719.600	650.000	718.200	670.000	718.500	690.000	722.600	711.000
GR	731.300	715.000	732.300	800.000	733.700	900.000	734.900	1000.000	0.0	0.0
NC	0.080	0.080	0.035	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	420.000	600.000

X1	202435.000	13.000	489.000	576.000	555.000	555.000	555.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	420.000	0.0	700.000	0.0	0.0	0.0	0.0
GR	730.100	0.0	729.100	100.000	728.600	200.000	727.200	300.000	726.000	400.000
GR	723.000	489.000	716.700	510.000	716.400	530.000	717.100	550.000	723.000	573.000
GR	726.800	576.000	728.800	600.000	735.700	700.000	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.300	0.500	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	485.000	590.000

ANN ARBOR R.R. BRIDGE,LENGTH 70 FT,WIDTH 9.75 FT

X1	202485.000	13.000	500.000	570.000	300.000	300.000	300.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	420.000	0.0	700.000	0.0	0.0	0.0	0.0
GR	734.600	0.0	734.400	100.000	734.500	200.000	734.700	300.000	735.500	400.000
GR	736.200	480.000	720.100	500.000	718.500	520.000	718.300	540.000	720.400	560.000
GR	721.400	570.000	736.700	600.000	737.800	700.000	0.0	0.0	0.0	0.0
SB	0.0	1.450	2.500	0.0	70.000	0.0	670.000	0.0	719.000	719.000
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	485.000	590.000

X1	202486.000	0.0	0.0	0.0	10.000	10.000	10.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	728.700	734.400	0.0	0.0	0.0	0.0	0.0
X3	0.0	0.0	0.0	420.000	0.0	700.000	0.0	0.0	0.0	0.0
BT	13.000	0.0	734.600	734.600	100.000	734.400	734.400	200.000	734.500	734.500
BT	300.000	734.700	734.700	400.000	735.500	735.500	480.000	736.200	736.200	500.000
BT	736.700	728.700	520.000	736.700	728.700	540.000	736.700	728.700	560.000	736.900
BT	728.800	570.000	736.900	728.900	600.000	736.700	736.700	700.000	737.800	737.800
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	420.000	600.000

```
X1 202535.000     15.000    500.000   600.000   120.000   120.000   120.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     420.000     0.0     700.000     0.0       0.0       0.0       0.0
GR   731.100      0.0     731.000   100.000   731.100   200.000   730.700   300.000   730.400   400.000
GR   729.900    490.000   729.000   500.000   723.200   501.000   723.000   505.000   718.900   525.000
GR   718.200    545.000   718.600   565.000   723.000   581.000   734.400   600.000   736.100   700.000
NC     0.0        0.0       0.0       0.200     0.400     0.0       0.0       0.0       0.0       0.0
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     400.000   600.000

X1 203135.000     0.0       0.0       0.0     300.000   300.000   300.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     400.000     0.0     750.000     0.0       0.0       0.0       0.0
NC     0.0        0.0       0.0       0.200     0.400     0.0       0.0       0.0       0.0       0.0
NH     5.000      0.030   200.000     0.035   298.800     0.030   370.000     1.000   420.000     0.030
NH   520.000      0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     100.000   520.000

X1 203234.000    15.000   200.000   298.800   200.000   200.000   200.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     100.000     0.0     520.000     0.0       0.0       0.0       0.0
GR   729.500    100.000   730.400   200.000   721.000   200.000   721.000   226.300   720.000   226.300
GR   718.000    236.300   717.800   266.900   718.000   271.300   719.000   282.500   721.000   298.800
GR   730.800    298.800   730.000   370.000   730.000   420.000   731.000   450.000   731.500   520.000
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     100.000   520.000

      WOODWORTH ST. BRIDGE,LENGTH 107.5 FT,WIDTH 64 FT

X1 203235.000     0.0       0.0       0.0      10.000    10.000    10.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     100.000     0.0     520.000     0.0       0.0       0.0       0.0
BT    14.000    100.000   729.500   729.500   200.000   730.400   729.500   200.000   732.400   729.500
BT   226.300    732.800   730.000   236.300   732.800   730.000   266.900   732.800   730.000   271.300
BT   732.800    730.000   282.500   732.600   730.000   298.800   732.800   729.500   298.800   730.800
BT   729.500    370.000   730.000   730.000   420.000   730.000   730.000   450.000   731.000   731.000
BT   520.000    731.500   731.500     0.0       0.0       0.0       0.0       0.0       0.0       0.0
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     100.000   520.000

X1 203236.000     0.0       0.0       0.0      64.000    64.000    64.000     0.0       0.0       0.0
X2     0.0        0.0       0.0       0.0       0.0       0.0       1.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     100.000     0.0     520.000     0.0       0.0       0.0       0.0
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     100.000   520.000

X1 203237.000     0.0       0.0       0.0      10.000    10.000    10.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     100.000     0.0     520.000     0.0       0.0       0.0       0.0
NC     0.030      0.030     0.035     0.0       0.0       0.0       0.0       0.0       0.0       0.0
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     215.000   620.000

X1 203335.000    16.000   307.000   440.000   150.000   150.000   150.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     200.000     0.0     620.000     0.0       0.0       0.0       0.0
GR   735.200      0.0     734.200   100.000   734.100   200.000   730.400   307.000   723.300   308.000
GR   720.400    310.000   716.700   370.000   717.900   400.000   719.200   410.000   723.300   424.000
GR   730.300    440.000   729.600   500.000   729.900   600.000   731.900   700.000   734.200   800.000
GR   735.100    900.000     0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
NC     0.0        0.0       0.0       0.300     0.500     0.0       0.0       0.0       0.0       0.0
ET     0.0        0.0       0.0       0.0       0.0       0.0       9.100     0.0     302.000   700.000

      STATE ST. BRIDGE,LENGTH 106 FT,WIDTH 42.5 FT

X1 203610.000    15.000   302.000   404.000   230.000   230.000   230.000     0.0       0.0       0.0
X3     0.0        0.0       0.0     250.000     0.0     700.000     0.0       0.0       0.0       0.0
GR   735.800      0.0     734.300   100.000   733.900   200.000   735.400   302.000   718.600   302.000
GR   718.900    330.000   718.700   352.000   718.700   367.000   718.900   375.000   719.000   404.000
GR   735.300    404.000   734.000   500.000   732.700   600.000   732.000   700.000   735.700   800.000
```

SB	0.900	1.250	2.900	0.0	102.000	5.000	1278.400	0.0	718.900	718.900
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	250.000	700.000
X1	203611.000	0.0	0.0	0.0	42.000	42.000	42.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	250.000	0.0	700.000	0.0	0.0	0.0	0.0
X2	0.0	0.0	1.000	732.500	732.000	0.0	0.0	0.0	0.0	0.0
BT	11.000	0.0	750.000	0.0	250.000	750.000	0.0	250.000	734.600	0.0
BT	302.000	735.400	0.0	330.000	735.300	0.0	367.000	735.300	0.0	404.000
BT	735.300	0.0	500.000	734.000	0.0	600.000	732.700	0.0	700.000	732.000
BT	0.0	700.000	750.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	250.000	700.000

DAM UPSTREAM OF STATE ST. BRIDGE

X1	203612.000	16.000	302.000	405.000	13.000	13.000	13.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	250.000	0.0	700.000	0.0	0.0	0.0	0.0
GR	735.800	0.0	734.300	100.000	733.900	200.000	735.400	302.000	718.600	302.000
GR	718.600	330.000	718.700	352.000	718.700	367.000	718.700	375.000	719.000	405.000
GR	735.300	405.000	734.000	500.000	732.700	600.000	733.400	700.000	735.700	800.000
GR	736.100	900.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB	0.0	1.500	3.100	0.0	102.000	0.0	1.000	0.0	718.700	718.700
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	250.000	700.000
X1	203613.000	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	718.710	729.500	0.0	0.0	0.0	0.0	0.0
X3	0.0	0.0	0.0	250.000	0.0	700.000	0.0	0.0	0.0	0.0
BT	16.000	0.0	750.000	0.0	250.000	750.000	0.0	250.000	734.600	0.0
BT	302.000	735.400	0.0	302.000	729.500	0.0	330.000	729.500	0.0	352.000
BT	729.500	0.0	367.000	729.500	0.0	375.000	729.500	0.0	405.000	729.500
BT	0.0	405.000	735.300	0.0	500.000	734.000	0.0	600.000	732.700	0.0
BT	700.000	733.400	0.0	700.000	750.000	0.0	900.000	750.000	0.0	0.0
NC	0.040	0.040	0.035	0.300	0.500	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.0	0.0	9.100	0.0	374.000	815.000
X1	203614.000	11.000	374.000	605.000	200.000	200.000	200.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GR	730.700	374.000	726.200	379.000	724.800	414.000	725.900	476.000	726.400	539.000
GR	722.000	571.000	728.200	602.000	730.700	605.000	731.100	635.000	731.500	775.000
GR	736.300	835.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	204485.000	18.000	535.000	1158.000	725.000	725.000	725.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	500.000	0.0	0.0	0.0	0.0	0.0	0.0
GR	737.100	161.000	735.700	261.000	733.500	361.000	732.800	461.000	730.700	535.000
GR	726.200	554.000	724.800	625.000	725.900	767.000	726.400	909.000	727.100	980.000
GR	728.200	1051.000	730.700	1158.000	735.500	1178.000	736.300	1200.000	735.800	1211.000
GR	735.000	1253.000	735.800	1268.000	737.000	1368.000	0.0	0.0	0.0	0.0
NC	0.0	0.0	0.0	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	206860.000	14.000	563.000	1110.000	2375.000	2375.000	2375.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	460.000	0.0	0.0	0.0	0.0	0.0	0.0
GR	737.300	0.0	735.700	100.000	735.900	200.000	734.900	300.000	734.500	400.000
GR	733.500	500.000	731.500	563.000	731.000	564.000	729.400	613.000	727.000	713.000
GR	726.000	913.000	725.400	1060.000	731.000	1110.000	737.300	1150.000	0.0	0.0
X1	207985.000	16.000	276.000	595.000	1125.000	1125.000	1125.000	0.0	0.0	0.0
GR	735.800	100.000	735.000	110.000	734.500	170.000	733.300	270.000	730.700	276.000
GR	729.400	305.000	727.000	363.000	726.000	479.000	725.400	566.000	730.700	595.000
GR	731.200	600.000	732.300	666.000	733.400	766.000	734.400	860.000	735.000	900.000
GR	740.000	1450.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	209110.000	11.000	350.000	898.000	1125.000	1125.000	1125.000	0.0	0.0	0.0
GR	737.600	0.0	735.100	120.000	731.200	291.000	730.900	300.000	730.500	350.000
GR	729.400	400.000	727.000	500.000	726.000	700.000	725.400	850.000	730.500	898.000
GR	737.000	915.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MOORE BUSINESS FORMS INC 77

```
*PROF 1

CCHV    0.300 CEHV    0.500
*SECNO 177360.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS      480.0     620.0  TYPE      1  TARGET      140.000
 ELENCL      725.00  ELENCR     725.00
177360.00    13.60   722.00      0.0     722.00    722.27      0.27      0.0       0.0     713.90
    5300.       0.    5300.       0.        0.     1278.        0.        0.        0.     725.00
     0.0       0.0     4.15      0.0     0.030     0.035     0.030     0.0     708.40     480.00
 0.000554       0.       0.        0.         0         0         0     0.0     140.00     620.00


FLOW DISTRIBUTION FOR SECNO  177360.00          CWSEL     722.00

STA       480.      620.
  PER Q     100.0
   AREA    1278.3
    VEL       4.1

*SECNO 177410.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.00 ELREA       725.00


        WASHINGTON ST. BRIDGE -ST. LOUIS , LENGTH 92 FT WIDTH 41 FT

177410.00    12.84   721.84      0.0       0.0     722.45      0.61      0.01      0.17     725.40
    5300.       0.    5300.       0.        0.      845.        0.        0.        0.     725.40
     0.00      0.0     6.28      0.0     0.030     0.035     0.030     0.032     709.00     503.00
 0.001284      10.      10.      10.         2         0         0       0.0     86.00     589.00


FLOW DISTRIBUTION FOR SECNO  177410.00          CWSEL     721.84

STA       503.      589.
  PER Q     100.0
   AREA     844.6
    VEL       6.3


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.90      1.76      2.50      0.0      86.00      3.50    784.00      0.0     712.00    712.00

*SECNO 177411.000
PRESSURE FLOW


 EGPRS      EGLWC      H3        QWEIR     QPR       BAREA   TRAPEZOID     ELLC      ELTRD
                                                             AREA
  723.08    722.48     0.04        0.     5300.      784.     809.      721.80    725.40


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.40 ELREA       725.40

177411.00    13.55   722.55      0.0       0.0     723.08      0.53      0.64      0.0     725.40
```

```
    5300.        0.     5300.        0.        0.      907.        0.        1.        0.    725.40
     0.00       0.0      5.85       0.0     0.030     0.035     0.030     0.034    709.00    503.00
 0.001034       40.       40.       40.         2         0         0       0.0     86.00    589.00


FLOW DISTRIBUTION FOR SECNO  177411.00          CWSEL      722.55

STA       503.      589.
  PER Q     100.0
   AREA     906.5
    VEL       5.8

*SECNO 177460.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

177460.00    13.84   723.24       0.0       0.0    723.26      0.02      0.02      0.15   722.30
    5300.       7.     5263.       29.       37.     4234.      109.       13.        2.   724.10
     0.05     0.20     1.24      0.27     0.030     0.035     0.030     0.035    709.40    82.12
 0.000045     200.     200.      200.         2         0         0       0.0    689.70   802.63


FLOW DISTRIBUTION FOR SECNO  177460.00          CWSEL      723.24

STA        82.      162.      621.      700.      803.
  PER Q     0.1      99.3       0.2       0.4
   AREA    37.4    4234.4      35.5      73.7
    VEL     0.2       1.2       0.3       0.3

CCHV    0.100 CEHV    0.300
*SECNO 178910.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


178910.00    11.90   723.30       0.0       0.0    723.32      0.02      0.06      0.00   719.30
    5300.     189.    5111.        0.      602.     4256.        0.      156.       24.   740.10
     0.37     0.31     1.20       0.0     0.060     0.040     0.070     0.039    711.40   184.42
 0.000050    1350.    1350.     1350.         2         0         0       0.0    732.98   917.40


FLOW DISTRIBUTION FOR SECNO  178910.00          CWSEL      723.30

STA       184.      300.      487.      940.
  PER Q     0.2       3.3      96.4
   AREA    86.8     514.7    4256.1
    VEL     0.1       0.3       1.2

*SECNO 180110.000
180110.00    16.77   723.37       0.0       0.0    723.41      0.04      0.08      0.00   721.30
    5300.      48.    5252.        0.      216.     3347.        0.      282.       44.   726.10
     0.60     0.22     1.57       0.0     0.060     0.035     0.060     0.037    706.60   422.79
 0.000076    1300.    1300.     1300.         0         0         0       0.0    591.29  1014.07


FLOW DISTRIBUTION FOR SECNO  180110.00          CWSEL      723.37

STA       423.      632.     1019.
  PER Q     0.9      99.1
   AREA   216.4    3347.4
    VEL     0.2       1.6
```

```
CCHV     0.300 CEHV     0.500
*SECNO 180660.000

3301 HV CHANGED MORE THAN HVINS


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.60 ELREA       727.80


        STATE ST. BRIDGE-ST.LOUIS ,LENGTH 122 FT WIDTH 20 FT


        SKEWED BY A FACTOR OF 0.87

180660.00      8.80    723.00      0.0       0.0    723.96      0.96      0.09      0.46    720.40
    5300.        0.     5300.       0.        0.     674.        0.       301.       47.    727.80
     0.61       0.0      7.86      0.0     0.060    0.035     0.060     0.037    714.20    876.09
 0.002953      400.      400.      400.         2        C         0       0.0    100.05    976.14


FLOW DISTRIBUTION FOR SECNO  180660.00          CWSEL     723.00

STA       876.      976.
  PER Q     100.0
   AREA     673.9
    VEL       7.9


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      1.50      2.50      0.0     115.00      2.00    870.00      0.0     717.00    717.00

*SECNO 180661.000
CLASS A LOW FLOW

3420 BRIDGE W.S.      722.95 BRIDGE VELOCITY ,       7.88      CALCULATED CHANNEL AREA ,       673.

 EGPRS      EGLWC       H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
     0.0    724.03      0.09        0.     5300.      870.      881.      724.80    724.50


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       725.60 ELREA       728.70

180661.00      8.89    723.09      0.0       0.0    724.03      0.93      0.07      0.0     720.40
    5300.        0.     5300.       0.        0.     683.        0.       302.       47.    727.80
     0.61       0.0      7.76      0.0     0.060    0.035     0.060     0.037    714.20    876.09
 0.002828       20.       20.       20.         0        0         0       0.0    100.05    976.14


FLOW DISTRIBUTION FOR SECNO  180661.00          CWSEL     723.09

STA       876.      976.
  PER Q     100.0
   AREA     683.1
    VEL       7.8

*SECNO 180710.000

3301 HV CHANGED MORE THAN HVINS

180710.00     17.81    724.31      0.0       0.0    724.32      0.01      0.01      0.28    719.00
    5300.       62.     5238.       0.       312.    6020.        0.       318.       49.    726.80
```

```
     0.68      0.20      0.87      0.0      0.060     0.035     0.060     0.037    706.50    265.30
 0.000018     200.      200.      200.        2         0         0       0.0    675.93    941.24


FLOW DISTRIBUTION FOR SECNO  180710.00          CWSEL      724.31

STA       265.      383.      946.
  PER Q       1.2      98.8
   AREA     311.7    6019.6
    VEL       0.2       0.9

CCHV     0.100 CEHV     0.300
*SECNO 182160.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CCRAR     TOPWID      ENDST


182160.00    15.73    724.33      0.0       0.0     724.34      0.02      0.02      0.00    719.90
    5300.      75.     5225.       0.       311.     5069.       0.       493.       68.     725.80
     1.03     0.24      1.03      0.0     0.060     0.030     0.060     0.035    708.60    230.26
 0.000020    1300.     1300.     1300.        2         0         0       0.0    600.02    830.26


FLOW DISTRIBUTION FOR SECNO  182160.00          CWSEL      724.33

STA       230.      241.      331.      833.
  PER Q       0.0       1.4      98.6
   AREA      12.0     299.4    5069.4
    VEL       0.1       0.2       1.0

*SECNO 184410.000
184410.00    14.66    724.36      0.0       0.0     724.37      0.01      0.02      0.00    724.20
    5300.       0.     5287.      13.        0.     8306.     203.      851.      109.     722.50
     2.02     0.00      0.64      0.06     0.060     0.030     0.060     0.033    709.70     31.65
 0.000007    2250.     2250.     2250.        0         0         0       0.0    993.53   1025.18


FLOW DISTRIBUTION FOR SECNO  184410.00          CWSEL      724.36

STA        32.      808.     1025.
  PER Q      99.8       0.2
   AREA    8306.0     202.9
    VEL       0.6       0.1

CCHV     0.200 CEHV     0.400
1490 NH CARD USED
*SECNO 185660.000
185660.00    13.72    724.32      0.0       0.0     724.44      0.13      0.03      0.05    724.00
    5300.       1.     5291.       9.        5.     1840.       17.     1000.      128.     722.70
     2.14     0.17      2.88      0.51     0.050     0.098     0.050     0.034    710.60    668.39
 0.000393    1250.     1250.     1250.        2         0         0       0.0    345.53   1013.92


FLOW DISTRIBUTION FOR SECNO  185660.00          CWSEL      724.32

STA       668.      700.      993.     1014.
  PER Q       0.0      99.8       0.2
   AREA       5.0    1839.5      16.9
    VEL       0.2       2.9       0.5

CCHV     0.300 CEHV     0.500
*SECNO 185662.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.00 ELREA       735.00
```

US-27 NORTHBOUND BRIDGE,LENGTH 150 FT WIDTH 48 FT

185662.00	14.95	724.35	0.0	0.0	724.73	0.38	0.16	0.12	727.70
5300.	0.	5300.	0.	0.	1077.	0.	1010.	130.	727.70
2.16	0.0	4.92	0.0	0.050	0.035	0.050	0.034	709.40	629.39
0.000757	300.	300.	300.	2	0	0	0.0	117.92	747.31

FLOW DISTRIBUTION FOR SECNO 185662.00 CWSEL 724.35

STA	629.	760.
PER Q	100.0	
AREA	1077.4	
VEL	4.9	

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.90	1.50	2.50	0.0	77.03	4.00	2031.30	1.90	713.00	713.00

*SECNO 185663.000
CLASS A LOW FLOW

3420 BRIDGE W.S. 724.32 BRIDGE VELOCITY , 4.95 CALCULATED CHANNEL AREA , 1070.

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD
0.0	724.74	0.02	0.	5300.	2031.	2030.	731.70	735.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 735.80 ELREA 735.80

185663.00	14.97	724.37	0.0	0.0	724.74	0.37	0.02	0.0	727.70
5300.	0.	5300.	0.	0.	1079.	0.	1012.	130.	727.70
2.16	0.0	4.91	0.0	0.050	0.035	0.050	0.034	709.40	629.37
0.000753	50.	50.	50.	0	0	0	0.0	117.99	747.36

FLOW DISTRIBUTION FOR SECNO 185663.00 CWSEL 724.37

STA	629.	760.
PER Q	100.0	
AREA	1079.5	
VEL	4.9	

*SECNO 186160.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA 735.00 ELREA 735.00

US-27 SOUTHBOUND BRIDGE,LENGTH 150 FT WIDTH 48 FT

186160.00	14.99	724.39	0.0	0.0	724.77	0.37	0.02	0.00	727.70
5300.	0.	5300.	0.	0.	1082.	0.	1012.	130.	727.70
2.16	0.0	4.90	0.0	0.050	0.035	0.050	0.034	709.40	629.35
0.000748	30.	30.	30.	0	0	0	0.0	118.09	747.43

```
FLOW DISTRIBUTION FOR SECNO  186160.00          CWSEL     724.39

STA       629.      760.
  PER Q     100.0
   AREA    1082.1
    VEL       4.9


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.90      1.50      2.50      0.0      77.00      4.00   2081.30      1.90    713.00    713.00

*SECNO 186161.000
CLASS A LOW FLOW

3420 BRIDGE W.S.     724.36 BRIDGE VELOCITY ,      4.93      CALCULATED CHANNEL AREA ,     1075.

 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                              AREA
     0.0     724.78     0.02        0.     5300.     2081.     2044.      731.80    735.80


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.80 ELREA       735.80

186161.00    15.01   724.41      0.0       0.0    724.78      0.37      0.02      0.0    727.70
    5300.       0.   5300.       0.        0.     1084.        0.     1014.     130.    727.70
     2.16      0.0     4.89      0.0     0.050     0.035     0.050     0.034   709.40   629.33
 0.000743      50.      50.      50.         0         0         0       0.0   118.17   747.49


FLOW DISTRIBUTION FOR SECNO  186161.00          CWSEL     724.41

STA       629.      760.
  PER Q     100.0
   AREA    1084.4
    VEL       4.9

*SECNO 186210.000
186210.00    10.00   724.60      0.0       0.0    724.91      0.31      0.11      0.02   718.90
    5300.      677.   4623.       0.      484.     974.        0.     1018.     131.    726.50
     2.17      1.40     4.75      0.0     0.050     0.035     0.050     0.034   714.60   539.60
 0.000767     150.     150.     150.         2         0         0       0.0   413.16   952.76


FLOW DISTRIBUTION FOR SECNO  186210.00          CWSEL     724.60

STA       540.      600.      800.      835.      956.
  PER Q       0.1       6.8       5.8      87.2
   AREA      18.2     320.8     145.4     973.6
    VEL       0.4       1.1       2.1       4.7

CCHV    0.100 CEHV    0.300
1490 NH CARD USED
*SECNO 187460.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       724.90 ELREA       726.40

187460.00    14.81   725.21      0.0       0.0    725.23      0.02      0.29      0.03   724.90
    5300.       0.   5300.       0.        4.     4383.        0.     1098.     146.    726.40
     2.45      0.06     1.21      0.0     0.080     0.086     0.050     0.035   710.40   609.04
 0.000119    1150.    1200.     900.         2         0         0       0.0   690.37  1299.41
```

```
FLOW DISTRIBUTION FOR SECNO  187460.00          CWSEL      725.21

STA       609.      634.     1325.
  PER Q       0.0     100.0
   AREA       3.9    4383.0
    VEL       0.1       1.2

1490 NH CARD USED
*SECNO 189960.000
189960.00    10.57   725.57      0.0       0.0    725.61      0.03      0.37      0.00   725.90
    5300.       0.    5223.       77.       0.     3526.      160.     1320.      180.    723.30
     2.90      0.0     1.48     0.49     0.060     0.088     0.060     0.036    715.00   141.55
 0.000204    1900.    2400.    2000.         2         0         0       0.0    558.10   709.55

FLOW DISTRIBUTION FOR SECNO  189960.00          CWSEL      725.57

STA       142.      604.      710.
  PER Q      98.5       1.5
   AREA    3526.2     159.6
    VEL       1.5       0.5

1490 NH CARD USED
*SECNO 191085.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

191085.00    10.52   725.72      0.0       0.0    725.75      0.03      0.14      0.00   721.60
    5300.      339.    4961.       0.      765.     3659.       0.     1411.      195.    731.00
     3.11      0.44     1.36     0.0     0.070     0.070     0.060     0.037    715.20   679.35
 0.000104      800.    1000.     850.         0         0         0       0.0    835.52  1514.87

FLOW DISTRIBUTION FOR SECNO  191085.00          CWSEL      725.72

STA       679.      800.      976.     1529.
  PER Q       0.8       5.6      93.6
   AREA     163.8     601.0    3659.0
    VEL       0.3       0.5       1.4

1490 NH CARD USED
*SECNO 192210.000
192210.00    12.38   725.88      0.0       0.0    725.91      0.03      0.16      0.00   728.20
    5300.       0.    5201.       99.       0.     3466.      117.     1499.      212.    721.00
     3.30      0.0     1.50     0.85     0.070     0.054     0.070     0.037    713.50   120.38
 0.000304      600.    1000.     700.         2         0         0       0.0    756.70   877.07

FLOW DISTRIBUTION FOR SECNO  192210.00          CWSEL      725.88

STA       120.      839.      856.      877.
  PER Q      98.1       1.4       0.5
   AREA    3466.0      75.3      41.9
    VEL       1.5       1.0       0.6

1490 NH CARD USED
CCHV     0.300 CEHV     0.500
*SECNO 195585.000
195585.00    12.28   727.38      0.0       0.0    727.66      0.28      1.63      0.12   722.50
    5300.       25.    4011.    1264.       25.      839.      935.     1692.      252.    724.00
     3.52      0.99     4.78     1.35     0.080     0.042     0.080     0.038    715.10    20.77
 0.001001      800.    3375.    2200.         2         0         0       0.0    383.17   403.94
```

```
FLOW DISTRIBUTION FOR SECNO  195585.00          CWSEL     727.38

STA        21.       31.      124.      138.      318.      404.
  PER Q       0.5      75.7       1.2      19.1       3.5
   AREA      25.0     839.0      47.4     699.0     183.3
    VEL       1.0       4.8       1.3       1.5       1.0

*SECNO 196440.000

3470 ENCROACHMENT STATIONS        0.0     350.0  TYPE      1  TARGET      349.999
196440.00    14.91   727.71      0.0       0.0    728.21      0.51      0.44      0.12    722.40
    5300.     247.    4836.     217.      196.     310.     221.     1710.     255.     724.20
     3.55     1.26     5.97     0.98     0.070    0.034    0.060     0.038   712.80     74.45
 0.000779     500.     500.     500.         0        0        0       0.0   275.55    350.00


FLOW DISTRIBUTION FOR SECNO  196440.00          CWSEL     727.71

STA        74.       80.      141.      211.      234.      311.      350.
  PER Q       0.0       4.6      91.2       1.6       1.3       0.7
   AREA       2.8     192.7     809.7      62.3     108.5      49.8
    VEL       0.4       1.3       6.0       1.3       0.9       0.8

CCHV    0.300 CEHV    0.500
*SECNO 196510.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA       735.00 ELREA       735.00


        BRIDGE ST. BRIDGE,LENGTH 150 FT WIDTH 35 FT


        SKEWED BY A FACTOR OF 0.77

196510.00    13.99   727.79      0.0       0.0    728.68      0.89      0.27      0.19    723.60
    5300.       0.    5300.       0.        0.      701.       0.     1716.     257.     724.50
     3.56      0.0     7.56      0.0     0.050    0.030    0.050     0.038   713.80    162.47
 0.001243     280.     280.     280.         2        0        0       0.0    72.38    234.85


FLOW DISTRIBUTION FOR SECNO  196510.00          CWSEL     727.79

STA       162.      235.
  PER Q     100.0
   AREA     701.2
    VEL       7.6


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.00      1.50      2.50      0.0      80.00      2.50   1253.20      0.60    718.00    718.00

*SECNO 196511.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


CLASS A LOW FLOW

3420 BRIDGE W.S.     727.75 BRIDGE VELOCITY ,      6.53      CALCULATED CHANNEL AREA ,      812.
```

```
ESPRS      EGLWC      H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRO
                                                            AREA
   0.0     728.73     0.07       0.      5300.      1253.    1221.      732.20     735.00


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA      735.00 ELREA      735.00

196511.00    14.06   727.86     0.0       0.0     728.73     0.87      0.05       0.0     723.60
   5300.       0.     5300.      0.        0.       706.      0.      1717.      257.     724.50
    3.56      0.0      7.51     0.0     0.050     0.030    0.050     0.038    713.80     162.47
 0.001216     40.      40.      40.        0         0        0       0.0      72.38     234.85


FLOW DISTRIBUTION FOR SECNO  196511.00          CWSEL     727.86

STA       162.      235.
  PER Q    100.0
   AREA    706.1
    VEL      7.5

1490 NH CARD USED
*SECNO 196560.000
196560.00    14.04   728.54     0.0       0.0     723.95     0.41      0.08       0.14    722.40
   5300.      132.    5036.     133.      62.       957.      53.     1719.      257.     722.80
    3.57      2.12     5.26     2.49     0.035     0.034    0.034     0.038    714.50     154.79
 0.000593     100.     100.     100.        2         0        0       0.0     121.89     276.69


FLOW DISTRIBUTION FOR SECNO  196560.00           CWSEL     728.54

STA       155.      175.      260.      270.      277.
  PER Q      2.5      95.0      2.3       0.2
   AREA     62.1     957.5     43.4       9.8
    VEL      2.1       5.3      2.8       1.3

CCHV     0.100 CEHV     0.300
1490 NH CARD USED
*SECNO 198285.000
198285.00    13.18   729.38     0.0       0.0     729.53     0.15      0.55       0.03    728.10
   5300.       3.     5297.      0.        8.      1695.      0.      1773.      263.     731.00
    3.72      0.39     3.13     0.0     0.040     0.099    0.034     0.038    716.20     301.14
 0.000205    1700.    1700.    1700.        2         0        0       0.0     175.61     476.75


FLOW DISTRIBUTION FOR SECNO  198285.00           CWSEL     729.38

STA       301.      313.      480.
  PER Q      0.1      99.9
   AREA      7.6    1694.6
    VEL      0.4       3.1

CCHV     0.200 CEHV     0.400
1490 NH CARD USED
*SECNO 199035.000

3470 ENCROACHMENT STATIONS        0.0      300.0  TYPE      1  TARGET      299.999
199035.00    13.27   729.57     0.0       0.0     729.78     0.21      0.23       0.02    726.70
   5300.      157.    3165.    1978.      99.       726.     834.     1802.      267.     723.20
    3.78      1.59     4.36     2.37     0.034     0.040    0.040     0.037    716.30       6.06
 0.000491     750.     750.     750.        2         0        0       0.0     293.94     300.00


FLOW DISTRIBUTION FOR SECNO  199035.00           CWSEL     729.57

STA         6.       32.       59.      130.      200.      300.
```

```
  PER Q        0.6       2.4      59.7      19.6      17.7
   AREA       29.4      69.4     725.7     396.9     437.0
    VEL        1.1       1.8       4.4       2.6       2.1

CCHV    0.200 CEHV    0.400
*SECNO 199735.000

3470 ENCROACHMENT STATIONS       450.0      700.0  TYPE      1  TARGET      250.000
199735.00    13.98   729.88      0.0       0.0     730.05     0.17      0.26      0.01    727.80
    5300.      93.    3788.    1419.       91.     1040.     641.     1830.      271.    722.30
     3.84     1.02     3.64     2.21    0.035     0.033    0.035     0.037    715.90    450.00
 0.000272     725.     725.     725.        2         0        0       0.0    250.00    700.00


FLOW DISTRIBUTION FOR SECNO  199735.00          CWSEL     729.88

STA      450.      500.      590.      700.
  PER Q        1.8      71.5      26.8
   AREA       91.1    1040.0     641.3
    VEL        1.0       3.6       2.2

CCHV    0.100 CEHV    0.300
*SECNO 199736.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        CLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       THA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS       450.0      700.0  TYPE      1  TARGET      250.000
199736.00    12.52   729.82      0.0       0.0     730.08     0.26      0.01      0.03    726.90
    5300.     189.    4434.     677.      141.      996.     417.     1831.      271.    726.90
     3.84     1.34     4.45     1.63    0.045     0.032    0.045     0.037    717.30    450.00
 0.000443      20.      20.      20.        2         0        0       0.0    250.00    700.00


FLOW DISTRIBUTION FOR SECNO  199736.00          CWSEL     729.82

STA      450.      500.      588.      700.
  PER Q        3.6      83.7      12.8
   AREA      141.0     996.0     416.6
    VEL        1.3       4.5       1.6

*SECNO 199785.000

3370 NORMAL BRIDGE,NRD  12 MIN ELTRD   725.30 MAX ELLC   732.50


3470 ENCROACHMENT STATIONS       450.0      700.0  TYPE      1  TARGET      250.000

        HASTINGS ST. FOOT BRIDGE,LENGTH 100 FT WIDTH 5 FT

199785.00    12.58   729.88      0.0       0.0     730.09     0.21      0.00      0.01    726.90
    5300.     351.    3702.    1247.      144.      940.     424.     1831.      271.    726.90
     3.84     2.43     3.94     2.94    0.045     0.032    0.045     0.037    717.30    450.00
 0.001420       1.       1.       1.        2         0        0    -61.60    250.00    700.00


FLOW DISTRIBUTION FOR SECNO  199785.00          CWSEL     729.88

STA      450.      500.      588.      700.
  PER Q        6.6      69.9      23.5
   AREA      144.2     940.1     423.8
    VEL        2.4       3.9       2.9
```

```
*SECNO 199786.000

3370 NORMAL BRIDGE.NRD  12 MIN ELTRD   725.30 MAX ELLC   732.50


3470 ENCROACHMENT STATIONS        450.0      700.0  TYPE       1  TARGET       250.000
199786.00     12.59    729.89      0.0        0.0    730.10      0.21      0.01      0.00    726.90
    5300.      351.    3701.     1248.      144.      941.      424.     1831.      271.     726.90
     3.84      2.43     3.93      2.94     0.045     0.032     0.045     0.037    717.30    450.00
 0.001417        5.       5.        5.         0         0         0    -61.60    250.00    700.00


FLOW DISTRIBUTION FOR SECNO  199786.00          CWSEL      729.89

STA       450.      500.      588.      700.
  PER Q        6.5      69.8      23.5
   AREA      144.4     940.5     424.3
    VEL        2.4       3.9       2.9

*SECNO 199787.000

3470 ENCROACHMENT STATIONS        450.0      700.0  TYPE       1  TARGET       250.000
199787.00     12.55    729.85      0.0        0.0    730.11      0.26      0.00      0.02    726.90
    5300.      191.    4426.      683.      143.      999.      420.     1831.      271.     726.90
     3.84      1.34     4.43      1.62     0.045     0.032     0.045     0.037    717.30    450.00
 0.000437        1.       1.        1.         2         0         0       0.0    250.00    700.00


FLOW DISTRIBUTION FOR SECNO  199787.00          CWSEL      729.85

STA       450.      500.      588.      700.
  PER Q        3.6      83.5      12.9
   AREA      142.7     999.0     420.4
    VEL        1.3       4.4       1.6

*SECNO 199835.000

3470 ENCROACHMENT STATIONS          0.0      700.0  TYPE       1  TARGET       699.999
199835.00     13.48    729.98      0.0        0.0    730.13      0.15      0.01      0.01    726.50
    5300.      333.    4180.      787.      367.     1216.      534.     1832.      271.     722.30
     3.84      0.91     3.44      1.47     0.045     0.032     0.045     0.037    716.50    340.00
 0.000228       20.      20.       20.         2         0         0       0.0    360.00    700.00


FLOW DISTRIBUTION FOR SECNO  199835.00          CWSEL      729.98

STA       340.      488.      598.      700.
  PER Q        6.3      78.9      14.8
   AREA      367.2    1216.2     533.5
    VEL        0.9       3.4       1.5

CCHV    0.100 CEHV    0.300
*SECNO 200860.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS        489.0      800.0  TYPE       1  TARGET       311.000

        GAGE LOCATION ON RIGHT BANK 270 FT DOWNSTREAM


        FROM SUPERIOR ST. BRIDGE
```

```
200860.00     14.12    730.12      0.0       0.0    730.37      0.25      0.21      0.03    729.30
    5300.        0.     5061.     239.        0.     1225.     279.     1863.     277.     729.60
     3.89       0.0      4.13      0.85     0.045     0.033     0.045     0.037   716.00    489.00
 0.000401      800.      700.      800.         2         0         0       0.0   311.00    800.00


FLOW DISTRIBUTION FOR SECNO  200860.00          CWSEL      730.12

STA       489.      608.      700.      800.
  PER Q     95.5       1.6       2.9
   AREA   1224.9     112.2     167.0
    VEL      4.1       0.8       0.9

*SECNO 200910.000

3470 ENCROACHMENT STATIONS       450.0      800.0  TYPE       1  TARGET       350.000

        SUPERIOR ST. BRIDGE,LENGTH 123 FT WIDTH 59 FT

200910.00     12.83    730.13      0.0       0.0    730.56      0.43      0.13      0.05    722.40
    5300.       134.     5013.     154.       76.      926.      92.     1871.     279.     722.40
     3.91       1.76      5.41      1.67     0.045     0.033     0.045     0.037   717.30    450.00
 0.000606      270.      270.      270.         2         0         0       0.0   350.00    300.00


FLOW DISTRIBUTION FOR SECNO  200910.00          CWSEL      730.13

STA       450.      500.      518.      603.      623.      800.
  PER Q      0.0       2.5      94.6       2.9       0.0
   AREA      6.3      69.8     926.1      78.5      13.7
    VEL      0.2       1.9       5.4       1.9       0.1


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      1.89      2.80      0.0      85.00      7.00    728.90      1.07    718.50    718.50

*SECNO 200911.000
PRESSURE AND WEIR FLOW


 EGPRS      EGLWC       H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
   731.68    730.64     0.08       959.     4353.      729.      808.      727.70    729.30


3470 ENCROACHMENT STATIONS       450.0      850.0  TYPE       1  TARGET       400.000
200911.00     13.53    730.83      0.0       0.0    731.17      0.35      0.61      0.0     722.40
    5300.       178.     4850.     272.      124.      986.     260.     1872.     280.     722.40
     3.91       1.44      4.92      1.04     0.045     0.033     0.045     0.037   717.30    450.00
 0.000461       60.       60.       60.         2         0         2       0.0   400.00    850.00


FLOW DISTRIBUTION FOR SECNO  200911.00          CWSEL      730.83

STA       450.      500.      518.      603.      623.      630.      800.      850.
  PER Q      0.5       2.9      91.5       3.3       0.1       1.5       0.3
   AREA     41.3      82.4     985.7      92.5       5.8     132.1      30.1
    VEL      0.6       1.8       4.9       1.9       0.6       0.6       0.5

*SECNO 200960.000

3470 ENCROACHMENT STATIONS       400.0      800.0  TYPE       1  TARGET       400.000
```

```
200960.00     13.65    731.05      0.0       0.0    731.22      0.17      0.03      0.02    728.70
    5300.       86.     4777.      438.      122.     1361.      426.     1876.      281.    726.60
     3.92      0.70      3.51      1.03     0.045     0.033     0.045     0.037    717.40    440.00
 0.000255      100.      100.      100.         2         0         0       0.0    360.00    800.00


FLOW DISTRIBUTION FOR SECNO  200960.00          CWSEL      731.05

STA       440.      519.      636.      700.      800.
  PER Q      1.6      90.1       5.0       3.3
   AREA    122.4    1361.0     220.7     204.9
    VEL      0.7       3.5       1.2       0.8

CCHV    0.100 CEHV    0.300
*SECNO 201460.000

3470 ENCROACHMENT STATIONS       500.0      820.0  TYPE       1  TARGET       320.000
201460.00     12.40    731.00      0.0       0.0    731.34      0.33      0.07      0.05    729.80
    5300.       63.     5213.       24.       95.     1117.       46.     1883.      282.    729.70
     3.93      0.66      4.67      0.52     0.050     0.033     0.050     0.037    718.60    500.00
 0.000534      185.      185.      185.         2         0         0       0.0    283.87    783.87


FLOW DISTRIBUTION FOR SECNO  201460.00          CWSEL      731.00

STA       500.      600.      713.      784.
  PER Q      1.2      98.4       0.4
   AREA     95.3    1117.1      46.2
    VEL      0.7       4.7       0.5

CCHV    0.300 CEHV    0.500
*SECNO 201510.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS       450.0      800.0  TYPE       1  TARGET       350.000

        C&O R.R. BRIDGE,LENGTH 101 FT,WIDTH 14 FT

201510.00     12.84    731.14      0.0       0.0    731.52      0.38      0.16      0.02    734.60
    5300.        0.     5300.       0.        0.     1069.       0.     1890.      283.    734.80
     3.95       0.0      4.96      0.0     0.050     0.033     0.050     0.037    718.30    605.00
 0.000597      280.      280.      280.         2         0         0       0.0     89.00    694.00


FLOW DISTRIBUTION FOR SECNO  201510.00          CWSEL      731.14

STA       605.      694.
  PER Q    100.0
   AREA   1068.8
    VEL      5.0


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.90      1.51      2.50       0.0     96.00      4.50    796.70      0.0     719.00    719.00

*SECNO 201511.000
PRESSURE FLOW
```

```
 EGPRS      EGLWC      H3       QWEIR      SPR       SAREA   TRAPEZOID      ELLC      ELTRD
                                                              AREA
  732.17    731.54     0.02        0.      5300.      797.     805.       727.80    733.30


3470 ENCROACHMENT STATIONS       450.0     800.0  TYPE      1  TARGET      350.000
201511.00    13.53   731.83      0.0       0.0    732.17     0.34      0.66      0.0    734.60
    5300.       0.    5300.       0.        0.     1131.       0.     1891.     283.    734.80
     3.95      0.0      4.69     0.0     0.050     0.033    0.050     0.037   718.30   605.00
 0.000503      14.      14.      14.         2         0        0       0.0    89.00   694.00


FLOW DISTRIBUTION FOR SECNO  201511.00          CWSEL     731.83

STA       605.      694.
  PER Q     100.0
   AREA    1130.8
    VEL       4.7

1490 NH CARD USED
*SECNO 201560.000

3470 ENCROACHMENT STATIONS       580.0     780.0  TYPE      1  TARGET      200.000
201560.00    13.76   731.96      0.0       0.0    732.24     0.28      0.04      0.02   722.60
    5300.      503.    4792.       5.      422.     1087.      19.     1894.     284.    731.30
     3.95      1.19     4.41     0.28     0.100     0.033    0.050     0.037   718.20   580.00
 0.000389      100.     100.     100.         2         0        0       0.0   191.37   771.37


FLOW DISTRIBUTION FOR SECNO  201560.00          CWSEL     731.96

STA       580.      600.      623.      715.      771.
  PER Q       3.9       5.6      90.4       0.1
   AREA     200.1     222.3    1086.6      18.7
    VEL       1.0       1.3       4.4       0.3

CCHV    0.100 CEHV    0.300
*SECNO 202435.000

3470 ENCROACHMENT STATIONS       420.0     700.0  TYPE      1  TARGET      280.000
202435.00    15.82   732.22      0.0       0.0    732.42     0.20      0.18      0.01   723.00
    5300.      633.    4544.     123.      556.     1184.     191.     1916.     286.    726.80
     4.00      1.14     3.84     0.64     0.080     0.035    0.080     0.037   716.40   420.00
 0.000265      555.     555.     555.         1         0        0       0.0   229.52   649.52


FLOW DISTRIBUTION FOR SECNO  202435.00          CWSEL     732.22

STA       420.      489.      576.      600.      650.
  PER Q      12.0      85.7       1.6       0.7
   AREA     555.7    1184.2     106.0      84.6
    VEL       1.1       3.8       0.8       0.4

CCHV    0.300 CEHV    0.500
*SECNO 202485.000

3470 ENCROACHMENT STATIONS       420.0     700.0  TYPE      1  TARGET      280.000

        ANN ARBOR R.R. BRIDGE,LENGTH 70 FT,WIDTH 9.75 FT

202485.00    13.91   732.21      0.0       0.0    732.67     0.46      0.11      0.13   720.10
    5300.      114.    5042.     145.       91.      904.     114.     1926.     288.    721.40
     4.01      1.25     5.57     1.27     0.080     0.035    0.080     0.037   718.30   484.96
 0.000571      300.     300.     300.         2         0        0       0.0   106.22   591.19
```

```
FLOW DISTRIBUTION FOR SECNO  202485.00          CWSEL     732.21

STA       485.      500.      570.      591.
  PER Q       2.1      95.1       2.7
   AREA      91.0     904.4     114.5
    VEL       1.2       5.6       1.3


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0       1.45      2.50      0.0      70.00      0.0      670.00     0.0      719.00    719.00

*SECNO 202486.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELX     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


PRESSURE FLOW


 EGPRS      EGLWC       H3        QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                 AREA
   733.61    733.31      0.0        0.      5300.      670.      679.      728.70    734.40


3470 ENCROACHMENT STATIONS       420.0     700.0  TYPE      1  TARGET      280.000
202486.00    14.92   733.22      0.0       0.0     733.61     0.39      0.95      0.0    720.10
    5300.     124.    5015.     161.      107.      976.     137.     1926.     288.    721.40
     4.01     1.15     5.14     1.18     0.080     0.035    0.080     0.037   718.30   483.70
 0.000439      10.      10.      10.         2         0        0       0.0   109.49   593.19


FLOW DISTRIBUTION FOR SECNO  202486.00          CWSEL     733.22

STA       484.      500.      570.      593.
  PER Q       2.3      94.6       3.0
   AREA     107.0     975.8     137.1
    VEL       1.2       5.1       1.2

*SECNO 202535.000

3470 ENCROACHMENT STATIONS       420.0     700.0  TYPE      1  TARGET      280.000
202535.00    15.23   733.43      0.0       0.0     733.70     0.27      0.05      0.04   729.00
    5300.     227.    5073.       0.      273.     1189.       0.     1930.     288.    734.40
     4.02     0.83     4.27      0.0     0.080     0.035    0.080     0.037   718.20   420.00
 0.000408     120.     120.     120.         2         0        0       0.0   178.38   598.38


FLOW DISTRIBUTION FOR SECNO  202535.00          CWSEL     733.43

STA       420.      490.      500.      600.
  PER Q       3.6       0.7      95.7
   AREA     233.4      39.8    1189.1
    VEL       0.8       0.9       4.3

CCHV    0.200 CEHV    0.400
*SECNO 203135.000

3470 ENCROACHMENT STATIONS       400.0     750.0  TYPE      1  TARGET      350.000
203135.00    15.37   733.57      0.0       0.0     733.82     0.26      0.12      0.00   729.00
    5300.     286.    5014.       0.      348.     1202.       0.     1940.     289.    734.40
```

```
     4.04      0.82      4.17      0.0      0.080     0.035     0.080     0.037    718.20    400.00
 0.000386     300.      300.      300.        0         0         0       0.0     198.59    598.59


FLOW DISTRIBUTION FOR SECNO  203135.00          CWSEL      733.57

STA       400.      490.      500.      600.
  PER Q       4.7       0.7      94.6
   AREA     306.5      41.1    1201.6
    VEL       0.8       0.9       4.2

CCHV    0.200 CEHV    0.400
1490 NH CARD USED
*SECNO 203234.000

3265 DIVIDED FLOW

3280 CROSS SECTION 203234.00 EXTENDED      2.30 FEET


3470 ENCROACHMENT STATIONS       100.0      520.0  TYPE       1  TARGET       420.000
203234.00    16.00   733.80      0.0       0.0    733.90      0.10      0.05      0.03   730.40
    5300.     574.    4036.     690.      385.    1438.      710.     1950.      291.    730.80
     4.07     1.49      2.81     0.97     0.030     0.035    0.042     0.037    717.80   100.00
 0.000158     200.      200.     200.         2         0        0       0.0    420.00   520.00


FLOW DISTRIBUTION FOR SECNO  203234.00          CWSEL      733.80

STA       100.      200.      299.      370.      520.
  PER Q      10.8      76.2       6.4       6.6
   AREA     385.2    1437.6     242.2     467.7
    VEL       1.5       2.8       1.4       0.7

*SECNO 203235.000

3265 DIVIDED FLOW

3280 CROSS SECTION 203235.00 EXTENDED      2.30 FEET


3370 NORMAL BRIDGE,NRD  14 MIN ELTRD   729.50 MAX ELLC   731.50


3470 ENCROACHMENT STATIONS       100.0      520.0  TYPE       1  TARGET       420.000

        WOODWORTH ST. BRIDGE,LENGTH 107.5 FT,WIDTH 64 FT

203235.00    16.01   733.81      0.0       0.0    733.90      0.09      0.00      0.00   730.40
    5300.    1113.    2847.    1340.      385.    1159.      710.     1950.      291.    730.80
     4.07     2.89      2.46     1.89     0.030     0.035    0.042     0.037    717.80   100.00
 0.000595      10.       10.      10.         0         0        0   -279.28    420.00   520.00


FLOW DISTRIBUTION FOR SECNO  203235.00          CWSEL      733.81

STA       100.      200.      299.      370.      450.      520.
  PER Q      21.0      53.7      12.5       5.3       7.5
   AREA     385.4    1158.5     242.4     289.3     178.8
    VEL       2.9       2.5       2.7       1.0       2.2

*SECNO 203236.000

3265 DIVIDED FLOW
```

3280 CROSS SECTION 203236.00 EXTENDED 2.34 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	ARCB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3370 NORMAL BRIDGE,NRD 14 MIN ELTRD 729.50 MAX ELLC 731.50

3470 ENCROACHMENT STATIONS			100.0	520.0	TYPE	1	TARGET	420.000	
203236.00	16.05	733.85	0.0	0.0	733.94	0.09	0.04	0.00	730.40
5300.	1118.	2829.	1353.	389.	1163.	719.	1954.	291.	730.60
4.07	2.87	2.43	1.88	0.030	0.035	0.042	0.037	717.80	100.00
0.000581	64.	64.	64.	1	0	0	-279.28	420.00	520.00

FLOW DISTRIBUTION FOR SECNO 203236.00 CWSEL 733.85

STA	100.	200.	299.	370.	450.	520.
PER Q	21.1	53.4	12.6	5.4	7.6	
AREA	389.4	1162.5	245.2	292.5	181.6	
VEL	2.9	2.4	2.7	1.0	2.2	

*SECNO 203237.000

3265 DIVIDED FLOW

3280 CROSS SECTION 203237.00 EXTENDED 2.36 FEET

3470 ENCROACHMENT STATIONS			100.0	520.0	TYPE	1	TARGET	420.000	
203237.00	16.05	733.85	0.0	0.0	733.95	0.10	0.00	0.00	730.40
5300.	581.	4016.	703.	391.	1443.	722.	1954.	292.	730.80
4.08	1.49	2.78	0.97	0.030	0.035	0.042	0.037	717.80	100.00
0.000155	10.	10.	10.	0	0	0	0.0	420.00	520.00

FLOW DISTRIBUTION FOR SECNO 203237.00 CWSEL 733.85

STA	100.	200.	299.	370.	520.
PER Q	11.0	75.8	6.5	6.7	
AREA	390.8	1443.1	246.2	476.1	
VEL	1.5	2.8	1.4	0.7	

*SECNO 203335.000

3470 ENCROACHMENT STATIONS			200.0	620.0	TYPE	1	TARGET	420.000	
203335.00	17.20	733.90	0.0	0.0	733.97	0.07	0.02	0.01	730.40
5300.	122.	4309.	869.	178.	1895.	729.	1964.	293.	730.30
4.10	0.69	2.27	1.19	0.030	0.035	0.030	0.037	716.70	205.63
0.000091	150.	150.	150.	0	0	0	0.0	414.37	620.00

FLOW DISTRIBUTION FOR SECNO 203335.00 CWSEL 733.90

STA	206.	307.	440.	500.	600.	620.
PER Q	2.3	81.3	5.3	9.6	1.5	
AREA	177.7	1895.1	237.3	415.6	76.1	
VEL	0.7	2.3	1.2	1.2	1.0	

```
CCHV     0.300 CEHV     0.500
    N


*SECNO 203610.000

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000

        STATE ST. BRIDGE.LENGTH 106 FT.WIDTH 42.5 FT

203610.00     15.28    733.88      0.0       0.0     734.05      0.17      0.03      0.05    735.40
    5300.        0.     5119.     181.        0.     1537.     207.     1976.     295.     735.30
     4.12       0.0      3.33     0.87     0.030     0.035    0.030     0.037    718.60    302.00
 0.000233      230.     230.      230.         2         0        0       0.0    293.14    700.00


FLOW DISTRIBUTION FOR SECNO  203610.00          CWSEL      733.88

STA       302.      404.      600.      700.
  PER Q      96.6       0.5       2.9
   AREA    1537.2      54.0     153.5
    VEL       3.3       0.5       1.0


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.90       1.20       2.90       0.0      102.00      5.00     1278.40      0.0      718.90     718.90

*SECNO 203611.000

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW


 EGPRS       EGLWC       H3        QWEIR       QPR        BAREA    TRAPEZOID      ELLC      ELTRD
                                                                      AREA
   734.13     734.05      0.01       673.      4634.      1278.     1319.      732.50     732.00


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000
203611.00     15.37    733.97      0.0       0.0     734.13      0.16      0.08      0.0     735.40
    5300.        0.     5102.     198.        0.     1545.     223.     1977.     295.     735.30
     4.12       0.0      3.30     0.89     0.030     0.035    0.030     0.037    718.60    302.00
 0.000228       42.      42.       42.         2         0        4       0.0    299.35    700.00


FLOW DISTRIBUTION FOR SECNO  203611.00          CWSEL      733.97

STA       302.      404.      600.      700.
  PER Q      96.3       0.6       3.1
   AREA    1545.4      61.6     161.6
    VEL       3.3       0.6       1.0

*SECNO 203612.000

3265 DIVIDED FLOW

   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS     BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT/RIGHT
```

```
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       STN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000

        DAM UPSTREAM OF STATE ST. BRIDGE

203612.00     15.37    733.97      0.0       0.0     734.13      0.17      0.00      0.00    735.40
    5300.        0.     5202.      98.        0.      1572.     154.     1978.     295.     735.30
     4.12       0.0      3.31      0.64     0.030     0.035    0.030     0.037    718.60    302.00
 0.000226       13.      13.       13.         0         0        0       0.0    300.58    700.00

FLOW DISTRIBUTION FOR SECNO  203612.00          CWSEL     733.97

STA       302.      405.      600.      700.
  PER Q     98.1       0.6       1.2
   AREA   1572.1      61.9      91.9
    VEL      3.3       0.6       3.7

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.0      1.50      3.10      0.0      102.00     0.0       1.00      0.0      718.70    718.70

*SECNO 203613.000

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

 EGPRS       EGLWC       H3        QWEIR     QPR       BAREA   TRAPEZOID      ELLC      ELTRD
                                                                  AREA
655004.12    734.23      0.0       5292.       7.        1.        1.      718.71    729.50


3470 ENCROACHMENT STATIONS       250.0      700.0  TYPE       1  TARGET       450.000
203613.00     16.38    734.98      0.0       0.0     735.10      0.13      0.97      0.0     735.40
    5300.        1.     4950.     349.        4.      1676.     390.     1978.     295.     735.30
     4.12       0.20     2.95      0.89     0.030     0.035    0.030     0.037    718.60    250.00
 0.000169       12.      12.       12.         2         0       19       0.0    397.69    700.00

FLOW DISTRIBUTION FOR SECNO  203613.00          CWSEL     734.98

STA       250.      273.      405.      500.      600.      700.
  PER Q      0.0      93.4       0.3       2.7       3.6
   AREA      4.0    1676.0      34.9     162.7     192.7
    VEL      0.2       3.0       0.4       0.9       1.0

CCHV    0.300 CEHV    0.500
*SECNO 203614.000
3280 CROSS SECTION 203614.00 EXTENDED       4.39 FEET


203614.00     13.09    735.09      0.0       0.0     735.15      0.06      0.03      0.02    730.70
    5300.        0.     4585.     715.        0.      2212.     738.     1990.     297.     730.70
     4.15       0.0      2.07      0.97     0.040     0.035    0.040     0.037    722.00    374.00
 0.000123      200.     200.      200.         2         0        0       0.0    445.92    819.92
```

```
FLOW DISTRIBUTION FOR SECNO  203614.00          CWSEL      735.09

STA       374.      605.      635.      775.      820.
  PER Q     86.5       2.5      10.0       0.9
   AREA   2212.0     125.8     531.2      80.7
    VEL      2.1       1.1       1.0       0.6

*SECNO 204485.000

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS       500.0     1368.0  TYPE       1  TARGET      -500.000
204485.00     10.39    735.19      0.0       0.0    735.21      0.02      0.04      0.01    730.70
    5300.       70.     5215.      15.      140.     5252.       44.     2060.      307.    730.70
     4.36      0.50      0.99      0.34    0.040     0.035     0.040     0.037    724.80    500.00
 0.000032      725.      725.      725.        0         0         0       0.0    690.96   1256.74


FLOW DISTRIBUTION FOR SECNO  204485.00           CWSEL      735.19

STA       500.      535.     1158.     1177.     1257.      Flowing to 1177.
  PER Q      1.3      98.4       0.3       0.0
   AREA    140.1    5251.7      42.2       1.4
    VEL      0.5       1.0       0.4       0.0

CCHV    0.100 CEHV    0.300
*SECNO 206860.000

3470 ENCROACHMENT STATIONS       460.0     1150.0  TYPE       1  TARGET      -460.000
206860.00      9.88    735.28      0.0       0.0    735.30      0.02      0.09      0.00    731.50
    5300.      107.     5169.      24.      238.     4478.       58.     2339.      344.    731.00
     4.94      0.45      1.15      0.41    0.040     0.035     0.040     0.037    725.40    460.00
 0.000045     2375.     2375.     2375.        2         0         0       0.0    677.16   1137.16


FLOW DISTRIBUTION FOR SECNO  206860.00           CWSEL      735.28

STA       460.      500.      563.     1110.     1137.
  PER Q      0.4       1.6      97.5       0.4
   AREA     63.1     175.0    4478.0      58.1
    VEL      0.3       0.5       1.2       0.4

*SECNO 207985.000
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


207985.00      9.93    735.33      0.0       0.0    735.38      0.05      0.07      0.01    730.70
    5300.       95.     4724.     481.      198.     2639.      671.     2445.      363.    730.70
     5.12      0.48      1.79      0.72    0.040     0.035     0.040     0.036    725.40    105.90
 0.000106     1125.     1125.     1125.        1         0         0       0.0    830.16    936.07


FLOW DISTRIBUTION FOR SECNO  207985.00           CWSEL      735.33

STA       106.      170.      270.      276.      595.      600.      666.      766.      860.      900.      936.   Flowing to 900
  PER Q      0.2       1.3       0.3      89.1       0.4       4.0       3.3       1.2       0.1       0.0
   AREA     35.3     142.8      20.0    2639.2      21.9     236.1     247.8     134.2      25.1       5.9
    VEL      0.3       0.5       0.8       1.8       1.0       0.9       0.7       0.5       0.3       0.1

*SECNO 209110.000
209110.00     10.03    735.43      0.0       0.0    735.45      0.02      0.07      0.00    730.50
    5300.      295.     4992.      13.      587.     4599.       32.     2558.      384.    730.50
```

5.42	0.50	1.09	0.40	0.040	0.035	0.040	0.036	725.40	143.52
0.000038	1125.	1125.	1125.	1	0	0	0.0	767.35	910.88

FLOW DISTRIBUTION FOR SECNO 209110.00 CWSEL 735.43

STA	144.	291.	300.	350.	893.	911.
PER Q	2.2	0.5	2.9	94.2	0.2	
AREA	311.6	39.4	236.3	4599.4	31.7	
VEL	0.4	0.6	0.6	1.1	0.4	

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*************************************************
```

2. Summary printout [illegible] plan

```
C
T1      CITY OF ALMA, PROJECT NO. 8546
T2      PINE RIVER
T3      PINE RIVER

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FC
    -10.      2.        0.        0.  0.0           0.0       0.0       0.   721.270   0.0

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
    1.000     0.0       -1.000    0.0       0.0       0.0       0.0       0.0       0.0       0.0

J5  LPRNT     NUMSEC                        ********REQUESTED SECTION NUMBERS********
    -10.000   -10.000   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
```

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*****************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ	
	0.	3.	0.	0.	0.0	0.0	0.0	0.	721.790	0.0	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE	
	2.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

```
*****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*****************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ	
	0.	4.	0.	0.	0.0	0.0	0.0	0.	722.000	0.0	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIM	ITRACE	
	3.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

```
*************************************************
  MEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*************************************************
```

T1
T2
T3

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	JSEL	FQ
	0.	5.	0.	0.	0.0	0.0	0.0	0.	722.500	0.0
J2	NPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALLOC	IBW	CHNIN	ITRACE
	15.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
*************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED  AUG1977
  ERROR CORR -  01,02
  MODIFICATION -  50,51,52,53
*************************************************
```

NOTE- ASTERISK * AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

PINE RIVER

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
177360.000	0.0	0.0	0.0	708.40	2990.00	721.27	0.0	721.37	2.30	2.54	1176.06	1973.26
177360.000	0.0	0.0	0.0	708.40	4580.00	721.79	0.0	722.00	4.45	3.67	1248.86	2170.98
177360.000	0.0	0.0	0.0	708.40	5300.00	722.00	0.0	722.27	5.54	4.15	1278.26	2252.63
177360.000	0.0	0.0	0.0	708.40	7110.00	722.50	0.0	722.93	8.41	5.27	1348.26	2451.16
177410.000	10.00	0.0	0.0	709.00	2990.00	721.21	0.0	721.43	5.00	3.78	791.01	1337.00
177410.000	10.00	0.0	0.0	709.00	4580.00	721.66	0.0	722.14	10.12	5.52	829.93	1439.45
177410.000	10.00	0.0	0.0	709.00	5300.00	721.84	0.0	722.45	12.84	6.28	844.59	1479.00
177410.000	10.00	0.0	0.0	709.00	7110.00	722.22	0.0	723.24	20.55	3.10	877.55	1568.52
177411.000	40.00	725.40	721.80	709.00	2990.00	721.22	0.0	721.44	4.99	3.78	791.75	1338.92
177411.000	40.00	725.40	721.80	709.00	4580.00	722.17	0.0	722.60	8.65	5.24	873.39	1557.14
177411.000	40.00	725.40	721.80	709.00	5300.00	722.55	0.0	723.08	10.34	5.85	906.51	1648.45
177411.000	40.00	725.40	721.80	709.00	7110.00	723.69	0.0	724.47	13.61	7.08	1004.31	1926.94
177460.000	200.00	0.0	0.0	709.40	2990.00	721.51	0.0	721.52	0.28	0.87	3445.59	5612.77
177460.000	200.00	0.0	0.0	709.40	4580.00	722.72	0.0	722.74	0.41	1.14	4050.54	7171.17
177460.000	200.00	0.0	0.0	709.40	5300.00	723.24	0.0	723.26	0.45	1.24	4381.02	7919.96
177460.000	200.00	0.0	0.0	709.40	7110.00	724.69	0.0	724.72	0.46	1.39	5567.70	10443.93
178910.000	1350.00	0.0	0.0	711.40	2990.00	721.55	0.0	721.56	0.32	0.85	3692.82	5323.12
178910.000	1350.00	0.0	0.0	711.40	4580.00	722.78	0.0	722.80	0.45	1.11	4485.36	6822.43
178910.000	1350.00	0.0	0.0	711.40	5300.00	723.30	0.0	723.32	0.50	1.20	4857.63	7527.00
178910.000	1350.00	0.0	0.0	711.40	7110.00	724.76	0.0	724.78	0.54	1.36	6007.51	9717.87
180110.000	1300.00	0.0	0.0	706.60	2990.00	721.60	0.0	721.61	0.52	1.12	2676.81	4155.89
180110.000	1300.00	0.0	0.0	706.60	4580.00	722.84	0.0	722.87	0.70	1.45	3265.88	5455.18
180110.000	1300.00	0.0	0.0	706.60	5300.00	723.37	0.0	723.41	0.76	1.57	3563.85	6065.64
180110.000	1300.00	0.0	0.0	706.60	7110.00	724.83	0.0	724.87	0.79	1.76	4582.66	7992.95
180660.000	400.00	0.0	0.0	714.20	2990.00	721.40	0.0	721.93	22.44	5.82	514.18	631.18
180660.000	400.00	0.0	0.0	714.20	4580.00	722.53	0.0	723.36	27.82	7.31	626.65	868.33
180660.000	400.00	0.0	0.0	714.20	5300.00	723.00	0.0	723.96	29.53	7.86	673.89	975.32
180660.000	400.00	0.0	0.0	714.20	7110.00	724.34	0.0	725.54	29.83	8.79	808.45	1301.76
180661.000	20.00	724.50	724.80	714.20	2990.00	721.45	0.0	721.96	21.86	5.77	518.32	639.44
180661.000	20.00	724.50	724.80	714.20	4580.00	722.61	0.0	723.41	26.77	7.22	634.22	885.20
180661.000	20.00	724.50	724.80	714.20	5300.00	723.09	0.0	724.03	28.28	7.76	683.05	996.55
180661.000	20.00	724.50	724.80	714.20	7110.00	724.40	0.0	725.58	29.25	8.74	813.52	1314.63

SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
180710.000	200.00	0.0	0.0	706.50	2990.00	722.12	0.0	722.12	0.12	0.62	4910.60	8609.84
180710.000	200.00	0.0	0.0	706.50	4580.00	723.66	0.0	723.67	0.16	0.80	5897.43	11326.56
180710.000	200.00	0.0	0.0	706.50	5300.00	724.31	0.0	724.32	0.18	0.87	6331.34	12573.54
180710.000	200.00	0.0	0.0	706.50	7110.00	725.93	0.0	725.95	0.20	1.00	7511.05	15991.22
182160.000	1300.00	0.0	0.0	708.60	2990.00	722.13	0.0	722.14	0.14	0.75	4081.38	7916.59
182160.000	1300.00	0.0	0.0	708.60	4580.00	723.68	0.0	723.69	0.19	0.95	4991.27	10647.07
182160.000	1300.00	0.0	0.0	708.60	5300.00	724.33	0.0	724.34	0.20	1.03	5380.69	11906.80
182160.000	1300.00	0.0	0.0	708.60	7110.00	725.95	0.0	725.98	0.22	1.18	6376.10	15321.26
184410.000	2250.00	0.0	0.0	709.70	2990.00	722.16	0.0	722.16	0.05	0.45	6599.45	13652.01
184410.000	2250.00	0.0	0.0	709.70	4580.00	723.71	0.0	723.71	0.06	0.59	7884.22	17977.21
184410.000	2250.00	0.0	0.0	709.70	5300.00	724.36	0.0	724.37	0.07	0.54	8508.94	19979.61
184410.000	2250.00	0.0	0.0	709.70	7110.00	726.00	0.0	726.00	0.08	0.74	10287.43	25505.34
185660.000	1250.00	0.0	0.0	710.60	2990.00	722.12	0.0	722.22	3.93	2.44	1223.83	1508.49
185660.000	1250.00	0.0	0.0	710.60	4580.00	723.66	0.0	723.78	3.99	2.78	1655.48	2292.40
185660.000	1250.00	0.0	0.0	710.60	5300.00	724.32	0.0	724.44	3.93	2.38	1861.42	2674.46
185660.000	1250.00	0.0	0.0	710.50	7110.00	725.95	0.0	726.08	3.40	2.97	2683.36	3857.61
185662.000	300.00	0.0	0.0	709.40	2990.00	722.20	0.0	722.40	5.07	3.59	832.60	1327.31
185662.000	300.00	0.0	0.0	709.40	4580.00	723.72	0.0	724.04	6.92	4.56	1004.40	1741.21
185662.000	300.00	0.0	0.0	709.40	5300.00	724.35	0.0	724.73	7.57	4.92	1077.42	1925.93
185662.000	300.00	0.0	0.0	709.40	7110.00	725.93	0.0	726.41	8.74	5.60	1263.86	2404.85
185663.000	50.00	735.30	731.70	709.40	2990.00	722.21	0.0	722.41	5.04	3.58	834.53	1331.78
185663.000	50.00	735.80	731.70	709.40	4580.00	723.73	0.0	724.05	6.90	4.56	1005.14	1743.03
185663.000	50.00	735.80	731.70	709.40	5300.00	724.37	0.0	724.74	7.53	4.91	1079.47	1931.17
185663.000	50.00	735.80	731.70	709.40	7110.00	725.95	0.0	726.44	8.70	5.59	1271.78	2410.48
186160.000	30.00	0.0	0.0	709.40	2990.00	722.23	0.0	722.42	5.01	3.58	836.18	1335.61
186160.000	30.00	0.0	0.0	709.40	4580.00	723.75	0.0	724.07	6.86	4.55	1007.50	1748.94
186160.000	30.00	0.0	0.0	709.40	5300.00	724.39	0.0	724.77	7.48	4.90	1082.12	1937.97
186160.000	30.00	0.0	0.0	709.40	7110.00	725.98	0.0	726.46	8.65	5.58	1275.11	2416.89
186161.000	50.00	735.80	731.80	709.40	2990.00	722.23	0.0	722.43	5.00	3.57	837.06	1337.65
186161.000	50.00	735.80	731.80	709.40	4580.00	723.77	0.0	724.09	6.82	4.54	1009.33	1753.52
186161.000	50.00	735.80	731.80	709.40	5300.00	724.41	0.0	724.78	7.43	4.89	1084.37	1943.75
186161.000	50.00	735.80	731.80	709.40	7110.00	726.00	0.0	726.48	8.61	5.56	1278.39	2423.21
186210.000	150.00	0.0	0.0	714.60	2990.00	722.30	0.0	722.55	8.32	4.10	777.49	1036.34
186210.000	150.00	0.0	0.0	714.60	4580.00	723.88	0.0	724.20	8.45	4.73	1184.03	1575.35
186210.000	150.00	0.0	0.0	714.60	5300.00	724.60	0.0	724.91	7.67	4.75	1457.99	1914.01
186210.000	150.00	0.0	0.0	714.60	7110.00	726.41	0.0	726.65	5.41	4.47	2370.29	3057.28
187460.000	1200.00	0.0	0.0	710.40	2990.00	722.87	0.0	722.89	1.23	1.04	2887.74	2691.03
187460.000	1200.00	0.0	0.0	710.40	4580.00	724.52	0.0	724.54	1.21	1.17	3924.94	4155.12
187460.000	1200.00	0.0	0.0	710.40	5300.00	725.21	0.0	725.23	1.19	1.21	4386.94	4854.02
187460.000	1200.00	0.0	0.0	710.40	7110.00	726.90	0.0	726.93	1.11	1.28	5698.12	6761.09
189960.000	2400.00	0.0	0.0	715.00	2990.00	723.25	0.0	723.27	2.13	1.21	2463.60	2048.73
189960.000	2400.00	0.0	0.0	715.00	4580.00	724.89	0.0	724.92	2.10	1.42	3298.44	3161.44
189960.000	2400.00	0.0	0.0	715.00	5300.00	725.57	0.0	725.61	2.04	1.48	3685.73	3707.68
189960.000	2400.00	0.0	0.0	715.00	7110.00	727.23	0.0	727.27	1.85	1.59	4693.18	5228.43

SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
191085.000	1000.00	0.0	0.0	715.20	2990.00	723.42	0.0	723.44	1.39	1.21	2629.28	2534.40
191085.000	1000.00	0.0	0.0	715.20	4580.00	725.04	0.0	725.07	1.13	1.32	3863.93	4311.13
191085.000	1000.00	0.0	0.0	715.20	5300.00	725.72	0.0	725.75	1.04	1.36	4423.69	5195.87
191085.000	1000.00	0.0	0.0	715.20	7110.00	727.36	0.0	727.39	0.87	1.42	5860.99	7641.83
192210.000	1000.00	0.0	0.0	713.50	2990.00	723.64	0.0	723.68	5.00	1.57	1928.95	1337.34
192210.000	1000.00	0.0	0.0	713.50	4580.00	725.21	0.0	725.25	3.46	1.51	3084.73	2463.03
192210.000	1000.00	0.0	0.0	713.50	5300.00	725.88	0.0	725.91	3.04	1.50	3583.19	3038.81
192210.000	1000.00	0.0	0.0	713.50	7110.00	727.49	0.0	727.52	2.32	1.50	4818.61	4664.90
195585.000	3375.00	0.0	0.0	715.10	2990.00	725.66	0.0	725.85	8.36	3.79	1168.93	1033.89
195585.000	3375.00	0.0	0.0	715.10	4580.00	726.86	0.0	727.12	9.80	4.55	1601.65	1463.26
195585.000	3375.00	0.0	0.0	715.10	5300.00	727.38	0.0	727.66	10.01	4.78	1798.60	1675.47
195585.000	3375.00	0.0	0.0	715.10	7110.00	728.69	0.0	728.98	9.72	5.16	2313.36	2280.98
196440.000	500.00	0.0	0.0	712.80	2990.00	725.93	0.0	726.21	4.95	4.26	795.73	1344.45
196440.000	500.00	0.0	0.0	712.80	4580.00	727.18	0.0	727.53	7.15	5.55	1083.42	1712.95
196440.000	500.00	0.0	0.0	712.80	5300.00	727.71	0.0	728.21	7.79	5.97	1225.90	1899.08
196440.000	500.00	0.0	0.0	712.80	7110.00	728.99	0.0	729.60	8.62	6.74	1582.02	2421.07
196510.000	280.00	0.0	0.0	713.80	2990.00	726.03	0.0	726.45	7.57	5.21	573.59	1086.96
196510.000	280.00	0.0	0.0	713.80	4580.00	727.29	0.0	728.02	11.02	6.89	664.74	1379.67
196510.000	280.00	0.0	0.0	713.80	5300.00	727.79	0.0	728.68	12.43	7.56	701.18	1503.18
196510.000	280.00	0.0	0.0	713.80	7110.00	728.97	0.0	730.24	15.47	9.03	787.05	1807.86
196511.000	40.00	735.00	732.20	713.80	2990.00	726.35	0.0	726.47	7.50	5.20	575.25	1092.09
196511.000	40.00	735.00	732.20	713.80	4580.00	727.34	0.0	728.07	10.83	6.85	668.43	1392.01
196511.000	40.00	735.00	732.20	713.80	5300.00	727.86	0.0	728.73	12.16	7.51	706.05	1519.95
196511.000	40.00	735.00	732.20	713.80	7110.00	729.09	0.0	730.33	14.97	8.94	795.22	1837.81
196560.000	100.00	0.0	0.0	714.50	2990.00	726.36	0.0	726.58	4.07	3.79	820.49	1481.33
196560.000	100.00	0.0	0.0	714.50	4580.00	727.90	0.0	728.25	5.48	4.86	995.57	1956.90
196560.000	100.00	0.0	0.0	714.50	5300.00	728.54	0.0	728.95	5.93	5.26	1072.82	2176.81
196560.000	100.00	0.0	0.0	714.50	7110.00	730.10	0.0	730.64	6.61	6.05	1270.23	2764.44
198285.000	1700.00	0.0	0.0	716.20	2990.00	726.91	0.0	726.99	1.49	2.30	1297.26	2452.34
198285.000	1700.00	0.0	0.0	716.20	4580.00	728.66	0.0	728.79	1.91	2.90	1578.42	3315.04
198285.000	1700.00	0.0	0.0	716.20	5300.00	729.38	0.0	729.53	2.05	3.13	1702.15	3704.29
198285.000	1700.00	0.0	0.0	716.20	7110.00	731.09	0.0	731.28	2.22	3.53	2183.92	4774.71
199035.000	750.00	0.0	0.0	716.30	2990.00	727.03	0.0	727.25	6.55	4.19	949.48	1168.68
199035.000	750.00	0.0	0.0	716.30	4580.00	728.83	0.0	729.04	5.33	4.33	1444.65	1984.03
199035.000	750.00	0.0	0.0	716.30	5300.00	729.57	0.0	729.78	4.91	4.36	1658.34	2390.78
199035.000	750.00	0.0	0.0	716.30	7110.00	731.30	0.0	731.50	4.11	4.41	2174.55	3505.56
199735.000	725.00	0.0	0.0	715.90	2990.00	727.43	0.0	727.54	2.48	2.97	1190.62	1898.33
199735.000	725.00	0.0	0.0	715.90	4580.00	729.17	0.0	729.32	2.70	3.48	1594.35	2786.01
199735.000	725.00	0.0	0.0	715.90	5300.00	729.88	0.0	730.05	2.72	3.64	1772.39	3213.64
199735.000	725.00	0.0	0.0	715.90	7110.00	731.55	0.0	731.74	2.69	3.96	2190.05	4336.94
199736.000	20.00	0.0	0.0	717.30	2990.00	727.37	0.0	727.58	4.18	3.68	942.17	1461.89
199736.000	20.00	0.0	0.0	717.30	4580.00	729.11	0.0	729.36	4.44	4.27	1375.82	2173.21
199736.000	20.00	0.0	0.0	717.30	5300.00	729.82	0.0	730.08	4.43	4.45	1553.66	2518.10
199736.000	20.00	0.0	0.0	717.30	7110.00	731.49	0.0	731.78	4.29	4.80	1971.15	3431.80

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
199785.000	1.00	725.30	732.50	717.30	2990.00	727.37	0.0	727.58	13.96	3.31	880.62	686.61
199785.000	1.00	725.30	732.50	717.30	4580.00	729.16	0.0	729.36	15.46	3.92	1326.78	1164.81
199785.000	1.00	725.30	732.50	717.30	5300.00	729.88	0.0	730.09	14.20	3.94	1508.11	1406.38
199785.000	1.00	725.30	732.50	717.30	7110.00	731.57	0.0	731.79	11.95	3.98	1929.91	2056.69
199786.000	5.00	725.30	732.50	717.30	2990.00	727.38	0.0	727.59	18.95	3.31	880.80	686.77
199786.000	5.00	725.30	732.50	717.30	4580.00	729.17	0.0	729.37	15.42	3.92	1328.00	1166.36
199786.000	5.00	725.30	732.50	717.30	5300.00	729.89	0.0	730.10	14.17	3.93	1509.28	1408.02
199786.000	5.00	725.30	732.50	717.30	7110.00	731.58	0.0	731.79	11.93	3.98	1930.79	2058.16
199787.000	1.00	0.0	0.0	717.30	2990.00	727.39	0.0	727.59	4.17	3.67	943.80	1464.17
199787.000	1.00	0.0	0.0	717.30	4580.00	729.14	0.0	729.38	4.39	4.25	1383.05	2186.67
199787.000	1.00	0.0	0.0	717.30	5300.00	729.85	0.0	730.11	4.37	4.43	1562.06	2535.07
199787.000	1.00	0.0	0.0	717.30	7110.00	731.53	0.0	731.82	4.24	4.78	1980.82	3454.57
199835.000	20.00	0.0	0.0	716.50	2990.00	727.49	0.0	727.60	2.24	2.88	1256.80	1995.71
199835.000	20.00	0.0	0.0	716.50	4580.00	729.26	0.0	729.40	2.32	3.32	1855.10	3006.73
199835.000	20.00	0.0	0.0	716.50	5300.00	729.98	0.0	730.13	2.28	3.44	2116.89	3511.45
199835.000	20.00	0.0	0.0	716.50	7110.00	731.67	0.0	731.83	2.14	3.67	2725.96	4855.12
200860.000	700.00	0.0	0.0	716.00	2990.00	727.64	0.0	727.80	3.12	3.19	936.05	1692.74
200860.000	700.00	0.0	0.0	716.00	4580.00	729.40	0.0	729.64	3.98	3.95	1282.46	2296.90
200860.000	700.00	0.0	0.0	716.00	5300.00	730.12	0.0	730.37	4.01	4.13	1504.07	2647.81
200860.000	700.00	0.0	0.0	716.00	7110.00	731.80	0.0	732.07	3.81	4.41	2025.60	3644.22
200910.000	270.00	0.0	0.0	717.30	2990.00	727.68	0.0	727.93	4.72	4.04	787.95	1376.16
200910.000	270.00	0.0	0.0	717.30	4580.00	729.43	0.0	729.81	5.72	5.04	990.10	1914.90
200910.000	270.00	0.0	0.0	717.30	5300.00	730.13	0.0	730.56	6.06	5.41	1094.44	2153.81
200910.000	270.00	0.0	0.0	717.30	7110.00	731.79	0.0	732.25	5.69	5.77	1678.50	2981.84
200911.000	60.00	729.30	727.70	717.30	2990.00	727.95	0.0	728.18	4.24	3.90	817.46	1452.02
200911.000	60.00	729.30	727.70	717.30	4580.00	730.16	0.0	730.48	4.46	4.66	1107.25	2167.65
200911.000	60.00	729.30	727.70	717.30	5300.00	730.83	0.0	731.17	4.61	4.92	1369.98	2469.70
200911.000	60.00	729.30	727.70	717.30	7110.00	732.20	0.0	732.58	4.70	5.36	1920.56	3280.14
200960.000	100.00	0.0	0.0	717.40	2990.00	728.09	0.0	728.22	2.61	2.93	1049.82	1849.57
200960.000	100.00	0.0	0.0	717.40	4580.00	730.37	0.0	730.53	2.50	3.34	1663.83	2898.01
200960.000	100.00	0.0	0.0	717.40	5300.00	731.05	0.0	731.22	2.55	3.51	1908.98	3321.18
200960.000	100.00	0.0	0.0	717.40	7110.00	732.43	0.0	732.63	2.73	3.92	2404.63	4303.14
201460.000	185.00	0.0	0.0	718.60	2990.00	728.09	0.0	728.31	5.09	3.77	792.71	1324.67
201460.000	185.00	0.0	0.0	718.60	4580.00	730.34	0.0	730.64	5.17	4.38	1081.56	2014.15
201460.000	185.00	0.0	0.0	718.60	5300.00	731.00	0.0	731.34	5.34	4.67	1258.59	2294.22
201460.000	185.00	0.0	0.0	718.60	7110.00	732.36	0.0	732.76	5.65	5.23	1681.67	2992.01
201510.000	280.00	0.0	0.0	718.30	2990.00	728.24	0.0	728.45	4.44	3.69	810.68	1418.21
201510.000	280.00	0.0	0.0	718.30	4580.00	730.47	0.0	730.79	5.30	4.54	1009.74	1989.25
201510.000	280.00	0.0	0.0	718.30	5300.00	731.14	0.0	731.52	5.97	4.96	1068.81	2169.63
201510.000	280.00	0.0	0.0	718.30	7110.00	732.47	0.0	733.02	7.80	5.99	1187.57	2545.73
201511.000	14.00	733.30	727.80	718.30	2990.00	728.36	0.0	728.57	4.26	3.64	821.77	1448.41
201511.000	14.00	733.30	727.80	718.30	4580.00	730.95	0.0	731.25	4.67	4.35	1052.50	2119.36
201511.000	14.00	733.30	727.80	718.30	5300.00	731.83	0.0	732.17	5.03	4.69	1130.83	2363.86
201511.000	14.00	733.30	727.80	718.30	7110.00	733.63	0.0	734.10	6.08	5.51	1290.26	2884.41

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
201560.000	100.00	0.0	0.0	718.20	2990.00	728.43	0.0	728.61	3.95	3.59	1033.62	1504.07
201560.000	100.00	0.0	0.0	718.20	4580.00	731.06	0.0	731.30	3.79	4.14	1387.12	2351.36
201560.000	100.00	0.0	0.0	718.20	5300.00	731.96	0.0	732.24	3.89	4.41	1527.57	2687.58
201560.000	100.00	0.0	0.0	718.20	7110.00	733.84	0.0	734.18	4.10	5.00	1901.98	3510.11
202435.000	555.00	0.0	0.0	716.40	2990.00	728.56	0.0	728.80	2.64	3.13	1205.16	1839.54
202435.000	555.00	0.0	0.0	716.40	4580.00	731.30	0.0	731.48	2.58	3.62	1725.26	2849.76
202435.000	555.00	0.0	0.0	716.40	5300.00	732.22	0.0	732.42	2.55	3.84	1930.54	3255.98
202435.000	555.00	0.0	0.0	716.40	7110.00	734.13	0.0	734.38	2.88	4.37	2395.25	4189.50
202485.000	300.00	0.0	0.0	718.30	2990.00	728.69	0.0	728.98	5.43	4.40	756.18	1282.82
202485.000	300.00	0.0	0.0	718.30	4580.00	731.30	0.0	731.70	5.48	5.20	1015.02	1955.88
202485.000	300.00	0.0	0.0	718.30	5300.00	732.21	0.0	732.67	5.71	5.57	1109.85	2217.92
202485.000	300.00	0.0	0.0	718.30	7110.00	734.07	0.0	734.69	6.42	6.47	1314.07	2805.34
202486.000	10.00	734.40	728.70	718.30	2990.00	728.70	0.0	728.99	9.78	4.37	757.28	956.16
202486.000	10.00	734.40	728.70	718.30	4580.00	731.20	0.0	731.83	29.96	6.54	792.82	836.71
202486.000	10.00	734.40	728.70	718.30	5300.00	733.22	0.0	733.61	4.39	5.14	1219.84	2530.64
202486.000	10.00	734.40	728.70	718.30	7110.00	735.27	0.0	735.79	4.90	5.95	1450.43	3212.97
202535.000	120.00	0.0	0.0	718.20	2990.00	728.85	0.0	729.09	5.71	3.96	755.83	1251.69
202535.000	120.00	0.0	0.0	718.20	4580.00	731.76	0.0	732.05	5.01	4.38	1166.75	2045.76
202535.000	120.00	0.0	0.0	718.20	5300.00	733.43	0.0	733.70	4.08	4.27	1462.34	2623.95
202535.000	120.00	0.0	0.0	718.20	7110.00	735.58	0.0	735.90	4.07	4.70	1889.08	3525.60
203135.000	300.00	0.0	0.0	718.20	2990.00	729.03	0.0	729.26	5.35	3.87	771.99	1292.20
203135.000	300.00	0.0	0.0	718.20	4580.00	731.92	0.0	732.20	4.73	4.29	1226.71	2106.10
203135.000	300.00	0.0	0.0	718.20	5300.00	733.57	0.0	733.82	3.86	4.17	1549.19	2697.09
203135.000	300.00	0.0	0.0	718.20	7110.00	735.72	0.0	736.02	3.79	4.57	2032.01	3653.71
203234.000	200.00	0.0	0.0	717.80	2990.00	729.21	0.0	729.35	2.98	3.04	984.02	1731.97
203234.000	200.00	0.0	0.0	717.80	4580.00	732.15	0.0	732.29	2.39	3.19	1839.14	2960.42
203234.000	200.00	0.0	0.0	717.80	5300.00	733.80	0.0	733.90	1.58	2.81	2532.63	4211.47
203234.000	200.00	0.0	0.0	717.80	7110.00	736.02	0.0	736.10	1.25	2.74	3462.41	6363.93
203235.000	10.00	729.50	731.50	717.80	2990.00	729.21	0.0	729.36	2.98	3.04	984.43	1733.09
203235.000	10.00	729.50	731.50	717.80	4580.00	732.14	0.0	732.30	8.08	3.44	1617.10	1611.24
203235.000	10.00	729.50	731.50	717.80	5300.00	733.81	0.0	733.90	5.95	2.46	2254.40	2172.81
203235.000	10.00	729.50	731.50	717.80	7110.00	736.02	0.0	736.10	3.39	2.08	3184.12	3861.70
203236.000	64.00	729.50	731.50	717.80	2990.00	729.23	0.0	729.38	2.96	3.03	986.21	1737.97
203236.000	64.00	729.50	731.50	717.80	4580.00	732.20	0.0	732.35	7.94	3.41	1631.80	1625.64
203236.000	64.00	729.50	731.50	717.80	5300.00	733.85	0.0	733.94	5.81	2.43	2271.26	2199.22
203236.000	64.00	729.50	731.50	717.80	7110.00	736.04	0.0	736.13	3.36	2.07	3192.01	3877.95
203237.000	10.00	0.0	0.0	717.80	2990.00	729.24	0.0	729.38	2.96	3.03	986.55	1738.89
203237.000	10.00	0.0	0.0	717.80	4580.00	732.22	0.0	732.36	2.33	3.15	1866.26	3002.70
203237.000	10.00	0.0	0.0	717.80	5300.00	733.85	0.0	733.95	1.55	2.78	2556.24	4259.80
203237.000	10.00	0.0	0.0	717.80	7110.00	736.04	0.0	736.13	1.23	2.73	3475.70	6398.19
203335.000	150.00	0.0	0.0	716.70	2990.00	729.34	0.0	729.42	1.54	2.32	1288.80	2409.44
203335.000	150.00	0.0	0.0	716.70	4580.00	732.31	0.0	732.40	1.24	2.44	2175.79	4115.88
203335.000	150.00	0.0	0.0	716.70	5300.00	733.90	0.0	733.97	0.91	2.27	2801.76	5543.16
203335.000	150.00	0.0	0.0	716.70	7110.00	736.08	0.0	736.15	0.78	2.31	3713.51	8046.27

SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
203610.000	230.00	0.0	0.0	718.60	2990.00	729.36	0.0	729.48	2.38	2.78	1076.06	1938.47
203610.000	230.00	0.0	0.0	718.60	4580.00	732.31	0.0	732.48	2.61	3.33	1383.09	2832.90
203610.000	230.00	0.0	0.0	718.60	5300.00	733.88	0.0	734.05	2.33	3.33	1744.67	3469.22
203610.000	230.00	0.0	0.0	718.60	7110.00	736.06	0.0	736.22	2.07	3.38	2592.42	4938.50
203611.000	42.00	732.00	732.50	718.60	2990.00	729.37	0.0	729.49	2.38	2.78	1076.46	1939.58
203611.000	42.00	732.00	732.50	718.60	4580.00	732.37	0.0	732.54	2.57	3.31	1393.15	2854.98
203611.000	42.00	732.00	732.50	718.60	5300.00	733.97	0.0	734.13	2.28	3.30	1768.59	3508.92
203611.000	42.00	732.00	732.50	718.60	7110.00	736.14	0.0	736.29	2.01	3.35	2628.42	5010.47
203612.000	13.00	0.0	0.0	718.60	2990.00	729.38	0.0	729.49	2.25	2.72	1098.47	1995.33
203612.000	13.00	0.0	0.0	718.60	4580.00	732.39	0.0	732.55	2.45	3.25	1408.18	2924.84
203612.000	13.00	0.0	0.0	718.60	5300.00	733.97	0.0	734.13	2.26	3.31	1725.80	3523.22
203612.000	13.00	0.0	0.0	718.60	7110.00	736.14	0.0	736.30	2.04	3.39	2586.45	4977.82
* 203613.000	12.00	729.50	718.71	718.60	2990.00	733.63	0.0	733.69	0.79	1.93	1628.90	3372.73
203613.000	12.00	729.50	718.71	718.60	4580.00	734.49	0.0	734.60	1.46	2.70	1892.51	3791.52
203613.000	12.00	729.50	718.71	718.60	5300.00	734.98	0.0	735.10	1.69	2.95	2070.32	4077.85
203613.000	12.00	729.50	718.71	718.60	7110.00	736.51	0.0	736.55	1.79	3.22	2752.22	5316.01
203614.000	200.00	0.0	0.0	722.00	2990.00	733.68	0.0	733.71	0.74	1.45	2332.34	3479.94
203614.000	200.00	0.0	0.0	722.00	4580.00	734.59	0.0	734.64	1.14	1.93	2726.35	4294.82
203614.000	200.00	0.0	0.0	722.00	5300.00	735.09	0.0	735.15	1.23	2.07	2949.68	4736.21
203614.000	200.00	0.0	0.0	722.00	7110.00	736.63	0.0	736.70	1.21	2.27	3649.76	6454.18
204485.000	725.00	0.0	0.0	724.80	2990.00	733.74	0.0	733.74	0.19	0.68	4448.41	6786.55
204485.000	725.00	0.0	0.0	724.80	4580.00	734.68	0.0	734.69	0.30	0.92	5085.57	8426.36
204485.000	725.00	0.0	0.0	724.80	5300.00	735.19	0.0	735.21	0.32	0.99	5435.37	9379.87
204485.000	725.00	0.0	0.0	724.80	7110.00	736.74	0.0	736.76	0.32	1.12	6618.54	12532.62
206860.000	2375.00	0.0	0.0	725.40	2990.00	733.79	0.0	733.80	0.29	0.81	3774.09	5572.24
206860.000	2375.00	0.0	0.0	725.40	4580.00	734.76	0.0	734.78	0.42	1.07	4423.12	7051.45
206860.000	2375.00	0.0	0.0	725.40	5300.00	735.28	0.0	735.30	0.45	1.15	4774.24	7913.68
206860.000	2375.00	0.0	0.0	725.40	7110.00	736.82	0.0	736.85	0.44	1.28	5828.31	10740.93
207985.000	1125.00	0.0	0.0	725.40	2990.00	733.83	0.0	733.85	0.77	1.33	2437.96	3413.22
207985.000	1125.00	0.0	0.0	725.40	4580.00	734.81	0.0	734.85	1.05	1.70	3092.59	4469.87
207985.000	1125.00	0.0	0.0	725.40	5300.00	735.33	0.0	735.38	1.06	1.79	3508.38	5136.64
207985.000	1125.00	0.0	0.0	725.40	7110.00	736.88	0.0	736.92	0.89	1.83	4929.18	7556.34
209110.000	1125.00	0.0	0.0	725.40	2990.00	733.89	0.0	733.90	0.25	0.77	4082.01	5964.25
209110.000	1125.00	0.0	0.0	725.40	4580.00	734.91	0.0	734.92	0.36	1.01	4820.34	7622.34
209110.000	1125.00	0.0	0.0	725.40	5300.00	735.43	0.0	735.45	0.38	1.09	5218.42	8559.80
209110.000	1125.00	0.0	0.0	725.40	7110.00	736.96	0.0	736.99	0.37	1.20	6454.93	11636.48

PINE RIVER

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
177360.000	2990.00	721.27	0.0	0.0	0.0	140.00	0.0
177360.000	4580.00	721.79	0.52	0.0	0.0	140.00	0.0
177360.000	5300.00	722.00	0.21	0.0	0.0	140.00	0.0
177360.000	7110.00	722.50	0.50	0.0	0.0	140.00	0.0
177410.000	2990.00	721.21	0.0	-0.06	0.0	86.00	10.00
177410.000	4580.00	721.66	0.45	-0.13	0.0	86.00	10.00
177410.000	5300.00	721.84	0.17	-0.16	0.0	86.00	10.00
177410.000	7110.00	722.22	0.38	-0.28	0.0	86.00	10.00
177411.000	2990.00	721.22	0.0	0.01	0.0	86.00	40.00
177411.000	4580.00	722.17	0.95	0.51	0.0	86.00	40.00
177411.000	5300.00	722.55	0.38	0.72	0.0	86.00	40.00
177411.000	7110.00	723.69	1.13	1.47	0.0	86.00	40.00
177460.000	2990.00	721.51	0.0	0.29	0.0	454.41	200.00
177460.000	4580.00	722.72	1.21	0.55	0.0	590.37	200.00
177460.000	5300.00	723.24	0.52	0.68	0.0	689.70	200.00
177460.000	7110.00	724.69	1.45	1.00	0.0	906.25	200.00
178910.000	2990.00	721.55	0.0	0.04	0.0	596.29	1350.00
178910.000	4580.00	722.78	1.23	0.06	0.0	692.09	1350.00
178910.000	5300.00	723.30	0.52	0.07	0.0	732.98	1350.00
178910.000	7110.00	724.76	1.45	0.07	0.0	851.83	1350.00
180110.000	2990.00	721.60	0.0	0.05	0.0	407.83	1300.00
180110.000	4580.00	722.84	1.25	0.06	0.0	536.70	1300.00
180110.000	5300.00	723.37	0.53	0.07	0.0	591.29	1300.00
180110.000	7110.00	724.83	1.46	0.07	0.0	804.74	1300.00
180660.000	2990.00	721.40	0.0	-0.19	0.0	100.05	400.00
180660.000	4580.00	722.53	1.12	-0.31	0.0	100.05	400.00
180660.000	5300.00	723.00	0.47	-0.37	0.0	100.05	400.00
180660.000	7110.00	724.34	1.34	-0.48	0.0	100.05	400.00
180661.000	2990.00	721.45	0.0	0.04	0.0	100.05	20.00
180661.000	4580.00	722.61	1.16	0.08	0.0	100.05	20.00
180661.000	5300.00	723.09	0.49	0.09	0.0	100.05	20.00
180661.000	7110.00	724.40	1.30	0.05	0.0	100.05	20.00
180710.000	2990.00	722.12	0.0	0.67	0.0	623.61	200.00
180710.000	4580.00	723.66	1.54	1.05	0.0	660.39	200.00
180710.000	5300.00	724.31	0.65	1.21	0.0	675.93	200.00
180710.000	7110.00	725.93	1.63	1.54	0.0	784.08	200.00
182160.000	2990.00	722.13	0.0	0.02	0.0	585.41	1300.00
182160.000	4580.00	723.68	1.54	0.02	0.0	595.68	1300.00
182160.000	5300.00	724.33	0.65	0.02	0.0	600.02	1300.00
182160.000	7110.00	725.95	1.63	0.02	0.0	720.22	1300.00
184410.000	2990.00	722.16	0.0	0.02	0.0	770.80	2250.00
184410.000	4580.00	723.71	1.55	0.03	0.0	916.04	2250.00
184410.000	5300.00	724.36	0.65	0.04	0.0	993.53	2250.00
184410.000	7110.00	726.00	1.63	0.04	0.0	1186.55	2250.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
185660.000	2990.00	722.12	0.0	-0.03	0.0	263.76	1250.00
185660.000	4580.00	723.56	1.54	-0.04	0.0	300.39	1250.00
185660.000	5300.00	724.32	0.65	-0.05	0.0	345.53	1250.00
185660.000	7110.00	725.95	1.63	-0.05	0.0	697.24	1250.00
185662.000	2990.00	722.20	0.0	0.08	0.0	108.84	300.00
185662.000	4580.00	723.72	1.52	0.05	0.0	115.29	300.00
185662.000	5300.00	724.35	0.63	0.04	0.0	117.92	300.00
185662.000	7110.00	725.93	1.58	-0.02	0.0	126.95	300.00
185663.000	2990.00	722.21	0.0	0.01	0.0	108.92	50.00
185663.000	4580.00	723.73	1.52	0.01	0.0	115.31	50.00
185663.000	5300.00	724.37	0.64	0.02	0.0	117.99	50.00
185663.000	7110.00	725.95	1.58	0.02	0.0	127.25	50.00
186160.000	2990.00	722.23	0.0	0.02	0.0	108.98	30.00
186160.000	4580.00	723.75	1.53	0.02	0.0	115.40	30.00
186160.000	5300.00	724.39	0.64	0.02	0.0	118.09	30.00
186160.000	7110.00	725.98	1.59	0.03	0.0	127.59	30.00
186161.000	2990.00	722.23	0.0	0.01	0.0	109.01	50.00
186161.000	4580.00	723.77	1.53	0.01	0.0	115.47	50.00
186161.000	5300.00	724.41	0.64	0.02	0.0	118.17	50.00
185161.000	7110.00	726.00	1.59	0.02	0.0	127.93	50.00
186210.000	2990.00	722.30	0.0	0.07	0.0	179.64	150.00
186210.000	4580.00	723.88	1.58	0.11	0.0	339.07	150.00
186210.000	5300.00	724.60	0.72	0.19	0.0	413.16	150.00
186210.000	7110.00	726.41	1.81	0.41	0.0	582.67	150.00
187460.000	2990.00	722.87	0.0	0.57	0.0	610.90	1200.00
187460.000	4580.00	724.52	1.65	0.64	0.0	649.64	1200.00
187460.000	5300.00	725.21	0.70	0.61	0.0	690.37	1200.00
187460.000	7110.00	726.90	1.69	0.49	0.0	863.92	1200.00
189960.000	2990.00	723.25	0.0	0.38	0.0	451.34	2400.00
189960.000	4580.00	724.89	1.64	0.37	0.0	558.67	2400.00
189960.000	5300.00	725.57	0.69	0.36	0.0	568.10	2400.00
189960.000	7110.00	727.23	1.66	0.33	0.0	662.04	2400.00
191085.000	2990.00	723.42	0.0	0.17	0.0	727.32	1000.00
191085.000	4580.00	725.04	1.62	0.16	0.0	803.33	1000.00
191085.000	5300.00	725.72	0.68	0.15	0.0	835.52	1000.00
191085.000	7110.00	727.36	1.64	0.13	0.0	912.98	1000.00
192210.000	2990.00	723.64	0.0	0.23	0.0	725.28	1000.00
192210.000	4580.00	725.21	1.57	0.17	0.0	747.37	1000.00
192210.000	5300.00	725.88	0.66	0.16	0.0	756.70	1000.00
192210.000	7110.00	727.49	1.61	0.13	0.0	779.33	1000.00
195585.000	2990.00	725.66	0.0	2.01	0.0	345.67	3375.00
195585.000	4580.00	726.86	1.21	1.65	0.0	371.85	3375.00
195585.000	5300.00	727.38	0.52	1.51	0.0	383.17	3375.00
195585.000	7110.00	728.69	1.30	1.20	0.0	399.96	3375.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
196440.000	2990.00	725.93	0.0	0.28	0.0	153.20	500.00
196440.000	4580.00	727.18	1.25	0.32	0.0	272.69	500.00
196440.000	5300.00	727.71	0.52	0.32	0.0	275.55	500.00
196440.000	7110.00	728.99	1.28	0.30	0.0	282.57	500.00
196510.000	2990.00	726.03	0.0	0.10	0.0	72.38	280.00
196510.000	4580.00	727.29	1.26	0.10	0.0	72.38	280.00
196510.000	5300.00	727.79	0.50	0.08	0.0	72.38	280.00
196510.000	7110.00	728.97	1.19	-0.01	0.0	72.38	280.00
196511.000	2990.00	726.05	0.0	0.02	0.0	72.38	40.00
196511.000	4580.00	727.34	1.29	0.05	0.0	72.38	40.00
196511.000	5300.00	727.86	0.52	0.07	0.0	72.38	40.00
196511.000	7110.00	729.09	1.23	0.11	0.0	72.38	40.00
196560.000	2990.00	726.36	0.0	0.32	0.0	109.78	100.00
196560.000	4580.00	727.90	1.53	0.56	0.0	118.32	100.00
196560.000	5300.00	728.54	0.64	0.68	0.0	121.89	100.00
196560.000	7110.00	730.10	1.56	1.01	0.0	131.06	100.00
198285.000	2990.00	726.91	0.0	0.54	0.0	156.70	1700.00
198285.000	4580.00	728.66	1.75	0.76	0.0	167.47	1700.00
198285.000	5300.00	729.38	0.72	0.84	0.0	175.61	1700.00
198285.000	7110.00	731.09	1.71	0.99	0.0	385.19	1700.00
199035.000	2990.00	727.03	0.0	0.12	0.0	255.78	750.00
199035.000	4580.00	728.83	1.80	0.18	0.0	285.51	750.00
199035.000	5300.00	729.57	0.74	0.19	0.0	293.94	750.00
199035.000	7110.00	731.30	1.73	0.21	0.0	300.00	750.00
199735.000	2990.00	727.43	0.0	0.40	0.0	199.93	725.00
199735.000	4580.00	729.17	1.74	0.34	0.0	250.00	725.00
199735.000	5300.00	729.88	0.71	0.31	0.0	250.00	725.00
199735.000	7110.00	731.55	1.67	0.25	0.0	250.00	725.00
199736.000	2990.00	727.37	0.0	-0.05	0.0	250.00	20.00
199736.000	4580.00	729.11	1.73	-0.06	0.0	250.00	20.00
199736.000	5300.00	729.82	0.71	-0.06	0.0	250.00	20.00
199736.000	7110.00	731.49	1.67	-0.06	0.0	250.00	20.00
199785.000	2990.00	727.37	0.0	-0.00	0.0	250.00	1.00
199785.000	4580.00	729.16	1.79	0.05	0.0	250.00	1.00
199785.000	5300.00	729.88	0.73	0.06	0.0	250.00	1.00
199785.000	7110.00	731.57	1.69	0.08	0.0	250.00	1.00
199786.000	2990.00	727.38	0.0	0.01	0.0	250.00	5.00
199786.000	4580.00	729.17	1.79	0.01	0.0	250.00	5.00
199786.000	5300.00	729.89	0.72	0.01	0.0	250.00	5.00
199786.000	7110.00	731.58	1.69	0.01	0.0	250.00	5.00
199787.000	2990.00	727.39	0.0	0.01	0.0	250.00	1.00
199787.000	4580.00	729.14	1.75	-0.03	0.0	250.00	1.00
199787.000	5300.00	729.85	0.72	-0.04	0.0	250.00	1.00
199787.000	7110.00	731.53	1.67	-0.05	0.0	250.00	1.00

SECND	Q	CWSEL	DIFHSP	DIFHSX	DIFKWS	TOPWID	XLCH
199835.000	2990.00	727.49	0.0	0.10	0.0	284.96	20.00
199835.000	4580.00	729.26	1.77	0.12	0.0	360.00	20.00
199835.000	5300.00	729.98	0.72	0.13	0.0	360.00	20.00
199835.000	7110.00	731.67	1.69	0.14	0.0	360.00	20.00
200860.000	2990.00	727.64	0.0	0.16	0.0	112.37	700.00
200860.000	4580.00	729.40	1.76	0.15	0.0	297.72	700.00
200860.000	5300.00	730.12	0.72	0.14	0.0	311.00	700.00
200860.000	7110.00	731.80	1.68	0.12	0.0	311.00	700.00
200910.000	2990.00	727.68	0.0	0.04	0.0	111.26	270.00
200910.000	4580.00	729.43	1.75	0.03	0.0	119.95	270.00
200910.000	5300.00	730.13	0.69	0.01	0.0	350.00	270.00
200910.000	7110.00	731.79	1.67	-0.00	0.0	350.00	270.00
200911.000	2990.00	727.95	0.0	0.26	0.0	112.57	60.00
200911.000	4580.00	730.16	2.21	0.73	0.0	362.22	60.00
200911.000	5300.00	730.83	0.66	0.70	0.0	400.00	60.00
200911.000	7110.00	732.20	1.38	0.41	0.0	400.00	60.00
200960.000	2990.00	728.09	0.0	0.14	0.0	164.57	100.00
200960.000	4580.00	730.37	2.28	0.21	0.0	360.00	100.00
200960.000	5300.00	731.05	0.68	0.22	0.0	360.00	100.00
200960.000	7110.00	732.43	1.38	0.22	0.0	360.00	100.00
201460.000	2990.00	728.09	0.0	0.00	0.0	107.21	185.00
201460.000	4580.00	730.34	2.25	-0.03	0.0	247.65	185.00
201460.000	5300.00	731.00	0.67	-0.05	0.0	283.87	185.00
201460.000	7110.00	732.36	1.36	-0.07	0.0	320.00	185.00
201510.000	2990.00	728.24	0.0	0.15	0.0	89.00	280.00
201510.000	4580.00	730.47	2.24	0.14	0.0	89.00	280.00
201510.000	5300.00	731.14	0.66	0.13	0.0	89.00	280.00
201510.000	7110.00	732.47	1.33	0.11	0.0	89.00	280.00
201511.000	2990.00	728.36	0.0	0.12	0.0	89.00	14.00
201511.000	4580.00	730.95	2.59	0.48	0.0	89.00	14.00
201511.000	5300.00	731.83	0.88	0.70	0.0	89.00	14.00
201511.000	7110.00	733.63	1.79	1.16	0.0	89.00	14.00
201560.000	2990.00	728.43	0.0	0.07	0.0	133.68	100.00
201560.000	4580.00	731.06	2.63	0.11	0.0	134.89	100.00
201560.000	5300.00	731.96	0.90	0.13	0.0	191.37	100.00
201560.000	7110.00	733.84	1.87	0.21	0.0	200.00	100.00
202435.000	2990.00	728.66	0.0	0.23	0.0	178.28	555.00
202435.000	4580.00	731.30	2.65	0.24	0.0	216.17	555.00
202435.000	5300.00	732.22	0.92	0.26	0.0	229.52	555.00
202435.000	7110.00	734.13	1.91	0.30	0.0	257.20	555.00
202485.000	2990.00	728.69	0.0	0.03	0.0	94.96	300.00
202485.000	4580.00	731.30	2.61	-0.00	0.0	103.33	300.00
202485.000	5300.00	732.21	0.90	-0.02	0.0	106.22	300.00
202485.000	7110.00	734.07	1.87	-0.06	0.0	112.21	300.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
202486.000	2990.00	728.70	0.0	0.01	0.0	95.01	10.00
202486.000	4580.00	731.20	2.50	-0.10	0.0	103.00	10.00
202486.000	5300.00	733.22	2.03	1.02	0.0	109.49	10.00
202486.000	7110.00	735.27	2.04	1.19	0.0	116.04	10.00
202535.000	2990.00	728.35	0.0	0.15	0.0	90.72	120.00
202535.000	4580.00	731.76	2.91	0.56	0.0	175.60	120.00
202535.000	5300.00	733.43	1.67	0.20	0.0	178.38	120.00
202535.000	7110.00	735.58	2.15	0.31	0.0	249.27	120.00
203135.000	2990.00	729.03	0.0	0.18	0.0	91.32	300.00
203135.000	4580.00	731.92	2.90	0.16	0.0	195.87	300.00
203135.000	5300.00	733.57	1.64	0.14	0.0	198.59	300.00
203135.000	7110.00	735.72	2.16	0.15	0.0	277.51	300.00
203234.000	2990.00	729.21	0.0	0.19	0.0	98.80	200.00
203234.000	4580.00	732.15	2.94	0.23	0.0	420.00	200.00
203234.000	5300.00	733.80	1.65	0.24	0.0	420.00	200.00
203234.000	7110.00	736.02	2.21	0.29	0.0	420.00	200.00
203235.000	2990.00	729.21	0.0	0.00	0.0	98.80	10.00
203235.000	4580.00	732.14	2.93	-0.01	0.0	420.00	10.00
203235.000	5300.00	733.81	1.67	0.01	0.0	420.00	10.00
203235.000	7110.00	736.02	2.21	0.01	0.0	420.00	10.00
203236.000	2990.00	729.23	0.0	0.02	0.0	98.80	64.00
203236.000	4580.00	732.20	2.97	0.06	0.0	420.00	64.00
203236.000	5300.00	733.85	1.65	0.04	0.0	420.00	64.00
203236.000	7110.00	736.04	2.19	0.02	0.0	420.00	64.00
203237.000	2990.00	729.24	0.0	0.00	0.0	98.80	10.00
203237.000	4580.00	732.22	2.99	0.02	0.0	420.00	10.00
203237.000	5300.00	733.85	1.63	-0.00	0.0	420.00	10.00
203237.000	7110.00	736.04	2.19	-0.00	0.0	420.00	10.00
203335.000	2990.00	729.34	0.0	0.10	0.0	130.65	150.00
203335.000	4580.00	732.31	2.97	0.09	0.0	368.10	150.00
203335.000	5300.00	733.90	1.59	0.05	0.0	414.37	150.00
203335.000	7110.00	736.08	2.18	0.04	0.0	420.00	150.00
203610.000	2990.00	729.36	0.0	0.03	0.0	102.00	230.00
203610.000	4580.00	732.31	2.94	-0.00	0.0	145.95	230.00
203610.000	5300.00	733.88	1.58	-0.02	0.0	293.14	230.00
203610.000	7110.00	736.06	2.18	-0.02	0.0	450.00	230.00
203611.000	2990.00	729.37	0.0	0.00	0.0	102.00	42.00
203611.000	4580.00	732.37	3.01	0.07	0.0	155.49	42.00
203611.000	5300.00	733.97	1.59	0.08	0.0	299.35	42.00
203611.000	7110.00	736.14	2.18	0.08	0.0	450.00	42.00
203612.000	2990.00	729.38	0.0	0.01	0.0	103.00	13.00
203612.000	4580.00	732.39	3.01	0.01	0.0	103.00	13.00
203612.000	5300.00	733.97	1.58	0.00	0.0	300.58	13.00
203612.000	7110.00	736.14	2.18	-0.00	0.0	450.00	13.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
* 203613.000	2990.00	733.63	0.0	4.25	0.0	274.66	12.00
203613.000	4580.00	734.49	0.86	2.10	0.0	338.80	12.00
203613.000	5300.00	734.98	0.49	1.01	0.0	397.69	12.00
203613.000	7110.00	736.51	1.54	0.37	0.0	450.00	12.00
203614.000	2990.00	733.68	0.0	0.05	0.0	428.27	200.00
203614.000	4580.00	734.59	0.91	0.10	0.0	439.62	200.00
203614.000	5300.00	735.09	0.50	0.12	0.0	445.92	200.00
203614.000	7110.00	736.63	1.54	0.12	0.0	461.00	200.00
204485.000	2990.00	733.74	0.0	0.05	0.0	670.65	725.00
204485.000	4580.00	734.68	0.94	0.09	0.0	674.60	725.00
204485.000	5300.00	735.19	0.51	0.10	0.0	690.96	725.00
204485.000	7110.00	736.74	1.55	0.11	0.0	846.43	725.00
206860.000	2990.00	733.79	0.0	0.05	0.0	656.67	2375.00
206860.000	4580.00	734.76	0.97	0.08	0.0	673.86	2375.00
206860.000	5300.00	735.28	0.52	0.09	0.0	677.16	2375.00
205860.000	7110.00	736.82	1.55	0.08	0.0	586.97	2375.00
207985.000	2990.00	733.83	0.0	0.04	0.0	579.22	1125.00
207985.000	4580.00	734.81	0.98	0.05	0.0	753.68	1125.00
207985.000	5300.00	735.33	0.52	0.06	0.0	830.16	1125.00
207985.000	7110.00	736.88	1.54	0.05	0.0	1005.93	1125.00
209110.000	2990.00	733.89	0.0	0.06	0.0	709.64	1125.00
209110.000	4580.00	734.91	1.01	0.09	0.0	747.65	1125.00
209110.000	5300.00	735.43	0.53	0.10	0.0	767.36	1125.00
209110.000	7110.00	736.96	1.53	0.09	0.0	863.55	1125.00

SUMMARY OF ERRORS

CAUTION SECNO ********* PROFILE 1 20 TRIALS OF EG NOT ENOUGH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

1601 PORTAGE STREET
KALAMAZOO, MICHIGAN 49001
(616) 385-0011

September 10, 1979

Mr. Daniel H. Morgan, P.E.
Flood Insurance Unit
Flood Plain Management Section
Water Management Division
Michigan Department of
Natural Resources
P.O. Box 30028
Lansing, MI 48909

Re: City of Alma Flood Insurance Study

Dear Mr. Morgan:

Enclosed for your review is our Hydraulic Analysis of the Pine River through the City of Alma.

The following information is included:

1. HEC-2 run for 100 year flood
2. Summary tables for 10, 50, 100 and 500 year floods
3. IPLOT for 100-year flow
4. Topographic map
5. Hydraulic Analysis Report.

If you have any questions on this information, please call me.

Very truly yours,

GOVE ASSOCIATES INC.

William J. McDonough, P.E.
Associate

:sp

encl: as noted

TABLE OF CONTENTS

Letter of Transmittal

Introduction

Method of Analysis

Results and Discussions

Table 1	Locations of Cross Sections
Figure 1	Rating Curve at USGS Gauging Station 1550
Figure 2	Convergence Test
Figure 3	100-Year Profile
Appendix I	Sketches and Pictures of Bridge Sections
Appendix II	Topographic Map with Delineated Natural Floodway and Inundated Area
Appendix III	Computer Output

HYDRAULIC ANALYSIS

1. INTRODUCTION

The stream being studied is the Pine River in the City of Alma, Michigan with 288 square miles drainage area. The City boundaries where the river passes through are taken as the study limits. The discharges and frequencies used in this study were obtained by analyzing the data from USGS gauging station, located 270 feet downstream from Superior Street Bridge in Alma. The method of analysis is the Log-Pearson Type III Method with a -0.1 skewness factor in accordance with the WRC guidelines. These flows have been submitted to the Michigan Department of Natural Resources for approval and shown as follows:

PEAK FLOWS (CFS)			
10 Year	50 Year	100 Year	500 Year
2990	4580	5300	7110

The flows were further prorated to the starting point by the method of Regional Analysis. The adjustment is less than 5% and not included in the input.

The project managers for FIA Studies are William McDonough and Duane Ellis.

2. METHOD OF ANALYSIS

Water surface profiles were computed through the HEC-2 backwater computer model, developed by the U.S. Army Corps of Engineers at the Hydrologic Engineering Center.

2.1 Cross Sections

The locations of cross sections were selected according to the suggestions in the HEC-2 Users Manual. A severe meandering reach between the U.S.-27 Bridge and the Bridge Street Bridge was observed. The locations of cross sections within this reach were determined in accordance with the book of Floodflow Computation, pages 246 - 247 (Sokolov etal, Unesco Press, 1976). Valley and bridge sections in the City of Alma were surveyed in April, 1979 while the cross sections in the City of St. Louis were surveyed in August, 1979. Table 1 shows the locations of cross sections used in this study. The sketches and pictures of bridge sections are also shown in Appendix I.

2.2 Roughness Coefficients

The roughness coefficients, n factors, were determined from field notes and pictures taken by surveyors and also from the field description by project engineer conducted in April, 1979. Through careful comparison with the materials and photographs shown in pages 101 - 123 in Chow's Open Channel Hydraulics (McGraw-Hill, New York, 1959), the n factors for channel and floodplain were obtained.

2.3 Starting Point and Elevation

We started the backwater computation at a station about 10,600 feet downstream from the City limit in order to have the convergence before the City limit. The starting elevations were determined by the convergence test. More detailed dicussions will be presented in Section 3.

2.4 High Water Marks

USGS gauging station, 0115500, is located in the City center and is regarded as the high water mark to calibrate the n factors. No other high water marks are available. A rating curve was developed at the gauging station as shown in Figure 1. The recorded maximum flood, 4400 cfs, occurred on March 19, 1948. The predicted 50-year flood is 4580 cfs. By checking with the City Staff, it was found that a narrow width trussed bridge at Euclid Avenue is not in existance. Since the effect on head loss by this small trussed bridge is negligible, we believe the established rating curve can be used without adjustment.

3. RESULTS AND DISCUSSIONS

3.1 Convergence Test and Starting Elevation

It is generally recognized that backwater curves converge upstream. If the starting cross section for the computations is selected far enough downstream, convergence will be reached before the study limit. However, the convergence distance also highly depends on the starting elevation. In this study, we have conducted the convergence test for each flow as shown in Figure 2. In Figure 2, it is clearly shown that the two (2) bridges in the City of St. Louis serve as the control sections. For starting elevations below a specific elevation, the backwater curves will converge immediately after the State Street Bridge. If the starting elevations are above that specific elevation, the backwater curves show little or no convergence for a long distance and the two (2) bridges are no longer the control sections. We finally conclude that the convergence distance, 10,600 feet, is sufficient in this study and the starting elevations for 10-, 50-, 100- and 500-year flood are 715, 717, 717 and 719 feet, respectively.

No stage-o-stat 1-4 ft mo st where stat not dam

OK but

3.2 Calibration for Roughness Coefficients

Because no other high water marks are available besides the gauging station, we can only calibrate the n factors to gauging station based on 50-year flood. This calibration factor is 1.1 for the channel and 1.0 for the floodplain as indicated by FN in J2.6 of J2 Card.

3.3 Floodway Determination

Secno 177360 to Secno 184760 are not in the City limit. They are included for convergence test. Washington Street Bridge and State Street Bridge in St. Louis do not have the bridge span to cover the whole channel but instead have long bridge abutments which intrude into the river channel as shown in Appendix I. State Street Bridge also has a skewness factor of 0.87. These two (2) bridges served as the control sections as shown in Figure 2 and in the computer output.

All the bridges except the Hastings Street Bridge were coded by the Special Bridge Routine. U.S. - 27 Bridges are two (2) similar parallel bridges and coded separately. Bridge Street Bridge is skewed to the stream for a factor of 0.77. The upstream section Secno 196560 not only has the same skewness factor but also encroached by the Bridge Street on the right bank. The cross sections upstream from Secno 199735 are encroached by the buildings along both sides of the river. Hastings Street Bridge is a narrow foot bridge with a width of 5 feet. Secno 200860 is the USGS gauging station 270 feet upstream from Superior Street Bridge. Woodworth Street Bridge is a new bridge now under construction. The bridge data was supplied by the City Staff. The design water surface elevation for 100-year flood from their information is 725.5 feet which does not agree with ours. For a flood of 4400 cfs, which is less than 50-year, the water surface elevation at the gauging station 2500 feet downstream from the Woodworth Street Bridge is already 729.18 feet. The dam upstream from State Street Bridge was coded by Special Bridge Routine. Secno 203135, 203614, and 206860 are manufactured stations.

725.5
VS 734.76

3.4 Results

In this report, the detailed computer printout including flow distribution for the modeled 100-year flood is shown in Appendix II. Also the summary printout for 10-, 50-, 100- and 500-year floods is also included. The last computer printout is the Iplot for the 100-year flood. The topographic map with delineated natural floodway and inundated area is also included in this report as shown in Appendix III. The 100-year profile is shown in Figure 3.

Part of New Subm. Hal

TABLE 1

LOCATIONS OF CROSS SECTIONS

WATER MANAGEMENT

CROSS SECTION	SECNO	LOCATION
A	177360	10' D/S from D/S face of Washington Street Bridge
B	177410	D/S face of Washington Street Bridge
	177411	U/S face of Washington Street Bridge
C	177460	200' U/S from U/S face of Washington Street Bridge
D	178910	1550' U/S from U/S face of Washington Street Bridge
E	180110	400' D/S from D/S face of State Street Bridge
F	180660	D/S face of State Street Bridge
	180661	U/S face of State Street Bridge
G	180710	200' U/S from U/S face of State Street Bridge
H	182160	1500' U/S from U/S face of State Street Bridge
I	184410	3750' U/S from U/S face of State Street Bridge
J	185660	300' D/S from D/S of US-27 Northbound Bridge
K	185662	D/S face of US-27 Northbound Bridge
	185663	U/S face of US-27 Northbound Bridge
	186160	D/S face of US-27 Southbound Bridge
	186161	U/S face of US-27 Southbound Bridge
L	186210	150' U/S from U/S face of US-27 Southbound Bridge
M	187460	1350' U/S from U/S face of US-27 Southbound Bridge

CROSS SECTION	SECNO	LOCATION
N	189960	3750' U/S from U/S face of US-27 Southbound Bridge
O	191085	4750' U/S from U/S face of US-27 Southbound Bridge
P	192210	5750' U/S from U/S face of US-27 Southbound Bridge
Q	195585	780' D/S from D/S face of Bridge Street Bridge
R	196440	280' D/S from D/S face of Bridge Street Bridge
S	196510	D/S face of Bridge Street Bridge
	196511	U/S face of Bridge Street Bridge
T	196560	100' U/S from U/S face of Bridge Street Bridge
U	198285	1800' U/S from U/S face of Bridge Street Bridge
V	199035	2550' U/S from U/S face of Bridge Street Bridge
W	199735	21' D/S from D/S face of Hastings Street Foot Bridge
X	199736	1' D/S from D/S face of Hastings Street Foot Bridge
	199785	D/S face of Hastings Street Foot Bridge
	199786	U/S face of Hastings Street Foot Bridge
	199787	1' U/S from U/S face of Hastings Street Foot Bridge
Y	199835	21' U/S from U/S face of Hastings Street Foot Bridge
Z	200860	USGS Gauging Station 1550
AA	200910	D/S face of Superior Street Bridge
	200911	U/S face of Superior Street Bridge

CROSS SECTION	SECNO	LOCATION
BB	200960	100' U/S from U/S face of Superior Street Bridge
CC	201460	280' D/S from D/S face of C & O Railroad Bridge
DD	201510	D/S face of C & O Railroad Bridge
	201511	U/S face of C & O Railroad Bridge
EE	201560	100' U/S from U/S face of C & O Railroad Bridge
FF	202435	300' D/S from D/S face of Ann Arbor Railroad Bridge
GG	202485	D/S face of Ann Arbor Railroad Bridge
	202486	U/S face of Ann Arbor Railroad Bridge
HH	202535	120' U/S from U/S face of Ann Arbor Railroad Bridge
II	203135	420' U/S from U/S face of Ann Arbor Railroad Bridge
JJ	203234	10' D/S from D/S face of Woodworth Street Bridge
	203235	D/S face of Woodworth Street Bridge
	203236	U/S face of Woodworth Street Bridge
	203237	10' U/S from U/S face of Woodworth Street Bridge
KK	203335	160' U/S from U/S face of Woodworth Street Bridge
LL	203610	D/S face of State Street Bridge
	203611	U/S face of State Street Bridge
MM	203612	D/S face of Dam
	203613	U/S face of Dam
NN	203614	200' U/S from U/S face of Dam
OO	204485	925' U/S from U/S face of Dam

Secno 200860
(2630 cfs) April 4, 1978 Flood

Stage 8.82
"0" = 718.37
727.19

Q		
2990	10	727.71
4580	50	729.35
5300	100	730.04
7110	500	= 731.69

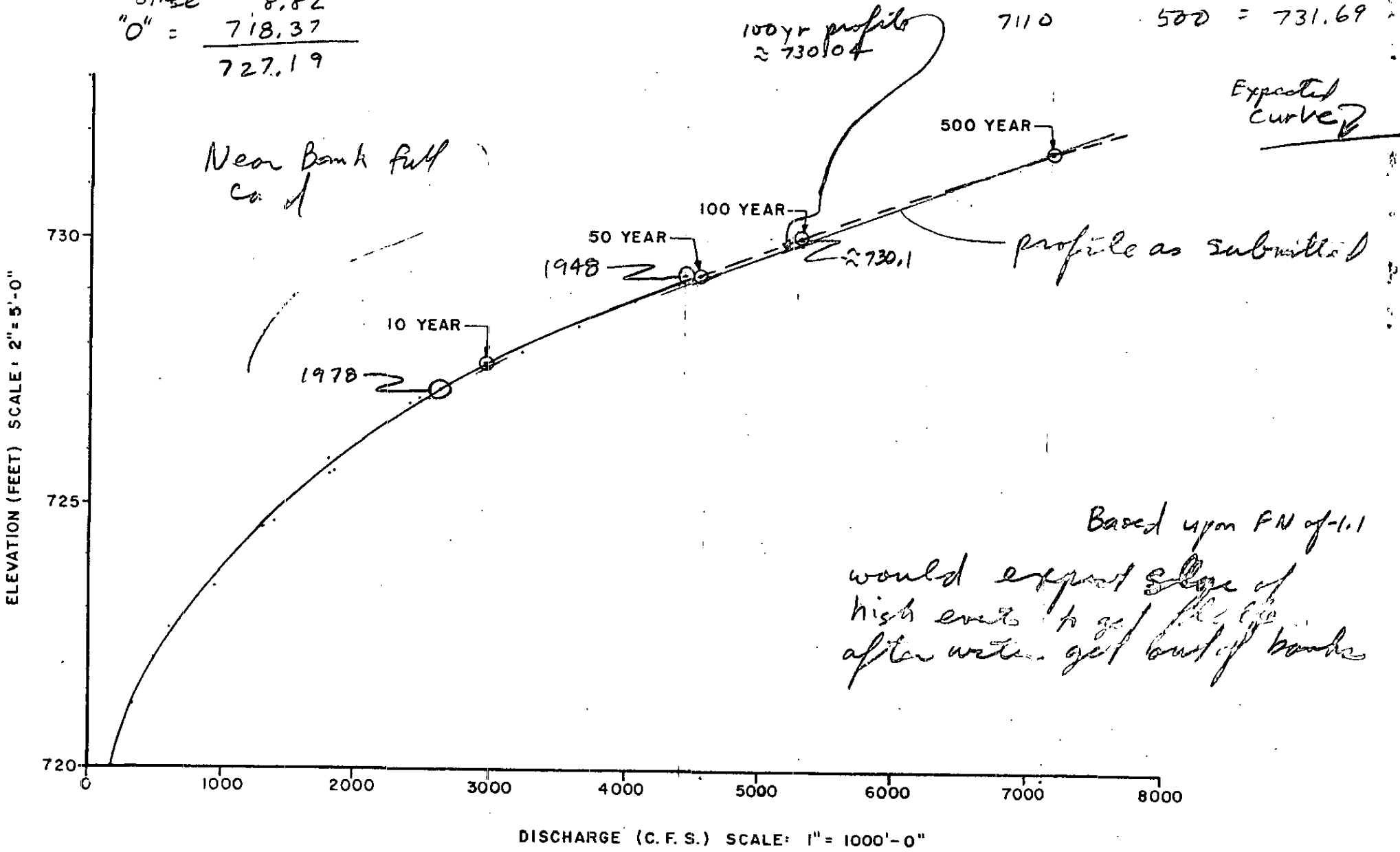


FIG. 1 RATING CURVE AT U.S.G.S. GAGING STATION 1550 ALMA 8546

at Dam
Max WS 722.00

Dam Plans
100yr = 721.7±.5
new dam

Old dam
1978 ≈ 721

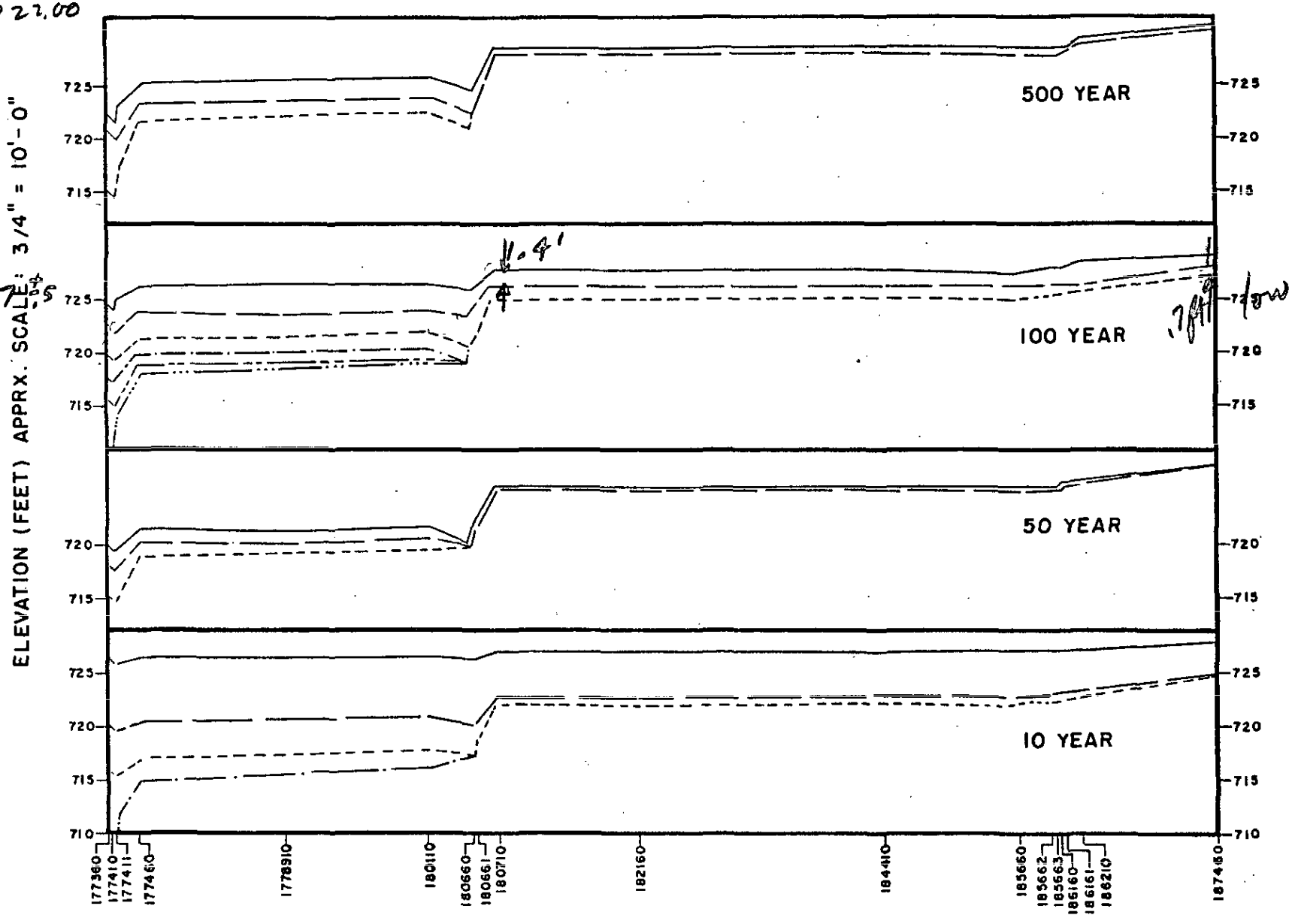
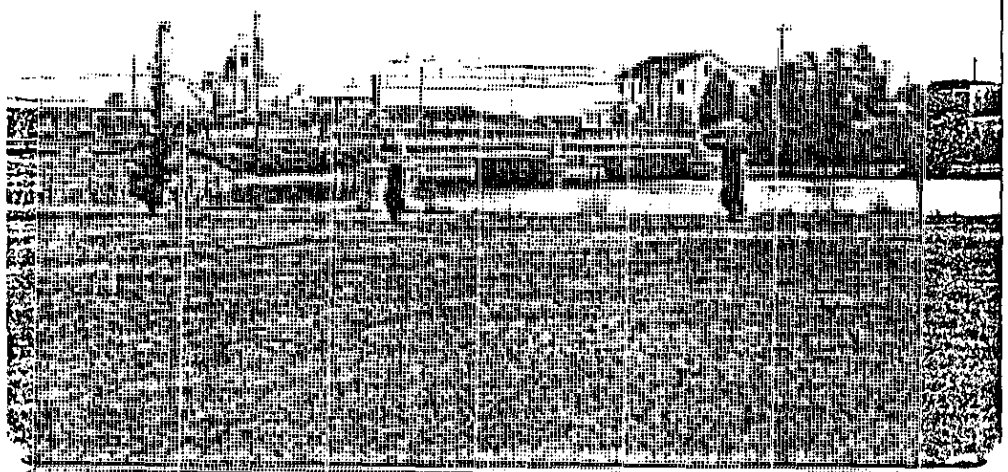


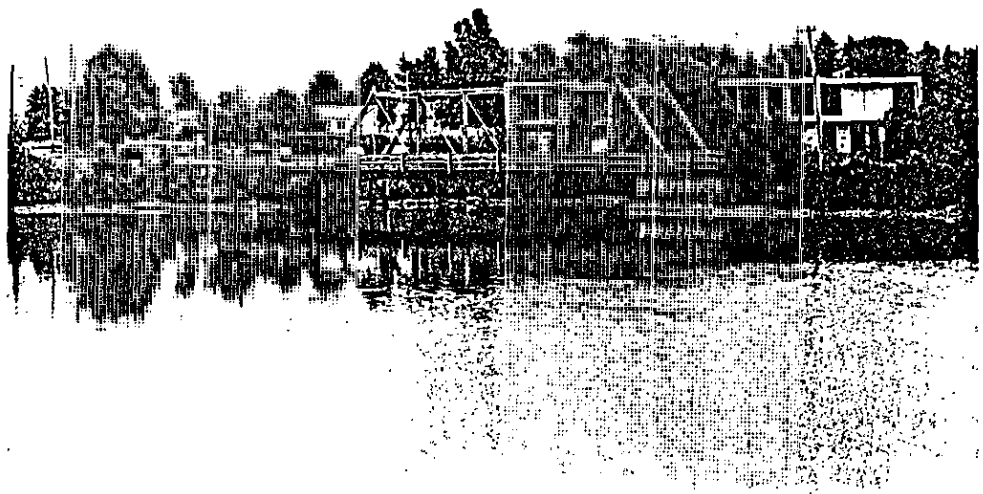
FIG. 2 CONVERGENCE TEST FOR PINE RIVER - ALMA

8546

Washington Street Bridge - St. Louis
Looking D/S

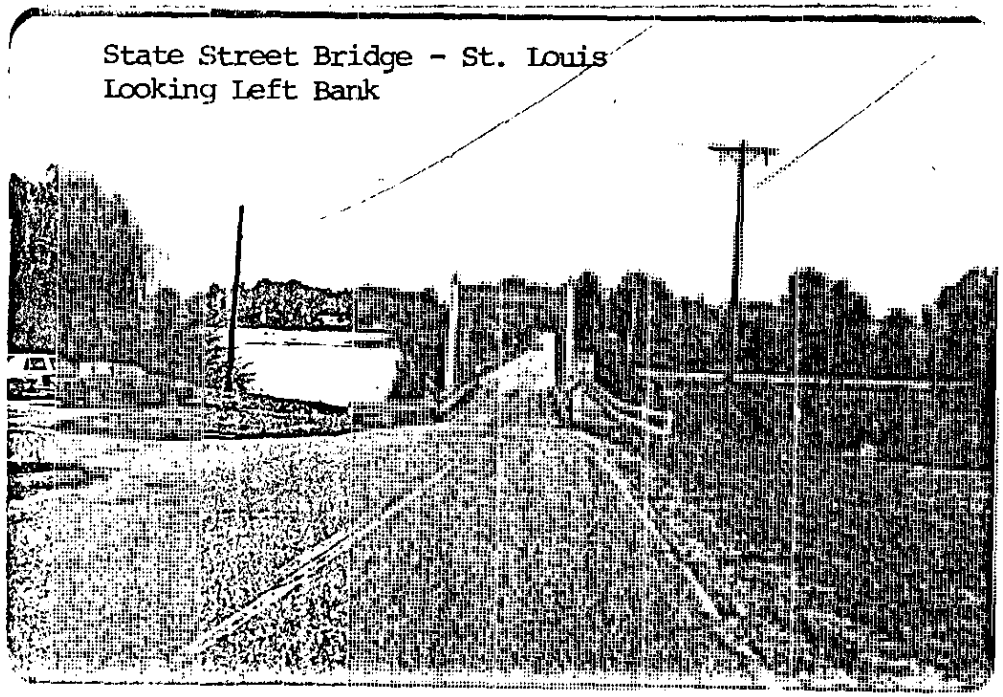


State Street Bridge - St. Louis - Looking U/S

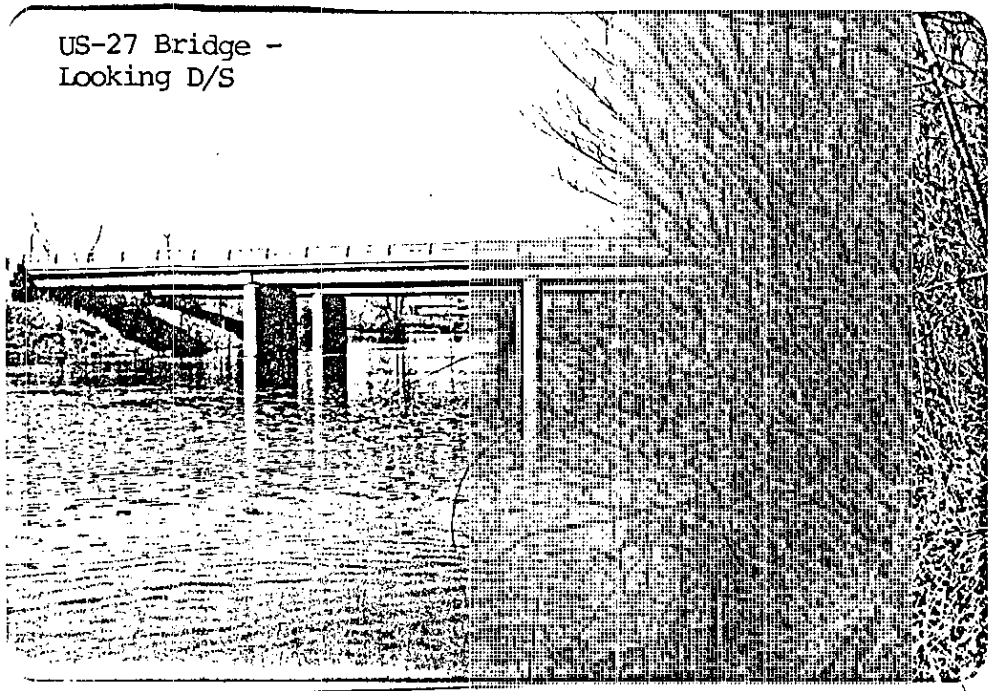


Washington Street Bridge - St. Louis
Looking Right Bank

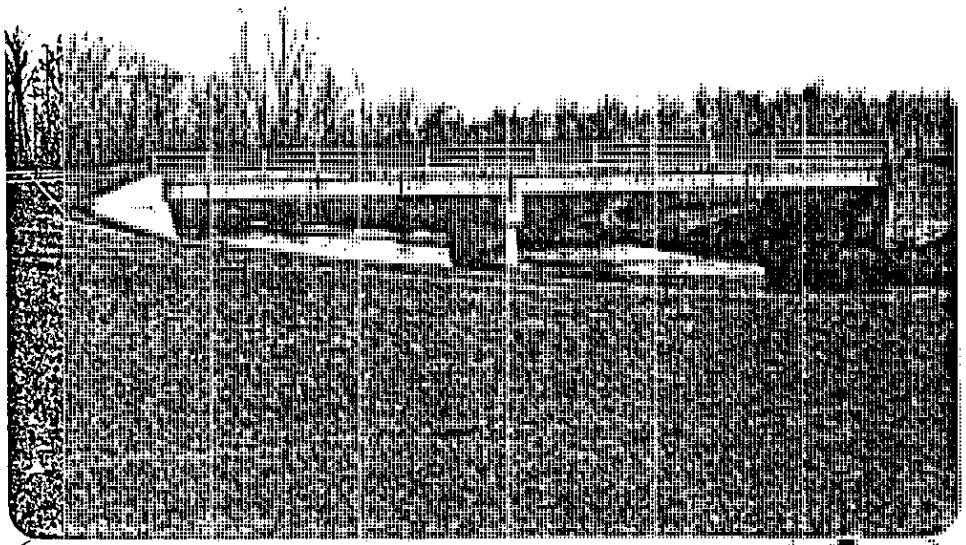
State Street Bridge - St. Louis
Looking Left Bank



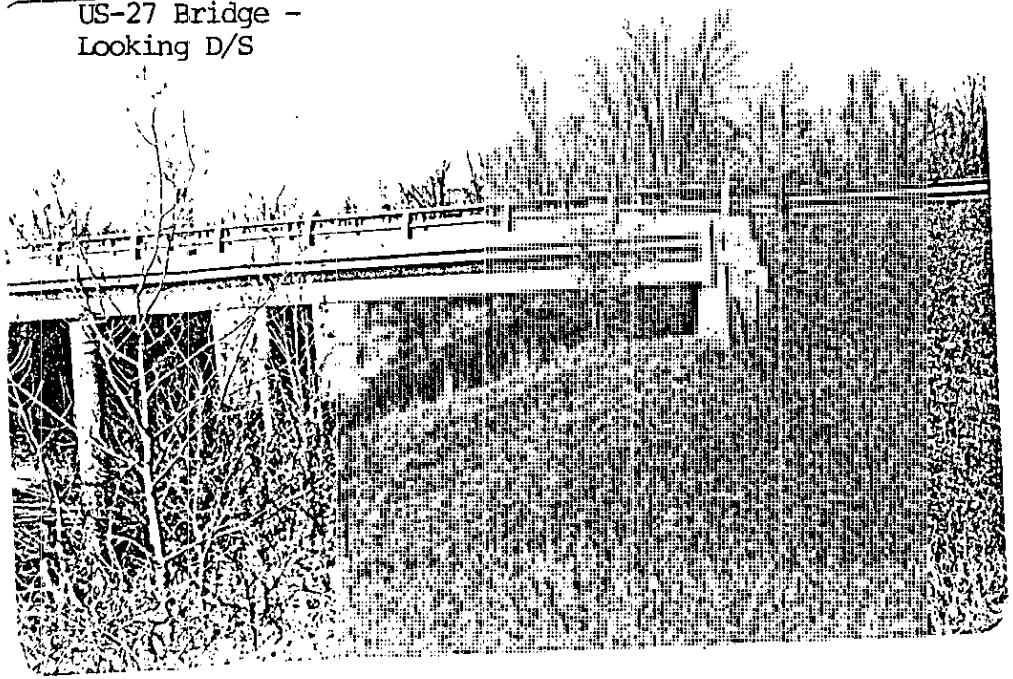
US-27 Bridge -
Looking D/S



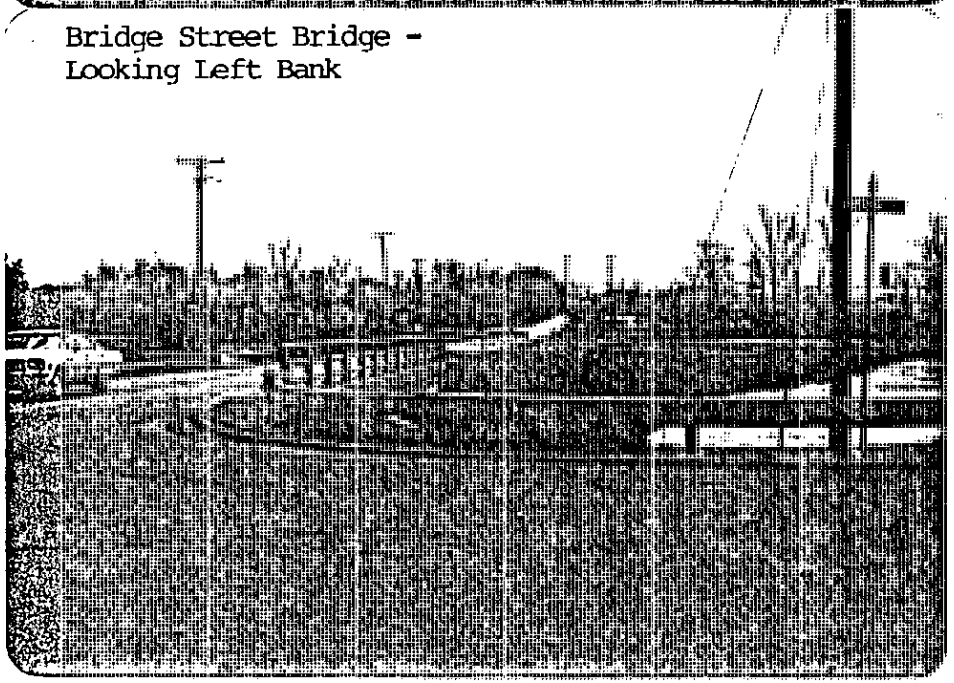
Bridge Street Bridge -
Looking D/S



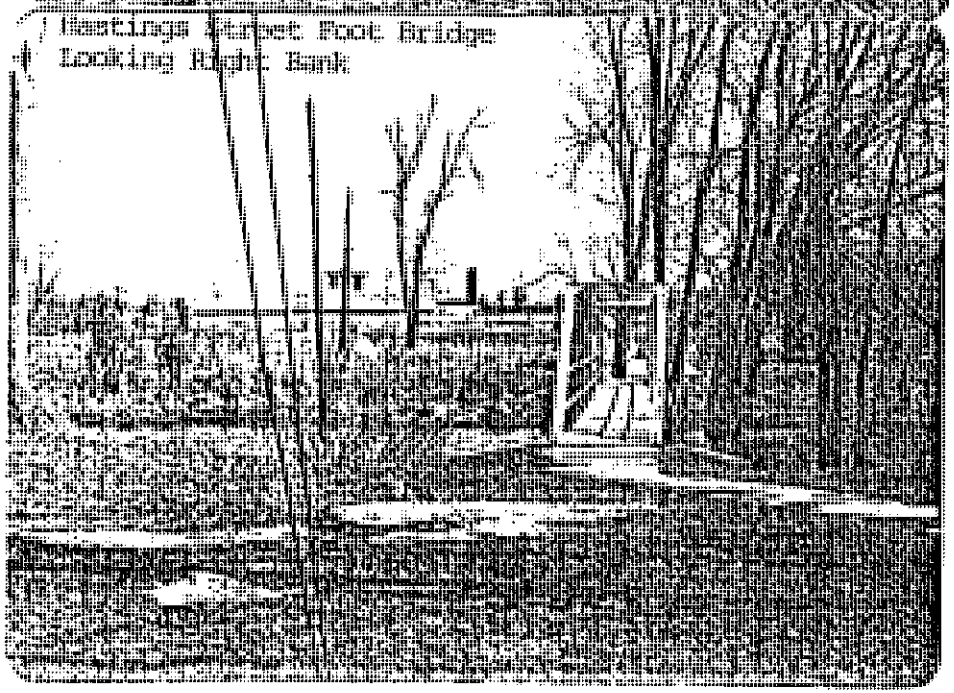
US-27 Bridge -
Looking D/S



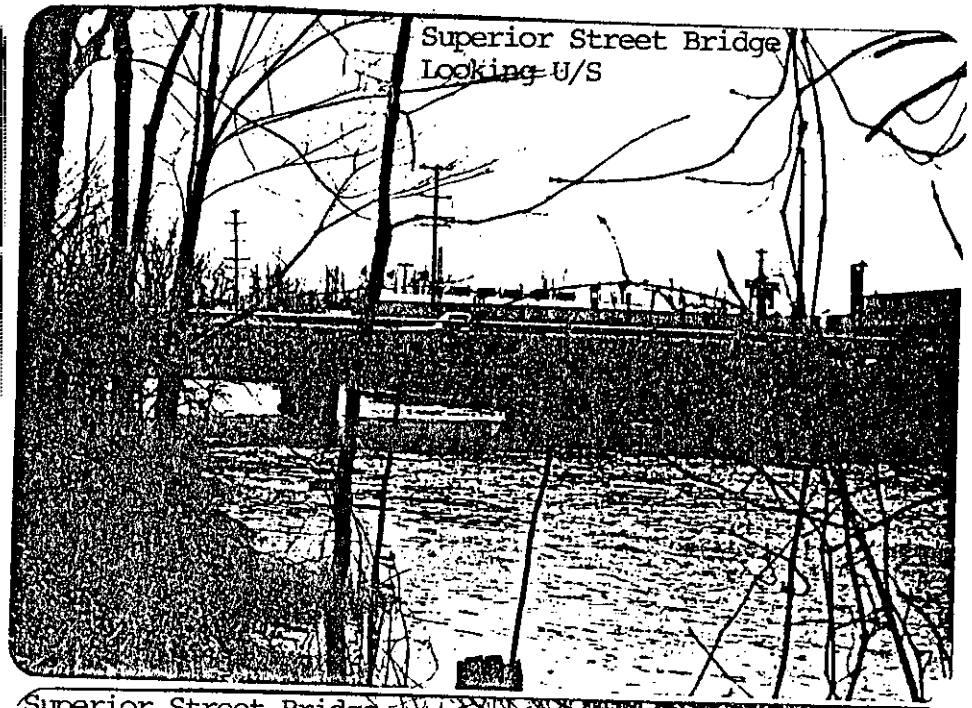
Bridge Street Bridge -
Looking Left Bank



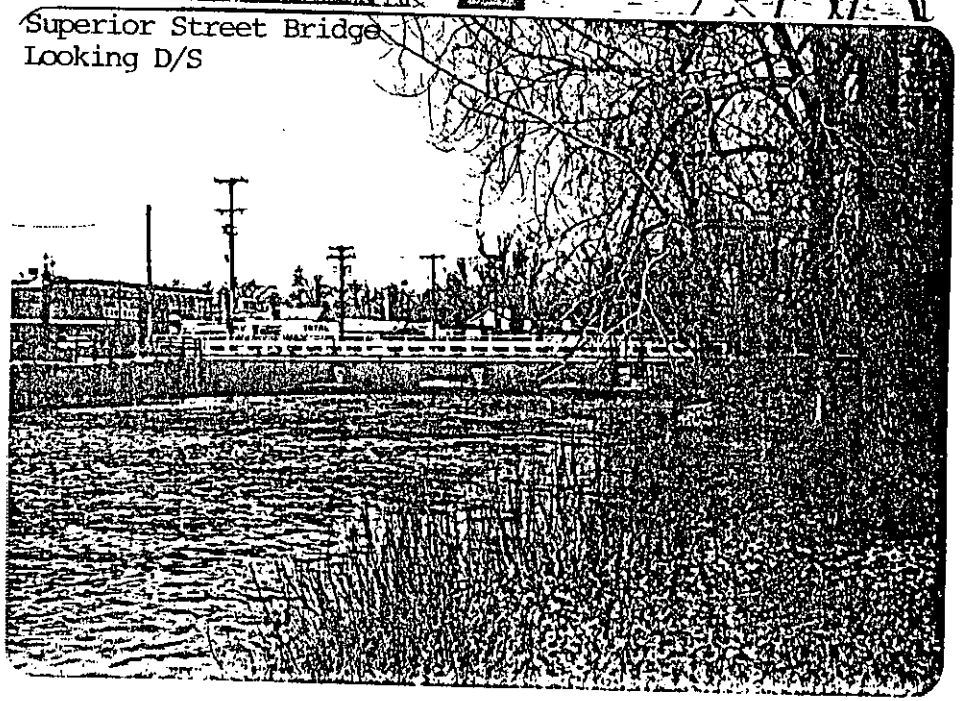
Hastings Street Foot Bridge
Looking



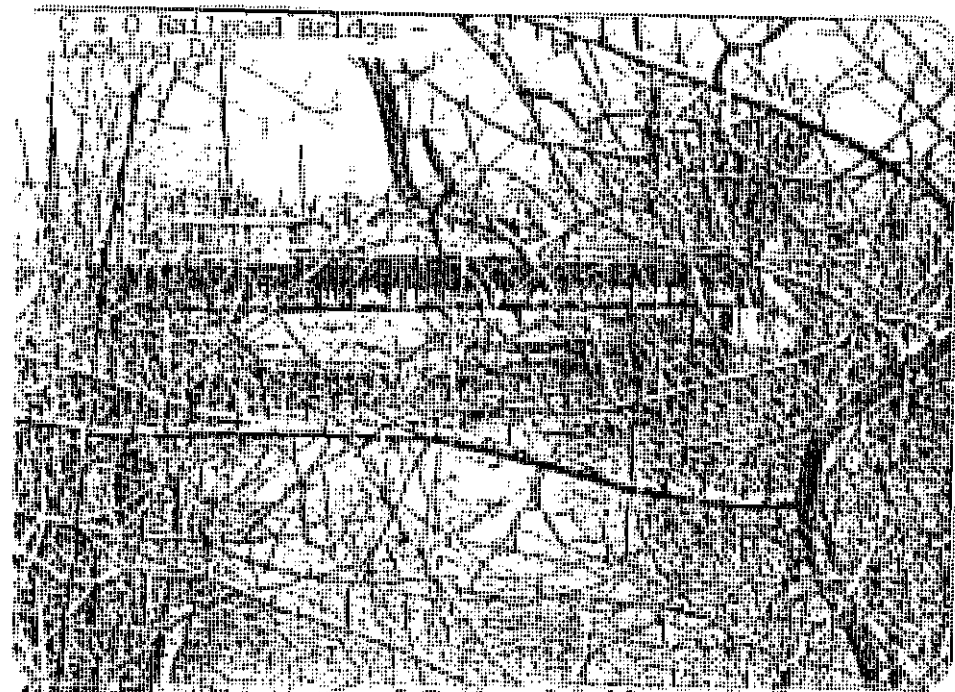
Hastings Street Foot Bridge
Looking Right Bank



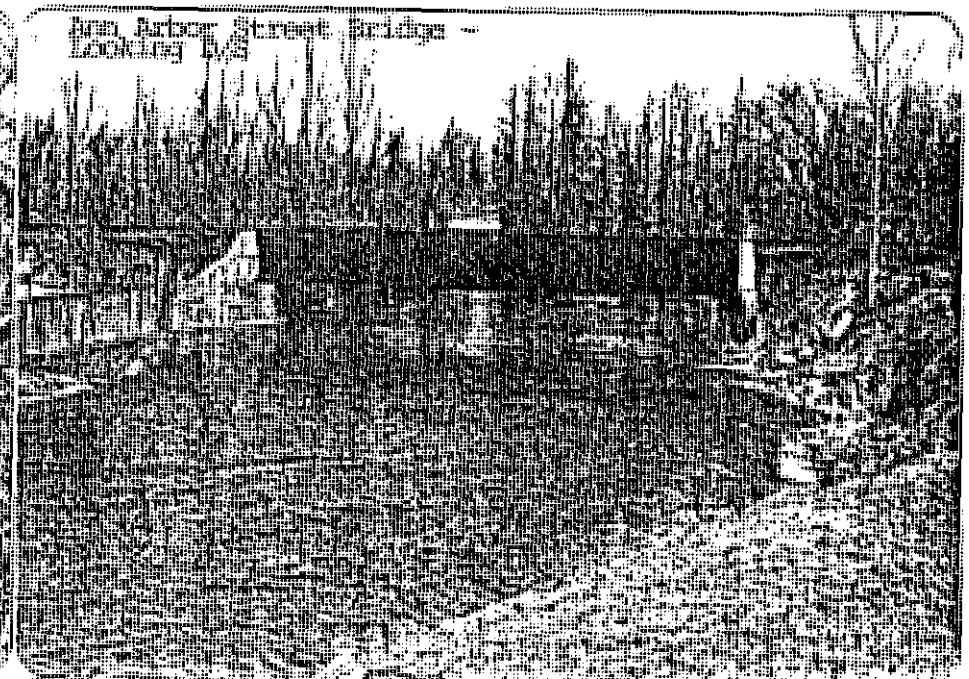
Superior Street Bridge
Looking U/S



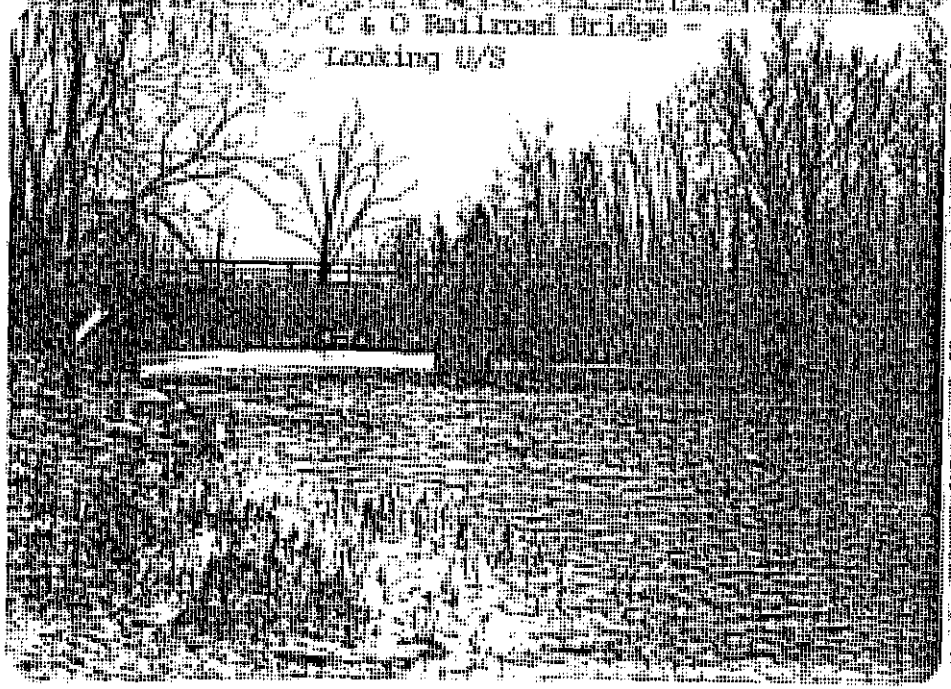
Superior Street Bridge
Looking D/S



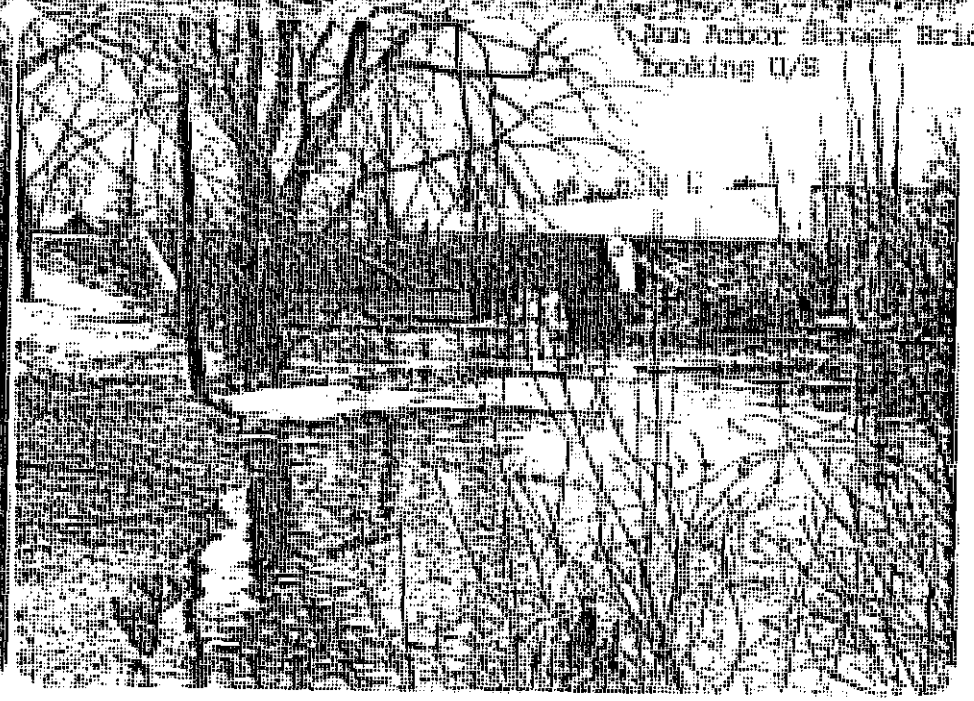
C & O Railroad Bridge -
Looking D/S



Ann Arbor Street Bridge -
Looking D/S

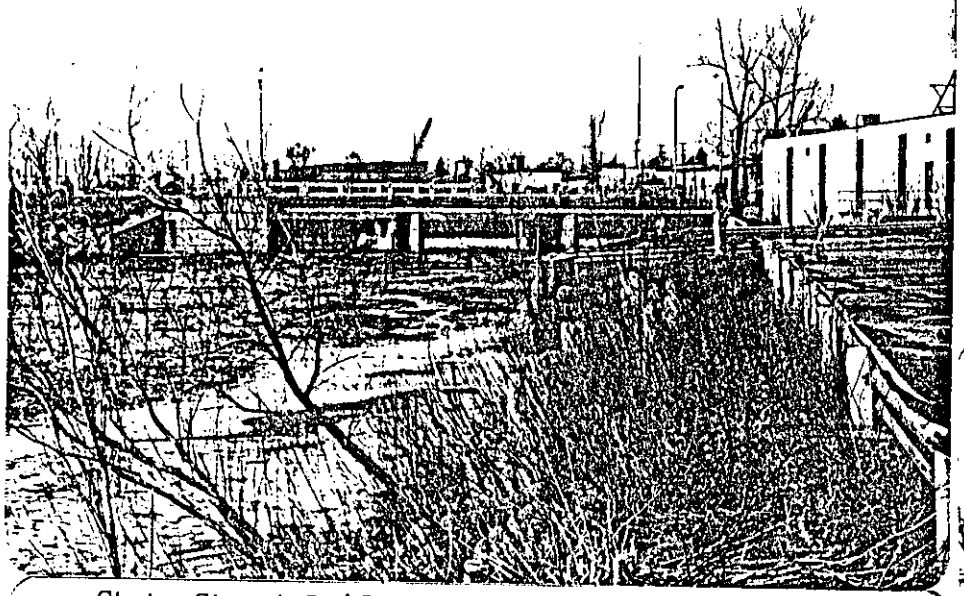


C & O Railroad Bridge -
Looking U/S

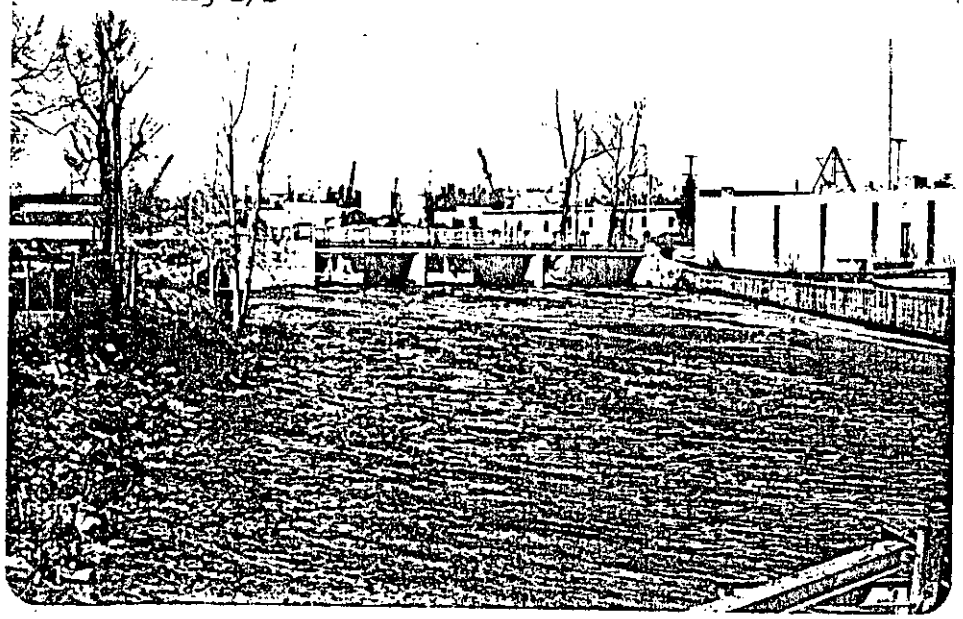


Ann Arbor Street Bridge -
Looking U/S

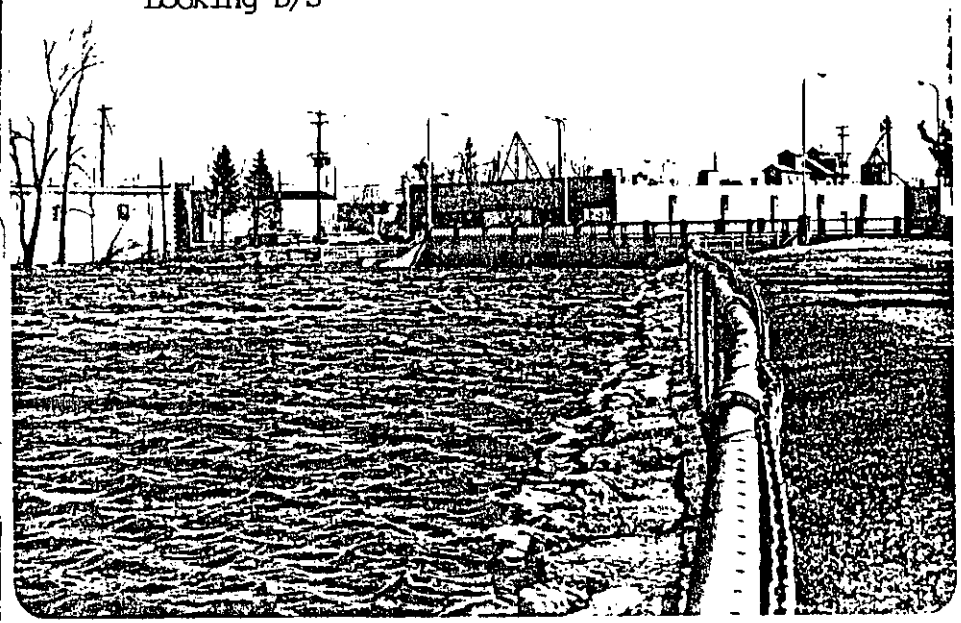
State Street Bridge & Dam -
Looking U/S



State Street Bridge & Dam -
Looking D/S



State Street Bridge & Dam -
Looking D/S



Dam – St. Louis PNW 121279

Starting Elev. for Pine River - Alma

July 30, 59 elev = 719.7'

Q = 102 cfs → Dam Crest = 719.7'

① 100-year Q = 5300 cfs elev = 721.7 ± 0.5 = 722.0

$h = 722 - 719.7 = 2.3$

$Q = Cb\,h^{3/2}$ $Cb = \frac{5300}{2.3^{3/2}} = 1519.44$

Assume same Cb for 10, 50, 100, & 500-year floods

② 10-year Q = 2990 $h^{3/2} = \frac{2990}{1519.44}$

$h = 1.57$ elev = 719.7 + 1.57 = $\boxed{721.27}$

③ 50-year Q = 4580

$h = 2.09$ elev = 719.7 + 2.09 = $\boxed{721.79}$

④ 500-year Q = 7110

$h = 2.80$ elev = 719.7 + 2.80 = $\boxed{722.50}$

⑤ Q = 2630 cfs

$h = 1.44$ elev = 721.14

St. Louis - Pine River PNW 120479

Washington St. Bridge

$K_e = 0.5$ intermediate pier $K = 0.05$

$A = 784$

$W.P. = 185$

$R = \frac{A}{W.P.} = 4.24$

$L = 41$

$n = 0.0035$

$K_f = \frac{29.1\, n^2 L}{R^{1.33}} = 0.21$

$\Sigma K_o R = 1 + 0.5 + 0.21 + 0.05 = \underline{1.76}$

Alma – pine River PNW 111279

Supain St bridge

$K_e = 0.5$ Intermediate pier = .05

$A = 774$

$W.P. = 196.5$

$R = \frac{A}{W.P.} = 3.94$

$L = 59$

$n = 0.035$

$$K_f = \frac{29.1\, n^2 L}{R^{1.33}} = \frac{29.1 \times 0.035^2 \times 59}{3.94^{1.33}} = 0.34$$

$\Sigma K_{OR} = 1 + 0.5 + 0.34 + 0.05 = 1.89$

$H/L = 0.36/60 < 0.15$ $D/H < 0.25$ COFB = 3.0

C & O R.R. Bridge

$K_e = 0.4$ Intermediate pier = 0.05

$A = 796.7$

$W.P. = 200$

$R = \frac{A}{W.P.} = 3.98$

$L = 10$

$n = 0.035$

$$K_f = \frac{29.1 \times 0.035^2 \times 10}{3.98^{1.33}} = 0.06$$

$\Sigma K_{OR} = 1 + 0.4 + 0.05 + 0.06 = 1.51$

Alma - pine River PNW 111979

Ann Arbor R.R. Bridge

$A = 670$ $n = 0.035$

$w.p. = 152$ $l = 9.75$

$R = \frac{A}{w.p.} = 4.41$

$Ke = 0.4$

$Kf = \frac{29.1 \times 0.035^2 \times 9.75}{4.41^{1.33}} = 0.05$

$\Sigma KOR = 1 + 0.4 + 0.05 = 1.45$

State St. Bridge

$A = 1278.4$ $l = 42$

$w.p. = 232$ $n = .035$

$R = 5.51$

$Kf = \frac{29.1 \times 0.035^2 \times 42}{5.51^{1.33}} = 0.15$

No Entrance loss

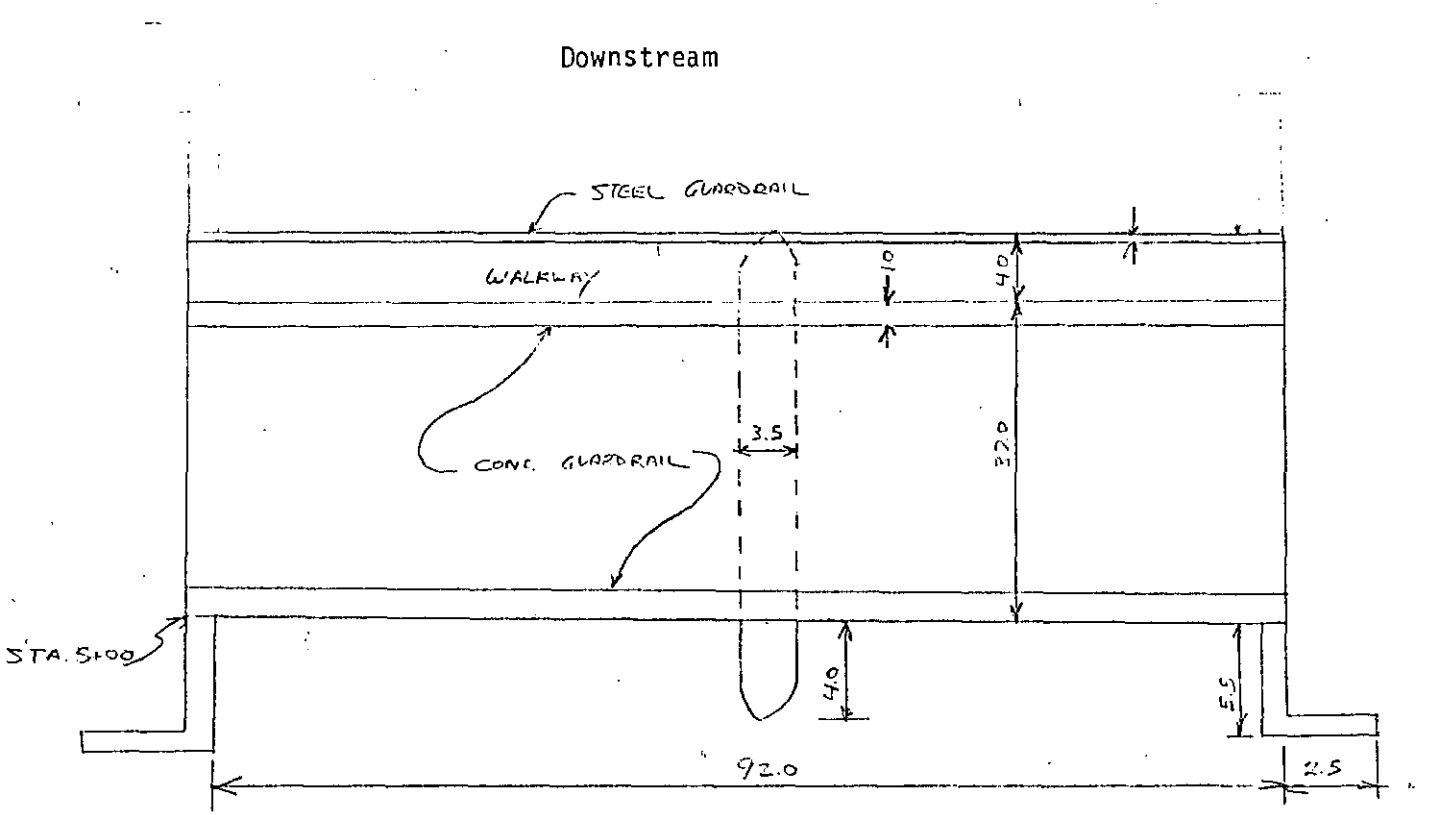
$\Sigma KOR = 1 + 0.15 + 0.05 = 1.2$

$H/L = 0.6/42 = 0.01 < 0.15 \Rightarrow COFQ = 3.02$

$D/H < 0.85$

Community: ST LOUIS	Structure: WASHINGTON ST BRIDGE	Type: CONC. STEEL ~~BRIDGE~~	Station: 1224+10

Downstream



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

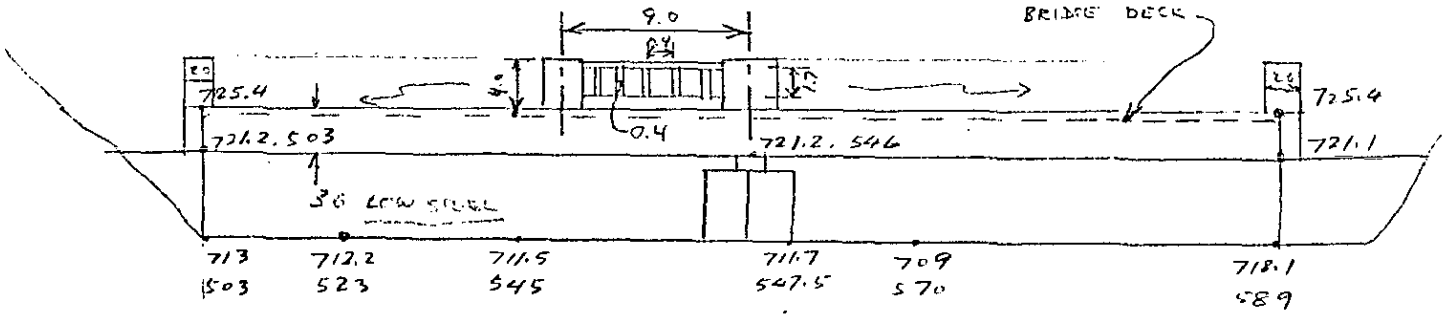
By: [illegible]

Date: [illegible]

Sheet 2 of 2

Community: ST. LOUIS	Structure: WASHINGTON ST. BRIDGE	Type: CONCRETE	Station: 1774 +10

A1-46



PROFILE SKETCH
(Looking Downstream)

Length: 92.0	Width: 41.0	Skew: —	Water Elevation: 718.1
No. of Piers: 1	Width of Piers: 3.5	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: GSC

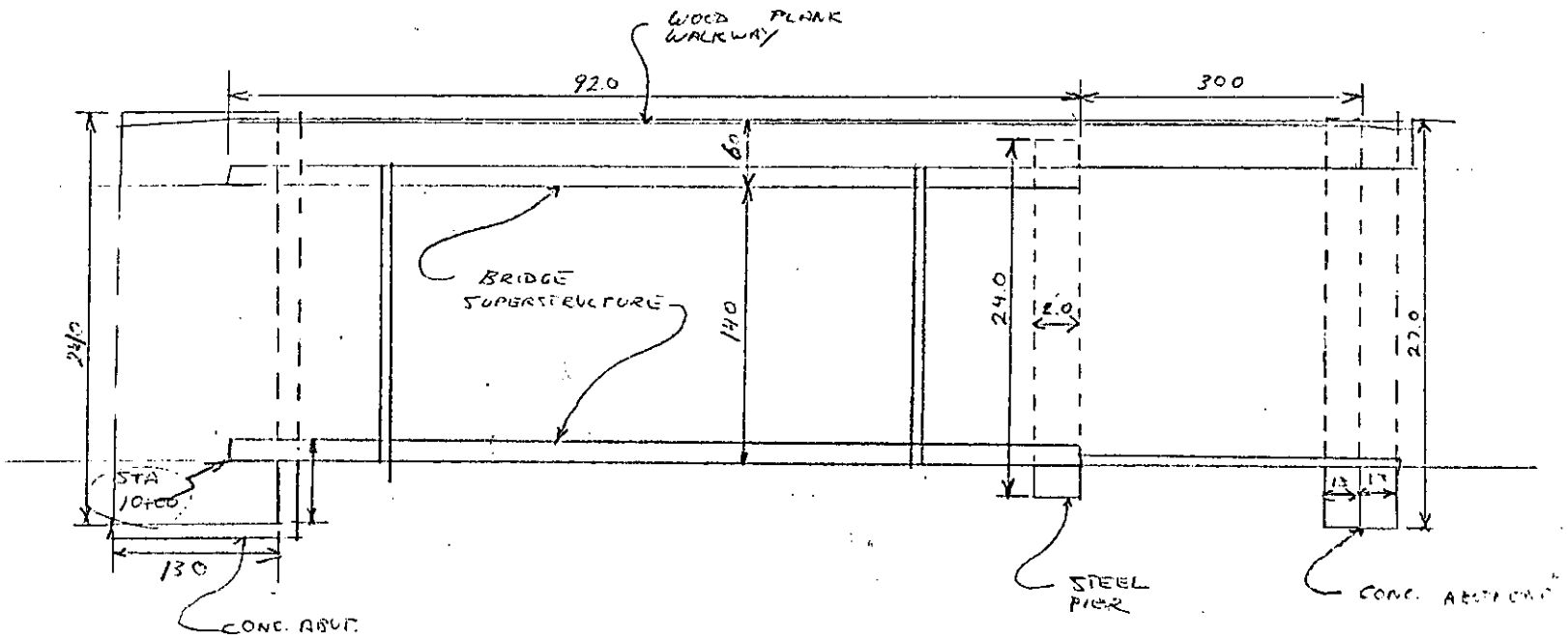
Date: 7/25/79

Sheet 1 of 2

Community: ST. LOUIS	Structure: [illegible] BRIDGE	Type: STEEL CANTILEVER [illegible]	Station: STA. [illegible]

Downstream

North



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

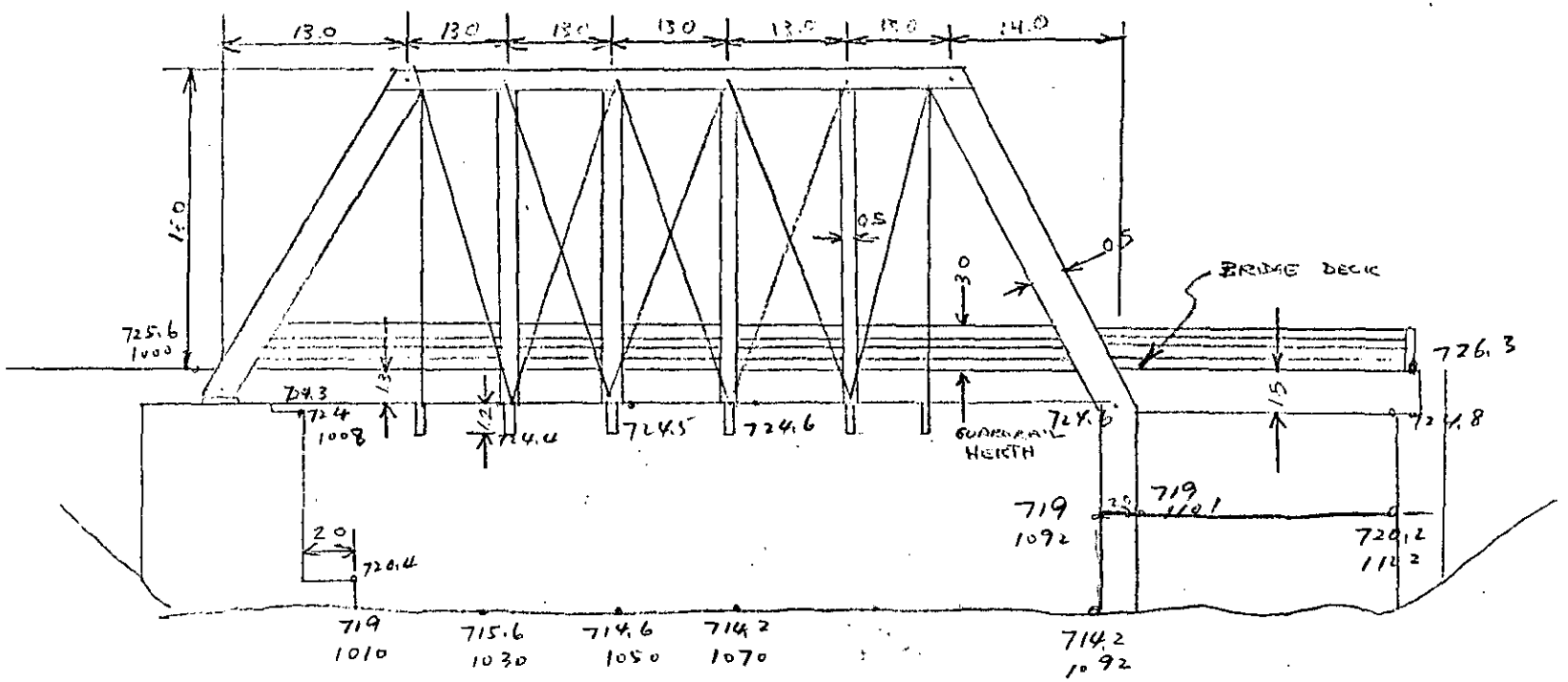
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: [illegible]

Sheet 2 of 2

Community: ST. LOUIS	Structure: SMITH ST BRIDGE	Type: STEEL CANTILEVER TRUSS	Station: 1806+60



PROFILE SKETCH
(Looking Downstream)

Length: 92.0 + 50.0	Width: 20.0	Skew:	Water Elevation: 719.0
No. of Piers: 1	Width of Piers: 2.0	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

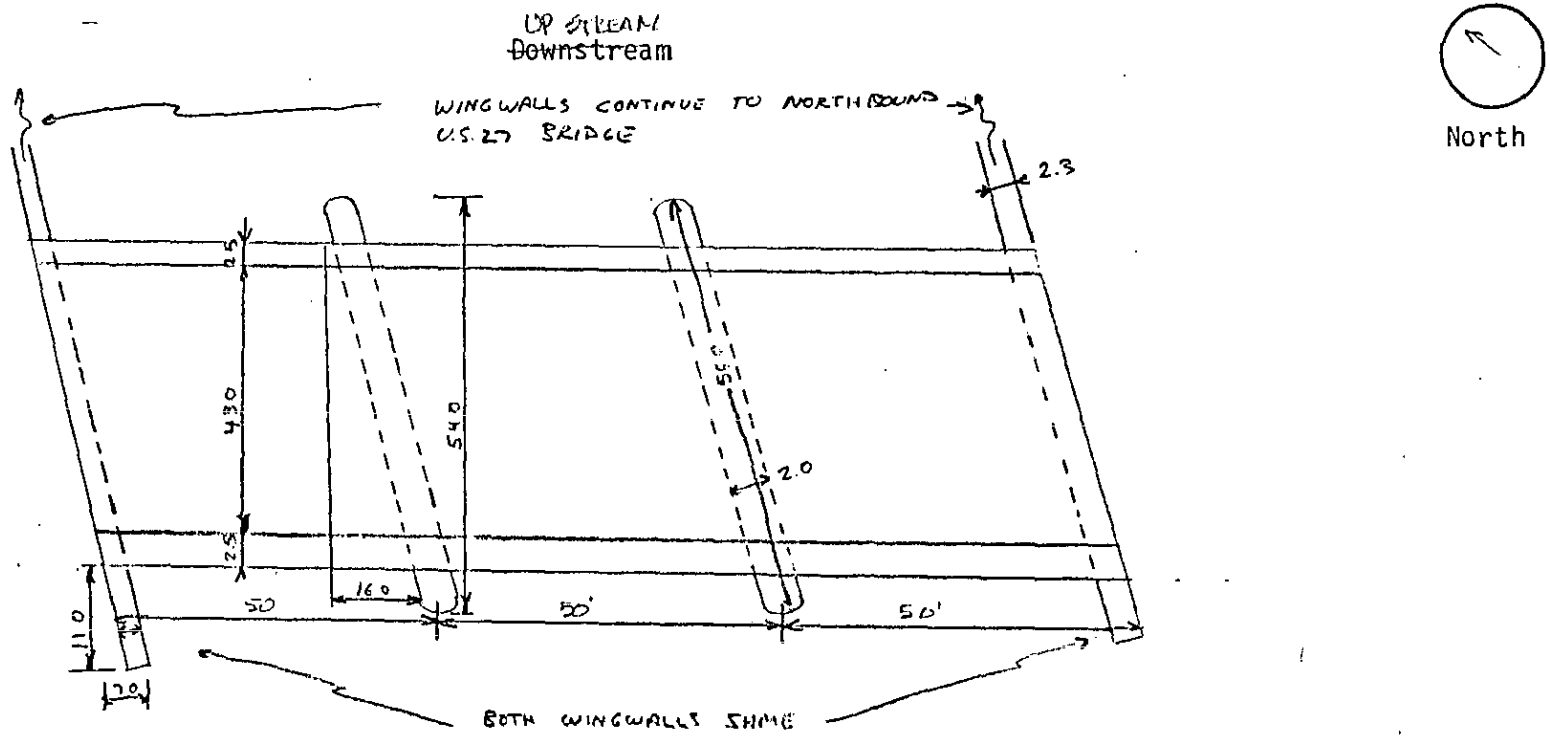
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: [illegible]

Sheet 1 of 2

Community: ALMA	Structure: U.S. 27 BRIDGE	Type: CONCRETE T-BEAM	Station: STA. 1861+60



PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

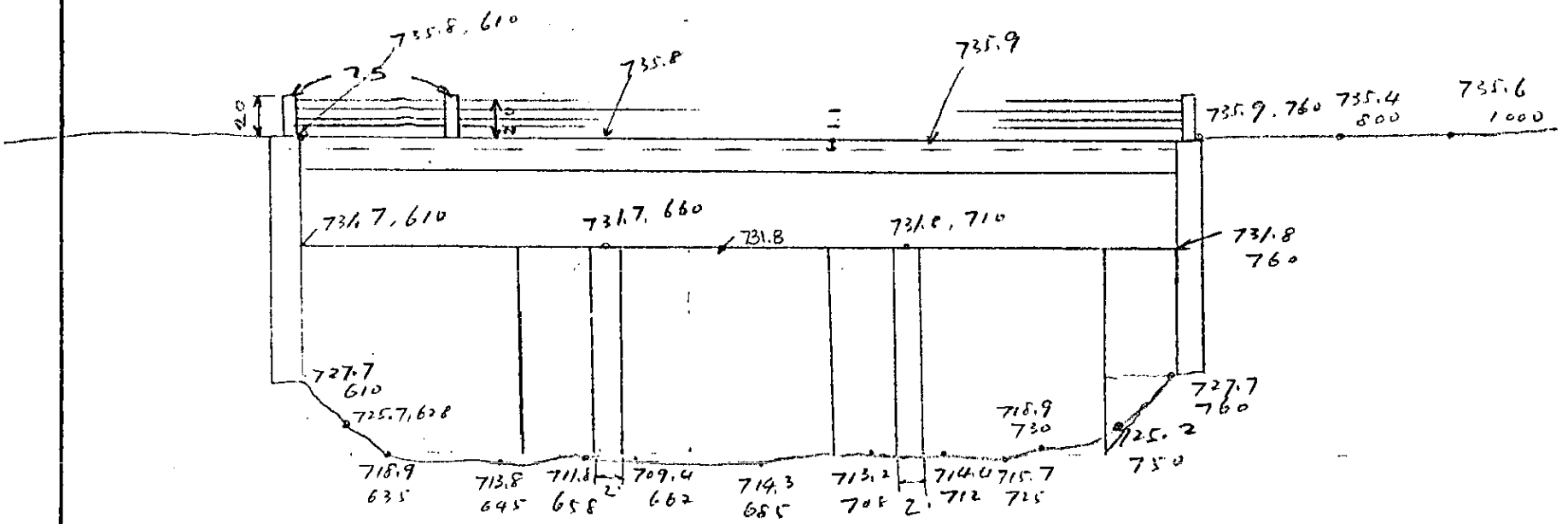
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: C.C.

Date: 4/18/79

Sheet 2 of 2

Community: ALMA	Structure: SOUTHBOUND US-27 BRIDGE	Type: CONCRETE & I-BEAM	Station: STA. 1861+60



PROFILE SKETCH
(Looking Downstream)

Length: 150.0 FT.	Width: 48.0	Skew: 16 FT x 48.0 FT	Water Elevation:
No. of Piers: 2	Width of Piers: 2.0	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

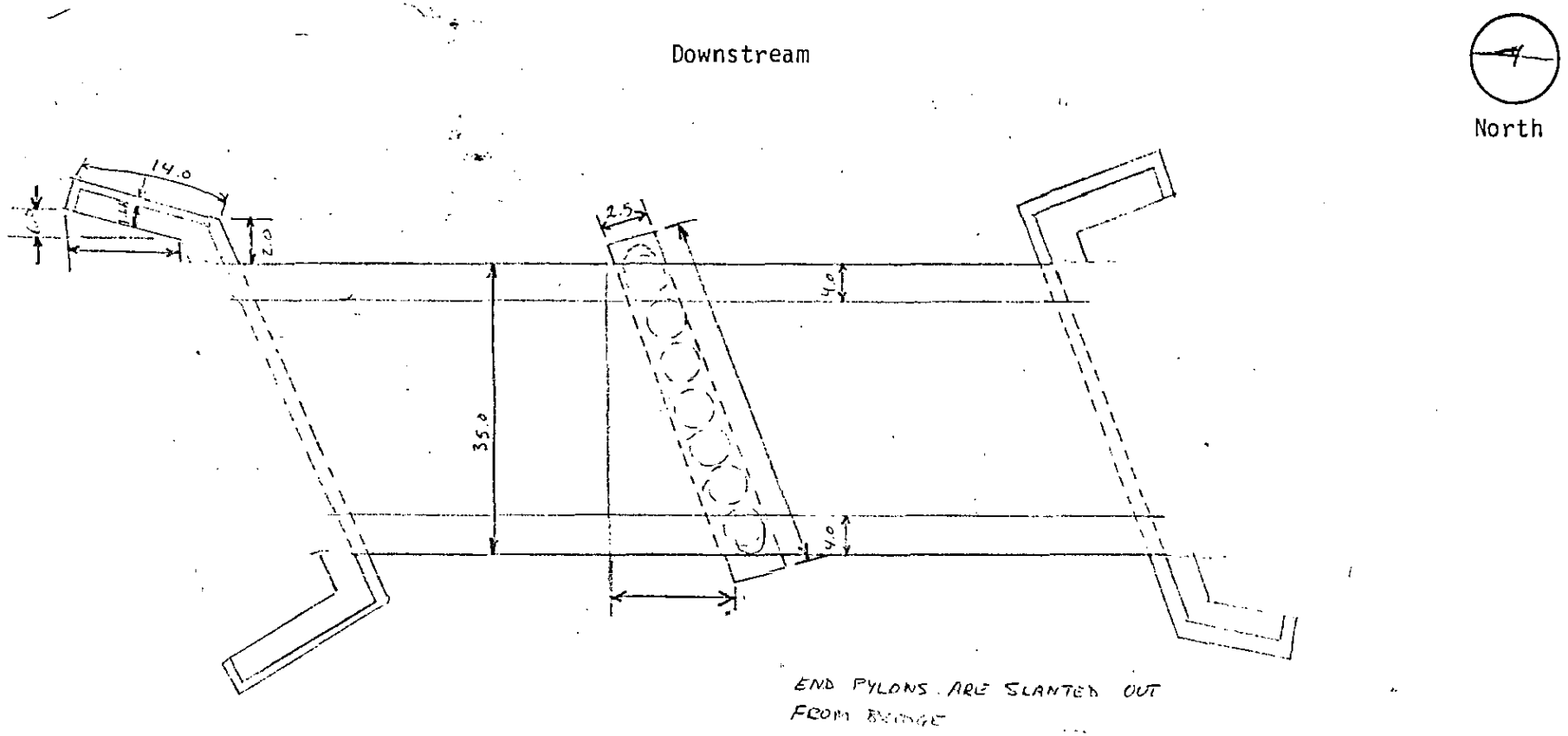
By: J.S.C.

Date: 4/16/79

Sheet 1 of 2

Community: ALMA	Structure: [illegible]	Type: [illegible]	Station: [illegible]

Downstream



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

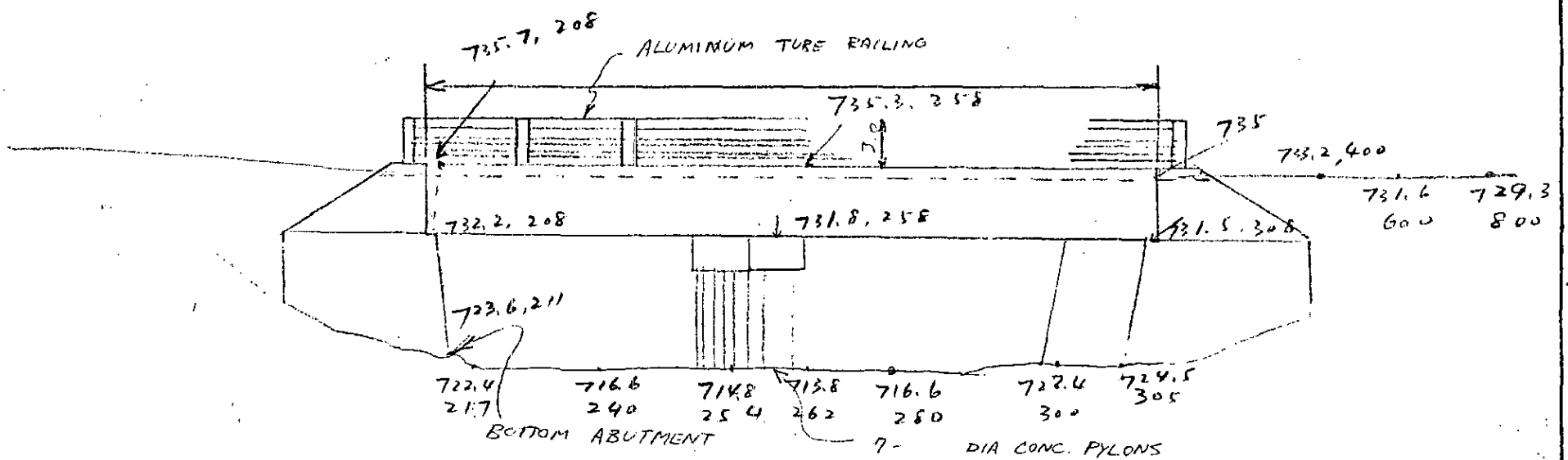
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: [illegible]

Sheet 2 of 2

Community: ALMA	Structure: [illegible]	Type: [illegible] CONC.	Station: 1965 FT



PROFILE SKETCH
(Looking Downstream)

Length: 100 FT.	Width:	Skew:	Water Elevation:
No. of Piers: 1	Width of Piers:	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

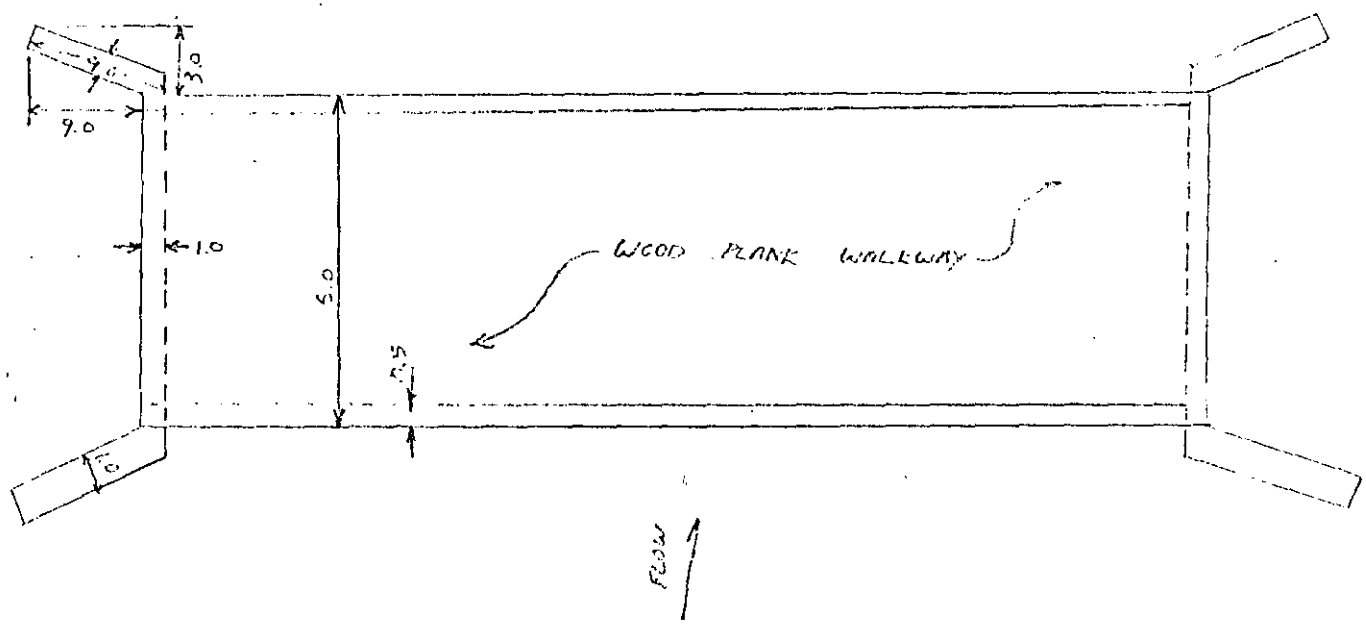
Date: 3/4/79

Sheet 1 of 2

Community: ALMA	Structure: [illegible]	Type: STEEL BEAM & WOOD PLANK	Station: 1977 185

Downstream

North



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

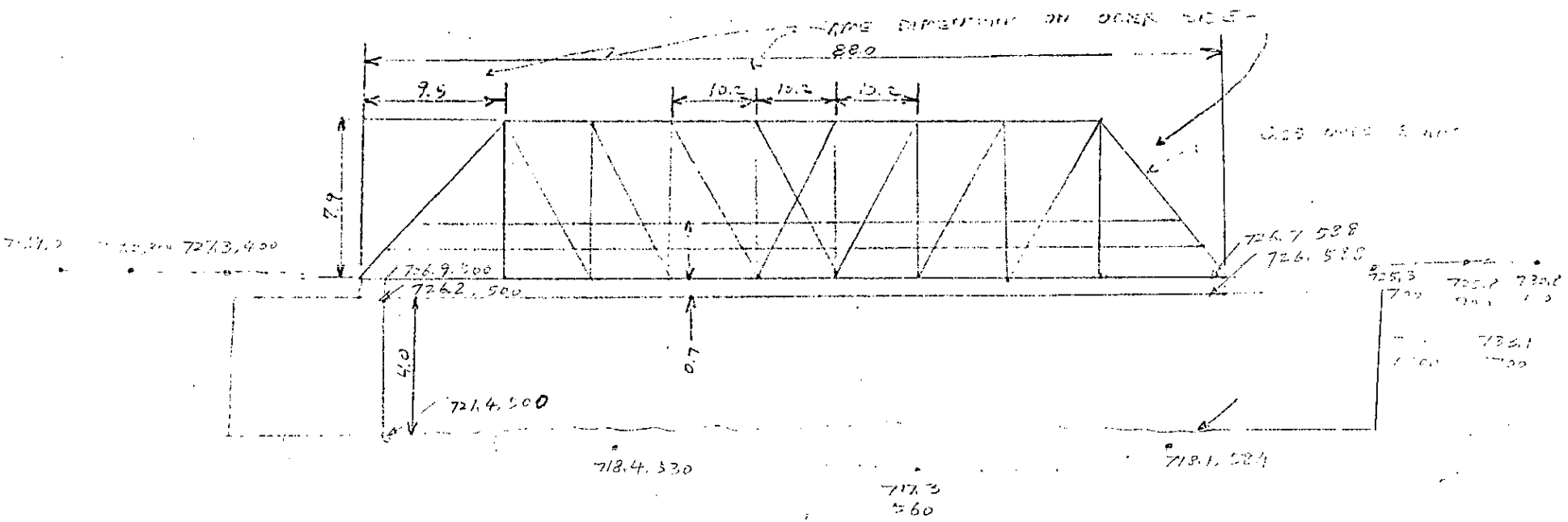
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: [illegible]

Sheet 2 of 2

Community: ALMA	Structure: HASTINGS ST. ROAD BRIDGE	Type: STEEL BEAM & WOOD PLANK	Station: 1211.63



PROFILE SKETCH
(Looking Downstream)

Length: 88.0	Width: 5.0	Skew: —	Water Elevation:
No. of Piers: —	Width of Piers: —	Shape of Piers: —	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

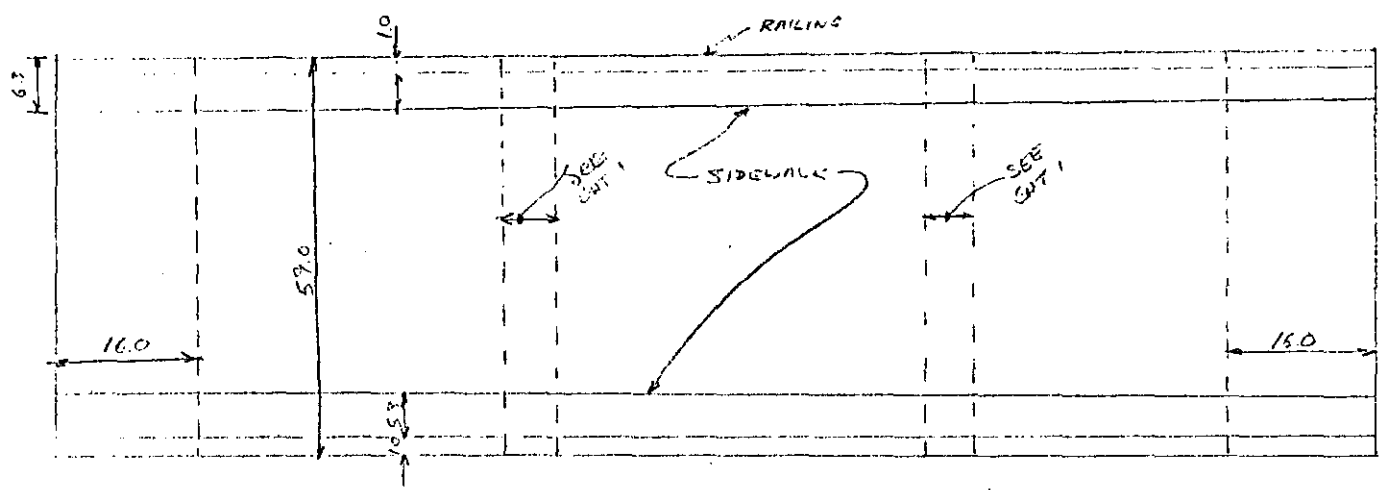
By: J.S.C.

Date: 8/14/79

Community: ALMA	Structure: SUPERIOR ST. BRIDGE	Type: PRE STRESSED CONC	Station: [illegible]

Downstream

North



Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

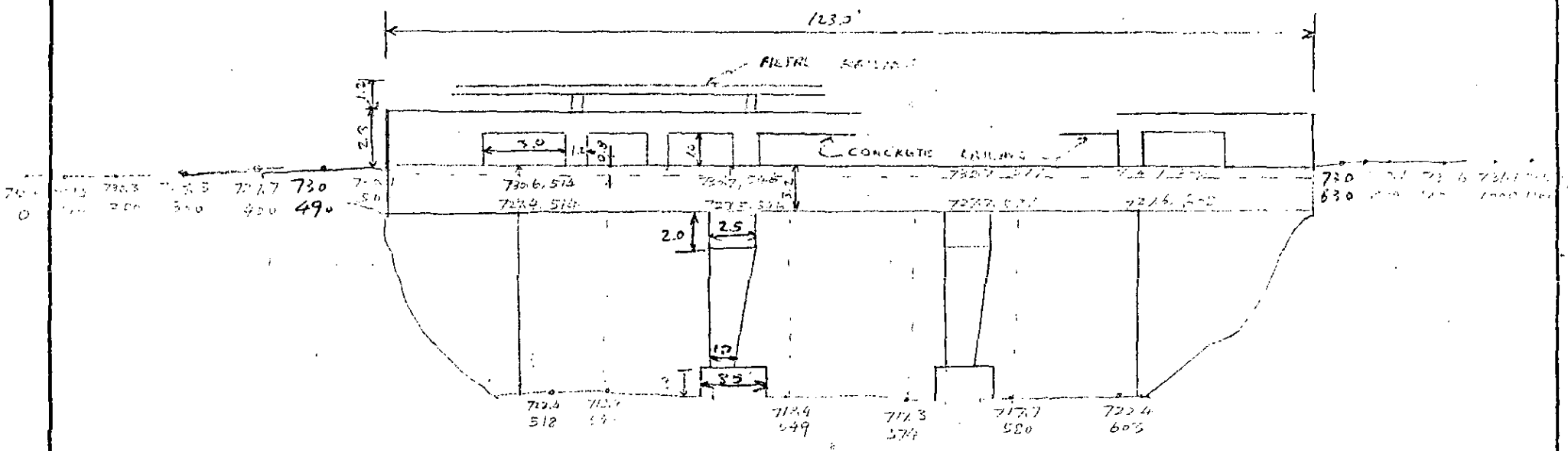
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: [illegible]

Sheet 2 of 2

Community: ALMA	Structure: SUPERIOR ST BRIDGE	Type: PRE-STRESSED CONCRETE	Station: 2007 + 10



PROFILE SKETCH
(Looking Downstream)

Length: 123.0 FT	Width: 59.0 FT	Skew:	Water Elevation:
No. of Piers: 2	Width of Piers: 2.5	Shape of Piers: ?	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

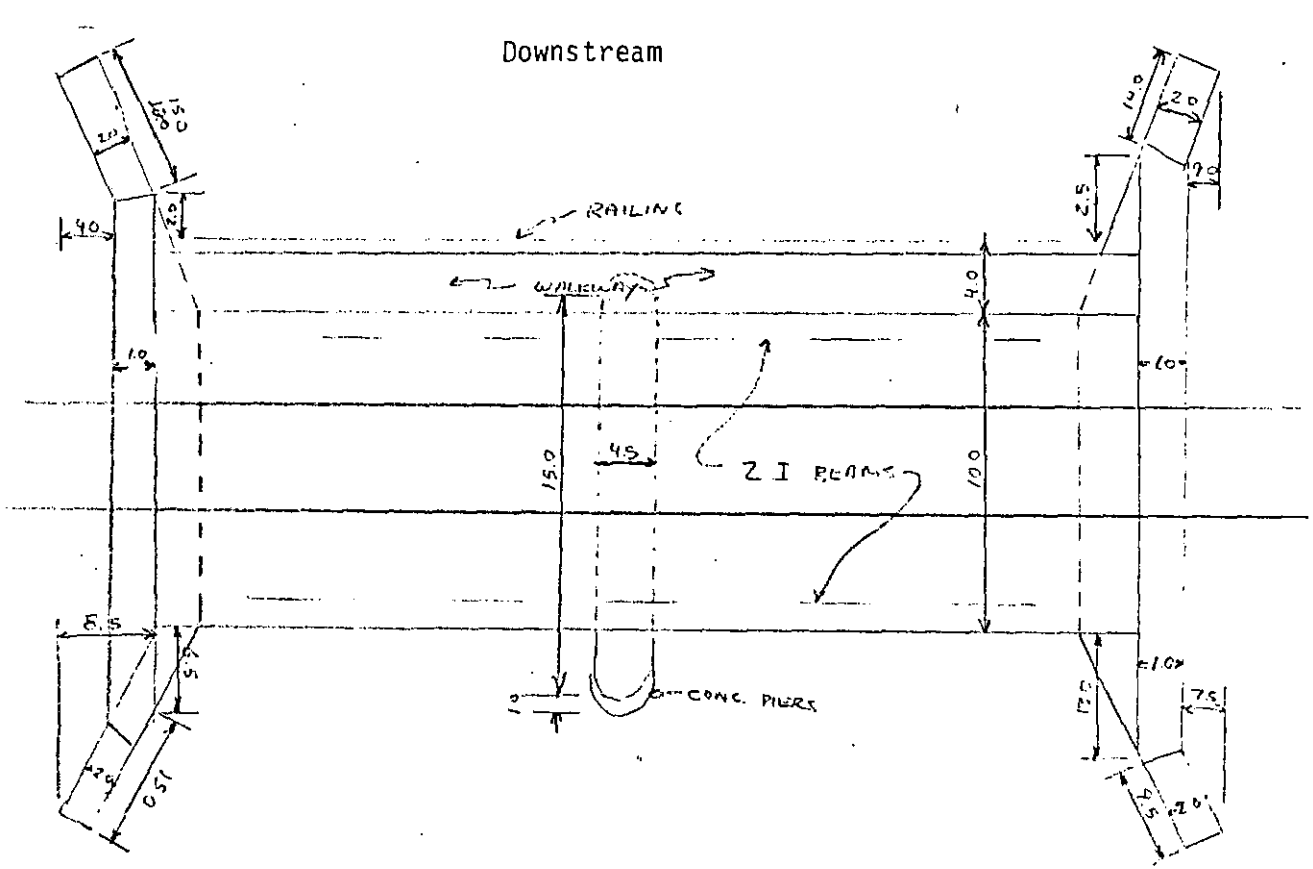
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: 5/15/78

Community: ALMA	Structure: 210 R.R. BRIDGE	Type: STEEL I-BEAM	Station: 2015+10

Downstream



North

Upstream

PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

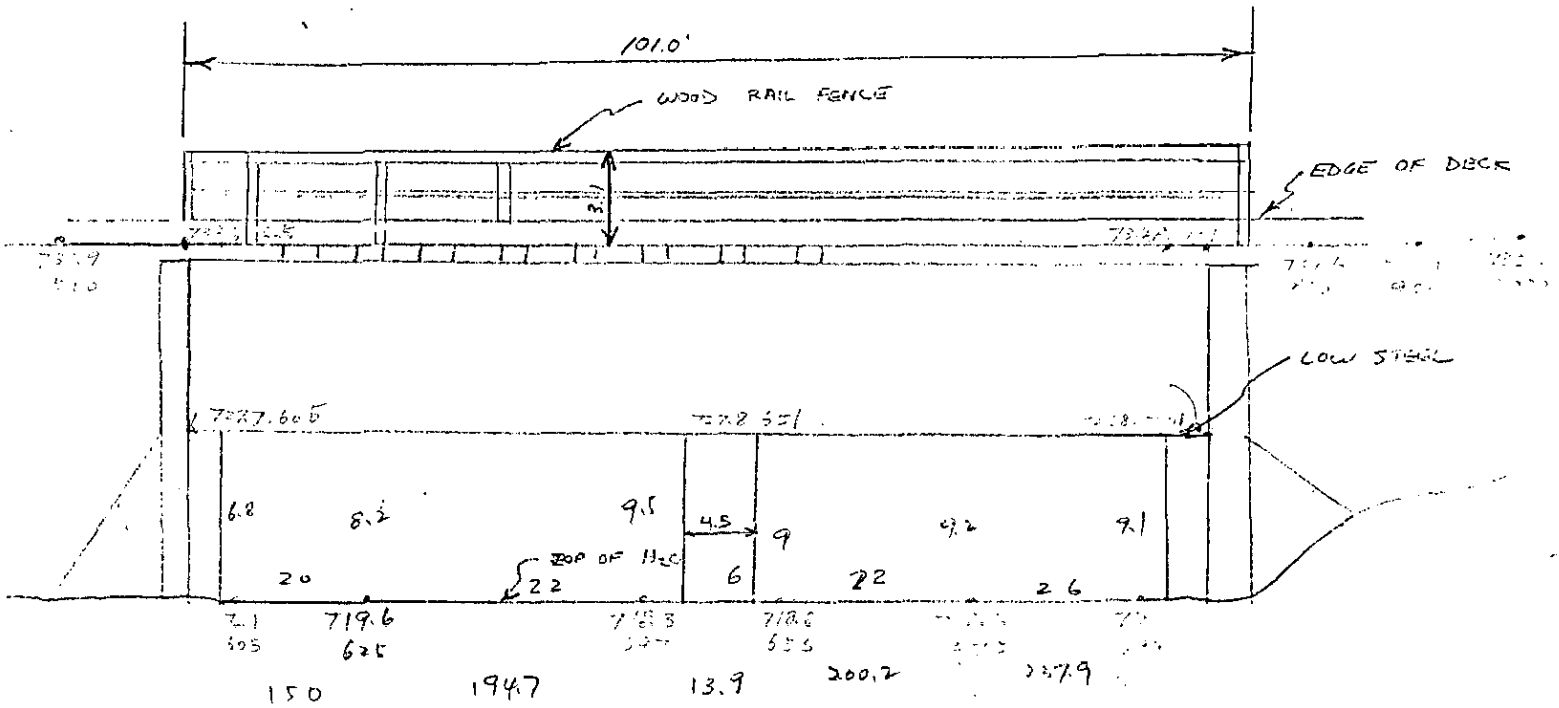
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: 3/15/79

Sheet 2 of 2

Community: ALMA	Structure: 3rd R.R. BRIDGE	Type: STEEL & [illegible]	Station: [illegible]



PROFILE SKETCH
(Looking Downstream)

Length: 101.0 FT.	Width: 14.0 FT (INCLUDING WALKWAY)	Skew:	Water Elevation:
No. of Piers: 1	Width of Piers: 4.5	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

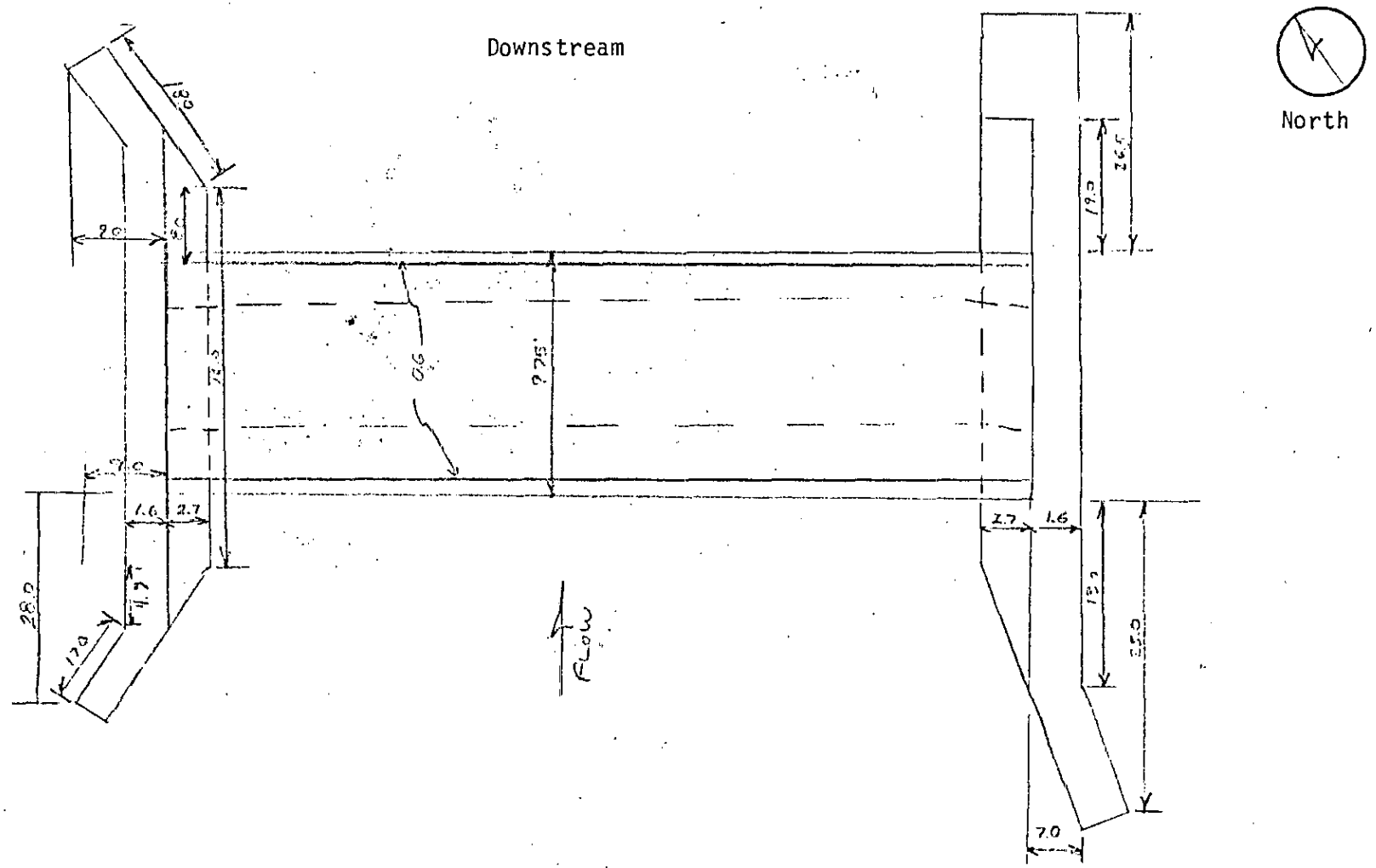
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: J.S.C.

Date: 3/13/79

Sheet 1 of 2

Community:	Structure:	Type:	Station:
[illegible]	[illegible]	STEEL I-BEAM	2024 +85



PLAN VIEW SKETCH

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

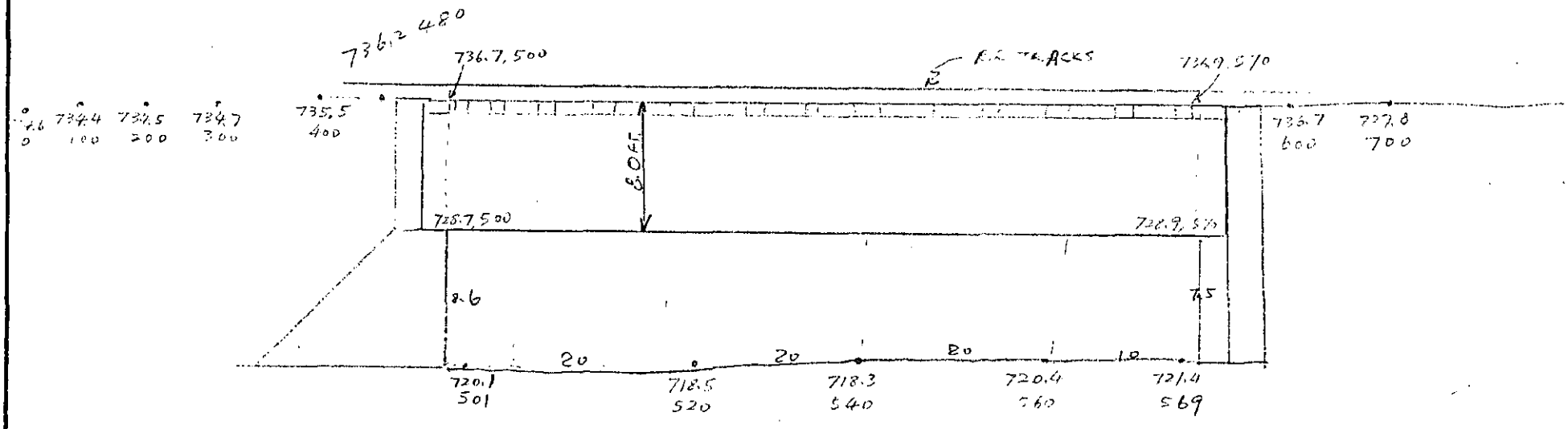
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: 5/12/79

Sheet 2 of 2

Community: ALPA	Structure: ANN ARBOR [illegible]	Type: STEEL I-BEAM	Station: [illegible]



SB 0 1.5 2.5 0 70 0 670 0 719 719

PROFILE SKETCH
(Looking Downstream)

Length: 720 FT	Width:	Skew:	Water Elevation:
No. of Piers: -	Width of Piers:	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

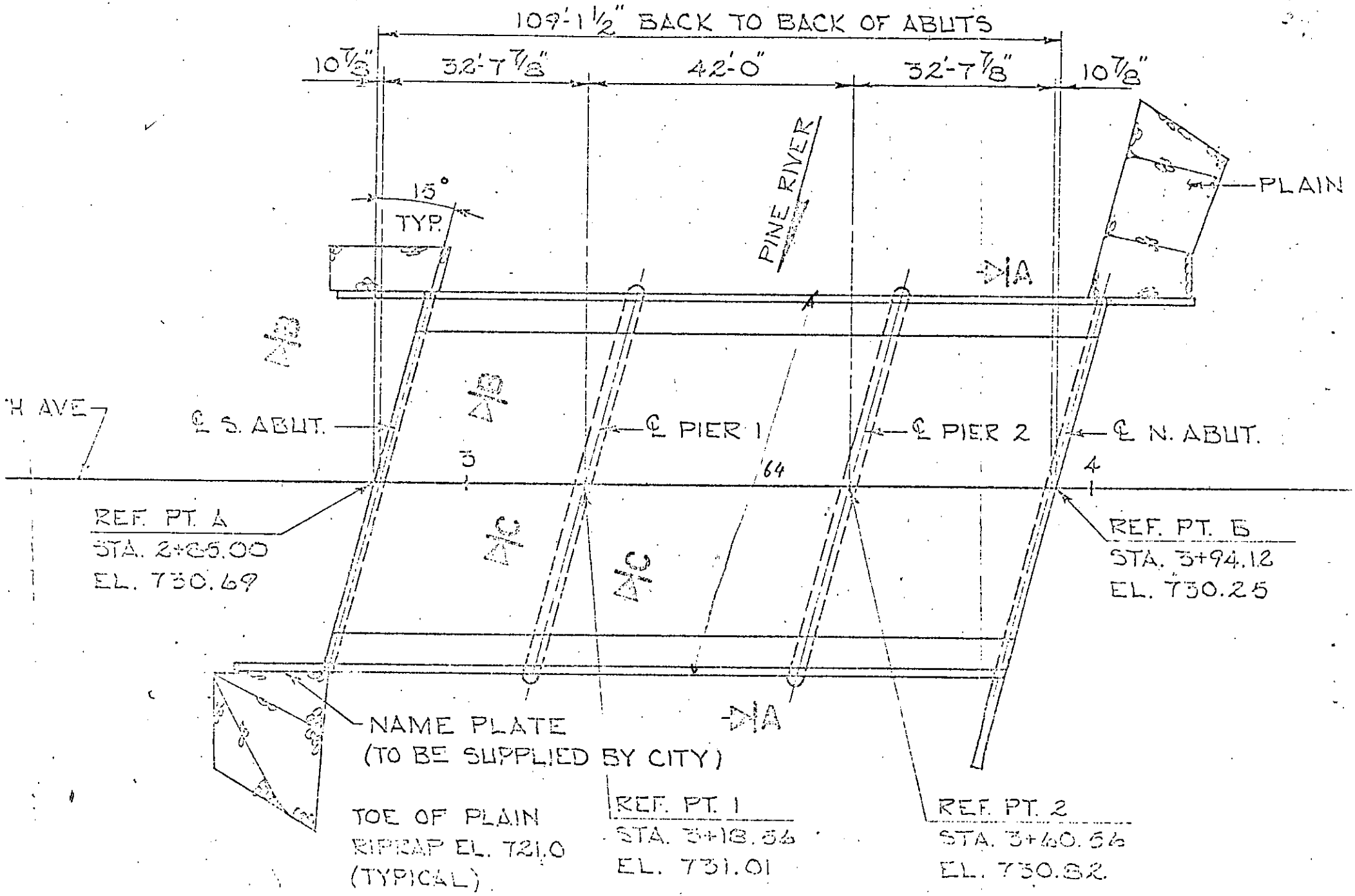
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

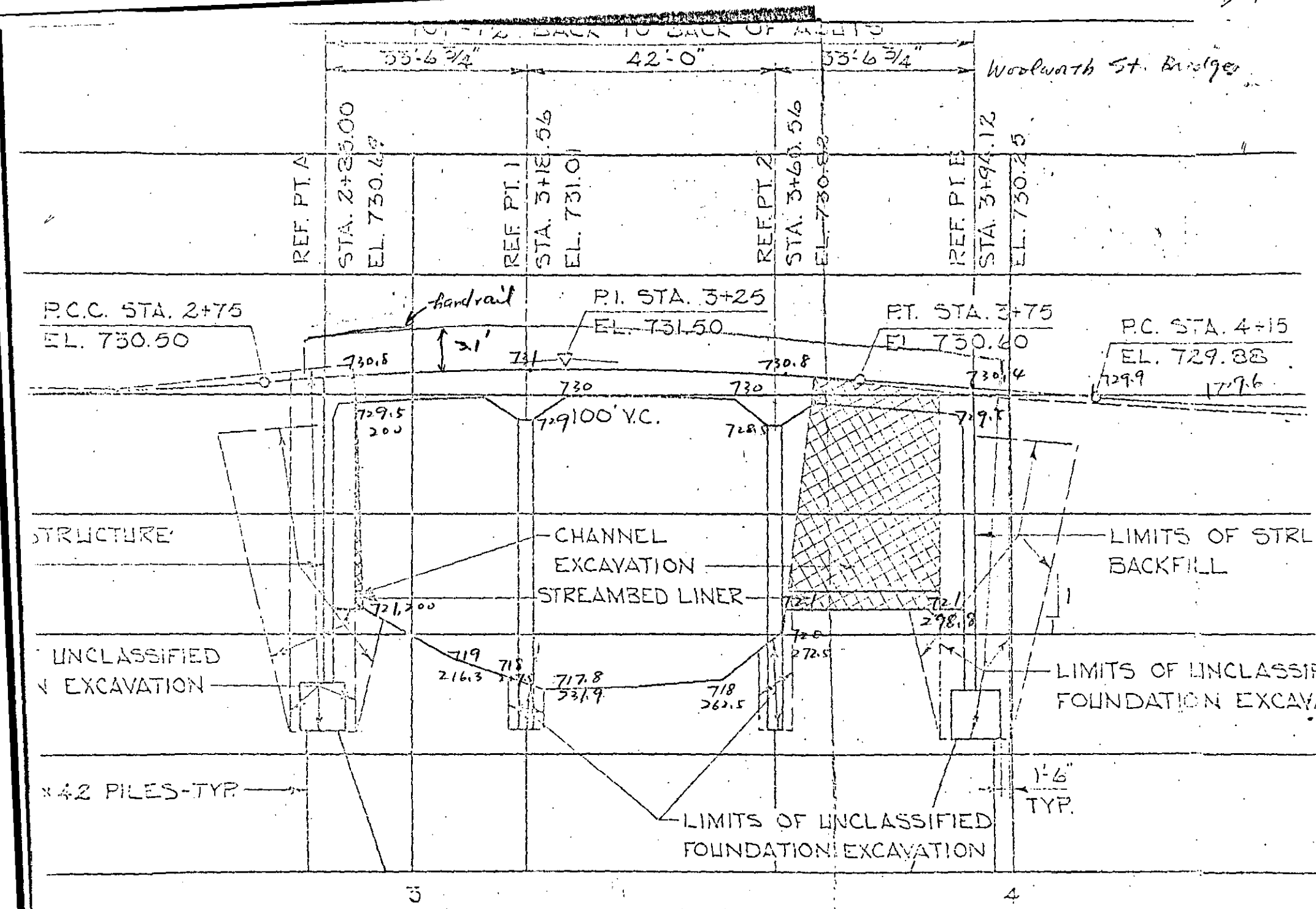
By: [illegible]

Date: 3/12/79

Sheet 1 of 2

Woolworth St. Bridge

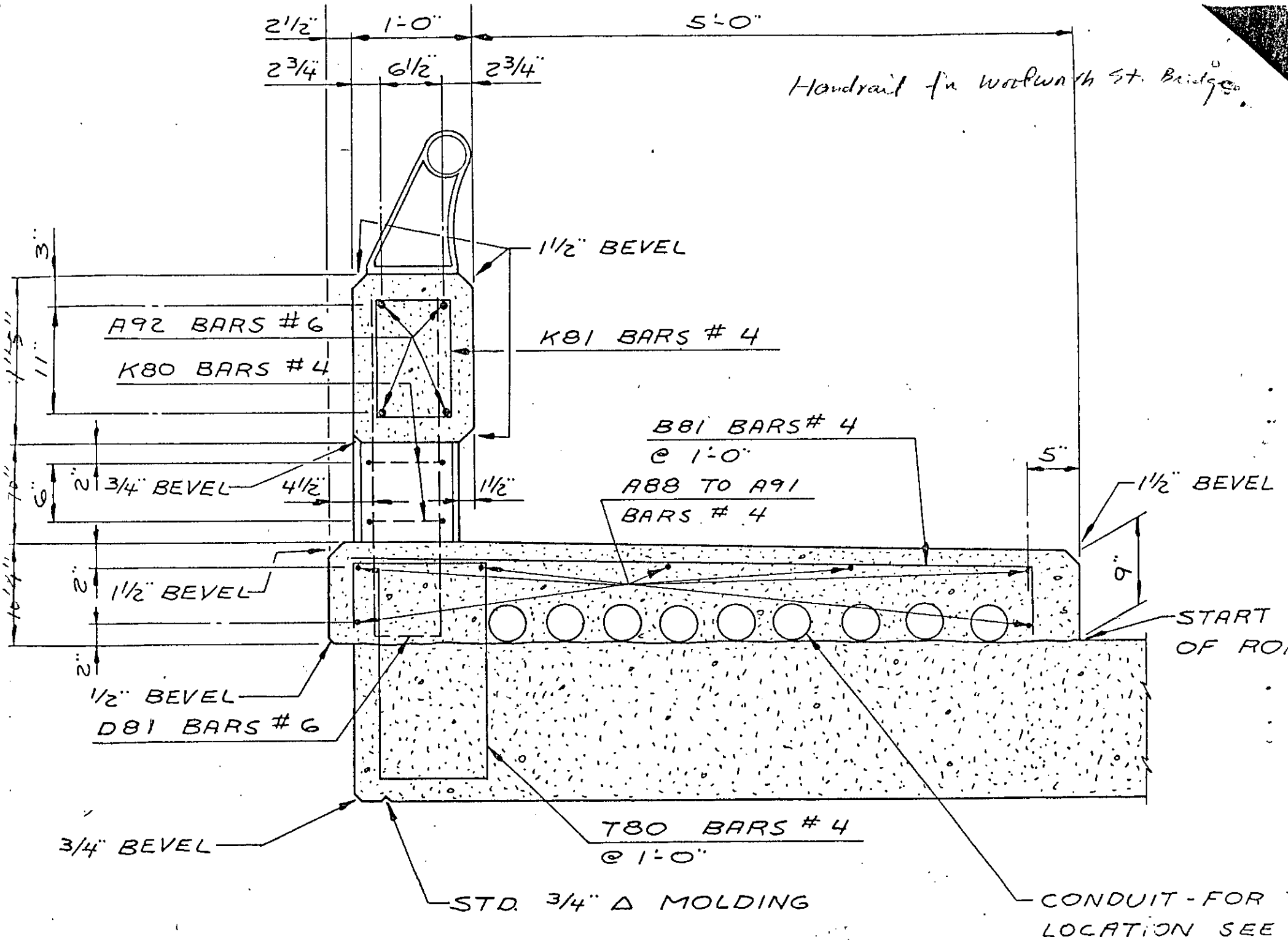




PROFILE

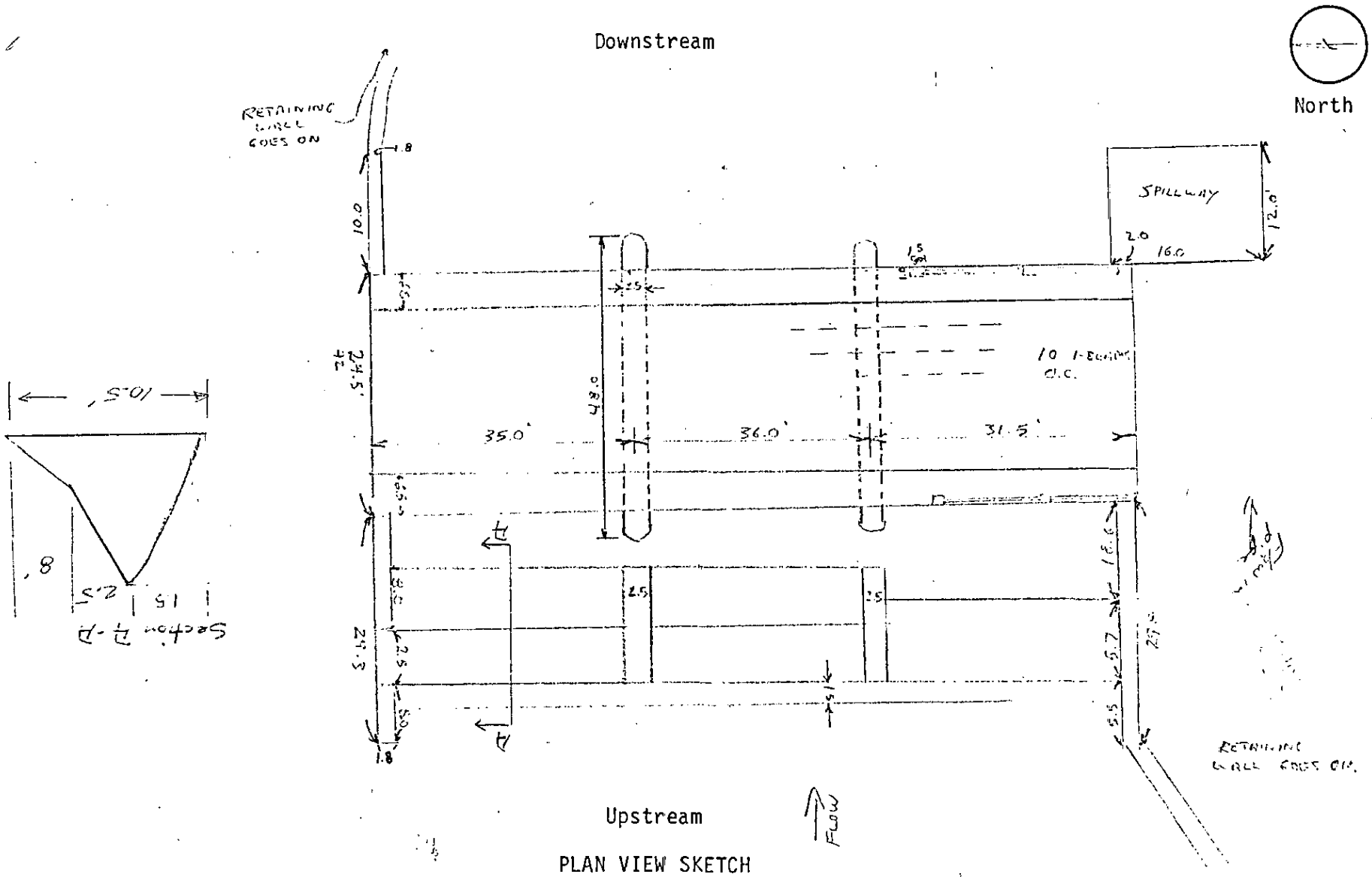
1" = 20' HORIZ.

1" = 5' VERT.



TYPICAL SECTION THRU SIDEWALK

Community: ALMA	Structure: SIXTH ST. BRIDGE	Type: I-BEAM & CONC.	Station: 2935+10



Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

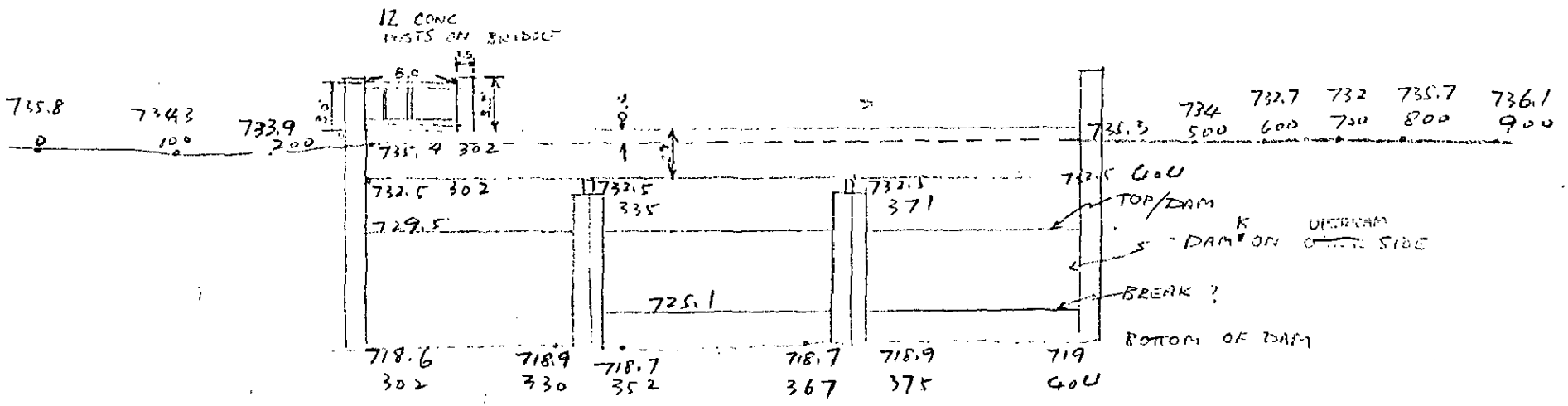
210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: JSC

Date: 3/10/79

Sheet 2 of 2

Community: [illegible]	Structure: STATE ST. BRIDGE	Type: I-BEAM & CONC	Station: 2036 H/O



PROFILE SKETCH
(Looking ~~Downstream~~ UPSTREAM)

Length: 166 FT	Width: 42.5 FT.	Skew:	Water Elevation:
No. of Piers: 2	Width of Piers: 2.5	Shape of Piers:	

Notes:

Gove Associates Inc.
ARCHITECTS/ENGINEERS/PLANNERS/SURVEYORS

210 MILL STREET
LANSING, MICHIGAN 48933
(517) 485-0555

By: [illegible]

Date: [illegible]

Sheet 1 of 2

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

            *** RUN DATE & TIME: 11/06/85 13:54
  T1         PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
  T2         STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
  Q          5990
*** Q-DATA FOR SEC-ID, ISEQ =            1
  WS         710.90
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC 1"
  XS   SEC 1  -4890
  GR        0,710.4  37,708.4  96,702.7  199,701.5  202,699.8  219,699.2
  GR        235,698.9  258,698.8  278,698.5  294,698.6  313,699.0
  GR        326,699.9  333,702.3  349,707.7  373,709.9
  N         0.090  0.045  0.110
  SA        199  333

*** FINISH PROCESSING CROSS SECTION - "SEC 1"
*** CROSS SECTION "SEC 1" ADDED TO DAF, RECORD NO. =    1, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC 1" AT SRD =  -4890.   ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  15):
       X       Y          X       Y          X       Y          X       Y
      0.0  710.40       37.0  708.40       96.0  702.70      199.0  701.50
    202.0  699.80      219.0  699.20      235.0  698.90      258.0  698.80
    278.0  698.50      294.0  698.60      313.0  699.00      326.0  699.90
    333.0  702.30      349.0  707.70      373.0  709.90

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      0.0  710.40      278.0  698.50      373.0  709.90        0.0  710.40

SUBAREA BREAKPOINTS (NSA =  3):
        199.     333.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.090   0.045   0.110
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME:  11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC 2"
  XS   SEC 2  -900
  GR        -23,715.3  42,708.6  106,706.6  175,705.9  178,702.2  196,700.3
  GR        217,700.6  241,700.2  260,699.8  283,700.1  296,701.4  306,704.7
  GR        326,703.8  347,703.6  365,706.0  374,709.1  382,711.3  395,715.0
  N         0.090  0.045  0.090  0.110
  SA        175  306  347

*** FINISH PROCESSING CROSS SECTION - "SEC 2"
*** CROSS SECTION "SEC 2" ADDED TO DAF, RECORD NO. =    2, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC 2" AT SRD =   -900.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  18):
       X       Y          X       Y          X       Y          X       Y
    -23.0  715.30      42.0  708.60     106.0  706.60     175.0  705.90
    178.0  702.20     196.0  700.30     217.0  700.60     241.0  700.20
    260.0  699.80     283.0  700.10     296.0  701.40     306.0  704.70
    326.0  703.80     347.0  703.60     365.0  706.00     374.0  709.10
    382.0  711.30     395.0  715.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    -23.0  715.30     260.0  699.80     395.0  715.00     -23.0  715.30

SUBAREA BREAKPOINTS (NSA =  4):
        175.     306.     347.

ROUGHNESS COEFFICIENTS (NSA =  4):
        0.090   0.045   0.090   0.110
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC A"
  XS   SEC A  1000
  GR        -23,716.0  42,709.3  106,707.3  175,706.6  178,702.9  196,701.0
  GR        217,701.3  241,700.9  260,700.5  283,700.8  296,702.1  306,705.4
  GR        326,704.5  347,704.3  365,706.7  374,709.8  382,712.0  395,715.7
  N         0.090  0.045  0.090  0.110
  SA        175  306  347

*** FINISH PROCESSING CROSS SECTION - "SEC A"
*** CROSS SECTION "SEC A" ADDED TO DAF, RECORD NO. =    3, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC A" AT SRD =   1000.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  18):
       X       Y          X       Y          X       Y          X       Y
    -23.0  716.00      42.0  709.30     106.0  707.30     175.0  706.60
    178.0  702.90     196.0  701.00     217.0  701.30     241.0  700.90
    260.0  700.50     283.0  700.80     296.0  702.10     306.0  705.40
    326.0  704.50     347.0  704.30     365.0  706.70     374.0  709.80
    382.0  712.00     395.0  715.70

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    -23.0  716.00     260.0  700.50     395.0  715.70     -23.0  716.00

SUBAREA BREAKPOINTS (NSA =  4):
        175.     306.     347.

ROUGHNESS COEFFICIENTS (NSA =  4):
        0.090    0.045    0.090    0.110
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC B"
  XS   SEC B  1280
  GR         60,719.0  68,713.6  82,706.0  99,703.2  101,702.4  115,701.7
  GR         130,700.6  143,701.0  155,701.2  165,701.2  177,701.8  177,705.1
  GR         192,715.8  205,725.8
  N          0.056

*** FINISH PROCESSING CROSS SECTION - "SEC B"
*** CROSS SECTION "SEC B" ADDED TO DAF, RECORD NO. =    4, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC B" AT SRD =   1280.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  14):
       X       Y          X       Y          X       Y          X       Y
    60.0  719.00      68.0  713.60      82.0  706.00      99.0  703.20
   101.0  702.40     115.0  701.70     130.0  700.60     143.0  701.00
   155.0  701.20     165.0  701.20     177.0  701.80     177.0  705.10
   192.0  715.80     205.0  725.80

 X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
    60.0  719.00     130.0  700.60     205.0  725.80     205.0  725.80

 SUBAREA BREAKPOINTS (NSA =  4):
        175.     306.     347.

 ROUGHNESS COEFFICIENTS (NSA =  4):
        0.056    0.056    0.056    0.056
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC C"
  XS   SEC C  2550
  GR         60,719.0  68,713.6  82,706.0  99,703.2  101,702.4  115,701.7
  GR         130,700.6  143,701.0  155,701.2  165,701.2  177,701.8  177,705.1
  GR         192,715.8  205,725.8
  N          0.060

*** FINISH PROCESSING CROSS SECTION - "SEC C"
*** CROSS SECTION "SEC C" ADDED TO DAF, RECORD NO. =    5, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC C" AT SRD =   2550.  ERR-CODE =      0

     SKEW      IHFNO    VSLOPE        EK        CK
      0.0          0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  14):
       X       Y          X       Y          X       Y          X       Y
    60.0  719.00      68.0  713.60      82.0  706.00      99.0  703.20
   101.0  702.40     115.0  701.70     130.0  700.60     143.0  701.00
   155.0  701.20     165.0  701.20     177.0  701.80     177.0  705.10
   192.0  715.80     205.0  725.80

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
     60.0  719.00     130.0  700.60     205.0  725.80     205.0  725.80

SUBAREA BREAKPOINTS (NSA =  4):
        175.     306.     347.

ROUGHNESS COEFFICIENTS (NSA =  4):
        0.060    0.060    0.060    0.060
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC D"
  XS   SEC D  3080
  GR         0,720.0  50,703.0  60,701.5  100,700.5  125,701.0  128,702.0
  GR         130,705.0  200,708.0  420,710.0  500,725.0
  N          0.090  0.045  0.090
  SA         50  130

*** FINISH PROCESSING CROSS SECTION - "SEC D"
*** CROSS SECTION "SEC D" ADDED TO DAF, RECORD NO. =    6, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC D" AT SRD =   3080.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  10):
       X       Y          X       Y          X       Y          X       Y
     0.0  720.00       50.0  703.00       60.0  701.50      100.0  700.50
   125.0  701.00      128.0  702.00      130.0  705.00      200.0  708.00
   420.0  710.00      500.0  725.00

 X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
     0.0  720.00      100.0  700.50      500.0  725.00      500.0  725.00

SUBAREA BREAKPOINTS (NSA =  3):
         50.     130.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.090   0.045   0.090
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC E"
  XS   SEC E  3860
  GR        -50,720.    0,715.
  GR        116,710.0  350,709.0  495,705.0  497,704.0  500,701.5  515,700.5
  GR        530,700.2  580,700.2  590,701.5  600,707.5  620,725.0
  N         0.045  0.045  0.090
  SA        490  600

*** FINISH PROCESSING CROSS SECTION - "SEC E"
*** CROSS SECTION "SEC E" ADDED TO DAF, RECORD NO. =    7, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC E" AT SRD =   3860.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  13):
       X       Y          X       Y          X       Y          X       Y
    -50.0  720.00       0.0  715.00     116.0  710.00     350.0  709.00
    495.0  705.00     497.0  704.00     500.0  701.50     515.0  700.50
    530.0  700.20     580.0  700.20     590.0  701.50     600.0  707.50
    620.0  725.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
    -50.0  720.00     530.0  700.20     620.0  725.00     620.0  725.00

SUBAREA BREAKPOINTS (NSA =  3):
        490.     600.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.045    0.045    0.090
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54


*** START PROCESSING CROSS SECTION - "SEC F"
  XS   SEC F  4620
  GR        0,720.0  70,715.0  350,710.0  455,705.0  480,702.5  530,702.5
  GR        540,705.0  680,725
  N         0.050  0.045  0.050
  SA        450  540
  PX   SEC 1

*** FINISH PROCESSING CROSS SECTION - "SEC F"
*** CROSS SECTION "SEC F" ADDED TO DAF, RECORD NO. =    8, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC F" AT SRD =   4620.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =   8):
       X       Y          X       Y          X       Y          X       Y
     0.0  720.00       70.0  715.00     350.0  710.00     455.0  705.00
   480.0  702.50      530.0  702.50     540.0  705.00     680.0  725.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      0.0  720.00      480.0  702.50     680.0  725.00     680.0  725.00

SUBAREA BREAKPOINTS (NSA =  3):
        450.     540.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.050   0.045   0.050
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
           *** RUN DATE & TIME: 11/06/85 13:54

 XSID:CODE   SRDL    LEW      AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD   FLEN    REW         K  ALPH    HO     ERR     FR#     VEL

SEC 1:XS   ******      0.     3004.  0.11 *****  711.01  703.23   5990.  710.90
    -4890. ******    373.   347498.  1.75 ***** *******   0.16    1.99

SEC 2:XS    3990.      7.     2803.  0.13  1.30  712.33 *******   5990.  712.20
     -900.  3990.    385.   315933.  1.78  0.01    0.00    0.18    2.14

SEC A:XS    1900.      7.     2798.  0.13  0.68  713.01 *******   5990.  712.89
     1000.  1900.    385.   315281.  1.78  0.00    0.00    0.18    2.14

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC B"     KRATIO =  0.43

SEC B:XS     280.     69.     1136.  0.45  0.24  713.41 *******   5990.  712.96
     1280.   280.    188.   135345.  1.04  0.16    0.00    0.31    5.27

SEC C:XS    1270.     66.     1395.  0.30  1.96  715.38 *******   5990.  715.08
     2550.  1270.    191.   171392.  1.04  0.00    0.00    0.23    4.30

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC D"     KRATIO =  2.12

SEC D:XS     530.     13.     3553.  0.10  0.31  715.68 *******   5990.  715.58
     3080.   530.    450.   363702.  2.31  0.00    0.00    0.16    1.69

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC E"     KRATIO =  1.80

SEC E:XS     780.     -8.     4714.  0.03  0.12  715.80 *******   5990.  715.77
     3860.   780.    609.   655365.  1.27  0.00    0.00    0.09    1.27

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC F"     KRATIO =  0.59

SEC F:XS     760.     58.     3324.  0.08  0.11  715.93 *******   5990.  715.85
     4620.   760.    616.   387299.  1.51  0.02    0.00    0.16    1.80
  ER
```

```
T1        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
T2        STARTING ELEVATION BASED ON HIGH WATER MARK NEAR NORTH CORPORATE LIMIT
Q         5990
WS        710.90
XS   SEC 1  -4890
GR        0,710.4  37,708.4  96,702.7  199,701.5  202,699.8  219,699.2
GR        235,698.9  258,698.8  278,698.5  294,698.6  313,699.0
GR        326,699.9  333,702.3  349,707.7  373,709.9
N         0.090  0.045  0.110
SA        199  333
XS   SEC 2  -900
GR        -23,715.3  42,708.6  106,706.6  175,705.9  178,702.2  196,700.3
GR        217,700.6  241,700.2  260,699.8  283,700.1  296,701.4  306,704.7
GR        326,703.8  347,703.6  365,706.0  374,709.1  382,711.3  395,715.0
N         0.090  0.045  0.090  0.110
SA        175  306  347
XS   SEC A  1000
GR        -23,716.0  42,709.3  106,707.3  175,706.6  178,702.9  196,701.0
GR        217,701.3  241,700.9  260,700.5  283,700.8  296,702.1  306,705.4
GR        326,704.5  347,704.3  365,706.7  374,709.8  382,712.0  395,715.7
N         0.090  0.045  0.090  0.110
SA        175  306  347
XS   SEC B  1280
GR        60,719.0  68,713.6  82,706.0  99,703.2  101,702.4  115,701.7
GR        130,700.6  143,701.0  155,701.2  165,701.2  177,701.8  177,705.1
GR        192,715.8  205,725.8
N         0.056
XS   SEC C  2550
GR        60,719.0  68,713.6  82,706.0  99,703.2  101,702.4  115,701.7
GR        130,700.6  143,701.0  155,701.2  165,701.2  177,701.8  177,705.1
GR        192,715.8  205,725.8
N         0.060
XS   SEC D  3080
GR        0,720.0  50,703.0  60,701.5  100,700.5  125,701.0  128,702.0
GR        130,705.0  200,708.0  420,710.0  500,725.0
N         0.090  0.045  0.090
SA        50  130
XS   SEC E  3860
GR        -50,720.    0,715.
GR        116,710.0  350,709.0  495,705.0  497,704.0  500,701.5  515,700.5
GR        530,700.2  580,700.2  590,701.5  600,707.5  620,725.0
N         0.045  0.045  0.090
SA        490  600
XS   SEC F  4620
GR        0,720.0  70,715.0  350,710.0  455,705.0  480,702.5  530,702.5
GR        540,705.0  680,725
N         0.050  0.045  0.050
SA        450  540
PX   SEC 1
PX   SEC 2
PX   SEC A
PX   SEC B
PX   SEC C
PX   SEC D
PX   SEC E
PX   SEC F
EX
ER
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

            *** RUN DATE & TIME: 11/06/85 14:38
  T1         PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
  T2          SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
  Q          5990
*** Q-DATA FOR SEC-ID, ISEQ =            1
  WS          715.85
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

SEC F:XS   ******     58.    3323.  0.08 *****  715.93  708.34   5990.  715.85
     4620. ******    616.  374495.  1.62 ***** *******    0.17    1.80

SEC G:XS     930.   -406.    2518.  0.14  0.31  716.27 *******   5990.  716.13
     5550.   930.    123.  288115.  1.62  0.03    0.00    0.24    2.38

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "EXIT "     KRATIO =  0.40

EXIT :XS     250.     22.     816.  0.84  0.27  716.89 *******   5990.  716.05
     5800.   250.    107.  116101.  1.00  0.35    0.00    0.42    7.34

SEC H:FV     100.     21.     843.  0.79  0.26  717.15 *******   5990.  716.37
     5900.   100.    108.  120561.  1.00  0.00    0.01    0.40    7.11
         <<<<<THE ABOVE RESULTS REFLECT "NORMAL" (UNCONSTRICTED) FLOW>>>>>

SEC I:AS     140.     19.     878.  0.72  0.33  717.48 *******   5990.  716.76
     6040.   140.    109.  125768.  1.00  0.00    0.00    0.39    6.82
         <<<<<THE ABOVE RESULTS REFLECT "NORMAL" (UNCONSTRICTED) FLOW>>>>>

 ===230 REJECTED FLOW CLASS 1 SOLUTION.
             WS1,WSSD,WS3 =   716.73        0.00      716.70
                     CRWS =   710.61    ********      708.73
                     YMAX =   720.00    ********      716.70

 ===260 ATTEMPTING FLOW CLASS 4 SOLUTION.

 ===265 ROAD OVERFLOW APPEARS EXCESSIVE.
                  GRD,GRDMAX,RATIO =     770.        379.     2.03

           <<<<<RESULTS REFLECTING THE CONSTRICTED FLOW FOLLOW>>>>>

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

MAINB:BR     100.      0.    1120.  0.34  0.22  717.04  708.25   5220.  716.70
     5900.   100.     95.  176136.  1.02  0.05    0.00    0.24    4.66

     TYPE PPCD FLOW      C     P/A    LSEL   BLEN   XLAB   XRAB
       4.   0.    4.  0.991  0.035  716.70 ****** ****** ******

    XSID:CODE    SRD   FLEN    HF   VHD     EGL     ERR       Q    WSEL
   MAINR:RG    5915.   110.  0.26  0.75  717.06    0.00    770.  716.56

              Q   WLEN    LEW    REW  DMAX  DAVG  VMAX  VAVG  HAVG  CAVG
   LT:      770.   250.  -355.  -105.   0.6   0.5   4.6   6.0   1.0   3.0
   RT:       0. ****** ****** ****** ***** ***** ***** ***** ***** *****

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS      Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#    VEL

SEC I:AS     110.     20.     860.  0.75  0.24  717.32  710.61   5990.  716.56
     6040.   117.    108.  123097.  1.00  0.03   -0.02    0.39    6.96
```

```
 M(G)   M(K)        KQ    XLKQ    XRKQ     OTEL
0.000  0.000  124475.     12.     107.  ********

                    <<<<<END OF BRIDGE COMPUTATIONS>>>>>

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC J"     KRATIO =  1.69
```

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
*** RUN DATE & TIME: 11/06/85 14:38

XSID:	CODE	SRDL	LEW	AREA	VHD	HF	EGL	CRWS	Q	WSEL
	SRD	FLEN	REW	K	ALPH	HO	ERR	FR#	VEL	
SEC J:	XS	570.	10.	1229.	0.37	0.80	718.11	*******	5990.	717.74
	6610.	570.	126.	207927.	1.01	0.00	0.00	0.27	4.88	
ER										

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "SEC F"
  XS   SEC F  4620
  GR        0,720.0  70,715.0  350,710.0  455,705.0  480,702.5  530,702.5
  GR        540,705.0  680,725
  N         0.050  0.045  0.075
  SA        450  540

*** FINISH PROCESSING CROSS SECTION - "SEC F"
*** CROSS SECTION "SEC F" ADDED TO DAF, RECORD NO. =    1, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC F" AT SRD =   4620.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =   8):
       X       Y          X       Y          X       Y          X       Y
      0.0  720.00      70.0  715.00     350.0  710.00     455.0  705.00
    480.0  702.50     530.0  702.50     540.0  705.00     680.0  725.00

  X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      0.0  720.00     480.0  702.50     680.0  725.00     680.0  725.00

SUBAREA BREAKPOINTS (NSA =  3):
        450.     540.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.050   0.045   0.075
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "SEC G"
  XS   SEC G  5550
  GR        -425,720.0
  GR        -400,715.0  0,711.3  8,710.9  22,705.1  35,703.5  54,703.2  70,702.9
  GR        86,703.2  102,704.2  109,705.4  118,711.9  120,714.3  125,717.5
  N         0.050  0.045  0.075
  SA        8  118

*** FINISH PROCESSING CROSS SECTION - "SEC G"
*** CROSS SECTION "SEC G" ADDED TO DAF, RECORD NO. =    2, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC G" AT SRD =   5550.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  14):
       X      Y           X      Y           X      Y           X      Y
   -425.0  720.00    -400.0  715.00       0.0  711.30       8.0  710.90
     22.0  705.10      35.0  703.50      54.0  703.20      70.0  702.90
     86.0  703.20     102.0  704.20     109.0  705.40     118.0  711.90
    120.0  714.30     125.0  717.50

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
   -425.0  720.00       70.0  702.90     125.0  717.50    -425.0  720.00

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.050   0.045   0.075
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "EXIT "
  XS   EXIT  5800
  GR          0,720.0
  GR         22,716.2  38,704.5  49,703.5  56,702.1  62,701.4  70,701.4  73,702.4
  GR         84,704.5  100,714.0  115,718.7
  N          0.045

*** FINISH PROCESSING CROSS SECTION - "EXIT "
*** CROSS SECTION "EXIT " ADDED TO DAF, RECORD NO. =    3, IXTYPE =    1

--- DATA SUMMARY FOR SECID "EXIT " AT SRD =   5800.  ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  11):
       X       Y          X       Y          X       Y          X       Y
      0.0  720.00       22.0  716.20       38.0  704.50       49.0  703.50
     56.0  702.10       62.0  701.40       70.0  701.40       73.0  702.40
     84.0  704.50      100.0  714.00      115.0  718.70

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      0.0  720.00       62.0  701.40      115.0  718.70       0.0  720.00

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.045   0.045   0.045
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "SEC H"
  XS   SEC H   5900
  GR          0,720.0
  GR         22,716.2  38,704.5  49,703.5  56,702.1  62,701.4  70,701.4  73,702.4
  GR         84,704.5  100,714.0  115,718.7
  N          0.045

*** FINISH PROCESSING CROSS SECTION - "SEC H"
*** CROSS SECTION "SEC H" ADDED TO DAF, RECORD NO. =    4, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC H" AT SRD =   5900.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  11):
       X       Y          X       Y          X       Y          X       Y
     0.0  720.00       22.0  716.20       38.0  704.50       49.0  703.50
    56.0  702.10       62.0  701.40       70.0  701.40       73.0  702.40
    84.0  704.50      100.0  714.00      115.0  718.70

 X-Y MAX-MIN POINTS:
    XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
     0.0  720.00       62.0  701.40      115.0  718.70        0.0  720.00

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.045   0.045   0.045
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "MAINB"
  BR   MAINB  5900  716.7  30
  GR        0,716.7  0,704.8  10,704.9  20,704.8  30,704.0  40,702.4  50,703.5
  GR        60,701.6  70,701.5  80,701.9  90,702.3  95,702.5  95,716.7  0,716.7
  N         0.030
  CD        4  30  1  720.6  90
  PW 0      703.5,3  716.7,3

*** FINISH PROCESSING CROSS SECTION - "MAINB"
*** CROSS SECTION "MAINB" ADDED TO DAF, RECORD NO. =    5, IXTYPE =    2

--- DATA SUMMARY FOR SECID "MAINB" AT SRD =   5900.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
     30.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  14):
       X       Y          X       Y          X       Y          X       Y
      0.0  716.70       0.0  704.80      10.0  704.90      20.0  704.80
     30.0  704.00      40.0  702.40      50.0  703.50      60.0  701.60
     70.0  701.50      80.0  701.90      90.0  702.30      95.0  702.50
     95.0  716.70       0.0  716.70

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      0.0  716.70      70.0  701.50      95.0  702.50       0.0  716.70

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.030   0.030   0.030

BRIDGE PARAMETERS:
 BRTYPE  BRWDTH     LSEL  USERCD  EMBSS   EMBELV  WWANGL
    4      30.0   716.70 *******   1.00   720.60   90.00

PIER DATA:  NPW =  2   PCODE = 0.
     PELV  PWDTH      PELV  PWDTH      PELV  PWDTH      PELV  PWDTH
    703.50   3.0     716.70   3.0
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "MAINR"
  XR   MAINR  5915  30
  GR        -505,720.0 -485,719.6 -465,719.3 -445,718.9 -425,718.5 -405,717.9
  GR         -395,717.3 -375,716.8 -355,716.4 -335,716.1 -315,716.0 -285,716.0
  GR         -265,716.0 -245,716.0 -225,716.0 -205,716.0 -185,716.0 -165,716.0
  GR         -145,716.0 -125,716.1 -105,716.4  -85,716.7  -65,717.0  -45,717.4
  GR         -25,717.9  -5,718.5  15,719.1  35,719.8

*** FINISH PROCESSING CROSS SECTION - "MAINR"
*** CROSS SECTION "MAINR" ADDED TO DAF, RECORD NO. =    6, IXTYPE =    4

--- DATA SUMMARY FOR SECID "MAINR" AT SRD =   5915.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  28):
       X       Y          X       Y          X       Y          X       Y
   -505.0  720.00     -485.0  719.60     -465.0  719.30     -445.0  718.90
   -425.0  718.50     -405.0  717.90     -395.0  717.30     -375.0  716.80
   -355.0  716.40     -335.0  716.10     -315.0  716.00     -285.0  716.00
   -265.0  716.00     -245.0  716.00     -225.0  716.00     -205.0  716.00
   -185.0  716.00     -165.0  716.00     -145.0  716.00     -125.0  716.10
   -105.0  716.40      -85.0  716.70      -65.0  717.00      -45.0  717.40
    -25.0  717.90       -5.0  718.50       15.0  719.10       35.0  719.80

  X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
   -505.0  720.00     -315.0  716.00       35.0  719.80     -505.0  720.00

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.045   0.045   0.045

ROAD GRADE DATA:  IPAVE  RDWID  USERCF
                  *****   30.0 *******

BRIDGE PROJECTION DATA:  XREFLT  XREFRT  FDSTLT  FDSTRT
                        ******* ******* ******* *******
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "SEC I"
  AS   SEC I  6040
  GR          0,720.0
  GR         22,716.2  38,704.5  49,703.5  56,702.1  62,701.4  70,701.4  73,702.4
  GR         84,704.5  100,714.0  115,718.7
  N          0.045

*** FINISH PROCESSING CROSS SECTION - "SEC I"
*** CROSS SECTION "SEC I" ADDED TO DAF, RECORD NO. =    7, IXTYPE =    5

--- DATA SUMMARY FOR SECID "SEC I" AT SRD =   6040.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  11):
       X       Y          X       Y          X       Y          X       Y
      0.0  720.00       22.0  716.20       38.0  704.50       49.0  703.50
     56.0  702.10       62.0  701.40       70.0  701.40       73.0  702.40
     84.0  704.50      100.0  714.00      115.0  718.70

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      0.0  720.00       62.0  701.40      115.0  718.70        0.0  720.00

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.045   0.045   0.045

BRIDGE PROJECTION DATA:  XREFLT  XREFRT  FDSTLT  FDSTRT
                        ******* ******* ******* *******
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

        PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
         SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
           *** RUN DATE & TIME: 11/06/85 14:38


*** START PROCESSING CROSS SECTION - "SEC J"
  XS   SEC J 6610
  GR        0,719.0
  GR        22,716.2  38,704.5  43,702.5  50,702.0  80,702.0  93,702.5  100,704.5
  GR        115,714.0  130,719.0
  N         0.042
  PX   SEC F

*** FINISH PROCESSING CROSS SECTION - "SEC J"
*** CROSS SECTION "SEC J" ADDED TO DAF, RECORD NO. =    8, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC J" AT SRD =   6610.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  10):
       X      Y          X      Y          X      Y          X      Y
      0.0  719.00      22.0  716.20      38.0  704.50      43.0  702.50
     50.0  702.00      80.0  702.00      93.0  702.50     100.0  704.50
    115.0  714.00     130.0  719.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      0.0  719.00      50.0  702.00     130.0  719.00        0.0  719.00

SUBAREA BREAKPOINTS (NSA =  3):
          8.     118.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.042   0.042   0.042
```

WSPRO FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286 MODEL FOR WATER-SURFACE PROFILE COMPUTATIONS

PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
*** RUN DATE & TIME: 11/06/85 14:38

XSID: CODE	SRDL	LEW	AREA	VHD	HF	EGL	CRWS	Q	WSEL
SRD	FLEN	REW	K	ALPH	HO	ERR	FR#	VEL	
SEC J: XS	570.	10.	1229.	0.37	0.80	718.11	*******	5990.	717.74
6610.	570.	126.	207927.	1.01	0.00	0.00	0.27	4.88	
ER									

NORMAL END OF WSPRO EXECUTION

```
T1          PINE RIVER AT ST LOUIS, MI 100 YEAR FLOOD
T2           SECTION 'SEC F' TO 'DSDAM' --CONTINUATION
Q           5990
WS           715.85
XS    SEC F  4620
GR          0,720.0  70,715.0  350,710.0  455,705.0  480,702.5  530,702.5
GR          540,705.0  680,725
N           0.050  0.045  0.075
SA          450  540
XS    SEC G  5550
GR          -425,720.0
GR          -400,715.0  0,711.3  8,710.9  22,705.1  35,703.5  54,703.2  70,702.9
GR          86,703.2  102,704.2  109,705.4  118,711.9  120,714.3  125,717.5
N           0.050  0.045  0.075
SA          8  118
XS    EXIT  5800
GR           0,720.0
GR          22,716.2  38,704.5  49,703.5  56,702.1  62,701.4  70,701.4  73,702.4
GR          84,704.5  100,714.0  115,718.7
N           0.045
XS    SEC H   5900
GR           0,720.0
GR          22,716.2  38,704.5  49,703.5  56,702.1  62,701.4  70,701.4  73,702.4
GR          84,704.5  100,714.0  115,718.7
N           0.045
BR    MAINB  5900  716.7  30
GR          0,716.7  0,704.8  10,704.9  20,704.8  30,704.0  40,702.4  50,703.5
GR          60,701.6  70,701.5  80,701.9  90,702.3  95,702.5  95,716.7  0,716.7
N           0.030
CD          4  30  1  720.6  90
PW 0        703.5,3  716.7,3
XR    MAINR  5915  30
GR          -505,720.0 -485,719.6 -465,719.3 -445,718.9 -425,718.5 -405,717.9
GR           -395,717.3 -375,716.8 -355,716.4 -335,716.1 -315,716.0 -285,716.0
GR           -265,716.0 -245,716.0 -225,716.0 -205,716.0 -185,716.0 -165,716.0
GR           -145,716.0 -125,716.1 -105,716.4  -85,716.7  -65,717.0  -45,717.4
GR           -25,717.9  -5,718.5  15,719.1  35,719.8
AS    SEC I  6040
GR           0,720.0
GR          22,716.2  38,704.5  49,703.5  56,702.1  62,701.4  70,701.4  73,702.4
GR          84,704.5  100,714.0  115,718.7
N           0.045
XS    SEC J 6610
GR          0,719.0
GR          22,716.2  38,704.5  43,702.5  50,702.0  80,702.0  93,702.5  100,704.5
GR          115,714.0  130,719.0
N           0.042
PX    SEC F
PX    SEC G
PX    EXIT
PX    SEC H
PX    MAINB
PX    MAINR
PX    SEC I
PX    SEC J
EX
ER
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

            *** RUN DATE & TIME: 11/06/85 15:28
  T1           LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
  T2            UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
  Q           5990
*** Q-DATA FOR SEC-ID, ISEQ =            1
  WS          721.9
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


*** START PROCESSING CROSS SECTION - "SEC K"
  XS   SEC K   6650
  GR           0,723.0  20.,708.0  270,708.0  290,723
  N            0.028

*** FINISH PROCESSING CROSS SECTION - "SEC K"
*** CROSS SECTION "SEC K" ADDED TO DAF, RECORD NO. =    1, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC K" AT SRD =   6650.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =   4):
       X       Y          X       Y          X       Y          X       Y
      0.0  723.00       20.0  708.00     270.0  708.00     290.0  723.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      0.0  723.00       20.0  708.00     290.0  723.00       0.0  723.00

ROUGHNESS COEFFICIENTS (NSA =  1):
        0.028
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


*** START PROCESSING CROSS SECTION - "EXIT "
  XS   EXIT    7100

*** FINISH PROCESSING CROSS SECTION - "EXIT "
*** CROSS SECTION "EXIT " ADDED TO DAF, RECORD NO. =    2, IXTYPE =    1

--- DATA SUMMARY FOR SECID "EXIT " AT SRD =   7100.   ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =   4):
       X       Y          X       Y          X       Y          X       Y
      0.0  723.00       20.0  708.00     270.0  708.00     290.0  723.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      0.0  723.00       20.0  708.00     290.0  723.00        0.0  723.00

ROUGHNESS COEFFICIENTS (NSA =  1):
        0.028
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


*** START PROCESSING CROSS SECTION - "SEC L"
  XS   SEC L   7200
  GR           0,723.0  20,708.0  380,708.0  400,723
  N            0.028

*** FINISH PROCESSING CROSS SECTION - "SEC L"
*** CROSS SECTION "SEC L" ADDED TO DAF, RECORD NO. =    3, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC L" AT SRD =   7200.   ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NQP =   4):
       X       Y          X       Y          X       Y          X       Y
      0.0  723.00      20.0  708.00     380.0  708.00     400.0  723.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      0.0  723.00      20.0  708.00     400.0  723.00        0.0  723.00

ROUGHNESS COEFFICIENTS (NSA =  1):
        0.028
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


*** START PROCESSING CROSS SECTION - "MILLB"
  BR   MILLB   7200  723.4
  GR          -171,723.85  -171,721.55  -160,718.33  -150,712.33  -140,710.03
  GR          -130,708.33  -120,709.83  -116,706.53  -113,706.53  -110,706.93
  GR          -100,706.83   -90,707.13   -80,709.53   -70,707.23   -58,706.83
  GR           -55,707.13   -50,706.93   -40,707.63   -30,707.93   -20,712.33
  GR           -10,717.71    -2,720.46     0,723.10  -171,723.85
  N            0.028
  CD           4  40  2.0  726.6  90
  PW 0         706.53,6  723.5,6

*** FINISH PROCESSING CROSS SECTION - "MILLB"
*** CROSS SECTION "MILLB" ADDED TO DAF, RECORD NO. =    4, IXTYPE =    2

--- DATA SUMMARY FOR SECID "MILLB" AT SRD =   7200.   ERR-CODE =      0

     SKEW      IHFNO     VSLOPE        EK        CK
      0.0          0     0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  24):
       X       Y           X       Y           X       Y           X       Y
   -171.0  723.85     -171.0  721.55     -160.0  718.33     -150.0  712.33
   -140.0  710.03     -130.0  708.33     -120.0  709.83     -116.0  706.53
   -113.0  706.53     -110.0  706.93     -100.0  706.83      -90.0  707.13
    -80.0  709.53      -70.0  707.23      -58.0  706.83      -55.0  707.13
    -50.0  706.93      -40.0  707.63      -30.0  707.93      -20.0  712.33
    -10.0  717.71       -2.0  720.46        0.0  723.10     -171.0  723.85

 X-Y MAX-MIN POINTS:
     XMIN       Y           X    YMIN       XMAX       Y           X    YMAX
   -171.0  723.85     -116.0  706.53        0.0  723.10     -171.0  723.85

ROUGHNESS COEFFICIENTS (NSA =  1):
        0.028

BRIDGE PARAMETERS:
 BRTYPE  BRWDTH     LSEL  USERCD  EMBSS   EMBELV  WWANGL
    4      40.0   723.40 *******   2.00   726.60   90.00

PIER DATA:  NPW =  2   PCODE = 0.
     PELV  PWDTH      PELV  PWDTH      PELV  PWDTH      PELV  PWDTH
   706.53   6.0     723.50   6.0
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


*** START PROCESSING CROSS SECTION - "SEC M"
  AS   SEC M   7360
  GR              0,723.5  20,708.0  480,708.0  500,723.5
  N               0.028

*** FINISH PROCESSING CROSS SECTION - "SEC M"
*** CROSS SECTION "SEC M" ADDED TO DAF, RECORD NO. =    5, IXTYPE =    5

--- DATA SUMMARY FOR SECID "SEC M" AT SRD =   7360.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =   4):
       X       Y          X       Y          X       Y          X       Y
      0.0  723.50      20.0  708.00     480.0  708.00     500.0  723.50

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN      XMAX       Y          X    YMAX
      0.0  723.50      20.0  708.00     500.0  723.50        0.0  723.50

ROUGHNESS COEFFICIENTS (NSA =  1):
        0.028

BRIDGE PROJECTION DATA:  XREFLT  XREFRT  FDSTLT  FDSTRT
                        ******* ******* ******* *******
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


*** START PROCESSING CROSS SECTION - "SEC N"
  XS   SEC N   12520
  GR          0,722.5        200,720.6      214,718.1      280,714.6      350,710.8
  GR          415,710.8      480,713.9      545,712.2      570,708.4      590,712.6
  GR          614,818.1      620,721.1      700,721.8      1100,727.0
  SA          480.           620.
  N           .030           .035           .030
  PX   SEC K

*** FINISH PROCESSING CROSS SECTION - "SEC N"
*** CROSS SECTION "SEC N" ADDED TO DAF, RECORD NO. =    6, IXTYPE =    1

--- DATA SUMMARY FOR SECID "SEC N" AT SRD =  12520.  ERR-CODE =      0

     SKEW     IHFNO    VSLOPE        EK        CK
      0.0         0    0.0000      0.50      0.00

X-Y COORDINATE PAIRS  (NGP =  14):
       X       Y          X       Y          X       Y          X       Y
     0.0  722.50      200.0  720.60      214.0  718.10      280.0  714.60
   350.0  710.80      415.0  710.80      480.0  713.90      545.0  712.20
   570.0  708.40      590.0  712.60      614.0  818.10      620.0  721.10
   700.0  721.80     1100.0  727.00

 X-Y MAX-MIN POINTS:
     XMIN       Y          X    YMIN       XMAX       Y          X    YMAX
      0.0  722.50      570.0  708.40     1100.0  727.00      614.0  818.10

SUBAREA BREAKPOINTS (NSA =  3):
        480.     620.

ROUGHNESS COEFFICIENTS (NSA =  3):
        0.030    0.035    0.030
```

```
WSPRO          FEDERAL HIGHWAY ADMINISTRATION - U. S. GEOLOGICAL SURVEY
V050286            MODEL  FOR  WATER-SURFACE  PROFILE  COMPUTATIONS

          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
           *** RUN DATE & TIME: 11/06/85 15:28


 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

SEC K:XS   ******     1.     3733.  0.04 *****  721.94  710.61   5990.  721.90
     6650. ******   289. 1075286.  1.00 ***** *******    0.08    1.60

EXIT :XS     450.     1.     3737.  0.04  0.01  721.95 *******   5990.  721.91
     7100.   450.   289. 1077188.  1.00  0.00    0.00    0.08    1.60

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC L"     KRATIO =  1.44

SEC L:FV     100.     1.     5276.  0.02  0.00  721.96 *******   5990.  721.94
     7200.   100.   399. 1550757.  1.00  0.00    0.00    0.05    1.14
         <<<<<THE ABOVE RESULTS REFLECT "NORMAL" (UNCONSTRICTED) FLOW>>>>>

SEC M:AS     160.     2.     6666.  0.01  0.00  721.96 *******   5990.  721.95
     7360.   160.   498. 1979884.  1.00  0.00    0.00    0.04    0.90
         <<<<<THE ABOVE RESULTS REFLECT "NORMAL" (UNCONSTRICTED) FLOW>>>>>

            <<<<<RESULTS REFLECTING THE CONSTRICTED FLOW FOLLOW>>>>>

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

MILLB:BR     100.  -171.     1950.  0.17  0.01  722.01  712.45   5990.  721.83
     7200.   100.    -1.   511575.  1.18  0.05    0.00    0.17    3.07

     TYPE PPCD FLOW       C    P/A    LSEL   BLEN   XLAB   XRAB
       4.   0.    1.   0.920  0.047  723.40 ****** ****** ******

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

SEC M:AS     120.     2.     6700.  0.01  0.01  722.03  709.74   5990.  722.01
     7360.   348.   498. 1996140.  1.00  0.01    0.00    0.04    0.89

       M(G)   M(K)       KQ   XLKQ   XRKQ    OTEL
      0.657  0.631  736924.   162.   332.   722.01

                     <<<<<END OF BRIDGE COMPUTATIONS>>>>>

 ===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS.
                              "SEC N"     KRATIO =  0.32

 XSID:CODE   SRDL    LEW     AREA   VHD    HF     EGL    CRWS       Q    WSEL
       SRD   FLEN    REW        K  ALPH    HO     ERR     FR#     VEL

SEC N:XS    5160.    37.     3774.  0.04  0.15  722.19 *******   5990.  722.15
    12520.  5160.   727.   630394.  1.04  0.01    0.00    0.12    1.59
  ER
```

```
T1          LIMITED DETAIL FLOOD INSURANCE STUDY FOR CITY OF ST. LOUIS
T2           UPSTREAM SIDE OF ST. LOUIS MUNICIPAL ELECTRIC PLANT DAM
Q          5990
WS         721.9
XS   SEC K   6650
GR           0,723.0  20.,708.0  270,708.0  290,723
N            0.028
XS   EXIT    7100
XS   SEC L   7200
GR           0,723.0  20,708.0  380,708.0  400,723
N            0.028
BR   MILLB   7200  723.4
GR          -171,723.85  -171,721.55  -160,718.33  -150,712.33  -140,710.03
GR          -130,708.33  -120,709.83  -116,706.53  -113,706.53  -110,706.93
GR          -100,706.83   -90,707.13   -80,709.53   -70,707.23   -58,706.83
GR           -55,707.13   -50,706.93   -40,707.63   -30,707.93   -20,712.33
GR           -10,717.71    -2,720.46     0,723.10  -171,723.85
N            0.028
CD           4  40  2.0  726.6  90
PW O         706.53,6  723.5,6
AS   SEC M   7360
GR             0,723.5  20,708.0  480,708.0  500,723.5
N              0.028
XS   SEC N   12520
GR         0,722.5       200,720.6     214,718.1     280,714.6     350,710.8
GR         415,710.8     480,713.9     545,712.2     570,708.4     590,712.6
GR         614,818.1     620,721.1     700,721.8     1100,727.0
SA         480.          620.
N          .030          .035          .030
PX   SEC K
PX   EXIT
PX   SEC L
PX   MILLB
PX   SEC M
PX   SEC N
EX
ER
```

STATION - 04155000 /USGS PINE RIVER AT ALMA, MICH. 1931-1985 04155000 /USGS

I N P U T D A T A S U M M A R Y

-- YEARS OF RECORD -- SYSTEMATIC	HISTORIC	HISTORIC PEAKS	GENERALIZED SKEW	STD. ERROR OF GENERAL. SKEW	SKEW OPTION	GAGE BASE DISCHARGE	USER-SET OUTLIER CRITERIA HIGH OUTLIER	LOW OUTLIER
55	0	0	-0.170	0.450	WRC WEIGHTED	0.0	--	--

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

```
**WCF109W-PEAKS WITH MISSING-DISCHARGE CODES  WERE BYPASSED.        3
**WCF113W-NUMBER OF SYSTEMATIC PEAKS HAS BEEN REDUCED TO NSYS =    52
  WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE.                  0.0
  WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION.           305.5
  WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE.      6927.6
  WCF002J-CALCS COMPLETED.  RETURN CODE =  2
```

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE DISCHARGE	FLOOD BASE EXCEEDANCE PROBABILITY	LOGARITHMIC MEAN	LOGARITHMIC STANDARD DEVIATION	LOGARITHMIC SKEW
SYSTEMATIC RECORD	0.0	1.0000	3.1628	0.2435	-0.138
W R C ESTIMATE	0.0	1.0000	3.1628	0.2435	-0.149

ANNUAL FREQUENCY CURVE ORDINATES -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	W R C ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR W R C ESTIMATES LOWER	UPPER
0.9950	317.3	319.1	287.2	228.7	405.1
0.9900	371.3	373.0	344.8	275.0	465.2
0.9500	565.2	566.1	548.5	448.9	675.8
0.9000	703.2	703.6	687.8	577.1	823.5
0.8000	911.6	911.3	901.8	773.6	1047.2
0.5000	1475.2	1473.7	1475.2	1296.3	1680.1
0.2000	2340.7	2340.1	2363.7	2036.6	2760.9
0.1000	2956.5	2958.7	3013.6	2528.3	3593.4
0.0400	3770.7	3779.1	3889.5	3151.1	4752.5
0.0200	4398.4	4413.4	4603.5	3616.0	5682.7
0.0100	5041.2	5064.6	5341.5	4081.4	6663.2
0.0050	5701.6	5735.2	6152.0	4550.3	7696.6
0.0020	6604.4	6654.2	7188.1	5178.6	9146.9

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 8/20/86 AT 1557 SEQ 1.0001

STATION - 04155000 /USGS PINE RIVER AT ALMA, MICH. 1931-1985 04155000 /USGS

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

INPUT DATA LISTING

WATER YEAR	DISCHARGE	CODES
1931	353.0	
1932	1060.0	
1933	1400.0	
1934	1100.0	
1935	3560.0	
1936	965.0	
1937	720.0	
1938	4070.0	
1939	-660.0	K
1940	-1330.0	K
1941	-772.0	K
1942	2210.0	
1943	2450.0	
1944	960.0	
1945	1840.0	
1946	3650.0	
1947	1820.0	
1948	4400.0	
1949	1200.0	
1950	3210.0	
1951	1320.0	
1952	1320.0	
1953	1270.0	
1954	1750.0	
1955	1150.0	
1956	1800.0	
1957	675.0	
1958	723.0	
1959	2400.0	
1960	2480.0	
1961	658.0	
1962	1210.0	
1963	622.0	
1964	480.0	
1965	2780.0	
1966	1050.0	
1967	2540.0	
1968	1710.0	
1969	1020.0	
1970	964.0	

EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	W R C ESTIMATE
1948	4400.0	0.0189	0.0189
1938	4070.0	0.0377	0.0377
1946	3650.0	0.0566	0.0566
1935	3560.0	0.0755	0.0755
1950	3210.0	0.0943	0.0943
1965	2780.0	0.1132	0.1132
1975	2720.0	0.1321	0.1321
1976	2630.0	0.1509	0.1509
1978	2630.0	0.1698	0.1698
1967	2540.0	0.1887	0.1887
1960	2480.0	0.2075	0.2075
1943	2450.0	0.2264	0.2264
1959	2400.0	0.2453	0.2453
1942	2210.0	0.2642	0.2642
1985	2080.0	0.2830	0.2830
1945	1840.0	0.3019	0.3019
1947	1820.0	0.3208	0.3208
1982	1820.0	0.3396	0.3396
1956	1800.0	0.3585	0.3585
1974	1790.0	0.3774	0.3774
1954	1750.0	0.3962	0.3962
1968	1710.0	0.4151	0.4151
1972	1680.0	0.4340	0.4340
1971	1610.0	0.4528	0.4528
1973	1540.0	0.4717	0.4717
1983	1460.0	0.4906	0.4906
1933	1400.0	0.5094	0.5094
1951	1320.0	0.5283	0.5283
1952	1320.0	0.5472	0.5472
1953	1270.0	0.5660	0.5660
1981	1270.0	0.5849	0.5849
1962	1210.0	0.6038	0.6038
1949	1200.0	0.6226	0.6226
1955	1150.0	0.6415	0.6415
1977	1120.0	0.6604	0.6604
1934	1100.0	0.6792	0.6792
1932	1060.0	0.6981	0.6981
1966	1050.0	0.7170	0.7170
1969	1020.0	0.7358	0.7358
1936	965.0	0.7547	0.7547

-- CONTINUED --

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 8/20/86 AT 1557 SEQ 1.0001

STATION - 04155000 /USGS PINE RIVER AT ALMA, MICH. 1931-1985 04155000 /USGS

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

INPUT DATA LISTING

WATER YEAR	DISCHARGE	CODES
	-- CONTINUED --	
1971	1610.0	
1972	1680.0	
1973	1540.0	
1974	1790.0	
1975	2720.0	
1976	2630.0	
1977	1120.0	
1978	2630.0	
1979	808.0	
1980	814.0	
1981	1270.0	
1982	1820.0	
1983	1460.0	
1984	936.0	
1985	2080.0	

EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	W R C ESTIMATE
1970	964.0	0.7736	0.7736
1944	960.0	0.7925	0.7925
1984	936.0	0.8113	0.8113
1980	814.0	0.8302	0.8302
1979	808.0	0.8491	0.8491
1958	723.0	0.8679	0.8679
1937	720.0	0.8868	0.8868
1957	675.0	0.9057	0.9057
1961	658.0	0.9245	0.9245
1963	622.0	0.9434	0.9434
1964	480.0	0.9623	0.9623
1931	353.0	0.9811	0.9811
1939	-660.0	--	--
1941	-772.0	--	--
1940	-1330.0	--	--

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 8/20/86 AT 1557 SEQ 1.0002

STATION - 04155000 /USGS PINE RIVER AT ALMA, MICH. 1931-1985 04155000 /USGS

I N P U T D A T A S U M M A R Y

-- YEARS OF RECORD -- SYSTEMATIC	HISTORIC	HISTORIC PEAKS	GENERALIZED SKEW	STD. ERROR OF GENERAL. SKEW	SKEW OPTION	GAGE BASE DISCHARGE	USER-SET OUTLIER CRITERIA HIGH OUTLIER	LOW OUTLIER
55	0	0	-0.170	0.450	WRC WEIGHTED	0.0	--	--

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

**WCF109W-PEAKS WITH MISSING-DISCHARGE CODES WERE BYPASSED. 3
**WCF113W-NUMBER OF SYSTEMATIC PEAKS HAS BEEN REDUCED TO NSYS = 52
WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE. 0.0
WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION. 305.5
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 6927.6
WCF002J-CALCS COMPLETED. RETURN CODE = 2

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE DISCHARGE	FLOOD BASE EXCEEDANCE PROBABILITY	LOGARITHMIC MEAN	LOGARITHMIC STANDARD DEVIATION	LOGARITHMIC SKEW
SYSTEMATIC RECORD	0.0	1.0000	3.1628	0.2435	-0.138
W R C ESTIMATE	0.0	1.0000	3.1628	0.2435	-0.149

ANNUAL FREQUENCY CURVE ORDINATES -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	W R C ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR W R C ESTIMATES LOWER	UPPER
0.9950	317.3	319.1	287.2	228.7	405.1
0.9900	371.3	373.0	344.8	275.0	465.2
0.9500	565.2	566.1	548.5	448.9	675.8
0.9000	703.2	703.6	687.8	577.1	823.5
0.8000	911.6	911.3	901.8	773.6	1047.2
0.5000	1475.2	1473.7	1475.2	1296.3	1680.1
0.2000	2340.7	2340.1	2363.7	2036.6	2760.9
0.1000	2956.5	2958.7	3013.6	2528.3	3593.4
0.0400	3770.7	3779.1	3889.5	3151.1	4752.5
0.0200	4398.4	4413.4	4603.5	3616.0	5682.7
0.0100	5041.2	5064.6	5341.5	4081.4	6663.2
0.0050	5701.6	5735.2	6152.0	4550.3	7696.6
0.0020	6604.4	6654.2	7188.1	5178.6	9146.9

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 8/20/86 AT 1557 SEQ 1.0001

STATION - 04155000 /USGS PINE RIVER AT ALMA, MICH. 1931-1985 04155000 /USGS

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

INPUT DATA LISTING

WATER YEAR	DISCHARGE	CODES
1931	353.0	
1932	1060.0	
1933	1400.0	
1934	1100.0	
1935	3560.0	
1936	965.0	
1937	720.0	
1938	4070.0	
1939	-660.0	K
1940	-1330.0	K
1941	-772.0	K
1942	2210.0	
1943	2450.0	
1944	960.0	
1945	1840.0	
1946	3650.0	
1947	1820.0	
1948	4400.0	
1949	1200.0	
1950	3210.0	
1951	1320.0	
1952	1320.0	
1953	1270.0	
1954	1750.0	
1955	1150.0	
1956	1800.0	
1957	675.0	
1958	723.0	
1959	2400.0	
1960	2480.0	
1961	658.0	
1962	1210.0	
1963	622.0	
1964	480.0	
1965	2780.0	
1966	1050.0	
1967	2540.0	
1968	1710.0	
1969	1020.0	
1970	964.0	

EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	W R C ESTIMATE
1948	4400.0	0.0189	0.0189
1938	4070.0	0.0377	0.0377
1946	3650.0	0.0566	0.0566
1935	3560.0	0.0755	0.0755
1950	3210.0	0.0943	0.0943
1965	2780.0	0.1132	0.1132
1975	2720.0	0.1321	0.1321
1976	2630.0	0.1509	0.1509
1978	2630.0	0.1698	0.1698
1967	2540.0	0.1887	0.1887
1960	2480.0	0.2075	0.2075
1943	2450.0	0.2264	0.2264
1959	2400.0	0.2453	0.2453
1942	2210.0	0.2642	0.2642
1985	2080.0	0.2830	0.2830
1945	1840.0	0.3019	0.3019
1947	1820.0	0.3208	0.3208
1982	1820.0	0.3396	0.3396
1956	1800.0	0.3585	0.3585
1974	1790.0	0.3774	0.3774
1954	1750.0	0.3962	0.3962
1968	1710.0	0.4151	0.4151
1972	1680.0	0.4340	0.4340
1971	1610.0	0.4528	0.4528
1973	1540.0	0.4717	0.4717
1983	1460.0	0.4906	0.4906
1933	1400.0	0.5094	0.5094
1951	1320.0	0.5283	0.5283
1952	1320.0	0.5472	0.5472
1953	1270.0	0.5660	0.5660
1981	1270.0	0.5849	0.5849
1962	1210.0	0.6038	0.6038
1949	1200.0	0.6226	0.6226
1955	1150.0	0.6415	0.6415
1977	1120.0	0.6604	0.6604
1934	1100.0	0.6792	0.6792
1932	1060.0	0.6981	0.6981
1966	1050.0	0.7170	0.7170
1969	1020.0	0.7358	0.7358
1936	965.0	0.7547	0.7547

-- CONTINUED --

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 8/20/86 AT 1557 SEQ 1.0001

STATION - 04155000 /USGS PINE RIVER AT ALMA, MICH. 1931-1985 04155000 /USGS

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

INPUT DATA LISTING

WATER YEAR	DISCHARGE	CODES
	-- CONTINUED --	
1971	1610.0	
1972	1680.0	
1973	1540.0	
1974	1790.0	
1975	2720.0	
1976	2630.0	
1977	1120.0	
1978	2630.0	
1979	808.0	
1980	814.0	
1981	1270.0	
1982	1820.0	
1983	1460.0	
1984	936.0	
1985	2080.0	

EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	W R C ESTIMATE
1970	964.0	0.7736	0.7736
1944	960.0	0.7925	0.7925
1984	936.0	0.8113	0.8113
1980	814.0	0.8302	0.8302
1979	808.0	0.8491	0.8491
1958	723.0	0.8679	0.8679
1937	720.0	0.8868	0.8868
1957	675.0	0.9057	0.9057
1961	658.0	0.9245	0.9245
1963	622.0	0.9434	0.9434
1964	480.0	0.9623	0.9623
1931	353.0	0.9811	0.9811
1939	-660.0	--	--
1941	-772.0	--	--
1940	-1330.0	--	--