ASA OFFICE BUILDING
City of Phoenix, Arizona

Floodplain Study Report for FEMA Application

PREMIER
ENGINEERING CORPORATION

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ASA OFFICE BUILDING
City of Phoenix, Arizona

Floodplain Study Report for FEMA Application

Prepared for:

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DE VERA
Date Signed 11/20/03
ARIZONA, U.S.A.

Prepared by:

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September 2003
Premier Project No. 2003011

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1.0 PURPOSE

The main purpose of the report is to support the application for CLOMR-Fill which will be submitted through the City of Phoenix. The site is located within a delineated floodplain.

2.0 LOCATION & DESCRIPTION

2.1 Location

The project is a proposed ASA Building with parking lot facilities located in an area under the City of Phoenix Zone Code C-1. The site is a portion of the northeast quarter of Section 12 Township 1 North, Range 2 East of the Gila and Salt River Base & Meridian. It is located on the northwest corner of 19th Avenue and Washington Street.

Figure 1 shows the vicinity map

2.2 Description

The Santa Fe Railroad passes between the project site and 19th Avenue. The project site is defined by Lots 1, 2, 23, 24, 25 and 26, Block 45, Capitol Addition according to Book 2 of Maps, Page 13, records of Maricopa County, Arizona. There is no building along the railroad track. The project east property line is 101 feet west of 19th Avenue.

The site is nearly flat with a slope of less than 0.1%. Generally, drainage is in the southwest direction following the historic floodway of Cave Creek Wash. It is located within the limits of Cave Creek Wash floodplain, Zone AE (Special Hazard Area)

Figure 2 shows a portion of the FIRM No. 04013C2130 F (Revised July 19, 2001, Panel 2130 of 4350) showing the location of the site. The development will impact Section NQ with base flood elevation of 1071.00 feet. Drainage–wise the site may be subject to flooding since it is within the delineated floodplain of Cave Creek Wash.

3.0 FEMA REQUIREMENT

Since the project site is within a delineated floodplain, the City of Phoenix requires citizens owning properties located within a special flood hazard area to apply for a permit before commencing any development for the site. The site is within Flood Zone AE with base flood elevations indicated on the FIRM.

Figure 3 shows the flow chart for the regulatory requirements as outlined in the City of Phoenix Policies and Standards. For this project a, Conditional Letter of Map Revision-Fill (CLOMR-Fill) application will be prepared and submitted to FEMA through the City of Phoenix. FEMA's action will be a letter from their office that this subject parcel of land or proposed structure that will be elevated by fill would not be inundated by the base flood, if fill is placed as proposed or the structure is built as proposed. In support of this application for CLOMR-Fill, are the HEC-RAS run results of floodplain modeling for the existing condition and the proposed development with the office building and parking lots.

4.0 EXISTING CONDITION

The project site and the surrounding area is partially developed with old buildings to the west, north and south. The original hydrologic and hydraulic study was performed by the US Corps of

Engineers in 1973. The final flood insurance study which resulted in the FIRM was prepared in 1977. In 1978 Cella Barr & Associates updated the previous study. A re-study of portion of the floodplain was undertaken by Willdan in October 2001 for the Department of Health Services building located northeast of the site along Monroe Street. The original HEC-2 model had been converted to HEC-RAS.

The ground surface has a slope of about 0.3% to the southwest. There is no visible remnant of the historic floodway. The whole area is subject to sheet flow when high intensity storms occurs. In general the onsite storm water runoff will sheet flow to the southwest.

Figure 4 shows an aerial photograph of site.

5.0 PROPOSED CONDITION

The proposed development will include the construction of a single one-story building, parking lot and associated facilities, sidewalks, hardscape and landscaping. .

Figure 5 is a copy of the site plan showing the proposed development with the building and parking facilities. The existing HEC-RAS model cross-section NQ (No. 5.95) location is approximately shown on this figure.

Figure 6 is a preliminary Grading and Drainage Plan. The finish floor elevation has been set at Elev. 1072.50. There are 3 Retention Basins proposed with a total storage capacity of 6540 cubic feet, which provides the City of Phoenix required 100yr-2hr storm water runoff

6.0 STUDY METHODOLOGY

This floodplain study uses the previous hydraulic model as supplied by the Flood Control District. Basically the original HEC-2 was converted to a HEC-RAS model for convenience of presentation. The HEC-RAS model was developed for the Department of Health Services by Willdan in October 2001.

The existing HEC-RAS model was modified to incorporate the effect of the proposed development.

7.0 RESULTS AND DISCUSSION

Appendix A shows the results of the model run for the existing condition. At River Station 5.95, the water surface elevation is 1071.22'

Appendix B shows the modified HEC-RAS model with the proposed condition. The Manning's n in the existing model was maintained. The station locations of the proposed building were inserted as indicated on the Site Plan. The model was re-run. At River Station 5.95, the generated water surface elevation is 1971.26 feet which is slightly higher than the water surface elevation for the existing condition.

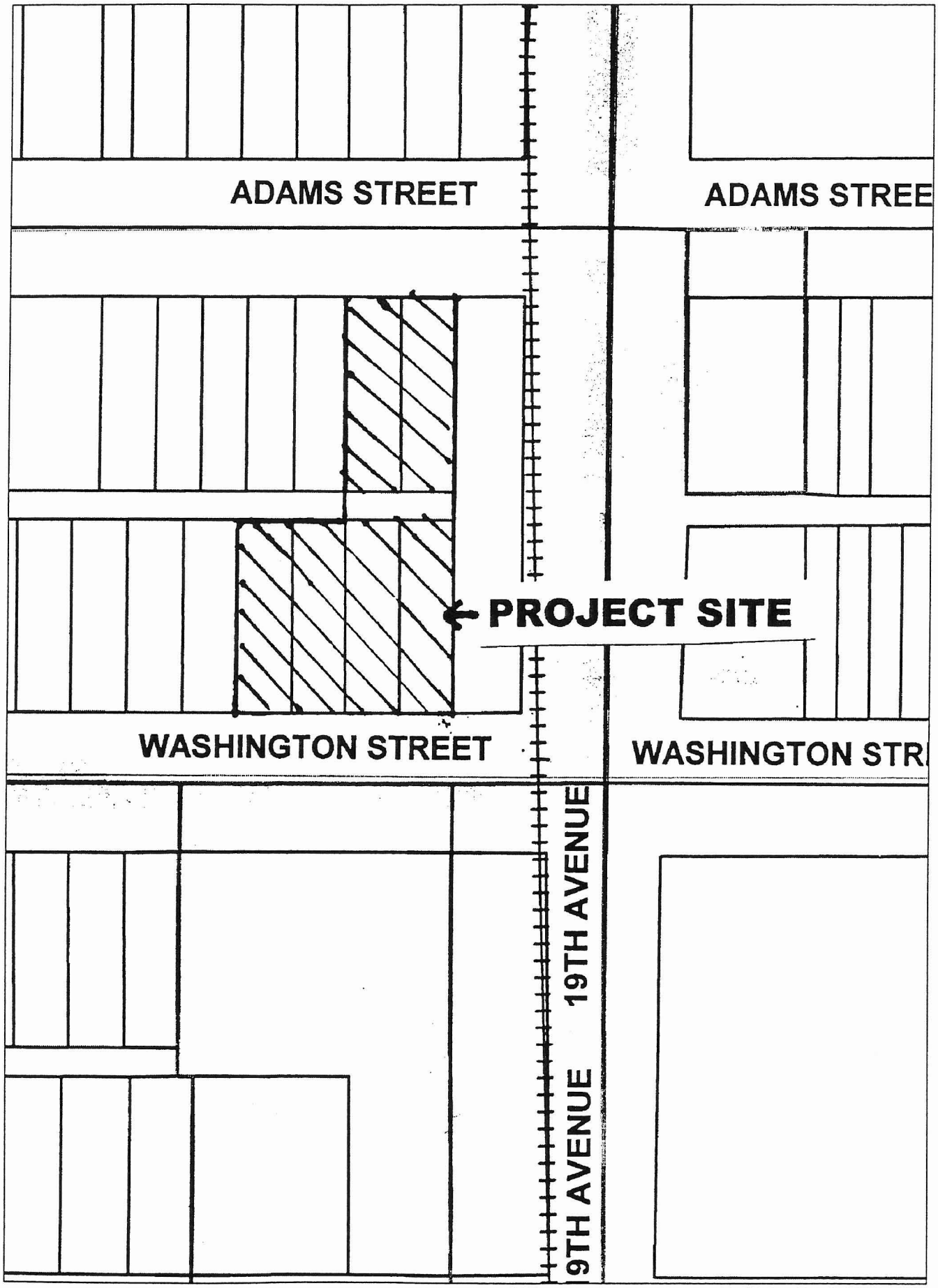
8.0 SUMMARY AND RECOMMENDATION

Using the existing condition HEC-RAS model, the cross-section that will be affected by the proposed development was modified by incorporating the blockage due to the proposed building. The existing model shows a water surface elevation of 1071.22 at River Station 5.95. The

modified model with the proposed building and parking facilities shows a water surface elevation of 1071.26. The difference is 0.04 feet which is equivalent to 0.48 inches. This will not significantly affect the existing flood elevation indicated on the FIRM. The proposed retention basins in the site will certainly reduce the impact of the 100yr flood. Also, with the grading and paving to be done, the surface roughness could be reduced.

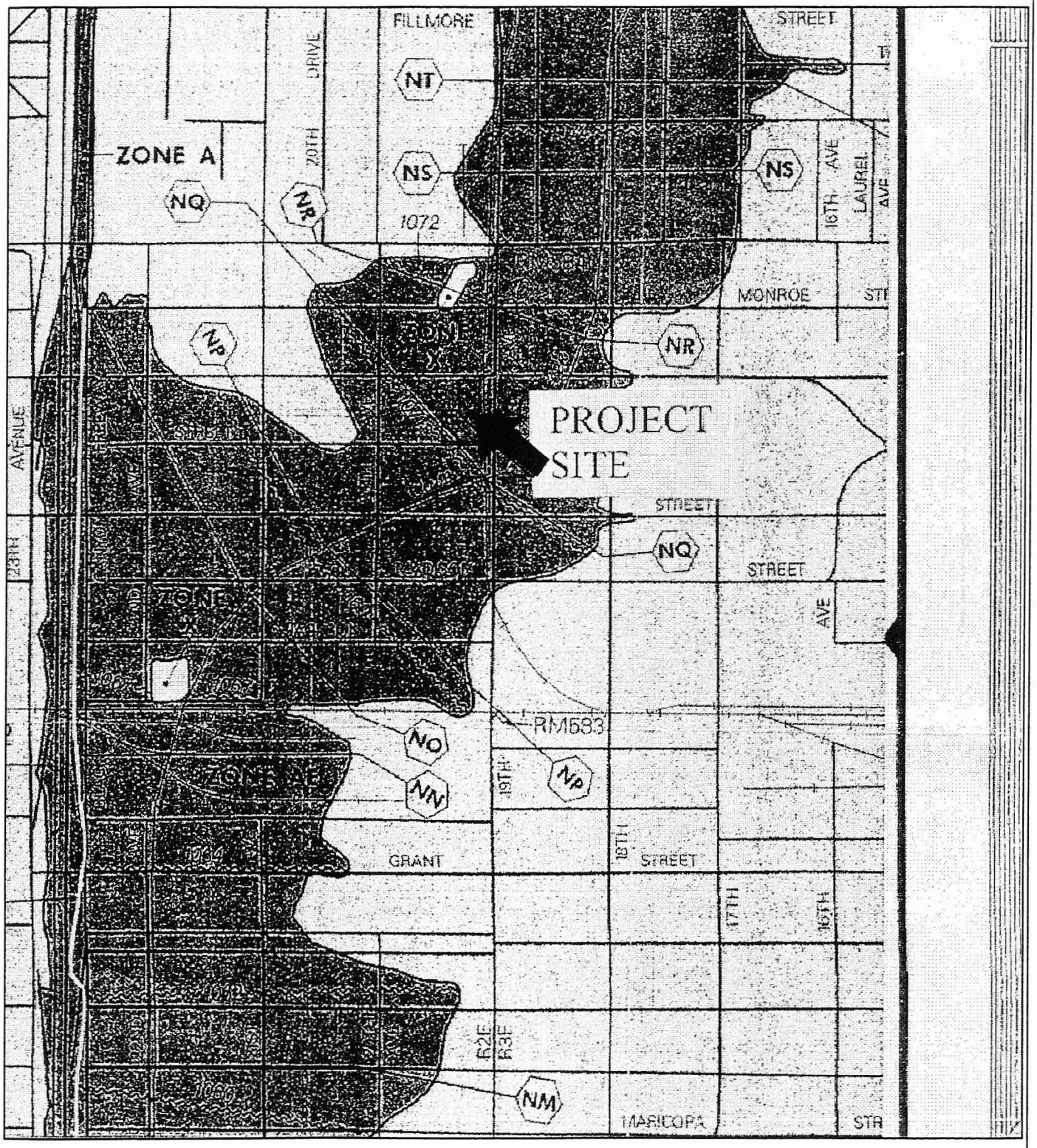
9.0 REFERENCES

- *Drainage Report for DHS Office Building & Parking Structure*, Prepared for Leo A. Daly Architects., Phoenix, Arizona by Kpff Consulting Engineers, Phoenix, Arizona, January 2002
- *A Detailed Hydraulic Analysis for a Portion of the Cave Creek Wash Within the City of Phoenix,*, Prepared by Willdan for Floodplain Manager, City of Phoenix, Oct. 2001
- *City of Phoenix Policies and Standards for Storm Water.* City of Phoenix, Arizona, September 2003.
- *Personal Communication With Lynn Thomas,* Maricopa County Flood Control District, Phoenix, Arizona.



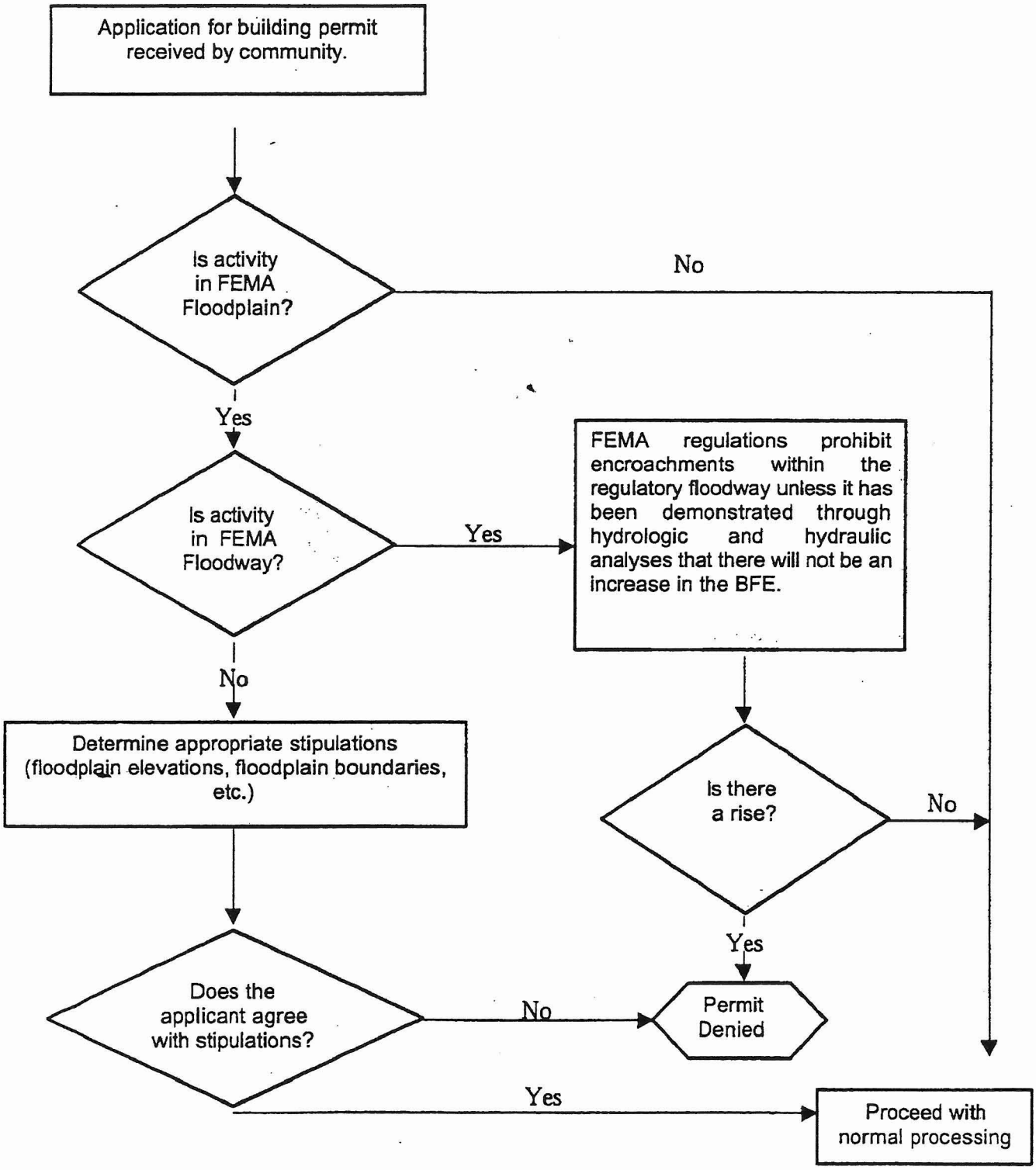
PREMIER ENGINEERING CORPORATION			
PROJ. NO. 200301	DRAWN BY MRD	VICINITY MAP	FIGURE 1
DATE 9/12/03	DESIGNED BY SHM		

$USER$ $DATE$ $TIME$ $FILE$



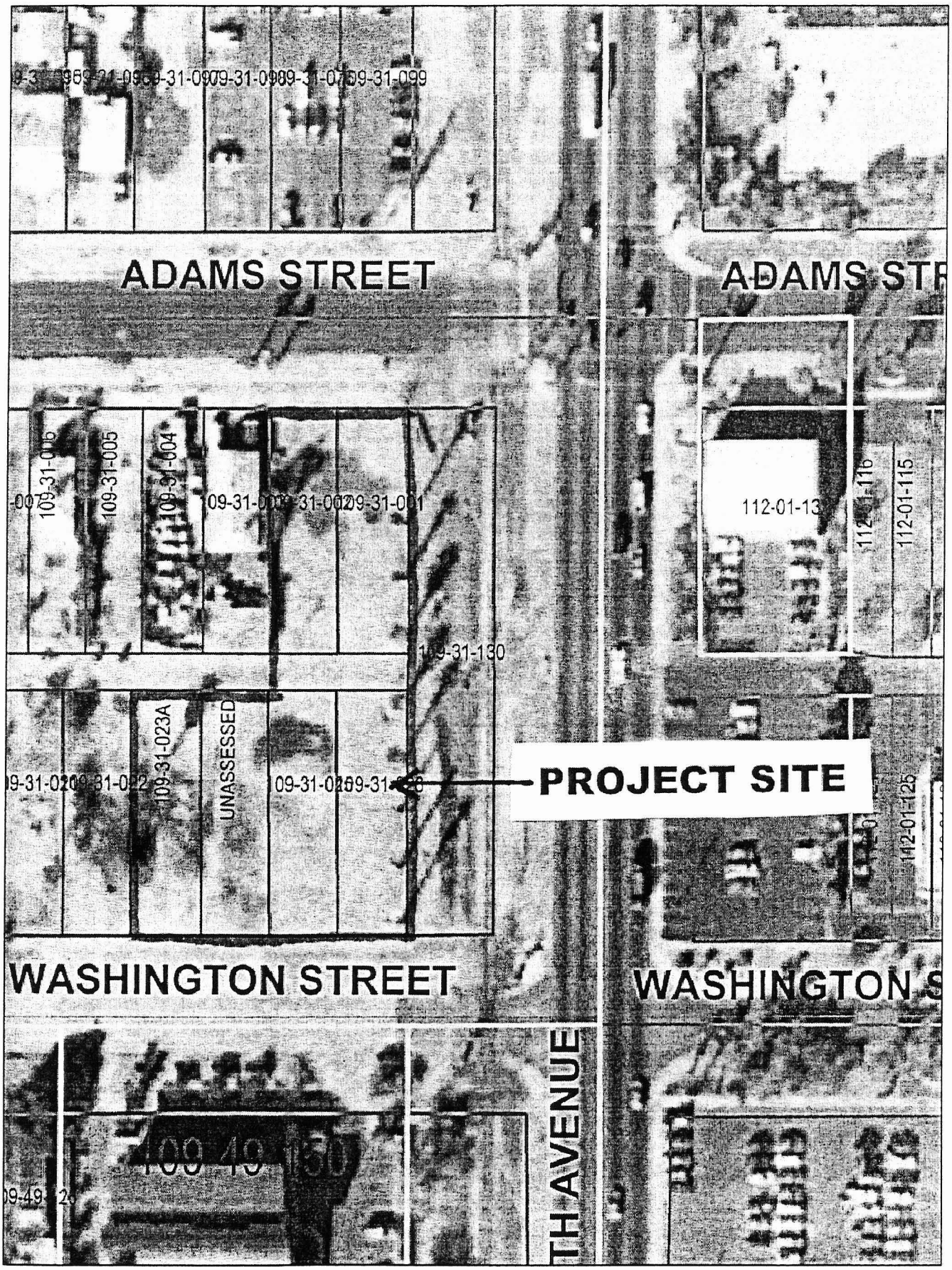
PREMIER ENGINEERING CORPORATION		PORTION OF FEMA FIRM	FIGURE 2
PROJ. NO. [illegible]	DRAWN BY MD		
DATE [illegible]	DESIGNED BY [illegible]		

Single Lot Building



PREMIER ENGINEERING CORPORATION	COP REQUIREMENT CHART	FIGURE 3
PROJECT NO. 2002010 DRAWN BY KL		
DATE 7/02 DESIGNED BY KD		

$USER$ $DATE$ $TIME$ $FILE$



PREMIER ENGINEERING CORPORATION	2003 AERIAL PHOTO	FIGURE 4
PROJECT NO. 2002010 DRAWN BY KL		
DATE 7/02 DESIGNED BY KD		

$USER$ $DATE$ $TIME$ $FILE$

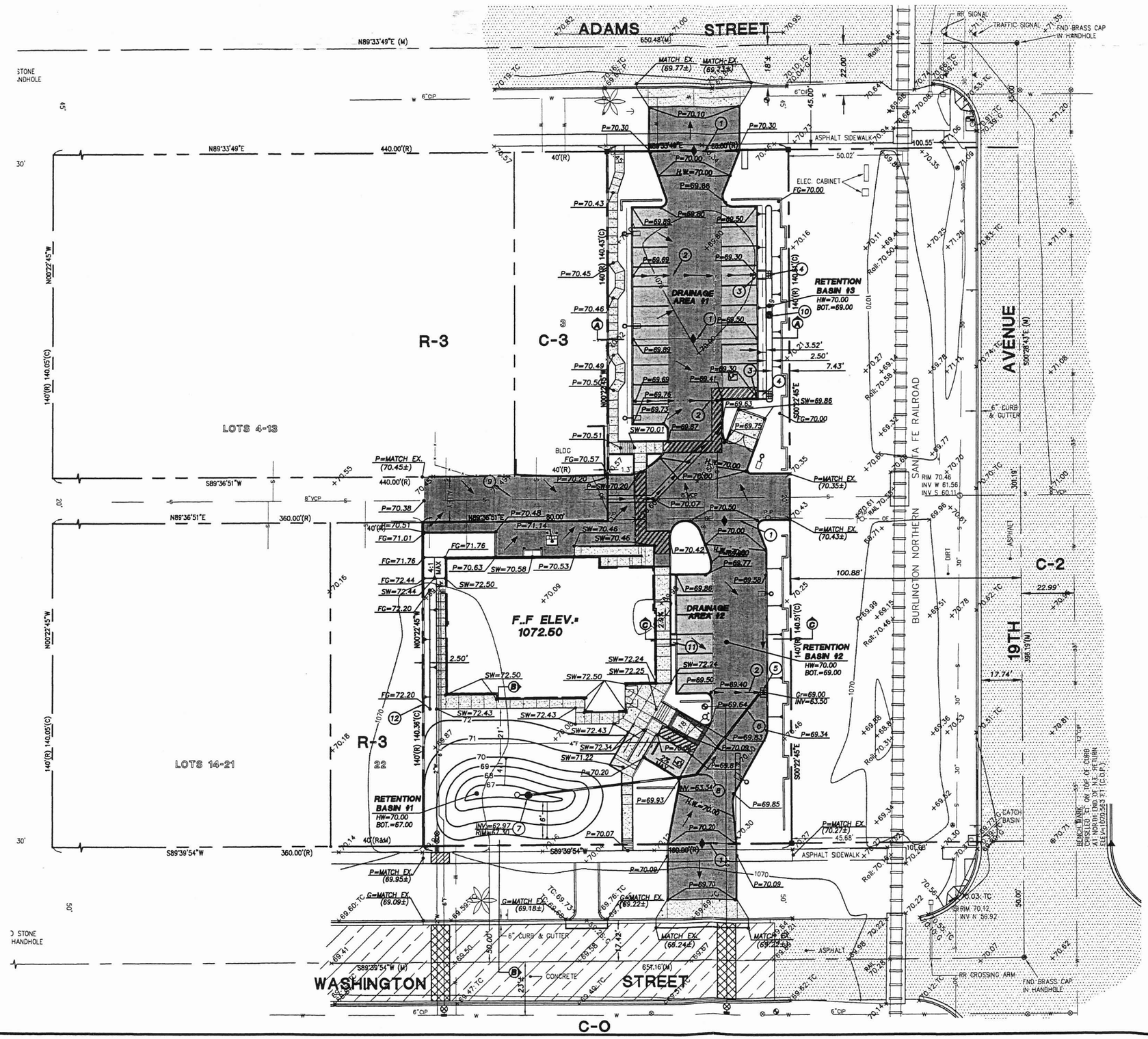
FIGURE 5

PREMIER

ASA OFFICE BUILDING
SITE PLAN
FEMA MODEL CROSS SECTION

DRAWING NAME:

XREF LIST:



CONSTRUCTION NOTES

1. CONSTRUCT PAVEMENT RIDGE/GRADE BREAK.
2. CONSTRUCT ASPHALT VALLEY GUTTER.
3. CURB OPENING PER SHEET C-1.03.
4. CONSTRUCT CONCRETE & RIP-RAP SPILLWAY PER DETAIL 250-A ON SHEET C1.04.
5. CONSTRUCT CATCH BASIN PER MAG STD DTL 535.
6. INSTALL 8" HDPE ADS N-12 STORM DRAIN PIPE OR APPROVED EQUAL.
7. CONSTRUCT MAXWELL-PLUS, DRYWELL PER DETAIL ON SHEET C-1.04.
8. INSTALL 8"-45° PIPE COLLAR.
9. CONSTRUCT CONCRETE VALLEY GUTTER PER SHEET C-1.03.
10. CONSTRUCT MAXWELL, TYPE IV DRYWELL PER DETAIL ON SHEET C-1.04.
11. CONCRETE SPILLWAY PER ARCHITECTURAL PLANS.
12. RETAINING WALL PER ARCHITECTURAL PLANS.

NOTES:

1. SEE SHEET C-1.04 FOR SECTIONS.
2. TOP OF CURB TO BE 6" ABOVE PAVEMENT GRADE UNLESS NOTED OTHERWISE.

RETENTION CALCULATIONS

SITE DATA

DRAINAGE AREA #1

A = 0.26 Ac.
C = 0.90
i = 1.25 in/hr (100, 2 hr)

REQUIRED VOLUME = 7,200 CIA
V_R = 2,106 cf

RETENTION BASIN #3

MAX. DEPTH = 1.00 ft
CROSS SECTION AREA = 28 sf
LENGTH = 85 ft

AVAILABLE VOLUME = 2,380 cf

DRAINAGE AREA #2

A = 0.51 Ac.
C = 0.90
i = 1.25 in/hr (100, 2 hr)

REQUIRED VOLUME = 7,200 CIA
V_R = 4,131 cf

RETENTION BASIN #1

MAX. DEPTH = 3.00 ft
HW AREA = 2,094 sf
BOT AREA = 176 sf

AVAILABLE VOLUME = 3,406 cf

RETENTION BASIN #2 (Parking Lot)

MAX. DEPTH = 1.00 ft
EFFECTIVE DEPTH = 0.50 ft.
HW AREA = 4000 sf

AVAILABLE VOLUME = 2,000 cf

FLOOD ZONE

THIS PROPERTY IS LOCATED IN FLOOD ZONE "AE" IN ACCORDANCE WITH THE FLOOD INSURANCE RATE MAP #04013C1230 F, DATED JULY 19, 2001. FLOOD ZONE "AE" IS DEFINED AS SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD WITH BASE FLOOD ELEVATIONS DETERMINED.

N

PRELIMINARY PLAN
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALE
20 0 10 20
1 INCH = 20 FT

Two working days before you dig CALL FOR THE BLUE STAKES 602-263-1100 Blue Stake Center

PREMIER
ENGINEERING CORPORATION
1600 W. BROADWAY ROAD, SUITE 165
TEMPE, AZ 85282
(480)829-6000 FAX (480)829-6016

REVISIONS	DATE

Registered Professional Engineer (Civil) CERTIFICATE 32837 KIMBERLY J. FOTI Date Signed Arizona, U.S.A.

ASA OFFICE BUILDING
1910 W. WASHINGTON STREET
PHOENIX, ARIZONA

SHEET TITLE: GRADING AND DRAINAGE PLAN

STATUS: REVIEW

DRAFTED: GJA
DESIGNED: KJF
CHECKED: SHM
DATE: December 1, 2003
JOB NO: 2003011

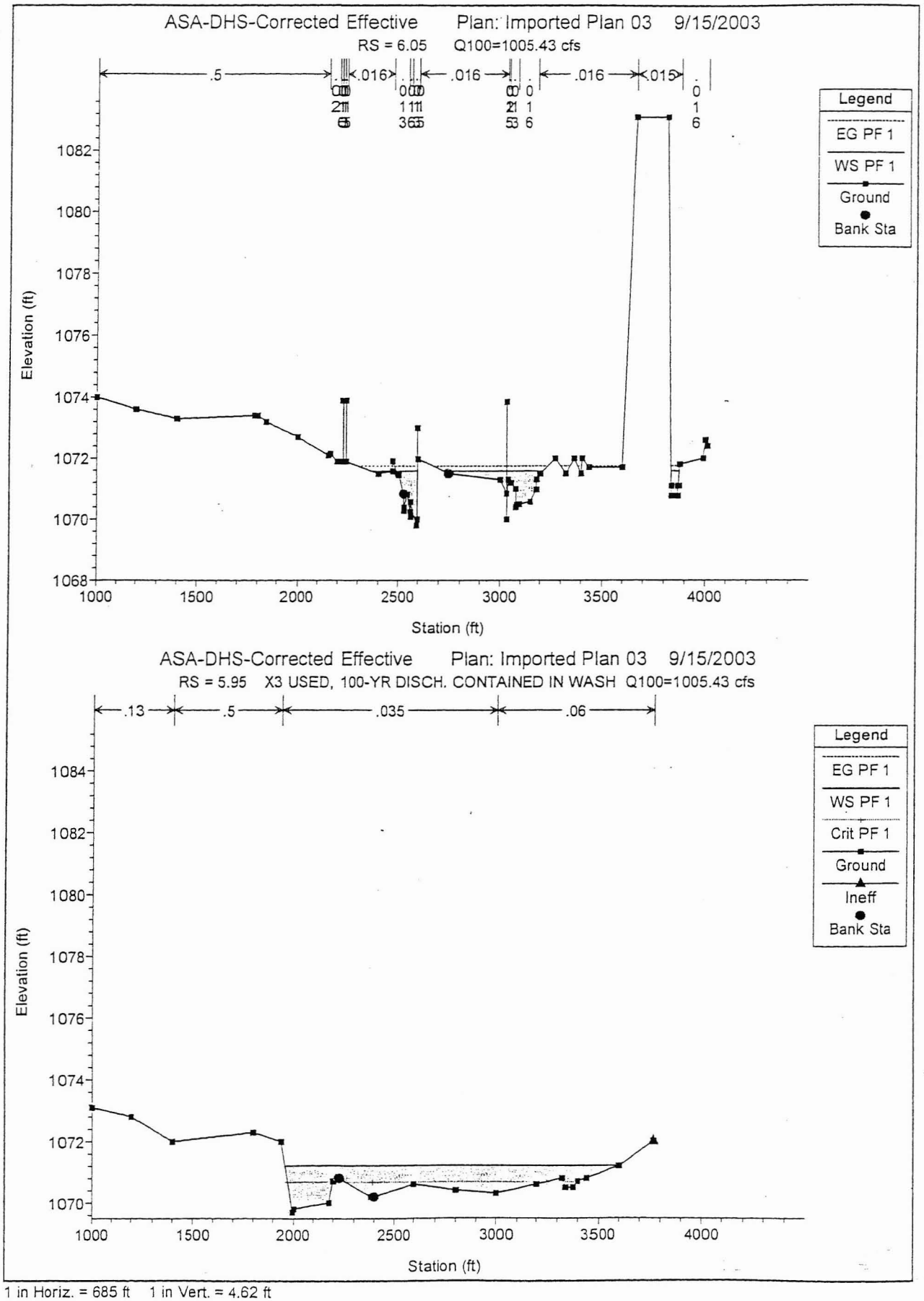
SHEET NO: C-1.02
02 OF 4

KIVA # 03-1269 SDEV # 0300529 G.S. 10-24

APPENDIX A

HEC-RAS MODEL RESULTS FOR EXISTING CONDITION

- CROSS SECTION PLOT
- SUMMARY TABLE
- GENERATED REPORT



1 in Horiz. = 685 ft 1 in Vert. = 4.62 ft

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9.61	PF 1	1237.00	1118.50	1119.94	1119.28	1119.95	0.016058	1.08	1201.64	1477.16	0.20
Reach-1	9.55	PF 1	1237.00	1116.40	1117.96	1117.00	1117.96	0.002765	0.61	2014.28	1994.69	0.09
Reach-1	9.45	PF 1	1237.00	1114.90	1116.34	1115.54	1116.34	0.003877	0.64	1925.87	2105.37	0.10
Reach-1	9.36	PF 1	1237.00	1112.80	1114.14		1114.15	0.005243	0.70	1808.39	1858.99	0.12
Reach-1	9.27	PF 1	1237.00	1110.80	1112.54		1112.65	0.001903	4.25	1710.21	1827.57	0.61
Reach-1	9.17	PF 1	1237.00	1109.60	1110.91	1110.65	1111.03	0.006741	3.51	1052.01	2021.00	0.62
Reach-1	9.08	PF 1	1210.00	1107.30	1108.56	1108.29	1108.73	0.003223	4.71	1363.24	1863.54	0.76
Reach-1	8.98	PF 1	1210.00	1106.00	1107.37		1107.47	0.001972	3.89	1949.82	2826.59	0.61
Reach-1	8.89	PF 1	1210.00	1104.90	1105.95		1106.03	0.004488	4.46	1589.34	2551.66	0.85
Reach-1	8.79	PF 1	1210.00	1103.00	1104.21		1104.28	0.002804	3.78	1760.54	2411.50	0.69
Reach-1	8.7	PF 1	1210.00	1101.40	1102.42		1102.56	0.004246	4.80	1567.28	2758.85	0.85
Reach-1	8.61	PF 1	1210.00	1099.90	1100.62		1100.65	0.003370	3.19	1936.34	2786.80	0.70
Reach-1	8.51	PF 1	1210.00	1098.50	1098.96	1098.62	1098.98	0.003375	2.32	1288.44	2888.32	0.65
Reach-1	8.42	PF 1	1210.00	1096.30	1097.08	1096.81	1097.12	0.004154	3.15	1430.63	3027.72	0.76
Reach-1	8.32	PF 1	1210.00	1095.10	1096.00		1096.02	0.001399	2.41	1748.05	3143.80	0.47
Reach-1	8.23	PF 1	1210.00	1094.40	1094.91		1094.93	0.003805	1.61	1207.66	2436.74	0.42
Reach-1	8.18	PF 1	1375.00	1092.80	1093.70	1093.52	1093.75	0.004851	2.22	880.09	2156.49	0.49
Reach-1	8.08	PF 1	1375.00	1091.80	1092.79	1092.37	1092.81	0.000962	1.20	1380.20	2226.23	0.22
Reach-1	7.99	PF 1	1375.00	1090.70	1091.40	1091.22	1091.49	0.013067	3.54	871.22	1836.67	0.83
Reach-1	7.89	PF 1	1375.00	1089.30	1089.48		1089.51	0.001664	0.74	1272.74	2463.49	0.38
Reach-1	7.8	PF 1	1375.00	1087.20	1088.13	1087.90	1088.20	0.004615	4.10	1050.97	2427.86	0.84
Reach-1	7.71	PF 1	1375.00	1085.50	1086.56		1086.59	0.002420	3.79	1809.10	3110.45	0.65
Reach-1	7.66	PF 1	1691.00	1084.50	1085.73		1085.81	0.005185	4.14	1173.82	2425.00	0.88
Reach-1	7.57	PF 1	1691.00	1083.40	1085.18		1085.20	0.000538	2.11	2675.03	4169.94	0.32
Reach-1	7.48	PF 1	1691.00	1084.00	1084.32	1084.10	1084.39	0.024200	5.37	1471.83	3984.08	1.68
Reach-1	7.38	PF 1	1691.00	1082.00	1083.26		1083.28	0.000756	2.25	2936.23	4007.71	0.37
Reach-1	7.29	PF 1	1691.00	1081.50	1082.69		1082.72	0.001943	2.98	2472.53	3216.28	0.56
Reach-1	7.2	PF 1	1691.00	1081.40	1081.81		1081.82	0.001664	1.52	1861.44	2790.08	0.45
Reach-1	7.11	PF 1	1865.00	1079.80	1081.10	1080.54	1081.12	0.001344	2.77	2252.06	2820.51	0.48
Reach-1	7.06		Lat Struct									
Reach-1	7.01	PF 1	1552.03	1079.50	1080.11		1080.16	0.003125	2.99	1576.93	2772.18	0.67
Reach-1	6.96		Lat Struct									
Reach-1	6.94	PF 1	1271.39	1078.70	1079.48		1079.49	0.001085	1.71	1498.70	2239.67	0.39
Reach-1	6.91		Lat Struct									
Reach-1	6.88	PF 1	980.43	1079.00	1079.23		1079.24	0.000446	0.50	1809.38	2438.28	0.21
Reach-1	6.8	PF 1	980.43	1078.00	1078.91		1078.93	0.001354	2.42	1856.59	2188.12	0.47

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	6.7	PF 1	980.43	1077.50	1077.98		1077.99	0.002771	0.31	1456.93	1781.21	0.09
Reach-1	6.61	PF 1	980.43	1076.00	1077.01		1077.02	0.001441	0.10	1490.56	2004.75	0.02
Reach-1	6.52	PF 1	980.43	1075.40	1075.79	1075.65	1075.89	0.004526	1.34	406.16	883.00	0.47
Reach-1	6.42	PF 1	980.43	1074.20	1074.94	1074.48	1074.97	0.000955	1.44	802.64	1304.46	0.36
Reach-1	6.33	PF 1	980.43	1073.40	1074.36	1073.87	1074.40	0.001407	2.53	1083.82	1634.93	0.48
Reach-1	6.23	PF 1	980.43	1072.60	1073.81	1073.21	1073.84	0.000896	2.34	1211.76	1652.76	0.40
Reach-1	6.14	PF 1	980.43	1071.80	1072.75	1072.72	1072.90	0.005912	4.30	387.84	950.93	0.94
Reach-1	6.05	PF 1	1005.43	1069.80	1071.66		1071.77	0.001298	2.98	386.41	855.84	0.60
Reach-1	5.95	PF 1	1005.43	1070.20	1071.26	1070.68	1071.27	0.000707	0.96	1220.26	1539.73	0.19
Reach-1	5.86	PF 1	1005.43	1069.30	1070.77		1070.79	0.001404	1.39	1235.87	2197.84	0.27
Reach-1	5.76	PF 1	1005.43	1068.50	1069.46		1069.49	0.005332	1.13	782.09	915.72	0.23
Reach-1	5.67	PF 1	1005.43	1067.30	1068.75		1068.76	0.000690	0.50	1955.36	2007.94	0.09
Reach-1	5.57	PF 1	1005.43	1066.60	1068.29		1068.29	0.001189	0.87	1992.99	1773.89	0.12
Reach-1	5.53		Lat Struct									
Reach-1	5.48	PF 1	1005.43	1066.40	1067.64		1067.65	0.001327	1.35	1390.33	1501.34	0.22
Reach-1	5.38	PF 1	1638.43	1065.00	1066.26	1065.83	1066.33	0.004462	2.47	1192.28	1693.80	0.40
Reach-1	5.31	PF 1	1638.43	1063.50	1065.13	1064.47	1065.15	0.002064	1.39	1414.79	1439.51	0.21
Reach-1	5.25	PF 1	1638.43	1062.60	1064.28	1063.80	1064.42	0.003173	4.73	1620.81	1471.09	0.64
Reach-1	5.23		Lat Struct									
Reach-1	5.2	PF 1	1501.93	1062.00	1063.48	1062.87	1063.58	0.002658	3.98	1530.20	1309.84	0.58
Reach-1	5.15		Lat Struct									
Reach-1	5.1	PF 1	1387.14	1060.30	1061.57	1061.46	1061.73	0.005716	4.96	1343.74	2042.72	0.81
Reach-1	5.08		Lat Struct									
Reach-1	5.07	PF 1	1330.93	1059.60	1061.04	1060.09	1061.06	0.001911	3.32	2285.39	2145.49	0.49
Reach-1	5.03	PF 1	1330.93	1059.80	1059.63	1059.59	1059.80	0.255071		412.89	989.54	0.00
Reach-1	4.98	PF 1	1330.93	1058.50	1059.25		1059.25	0.000494	1.09	3938.88	3577.98	0.22
Reach-1	4.95	PF 1	1330.93	1056.80	1059.23		1059.23	0.000042	0.69	8938.05	3924.16	0.08
Reach-1	4.89	PF 1	1330.93	1056.80	1059.22		1059.22	0.000017	0.42	11172.95	3099.71	0.05
Reach-1	4.79	PF 1	1330.93	1054.40	1059.21	1054.09	1059.21	0.000013	0.54	10311.23	2443.45	0.05

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: ASA-DHS-Corrected Effective
Project File : ExstgDHS.prj
Run Date and Time: 9/12/2003 11:46:22 AM

Project in English units

Project Description:
DHS Drainage Study for new Building and parking structure FEMA FLOOD
INSURANCE RE-STUDY CELLA BARR ASSPCIATES
OF MARICOPA COUNTY,
ARIZONA 5062 N. 19TH AVE.
CAVE CREEK WASH JOB
#04856-05-75 PHOENIX, ARIZONA 85015
FEMA FLOOD INSURANCE
RE-STUDY CELLA BARR ASSPCIATES
OF MARICOPA COUNTY, ARIZONA
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FLOW DATA

Flow Title: Imported Flow 05
Flow File : a:\ExstgDHS.f05

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	9.61	1237
RIVER-1	Reach-1	9.08	1210
RIVER-1	Reach-1	8.18	1375
RIVER-1	Reach-1	7.66	1691
RIVER-1	Reach-1	7.11	1865
RIVER-1	Reach-1	6.05	1890
RIVER-1	Reach-1	5.38	2523

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Critical	Known WS = 1059.21

GEOMETRY DATA

Geometry Title: Imported Geom 03
Geometry File : a:\ExstgDHS.g03

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9.61

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3000	1121.6	3024.7	1121.8	3041.6	1121.6	3085.6	1121.5	3101.4	1121.7
3116.6	1121.9	3301.4	1121.9	3501.4	1121.8	3701.4	1121.4	3880	1120
4101.4	1119.1	4301.4	1119.2	4501.4	1118.5	4644.6	1118.6	4701.4	1118.8

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  4901.4  1119.1  5101.4    1119  5301.4  1119.9  5501.4    1120  5587.5  1120.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    3000     .16    3880     .16  4644.6     .16

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3880  4644.6              360     360     360             .1       .3
Sediment Elevation = 0

CROSS SECTION

*****
FOLLOWING RIVER STATIONS WERE DELETED UNTIL RS 6.23
*****


RIVER: RIVER-1
REACH: Reach-1            RS: 6.14

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1074.8    1200  1074.6    1400  1074.7    1649  1074.6  1657.9  1073.8
  1695.2  1073.6    1800  1073.7  1856.2  1073.5    1876  1073.9  1903.1  1073.6
    2000  1073.6    2200  1073.7  2317.7  1072.8    2400  1073.1  2599.9    1073
  2799.9  1072.5  2851.8  1072.5  2860.7  1071.9  2866.2  1072.4  2999.9  1072.5
  3072.5    1072  3110.2  1071.8    3130    1072  3199.9  1072.2  3399.9  1072.5
  3599.9  1072.1  3627.7  1072.5  3724.6  1073.5  3799.9  1072.9    3900    1073
  3999.9    1072    4115  1071.5    4740    1072

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .13  1657.9     .03    1876      .5    2200     .03  2999.9     .02
    3130     .03  3799.9     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        2999.9    3130              490     480     450             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  3724.6    4740  1073.5        F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  3724.6    4740  1073.5
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 6.05

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    1074    1200  1073.6    1400  1073.3    1789  1073.4    1800  1073.4
  1842.1  1073.2    2000  1072.7  2156.86  1072.1  2166.64  1072.15    2200  1071.9
 2210.09  1071.9  2210.73  1071.9  2217.12  1071.9  2222.11  1071.9  2222.12  1073.9
 2236.21  1073.9  2236.22  1071.9    2400  1071.5  2472.43  1071.58  2473.05  1071.91
 2497.85  1071.5  2502.86  1071.46  2527.79  1070.83  2528.39  1070.29  2529.62  1070.4
 2545.84  1070.81  2561.71  1070.25  2562.93  1070.09  2563.39  1070.58  2592.84  1069.8
 2595.84    1070  2595.85    1073  2596.51    1073  2596.52    1070  2598.94  1071.97
    2750  1071.5   2999.9  1071.3    3032  1070.85  3032.01  1073.85  3032.34  1073.85
 3032.34    1070  3039.65  1071.31  3054.57  1071.2  3076.36    1071  3078.27  1070.4
 3081.92  1070.49  3094.1  1070.5  3150.72  1070.58  3183.33  1070.98  3183.83  1071.31

  3199.9  1071.5  3271.56    1072   3324.9  1071.5  3364.27    1072   3399.9  1071.5
 3405.55    1072  3439.75  1071.7   3599.9  1071.7  3664.06  1083.1  3812.76  1083.1
  3838.6  1071.1   3839.1  1070.77  3869.46  1070.77  3869.97  1071.1    3874  1071.1
 3877.88  1071.8  3990.25    1072   3999.9  1072.6   4009.6  1072.4

Manning's n Values        num=      18
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    1000      .5  2156.86     .02    2200    .016  2210.73    .013  2222.11    .015
 2236.22    .016  2472.43    .013  2545.84    .016  2563.39    .013  2595.84    .015
 2598.94    .016    3032    .015  3032.34     .02  3039.65    .013  3081.92    .016
 3183.83    .016  3664.06    .015  3877.88    .016

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        2527.79    2750              560     500     480             .1       .3
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.95

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1073.1    1200  1072.8    1400    1072    1800  1072.3  1939.2    1072
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   1992.7  1069.7    2000  1069.8  2179.3    1070    2200  1070.7    2225  1070.8
   2385.2  1070.2    2400  1070.2  2599.9  1070.6  2799.9  1070.4  2999.9  1070.3
   3199.9  1070.6  3323.1  1070.8  3337.6  1070.5  3375.9  1070.5  3399.9  1070.7
   3445.8  1070.8  3599.9  1071.2  3765.7    1072

 Manning's n Values         num=       4
      Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
     1000     .13    1400      .5  1939.2    .035  2999.9     .06

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2225    2400             510     500     470             .1       .3
 Ineffective Flow      num=       1
    Sta L   Sta R    Elev  Permanent
   3765.7  3765.7    1072        F
 Blocked Obstructions      num=       1
    Sta L   Sta R    Elev
   3765.7  3765.7    1072
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1             RS: 5.86

 INPUT
 Description:
 Station Elevation Data     num=      19
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     1000  1072.4    1200  1072.5  1295.5  1072.1  1397.4  1070.2    1400  1070.4
     1600  1070.6    1800  1069.4    2000  1069.8  2083.5  1069.9  2117.1  1069.3
   2168.3  1069.5  2187.8  1070.6    2260  1070.6  2368.8  1069.3    2390    1070
     2450    1070    2940  1070.5    3540  1070.5    3680    1072

 Manning's n Values         num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     1000    .035    2000    .035    2260     .13

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2000    2260             540     500     490             .1       .3
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1             RS: 5.76

 INPUT
 Description:
 Station Elevation Data     num=      15
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     1000  1070.5    1200    1070    1400    1070    1800    1070  1847.1  1068.4
     2000  1068.3    2200  1068.5    2400  1068.5  2599.9  1068.9    2740  1069.5
     3040    1070    3300  1070.5    3820    1070    4600  1070.5    4920    1071

 Manning's n Values         num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     1000     .08    2400     .08  2599.9     .08

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2400  2599.9             490     500     470             .1       .3
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1             RS: 5.67

 INPUT
 Description:
 Station Elevation Data     num=      17
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     1000  1069.9    1200  1067.7    1400  1067.2    1800  1067.4    2050  1067.3
     2280  1068.1    2400  1067.6  2599.9  1068.6  2799.9    1068  2999.9  1068.3
   3199.9  1069.1    3440    1070    3710  1070.5    3960    1070    4040  1069.5
     4140    1070    4500    1070

 Manning's n Values         num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     1000     .08    2050     .08    2280     .08

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2050    2280             530     500     520             .1       .3
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1             RS: 5.57

 INPUT
 Description:
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Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1068.7    1200  1066.9  1356.8  1066.1  1406.1  1066.2    1600  1066.5
    1700  1066.6    1830  1066.8    2000    1067    2200  1067.6  2271.1  1066.9
  2322.9  1066.8    2400  1068.1  2599.9  1068.4  2710.1  1068.2  2735.5  1067.4
  2772.9  1067.6  2799.9    1068  2852.5  1068.1  2916.1  1068.1  2999.9  1068.5
  3102.4  1068.7    3600  1068.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .13    1700     .08    1830     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1700    1830              450     500     580             .1       .3
Sediment Elevation = 0

LATERAL STRUCTURE


RIVER: RIVER-1
REACH: Reach-1            RS: 5.53

INPUT
Description: Left Overbank Between Stations 5.48 and 5.57
Lateral structure position     = Left overbank
Distance from Upstream XS =       0
Deck/Roadway Width        =       0
Weir Coefficient          =    1.55
Weir Flow Reference       = Water Surface
 Weir Embankment Coordinates    num =        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    1070     730    1068     860  1066.7    1560  1066.7    1660    1068

Weir crest shape                          = Broad Crested


CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.48

INPUT
Description: WEIR FLOW INTO I-10 FREEWAY FLOW RETUTRNS AT SECTION 4.98. FLOW
             PATH
 FOR OVER SPILL IS THE I-10 FREEWAY. IN THIS MODEL IT IS
             ASSUMED THAT
 THE SOUTHER PACIFIC RAILROAD DOES NOT FUNCTION AS A
             LEVEE AND HAS
 FAILED ALLOWING FLOW TO FOLLOW ITS NATURAL
             COURSE.

Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  3203.5  1068.6  3399.9  1069.3  3599.9  1068.5  3799.9  1067.6  3999.9  1067.3
  4199.9  1067.1  4399.9  1066.6  4599.9  1066.1    4710  1066.4  4799.9  1066.5
    4850  1066.4  4899.6  1070.1  4999.9  1070.1  5070.2  1069.7  5088.8  1065.6
    5117  1065.5  5123.1  1064.5  5134.6  1066.2  5199.9  1066.4  5399.9  1066.7
  5454.2  1066.7  5505.7  1066.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  3203.5     .13    4710    .045    4850     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          4710    4850              500     500     520             .1       .3
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.38

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data     num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1068.5  1037.9  1068.5    1065  1070.2  1161.3  1068.7    1200  1068.8
  1371.6  1067.7    1400  1067.6    1423  1067.6    1600  1067.2    1800    1066
  1991.9  1064.4    2000  1064.5  2051.5  1064.6    2200  1065.6    2400    1066
  2599.9  1065.8  2742.2  1066.2  2799.9  1066.5  2999.9  1066.7  3199.9  1066.5
  3302.6  1066.8  3353.6  1067.1  3399.9  1067.6  3599.9  1067.7  3799.9  1066.7
  3999.9  1066.2  4199.9    1066  4399.9  1065.8  4599.9  1065.7  4799.9  1065.6
  4999.9  1065.4    5130  1065.1  5199.9  1065.1    5240    1065  5399.9    1065
  5599.8  1065.4  5656.3  1066.1  5698.7  1066.7

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .13    5130    .045    5240    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5130    5240              400     400     400             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
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```
    1000  3599.9  1067.7       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1000  3599.9  1067.7
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.31

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1064.2    1200  1065.1    1400  1064.2    1800  1064.5    2000  1064.5
  2117.1  1064.1  2122.4  1063.7    2160  1063.8    2200  1064.2    2400    1065
  2599.9  1065.6    2725  1065.3  2781.3  1065.6  2799.9  1066.2  2999.9  1066.6
  3199.9  1066.3  3399.9  1066.2  3599.9  1065.3  3799.9  1064.5  3999.9  1064.2
  4199.9  1064.2  4399.9  1064.4  4599.9  1063.9    4670    1064    4770  1063.5
  4799.9  1063.1  4999.9  1063.8  5106.3  1065.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06    4670     .06    4770     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          4670    4770              290     280     280              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1000  2999.9  1066.6       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1000  2999.9  1066.6
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.25

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    1065    1200  1064.5    1400  1064.2    1800  1063.6    2000  1063.2
    2200  1062.8    2400  1062.8  2599.9  1062.4  2799.9  1062.2  2999.9    1063
  3199.9  1063.4  3399.9  1063.9  3599.9  1064.2  3799.9  1064.5  3999.9    1065
  4199.9  1064.6  4399.9    1064  4599.9  1063.3  4799.9  1063.4  4999.9  1062.8
  5199.9  1062.4    5350  1062.6  5399.9  1062.6    5430  1062.6  5550.8    1063
  5799.8  1064.4  5894.3  1064.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .13    5350    .025    5430     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5350    5430              290     280     285              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1000  3999.9    1065       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1000  3999.9    1065
Sediment Elevation = 0

LATERAL STRUCTURE


RIVER: RIVER-1
REACH: Reach-1            RS: 5.23

INPUT
Description: Left Overbank Between Stations 5.20 and 5.25
Lateral structure position     = Left overbank
Distance from Upstream XS =       0
Deck/Roadway Width        =       0
Weir Coefficient          =    1.55
Weir Flow Reference       = Water Surface
 Weir Embankment Coordinates     num =        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  1064.4      80    1064     180    1063     280  1062.9

Weir crest shape                          = Broad Crested


CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.2

INPUT
```

Description: WEIR FLOW INTO I-10 FREEWAY FLOW RETUTRNS AT SECTION 4.98. FLOW
PATH
FOR OVER SPILL IS THE I-10 FREEWAY
X3 CARD USED SO THAT
THE 100-YR DISCHARGE IS CONTAINED WITHIN THE FLOW
PATH OF CAVE
CREEK WASH

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1065.7	1200	1064.7	1376.5	1064.4	1400	1065.5	1430.6	1065.4
1439.3	1064.3	1600	1064.3	1800	1063.7	2000	1063.7	2074.4	1063.5
2086.6	1062.7	2157.5	1062.4	2200	1062.9	2400	1063	2599.9	1063.1
2799.9	1062.6	2816.3	1062.5	2852.2	1062.3	2999.9	1062.8	3199.9	1063.3
3399.9	1063.6	3407.4	1063.6	3415.5	1063.3	3478.8	1063.4	3599.9	1063.2
3799.9	1063.8	3999.9	1065.1	4170.9	1065.8	4180.6	1064.6	4199.9	1064.6
4399.9	1064	4599.9	1063.2	4739.6	1062.8	4799.9	1062.7	4999.9	1062.3
5199.9	1062.1	5399.9	1062	5500	1062	5599.8	1061.9	5799.8	1061.8
5806.4	1062	5839.8	1062.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	5399.9	.025	5500	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5399.9	5500	500	500	500	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
1000	4170.9	1065.8	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1000	4170.9	1065.8

Sediment Elevation = 0

LATERAL STRUCTURE

RIVER: RIVER-1
REACH: Reach-1 RS: 5.15

INPUT
Description: Left Overbank Between Stations 5.10 and 5.20
Lateral structure position = Left overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 0
Weir Coefficient = 1.55
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1062.9	200	1062.5	300	1062	500	1061.9

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.1

INPUT
Description: WEIR FLOW INTO I-10 FREEWAY FLOW RETUTRNS AT SECTION 4.98. FLOW
PATH
FOR OVER SPILL IS THE I-10 FREEWAY
X3 CARD USED SO THAT
THE 100-YR DISCHARGE IS CONTAINED WITHIN THE FLOW
PATH OF CAVE
CREEK WASH

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1063.5	1200	1063.1	1400	1062.3	1511	1061.5	1564.4	1062.2
1600	1062.2	1800	1062	2000	1062	2169.2	1061.8	2200	1061.9
2213.6	1061.9	2400	1061.5	2600	1061.4	2771.8	1062.2	2799.9	1062.2
2827.2	1062	2859.4	1063.2	2980.9	1062.8	2992	1061.4	2999.9	1061.4
3199.9	1061.2	3399.9	1060.9	3599.9	1061.1	3799.9	1061	3999.9	1061.2
4137.2	1060.7	4148.9	1061	4199.9	1061	4399.9	1060.9	4599.9	1060.5
4730	1060.9	4765	1060.3	4770	1060.3	4830	1060.3	4999.9	1060.4
5012.8	1060.5	5039.9	1061.9	5081	1061.7	5118.8	1060.4	5139.5	1060.5
5150	1061.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	4730	.025	4830	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4730	4830	200	200	200	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	2859.4	1063.2	F
5039.9	5150	1061.9	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	2859.4	1063.2	5039.9	5150	1061.9

Sediment Elevation = 0

LATERAL STRUCTURE

RIVER: RIVER-1
REACH: Reach-1 RS: 5.08

INPUT
Description: Left Overbank Between Stations 5.07 and 5.10
Lateral structure position = Left overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 0
Weir Coefficient = 1.55
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1061.9	100	1061.5	150	1060.6	200	1060.2

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.07

INPUT
Description: WEIR FLOW INTO I-10 FREEWAY RETUTRNS TO THE MAIN FLOW PATH AT SECTION
X3 CARD USED SO THAT THE 100-YR DISCHARGE IS CONTAINED WITHIN THE FLOW
PATH OF CAVE CREEK WASH
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1062.7	1073.2	1062	1200	1062.3	1600	1061.7	1800	1061.5
2000	1061.5	2200	1061.6	2332.5	1063.1	2400	1062	2600	1061
2799.9	1060.6	2999.9	1060.5	3199.9	1060.3	3399.9	1060.2	3599.9	1059.9
3681.8	1059.6	3799.9	1059.8	3999.9	1059.6	4199.9	1059.6	4225	1059.6
4290	1059.6	4599.9	1059.4	4694.3	1059.3	4716.3	1059.5	4736.7	1060.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	4199.9	.025	4225	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4199.9	4225	210	190	190	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
1000	2332.5	1063.1	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1000	2332.5	1063.1

Sediment Elevation = 0

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.03

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1061.7	1008.8	1061.4	1200	1062.2	1519.2	1061.3	1552.3	1061.3
1568.9	1061.8	1600	1061.9	1704.4	1062.1	1722.7	1064.3	1800	1062.8
2000	1062.5	2112.9	1062.4	2119.7	1062.1	2186.3	1061.5	2200	1061.6
2400	1061.3	2600	1060.6	2799.9	1060.2	2994.5	1059.8	2999.9	1060.3
3004.6	1060.4	3140	1060	3240	1059.8	3399.9	1059.4	3509.8	1059.2
3599.9	1059.3	3799.9	1059.2	3999.9	1058.9	4199.9	1059.2	4399.9	1060.1
4548.3	1060.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	3140	.025	3240	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3140	3240	270	270	280	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.98

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1060	1200	1058.7	1400	1058.3	1497.3	1060.2	1600	1059.3
1800	1059.3	1841.2	1059.3	1867.3	1058	2000	1057.3	2200	1057.5
2400	1056.7	2450.8	1056.5	2600	1057.1	2800	1057.2	2999.9	1057.3
3199.9	1057.6	3399.9	1057.8	3599.9	1058.5	3799.9	1059.1	3999.9	1059.7
4199.9	1058.9	4237.8	1058.3	4249.7	1059.1	4399.9	1059.2	4599.9	1059.3
4760	1058.5	4799.9	1058.5	4850	1058.5	4999.9	1058.6	5213	1060

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.13	4760	.025	4850	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4760	4850	200	175	170	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.95

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1078.3	1006.6	1066.9	1031.4	1065.2	1081.3	1059.6	1088.5	1059.1
1129	1058.8	1200	1057.8	1400	1057.7	1600	1056.5	1677.6	1056.8
1701.1	1057.3	1800	1056.9	1848.2	1056.8	1869.9	1056.3	2000	1056.3
2142.3	1056.2	2156.6	1057.2	2177.1	1056.2	2200	1056.3	2400	1055.6
2600	1055.4	2800	1055.7	2875.5	1055.8	2914.1	1055.9	2926.7	1052.4
2933.1	1054.9	2999.9	1055.3	3199.9	1055.5	3399.9	1056.1	3580	1056.8
3599.9	1056.8	3650	1056.8	3799.9	1057.3	3999.9	1058.7	4199.9	1058.5
4399.9	1058.5	4599.9	1057.7	4799.9	1058.2	4999.9	1058.3	5018.8	1059.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	3580	.025	3650	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3580	3650	315	315	250	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.89

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1065.5	1040.8	1069.9	1109.1	1066.7	1172.3	1060.3	1178.6	1056.5
1200	1056.5	1400	1055.6	1460.9	1055.6	1476.9	1054.9	1600	1055.5
1771	1055.2	1787.3	1054.1	1800	1054.2	2000	1054.2	2200	1053.7
2400	1053.8	2461.4	1053.8	2470.5	1054.7	2600	1054.5	2684.7	1054.2
2800	1055.1	2999.9	1055.2	3199.9	1055.7	3399.9	1057.2	3599.9	1057.3
3799.9	1056.8	3900	1057	3999.9	1057.2	4199.9	1057.5	4290.2	1059.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	3799.9	.025	3900	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3799.9	3900	570	500	500	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.79

INPUT
Description: THIS IS THE FLOODPLAIN MODEL TO BE USED IN CONJUCTION WITH THE

FLOODWAY MODEL, CAVE.FLDWY.2. THIS MODEL UTILIZES THE SPLIT
FLOW
AND X3 CARDS. THE X3 CARDS ARE USED TO SET CROSS-SECTION
"BOUNDARIES"
AT TOPOGRAPICALLY HIGH GROUND THAT CONTAINS THE
Q100-YR WITHIN THE
CROSS-SECTION.
CROSS-SECTION EXTENDED
MESSAGES OCCUR AT LOCATIONS OF WEIR FLOW.

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1077.7	1042.8	1085.6	1120.1	1083.6	1200	1055.7	1260.7	1054.4
1305.3	1054.9	1400	1052	1421	1051.4	1447.4	1054.1	1501.2	1054.7
1600	1054.3	1800	1053.7	2000	1053.6	2200	1054	2400	1054.7
2600	1054.5	2760	1054.4	2789.3	1055.4	2800	1055.4	2850	1055.4
2999.9	1055.8	3199.9	1056.1	3307.6	1056.5	3399.9	1057.8	3599.9	1057.9
3633.4	1059.2								

Manning's n Values num= 3

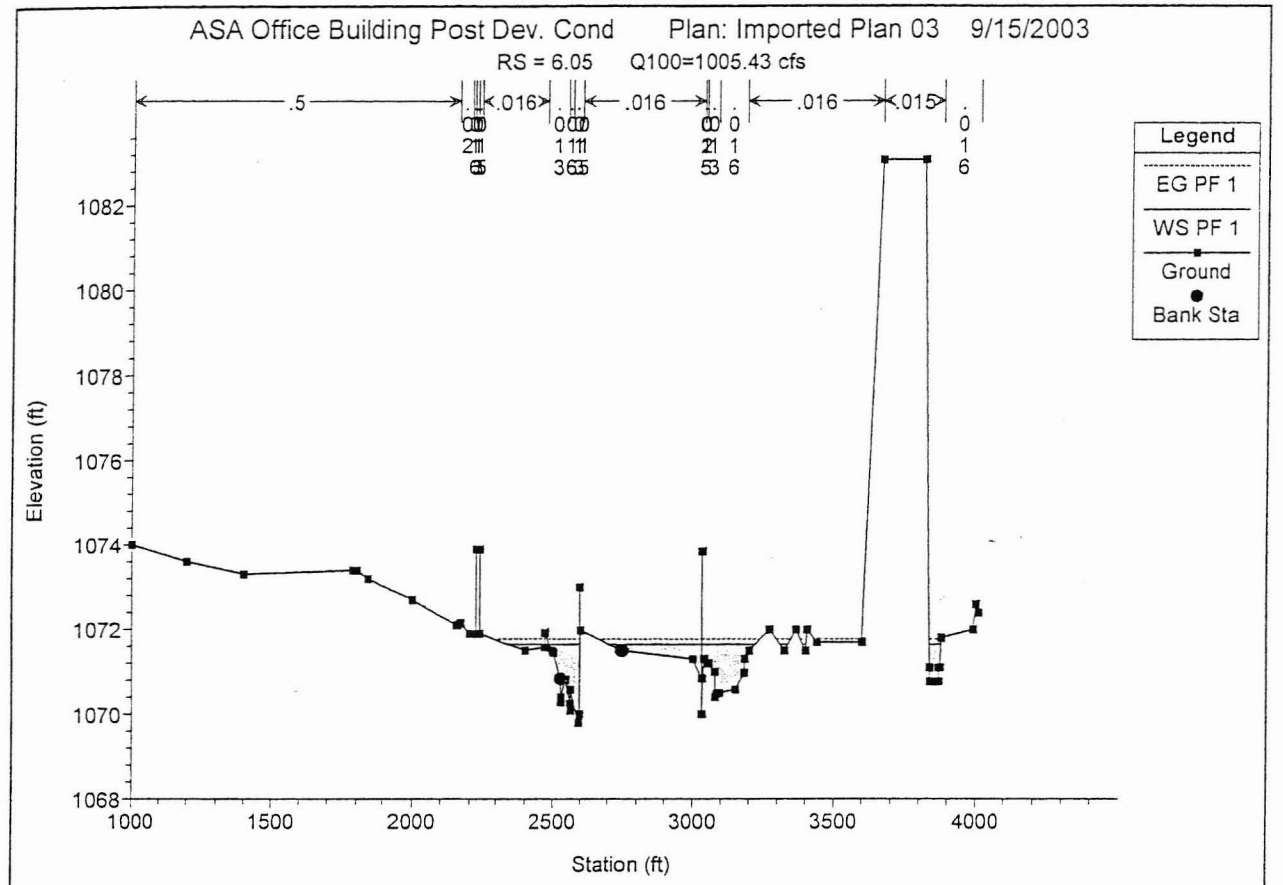
Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	2760	.025	2850	.13

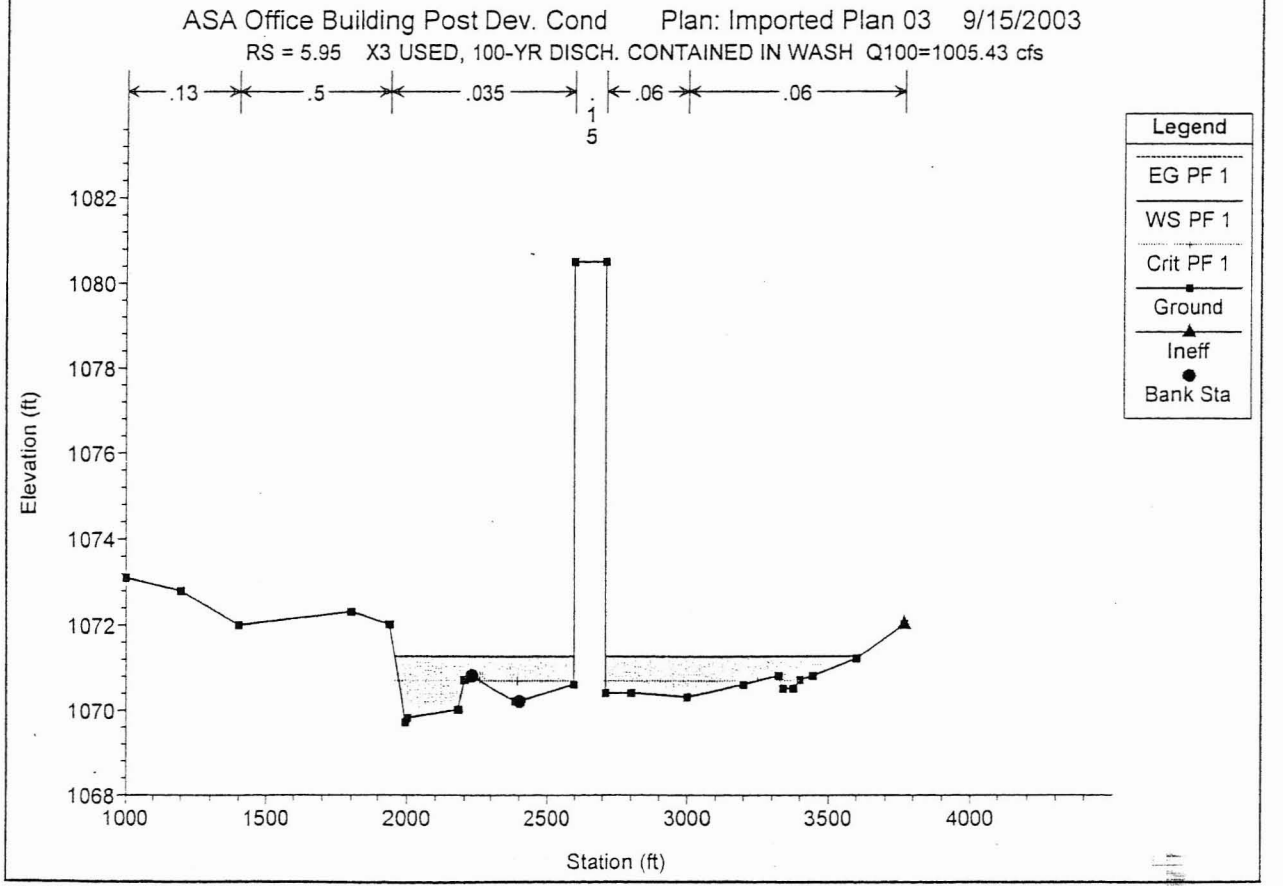
Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2760	2850	0	0	0	.1	.3

APPENDIX B

HEC-RAS MODEL RESULTS FOR DEVELOPED CONDITION

- CROSS SECTION PLOT
- SUMMARY TABLE
- GENERATED REPORT





1 in Horiz. = 685 ft 1 in Vert. = 4.62 ft

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	9.61	PF 1	1237.00	1118.50	1119.94	1119.28	1119.95	0.016058	1.08	1201.64	1477.16	0.20
Reach-1	9.55	PF 1	1237.00	1116.40	1117.96	1117.00	1117.96	0.002765	0.61	2014.28	1994.69	0.09
Reach-1	9.45	PF 1	1237.00	1114.90	1116.34	1115.54	1116.34	0.003877	0.64	1925.87	2105.37	0.10
Reach-1	9.36	PF 1	1237.00	1112.80	1114.14		1114.15	0.005243	0.70	1808.39	1858.99	0.12
Reach-1	9.27	PF 1	1237.00	1110.80	1112.54		1112.65	0.001903	4.25	1710.21	1827.57	0.61
Reach-1	9.17	PF 1	1237.00	1109.60	1110.91	1110.65	1111.03	0.006741	3.51	1052.01	2021.00	0.62
Reach-1	9.08	PF 1	1210.00	1107.30	1108.56	1108.29	1108.73	0.003223	4.71	1363.24	1863.54	0.76
Reach-1	8.98	PF 1	1210.00	1106.00	1107.37		1107.47	0.001972	3.89	1949.82	2826.59	0.61
Reach-1	8.89	PF 1	1210.00	1104.90	1105.95		1106.03	0.004488	4.46	1589.34	2551.66	0.85
Reach-1	8.79	PF 1	1210.00	1103.00	1104.21		1104.28	0.002804	3.78	1760.54	2411.50	0.69
Reach-1	8.7	PF 1	1210.00	1101.40	1102.42		1102.56	0.004246	4.80	1567.28	2758.85	0.85
Reach-1	8.61	PF 1	1210.00	1099.90	1100.62		1100.65	0.003370	3.19	1936.34	2786.80	0.70
Reach-1	8.51	PF 1	1210.00	1098.50	1098.96	1098.62	1098.98	0.003375	2.32	1288.44	2888.32	0.65
Reach-1	8.42	PF 1	1210.00	1096.30	1097.08	1096.81	1097.12	0.004154	3.15	1430.63	3027.72	0.76
Reach-1	8.32	PF 1	1210.00	1095.10	1096.00		1096.02	0.001399	2.41	1748.05	3143.80	0.47
Reach-1	8.23	PF 1	1210.00	1094.40	1094.91		1094.93	0.003805	1.61	1207.66	2436.74	0.42
Reach-1	8.18	PF 1	1375.00	1092.80	1093.70	1093.52	1093.75	0.004851	2.22	880.09	2156.49	0.49
Reach-1	8.08	PF 1	1375.00	1091.80	1092.79	1092.37	1092.81	0.000962	1.20	1380.20	2226.23	0.22
Reach-1	7.99	PF 1	1375.00	1090.70	1091.40	1091.22	1091.49	0.013067	3.54	871.22	1836.67	0.83
Reach-1	7.89	PF 1	1375.00	1089.30	1089.48		1089.51	0.001664	0.74	1272.74	2463.49	0.38
Reach-1	7.8	PF 1	1375.00	1087.20	1088.13	1087.90	1088.20	0.004615	4.10	1050.97	2427.86	0.84
Reach-1	7.71	PF 1	1375.00	1085.50	1086.56		1086.59	0.002420	3.79	1809.10	3110.45	0.65
Reach-1	7.66	PF 1	1691.00	1084.50	1085.73		1085.81	0.005185	4.14	1173.82	2425.00	0.88
Reach-1	7.57	PF 1	1691.00	1083.40	1085.18		1085.20	0.000538	2.11	2675.03	4169.94	0.32
Reach-1	7.48	PF 1	1691.00	1084.00	1084.32	1084.10	1084.39	0.024200	5.37	1471.83	3984.08	1.68
Reach-1	7.38	PF 1	1691.00	1082.00	1083.26		1083.28	0.000756	2.25	2936.23	4007.71	0.37
Reach-1	7.29	PF 1	1691.00	1081.50	1082.69		1082.72	0.001943	2.98	2472.53	3216.28	0.56
Reach-1	7.2	PF 1	1691.00	1081.40	1081.81		1081.82	0.001664	1.52	1861.44	2790.08	0.45
Reach-1	7.11	PF 1	1865.00	1079.80	1081.10	1080.54	1081.12	0.001345	2.77	2251.71	2820.49	0.48
Reach-1	7.06		Lat Struct									
Reach-1	7.01	PF 1	1552.03	1079.50	1080.11		1080.16	0.003123	2.99	1577.27	2772.18	0.67
Reach-1	6.96		Lat Struct									
Reach-1	6.94	PF 1	1271.39	1078.70	1079.48		1079.49	0.001085	1.71	1498.97	2240.38	0.39
Reach-1	6.91		Lat Struct									
Reach-1	6.88	PF 1	980.42	1079.00	1079.23		1079.24	0.000446	0.50	1809.67	2438.36	0.21
Reach-1	6.8	PF 1	980.42	1078.00	1078.91		1078.93	0.001353	2.42	1856.85	2188.34	0.47

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	6.7	PF 1	980.42	1077.50	1077.98		1077.99	0.002772	0.31	1456.72	1781.12	0.09
Reach-1	6.61	PF 1	980.42	1076.00	1077.01		1077.02	0.001442	0.10	1490.31	2004.57	0.02
Reach-1	6.52	PF 1	980.42	1075.40	1075.79	1075.65	1075.89	0.004523	1.34	406.26	883.14	0.47
Reach-1	6.42	PF 1	980.42	1074.20	1074.94	1074.48	1074.97	0.000956	1.44	802.32	1304.30	0.36
Reach-1	6.33	PF 1	980.42	1073.40	1074.37	1073.87	1074.40	0.001389	2.52	1088.81	1635.30	0.48
Reach-1	6.23	PF 1	980.42	1072.60	1073.78	1073.21	1073.82	0.001001	2.42	1163.66	1644.67	0.42
Reach-1	6.14	PF 1	980.42	1071.80	1072.81	1072.72	1072.92	0.003965	3.73	445.98	984.05	0.78
Reach-1	6.05	PF 1	1005.42	1069.80	1071.59		1071.75	0.001750	3.84	325.11	764.00	0.72
Reach-1	5.95	PF 1	1005.42	1070.20	1071.22	1070.68	1071.23	0.000597	0.85	1231.80	1645.47	0.17
Reach-1	5.86	PF 1	1005.42	1069.30	1070.77		1070.79	0.001404	1.39	1235.87	2197.84	0.27
Reach-1	5.76	PF 1	1005.42	1068.50	1069.46		1069.49	0.005332	1.13	782.09	915.72	0.23
Reach-1	5.67	PF 1	1005.42	1067.30	1068.75		1068.76	0.000690	0.50	1955.36	2007.94	0.09
Reach-1	5.57	PF 1	1005.42	1066.60	1068.29		1068.29	0.001188	0.87	1992.99	1773.89	0.12
Reach-1	5.53		Lat Struct									
Reach-1	5.48	PF 1	1005.42	1066.40	1067.64		1067.65	0.001328	1.35	1390.15	1501.31	0.22
Reach-1	5.38	PF 1	1638.42	1065.00	1066.27	1065.83	1066.33	0.004458	2.47	1192.69	1693.92	0.40
Reach-1	5.31	PF 1	1638.42	1063.50	1065.13	1064.47	1065.15	0.002064	1.39	1414.79	1439.51	0.21
Reach-1	5.25	PF 1	1638.42	1062.60	1064.28	1063.80	1064.42	0.003173	4.73	1620.81	1471.09	0.64
Reach-1	5.23		Lat Struct									
Reach-1	5.2	PF 1	1501.92	1062.00	1063.48	1062.87	1063.58	0.002658	3.98	1530.20	1309.84	0.58
Reach-1	5.15		Lat Struct									
Reach-1	5.1	PF 1	1387.14	1060.30	1061.57	1061.46	1061.73	0.005716	4.96	1343.74	2042.72	0.81
Reach-1	5.08		Lat Struct									
Reach-1	5.07	PF 1	1330.94	1059.60	1061.04	1060.09	1061.06	0.001911	3.32	2285.39	2145.49	0.49
Reach-1	5.03	PF 1	1330.94	1059.80	1059.63	1059.59	1059.80	0.255074		412.89	989.54	0.00
Reach-1	4.98	PF 1	1330.94	1058.50	1059.25		1059.25	0.000494	1.09	3938.88	3577.98	0.22
Reach-1	4.95	PF 1	1330.94	1056.80	1059.23		1059.23	0.000042	0.69	8938.05	3924.16	0.08
Reach-1	4.89	PF 1	1330.94	1056.80	1059.22		1059.22	0.000017	0.42	11172.95	3099.71	0.05
Reach-1	4.79	PF 1	1330.94	1054.40	1059.21	1054.09	1059.21	0.000013	0.54	10311.23	2443.45	0.05

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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PROJECT DATA
Project Title: ASA Building Proposed Condition Model
Project File : ASAPostDev.prj
Run Date and Time: 9/12/2003 8:45:04 AM

Project in English units

Project Description:
ASA Floodplain Study based on DHS Drainage Study for a Building and parking structure FEMA FLOOD
INSURANCE RE-STUDY CELLA BARR ASSPCIATES
OF MARICOPA COUNTY,
ARIZONA 5062 N. 19TH AVE.
CAVE CREEK WASH JOB
#04856-05-75 PHOENIX, ARIZONA 85015
FEMA FLOOD INSURANCE
RE-STUDY CELLA BARR ASSPCIATES
OF MARICOPA COUNTY, ARIZONA
5062 N. 19TH AVE.
CAVE CREEK WASH JOB #04856-05-75
PHOENIX, ARIZONA 85015
FEMA FLOOD INSURANCE RE-STUDY
CELLA BARR ASSPCIATES
OF MARICOPA COUNTY, ARIZONA 5062 N.
19TH AVE.
CAVE CREEK WASH JOB #04856-05-75 PHOENIX, ARIZONA
85015

FLOW DATA

Flow Title: Imported Flow 05
Flow File : a:\ASAPostDev.f05

Flow Data (cfs)

River	Reach	RS	PF 1
RIVER-1	Reach-1	9.61	1237
RIVER-1	Reach-1	9.08	1210
RIVER-1	Reach-1	8.18	1375
RIVER-1	Reach-1	7.66	1691
RIVER-1	Reach-1	7.11	1865
RIVER-1	Reach-1	6.05	1890
RIVER-1	Reach-1	5.38	2523

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1	Critical	Known WS = 1059.21

GEOMETRY DATA

Geometry Title: Imported Geom 03
Geometry File : a:\ASAPostDev.g03

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 9.61

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3000	1121.6	3024.7	1121.8	3041.6	1121.6	3085.6	1121.5	3101.4	1121.7
3116.6	1121.9	3301.4	1121.9	3501.4	1121.8	3701.4	1121.4	3880	1120
4101.4	1119.1	4301.4	1119.2	4501.4	1118.5	4644.6	1118.6	4701.4	1118.8

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  4901.4  1119.1  5101.4    1119  5301.4  1119.9  5501.4    1120  5587.5  1120.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    3000     .16    3880     .16  4644.6     .16

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3880  4644.6              360     360     360             .1       .3
Sediment Elevation = 0

CROSS SECTION


*****
FOLLOWIN RIVER STATIONS WERE DELETED UNTIL R.S.6.23
*****


RIVER: RIVER-1
REACH: Reach-1             RS: 6.14

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data     num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1074.8    1200  1074.6    1400  1074.7    1649  1074.6  1657.9  1073.8
  1695.2  1073.6    1800  1073.7  1856.2  1073.5    1876  1073.9  1903.1  1073.6
    2000  1073.6    2200  1073.7  2317.7  1072.8    2400  1073.1  2599.9    1073
  2799.9  1072.5  2851.8  1072.5  2860.7  1071.9  2866.2  1072.4  2999.9  1072.5
  3072.5    1072  3110.2  1071.8    3130    1072  3199.9  1072.2  3399.9  1072.5
  3599.9  1072.1  3627.7  1072.5  3724.6  1073.5  3799.9  1072.9    3900    1073
  3999.9    1072    4115  1071.5    4740    1072

Manning's n Values         num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .13  1657.9     .03    1876      .5    2200     .03  2999.9     .02
    3130     .03  3799.9     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        2999.9    3130              490     480     450             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
  3724.6    4740  1073.5       F
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
  3724.6    4740  1073.5
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1             RS: 6.05

INPUT
Description:
Station Elevation Data     num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    1074    1200  1073.6    1400  1073.3    1789  1073.4    1800  1073.4
  1842.1  1073.2    2000  1072.7 2156.86  1072.1 2166.64 1072.15    2200  1071.9
 2210.09  1071.9 2210.73  1071.9 2217.12  1071.9 2222.11  1071.9 2222.12  1073.9
 2236.21  1073.9 2236.22  1071.9    2400  1071.5 2472.43 1071.58 2473.05 1071.91
 2497.85  1071.5 2502.86 1071.46 2527.79 1070.83 2528.39 1070.29 2529.62  1070.4
 2545.84 1070.81 2561.71 1070.25 2562.93 1070.09 2563.39 1070.58 2592.84  1069.8
 2595.84    1070 2595.85    1073 2596.51    1073 2596.52    1070 2598.94 1071.97
    2750  1071.5  2999.9  1071.3    3032 1070.85 3032.01 1073.85 3032.34 1073.85
 3032.34    1070 3039.65 1071.31 3054.57  1071.2 3076.36    1071 3078.27  1070.4
 3081.92 1070.49  3094.1  1070.5 3150.72 1070.58 3183.33 1070.98 3183.83 1071.31
  3199.9  1071.5 3271.56    1072  3324.9  1071.5 3364.27    1072  3399.9  1071.5
 3405.55    1072 3439.75  1071.7  3599.9  1071.7 3664.06  1083.1 3812.76  1083.1
  3838.6  1071.1  3839.1 1070.77 3869.46 1070.77 3869.97  1071.1    3874  1071.1
 3877.88  1071.8 3990.25    1072  3999.9  1072.6  4009.6  1072.4

Manning's n Values         num=      18
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    1000      .5 2156.86     .02    2200    .016 2210.73    .013 2222.11    .015
 2236.22    .016 2472.43    .013 2545.84    .016 2563.39    .013 2595.84    .015
 2598.94    .016    3032    .015 3032.34     .02 3039.65    .013 3081.92    .016
 3183.83    .016 3664.06    .015 3877.88    .016

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       2527.79    2750              560     500     480             .1       .3
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1             RS: 5.95

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1073.1    1200  1072.8    1400    1072    1800  1072.3  1939.2    1072
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   1992.7  1069.7    2000  1069.8  2179.3    1070    2200  1070.7    2225  1070.8
   2385.2  1070.2    2400  1070.2    2596  1070.6 2596.10  1080.5    2711  1080.5
   2711.1  1070.4  2799.9  1070.4  2999.9  1070.3  3199.9  1070.6  3323.1  1070.8
   3337.6  1070.5  3375.9  1070.5  3399.9  1070.7  3445.8  1070.8  3599.9  1071.2
   3765.7    1072

 Manning's n Values        num=       6
      Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
     1000     .13    1400      .5  1939.2    .035 2596.12     .15  2711.1     .06
   2999.9     .06

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2225    2400              510     500     470              .1       .3
 Ineffective Flow     num=       1
    Sta L   Sta R    Elev  Permanent
   3765.7  3765.7    1072       F
 Blocked Obstructions     num=       1
    Sta L   Sta R    Elev
   3765.7  3765.7    1072
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1            RS: 5.86

 INPUT
 Description:
 Station Elevation Data    num=      19
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     1000  1072.4    1200  1072.5  1295.5  1072.1  1397.4  1070.2    1400  1070.4
     1600  1070.6    1800  1069.4    2000  1069.8  2083.5  1069.9  2117.1  1069.3
   2168.3  1069.5  2187.8  1070.6    2260  1070.6  2368.8  1069.3    2390    1070
     2450    1070    2940  1070.5    3540  1070.5    3680    1072

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     1000    .035    2000    .035    2260     .13

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2000    2260              540     500     490              .1       .3
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1            RS: 5.76

 INPUT
 Description:
 Station Elevation Data    num=      15
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     1000  1070.5    1200    1070    1400    1070    1800    1070  1847.1  1068.4
     2000  1068.3    2200  1068.5    2400  1068.5  2599.9  1068.9    2740  1069.5
     3040    1070    3300  1070.5    3820    1070    4600  1070.5    4920    1071

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     1000     .08    2400     .08  2599.9     .08

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2400  2599.9              490     500     470              .1       .3
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1            RS: 5.67

 INPUT
 Description:
 Station Elevation Data    num=      17
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     1000  1069.9    1200  1067.7    1400  1067.2    1800  1067.4    2050  1067.3
     2280  1068.1    2400  1067.6  2599.9  1068.6  2799.9    1068  2999.9  1068.3
   3199.9  1069.1    3440    1070    3710  1070.5    3960    1070    4040  1069.5
     4140    1070    4500    1070

 Manning's n Values        num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     1000     .08    2050     .08    2280     .08

 Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2050    2280              530     500     520              .1       .3
 Sediment Elevation = 0

 CROSS SECTION


 RIVER: RIVER-1
 REACH: Reach-1            RS: 5.57
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INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1068.7	1200	1066.9	1356.8	1066.1	1406.1	1066.2	1600	1066.5
1700	1066.6	1830	1066.8	2000	1067	2200	1067.6	2271.1	1066.9
2322.9	1066.8	2400	1068.1	2599.9	1068.4	2710.1	1068.2	2735.5	1067.4
2772.9	1067.6	2799.9	1068	2852.5	1068.1	2916.1	1068.1	2999.9	1068.5
3102.4	1068.7	3600	1068.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	1700	.08	1830	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1700	1830	450	500	580	.1	.3

Sediment Elevation = 0

LATERAL STRUCTURE

RIVER: RIVER-1
REACH: Reach-1 RS: 5.53

INPUT
Description: Left Overbank Between Stations 5.48 and 5.57
Lateral structure position = Left overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 0
Weir Coefficient = 1.55
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1070	730	1068	860	1066.7	1560	1066.7	1660	1068

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.48

INPUT
Description: WEIR FLOW INTO I-10 FREEWAY FLOW RETUTRNS AT SECTION 4.98. FLOW PATH
FOR OVER SPILL IS THE I-10 FREEWAY. IN THIS MODEL IT IS ASSUMED THAT
THE SOUTHER PACIFIC RAILROAD DOES NOT FUNCTION AS A LEVEE AND HAS
FAILED ALLOWING FLOW TO FOLLOW ITS NATURAL COURSE.

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3203.5	1068.6	3399.9	1069.3	3599.9	1068.5	3799.9	1067.6	3999.9	1067.3
4199.9	1067.1	4399.9	1066.6	4599.9	1066.1	4710	1066.4	4799.9	1066.5
4850	1066.4	4899.6	1070.1	4999.9	1070.1	5070.2	1069.7	5088.8	1065.6
5117	1065.5	5123.1	1064.5	5134.6	1066.2	5199.9	1066.4	5399.9	1066.7
5454.2	1066.7	5505.7	1066.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3203.5	.13	4710	.045	4850	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4710	4850	500	500	520	.1	.3

Sediment Elevation = 0

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.38

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1068.5	1037.9	1068.5	1065	1070.2	1161.3	1068.7	1200	1068.8
1371.6	1067.7	1400	1067.6	1423	1067.6	1600	1067.2	1800	1066
1991.9	1064.4	2000	1064.5	2051.5	1064.6	2200	1065.6	2400	1066
2599.9	1065.8	2742.2	1066.2	2799.9	1066.5	2999.9	1066.7	3199.9	1066.5
3302.6	1066.8	3353.6	1067.1	3399.9	1067.6	3599.9	1067.7	3799.9	1066.7
3999.9	1066.2	4199.9	1066	4399.9	1065.8	4599.9	1065.7	4799.9	1065.6
4999.9	1065.4	5130	1065.1	5199.9	1065.1	5240	1065	5399.9	1065
5599.8	1065.4	5656.3	1066.1	5698.7	1066.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	5130	.045	5240	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5130	5240	400	400	400	.1	.3

```
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
    1000  3599.9  1067.7       F
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
    1000  3599.9  1067.7
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.31

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  1066.2    1200  1065.1    1400  1064.2    1800  1064.5    2000  1064.5
  2117.1  1064.1  2122.4  1063.7    2160  1063.8    2200  1064.2    2400    1065
  2599.9  1065.6    2725  1065.3  2781.3  1065.6  2799.9  1066.2  2999.9  1066.6
  3199.9  1066.3  3399.9  1066.2  3599.9  1065.3  3799.9  1064.5  3999.9  1064.2
  4199.9  1064.2  4399.9  1064.4  4599.9  1063.9    4670    1064    4770  1063.5
  4799.9  1063.1  4999.9  1063.8  5106.3  1065.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06    4670     .06    4770     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          4670    4770              290     280     280             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
    1000  2999.9  1066.6       F
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
    1000  2999.9  1066.6
Sediment Elevation = 0

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.25

INPUT
Description: X3 USED, 100-YR DISCH. CONTAINED IN WASH
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    1065    1200  1064.5    1400  1064.2    1800  1063.6    2000  1063.2
    2200  1062.8    2400  1062.8  2599.9  1062.4  2799.9  1062.2  2999.9    1063
  3199.9  1063.4  3399.9  1063.9  3599.9  1064.2  3799.9  1064.5  3999.9    1065
  4199.9  1064.6  4399.9    1064  4599.9  1063.3  4799.9  1063.4  4999.9  1062.8
  5199.9  1062.4    5350  1062.6  5399.9  1062.6    5430  1062.6  5550.8    1063
  5799.8  1064.4  5894.3  1064.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .13    5350    .025    5430     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5350    5430              290     280     285             .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
    1000  3999.9    1065       F
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
    1000  3999.9    1065
Sediment Elevation = 0

LATERAL STRUCTURE


RIVER: RIVER-1
REACH: Reach-1            RS: 5.23

INPUT
Description: Left Overbank Between Stations 5.20 and 5.25
Lateral structure position      = Left overbank
Distance from Upstream XS =       0
Deck/Roadway Width        =       0
Weir Coefficient          =    1.55
Weir Flow Reference       = Water Surface
 Weir Embankment Coordinates    num =        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  1064.4      80    1064     180    1063     280  1062.9

Weir crest shape                          = Broad Crested


CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 5.2
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INPUT
Description: WEIR FLOW INTO I-10 FREEWAY FLOW RETUTRNS AT SECTION 4.98. FLOW
PATH
FOR OVER SPILL IS THE I-10 FREEWAY
X3 CARD USED SO THAT
THE 100-YR DISCHARGE IS CONTAINED WITHIN THE FLOW
PATH OF CAVE
CREEK WASH

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1065.7	1200	1064.7	1376.5	1064.4	1400	1065.5	1430.6	1065.4
1439.3	1064.3	1600	1064.3	1800	1063.7	2000	1063.7	2074.4	1063.5
2086.6	1062.7	2157.5	1062.4	2200	1062.9	2400	1063	2599.9	1063.1
2799.9	1062.6	2816.3	1062.5	2852.2	1062.3	2999.9	1062.8	3199.9	1063.3
3399.9	1063.6	3407.4	1063.6	3415.5	1063.3	3478.8	1063.4	3599.9	1063.2
3799.9	1063.8	3999.9	1065.1	4170.9	1065.8	4180.6	1064.6	4199.9	1064.6
4399.9	1064	4599.9	1063.2	4739.6	1062.8	4799.9	1062.7	4999.9	1062.3
5199.9	1062.1	5399.9	1062	5500	1062	5599.8	1061.9	5799.8	1061.8
5806.4	1062	5839.8	1062.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	5399.9	.025	5500	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5399.9	5500	500	500	500	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
1000	4170.9	1065.8	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1000	4170.9	1065.8

Sediment Elevation = 0

LATERAL STRUCTURE

RIVER: RIVER-1
REACH: Reach-1 RS: 5.15

INPUT
Description: Left Overbank Between Stations 5.10 and 5.20
Lateral structure position = Left overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 0
Weir Coefficient = 1.55
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1062.9	200	1062.5	300	1062	500	1061.9

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.1

INPUT
Description: WEIR FLOW INTO I-10 FREEWAY FLOW RETUTRNS AT SECTION 4.98. FLOW
PATH
FOR OVER SPILL IS THE I-10 FREEWAY
X3 CARD USED SO THAT
THE 100-YR DISCHARGE IS CONTAINED WITHIN THE FLOW
PATH OF CAVE
CREEK WASH

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1063.5	1200	1063.1	1400	1062.3	1511	1061.5	1564.4	1062.2
1600	1062.2	1800	1062	2000	1062	2169.2	1061.8	2200	1061.9
2213.6	1061.9	2400	1061.5	2600	1061.4	2771.8	1062.2	2799.9	1062.2
2827.2	1062	2859.4	1063.2	2980.9	1062.8	2992	1061.4	2999.9	1061.4
3199.9	1061.2	3399.9	1060.9	3599.9	1061.1	3799.9	1061	3999.9	1061.2
4137.2	1060.7	4148.9	1061	4199.9	1061	4399.9	1060.9	4599.9	1060.5
4730	1060.9	4765	1060.3	4770	1060.3	4830	1060.3	4999.9	1060.4
5012.8	1060.5	5039.9	1061.9	5081	1061.7	5118.8	1060.4	5139.5	1060.5
5150	1061.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	4730	.025	4830	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4730	4830	200	200	200	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
1000	2859.4	1063.2	F
5039.9	5150	1061.9	F

Blocked Obstructions num= 2

Sta L	Sta R	Elev	Sta L	Sta R	Elev
1000	2859.4	1063.2	5039.9	5150	1061.9

Sediment Elevation = 0

LATERAL STRUCTURE

RIVER: RIVER-1
REACH: Reach-1 RS: 5.08

INPUT
Description: Left Overbank Between Stations 5.07 and 5.10
Lateral structure position = Left overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 0
Weir Coefficient = 1.55
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	1061.9	100	1061.5	150	1060.6	200	1060.2

Weir crest shape = Broad Crested

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.07

INPUT
Description: WEIR FLOW INTO I-10 FREEWAY RETUTRNS TO THE MAIN FLOW PATH AT SECTION
X3 CARD USED SO THAT THE 100-YR DISCHARGE IS CONTAINED WITHIN THE FLOW
PATH OF CAVE CREEK WASH
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1062.7	1073.2	1062	1200	1062.3	1600	1061.7	1800	1061.5
2000	1061.5	2200	1061.6	2332.5	1063.1	2400	1062	2600	1061
2799.9	1060.6	2999.9	1060.5	3199.9	1060.3	3399.9	1060.2	3599.9	1059.9
3681.8	1059.6	3799.9	1059.8	3999.9	1059.6	4199.9	1059.6	4225	1059.6
4290	1059.6	4599.9	1059.4	4694.3	1059.3	4716.3	1059.5	4736.7	1060.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	4199.9	.025	4225	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4199.9	4225	210	190	190	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
1000	2332.5	1063.1	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
1000	2332.5	1063.1

Sediment Elevation = 0

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 5.03

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1061.7	1008.8	1061.4	1200	1062.2	1519.2	1061.3	1552.3	1061.3
1568.9	1061.8	1600	1061.9	1704.4	1062.1	1722.7	1064.3	1800	1062.8
2000	1062.5	2112.9	1062.4	2119.7	1062.1	2186.3	1061.5	2200	1061.6
2400	1061.3	2600	1060.6	2799.9	1060.2	2994.5	1059.8	2999.9	1060.3
3004.6	1060.4	3140	1060	3240	1059.8	3399.9	1059.4	3509.8	1059.2
3599.9	1059.3	3799.9	1059.2	3999.9	1058.9	4199.9	1059.2	4399.9	1060.1
4548.3	1060.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	3140	.025	3240	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3140	3240	270	270	280	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.98

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	1060	1200	1058.7	1400	1058.3	1497.3	1060.2	1600	1059.3
1800	1059.3	1841.2	1059.3	1867.3	1058	2000	1057.3	2200	1057.5
2400	1056.7	2450.8	1056.5	2600	1057.1	2800	1057.2	2999.9	1057.3
3199.9	1057.6	3399.9	1057.8	3599.9	1058.5	3799.9	1059.1	3999.9	1059.7
4199.9	1058.9	4237.8	1058.3	4249.7	1059.1	4399.9	1059.2	4599.9	1059.3

4760	1058.5	4799.9	1058.5	4850	1058.5	4999.9	1058.6	5213	1060

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.13	4760	.025	4850	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
4760	4850	200	175	170	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.95

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1078.3	1006.6	1066.9	1031.4	1065.2	1081.3	1059.6	1088.5	1059.1
1129	1058.8	1200	1057.8	1400	1057.7	1600	1056.5	1677.6	1056.8
1701.1	1057.3	1800	1056.9	1848.2	1056.8	1869.9	1056.3	2000	1056.3
2142.3	1056.2	2156.6	1057.2	2177.1	1056.2	2200	1056.3	2400	1055.6
2600	1055.4	2800	1055.7	2875.5	1055.8	2914.1	1055.9	2926.7	1052.4
2933.1	1054.9	2999.9	1055.3	3199.9	1055.5	3399.9	1056.1	3580	1056.8
3599.9	1056.8	3650	1056.8	3799.9	1057.3	3999.9	1058.7	4199.9	1058.5
4399.9	1058.5	4599.9	1057.7	4799.9	1058.2	4999.9	1058.3	5018.8	1059.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	3580	.025	3650	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3580	3650	315	315	250	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.89

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1065.5	1040.8	1069.9	1109.1	1066.7	1172.3	1060.3	1178.6	1056.5
1200	1056.5	1400	1055.6	1460.9	1055.6	1476.9	1054.9	1600	1055.5
1771	1055.2	1787.3	1054.1	1800	1054.2	2000	1054.2	2200	1053.7
2400	1053.8	2461.4	1053.8	2470.5	1054.7	2600	1054.5	2684.7	1054.2
2800	1055.1	2999.9	1055.2	3199.9	1055.7	3399.9	1057.2	3599.9	1057.3
3799.9	1056.8	3900	1057	3999.9	1057.2	4199.9	1057.5	4290.2	1059.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	3799.9	.025	3900	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3799.9	3900	570	500	500	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.79

INPUT
Description: THIS IS THE FLOODPLAIN MODEL TO BE USED IN CONJUCTION WITH THE

FLOODWAY MODEL, CAVE.FLDWY.2. THIS MODEL UTILIZES THE SPLIT
FLOW
AND X3 CARDS. THE X3 CARDS ARE USED TO SET CROSS-SECTION
"BOUNDARIES"
AT TOPOGRAPICALLY HIGH GROUND THAT CONTAINS THE
Q100-YR WITHIN THE
CROSS-SECTION.
CROSS-SECTION EXTENDED
MESSAGES OCCUR AT LOCATIONS OF WEIR FLOW.

Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	1077.7	1042.8	1085.6	1120.1	1083.6	1200	1055.7	1260.7	1054.4
1305.3	1054.9	1400	1052	1421	1051.4	1447.4	1054.1	1501.2	1054.7
1600	1054.3	1800	1053.7	2000	1053.6	2200	1054	2400	1054.7
2600	1054.5	2760	1054.4	2789.3	1055.4	2800	1055.4	2850	1055.4
2999.9	1055.8	3199.9	1056.1	3307.6	1056.5	3399.9	1057.8	3599.9	1057.9
3633.4	1059.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.13	2760	.025	2850	.13

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2760	2850	0	0	0	.1	.3