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ADDENDUM TO
DRAINAGE DESIGN REPORT
SHEA BOULEVARD
SCOTTSDALE ROAD TO PIMA ROAD

CITY OF SCOTTSDALE, ARIZONA
PROJECT NO. S7501

ARIZONA DEPARTMENT OF TRANSPORTATION
PROJECT NO. M-703(5)

January, 1988

Prepared by:

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CERTIFICATE NO. 15290
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ARIZONA, U.S.A.

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INTRODUCTION

This report presents the results of a hydraulic analysis of the 100-year floodplain at 82nd Place and Shea Boulevard. The hydraulic analysis was made for the pre- and post-1982 Shea Boulevard road improvements to document the affect to the floodplain from these road improvements. The results of this analysis will be utilized in establishing the need and level of drainage improvements necessary to mitigate any increase in flooding hazard due to the road improvements.

BACKGROUND

A hydrologic analysis of the drainage area contributing to the Shea Boulevard wash crossing west of 82nd Place was made utilizing the Soil Conservation Service TR-20 computer program as part of the original report. The 100-year peak discharges from this hydrologic analysis were utilized in performing the hydraulic analysis for this report. The TR-20 schematic and drainage area map for this hydrologic analysis (Figure A-1) has been included in this addendum in Appendix A.

HYDRAULIC ANALYSIS

The hydraulic analysis was performed utilizing the U.S. Corps of Engineer's HEC-2 hydraulic backwater program. The aerial photo utilized for the floodplain base maps was obtained from Cooper Aerial Survey Company at scale 1-inch equals 100-feet, and dated June 13, 1985. Contour mapping at scale 1-inch equals 100-foot, 2' C.I. was obtained from Kenny Aerial Mapping Company (dated 1984) for the area north of Shea Boulevard. Cross-sections of the channel south of Shea Boulevard, the Arabian Trail box culvert road crossing, Shea Boulevard box culvert road crossing, and cross-sections along Shea Boulevard were obtained by A-N West for the existing roadway. Contours along Shea Boulevard prior to the 1982 road improvements were obtained from the 1982 Shea Road Improvement Plans (Project No. M-703-3(4).

Because the residential areas north and south of Shea Boulevard have been fully developed prior to 1982 the cross-section and contour map data was assumed to be unchanged in this area before and after the 1982 improvements.

The pre- and post-1982 road improvements base maps were produced by superimposing the relevant contour data onto the aerial photo base map (see Exhibits 1 and 2).

The HEC-2 hydraulic analysis for the pre- and post-1982 road improvements modeled common cross-sections and box culvert data from Arabian Trail upstream to Shea Boulevard. At Shea Boulevard the pre-1982 road improvement analysis modeled the dip section wash crossing and the post-1982 improvement analysis modeled the existing double-barrel 12-foot by 3-foot box culvert crossing. Upstream of Shea Boulevard the hydraulic analysis was first performed on the main wash to cross-section 16 (100-year discharge equals 240 cfs and TR-20 C.P. No. 11). The hydraulic analysis was then performed on the common reach of the middle and east tributaries (100-year discharge equals 114 cfs and TR-20 C.P. No. 7) for cross-sections 11 and 12 using the tributary analysis subroutine of HEC-2. The hydraulic analysis was then performed on the middle tributary (100-year discharge equals 52 cfs, TR-20 C.P. No. 5) and the east tributary (100-year discharge equals 64 cfs, TR-20 C.P. No. 4).

Ineffective flow areas which included houses, fenced yards, and areas beyond ridge lines were blocked out by the GR points of the ET option in the HEC-2 model. A Manning's 'n' value of 0.035 was used for the remaining channel and overbank flow areas except for streets and the Shea Boulevard right-of-way which consisted of desert landscaping (i.e. gravel, scattered bushes, trees, and short grass). A Manning's 'n' value of 0.016 was used for paved street areas and a 'n' value of 0.030 was used for the graded gravel shoulder along Shea Boulevard. The combined pavement and shoulder of Shea Boulevard was assigned a weighted Mannings's 'n' value of 0.025 for the pre-1982 road improvements analysis.

The input and output data from the pre- and post-1982 roadway HEC-2 analysis is included in Appendix A and B. Table 1 summarizes the computed 100-year water surface elevations upstream of Shea Boulevard and shows the interpolated water surface elevation at several critical residential houses.

As indicated by the HEC-2 data and Table 1, the 1982 roadway improvements do not cause an increase in water surface elevations on the main wash at the Lot 1 house. There are increases in water surface elevations of up to 1-foot along Shea Boulevard east of 82nd Street due to the 1982 road improvements.

ALTERNATE DRAINAGE SYSTEMS ALONG 82ND PLACE

CONCRETE CHANNEL

The concrete channel originally proposed in the "Drainage Design Report, Shea Boulevard" was designed for the 100-year discharge of 240 cfs. The upstream channel alignment started at the northeast corner of 82nd Place and Clinton, crossed 82nd Place at an angle, and proceeded south along the west side of 82nd Place to the intersection with the concrete channel at Shea Boulevard. Although the channel was designed to contain the 100-year discharge of 240 cfs within the channel, the natural wash approaching the channel inlet at Clinton does not contain this flow. The floodplain is approximately 200 feet wide at the proposed concrete channel inlet which has a width of 20 feet. Without further channel upstream improvements it is estimated that 100 cfs would enter the concrete channel at its inlet (at Clinton) for a 100-year storm of 240 cfs with an additional 100 cfs entering the channel within 100 feet of the inlet. The remaining estimated 40 cfs would not enter the 82nd Place channel, but flow in the west overbank to the 2-barrel 12-foot by 3-foot culvert at Shea. The estimated construction cost for the concrete channel along 82nd Place (excluding 0.139 acres right-of-way) is $82,300 for the channel segment north of the proposed channel along Shea Boulevard.

ALTERNATE 1 - NO DRAINAGE IMPROVEMENTS ALONG 82ND PLACE

A hydraulic analysis by HEC-2 was performed for Alternate 1 to determine the impact on the floodplain should no drainage improvements be constructed along 82nd Place. The HEC-2 analysis modeled the concrete channel along Shea Boulevard from the 2-barrel 12-foot by 3-foot box culvert to 82nd Place and the storm drain 53-inch span by 34-inch rise along Shea to 84th Street. As shown on Table 1, there was no significant increase in the WSEL of the main wash for this alternate. This alternative would have no additional construction cost for drainage facilities along 82nd Place.

ALTERNATE 2 - 50 TO 60 CFS CAPACITY STORM DRAIN ALONG 82ND PLACE

This alternate would involve the construction of a storm drain along the same general alignment as the original concrete channel but would involve a storm drain of 50 to 60 cfs capacity (i.e. 49-inch span by 33-inch rise CMPA). As shown in Table 1, the HEC-2 analysis indicates that the floodplain elevations would be lowered from 0.05 feet to 0.08 feet along 82nd Place. The estimated

construction cost for the storm drain along 82nd Place is $47,200 for the reach north of the proposed channel along Shea Boulevard.

ALTERNATE 3

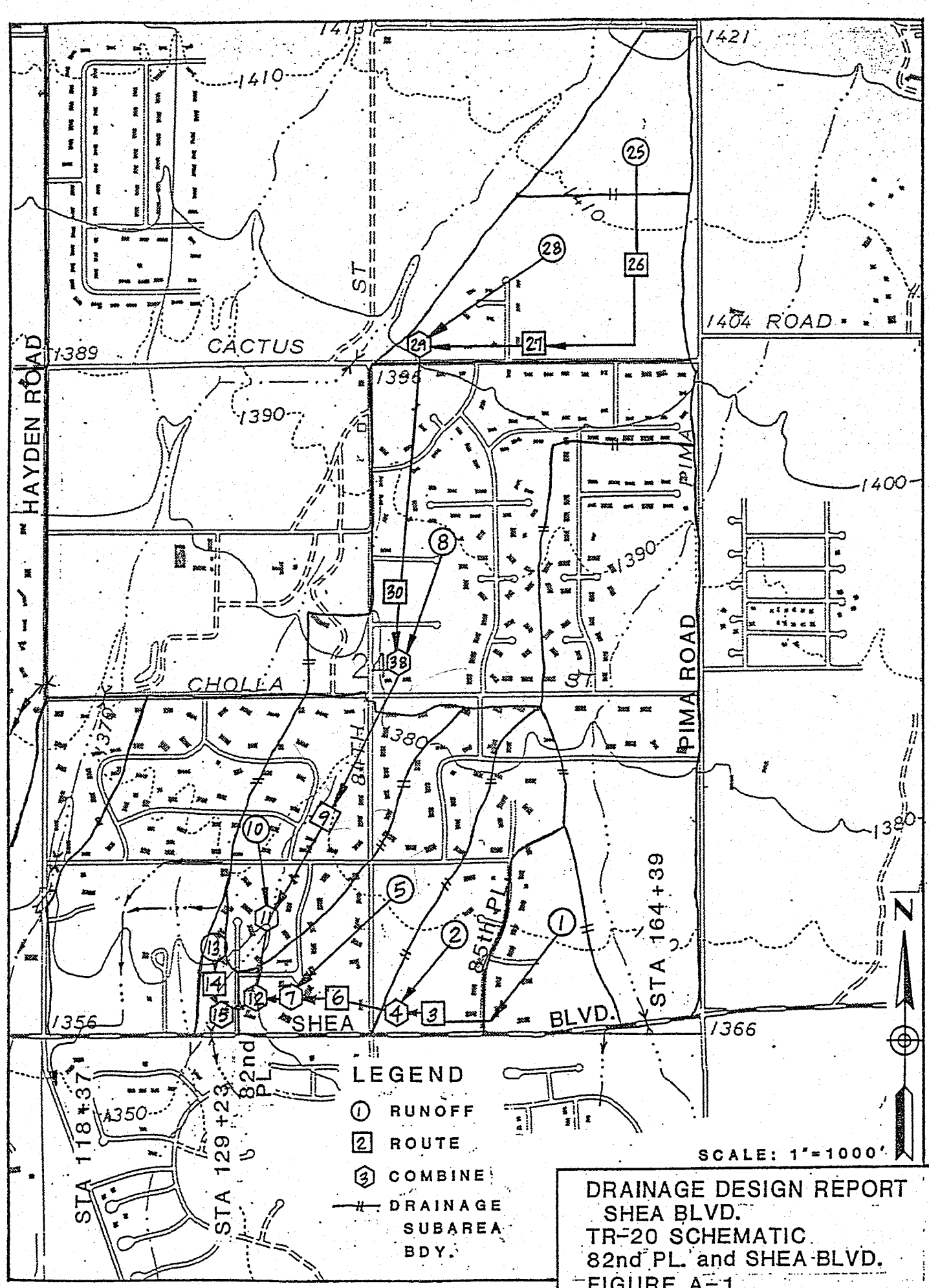
This alternate would involve the construction of two storm drains along the same general alignment as the original concrete channel but would involve two storm drains of approximately 120 cfs total capacity (i.e. a 2 - 49-inch span by 33-inch rise CMPA's. As shown in Table 1, the HEC-2 analysis indicates that the floodplain elevations would be lowered from 0.16 feet to 0.25 feet along 82nd Place. The estimated construction cost for the two storm drains along 82nd Place is $83,000 for the reach north of the proposed channel along Shea Boulevard.

TABLE 1
SUMMARY OF
PRE- AND POST-1982 ROAD IMPROVEMENTS
100-YEAR WATER SURFACE ELEVATIONS

HEC-2 CROSS-SECTION I.D. AND WATERCOURSE SEE EXHIBITS (1 OR 2)	LOT NO./ HOUSE FINISHED FLOOR ELEVATION	Q_{100} cfs	PRE-1982 ROADWAY WSEL	POST-1982 ROADWAY WSEL	ALTERNATE 1[5] WSEL	ALTERNATE 2[6] WSEL	ALTERNATE 3[7] WSEL
11 (Main Wash)		240	1359.01	1359.02	1358.98	1358.93	1358.79
	20/1359.43		1359.40[1]	1359.40[1]	1359.40[1]	1359.34[1]	1359.21[1]
12 (Main Wash)		240	1360.56	1360.46	1360.46	1360.39	1360.30
	19/1361.32		1360.75[1]	1360.68[1]	1360.68[1]	1360.61[1]	1360.50[1]
13 (Main Wash)		240	1361.31	1361.33	1361.33	1361.25	1361.08
14 (Main Wash)		240	1362.27	1362.28	1362.28	1362.28	1362.29
15 (Main Wash)		240	1363.48	1363.47	1363.47	1363.47	1363.47
16 (Main Wash)		240	1364.58	1364.59	1364.59	1364.59	1364.59
11 (Middle & East Tributary)		114/52[4]	1358.44	1359.37[2]	1358.98	1358.96	1358.98
	1/1360.20		1359.10[1]	1359.84[1]	1359.57[1]	1359.50[1]	1359.51[1]
12 (Middle & East Tributary)		114/52[4]	1359.56	1360.17[2]	1359.98	1359.88	1359.88
13 (Middle Tributary)		52	1360.29	1360.42[2]	1360.36	1360.35	1360.36
14 (Middle Tributary)		52	1361.88	1361.75	1361.77	1361.79	1361.77
13 (East Tributary)		64	1360.24	1361.32[2]	[3]	[3]	[3]
	2/1361.91		1360.43[1]	1361.51[1]			
14 (East Tributary)		64	1360.93	1362.01[2]	[3]	[3]	[3]

1. Interpolated 100-year highwater at upstream side of house.
2. Post-Roadway WSEL higher than Pre-Roadway WSEL.
3. No surface flow outside right-of-way. Flow contained in proposed storm drain pipe and gutter along Shea Boulevard.
4. 100-Year discharge is 52 cfs for proposed Alternate 1 drainage system. East Tributary flow conveyed in pipe and street (see Note 3).
5. Drainage channel (b=8′) and storm drain along Shea; no drainage facilities along 82nd Place.
6. Drainage channel (b=11′) and storm drain along Shea with 50 cfs capacity culvert along 82nd Place from Shea to Clinton.
7. Drainage channel (b=14′) and storm drain along Shea with 120 cfs capacity culverts (two) along 82nd Place from Shea to Clinton.

Appendix A



DRAINAGE DESIGN REPORT
SHEA BLVD.
TR-20 SCHEMATIC
82nd PL. and SHEA BLVD.
FIGURE A-1

Appendix B

THIS RUN EXECUTED 01-01-80

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**************************************************
HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION AUGUST 1985
**************************************************
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```
T1      Shes Blvd. Channel Backwater Analysis              <SHEA.PRE>
T2      From Clinton Street to Arabian Trail near 82nd Pl.  Dec.,16,1987
T3      Pre 1982 Road Improvements    100 Year Profile

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     0.        2.        0.        0.   .004000      .00       .0        0.    54.600     .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   -1.000     .000     -1.000     .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000    43.000     1.000     2.000    26.000    39.000    21.000    22.000    27.000    28.000

   53.000    54.000     .000     36.000    13.000    14.000    15.000    55.000    26.000    56.000

   23.000     1.000    31.000     4.000    42.000    57.000     .000     38.000    39.000    33.000

    3.000    10.000    11.000    12.000     5.000     7.000     8.000    16.000    17.000    18.000

J3  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

  -10.000   -10.000     .000      .000      .000      .000      .000      .000      .000      .000

QT     1.000   359.000     .000      .000      .000      .000      .000      .000      .000      .000
NC      .030      .030      .030      .100      .300      .000      .000      .000      .000      .000
        Cross Section Stationing from left to right looking downstream. Flowline
        at Station 1000.0 for Sections 9-16
        Pre-1982 Road Improvements HEC-2 model is of existing floodplain prior
        to road Improvements
X1     1.000     9.000    16.500    68.000      .000      .000      .000      .000      .000      .000
GR    60.800      .000    56.800      .100    55.800    16.500    52.700    32.000    52.000    38.000
GR    32.500    42.000    56.000    68.000    57.000   103.000    61.000   103.100      .000      .000

X1     2.000     9.000    16.500    68.000    50.000    50.000    50.000      .000      .000      .000
GR    61.000      .000    57.000      .100    56.000    16.500    52.900    32.000    52.200    38.000
GR    52.700    42.000    56.200    68.000    57.200   103.000    61.200   103.100      .000      .000
```

```
NC      .000     .000     .016     .000     .000     .000     .000     .000     .000     .000
        Begin Arabian Trail Culvert 1-10 Ft x 3 Ft Box
X1     3.000    8.000   30.000   73.000   59.000   40.000   50.000     .000     .000     .000
GR    61.000     .000   57.000     .100   56.400   30.000   52.500   44.000   52.000   54.000
GR    56.500   73.000   57.000  109.000   61.000  109.100     .000     .000     .000     .000

GB      .000    1.560    2.630  155.000   10.000     .000   30.000     .000   52.300   52.000
        End Box Culvert
X1     4.000     .000     .000     .000   75.000   75.000   75.000     .000     .300     .000
X2      .000     .000    1.000   55.300   57.000     .000     .000     .000     .000     .000

X1     5.000    9.000   20.000   81.000   94.000   64.000   43.000     .000     .000     .000
GR    60.100     .000   56.100     .100   55.700   20.000   53.400   41.000   53.300   56.000
GR    53.700   61.000   56.200   81.000   56.400  102.000   60.400  102.100     .000     .000

NC      .000     .000     .030     .100     .300     .000     .000     .000     .000     .000
X1     6.000    7.000     .100   63.000  100.000  100.000  100.000     .000     .000     .000
GR    61.100     .000   57.100     .100   53.900   23.000   53.900   43.000   56.200   63.000
GR    56.400   81.000   60.400   81.100     .000     .000     .000     .000     .000     .000

X1     7.000    8.000     .100   62.000  100.000  100.000  100.000     .000     .000     .000
GR    60.700     .000   56.700     .100   54.600   21.000   54.100   37.000   54.500   42.000
GR    56.200   62.000   56.600   81.000   60.600   81.100     .000     .000     .000     .000

X1     8.000    9.000     .100   65.000  100.000  100.000  100.000     .000     .000     .000
GR    60.200     .000   56.200     .100   55.100   19.000   54.600   38.000   54.900   44.000
GR    56.200   65.000   56.600   82.000   60.600   82.100     .000     .000     .000     .000

X1     9.000   10.000  895.000 1020.000   35.000   35.000   35.000     .000     .000     .000
GR    66.000  895.000   57.300  895.000   57.000  970.000   56.000  978.000   55.000  984.000
GR    54.000  992.000   54.000 1006.000   55.000 1010.000   56.000 1020.000   66.000 1020.000

ET      .000    7.100     .000     .000     .000     .000  830.000 1080.000     .000     .000
NH     2.000     .030  868.000     .016 1135.000     .000     .000     .000     .000     .000
        Shea Boulevard Dip Section
X1    10.000   12.000  993.000 1018.000   85.000   85.000   75.000     .000     .000     .000
GR    66.000  830.000   57.300  830.000   57.000  845.000   56.000  852.000   56.000  858.000
GR    57.000  868.000   58.000  880.000   57.000  925.000   56.000  993.000   55.800 1000.000
GR    56.000 1018.000   57.000 1135.000     .000     .000     .000     .000     .000     .000

ET     1.000  240.000     .000     .000     .000     .000     .000     .000     .000     .000
NH     4.000     .025  585.000     .035  772.000     .016  796.000     .035 1230.000     .000
ET      .000    7.100     .000     .000     .000     .000  735.000 1150.000     .000     .000
        100 Year Discharge Reduced. Ineffective Areas blocked out by GR and ET
        cards
X1    11.000   26.000  992.000 1002.000  250.000  230.000  275.000     .000     .000     .000
GR    66.000  510.000   58.000  510.000   58.000  535.000   58.000  548.000   58.200  553.000
GR    58.500  585.000   58.000  585.000   58.200  640.000   59.300  710.000   66.000  710.000
GR    66.000  735.000   59.500  735.000   59.200  772.000   59.400  783.000   59.200  796.000
GR    58.700  804.000   58.700  850.000   66.000  850.000   66.000  970.000   58.700  970.000
GR    58.000  992.000   56.800  996.000   56.900  998.000   58.000 1002.000   58.800 1045.000
GR    59.200 1230.000     .000     .000     .000     .000     .000     .000     .000     .000
```

H	4.000	.025	500.000	.035	938.000	.016	965.000	.035	1280.000	.000
ET	.000	7.100	.000	.000	.000	.000	900.000	1280.000	.000	.000
X1	12.000	29.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
R	66.000	411.000	59.500	411.000	59.000	441.000	59.000	450.000	59.300	456.000
GR	59.800	476.000	59.000	500.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
R	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	60.100	1280.000
H	3.000	.025	330.000	.035	970.000	.016	1040.000	.035	1300.000	.000
ET	.000	7.100	.000	.000	.000	.000	830.000	1300.000	.000	.000
X1	13.000	25.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
R	66.000	255.000	60.300	255.000	60.000	255.000	59.000	290.000	60.000	305.000
GR	60.300	330.000	61.000	375.000	61.200	420.000	66.000	420.000	66.000	532.000
GR	60.000	532.000	59.200	550.000	60.000	570.000	60.300	620.000	60.200	720.000
R	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000
H	3.000	.035	1095.000	.016	1120.000	.035	1260.000	.000	.000	.000
X1	14.000	17.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.800	996.000	60.800	998.000	62.000	1002.000	62.100	1095.000
R	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
H	3.000	.035	1205.000	.016	1235.000	.035	1390.000	.000	.000	.000
X1	15.000	20.000	996.000	1006.000	165.000	165.000	190.000	.000	.000	.000
GR	65.000	775.000	65.000	795.000	66.000	795.000	66.000	940.000	64.000	940.000
GR	64.000	990.000	62.000	996.000	61.200	998.000	61.200	1000.000	62.000	1006.000
R	63.200	1040.000	66.000	1040.000	66.000	1140.000	63.200	1140.000	63.100	1205.000
GR	63.100	1235.000	63.300	1320.000	66.000	1320.000	66.000	1390.000	64.000	1390.000
H	2.000	.016	790.000	.035	1280.000	.000	.000	.000	.000	.000
X1	16.000	19.000	993.000	1010.000	200.000	200.000	200.000	.000	.000	.000
GR	66.000	750.000	65.600	765.000	65.600	790.000	65.100	836.000	69.000	836.000
GR	67.000	960.000	64.300	960.000	64.000	995.000	62.300	998.000	62.300	1060.000
GR	64.000	1010.000	64.400	1070.000	64.000	1110.000	64.200	1130.000	69.000	1130.000
GR	69.000	1220.000	64.400	1220.000	64.600	1280.000	69.000	1230.000	.000	.000
ET	1.000	359.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.016	.016	.016	.100	.300	.000	.000	.000	.000	.000

Begin middle and east tributaries analysis. Discharge decreased and ineffective areas blocked out by GR and ET upstream of this section.

X1	-10.000	12.000	993.000	1018.000	85.000	85.000	75.000	.000	.000	.000
GR	66.000	830.000	57.300	830.000	57.000	845.000	56.000	852.000	56.000	858.000
GR	57.000	868.000	58.000	890.000	57.000	925.000	56.000	993.000	55.800	1000.000
GR	56.000	1018.000	57.000	1135.000	.000	.000	.000	.000	.000	.000

NT	1.000	114.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.025	585.000	.035	772.000	.016	796.000	.035	1230.000	.000
ET	.000	7.100	.000	.000	.000	.000	510.000	735.000	.000	.000
1	11.000	26.000	992.000	1002.000	250.000	230.000	275.000	.000	.000	.000
LR	66.000	510.000	58.000	510.000	58.000	535.000	58.000	548.000	58.200	553.000
GR	58.500	565.000	58.000	585.000	58.000	595.000	59.300	710.000	66.000	716.000
R	66.000	735.000	59.500	735.000	59.200	772.000	59.400	783.000	59.200	796.000
R	58.700	804.000	58.700	850.000	66.000	850.000	66.000	970.000	58.700	970.000
GR	58.000	992.000	56.800	996.000	56.800	998.000	56.000	1002.000	58.800	1045.000
R	59.200	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.025	500.000	.035	938.000	.016	965.000	.035	1200.000	.000
ET	.000	7.100	.000	.000	.000	.000	411.000	900.000	.000	.000
	Begin middle tributary analysis upstream of this section									
1	12.100	29.000	995.000	1003.000	185.000	140.000	225.000	.000	.000	.000
GR	66.000	411.000	59.500	411.000	59.000	441.000	59.000	450.000	59.300	456.000
R	59.300	476.000	59.000	500.000	59.300	620.000	59.500	690.000	66.000	690.000
R	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
R	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	.000	.000
ET	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	3.000	.025	330.000	.035	970.000	.016	1040.000	.035	1300.000	.000
ET	.000	7.100	.000	.000	.000	.000	480.000	830.000	.000	.000
1	13.000	25.000	1000.000	1040.000	160.000	150.000	190.000	.000	.000	.000
GR	66.000	255.000	60.300	255.000	60.000	285.000	59.000	290.000	60.000	305.000
R	60.300	330.000	61.000	375.000	61.200	420.000	66.000	420.000	66.000	532.000
GR	60.000	532.000	59.800	550.000	60.000	570.000	60.300	620.000	60.200	720.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
R	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000
ET	.000	7.100	.000	.000	.000	.000	400.000	780.000	.000	.000
NH	4.000	.025	150.000	.035	1095.000	.016	1120.000	.035	1240.000	.000
1	14.000	37.000	992.000	1002.000	150.000	159.000	155.000	.000	.000	.000
GR	66.000	70.000	60.700	70.000	60.200	102.000	60.800	150.000	61.000	165.000
GR	61.500	210.000	61.800	267.000	66.000	267.000	66.000	333.000	61.800	333.000
GR	61.800	428.000	61.300	483.000	61.900	528.000	66.000	528.000	66.000	635.000
GR	62.000	635.000	62.000	680.000	62.000	690.000	62.300	715.000	66.000	715.000
GR	64.000	750.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.500	996.000	60.500	998.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
NT	1.000	114.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.025	500.000	.035	938.000	.016	965.000	.035	1200.000	.000
ET	.000	7.100	.000	.000	.000	.000	411.000	900.000	.000	.000
	Begin east tributary analysis upstream of this section									
1	-12.100	29.000	995.000	1003.000	185.000	140.000	225.000	.000	.000	.000
GR	66.000	411.000	59.500	411.000	59.000	441.000	59.000	450.000	59.300	456.000
GR	59.800	476.000	59.000	500.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000

R	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
R	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	.000	.000
T	1.000	64.000	.000	.000	.000	.000	.000	.000	.000	.000
H	3.000	.025	330.000	.035	970.000	.016	1040.000	.035	1300.000	.000
T	.000	7.100	.000	.000	.000	.000	255.000	480.000	.000	.000
1	13.000	25.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
R	66.000	255.000	60.300	255.000	60.000	285.000	59.000	290.000	60.000	305.000
R	60.300	330.000	61.000	375.000	61.200	420.000	66.000	420.000	66.000	532.000
R	60.000	532.000	59.800	550.000	60.000	570.000	60.300	620.000	60.200	720.000
R	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
R	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000
T	.000	7.100	.000	.000	.000	.000	70.000	400.000	.000	.000
H	4.000	.025	150.000	.035	1095.000	.016	1120.000	.035	1260.000	.000
1	14.000	37.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
R	66.000	70.000	60.700	70.000	60.200	102.000	60.800	150.000	61.000	165.000
R	61.500	210.000	61.800	267.000	66.000	267.000	66.000	333.000	61.800	333.000
R	61.800	428.000	61.300	483.000	61.900	528.000	66.000	528.000	66.000	635.000
R	62.000	635.000	62.000	630.000	62.000	690.000	62.300	715.000	66.000	715.000
R	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
R	62.000	992.000	60.800	996.000	60.800	998.000	62.000	1002.000	62.100	1095.000
R	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
R	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
J	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 01-01-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Pre 1982 Road Improvemen

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	1.000	359.00	55.37	.00	4.53	.00	16.50	68.00	.00	.00	18.63	63.36
	2.000	359.00	55.57	.00	4.54	50.00	16.50	68.00	.00	.00	18.63	63.34
	3.000	359.00	55.66	.00	4.46	50.00	30.00	70.00	.00	.00	32.64	69.47
	4.000	359.00	57.30	.00	2.61	75.00	30.00	73.00	.00	.00	.10	109.00
	5.000	359.00	57.37	.00	1.77	43.00	20.00	81.00	.00	.00	.07	102.02
	6.000	359.00	57.38	.00	2.11	100.00	.10	63.00	.00	.00	.09	81.02
	7.000	359.00	57.43	.00	2.32	100.00	.10	62.00	.00	.00	.08	81.02
	8.000	359.00	57.50	.00	2.33	100.00	.10	65.00	.00	.00	.07	82.02
	9.000	359.00	57.54	.00	2.31	35.00	895.00	1020.00	.00	.00	895.00	1020.00
	10.000	359.00	57.63	.00	1.88	75.00	993.00	1018.00	830.00	1080.00	830.00	1080.00
*	11.000	240.00	59.01	59.01	5.36	275.00	992.00	1002.00	735.00	1150.00	799.04	1142.05
*	12.000	240.00	60.56	60.56	5.26	225.00	995.00	1003.00	900.00	1280.00	900.00	1200.00
	13.000	240.00	61.31	61.31	4.21	190.00	1000.00	1040.00	830.00	1300.00	925.51	1110.00
*	14.000	240.00	62.27	62.27	4.97	155.00	992.00	1002.00	.00	.00	970.59	1256.22
	15.000	240.00	63.48	.00	4.15	190.00	996.00	1006.00	.00	.00	991.55	1316.59
*	16.000	240.00	64.58	64.58	4.62	200.00	995.00	1010.00	.00	.00	986.00	1272.92
	-10.000	359.00	57.63	.00	1.56	75.00	993.00	1018.00	.00	.00	830.00	1135.00

	SECND	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
*	11.000	114.00	58.44	58.44	.00	275.00	992.00	1002.00	510.00	735.00	510.00	633.87
	12.100	114.00	59.56	.00	.00	225.00	995.00	1003.00	411.00	900.00	411.00	690.00
	13.000	52.00	60.29	.00	.00	190.00	1000.00	1040.00	480.00	830.00	532.00	725.15
	14.000	52.00	61.88	.00	.00	155.00	992.00	1002.00	400.00	780.00	400.00	525.93
	-12.100	114.00	59.56	.00	.00	225.00	995.00	1003.00	411.00	900.00	411.00	690.00
*	13.000	64.00	60.24	60.24	.00	190.00	1000.00	1040.00	255.00	480.00	261.39	324.67
	14.000	64.00	60.93	.00	.00	155.00	992.00	1002.00	70.00	400.00	70.00	160.28

re 1982 Road Improvemen

SUMMARY PRINTOUT

	SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
	1.000	.00	359.00	.00	.00	4.53	.00	60.80	55.37	.00	44.73	52.00	1.00
	2.000	.00	359.00	.00	.00	4.54	.00	61.00	55.57	.20	44.71	52.20	1.00
	3.000	.00	359.00	.00	.00	4.46	.00	61.00	55.66	.09	36.83	52.00	1.00
	4.000	2.71	353.86	2.42	.30	2.61	.26	61.30	57.30	1.64	108.90	52.30	1.23
	5.000	16.35	332.35	10.30	.56	1.77	.46	60.10	57.37	.07	101.96	53.30	1.30
	6.000	.00	336.41	22.59	.00	2.11	1.16	60.40	57.38	.00	80.93	53.90	1.06
	7.000	.00	333.32	25.68	.01	2.32	1.31	60.60	57.43	.05	80.94	54.10	1.06
	8.000	.00	332.53	26.47	.01	2.33	1.42	60.20	57.50	.07	81.95	54.60	1.05
	9.000	.00	359.00	.00	.00	2.31	.00	66.00	57.54	.04	125.00	54.00	1.00
	10.000	142.95	81.45	134.60	1.15	1.88	1.59	57.00	57.63	.09	229.06	55.80	1.13
*	11.000	67.00	92.66	80.34	2.27	5.36	2.21	59.20	59.01	1.38	223.01	56.80	1.70
*	12.000	60.10	77.69	102.21	2.04	5.26	2.66	60.00	60.56	1.55	158.00	58.00	1.55
	13.000	60.79	137.73	41.48	2.52	4.21	2.21	62.00	61.31	.76	184.49	60.50	1.25
*	14.000	3.84	49.06	187.09	1.34	4.97	2.59	64.00	62.27	.95	285.62	60.80	1.29
	15.000	7.01	81.52	151.47	2.12	4.15	1.92	64.00	63.48	1.22	225.04	61.20	1.50
*	16.000	31.19	111.32	97.49	2.09	4.82	1.88	66.00	64.56	1.09	222.92	62.30	1.79
	-10.000	137.29	67.42	154.30	1.11	1.56	1.17	57.00	57.63	-6.95	283.69	55.80	1.05
*	11.000	114.00	.00	.00	3.14	.00	.00	59.20	58.44	.81	119.02	58.00	1.00
	12.100	114.00	.00	.00	1.36	.00	.00	60.00	59.56	1.12	262.39	59.00	1.00
	13.000	52.00	.00	.00	2.07	.00	.00	62.00	60.29	.73	174.71	59.80	1.00
	14.000	52.00	.00	.00	1.62	.00	.00	66.00	61.88	1.59	125.93	61.30	1.00
	-12.100	114.00	.00	.00	1.37	.00	.00	60.00	59.56	-2.32	262.18	59.00	1.00
*	13.000	64.00	.00	.00	3.23	.00	.00	62.00	60.24	.68	63.28	59.00	1.00
	14.000	64.00	.00	.00	1.72	.00	.00	66.00	60.93	.70	90.28	60.20	1.00

re 1982 Road Improvemen

SUMMARY PRINTOUT

SECNO	XLCH	K*CHSL	EG	HV	HL	CLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
1.000	.00	.00	55.69	.32	.00	.00	39.65	.00	3.37	30.00	30.00	30.00
2.000	50.00	4.00	55.89	.32	.20	.00	39.76	.09	3.37	30.00	30.00	30.00
3.000	50.00	-4.00	55.97	.31	.08	.00	8.40	.18	3.66	30.00	16.00	30.00
4.000	75.00	4.00	57.41	.10	1.44	.00	1.76	.38	5.00	30.00	16.00	30.00
5.000	43.00	23.26	57.42	.05	.01	.01	.82	.61	4.07	30.00	16.00	30.00
6.000	100.00	6.00	57.44	.07	.02	.01	5.30	1.09	3.46	30.00	30.00	30.00
7.000	100.00	2.00	57.51	.08	.06	.00	7.17	1.48	3.33	30.00	30.00	30.00
8.000	100.00	5.00	57.58	.08	.07	.00	7.78	1.85	2.90	30.00	30.00	30.00
9.000	35.00	-17.14	57.62	.08	.04	.00	16.61	1.98	3.54	30.00	30.00	30.00
10.000	75.00	24.00	57.66	.04	.03	.00	1.97	2.36	1.83	19.64	16.00	16.00
11.000	275.00	3.64	59.23	.22	.11	.06	80.27	3.31	2.21	35.00	35.00	35.00
* 12.000	225.00	5.33	60.76	.20	1.42	.00	80.69	3.63	2.56	31.73	35.00	35.00
13.000	190.00	13.16	61.51	.20	.75	.00	26.87	3.93	.91	17.43	16.00	16.00
* 14.000	155.00	1.94	62.43	.16	.80	.00	145.81	4.21	1.47	35.00	35.00	33.55
15.000	190.00	2.11	63.61	.13	1.18	.00	39.93	4.57	2.28	35.00	35.00	30.52
16.000	200.00	5.50	64.77	.20	1.08	.02	76.31	5.01	2.28	35.00	35.00	35.00
-10.000	75.00	.00	57.65	.02	.00	.00	1.37	5.39	1.83	16.00	16.00	16.00
11.000	275.00	8.00	58.59	.15	.06	.04	141.55	6.33	.44	27.50	16.00	16.00
12.100	225.00	4.44	59.59	.03	.98	.01	32.66	6.56	.56	31.56	16.00	16.00
13.000	190.00	4.21	60.35	.07	.75	.01	151.06	6.76	.49	35.00	16.00	16.00
14.000	155.00	9.68	61.92	.04	1.56	.00	76.30	6.86	.56	35.00	16.00	16.00
-12.100	225.00	.00	59.59	.03	.00	.00	33.57	7.07	.56	31.56	16.00	16.00
13.000	190.00	.00	60.40	.16	.67	.04	66.76	7.26	1.24	25.00	16.00	16.00
14.000	155.00	7.74	60.98	.05	.57	.01	24.47	7.36	.73	25.04	16.00	16.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   12.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   12.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   14.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   14.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   16.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   16.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   13.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
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Appendix C

THIS RUN EXECUTED 01-02-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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C
T1      Shea Blvd. Channel Backwater Analysis              <SHEA.AFT>
T2      From Clinton Street to Arabian Trail near B2nd Pl.  Dec.,23,1987
T3      Post - 1982 Road Improvements    100 Year Profile

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       2.       0.       0.   .004000      .00       .0       0.    54.600    .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    -1.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   43.000    1.000    2.000   26.000   39.000   21.000   22.000   27.000   28.000

    53.000   54.000     .000   38.000   13.000   14.000   15.000   55.000   26.000   56.000

    63.000    1.000   51.000    4.000   42.000   57.000     .000   38.000   39.000   33.000

     3.000   10.000   11.000   12.000    5.000    7.000    8.000   16.000   17.000   18.000

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

   -10.000  -10.000     .000     .000     .000     .000     .000     .000     .000     .000

QT      1.000   359.000     .000     .000     .000     .000     .000     .000     .000     .000
NC       .030     .030     .030     .100     .300     .000     .000     .000     .000     .000
        Cross Section Stationing from left to right looking downstream. Flowline
        at Station 1000.0 for Sections 9-16 Post-1982 Road improvements
        HEC-2 model is of existing floodplain after road improvements
X1      1.000     9.000    16.500    68.000     .000     .000     .000     .000     .000     .000
GR     60.800     .000    56.800     .100    55.800    16.500    52.700    32.000    52.000    38.000
GR     52.500    42.000    56.000    68.000    57.000   103.000    61.000   103.100     .000     .000

X1      2.000     9.000    16.500    68.000    50.000    50.000    50.000     .000     .000     .000
GR     61.000     .000    57.000     .100    56.000    16.500    52.900    32.000    52.200    38.000
GR     52.700    42.000    56.200    68.000    57.200   103.000    61.200   103.100     .000     .000
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NC      .000      .000      .016      .000      .000      .000      .000      .000      .000      .000
      Begin Arabian Trail Culvert 1-10 Ft x 3 Ft Box
X1     3.000     8.000    30.000    73.000    59.000    40.000    50.000      .000      .000      .000
GR    61.000      .000    57.000      .100    56.400    30.000    52.500    44.000    52.000    54.000
GR    56.500    73.000    57.000   109.000    61.000   109.100      .000      .000      .000      .000

SB      .000     1.560     2.630   155.000    10.000      .000    30.000      .000    52.300    52.000
      End Box Culvert
X1     4.000      .000      .000      .000    75.000    75.000    75.000      .000      .300      .000
X2      .000      .000     1.000    55.300    57.000      .000      .000      .000      .000      .000

X1     5.000     9.000    20.000    81.000    94.000    64.000    43.000      .000      .000      .000
GR    60.100      .000    56.100      .100    55.700    20.000    53.400    41.000    53.300    56.000
GR    53.700    61.000    56.200    81.000    56.400   102.000    60.400   102.100      .000      .000

NC      .000      .000      .030      .100      .300      .000      .000      .000      .000      .000
X1     6.000     7.000      .100    63.000   100.000   100.000   100.000      .000      .000      .000
GR    61.100      .000    57.100      .100    53.900    23.000    53.900    43.000    56.200    63.000
GR    56.400    81.000    60.400    81.100      .000      .000      .000      .000      .000      .000

X1     7.000     8.000      .100    62.000   100.000   100.000   100.000      .000      .000      .000
GR    60.700      .000    56.700      .100    54.600    21.000    54.100    37.000    54.500    42.000
GR    56.200    62.000    56.600    81.000    60.600    81.100      .000      .000      .000      .000

X1     8.000     8.000      .100    65.000   100.000   100.000   100.000      .000      .000      .000
GR    60.200      .000    56.200      .100    55.100    19.000    54.600    38.000    54.900    44.000
GR    56.200    65.000    56.600    82.000    60.600    82.100      .000      .000      .000      .000

X1     9.000     8.000     6.000    58.000    46.000    46.000    46.000      .000      .000      .000
GR    58.000      .000    57.300     6.000    54.800    29.000    54.200    40.000    54.300    48.000
GR    56.000    58.000    56.900    83.000    60.900    93.100      .000      .000      .000      .000

X1    10.000     8.000     8.000    59.000     2.000    37.000    20.000      .000      .000      .000
GR    53.000      .000    57.300     8.000    54.700    31.000    54.300    45.000    54.600    53.000
GR    55.400    59.000    57.200    95.000    61.400    95.100      .000      .000      .000      .000

NC      .000      .000      .016      .300      .500      .000      .000      .000      .000      .000
      Begin Shea Boulevard Culverts  2-12 Ft x 3 Ft Boxes
X1    10.100     9.000    65.000    89.400    28.000    28.000    28.000      .000      .000      .000
X2      .000      .000      .000    57.450    59.550      .000      .000      .000      .000      .000
GR    59.750      .000    59.550    65.000    54.450    65.100    54.450    77.100    57.450    77.200
GR    54.450    77.300    54.450    89.300    59.450    89.400    58.550   150.000      .000      .000

      End Shea Boulevard Culverts
X1    10.200    10.000      .000   165.000   110.000   110.000   110.000      .000      .000      .000
X2      .000      .000      .000    57.770    59.550      .000      .000      .000      .000      .000
GR    59.850      .000    59.600   101.000    54.770   101.100    54.770   113.100    57.770   113.200
GR    57.770   113.600    54.770   113.700    54.770   125.700    59.550   125.800    59.450   165.000
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QT     1.000   240.000      .000      .000      .000      .000      .000      .000      .000      .000
NC      .000      .000      .000      .100      .300      .000      .000      .000      .000      .000
NH     4.000      .016   585.000      .035   772.000      .016   796.000      .035  1230.000      .000
ET      .000     7.100      .000      .000      .000      .000   735.000  1150.000      .000      .000
        100 Year Discharge Reduced. Ineffective Areas blocked out by GR and ET
        cards
X1    11.000    21.000   992.000  1002.000   300.000   200.000   190.000      .000      .000      .000
GR    60.500   600.000    60.000   630.000    58.500   670.000    59.300   710.000    66.000   710.000
GR    66.000   735.000    59.500   735.000    59.200   772.000    59.400   783.000    59.200   796.000
GR    58.700   804.000    58.700   850.000    66.000   850.000    66.000   970.000    58.700   970.000
GR    58.000   992.000    56.800   996.000    56.300   998.000    58.000  1002.000    58.800  1045.000
GR    59.000  1230.000      .000      .000      .000      .000      .000      .000      .000      .000

NH     4.000      .016   500.000      .035   938.000      .016   965.000      .035  1280.000      .000
ET      .000     7.100      .000      .000      .000      .000   900.000  1280.000      .000      .000
X1    12.000    25.000   995.000  1003.000   165.000   140.000   225.000      .000      .000      .000
GR    61.000   500.000    60.000   560.000    59.300   620.000    59.500   690.000    66.000   690.000
GR    66.000   760.000    59.600   760.000    60.000   805.000    66.000   805.000    66.000   900.000
GR    60.200   900.000    60.200   926.000    60.300   938.000    60.500   950.000    60.300   965.000
GR    60.000   995.000    58.000   998.000    58.000  1000.000    59.800  1003.000    59.500  1018.000
GR    66.000  1018.000    66.000  1150.000    60.000  1150.000    60.000  1200.000    60.100  1280.000

NH     3.000      .035   970.000      .016  1040.000      .035  1300.000      .000      .000      .000
X1    13.000    10.000  1000.000  1040.000   160.000   160.000   190.000      .000      .000      .000
GR    62.000   830.000    61.000   970.000    60.500  1000.000    60.500  1040.000    61.000  1050.000
GR    61.200  1110.000    66.000  1110.000    66.000  1210.000    61.800  1210.000    62.000  1300.000

NH     3.000      .035  1095.000      .016  1120.000      .035  1260.000      .000      .000      .000
X1    14.000    17.000   992.000  1002.000   150.000   150.000   155.000      .000      .000      .000
GR    64.000   730.000    63.000   875.000    66.000   875.000    66.000   960.000    62.400   960.000
GR    62.000   992.000    60.800   996.000    60.800   998.000    62.000  1002.000    62.100  1095.000
GR    62.100  1120.000    62.000  1140.000    61.700  1170.000    61.700  1195.000    62.000  1225.000
GR    62.300  1260.000    66.000  1260.000      .000      .000      .000      .000      .000      .000

NH     3.000      .035  1203.000      .016  1235.000      .035  1390.000      .000      .000      .000
X1    15.000    20.000   996.000  1006.000   165.000   165.000   190.000      .000      .000      .000
GR    65.000   775.000    65.000   795.000    66.000   795.000    66.000   940.000    64.000   940.000
GR    64.000   990.000    62.000   996.000    61.200   998.000    61.200  1000.000    62.000  1006.000
GR    63.200  1040.000    66.000  1040.000    66.000  1140.000    63.200  1140.000    63.100  1205.000
GR    63.100  1235.000    63.500  1320.000    66.000  1320.000    66.000  1390.000    64.000  1390.000

NH     2.000      .016   790.000      .035  1280.000      .000      .000      .000      .000      .000
X1    16.000    19.000   995.000  1010.000   200.000   200.000   200.000      .000      .000      .000
GR    66.000   750.000    65.600   768.000    65.600   790.000    65.100   836.000    69.000   836.000
GR    69.000   960.000    64.300   960.000    64.000   995.000    62.300   998.000    62.300  1000.000
GR    64.000  1010.000    64.400  1070.000    64.000  1110.000    64.200  1130.000    69.000  1130.000
GR    69.000  1220.000    64.400  1220.000    64.600  1280.000    69.000  1280.000      .000      .000
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NC      .000      .000      .016      .300      .500      .000      .000      .000      .000      .000
IT     1.000   359.000      .000      .000      .000      .000      .000      .000      .000      .000
       Begin middle and east tributaries analysis.  Discharge
       decreased and ineffective areas blocked out by GR and ET
X1   -10.200    10.000      .000   165.000   110.000   110.000   110.000      .000      .000      .000
X2      .000      .000      .000    57.770    59.550      .000      .000      .000      .000      .000
GR    59.850      .000    59.600   101.000    54.770   101.100    54.770   113.100    57.770   113.200
GR    57.770   113.600    54.770   113.700    54.770   125.700    59.550   125.800    59.450   165.000

IT     1.000   114.000      .000      .000      .000      .000      .000      .000      .000      .000
NC      .000      .000      .000      .100      .300      .000      .000      .000      .000      .000
NH     4.000      .016   630.000      .035   772.000      .016   796.000      .035  1230.000      .000
ET      .000     7.100      .000      .000      .000      .000   600.000   735.000      .000      .000
X1    11.000    21.000   992.000  1002.000   300.000   200.000   190.000      .000      .000      .000
GR    60.500   600.000    60.000   630.000    58.500   670.000    59.300   710.000    66.000   710.000
GR    66.000   735.000    59.500   735.000    59.200   772.000    59.400   783.000    59.200   796.000
GR    58.700   804.000    58.700   850.000    66.000   850.000    66.000   970.000    58.700   970.000
GR    58.000   992.000    56.800   996.000    56.800   998.000    58.000  1002.000    58.800  1045.000
GR    59.000  1230.000      .000      .000      .000      .000      .000      .000      .000      .000

NH     4.000      .016   560.000      .035   938.000      .016   965.000      .035  1200.000      .000
ET      .000     7.100      .000      .000      .000      .000   500.000   900.000      .000      .000
       Begin middle tributary analysis upstream of this section
X1    12.100    24.000   995.000  1003.000   165.000   140.000   225.000      .000      .000      .000
GR    61.000   500.000    60.000   560.000    59.300   620.000    59.500   690.000    66.000   690.000
GR    66.000   760.000    59.600   760.000    60.000   805.000    66.000   805.000    66.000   900.000
GR    60.200   900.000    60.200   926.000    60.300   938.000    60.500   950.000    60.300   965.000
GR    60.000   995.000    58.000   998.000    58.000  1000.000    59.800  1003.000    59.900  1018.000
GR    66.000  1018.000    66.000  1150.000    60.000  1150.000    60.000  1200.000      .000      .000

IT     1.000    52.000      .000      .000      .000      .000      .000      .000      .000      .000
ET      .000     7.100      .000      .000      .000      .000   480.000   830.000      .000      .000
NH     4.000      .016   394.000      .035   970.000      .016  1040.000      .035  1300.000      .000
X1    13.000    25.000  1000.000  1040.000   160.000   160.000   190.000      .000      .000      .000
GR    61.400   346.000    61.400   347.000    61.400   348.000    61.400   350.000    61.000   378.000
GR    60.500   394.000    61.000   400.000    61.200   420.000    66.000   420.000    66.000   532.000
GR    60.000   532.000    59.800   550.000    60.000   570.000    60.300   620.000    60.200   720.000
GR    62.000   830.000    61.000   970.000    60.500  1000.000    60.500  1040.000    61.000  1050.000
GR    61.200  1110.000    66.000  1110.000    66.000  1210.000    61.800  1210.000    62.000  1300.000

ET      .000     7.100      .000      .000      .000      .000   400.000   780.000      .000      .000
NH     4.000      .016   210.000      .035  1095.000      .016  1120.000      .035  1260.000      .000
X1    14.000    37.000   992.000  1002.000   150.000   150.000   155.000      .000      .000      .000
GR    61.900   161.000    61.900   162.000    61.900   163.000    61.900   164.000    61.900   165.000
GR    61.500   210.000    61.800   267.000    66.000   267.000    66.000   333.000    61.800   333.000
GR    61.800   428.000    61.300   483.000    61.900   528.000    66.000   528.000    66.000   635.000
GR    62.000   635.000    62.000   680.000    62.000   690.000    62.300   715.000    66.000   715.000
GR    64.000   780.000    63.000   875.000    66.000   875.000    66.000   960.000    62.400   960.000
GR    62.000   992.000    60.800   996.000    60.800   998.000    62.000  1002.000    62.100  1095.000
GR    62.100  1120.000    62.000  1140.000    61.700  1170.000    61.700  1195.000    62.000  1225.000
GR    62.300  1260.000    66.000  1260.000      .000      .000      .000      .000      .000      .000
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QT	1.000	114.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	560.000	.035	938.000	.016	965.000	.035	1200.000	.000
ET	.000	7.100	.000	.000	.000	.000	500.000	900.000	.000	.000

Begin east tributary analysis upstream of this section

X1	-12.100	24.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	.000	.000

QT	1.000	64.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	346.000	480.000	.000	.000
NH	4.000	.016	394.000	.035	970.000	.016	1040.000	.035	1300.000	.000
X1	13.000	25.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	61.400	346.000	61.400	347.000	61.400	348.000	61.400	350.000	61.000	378.000
GR	60.500	394.000	61.000	400.000	61.200	420.000	66.000	420.000	66.000	532.000
GR	60.000	532.000	59.800	550.000	60.000	570.000	60.300	620.000	60.200	720.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000

ET	.000	7.100	.000	.000	.000	.000	161.000	400.000	.000	.000
NH	4.000	.016	210.000	.035	1095.000	.016	1120.000	.035	1260.000	.000
X1	14.000	37.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
GR	61.900	161.000	61.900	162.000	61.900	163.000	61.900	164.000	61.900	165.000
GR	61.500	210.000	61.800	267.000	66.000	267.000	66.000	333.000	61.800	333.000
GR	61.800	428.000	61.300	483.000	61.900	528.000	66.000	528.000	66.000	635.000
GR	62.000	635.000	62.000	680.000	62.000	690.000	62.300	715.000	66.000	715.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.800	996.000	60.800	998.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 01-02-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Post - 1982 Road Improve

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	1.000	359.00	55.37	.00	4.53	.00	16.50	68.00	.00	.00	18.63	63.36
	2.000	359.00	55.57	.00	4.54	50.00	16.50	68.00	.00	.00	18.63	63.34
	3.000	359.00	55.66	.00	4.46	50.00	30.00	73.00	.00	.00	32.64	69.47
	4.000	359.00	57.30	.00	2.61	75.00	30.00	73.00	.00	.00	.10	109.00
	5.000	359.00	57.37	.00	1.77	43.00	20.00	81.00	.00	.00	.07	102.02
	6.000	359.00	57.38	.00	2.11	100.00	.10	63.00	.00	.00	.09	81.02
	7.000	359.00	57.43	.00	2.32	100.00	.10	62.00	.00	.00	.08	81.02
	8.000	359.00	57.50	.00	2.33	100.00	.10	65.00	.00	.00	.07	82.02
	9.000	359.00	57.53	.00	2.67	46.00	6.00	58.00	.00	.00	3.97	84.61
	10.000	359.00	57.57	.00	2.39	20.00	8.00	59.00	.00	.00	4.88	95.01
	10.100	359.00	57.46	.00	4.95	28.00	65.00	89.40	.00	.00	65.04	89.36
	10.200	359.00	57.62	.00	5.22	110.00	.00	165.00	.00	.00	101.04	125.76
*	11.000	240.00	59.02	59.02	4.99	190.00	992.00	1002.00	735.00	1150.00	798.81	1150.00
*	12.000	240.00	60.46	60.46	4.90	225.00	995.00	1003.00	900.00	1280.00	900.00	1280.00
*	13.000	240.00	61.33	61.33	4.54	190.00	1000.00	1040.00	.00	.00	923.95	1110.00
*	14.000	240.00	62.28	62.28	4.68	155.00	992.00	1002.00	.00	.00	969.35	1258.04
	15.000	240.00	63.47	.00	4.28	190.00	996.00	1006.00	.00	.00	991.59	1313.57

SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
16.000	240.00	64.59	64.59	4.64	200.00	995.00	1010.00	.00	.00	960.00	1277.60
-10.200	359.00	57.62	.00	5.22	110.00	.00	165.00	.00	.00	101.04	125.76
11.000	114.00	59.37	59.37	.00	190.00	992.00	1002.00	600.00	735.00	646.72	710.00
12.100	114.00	60.17	.00	.00	225.00	995.00	1003.00	500.00	900.00	549.52	805.00
13.000	52.00	60.42	.00	.00	190.00	1000.00	1040.00	480.00	830.00	532.00	733.72
14.000	52.00	61.75	61.75	.00	155.00	992.00	1002.00	400.00	780.00	433.26	516.91
-12.100	114.00	60.17	.00	.00	225.00	995.00	1003.00	500.00	900.00	549.61	905.00
13.000	64.00	61.32	61.32	.00	190.00	1000.00	1040.00	346.00	480.00	355.41	420.00
14.000	64.00	62.01	.00	.00	155.00	992.00	1002.00	161.00	400.00	161.00	400.00

Fast - 1982 Road Improve

UMMARY PRINTOUT

SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
1.000	.00	359.00	.00	.00	4.53	.00	60.80	55.37	.00	44.73	52.00	1.00
2.000	.00	359.00	.00	.00	4.54	.00	61.00	55.57	.20	44.71	52.20	1.00
3.000	.00	359.00	.00	.00	4.46	.00	61.00	55.66	.09	36.83	52.00	1.00
4.000	2.71	353.86	2.42	.30	2.61	.26	61.30	57.30	1.64	108.90	52.30	1.23
5.000	16.35	332.35	10.30	.56	1.77	.46	60.10	57.37	.07	101.96	53.30	1.30
6.000	.00	336.41	22.59	.00	2.11	1.16	60.40	57.38	.00	80.93	53.90	1.06
7.000	.00	333.32	25.68	.01	2.32	1.31	60.60	57.43	.05	80.94	54.10	1.06
8.000	.00	332.53	26.47	.01	2.33	1.42	60.20	57.50	.07	81.95	54.60	1.05
9.000	.09	314.00	44.91	.37	2.67	1.62	58.00	57.53	.03	80.64	54.20	1.08
10.000	.15	286.26	72.59	.36	2.39	1.58	58.00	57.57	.04	90.12	54.30	1.08
10.100	.00	359.00	.00	.00	4.95	.00	58.55	57.46	-.12	24.32	54.45	1.00
10.200	.00	359.00	.00	.00	5.22	.00	59.45	57.62	.16	24.31	54.77	1.00
* 11.000	65.27	86.95	87.78	2.13	4.99	1.98	59.00	59.02	1.41	231.19	56.30	1.73
* 12.000	31.50	68.50	140.00	1.56	4.90	2.16	60.10	60.46	1.44	242.52	58.00	1.69
* 13.000	67.59	150.80	21.61	2.70	4.54	1.10	62.00	61.33	.87	186.15	60.50	1.59
* 14.000	4.16	46.93	188.90	1.30	4.68	2.48	64.00	62.28	.95	289.69	60.80	1.27
15.000	7.09	83.52	149.39	2.19	4.28	1.97	64.00	63.47	1.18	221.98	61.20	1.51
* 16.000	31.67	108.27	100.06	2.05	4.64	1.83	66.00	64.59	1.13	227.60	62.30	1.77
-10.200	.00	359.00	.00	.00	5.22	.00	59.45	57.62	-6.97	24.31	54.77	1.00
* 11.000	114.00	.00	.00	3.92	.00	.00	59.00	59.37	1.75	63.28	58.50	1.00
12.100	114.00	.00	.00	1.10	.00	.00	60.00	60.17	.80	185.48	59.30	1.00
13.000	52.00	.00	.00	.99	.00	.00	62.00	60.42	.25	201.72	59.80	1.00
* 14.000	52.00	.00	.00	2.75	.00	.00	66.00	61.75	1.33	83.65	61.30	1.00
-12.100	114.00	.00	.00	1.10	.00	.00	60.00	60.17	-1.58	185.39	59.30	1.00

SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
13.000	64.00	.00	.00	3.09	.00	.00	62.00	61.32	1.15	64.59	60.50	1.00
14.000	64.00	.00	.00	1.31	.00	.00	66.00	62.01	.69	173.00	61.50	1.00

Post - 1982 Road Improve

SUMMARY PRINTOUT

	SECNO	XLCH	K*CHSL	EG	HV	HL	OLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
	1.000	.00	.00	55.69	.32	.00	.00	39.65	.00	3.37	30.00	30.00	30.00
	2.000	50.00	4.00	55.89	.32	.20	.00	39.76	.09	3.37	30.00	30.00	30.00
	3.000	50.00	-4.00	55.97	.31	.08	.00	8.40	.18	3.66	30.00	16.00	30.00
	4.000	75.00	4.00	57.41	.10	1.44	.00	1.76	.38	5.00	30.00	16.00	30.00
	5.000	43.00	23.26	57.42	.05	.01	.01	.82	.61	4.07	30.00	16.00	30.00
	6.000	100.00	6.00	57.44	.07	.02	.01	5.30	1.09	3.48	30.00	30.00	30.00
	7.000	100.00	2.00	57.51	.08	.06	.00	7.17	1.48	3.33	30.00	30.00	30.00
	8.000	100.00	5.00	57.58	.08	.07	.00	7.78	1.85	2.90	30.00	30.00	30.00
	9.000	46.00	-8.70	57.63	.10	.04	.01	9.81	2.02	3.33	30.00	30.00	30.00
	10.000	20.00	5.00	57.65	.08	.02	.00	7.53	2.10	3.27	30.00	30.00	30.00
	10.100	28.00	5.36	57.84	.38	.03	.15	22.27	2.18	3.01	30.00	16.00	30.00
	10.200	110.00	2.91	58.04	.42	.18	.02	13.00	2.36	2.85	30.00	16.00	30.00
*	11.000	190.00	10.68	59.21	.16	.45	.02	68.77	2.75	2.22	35.00	35.00	35.00
*	12.000	225.00	5.33	60.61	.15	1.24	.00	75.27	3.11	2.46	33.46	35.00	35.00
*	13.000	190.00	13.16	61.56	.24	.79	.02	30.70	3.45	.83	17.51	16.00	35.00
*	14.000	155.00	1.94	62.43	.14	.84	.01	126.62	3.74	1.48	35.00	35.00	33.45
	15.000	190.00	2.11	63.60	.14	1.18	.00	42.94	4.10	2.27	35.00	35.00	30.58
*	16.000	200.00	5.50	64.77	.18	1.08	.01	69.81	4.54	2.29	35.00	35.00	35.00
	-10.200	110.00	.00	58.04	.42	.00	.00	13.01	4.75	2.85	30.00	16.00	30.00
*	11.000	190.00	19.63	59.61	.24	.48	.02	240.23	5.00	.87	35.00	16.00	30.00
	12.100	225.00	3.56	60.19	.02	.56	.02	12.82	5.25	.87	34.90	16.00	30.00
	13.000	190.00	2.63	60.44	.02	.25	.00	25.07	5.53	.62	35.00	16.00	30.00
*	14.000	155.00	9.68	61.87	.12	.91	.03	304.50	5.66	.45	35.00	16.00	30.00
	-12.100	225.00	.00	60.19	.02	.00	.00	12.93	5.89	.87	34.90	16.00	30.00

SECNO	XLCH	K*CHSL	EG	HV	HL	OLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
13.000	190.00	6.32	61.47	.15	.31	.04	55.83	6.12	.82	19.76	16.00	30.00
14.000	155.00	6.45	62.04	.03	.56	.01	26.44	6.24	.51	25.86	16.00	30.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   12.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   12.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   13.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   14.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   14.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   16.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   16.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   14.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   14.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   14.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   13.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   13.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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Appendix D

THIS RUN EXECUTED 01-01-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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Alternate 1
Drainage System
Channel (b=8') and storm drain along Shea and with no proposed drainage facility along 82ND Place

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T1      Shea Blvd. Channel Backwater Analysis          <Shea.hc4>
T2      From Clinton St to Arabian Tr near 82nd PL.,July,1987 revised Jan,1988
T3      Shea Blvd Channel              Q(100)=359 cfs

J1  ICHECK    INQ      NINV     IDIR     STRT    METRIC   HVINS     Q      WSEL     FQ

     0.       2.       0.       0.   .004000     .00      .0    359.   54.600   .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN    ALLDC    IBW    CHNIM   ITRACE

   -1.000     .000   -1.000     .000     .000    .000    .000    .000    .000    .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   36.000   43.000    1.000    2.000   26.000   39.000   21.000   22.000   27.000   28.000

   53.000   54.000     .000   38.000   13.000   14.000   15.000   55.000   26.000   36.000

   63.000    1.000   51.000    4.000   42.000   57.000     .000   38.000   39.000   33.000

    3.000   10.000   11.000   12.000    5.000    7.000    8.000   16.000   17.000   18.000

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

  -10.000  -10.000     .000     .000     .000     .000     .000     .000     .000     .000

NC     .030     .030     .030     .100     .300     .000     .000     .000     .000     .000
X1    1.000    9.000   16.500   68.000     .000     .000     .000     .000     .000     .000
GR   60.800     .000   56.800     .100   55.800   16.500   52.700   32.000   52.000   38.000
GR   52.500   42.000   56.000   68.000   57.000  103.000   61.000  103.100     .000     .000

X1    2.000    9.000   16.500   68.000   50.000   50.000   50.000     .000     .000     .000
GR   61.000     .000   57.000     .100   56.000   16.500   52.900   32.000   52.200   38.000
GR   52.700   42.000   56.200   68.000   57.200  103.000   61.200  103.100     .000     .000

NC     .000     .000     .016     .000     .000     .000     .000     .000     .000     .000
X1    3.000    8.000   30.000   73.000   59.000   40.000   50.000     .000     .000     .000
GR   61.000     .000   57.000     .100   56.400   30.000   52.500   44.000   52.000   54.000
GR   56.500   73.000   57.000  109.000   61.000  109.100     .000     .000     .000     .000
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SB	.000	1.560	2.630	155.000	10.000	.000	30.000	.000	52.300	52.000
X1	4.000	.000	.000	.000	75.000	75.000	75.000	.000	.300	.000
X2	.000	.000	1.000	55.300	57.000	.000	.000	.000	.000	.000
X1	5.000	9.000	20.000	81.000	94.000	64.000	43.000	.000	.000	.000
GR	60.100	.000	56.100	.100	55.700	20.000	53.400	41.000	53.300	56.000
GR	53.700	61.000	56.200	81.000	56.400	102.000	60.400	102.100	.000	.000
NC	.000	.000	.030	.100	.300	.000	.000	.000	.000	.000
X1	6.000	7.000	.100	63.000	100.000	100.000	100.000	.000	.000	.000
GR	61.100	.000	57.100	.100	53.900	23.000	53.900	43.000	56.200	63.000
GR	56.400	81.000	60.400	81.100	.000	.000	.000	.000	.000	.000
X1	7.000	8.000	.100	62.000	100.000	100.000	100.000	.000	.000	.000
GR	60.700	.000	56.700	.100	54.600	21.000	54.100	37.000	54.500	42.000
GR	56.200	62.000	56.600	81.000	60.600	81.100	.000	.000	.000	.000
X1	8.000	8.000	.100	65.000	100.000	100.000	100.000	.000	.000	.000
GR	60.200	.000	56.200	.100	55.100	19.000	54.600	38.000	54.900	44.000
GR	56.200	65.000	56.600	82.000	60.600	82.100	.000	.000	.000	.000
X1	9.000	8.000	6.000	58.000	46.000	46.000	46.000	.000	.000	.000
GR	58.000	.000	57.300	6.000	54.800	29.000	54.200	40.000	54.300	48.000
GR	56.000	58.000	56.900	83.000	60.900	63.100	.000	.000	.000	.000
X1	10.000	9.000	8.000	59.000	2.000	37.000	20.000	.000	.000	.000
GR	58.000	.000	57.300	8.000	54.700	31.000	54.300	45.000	54.600	53.000
GR	55.400	59.000	57.200	95.000	61.400	95.100	.000	.000	.000	.000
NC	.000	.000	.016	.300	.500	.000	.000	.000	.000	.000
X1	10.100	9.000	65.000	89.400	28.000	28.000	29.000	.000	.000	.000
X2	.000	.000	.000	57.450	59.550	.000	.000	.000	.000	.000
GR	59.750	.000	59.550	65.000	54.450	65.100	54.450	77.100	57.450	77.200
GR	54.450	77.300	54.450	89.300	59.450	89.400	58.550	150.000	.000	.000
X1	10.200	10.000	.000	165.000	110.000	110.000	110.000	.000	.000	.000
X2	.000	.000	.000	57.770	59.550	.000	.000	.000	.000	.000
GR	59.850	.000	59.600	101.000	54.770	101.100	54.770	113.100	57.770	113.200
GR	57.770	113.600	54.770	113.700	54.770	125.700	59.550	125.800	59.450	165.000
QT	1.000	352.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.300	5.000	10.000	35.000	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	59.280	10.000	54.780	10.100	54.780	30.100	59.280	35.000

Begin Main Wash. Decrease Discharge. Ineffective area blocked out.

QT	1.000	240.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	4.000	.016	585.000	.035	772.000	.016	796.000	.035	1230.000	.000
ET	.000	7.100	.000	.000	.000	.000	735.000	1150.000	.000	.000
X1	11.000	21.000	992.000	1002.000	300.000	200.000	190.000	.000	.000	.000
GR	60.500	600.000	60.000	630.000	58.500	670.000	59.300	710.000	66.000	710.500
GR	66.000	735.000	59.500	735.000	59.200	772.000	59.400	783.000	59.200	796.000
GR	58.700	804.000	58.700	850.000	66.000	850.000	66.300	970.000	58.700	970.000
GR	58.000	992.000	56.800	996.000	56.800	998.000	58.000	1002.000	58.800	1045.000

GR	59.000	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	500.000	.035	938.000	.016	965.000	.035	1280.000	.000
ET	.000	7.100	.000	.000	.000	.000	900.000	1280.000	.000	.000
X1	12.000	25.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	939.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	60.100	1280.000
NH	3.000	.035	970.000	.016	1040.000	.035	1300.000	.000	.000	.000
X1	13.000	10.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1330.000
NH	3.000	.035	1095.000	.016	1120.000	.035	1260.000	.000	.000	.000
X1	14.000	17.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.800	996.000	60.800	998.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
NH	3.000	.035	1205.000	.016	1235.000	.035	1390.000	.000	.000	.000
X1	15.000	20.000	996.000	1006.000	165.000	165.000	190.000	.000	.000	.000
GR	65.000	775.000	65.000	795.000	66.000	795.000	66.000	940.000	64.000	940.000
GR	64.000	990.000	62.000	996.000	61.200	998.000	61.200	1000.000	62.000	1006.000
GR	63.200	1040.000	66.000	1040.000	66.000	1140.000	63.200	1140.000	63.100	1205.000
GR	63.100	1235.000	63.500	1320.000	66.000	1320.000	66.000	1390.000	64.000	1390.000
NH	2.000	.016	790.000	.035	1280.000	.000	.000	.000	.000	.000
X1	16.000	19.000	995.000	1010.000	200.000	200.000	200.000	.000	.000	.000
GR	66.000	750.000	65.600	763.000	65.600	790.000	65.100	836.000	69.000	836.000
GR	69.000	960.000	64.300	960.000	64.000	995.000	62.300	998.000	62.300	1000.000
GR	64.000	1010.000	64.400	1070.000	64.000	1110.000	64.200	1130.000	69.000	1130.000
GR	69.000	1220.000	64.400	1220.000	64.600	1280.000	69.000	1280.000	.000	.000
NC	.016	.016	.016	.300	.500	.000	.000	.000	.000	.000
QT	1.000	352.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	-10.300	5.000	10.000	35.000	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	59.280	10.000	54.780	10.100	54.780	30.100	59.280	35.000

Begin hydraulic analysis of concrete channel (b=8')

QT	1.000	200.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.400	4.000	.000	30.500	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	54.800	4.000	54.800	21.000	59.300	30.500	.000	.000
X1	10.500	4.000	.000	20.000	.000	.000	5.000	.000	.000	.000
GR	59.300	.000	54.800	6.000	54.800	14.000	59.300	20.000	.000	.000

NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
X1	10.600	4.000	.000	20.000	.000	.000	166.000	.000	.000	.000
GR	59.550	.000	55.050	6.000	55.050	14.000	59.550	20.000	.000	.000

Begin Box culvert under 82ND Place at Shea. Decrease Discharge

NC	.000	.000	.000	.300	.500	.000	.000	.000	.000	.000
BT	1.000	114.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.700	4.000	.000	8.200	.000	.000	22.000	.000	.000	.000
X2	.000	.000	.000	58.100	58.850	.000	.000	.000	.000	.000
GR	58.850	.000	55.100	.100	55.100	8.100	58.850	8.200	.000	.000
X1	10.800	.000	.000	.000	.000	.000	58.000	.000	.150	.000
X2	.000	.000	.000	58.250	59.000	.000	.000	.000	.000	.000

End Box Culvert. Decrease Dis charge for Middle Tributary

BT	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.900	6.000	.000	19.000	.000	.000	6.000	.000	.000	.000
GR	59.500	.000	57.500	.000	57.500	14.000	58.500	17.000	58.500	18.000
GR	59.500	19.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	3.000	.035	772.000	.016	796.000	.035	1230.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	640.000	735.000	.000	.000
X1	11.000	21.000	992.000	1002.000	40.000	200.000	190.000	.000	.000	.000
GR	60.000	630.000	58.500	650.000	58.500	670.000	59.300	710.000	66.000	710.000
GR	66.000	735.000	59.500	735.000	57.200	772.000	59.400	783.000	59.200	796.000
GR	58.700	804.000	58.700	850.000	66.000	850.000	66.000	970.000	58.700	970.000
GR	58.000	992.000	56.800	996.000	56.800	998.000	58.000	1002.000	58.800	1045.000
GR	59.000	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	560.000	.035	938.000	.016	965.000	.035	1200.000	.000
ET	.000	7.100	.000	.000	.000	.000	555.000	900.000	.000	.000
X1	12.100	24.000	995.000	1003.000	145.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	995.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	.000	.000
BT	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	480.000	830.000	.000	.000
NH	4.000	.016	394.000	.035	970.000	.016	1040.000	.035	1300.000	.000
X1	13.000	25.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	61.400	346.000	61.400	347.000	61.400	348.000	61.400	350.000	61.000	378.000
GR	60.500	394.000	61.000	400.000	61.200	420.000	66.000	420.000	66.000	532.000
GR	60.000	532.000	59.800	550.000	60.000	570.000	60.300	620.000	60.200	720.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000
ET	.000	7.100	.000	.000	.000	.000	400.000	760.000	.000	.000
NH	4.000	.016	210.000	.035	1095.000	.016	1120.000	.035	1260.000	.000

X1	14.000	37.000	992.000	1002.000	150.000	150.000	153.000	.000	.000	.000
GR	61.900	161.000	61.900	162.000	61.900	163.000	61.900	164.000	61.900	165.000
GR	61.500	210.000	61.800	267.000	66.000	267.000	66.000	333.000	61.800	333.000
GR	61.800	428.000	61.300	483.000	61.900	528.000	66.000	528.000	66.000	635.000
GR	62.000	635.000	62.000	680.000	62.000	690.000	62.300	715.000	66.000	715.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.800	996.000	60.800	993.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 01-01-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
*************************************************
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Alternate 1
Drainage System
Channel (b = 11') and
storm drain along
Shea and with
no proposed drainage
facility along 82nd
Place

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

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	1.000	359.00	55.37	.00	4.53	.00	16.50	68.00	.00	.00	18.63	63.36
	2.000	359.00	55.57	.00	4.54	50.00	16.50	68.00	.00	.00	18.63	63.34
	3.000	359.00	55.66	.00	4.46	50.00	30.00	73.00	.00	.00	32.64	69.47
	4.000	359.00	57.30	.00	2.61	75.00	30.00	73.00	.00	.00	.10	109.00
	5.000	359.00	57.37	.00	1.77	43.00	20.00	81.00	.00	.00	.07	102.02
	6.000	359.00	57.38	.00	2.11	100.00	.10	63.00	.00	.00	.09	81.02
	7.000	359.00	57.43	.00	2.32	100.00	.10	62.00	.00	.00	.08	81.02
	8.000	359.00	57.50	.00	2.33	100.00	.10	65.00	.00	.00	.07	82.02
	9.000	359.00	57.53	.00	2.67	46.00	6.00	58.00	.00	.00	3.97	83.02
	10.000	359.00	57.57	.00	2.39	20.00	8.00	59.00	.00	.00	4.88	95.01
	10.100	359.00	57.46	.00	4.95	28.00	65.00	89.40	.00	.00	65.04	89.36
	10.200	359.00	57.62	.00	5.22	110.00	.00	165.00	.00	.00	101.04	125.76
	10.300	352.00	57.58	.00	5.83	10.00	10.00	35.00	.00	.00	10.04	33.15
*	11.000	240.00	58.98	58.98	5.51	190.00	992.00	1002.00	735.00	1150.00	799.46	1150.00
	12.000	240.00	60.46	.00	4.86	225.00	995.00	1003.00	900.00	1280.00	900.00	1280.00
*	13.000	240.00	61.33	61.33	4.54	190.00	1000.00	1040.00	.00	.00	923.85	1110.00
*	14.000	240.00	62.28	62.28	4.68	155.00	992.00	1002.00	.00	.00	969.35	1253.04

SECND	Ø	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
15.000	240.00	63.47	.00	4.28	190.00	996.00	1006.00	.00	.00	991.59	1313.57
16.000	240.00	64.59	64.59	4.64	200.00	995.00	1010.00	.00	.00	960.00	1277.60
-10.300	352.00	57.58	.00	5.83	10.00	10.00	35.00	.00	.00	10.04	33.15
10.400	200.00	58.12	.00	2.74	10.00	.00	30.50	.00	.00	1.05	28.01
10.500	200.00	57.98	.00	5.14	5.00	.00	20.00	.00	.00	1.76	18.24
10.600	200.00	58.16	.00	5.30	166.00	.00	20.00	.00	.00	1.86	18.14
10.700	114.00	58.31	.00	4.70	22.00	.00	8.20	.00	.00	.01	8.19
10.800	114.00	58.44	.00	4.70	58.00	.00	8.20	.00	.00	.01	8.19
10.900	52.00	58.76	.00	2.58	6.00	.00	19.00	.00	.00	.00	18.26
11.000	52.00	58.98	.00	.00	190.00	992.00	1002.00	640.00	735.00	643.60	694.02
12.100	52.00	59.88	.00	.00	225.00	995.00	1003.00	585.00	900.00	570.73	790.92
13.000	52.00	60.36	.00	.00	190.00	1000.00	1040.00	480.00	830.00	532.00	729.88
14.000	52.00	61.77	.00	.00	135.00	992.00	1002.00	400.00	780.00	431.05	518.42

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
	1.000	.00	359.00	.00	.00	4.53	.00	60.80	55.37	.00	44.73	52.00	1.00
	2.000	.00	359.00	.00	.00	4.54	.00	61.00	55.57	.20	44.71	52.20	1.00
	3.000	.00	359.00	.00	.00	4.46	.00	61.00	55.66	.09	36.83	52.00	1.00
	4.000	2.71	353.86	2.42	.30	2.61	.26	61.30	57.30	1.64	108.90	52.30	1.23
	5.000	16.35	332.35	10.30	.56	1.77	.46	60.10	57.37	.07	101.96	53.30	1.30
	6.000	.00	336.41	22.59	.00	2.11	1.16	60.40	57.38	.00	80.93	53.90	1.06
	7.000	.00	333.32	25.68	.01	2.32	1.31	60.60	57.43	.05	80.94	54.10	1.06
	8.000	.00	332.53	26.47	.01	2.33	1.42	60.20	57.50	.07	81.95	54.60	1.05
	9.000	.09	314.96	43.95	.37	2.67	1.62	58.00	57.53	.02	79.05	54.20	1.08
	10.000	.15	286.24	72.61	.36	2.39	1.58	58.00	57.57	.05	90.13	54.30	1.08
	10.100	.00	359.00	.00	.00	4.95	.00	59.55	57.46	-.12	24.32	54.45	1.00
	10.200	.00	359.00	.00	.00	5.22	.00	59.45	57.62	.16	24.31	54.77	1.00
	10.300	.00	352.00	.00	.00	5.83	.00	59.28	57.58	-.04	23.11	54.78	1.00
*	11.000	63.28	93.97	82.75	2.29	5.51	2.15	59.00	58.98	1.41	230.54	56.80	1.79
	12.000	31.80	68.07	140.13	1.55	4.86	2.15	60.10	60.46	1.48	242.82	58.00	1.68
*	13.000	67.59	150.80	21.61	2.70	4.54	1.10	62.00	61.33	.87	186.15	60.50	1.59
*	14.000	4.16	46.93	188.90	1.30	4.68	2.46	64.00	62.28	.95	288.69	60.80	1.27
	15.000	7.09	93.52	149.40	2.19	4.28	1.97	64.00	63.47	1.18	221.98	61.20	1.51
*	16.000	31.67	108.27	100.06	2.05	4.64	1.83	66.00	64.59	1.13	227.60	62.30	1.77
	-10.300	.00	352.00	.00	.00	5.63	.00	59.28	57.58	-7.01	23.11	54.78	1.00
	10.400	.00	200.00	.00	.00	2.74	.00	59.30	58.12	.54	26.96	54.80	1.00
	10.500	.00	200.00	.00	.00	5.14	.00	59.30	57.98	-.14	16.47	54.80	1.00
	10.600	.00	200.00	.00	.00	5.30	.00	59.55	58.16	.18	16.29	55.05	1.00
	10.700	.00	114.00	.00	.00	4.70	.00	58.85	58.31	.15	8.17	55.10	1.00

SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
10.800	.00	114.00	.00	.00	4.70	.00	59.00	58.44	.13	8.17	55.25	1.00
10.900	.00	52.00	.00	.00	2.58	.00	59.50	58.76	.32	18.26	57.50	1.00
11.000	52.00	.00	.00	3.07	.00	.00	59.00	58.98	.21	50.42	58.50	1.00
12.100	52.00	.00	.00	1.01	.00	.00	60.00	59.88	.90	150.19	59.30	1.00
13.000	52.00	.00	.00	1.30	.00	.00	62.00	60.36	.48	197.88	59.80	1.00
14.000	52.00	.00	.00	2.52	.00	.00	66.00	61.77	1.41	87.37	61.30	1.00

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	XLCH	K*CHSL	EG	HV	HL	OLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
	1.000	.00	.00	55.69	.32	.00	.00	39.65	.00	3.37	30.00	30.00	30.00
	2.000	50.00	4.00	55.89	.32	.20	.00	39.76	.09	3.37	30.00	30.00	30.00
	3.000	50.00	-4.00	55.97	.31	.08	.00	8.40	.18	3.66	30.00	16.00	30.00
	4.000	75.00	4.00	57.41	.10	1.44	.00	1.76	.38	5.00	30.00	16.00	30.00
	5.000	43.00	23.26	57.42	.05	.01	.01	.82	.61	4.07	30.00	16.00	30.00
	6.000	100.00	6.00	57.44	.07	.02	.01	5.30	1.09	3.48	30.00	30.00	30.00
	7.000	100.00	2.00	57.51	.08	.06	.00	7.17	1.48	3.33	30.00	30.00	30.00
	8.000	100.00	5.00	57.58	.08	.07	.00	7.78	1.85	2.90	30.00	30.00	30.00
	9.000	46.00	-8.70	57.63	.10	.04	.01	5.87	2.02	3.33	30.00	30.00	30.00
	10.000	20.00	5.00	57.65	.08	.02	.00	7.53	2.10	3.27	30.00	30.00	30.00
	10.100	28.00	5.36	57.84	.38	.03	.15	22.27	2.18	3.01	30.00	16.00	30.00
	10.200	110.00	2.91	58.04	.42	.18	.02	13.00	2.36	2.85	30.00	16.00	30.00
	10.300	10.00	1.00	58.11	.53	.01	.05	13.47	2.37	2.80	30.00	16.00	30.00
*	11.000	190.00	10.63	59.22	.23	.49	.03	86.80	2.72	2.16	35.00	35.00	35.00
	12.000	225.00	5.33	60.61	.15	1.39	.01	73.93	3.06	2.46	33.42	35.00	35.00
*	13.000	190.00	13.16	61.56	.24	.79	.03	30.71	3.40	.83	17.51	16.00	35.00
*	14.000	155.00	1.94	62.43	.14	.84	.01	126.62	3.69	1.48	35.00	35.00	33.45
	15.000	190.00	2.11	63.60	.14	1.18	.00	42.94	4.06	2.27	35.00	35.00	30.58
*	16.000	200.00	5.50	64.77	.18	1.08	.01	69.61	4.50	2.29	35.00	35.00	35.00
	-10.300	10.00	.00	58.11	.53	.00	.00	13.47	4.51	2.80	16.00	16.00	16.00
	10.400	10.00	2.00	58.24	.12	.01	.12	2.57	4.52	3.32	16.00	16.00	16.00
	10.500	5.00	.00	58.39	.41	.00	.15	11.48	4.53	3.18	16.00	16.00	16.00
	10.600	166.00	1.51	58.59	.44	.20	.01	12.45	4.68	3.11	16.00	16.00	16.00
	10.700	22.00	2.27	58.65	.34	.03	.03	22.75	4.69	3.21	16.00	16.00	16.00

SECNO	XLCH	K*CHSL	EG	HV	HL	DLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
10.800	58.00	2.59	58.79	.34	.13	.00	22.75	4.72	3.19	16.00	16.00	16.00
10.900	6.00	375.00	58.87	.10	.01	.07	7.55	4.73	1.26	16.00	16.00	16.00
11.000	190.00	5.26	59.12	.15	.24	.01	197.57	4.78	.48	35.00	16.00	16.00
12.100	225.00	3.56	59.89	.02	.76	.01	19.91	4.91	.58	35.00	16.00	16.00
13.000	190.00	2.63	60.38	.03	.49	.00	52.45	5.08	.56	35.00	16.00	16.00
14.000	155.00	9.68	61.87	.10	1.46	.02	241.46	5.18	.47	35.00	16.00	16.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=    11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    13.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    14.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    14.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    16.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    16.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
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Appendix E

THIS RUN EXECUTED 01-01-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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Alternate 2
Drainage System
Channel (b=11') and storm drain along Shea and 50 cfs± cap. storm drain along 82ND Place to Clinton

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T1      Shea Blvd. Channel Backwater Analysis          <Shea.hc5>
T2      From Clinton St to Arabian Tr near 82nd PL.,July,1987 revised Jan,1988
T3      Shea Blvd Channel              Q(100)=359 cfs

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       2.       0.       0.  .004000      .00       .0     359.   54.600     .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    -1.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   43.000    1.000    2.000   26.000   39.000   21.000   22.000   27.000   28.000

    53.000   54.000     .000   38.000   13.000   14.000   15.000   55.000   26.000   56.000

    63.000    1.000   51.000    4.000   42.000   57.000     .000   38.000   39.000   33.000

     3.000   10.000   11.000   12.000    5.000    7.000    8.000   16.000   17.000   18.000

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

   -10.000  -10.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .030     .030     .030     .100     .300     .000     .000     .000     .000     .000
X1     1.000    9.000   16.500   68.000     .000     .000     .000     .000     .000     .000
GR    60.800     .000   56.800     .100   55.800   16.500   52.700   32.000   52.000   38.000
GR    52.500   42.000   56.000   68.000   57.000  103.000   61.000  103.100     .000     .000

X1     2.000    9.000   16.500   68.000   50.000   50.000   50.000     .000     .000     .000
GR    61.000     .000   57.000     .100   56.000   16.500   52.900   32.000   52.200   38.000
GR    52.700   42.000   56.200   68.000   57.200  103.000   61.200  103.100     .000     .000

NC      .000     .000     .016     .000     .000     .000     .000     .000     .000     .000
X1     3.000    8.000   30.000   73.000   59.000   40.000   50.000     .000     .000     .000
GR    61.000     .000   57.000     .100   56.400   30.000   52.500   44.000   52.000   54.000
GR    56.500   73.000   57.000  109.000   61.000  109.100     .000     .000     .000     .000
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SB	.000	1.560	2.630	155.000	10.000	.000	30.000	.000	52.300	52.000
X1	4.000	.000	.000	.000	75.000	75.000	75.000	.000	.300	.000
X2	.000	.000	1.000	55.300	57.000	.000	.000	.000	.000	.000
X1	5.000	9.000	20.000	81.000	94.000	64.000	43.000	.000	.000	.000
GR	60.100	.000	56.100	.100	55.700	20.000	53.400	41.000	53.300	56.000
GR	53.700	61.000	56.200	81.000	55.400	102.000	60.400	102.100	.000	.000
NC	.000	.000	.030	.100	.300	.000	.000	.000	.000	.000
X1	6.000	7.000	.100	63.000	100.000	100.000	100.000	.000	.000	.000
GR	61.100	.000	57.100	.100	53.900	23.000	53.900	43.000	56.200	63.000
GR	56.400	81.000	60.400	81.100	.000	.000	.000	.000	.000	.000
X1	7.000	8.000	.100	62.000	100.000	100.000	100.000	.000	.000	.000
GR	60.700	.000	56.700	.100	54.600	21.000	54.100	37.000	54.500	42.000
GR	56.200	62.000	56.600	81.000	60.600	81.100	.000	.000	.000	.000
X1	8.000	8.000	.100	65.000	100.000	100.000	100.000	.000	.000	.000
GR	60.200	.000	56.200	.100	55.100	19.000	54.600	38.000	54.900	44.000
GR	56.200	65.000	56.600	82.000	60.600	82.100	.000	.000	.000	.000
X1	9.000	8.000	6.000	58.000	46.000	46.000	46.000	.000	.000	.000
GR	58.000	.000	57.300	6.000	54.800	29.000	54.200	40.000	54.300	48.000
GR	56.000	58.000	56.900	83.000	60.900	83.100	.000	.000	.000	.000
X1	10.000	8.000	8.000	59.000	2.000	37.000	20.000	.000	.000	.000
GR	58.000	.000	57.300	8.000	54.700	31.000	54.300	45.000	54.600	53.000
GR	55.400	59.000	57.200	95.000	61.400	95.100	.000	.000	.000	.000
NC	.000	.000	.016	.300	.500	.000	.000	.000	.000	.000
X1	10.100	9.000	65.000	89.400	28.000	28.000	26.000	.000	.000	.000
X2	.000	.000	.000	57.450	59.550	.000	.000	.000	.000	.000
GR	59.750	.000	59.550	65.000	54.450	65.100	54.450	77.100	57.450	77.200
GR	54.450	77.300	54.450	89.300	59.450	89.400	58.550	150.000	.000	.000
X1	10.200	10.000	.000	165.000	110.000	110.000	110.000	.000	.000	.000
X2	.000	.000	.000	57.770	59.550	.000	.000	.000	.000	.000
GR	59.850	.000	59.600	101.000	54.770	101.100	54.770	113.100	57.770	113.200
GR	57.770	113.600	54.770	113.700	54.770	125.700	59.550	125.300	59.450	165.000
QT	1.000	352.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.300	5.000	10.000	35.000	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	59.280	10.000	54.780	10.100	54.780	30.100	59.280	35.000

Begin Main wash. Decrease Discharge. Ineffective area blocked out. 50cfs of Qmg = 240 cfs is being conveyed in pipe

ET	1.000	190.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	4.000	.016	585.000	.035	772.000	.016	796.000	.035	1230.000	.000
ET	.000	7.100	.000	.000	.000	.000	735.000	1150.000	.000	.000
X1	11.000	21.000	992.000	1002.000	300.000	200.000	190.000	.000	.000	.000
GR	60.500	600.000	60.000	630.000	58.500	670.000	59.300	710.000	66.000	710.000
GR	66.000	735.000	59.500	735.000	59.200	772.000	59.400	783.000	59.200	796.000
GR	53.700	804.000	58.700	850.000	66.000	850.000	66.000	970.000	58.700	970.000
GR	58.000	992.000	56.800	996.000	56.800	995.000	58.000	1002.000	58.200	1045.000

GR	59.000	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	500.000	.035	938.000	.016	965.000	.035	1280.000	.000
ET	.000	7.100	.000	.000	.000	.000	900.000	1280.000	.000	.000
X1	12.000	25.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	780.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	53.000	998.000	56.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	60.100	1230.000
NH	3.000	.035	970.000	.016	1040.000	.035	1300.000	.000	.000	.000
X1	13.000	10.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.300	1210.000	62.000	1300.000
ET	1.000	240.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	3.000	.035	1095.000	.016	1120.000	.035	1260.000	.000	.000	.000
X1	14.000	17.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.300	996.000	60.300	999.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
NH	3.000	.035	1205.000	.016	1235.000	.035	1390.000	.000	.000	.000
X1	15.000	20.000	996.000	1006.000	165.000	165.000	190.000	.000	.000	.000
GR	63.000	775.000	65.000	795.000	66.000	795.000	66.000	940.000	64.000	940.000
GR	64.000	990.000	62.000	996.000	61.200	998.000	61.200	1000.000	62.000	1006.000
GR	63.200	1040.000	66.000	1040.000	66.000	1140.000	63.200	1140.000	63.100	1205.000
GR	63.100	1225.000	63.500	1320.000	66.000	1320.000	66.000	1390.000	64.000	1390.000
NH	2.000	.016	790.000	.035	1280.000	.000	.000	.000	.000	.000
X1	16.000	19.000	995.000	1010.000	200.000	200.000	200.000	.000	.000	.000
GR	66.000	750.000	65.600	768.000	65.600	799.000	65.100	836.000	67.000	836.000
GR	67.000	960.000	64.300	960.000	64.600	995.000	62.300	998.000	62.300	1000.000
GR	64.000	1010.000	64.400	1070.000	64.600	1110.000	64.200	1130.000	67.000	1130.000
GR	69.000	1220.000	64.400	1220.000	64.600	1280.000	69.000	1280.000	.000	.000
HC	.016	.016	.016	.300	.300	.000	.000	.000	.000	.000
ET	1.000	352.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	-10.300	5.000	10.000	35.000	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	59.250	10.000	54.750	10.100	54.750	30.100	59.250	35.000

Begin hydraulic analysis of concrete channel (b=11'). Design Discharge (channe
includes 50 cfs for pipe along 82ND Place

ET	1.000	250.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.400	4.000	.000	30.500	.000	.300	10.000	.000	.000	.000
GR	59.300	.000	54.800	4.000	54.500	21.000	59.300	30.500	.000	.000
X1	10.500	4.000	.000	23.000	.000	.000	5.000	.000	.000	.000
GR	59.300	.000	54.800	6.000	54.800	17.000	59.300	23.000	.000	.000

NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
X1	10.600	4.000	.000	23.000	.000	.000	166.000	.000	.000	.000
GR	59.550	.000	55.050	6.000	55.050	17.000	59.550	23.000	.000	.000

Begin Box culvert under 82ND Place at Shea. Decrease Discharge.

NC	.000	.000	.000	.300	.500	.000	.000	.000	.000	.000
QT	1.300	114.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.700	4.000	.000	8.200	.000	.000	22.000	.000	.000	.000
X2	.000	.000	.000	58.100	58.850	.000	.000	.000	.000	.000
GR	58.850	.000	55.100	.100	55.100	8.100	53.850	8.200	.000	.000
X1	10.800	.000	.000	.000	.000	.000	58.000	.000	.150	.000
X2	.000	.000	.000	53.250	57.000	.000	.000	.000	.000	.000

End Box Culvert. Decrease Discharge for Middle Tributary.

QT	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.900	6.000	.000	19.000	.000	.000	6.000	.000	.000	.000
GR	59.500	.000	57.300	.000	57.300	14.000	58.500	17.000	58.500	18.000
GR	59.500	19.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	3.000	.035	772.000	.016	796.000	.035	1230.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	640.000	735.000	.000	.000
X1	11.000	21.000	992.000	1002.000	40.000	200.000	190.000	.000	.000	.000
GR	60.000	630.000	58.500	650.000	58.500	670.000	59.300	710.000	66.000	710.000
GR	66.000	735.000	59.500	735.000	59.200	772.000	57.400	783.000	59.200	796.000
GR	58.700	864.000	58.700	850.000	66.000	850.000	66.000	970.000	58.700	970.000
GR	58.000	972.000	58.800	996.000	56.300	998.000	58.000	1002.000	58.300	1045.000
GR	57.000	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	560.000	.035	938.000	.016	965.000	.035	1200.000	.000
ET	.000	7.100	.000	.000	.000	.000	555.000	900.000	.000	.000
X1	12.100	24.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.200	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	905.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	998.000	59.000	1000.000	59.300	1003.000	59.900	1018.000
GR	66.000	1019.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	.000	.000
QT	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	460.000	830.000	.000	.000
NH	4.000	.016	394.000	.035	970.000	.016	1040.000	.035	1300.000	.000
X1	13.000	25.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	61.400	346.000	61.400	347.000	61.400	348.000	61.400	350.000	61.000	378.000
GR	60.500	394.000	61.000	400.000	61.200	420.000	66.000	420.000	66.000	532.000
GR	60.000	532.000	59.500	550.000	60.000	570.000	60.300	620.000	60.200	720.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.300	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.300	1210.000	62.000	1300.000
ET	.000	7.100	.000	.000	.000	.000	400.000	780.000	.000	.000
NH	4.000	.016	210.000	.035	1095.000	.016	1120.000	.035	1260.000	.000

XI	14.000	37.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
GR	61.900	161.000	61.900	162.000	61.900	163.000	61.900	164.000	61.900	165.000
GR	61.500	210.000	61.800	267.000	66.000	267.000	66.000	333.000	61.800	333.000
GR	61.800	428.000	61.300	483.000	61.900	528.000	66.000	528.000	66.000	635.000
GR	62.000	635.000	62.000	680.000	62.000	690.000	62.300	715.000	66.000	715.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.800	996.000	60.800	998.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 01-01-80

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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Alternate 2
Drainage System
Channel (b = 11') and
storm drain along
Shea and 50 cfs ±
cap. storm drain along
82ND Pl. to Clinton.

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

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	1.000	359.00	55.37	.00	4.53	.00	16.50	68.00	.00	.00	18.63	63.36
	2.000	359.00	55.57	.00	4.54	50.00	16.50	68.00	.00	.00	18.63	63.34
	3.000	359.00	55.66	.00	4.46	50.00	30.00	73.00	.00	.00	32.64	69.47
	4.000	359.00	57.30	.00	2.61	75.00	30.00	73.00	.00	.00	.10	109.00
	5.000	359.00	57.37	.00	1.77	43.00	20.00	81.00	.00	.00	.07	102.02
	6.000	359.00	57.38	.00	2.11	100.00	.10	63.00	.00	.00	.09	81.02
	7.000	359.00	57.43	.00	2.32	100.00	.10	62.00	.00	.00	.08	81.02
	8.000	359.00	57.50	.00	2.33	100.00	.10	65.00	.00	.00	.07	82.02
	9.000	359.00	57.53	.00	2.67	46.00	6.00	58.00	.00	.00	3.97	53.02
	10.000	359.00	57.57	.00	2.39	20.00	8.00	59.30	.00	.00	4.88	55.01
	10.100	359.00	57.46	.00	4.95	28.00	65.00	89.40	.00	.00	65.04	89.36
	10.200	359.00	57.62	.00	5.22	110.00	.00	165.00	.00	.00	101.04	125.76
	10.300	352.00	57.58	.00	5.63	10.00	10.00	35.00	.00	.00	10.04	33.15
*	11.000	190.00	58.93	58.93	5.05	190.00	992.00	1002.00	735.00	1150.00	800.36	1150.00
*	12.000	190.00	60.39	60.39	4.78	225.00	995.00	1003.00	900.00	1280.00	900.00	1280.00
*	13.000	190.00	61.25	61.25	4.24	190.00	1000.00	1040.00	.00	.00	935.52	1110.00
*	14.000	240.00	62.28	62.28	4.66	155.00	992.00	1002.00	.00	.00	969.26	1258.17

SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
15.000	240.00	63.47	.00	4.30	190.00	996.00	1006.00	.00	.00	991.60	1313.23
* 16.000	240.00	64.59	64.59	4.64	200.00	995.00	1010.00	.00	.00	960.00	1277.53
-10.300	352.00	57.58	.00	5.83	10.00	10.00	35.00	.00	.00	10.04	33.15
10.400	250.00	58.02	.00	3.56	10.00	.00	30.50	.00	.00	1.14	27.79
10.500	250.00	57.90	.00	3.33	5.00	.00	23.00	.00	.00	1.87	21.13
10.600	250.00	58.08	.00	3.43	186.00	.00	23.00	.00	.00	1.96	21.04
10.700	114.00	58.27	.00	4.70	22.00	.00	8.20	.00	.00	.02	8.18
10.800	114.00	58.40	.00	4.70	58.00	.00	8.20	.00	.00	.02	8.18
10.900	52.00	58.72	.00	2.68	6.00	.00	19.00	.00	.00	.00	18.22
* 11.000	52.00	58.96	58.96	.00	190.00	992.00	1002.00	640.00	735.00	643.85	693.07
12.100	52.00	59.88	.00	.00	225.00	995.00	1003.00	555.00	900.00	570.09	791.76
13.000	52.00	60.35	.00	.00	190.00	1000.00	1040.00	480.00	830.00	532.00	729.43
14.000	52.00	61.79	.00	.00	155.00	992.00	1002.00	400.00	780.00	429.38	619.56

Shea Blvd Channel

SUMMARY PRINTOUT

SECNO	WLOB	WCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
1.000	.00	359.00	.00	.00	4.53	.00	60.80	55.37	.00	44.73	52.00	1.00
2.000	.00	359.00	.00	.00	4.54	.00	61.00	55.57	.20	44.71	52.20	1.00
3.000	.00	359.00	.00	.00	4.46	.00	61.00	55.66	.09	36.83	52.00	1.00
4.000	2.71	353.86	2.42	.30	2.61	.26	61.30	57.30	1.64	108.90	52.30	1.23
5.000	16.35	332.35	10.30	.58	1.77	.46	60.10	57.37	.07	101.96	53.30	1.30
6.000	.00	336.41	22.59	.00	2.11	1.16	60.40	57.38	.00	80.93	53.90	1.06
7.000	.00	333.32	25.68	.01	2.32	1.31	60.60	57.43	.05	80.94	54.10	1.06
8.000	.00	332.53	26.47	.01	2.33	1.42	60.20	57.50	.07	81.95	54.60	1.05
9.000	.09	314.96	43.95	.37	2.67	1.62	58.00	57.53	.02	79.05	54.20	1.08
10.000	.15	286.24	72.61	.36	2.39	1.58	58.00	57.57	.05	90.13	54.30	1.08
10.100	.00	359.00	.00	.00	4.95	.00	58.55	57.46	-.12	24.32	54.45	1.00
10.200	.00	359.00	.00	.00	5.22	.00	59.45	57.62	.16	24.31	54.77	1.00
10.300	.00	352.00	.00	.00	5.83	.00	59.28	57.58	-.04	23.11	54.78	1.00
* 11.000	47.20	83.18	59.61	2.00	5.05	1.98	59.00	58.93	1.35	229.64	56.80	1.83
* 12.000	18.74	64.20	107.07	1.29	4.78	1.95	60.10	60.39	1.46	233.37	58.00	1.91
* 13.000	50.51	126.44	13.05	2.64	4.24	.95	62.00	61.25	.85	174.48	60.50	1.51
* 14.000	4.19	46.79	189.03	1.29	4.66	2.47	64.00	62.28	1.04	288.91	60.80	1.27
15.000	7.10	83.75	149.16	2.19	4.30	1.97	64.00	63.47	1.18	221.63	61.20	1.51
* 16.000	31.66	108.32	100.02	2.05	4.64	1.83	66.00	64.59	1.13	227.53	62.30	1.77
-10.300	.00	352.00	.00	.00	5.83	.00	59.28	57.58	-7.01	23.11	54.78	1.00
10.400	.00	250.00	.00	.00	3.56	.00	59.30	58.02	.44	26.65	54.80	1.00
10.500	.00	250.00	.00	.00	5.33	.00	59.30	57.90	-.12	19.27	54.80	1.00
10.600	.00	250.00	.00	.00	5.48	.00	59.55	58.08	.18	19.08	55.05	1.00
10.700	.00	114.00	.00	.00	4.70	.00	58.85	58.27	.19	8.17	55.10	1.00

SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
10.800	.00	114.00	.00	.00	4.70	.00	59.00	58.40	.13	8.17	55.25	1.00
10.900	.00	52.00	.00	.00	2.68	.00	59.50	58.72	.31	18.22	57.50	1.00
* 11.000	52.00	.00	.00	3.26	.00	.00	59.00	58.96	.25	49.23	58.50	1.00
12.100	52.00	.00	.00	.99	.00	.00	60.00	59.88	.91	151.68	59.30	1.00
13.000	52.00	.00	.00	1.35	.00	.00	62.00	60.35	.48	197.43	59.80	1.00
14.000	52.00	.00	.00	2.37	.00	.00	66.00	61.79	1.43	90.18	61.30	1.00

Shea Blvd Channel

SUMMARY PRINTOUT

SECND	XLCH	K*CHSL	EB	HV	HL	OLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
1.000	.00	.00	55.69	.32	.00	.00	39.65	.00	3.37	30.00	30.00	30.00
2.000	50.00	4.00	55.89	.32	.20	.00	39.76	.09	3.37	30.00	30.00	30.00
3.000	50.00	-4.00	55.97	.31	.06	.00	6.40	.16	3.66	30.00	16.00	30.00
4.000	75.00	4.00	57.41	.10	1.44	.00	1.76	.38	5.00	30.00	16.00	30.00
5.000	43.00	23.26	57.42	.05	.01	.01	.82	.61	4.07	30.00	16.00	30.00
6.000	100.00	6.00	57.44	.07	.02	.01	5.30	1.09	3.48	30.00	30.00	30.00
7.000	100.00	2.00	57.51	.08	.06	.00	7.17	1.48	3.33	30.00	30.00	30.00
8.000	100.00	5.00	57.58	.08	.07	.00	7.78	1.85	2.90	30.00	30.00	30.00
9.000	46.00	-8.70	57.63	.10	.04	.01	9.87	2.02	3.33	30.00	30.00	30.00
10.000	20.00	5.00	57.65	.08	.02	.00	7.53	2.10	3.27	30.00	30.00	30.00
10.100	28.00	5.36	57.84	.38	.03	.15	22.27	2.18	3.01	30.00	16.00	30.00
10.200	110.00	2.91	58.04	.42	.18	.02	13.00	2.36	2.85	30.00	16.00	30.00
10.300	10.00	1.00	58.11	.53	.01	.05	13.47	2.37	2.80	30.00	16.00	30.00
* 11.000	190.00	10.63	59.14	.21	.44	.03	76.07	2.69	2.13	35.00	35.00	35.00
* 12.000	225.00	5.33	60.55	.16	1.34	.01	75.43	2.98	2.39	34.41	35.00	35.00
* 13.000	190.00	13.16	61.46	.22	.80	.02	30.72	3.26	.75	16.93	16.00	35.00
* 14.000	155.00	1.94	62.43	.14	.91	.01	125.36	3.52	1.48	35.00	35.00	33.44
15.000	190.00	2.11	63.61	.14	1.18	.00	43.30	3.89	2.27	35.00	35.00	30.53
* 16.000	200.00	5.50	64.77	.18	1.08	.01	69.91	4.33	2.29	35.00	35.00	35.00
-10.300	10.00	.00	58.11	.53	.00	.00	13.47	4.34	2.80	16.00	16.00	16.00
10.400	10.00	2.00	58.21	.20	.01	.10	4.48	4.35	3.22	16.00	16.00	16.00
10.500	5.00	.00	58.34	.44	.00	.12	11.51	4.36	3.10	16.00	16.00	16.00
10.600	166.00	1.51	58.55	.47	.20	.01	12.47	4.54	3.03	16.00	16.00	16.00
10.700	22.00	2.27	58.62	.34	.03	.04	22.75	4.55	3.17	16.00	16.00	16.00

SECND	XLCH	K*CHSL	EG	HV	HL	DLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
10.800	58.00	2.59	58.75	.34	.13	.00	22.75	4.59	3.15	16.00	16.00	16.00
10.900	6.00	375.00	58.83	.11	.01	.07	8.49	4.59	1.22	16.00	16.00	16.00
11.000	190.00	5.26	59.13	.16	.28	.02	231.62	4.64	.46	35.00	16.00	16.00
12.100	225.00	3.56	59.89	.02	.75	.01	18.75	4.77	.38	35.00	16.00	16.00
13.000	190.00	2.63	60.38	.03	.49	.00	57.65	4.94	.55	35.00	16.00	16.00
14.000	155.00	9.68	61.87	.09	1.47	.02	204.00	5.04	.49	35.00	16.00	16.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   12.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   12.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   13.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   14.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   14.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   16.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   16.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=   11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   11.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
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Appendix F

THIS RUN EXECUTED 01-02-80

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*************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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Alternate 3
Drainage System
Channel (b=14') and
Storm drain along
Shea and 120 cfs±
capacity storm drains
(2) along 82ND Place
to Clinton

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T1      Shea Blvd. Channel Backwater Analysis          <Shea.hc6>
T2      From Clinton St to Arabian Tr near 82nd PL.,July,1987 revised Jan,1988
T3      Shea Blvd Channel              Q(100)=359 cfs

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       2.       0.       0.   .004000      .00       .0     359.    54.600     .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC    IBW      CHNIM    ITRACE

   -1.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

   38.000   43.000    1.000    2.000   26.000   39.000   21.000   22.000   27.000   28.000

   53.000   54.000     .000   38.000   13.000   14.000   15.000   55.000   26.000   56.000

   63.000    1.000   51.000    4.000   42.000   57.000     .000   38.000   39.000   33.000

    3.000   10.000   11.000   12.000    5.000    7.000    8.000   16.000   17.000   18.000

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

  -10.000  -10.000     .000     .000     .000     .000     .000     .000     .000     .000

NC     .030     .030     .030     .100     .300     .000     .000     .000     .000     .000
X1    1.000    9.000   16.500   68.000     .000     .000     .000     .000     .000     .000
GR   60.800     .000   56.800     .100   55.800   16.500   52.700   32.000   52.000   38.000
GR   52.500   42.000   56.000   68.000   57.000  103.000   61.000  103.100     .000     .000

X1    2.000    9.000   16.500   68.000   50.000   50.000   50.000     .000     .000     .000
GR   61.000     .000   57.000     .100   56.000   16.500   52.900   32.000   52.200   38.000
GR   52.700   42.000   56.200   68.000   57.200  103.000   61.200  103.100     .000     .000

NC     .000     .000     .016     .000     .000     .000     .000     .000     .000     .000
X1    3.000    8.000   30.000   73.000   59.000   40.000   50.000     .000     .000     .000
GR   61.000     .000   57.000     .100   56.400   30.000   52.500   44.000   52.000   54.000
GR   56.500   73.000   57.000  109.000   61.000  109.100     .000     .000     .000     .000
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SB	.000	1.580	2.630	155.000	10.000	.000	30.000	.000	52.300	52.000
X1	4.000	.000	.000	.000	75.000	75.000	75.000	.000	.300	.000
X2	.000	.000	1.000	55.300	57.000	.000	.000	.000	.000	.000
X1	5.000	9.000	20.000	81.000	94.000	64.000	43.000	.000	.000	.000
GR	60.100	.000	56.100	.100	55.700	20.000	53.400	41.000	53.300	56.000
GR	53.700	61.000	56.200	81.000	56.400	102.000	60.400	102.100	.000	.000
NC	.000	.000	.030	.100	.300	.000	.000	.000	.000	.000
X1	6.000	7.000	.100	63.000	100.000	100.000	100.000	.000	.000	.000
GR	61.100	.000	57.100	.100	53.900	23.000	53.900	43.000	56.200	63.000
GR	56.400	81.000	60.400	81.100	.000	.000	.000	.000	.000	.000
X1	7.000	8.000	.100	62.000	100.000	100.000	100.000	.000	.000	.000
GR	60.700	.000	56.700	.100	54.600	21.000	54.100	37.000	54.500	42.000
GR	56.200	62.000	56.600	81.000	60.600	81.100	.000	.000	.000	.000
X1	8.000	8.000	.100	65.000	100.000	100.000	100.000	.000	.000	.000
GR	60.200	.000	56.200	.100	55.100	19.000	54.600	38.000	54.900	44.000
GR	56.200	65.000	56.600	82.000	60.600	82.100	.000	.000	.000	.000
X1	9.000	8.000	8.000	58.000	46.000	46.000	46.000	.000	.000	.000
GR	58.000	.000	57.300	8.000	54.800	29.000	54.200	40.000	54.300	48.000
GR	56.000	58.000	56.900	83.000	60.900	83.100	.000	.000	.000	.000
X1	10.000	8.000	8.000	59.000	2.000	37.000	20.000	.000	.000	.000
GR	58.000	.000	57.300	8.000	54.700	31.000	54.300	45.000	54.600	53.000
GR	55.400	59.000	57.200	95.000	61.400	95.100	.000	.000	.000	.000
NC	.000	.000	.016	.300	.500	.000	.000	.000	.000	.000
X1	10.100	9.000	65.000	89.400	28.000	28.000	28.000	.000	.000	.000
X2	.000	.000	.000	57.450	59.550	.000	.000	.000	.000	.000
GR	59.750	.000	59.550	65.000	54.450	65.100	54.450	77.100	57.450	77.200
GR	54.450	77.300	54.450	89.300	59.450	89.400	58.550	150.000	.000	.000
X1	10.200	10.000	.000	165.000	110.000	110.000	110.000	.000	.000	.000
X2	.000	.000	.000	57.770	59.550	.000	.000	.000	.000	.000
GR	59.850	.000	59.600	101.000	54.770	101.100	54.770	113.100	57.770	113.200
GR	57.770	113.600	54.770	113.700	54.770	125.700	59.550	125.800	59.450	165.000
BT	1.000	352.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.300	5.000	10.000	35.000	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	59.280	10.000	54.780	10.100	54.780	30.100	59.250	35.000

Begin Main Wash. Decrease Discharge. 120 cfs of Q100=240 cfs is being conveyed by two Strip drains. Ineffective areas blocked out.

BT	1.000	120.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NR	4.000	.016	585.000	.035	772.000	.016	796.000	.035	1230.000	.000
ET	.000	7.100	.000	.000	.000	.000	735.000	1150.000	.000	.000
X1	11.000	21.000	992.000	1002.000	300.000	200.000	190.000	.000	.000	.000
GR	60.500	600.000	60.000	630.000	58.500	670.000	59.300	710.000	66.000	710.000
GR	66.000	735.000	59.500	735.000	59.200	772.000	59.400	783.000	59.200	796.000
GR	58.700	804.000	58.700	850.000	66.000	850.000	66.000	970.000	58.700	973.000
GR	58.000	992.000	56.800	996.000	36.800	998.000	58.000	1002.000	58.800	1045.000

GR	59.000	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	500.000	.035	938.000	.016	965.000	.035	1280.000	.000
ET	.000	7.100	.000	.000	.000	.000	900.000	1280.000	.000	.000
X1	12.000	25.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.300	620.000	59.300	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	965.000
GR	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	60.100	1280.000
NH	3.000	.035	970.000	.016	1040.000	.035	1300.000	.000	.000	.000
X1	13.000	10.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	62.000	630.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000
QT	1.000	240.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	3.000	.035	1095.000	.016	1120.000	.035	1260.000	.000	.000	.000
X1	14.000	17.000	992.000	1002.000	150.000	150.000	155.000	.000	.000	.000
GR	64.000	780.000	63.000	875.000	66.000	875.000	66.000	960.000	62.400	960.000
GR	62.000	992.000	60.800	996.000	60.800	996.000	62.000	1002.000	62.100	1095.000
GR	62.100	1120.000	62.000	1140.000	61.700	1170.000	61.700	1195.000	62.000	1225.000
GR	62.300	1260.000	66.000	1260.000	.000	.000	.000	.000	.000	.000
NH	3.000	.035	1205.000	.016	1235.000	.035	1390.000	.000	.000	.000
X1	15.000	20.000	996.000	1006.000	165.000	165.000	190.000	.000	.000	.000
GR	65.000	775.000	65.000	795.000	66.000	795.000	66.000	940.000	64.000	940.000
GR	64.000	990.000	62.000	996.000	61.200	996.000	61.200	1000.000	62.000	1006.000
GR	63.200	1040.000	66.000	1040.000	66.000	1140.000	63.200	1140.000	63.100	1205.000
GR	63.100	1235.000	63.500	1320.000	66.000	1320.000	66.000	1390.000	64.000	1390.000
NH	2.000	.016	790.000	.035	1280.000	.000	.000	.000	.000	.000
X1	16.000	19.000	995.000	1010.000	200.000	200.000	200.000	.000	.000	.000
GR	66.000	750.000	65.600	768.000	65.600	790.000	65.100	836.000	69.000	836.000
GR	69.000	960.000	64.300	960.000	64.000	995.000	62.300	998.000	62.300	1000.000
GR	64.000	1010.000	64.400	1070.000	64.000	1110.000	64.200	1130.000	69.000	1130.000
GR	67.000	1220.000	64.400	1220.000	64.600	1230.000	69.000	1280.000	.000	.000

Begin hydraulic analysis at concrete channel (b = 14') . Design discharge includes 120 cfs for pipes (2) along 82ND Place.

NC	.016	.016	.016	.300	.500	.000	.000	.000	.000	.000
QT	1.000	352.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	-10.300	5.000	10.000	35.000	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	59.280	10.000	54.760	10.100	54.780	30.100	59.280	35.000
QT	1.000	320.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.400	4.000	.000	30.500	.000	.000	10.000	.000	.000	.000
GR	59.300	.000	54.800	4.000	54.800	21.000	59.300	30.500	.000	.000
X1	10.500	4.000	.000	26.000	.000	.000	5.000	.000	.000	.000
GR	59.300	.000	54.800	6.000	54.800	20.000	59.300	26.000	.000	.000

NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
X1	10.600	4.000	.000	26.000	.000	.000	166.000	.000	.000	.000
GR	59.550	.000	55.050	6.000	55.050	20.000	59.550	26.000	.000	.000

Begin Box Culvert under 82ND Place at Shea. Decrease Discharge.

NC	.000	.000	.000	.300	.500	.000	.000	.000	.000	.000
QT	1.000	114.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.700	4.000	.000	8.200	.000	.000	22.000	.000	.000	.000
X2	.000	.000	.000	58.100	58.850	.000	.000	.000	.000	.000
GR	58.850	.000	55.100	.100	55.100	8.100	58.850	8.200	.000	.000
X1	10.800	.000	.000	.000	.000	.000	58.900	.000	.150	.000
X2	.000	.000	.000	58.250	59.000	.000	.000	.000	.000	.000

End Box Culvert Decrease Discharge for Middle Tributary.

QT	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	10.900	6.000	.000	19.000	.000	.000	6.000	.000	.000	.000
GR	59.500	.000	57.500	.000	57.500	14.000	58.500	17.000	58.500	18.000
GR	59.500	19.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	3.000	.035	772.000	.016	796.000	.035	1230.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	640.000	735.000	.000	.000
X1	11.000	21.000	992.000	1002.000	40.000	200.000	190.000	.000	.000	.000
GR	60.000	630.000	58.500	650.000	58.500	670.000	59.300	710.000	66.000	710.000
GR	66.000	735.000	59.500	735.000	59.200	772.000	59.400	783.000	59.200	796.000
GR	58.700	804.000	58.700	850.000	66.000	850.000	66.000	970.000	58.700	970.000
GR	58.000	992.000	56.800	996.000	56.800	998.000	58.000	1002.000	58.800	1045.000
GR	59.000	1230.000	.000	.000	.000	.000	.000	.000	.000	.000
NH	4.000	.016	560.000	.035	938.000	.016	955.000	.035	1200.000	.000
ET	.000	7.100	.000	.000	.000	.000	555.000	900.000	.000	.000
X1	12.100	24.000	995.000	1003.000	165.000	140.000	225.000	.000	.000	.000
GR	61.000	500.000	60.000	560.000	59.300	620.000	59.500	690.000	66.000	690.000
GR	66.000	760.000	59.600	760.000	60.000	805.000	66.000	805.000	66.000	900.000
GR	60.200	900.000	60.200	926.000	60.300	938.000	60.500	950.000	60.300	955.000
GR	60.000	995.000	58.000	998.000	58.000	1000.000	59.800	1003.000	59.900	1018.000
GR	66.000	1018.000	66.000	1150.000	60.000	1150.000	60.000	1200.000	.000	.000
QT	1.000	52.000	.000	.000	.000	.000	.000	.000	.000	.000
ET	.000	7.100	.000	.000	.000	.000	480.000	830.000	.000	.000
NH	4.000	.016	394.000	.035	970.000	.016	1040.000	.035	1300.000	.000
X1	13.000	25.000	1000.000	1040.000	160.000	160.000	190.000	.000	.000	.000
GR	61.400	346.000	61.400	347.000	61.400	348.000	61.400	350.000	61.000	378.000
GR	60.500	394.000	61.000	400.000	61.200	420.000	66.000	420.000	66.000	532.000
GR	60.000	532.000	59.800	550.000	60.000	570.000	60.300	620.000	60.200	720.000
GR	62.000	830.000	61.000	970.000	60.500	1000.000	60.500	1040.000	61.000	1050.000
GR	61.200	1110.000	66.000	1110.000	66.000	1210.000	61.800	1210.000	62.000	1300.000
ET	.000	7.100	.000	.000	.000	.000	400.000	780.000	.000	.000
NH	4.000	.016	210.000	.035	1095.000	.016	1120.000	.035	1260.000	.000

THIS RUN EXECUTED 01-02-80

Alternate 3
Drainage System

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**************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	1.000	359.00	55.37	.00	4.53	.00	16.50	68.00	.00	.00	18.63	63.36
	2.000	359.00	55.57	.00	4.54	50.00	16.50	68.00	.00	.00	16.63	63.34
	3.000	359.00	55.66	.00	4.46	50.00	30.00	73.00	.00	.00	32.64	69.47
	4.000	359.00	57.30	.00	2.61	75.00	30.00	73.00	.00	.00	.10	109.00
	5.000	359.00	57.37	.00	1.77	43.00	20.00	81.00	.00	.00	.07	102.02
	6.000	359.00	57.38	.00	2.11	100.00	.10	63.00	.00	.00	.09	81.02
	7.000	359.00	57.43	.00	2.32	100.00	.10	62.00	.00	.00	.08	81.02
	8.000	359.00	57.50	.00	2.33	100.00	.10	65.00	.00	.00	.07	82.02
	9.000	359.00	57.53	.00	2.67	46.00	6.00	58.00	.00	.00	3.97	83.02
	10.000	359.00	57.57	.00	2.39	20.00	8.00	59.00	.00	.00	4.88	95.01
	10.100	359.00	57.46	.00	4.95	28.00	65.00	89.40	.00	.00	65.04	89.36
	10.200	359.00	57.62	.00	5.22	110.00	.00	165.00	.00	.00	101.04	125.76
	10.300	352.00	57.58	.00	5.83	10.00	10.00	35.00	.00	.00	10.04	33.15
*	11.000	120.00	58.79	58.79	4.41	190.00	992.00	1002.00	735.00	1150.00	802.54	1044.53
*	12.000	120.00	60.30	60.30	4.06	225.00	995.00	1003.00	900.00	1280.00	900.00	1280.00
*	13.000	120.00	61.08	61.08	3.87	190.00	1000.00	1040.00	.00	.00	959.04	1073.49
	14.000	240.00	62.29	62.28	4.64	155.00	992.00	1002.00	.00	.00	969.19	1258.26

SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
15.000	240.00	63.47	.00	4.31	190.00	996.00	1006.00	.00	.00	991.60	1312.96
16.000	240.00	64.59	64.59	4.66	200.00	995.00	1010.00	.00	.00	960.00	1277.10
-10.300	352.00	57.58	.00	5.83	10.00	10.00	35.00	.00	.00	10.04	33.15
10.400	320.00	57.77	.00	5.00	10.00	.00	30.50	.00	.00	1.35	27.29
10.500	320.00	57.67	.00	6.25	5.00	.00	26.00	.00	.00	2.17	23.83
10.600	320.00	57.95	.00	6.18	166.00	.00	26.00	.00	.00	2.14	23.86
10.700	114.00	58.31	.00	4.70	22.00	.00	8.20	.00	.00	.01	8.19
10.800	114.00	58.44	.00	4.70	58.00	.00	8.20	.00	.00	.01	8.19
10.900	52.00	58.76	.00	2.58	6.00	.00	19.00	.00	.00	.00	18.26
11.000	52.00	58.98	.00	.00	190.00	992.00	1002.00	640.00	735.00	643.59	694.04
12.100	52.00	59.68	.00	.00	225.00	995.00	1003.00	555.00	900.00	570.75	790.89
13.000	52.00	60.36	.00	.00	190.00	1006.00	1040.00	480.00	830.00	532.00	729.90
14.000	52.00	61.77	.00	.00	155.00	992.00	1002.00	400.00	780.00	431.13	518.36

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
	1.000	.00	359.00	.00	.00	4.53	.00	60.80	55.37	.00	44.73	52.00	1.00
	2.000	.00	359.00	.00	.00	4.54	.00	61.00	55.57	.20	44.71	52.20	1.00
	3.000	.00	359.00	.00	.00	4.46	.00	61.00	55.66	.09	36.83	52.00	1.00
	4.000	2.71	353.86	2.42	.30	2.61	.26	61.30	57.30	1.64	105.90	52.30	1.23
	5.000	16.35	332.35	10.30	.56	1.77	.46	60.10	57.37	.07	101.96	53.30	1.30
	6.000	.00	336.41	22.59	.00	2.11	1.16	60.40	57.38	.00	80.93	53.90	1.06
	7.000	.00	333.32	25.68	.01	2.32	1.31	60.60	57.43	.05	80.94	54.10	1.06
	8.000	.00	332.53	26.47	.01	2.33	1.42	60.20	57.50	.07	81.95	54.60	1.05
	9.000	.09	314.96	43.95	.37	2.67	1.62	58.00	57.53	.02	79.05	54.20	1.09
	10.000	.15	286.24	72.61	.38	2.39	1.58	58.00	57.57	.05	90.13	54.30	1.09
	10.100	.00	359.00	.00	.00	4.95	.00	58.55	57.46	-.12	24.32	54.45	1.00
	10.200	.00	359.00	.00	.00	5.22	.00	59.45	57.62	.16	24.31	54.77	1.00
	10.300	.00	352.00	.00	.00	5.83	.00	59.28	57.58	-.04	23.11	54.78	1.00
*	11.000	22.17	66.72	31.11	1.59	4.41	1.85	59.00	58.79	1.21	121.99	56.80	1.78
*	12.000	6.59	51.74	61.67	.82	4.06	1.45	60.10	60.30	1.51	221.61	58.00	2.29
*	13.000	26.25	89.50	4.25	2.55	3.87	1.01	62.00	61.98	.77	114.46	60.50	1.24
	14.000	4.20	46.69	189.11	1.29	4.64	2.47	64.00	62.29	1.21	289.07	60.80	1.27
	15.000	7.10	83.93	148.97	2.20	4.31	1.98	64.00	63.47	1.18	221.37	61.20	1.51
*	16.000	31.62	108.59	99.79	2.05	4.66	1.84	66.00	64.59	1.12	227.10	62.30	1.77
	-10.300	.00	352.00	.00	.00	5.83	.00	59.28	57.58	-7.01	23.11	54.78	1.00
	10.400	.00	320.00	.00	.00	5.00	.00	59.30	57.77	.19	25.94	54.80	1.00
	10.500	.00	320.00	.00	.00	6.25	.00	59.30	57.67	-.10	21.35	54.80	1.00
	10.600	.00	320.00	.00	.00	6.19	.00	59.55	57.95	.28	21.73	55.05	1.00
	10.700	.00	114.00	.00	.00	4.70	.00	58.85	58.31	.36	8.17	55.10	1.00

SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFWSX	TOPWID	ELMIN	ALPHA
10.800	.00	114.00	.00	.00	4.70	.00	59.00	58.44	.13	8.17	55.25	1.00
10.900	.00	52.00	.00	.00	2.58	.00	59.50	58.76	.32	18.26	57.50	1.00
11.000	52.00	.00	.00	3.07	.00	.00	59.00	58.98	.21	50.45	58.50	1.00
12.100	52.00	.00	.00	1.01	.00	.00	60.00	59.88	.90	150.14	59.30	1.00
13.000	52.00	.00	.00	1.29	.00	.00	62.00	60.36	.48	197.90	59.80	1.00
14.000	52.00	.00	.00	2.53	.00	.00	66.00	61.77	1.41	87.23	61.30	1.00

Shea Blvd Channel

SUMMARY PRINTOUT

	SECNO	XLCH	K*CHSL	EG	HV	HL	DLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
	1.000	.00	.00	55.69	.32	.00	.00	39.65	.00	3.37	30.00	30.00	30.00
	2.000	50.00	4.00	55.89	.32	.20	.00	39.76	.09	3.37	30.00	30.00	30.00
	3.000	50.00	-4.00	55.97	.31	.08	.00	8.40	.18	3.66	30.00	16.00	30.00
	4.000	75.00	4.00	57.41	.10	1.44	.00	1.76	.38	5.00	30.00	16.00	30.00
	5.000	43.00	23.26	57.42	.05	.01	.01	.82	.61	4.07	30.00	16.00	30.00
	6.000	100.00	6.00	57.44	.07	.02	.01	5.30	1.09	3.48	30.00	30.00	30.00
	7.000	100.00	2.00	57.51	.08	.06	.00	7.17	1.48	3.33	30.00	30.00	30.00
	8.000	100.00	5.00	57.58	.08	.07	.00	7.78	1.85	2.90	30.00	30.00	30.00
	9.000	46.00	-8.70	57.63	.10	.04	.01	9.87	2.02	3.33	30.00	30.00	30.00
	10.000	20.00	5.00	57.65	.08	.02	.00	7.53	2.10	3.27	30.00	30.00	30.00
	10.100	28.00	5.36	57.84	.38	.03	.15	22.27	2.18	3.01	30.00	16.00	30.00
	10.200	110.00	2.91	58.04	.42	.18	.02	13.00	2.36	2.85	30.00	16.00	30.00
	10.300	10.00	1.00	58.11	.53	.01	.05	13.47	2.37	2.80	30.00	16.00	30.00
*	11.000	190.00	10.63	58.98	.19	.37	.03	65.28	2.62	1.99	35.00	35.00	35.00
*	12.000	225.00	5.33	60.43	.13	1.14	.01	58.51	2.83	2.30	35.00	35.00	35.00
*	13.000	190.00	13.16	61.27	.20	.80	.02	36.02	3.03	.58	16.09	16.00	35.00
	14.000	155.00	1.94	62.43	.14	1.15	.01	124.50	3.25	1.49	35.00	35.00	33.44
	15.000	190.00	2.11	63.61	.14	1.18	.00	43.58	3.61	2.27	35.00	35.00	30.59
*	16.000	200.00	5.50	64.77	.18	1.09	.01	70.46	4.05	2.29	35.00	35.00	35.00
	-10.300	10.00	.00	58.11	.53	.00	.00	13.47	4.06	2.80	16.00	16.00	16.00
	10.400	10.00	2.00	58.16	.39	.01	.04	9.61	4.08	2.97	16.00	16.00	16.00
	10.500	5.00	.00	58.28	.61	.01	.11	16.13	4.08	2.37	16.00	16.00	16.00
	10.600	166.00	1.51	58.54	.59	.26	.00	15.61	4.29	2.90	16.00	16.00	16.00
	10.700	22.00	2.27	58.65	.34	.04	.08	22.75	4.30	3.21	16.00	16.00	16.00

SECND	XLCH	K*CHSL	EG	HV	HL	DLOSS	10K*S	VOL	DEPTH	K*XNL	K*XNCH	K*XNR
10.800	58.00	2.59	58.79	.34	.13	.00	22.75	4.33	3.19	16.00	16.00	16.00
10.900	6.00	375.00	58.87	.10	.01	.07	7.54	4.33	1.26	16.00	16.00	16.00
11.000	190.00	5.26	59.12	.15	.24	.01	196.92	4.39	.48	35.00	16.00	16.00
12.100	225.00	3.56	59.89	.02	.76	.01	19.95	4.52	.58	35.00	16.00	16.00
13.000	190.00	2.63	60.38	.03	.49	.00	52.22	4.68	.56	35.00	16.00	16.00
14.000	155.00	9.68	61.87	.10	1.46	.02	243.53	4.79	.47	35.00	16.00	16.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=    11.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    11.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    11.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    12.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    12.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    13.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    13.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=    16.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    16.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY
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Appendix G

AN WEST INC.
Consulting Engineers
Richmond, California
San Jose, California
Phoenix, Arizona

Proj. No. _____ Sht. ___ of ___

Shea Boulevard — Calc. By GAS — Date 11/6/87

82ND Place Channel — Chkd. By _____ Date _____

Quantity and Cost Estimate
Concrete Channel Improvements along 82ND Place
Sta. 10+51 ± (82ND Pl. Sur. ℄) to Sta 14+69 ±

1. Concrete Lined Channel 5" Thick
263 LF X 22.6' ÷ 9 = 660.4 S.Y. X $22/SY. = $14,528

2. 12' X 3' RCB
125 LF X 1.29 C.Y./LF = 161.8 C.Y. X $250/CY = $40,457

3. Headwalls to RCB at Driveways
12 Headwalls X 2.25 C.Y./Headwall = 27 C.Y. X $250/CY. = $6750

4. Drop Inlet at RCB, 82ND Pl. & Clinton = 7.5 CY X $250 = $1875

5. Outlet Headwall at RCB 82ND Pl & Clinton = 5.0 CY X $250 = $1255

6. Pavement Replacement at 82ND Pl. & Clinton = 74 S.Y. X $20/SY = $1480

7. Lower 6" waterline 1 Ea X $500 = $500

8. Lower Service Connection Waterline 2 Ea X $200 $400

9. Install and Grade Gravel Driveway Surface 227 S.Y. X $8 $1816

10. Clear Site (0.25 Ac) and Transplant 22± Shrubs & Trees $2500

Total	$71,561
Excluding R/W (0.139 Ac)	
15% Contingency	10734
Grand Total	82,295

AN WEST INC.
Consulting Engineers
Richmond, California
San Jose, California
Phoenix, Arizona

Shea Boulevard
82ND P

Proj. No. M-703(5) Sht. ___ of ___
Calc. By GAS Date 1/7/88
Chkd. By ___ Date ___

Alternate 2 Drainage System
Quantity and Cost Estimate
Storm Drains (2) along 82ND Place
Sta 10+41 ± (82ND Place Sur. ℄ to Sta 14+69 ±
120 cfs ± Capacity Storm Drains (2)

1. 856 LF 33" x 49 CMPA "Smoothwall" x $75*/LF $64200.0
   * Reduce linear foot price for two pipe installed side x side in same trench

2. Entrance Headwall and Trash Rack 1 Ea x 5500 $5500.0

3. Pavement Replacement at 82ND and Clinton 80 S.Y. x $20 1600.0

4. Lower 6" Waterline 1 Ea x $500 500.0

5. Lower Service Connection Waterlines 2 Ea x $200 400.0

Total 72,200
15% Contingency 10 830
Grand Total $83,030

Note: No right of way required along 82ND Place except for northeast corner of 82ND Place and Clinton

AN WEST INC.
Consulting Engineers
Richmond, California
San Jose, California
Phoenix, Arizona

Proj. No. M-703(5) Sht. ___ of ___

Shea Boulevard Drainage Design — Calc. By GAS — Date 1/7/88

82ND Place Storm Drain — Chkd. By ___ — Date ___

Alternate 2 Drainage System
Quantity and Cost Estimate
Storm Drain along 82ND Place
Sta 10+41 ± (82ND Pl Sur ℄) to Sta 14+69 ±
50 cfs ± Capacity Storm Drain

1. 428 LF 33" X 49" CMPA "Smooth wall" X $80/LF = $34,240
2. Entrance Headwall and Trash Rack, 1 Ea X $4500 = 4500
3. Pavement Replacement at 82ND Pl and Clinton 70 SY X $20 = $1400
4. Lower 6" waterline 1 Ea X $500 = $500
5. Lower Service Connection waterlines 2 Ea X $200 = $400

Total $41,040
15% Contingency 6156
Grand Total $47,196

Note: No right of way required along 82ND Place except for northeast corner of 82ND Place and Clinton.

1370
1360
1350
MAIN WASH
240
MIDDLE TRIB.
52
EAST TRIB.
64
4
86nd PL
LOT 22
LOT 32
LOT 19
LOT 21
LOT 20
LOT 1
LOT 2
LOT 3
LOT 4
FF 60.20
FF 62.98
FF 63.00
100-YEAR FLOOD PLAIN
100-YEAR FLOOD PLAIN
100-YEAR FLOOD PLAIN
SHEA BLVD.
EDGE OF PAVEMENT PRE-1982
ARABIAN TRAIL
359
LEGEND
FLOODPLAIN DELINEATION
HEC-2 CROSS SECTION
EFFECTIVE AREA ENCROACHMENT
359 15
100 YEAR DISCHARGE (cfs)
TR-20 I.D. NO. (FROM REPORT)
FF 59.43
FINISHED FLOOR ELEVATIONS
FLOWLINE
EXHIBIT 1
PRE-1982 ROAD IMPROVEMENTS
100 YEAR FLOODPLAIN
DESIGN
DRAWN
CHECK
SCALE
HORZ. 1"=100'
VERT.
JOB NO.
4725-09
DATE
Dec. 87
SHEET
OF
A-N WEST INC.
Consulting Engineers
7600 NORTH 15TH STREET, SUITE 200
PHOENIX, ARIZONA 85020
(602) 861-2200

EXHIBIT 2

POST 1982 ROAD IMPROVEMENTS
100 YEAR FLOODPLAIN

DESIGN GAS	SCALE	JOB NO.	DATE	SHEET
DRAWN PJS	HORZ. 1" = 100'	4725-09	Dec. 87	OF
CHECK GAS	VERT.			

A-N WEST INC.
Consulting Engineers
7600 NORTH 15TH STREET, SUITE 200
PHOENIX, ARIZONA 85020
(602) 861-2200