

## Avalon Second Addition Drainage Report

This report summarizes the findings of the drainage analysis for Avalon Second Addition to Wichita, Sedgwick County, Kansas. It is presented in conjunction with revisions to the drainage report previously submitted for Avalon Addition, and modifies the earlier drainage concept.

The report presents storm sewer design calculations, street flow analysis at critical locations, inlet capacity analysis, and detention pond analysis used to establish minimum openings and four corner elevations.

The hydrologic analysis summary is shown in Table 1. Of note is the 100 year event flows shown for system 100.

Storm sewer hydraulic analysis is given in tables 2A thru 4B for the pipe systems shown on the accompanying drainage plan. (See Attachment A)

Table 5 summarizes the results of street flow analysis at critical points. It was determined that roll curb would contain the 2 year event.

HEC-1 was used to model the proposed detention ponds. The results are displayed on Attachment A and in Appendix A.

For existing, or pre-project conditions, the 100-year peak discharge for the drainage basin was computed to be 80 cfs. For proposed, or post-project conditions, the 100-year peak discharge at the outlet was computed to be 56 cfs.

The proposed four corner plan is included as Attachment B.

Table 1

Hydrology							
Basin	Inlet #	Area	Time of Concentration	Intersity	C	Flow (cfs)	Year Event
M	120	0.15	15	7.37	0.6	0.66	100
G	130	0.34	15	7.37	0.6	1.50	100
N	140	38.5	60	3.73	0.55	78.98	100
C	220	1.94	15	3.83	0.6	4.46	2
D	230	1.11	15	3.83	0.6	2.55	2
I1	310	1.61	15	3.83	0.6	3.70	2
I2	310	0.78	15	3.83	0.6	1.79	2
J1	320	2.03	15	3.83	0.6	4.66	2
J2	320	0.59	15	3.83	0.6	1.36	2
A	330	0.88	15	3.83	0.6	2.02	2
B	340	1.64	15	3.83	0.6	3.77	2
E	N/A	0.61	15	3.83	0.6	1.40	2
F	N/A	0.92	15	3.83	0.6	2.11	2
H	N/A	1.14	15	3.83	0.6	2.62	2
K	N/A	0.57	15	3.83	0.6	1.31	2
L	N/A	0.35	15	3.83	0.6	0.80	2



T-26/K 2B  
S100\_I2.OUT

Date: 10-16-2003  
Time: 11:55:35

Input File: sys100.txt

Avalon Second System 100

Storm Frequency = 100-Year

\* \* \* H Y D R A U L I C S \* \* \*

Node	Hyd-slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
100	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1334.0000	1334.0000	.00
110	.00322	.5472	.0000	.0000	.0327	.1421	.0161	.7381	1334.7380	1335.0000	.26
120	.00322	.2575	.0000	.0653	.0000	.0000	1.3159	1.6387	1336.3770	1338.2000	1.82
130	.00000	.0001	.0000	.0000	.0000	.0000	.0006	.0007	1336.3780	1338.2000	1.82
140	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1336.3780	1338.2000	1.82

0

TE 103A

S200\_11.OUT

Date: 10-16-2003  
Time: 11:14:03

Input File: sys200.txt

Avalon Second System 200

Storm Frequency = 2-Year

\* \* \* H Y D R O L O G Y \* \* \*

Tributary Area		Hydrology			Summation			Conduit Data						
Node to Node	C Area (Ac)	Slope (%)	Length (Ft)	Tc (Min)	I (In/Hr)	Q (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
210 200	.00	.00	.0	.00	.00	.00	18.72	3.45	.00	6.71	3.80	50.00	.22	18.94
220 210	.00	.00	.0	15.00	3.83	4.46	17.41	3.57	4.16	6.71	3.80	300.00	1.32	18.72
230 220	.00	.00	.0	15.00	3.83	2.55	15.00	3.83	2.55	2.55	2.08	300.00	2.41	17.41

0

T-61 3B

S200\_12.OUT

Date: 10-16-2003  
Time: 11:14:03

Input File: sys200.txt

Avalon Second System 200

Storm Frequency = 2-Year

\* \* \* H Y D R A U L I C S \* \* \*

```

*****
Node   Hyd-slope  Friction  Bend  Transition  Manhole  Deflection  Junction  Total  Hyd-GI  Desired  Diff.
(Ft/Ft) (Ft)      (Ft)      (Ft)      (Ft)      (Ft)      (Ft)      (Ft)      (Ft)      Elevation Elevation (Ft)
*****
200   .00000    .0000    .0000    .0000    .0000    .0000    .0000    .0000    1332.0000 1334.0000  2.00
210   .00408    .2041    .0000    .0000    .0112    .0204    .2357    1332.2360 1335.0000  2.76
220   .00408    1.2243    .0000    .0157    .0000    .4335    1.7071    1333.9430 1335.0000  1.06
230   .00156    .4675    .0000    .0000    .0000    .0000    .4675    1334.4100 1335.0000  .59
*****

```

0

Tok: 4A

S300\_11.OUT

Date: 10-16-2003  
Time: 11:21:30

Input File: sys300.txt

Avalon Second System 300

Storm Frequency = 2-Year

\* \* \* H Y D R O L O G Y \* \* \*

Node	C	Area (AC)	Slope (%)	Length (FT)	TC (Min)	I(0) (In/Hr)	q(0) (CFS)	Tributary Area	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Hydrology Summation	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Conduit Data	Size	Velocity (Ft/Sec)	Length (FT)	TT (Min)	TT+TC (Min)
310	300	.00	.00	.0	15.00	3.83	5.49	5.49	17.27	3.59	5.14	16.51	16.51	17.27	3.59	5.14	16.51	16.51	24"	5.26	200.00	.63	17.90
320	310	.00	.00	.0	15.00	3.83	6.02	6.02	17.13	3.60	5.66	11.37	11.37	17.13	3.60	5.66	11.37	11.37	24"	3.62	30.00	.14	17.27
330	320	.00	.00	.0	15.00	3.83	2.02	2.02	16.36	3.68	1.94	5.71	5.71	16.36	3.68	1.94	5.71	5.71	18"	3.23	150.00	.77	17.13
340	330	.00	.00	.0	15.00	3.83	3.77	3.77	15.00	3.83	3.77	3.77	3.77	15.00	3.83	3.77	3.77	3.77	15"	3.07	250.00	1.36	16.36

T=164B

S300\_12.OUT

Date: 10-16-2003  
Time: 11:21:30

Input File: sys300.txt

Avalon Second System 300

Storm Frequency = 2-Year

\* \* \* H Y D R A U L I C S \* \* \*

```

*****
Node   Hyd-Slope Friction Bend Transition Manhole Deflection Junction Total Hyd-Gl Elevation Desired Elevation Diff.
(Ft/Ft) (Ft) (Ft) (Ft) (Ft) (Ft) (Ft) (Ft) (Ft) (Ft) (Ft)
*****
300    .00000    .0000    .0000    .0000    .0000    .0000    .0000    .0000    1332.0000    1334.0000    2.00
310    .00533    1.0654    .0000    .0226    .0000    .0000    .4715    1.5594    1333.5590    1338.0000    4.44
320    .00253    .0758    .0000    .0041    .0000    .0000    .3014    .3813    1333.9410    1338.0000    4.06
330    .00296    .4434    .0000    .0016    .0000    .0733    .1588    .6770    1334.6180    1336.0000    1.38
340    .00341    .8515    .0000    .0000    .0000    .0000    .0000    .8515    1335.4690    1336.5000    1.03
*****

```

0

# Table 5

## Street Flow Calculations

Node #	Area	C	t <sub>c</sub>	i <sup>2</sup>	Q <sub>2</sub>	Slope	Depth of Flow	Width of Flow	Inlet Length	Q in	Q by
120	1.29	0.6	15	3.83	2.96	sump	0.33	10.56	5'	2.96	n/a
130	1.26	0.6	15	3.83	2.90	sump	0.33	10.56	5'	2.90	n/a
310	2.39	0.6	15	3.83	5.49	sump	0.33	10.56	5'	5.49	n/a
320	2.62	0.6	15	3.83	6.02	sump	0.33	10.56	5'	6.02	n/a

# APPENDIX A

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

```
*****  
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *  
* FEBRUARY 1981 *  
* REVISED 02 AUG 88 *  
* RUN DATE 10/16/2003 TIME 12:38:27 *  
*****
```

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

```
X X XXXXXX XXXX X  
X X X X X X  
X X X X X  
XXXXXX XXXX X XXXX X  
X X X X X  
X X X X X  
X X XXXXXX XXXX XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.  
THE DEFINITION OF -AMSK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION  
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE, SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,  
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION  
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

HEC-1 INPUT

PAGE 1

```

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1         ID
2         ID
3         ID
*** LIST ***
*** FREE ***

4         *DIAGRAM
5         IT      15 27SEP99   1200      0 28SEP99   2000
6         IN      15 27SEP99   1200
7         IO      0          5
8         JR      PREC      7.8
          *
          *

8         KK      W-BAS1
          *
          *
          *      UNDEVELOPED 38.5 ACRES WEST OF TYLER ROAD (VERY FLAT TOPOGRAPHY)
          *
          *
9         KO      5
10        BA      .06016
11        PB      1.00
12        PC      0.000  0.003  0.006  0.008  0.011  0.014  0.017  0.019  0.022  0.025
13        PC      0.029  0.032  0.035  0.038  0.042  0.045  0.048  0.052  0.056  0.060
14        PC      0.064  0.068  0.072  0.076  0.080  0.085  0.090  0.095  0.100  0.105
15        PC      0.110  0.115  0.120  0.127  0.134  0.140  0.147  0.155  0.163  0.172
16        PC      0.181  0.193  0.204  0.220  0.235  0.259  0.283  0.387  0.663  0.699
17        PC      0.735  0.754  0.772  0.786  0.799  0.810  0.820  0.828  0.835  0.843
18        PC      0.850  0.858  0.865  0.873  0.880  0.885  0.889  0.894  0.898  0.903
19        PC      0.907  0.912  0.916  0.921  0.925  0.929  0.934  0.938  0.943  0.947
20        PC      0.952  0.955  0.958  0.961  0.964  0.967  0.970  0.973  0.976  0.979
21        PC      0.982  0.985  0.988  0.991  0.994  0.997  1.000
22        LS      0          80          0
23        UD      0.90
          *
          *

24        KK      W-BAS2
          *
          *
          *      ASSUMED 30.0 ACRES EAST OF TYLER ROAD TO BE DEVELOPED
          *
          *
25        KO      5
26        BA      .04688
27        PB      1.00
28        PC      0.000  0.003  0.006  0.008  0.011  0.014  0.017  0.019  0.022  0.025
29        PC      0.029  0.032  0.035  0.038  0.042  0.045  0.048  0.052  0.056  0.060
30        PC      0.064  0.068  0.072  0.076  0.080  0.085  0.090  0.095  0.100  0.105
31        PC      0.110  0.115  0.120  0.127  0.134  0.140  0.147  0.155  0.163  0.172
32        PC      0.181  0.193  0.204  0.220  0.235  0.259  0.283  0.387  0.663  0.699
33        PC      0.735  0.754  0.772  0.786  0.799  0.810  0.820  0.828  0.835  0.843
34        PC      0.850  0.858  0.865  0.873  0.880  0.885  0.889  0.894  0.898  0.903
    
```

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

HEC-1 INPUT

PAGE 2

LINE	ID	1	2	3	4	5	6	7	8	9	10
35	PC	0.907	0.912	0.916	0.921	0.925	0.929	0.934	0.938	0.943	0.947
36	PC	0.952	0.955	0.958	0.961	0.964	0.967	0.970	0.973	0.976	0.979
37	PC	0.982	0.985	0.988	0.991	0.994	0.997	1.000			
38	LS	0	80	38							
39	UD	0.20									
	*										
	*										
40	KK W-COMB										
41	KO	5									
42	HC	2	0								
	*										
	*										
	*	ROUTE OUTFLOW FROM PONDS W. OF R/R THROUGH PROPOSED 36 RCP UNDER R/R									
	*										
43	KK W-PND										
44	RS	1	ELEV	1330.0							
45	SA	3.2	3.5								
46	SE	1330.0	1335.0								
47	SQ	0	6	12	18	24	30	36	42	48	54
48	SQ	60	68								
49	SE	1330.0	1331.13	1331.61	1332.03	1332.37	1332.69	1333.03	1333.34	1333.68	1334.02
50	SE	1334.5	1335.00								
	*										
	*										
	*										
51	KK BAS1-7										
	*										
	*										
	*	TOTAL AREA EAST OF RAILROAD 101.4 ACRES									
	*	CONSERVATIVELY ACCOUNT FOR ENTIRE OUTFLOW TO GO OVER WEIR AT POND 7									
	*	TOP OF WEIR ELEVATION 1332.3									
	*	STATIC LEVEL WILL BE AT 1330.0 BASED ON AN ASSUMED LOW FLOW OUTFLOW STRUCTURE									
	*										
52	KO	5									
53	BA	.15844									
54	PB	1.00									
55	PC	0.000	0.003	0.006	0.008	0.011	0.014	0.017	0.019	0.022	0.025
56	PC	0.029	0.032	0.035	0.038	0.042	0.045	0.048	0.052	0.056	0.060
57	PC	0.064	0.068	0.072	0.076	0.080	0.085	0.090	0.095	0.100	0.105
58	PC	0.110	0.115	0.120	0.127	0.134	0.140	0.147	0.155	0.163	0.172
59	PC	0.181	0.193	0.204	0.220	0.235	0.259	0.283	0.387	0.663	0.699
60	PC	0.735	0.754	0.772	0.786	0.799	0.810	0.820	0.828	0.835	0.843
61	PC	0.850	0.858	0.865	0.873	0.880	0.885	0.889	0.894	0.898	0.903
62	PC	0.907	0.912	0.916	0.921	0.925	0.929	0.934	0.938	0.943	0.947
63	PC	0.952	0.955	0.958	0.961	0.964	0.967	0.970	0.973	0.976	0.979
64	PC	0.982	0.985	0.988	0.991	0.994	0.997	1.000			
65	LS	0	80	38							
66	UD	0.20									
	*										

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

HEC-1 INPUT

PAGE 3

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
67	KK W-COMB
68	KO 5
69	EC 2 0
	* * *
70	KK POND7
71	RS 1 ELEV 1330.0
72	SA 11.5 15.8
73	SE 1330.0 1335.0
	* *
74	SQ 0 10 20 30 40 50 60 70 80 90
75	SQ 100
76	SE 1332.3 1332.77 1333.05 1333.28 1333.49 1333.68 1333.86 1334.03 1334.19 1334.34
77	SE 1334.5
	* * *
78	ZZ

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

## SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
8	W-BAS1	
	.	
24	.	W-BAS2
	.	
40	W-COMB.....	
	V	
	V	
43	W-PND	
	.	
51	.	BAS1-7
	.	
67	W-COMB.....	
	V	
	V	
70	POND7	

(\*\*\*) RUNOFF ALSO COMPUTED AT THIS LOCATION

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

\*\*\*\*\*  
\* PLOOD HYDROGRAPH PACKAGE (HEC-1) \*  
\* FEBRUARY 1981 \*  
\* REVISED 02 AUG 88 \*  
\* RUN DATE 10/16/2003 TIME 12:38:27 \*  
\*\*\*\*\*

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

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

IT HYDROGRAPH TIME DATA  
NMIN 15 MINUTES IN COMPUTATION INTERVAL  
IDATE 27SEP99 STARTING DATE  
ITIME 1200 STARTING TIME  
NQ 129 NUMBER OF HYDROGRAPH ORDINATES  
NDDATE 28SEP99 ENDING DATE  
NDTIME 2000 ENDING TIME  
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .25 HOURS  
TOTAL TIME BASE 32.00 HOURS

#### ENGLISH UNITS

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

JP MULTI-PLAN OPTION  
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION  
RATIOS OF PRECIPITATION  
7.80

\*\*\* \*\* \*\* \*\* \*\*

\*\*\*\*\*  
\* \*  
8 KK \* W-BAS1 \*  
\* \*  
\*\*\*\*\*

9 KO OUTPUT CONTROL VARIABLES  
IPRNT 5 PRINT CONTROL  
IPLOT 5 PLOT CONTROL  
QSCAL 0. HYDROGRAPH PLOT SCALE

\*\*\* \*\* \*\* \*\*~

\*\*\*\*\*  
\* \*  
24 KK \* W-BAS2 \*  
\* \*  
\*\*\*\*\*

25 KO OUTPUT CONTROL VARIABLES  
IPRNT 5 PRINT CONTROL

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

IPLT 5 PLOT CONTROL  
 QSCAL 0. HYDROGRAPH PLOT SCALE

\*\*\* \*\*

\*\*\*\*\*  
 \* \*  
 40 KK \* W-COMB \*  
 \* \*  
 \*\*\*\*\*

41 KO OUTPUT CONTROL VARIABLES  
 IPRNT 5 PRINT CONTROL  
 IPLT 5 PLOT CONTROL  
 QSCAL 0. HYDROGRAPH PLOT SCALE

\*\*\* \*\*

\*\*\*\*\*  
 \* \*  
 43 KK \* W-PND \*  
 \* \*  
 \*\*\*\*\*

## HYDROGRAPH ROUTING DATA

44 RS STORAGE ROUTING  
 NSTPS 1 NUMBER OF SUBREACHES  
 ITYP ELEV TYPE OF INITIAL CONDITION  
 RSVRIC 1330.00 INITIAL CONDITION  
 X .00 WORKING R AND D COEFFICIENT

45 SA AREA 3.2 3.5

46 SE ELEVATION 1330.00 1335.00

47 SQ DISCHARGE 0. 6. 12. 18. 24. 30. 36. 42. 48. 54.  
 60. 68.

49 SE ELEVATION 1330.00 1331.13 1331.61 1332.03 1332.37 1332.69 1333.03 1333.34 1333.68 1334.02  
 1334.50 1335.00

\*\*\*

## COMPUTED STORAGE-ELEVATION DATA

STORAGE .00 16.74  
 ELEVATION 1330.00 1335.00

## COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE .00 3.65 5.23 6.62 7.75 8.82 9.97 11.02 12.18 13.34  
 OUTFLOW .00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00  
 ELEVATION 1330.00 1331.13 1331.61 1332.03 1332.37 1332.69 1333.03 1333.34 1333.68 1334.02

STORAGE 15.00 16.74  
 OUTFLOW 60.00 68.00  
 ELEVATION 1334.50 1335.00

\*\*\*\*\*

## HYDROGRAPH AT STATION W-PND PLAN 1, RATIO = 7.80

\*\*\*\*\*

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
27	SEP	1200	1	0.	.0	1330.0	27	SEP	2245	44	3.	1.9	1330.6	28	SEP	0930	87	12.	5.2	1331.6
27	SEP	1215	2	0.	.0	1330.0	27	SEP	2300	45	4.	2.2	1330.7	28	SEP	0945	88	11.	5.1	1331.6
27	SEP	1230	3	0.	.0	1330.0	27	SEP	2315	46	4.	2.4	1330.8	28	SEP	1000	89	11.	5.0	1331.5
27	SEP	1245	4	0.	.0	1330.0	27	SEP	2330	47	5.	2.8	1330.9	28	SEP	1015	90	11.	4.9	1331.5
27	SEP	1300	5	0.	.1	1330.0	27	SEP	2345	48	6.	3.6	1331.1	28	SEP	1030	91	10.	4.8	1331.5
27	SEP	1315	6	0.	.1	1330.0	28	SEP	0000	49	15.	5.8	1331.8	28	SEP	1045	92	10.	4.7	1331.5

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

27 SEP 1330	7	0.	.1	1330.0	* 28 SEP 0015	50	30.	8.7	1332.7	* 28 SEP 1100	93	10.	4.6	1331.4
27 SEP 1345	8	0.	.1	1330.0	* 28 SEP 0030	51	41.	10.9	1333.3	* 28 SEP 1115	94	9.	4.6	1331.4
27 SEP 1400	9	0.	.1	1330.0	* 28 SEP 0045	52	49.	12.4	1333.7	* 28 SEP 1130	95	9.	4.5	1331.4
27 SEP 1415	10	0.	.1	1330.0	* 28 SEP 0100	53	54.	13.4	1334.1	* 28 SEP 1145	96	9.	4.4	1331.4
27 SEP 1430	11	0.	.2	1330.0	* 28 SEP 0115	54	57.	14.1	1334.2	* 28 SEP 1200	97	9.	4.4	1331.4
27 SEP 1445	12	0.	.2	1330.1	* 28 SEP 0130	55	58.	14.4	1334.3	* 28 SEP 1215	98	9.	4.3	1331.3
27 SEP 1500	13	0.	.2	1330.1	* 28 SEP 0145	56	58.	14.4	1334.3	* 28 SEP 1230	99	8.	4.2	1331.3
27 SEP 1515	14	0.	.2	1330.1	* 28 SEP 0200	57	57.	14.1	1334.2	* 28 SEP 1245	100	8.	4.1	1331.3
27 SEP 1530	15	0.	.2	1330.1	* 28 SEP 0215	58	55.	13.7	1334.1	* 28 SEP 1300	101	7.	4.0	1331.2
27 SEP 1545	16	0.	.2	1330.1	* 28 SEP 0230	59	53.	13.2	1334.0	* 28 SEP 1315	102	7.	3.9	1331.2
27 SEP 1600	17	0.	.3	1330.1	* 28 SEP 0245	60	51.	12.7	1333.8	* 28 SEP 1330	103	6.	3.8	1331.2
27 SEP 1615	18	0.	.3	1330.1	* 28 SEP 0300	61	48.	12.1	1333.7	* 28 SEP 1345	104	6.	3.7	1331.1
27 SEP 1630	19	0.	.3	1330.1	* 28 SEP 0315	62	45.	11.6	1333.5	* 28 SEP 1400	105	6.	3.6	1331.1
27 SEP 1645	20	1.	.3	1330.1	* 28 SEP 0330	63	42.	11.1	1333.4	* 28 SEP 1415	106	6.	3.4	1331.1
27 SEP 1700	21	1.	.3	1330.1	* 28 SEP 0345	64	40.	10.6	1333.2	* 28 SEP 1430	107	5.	3.3	1331.0
27 SEP 1715	22	1.	.3	1330.1	* 28 SEP 0400	65	37.	10.1	1333.1	* 28 SEP 1445	108	5.	3.2	1331.0
27 SEP 1730	23	1.	.4	1330.1	* 28 SEP 0415	66	35.	9.7	1333.0	* 28 SEP 1500	109	5.	3.1	1331.0
27 SEP 1745	24	1.	.4	1330.1	* 28 SEP 0430	67	33.	9.3	1332.8	* 28 SEP 1515	110	5.	3.0	1330.9
27 SEP 1800	25	1.	.4	1330.1	* 28 SEP 0445	68	30.	8.9	1332.7	* 28 SEP 1530	111	5.	2.9	1330.9
27 SEP 1815	26	1.	.4	1330.1	* 28 SEP 0500	69	28.	8.5	1332.6	* 28 SEP 1545	112	5.	2.8	1330.9
27 SEP 1830	27	1.	.5	1330.1	* 28 SEP 0515	70	27.	8.2	1332.5	* 28 SEP 1600	113	4.	2.7	1330.8
27 SEP 1845	28	1.	.5	1330.2	* 28 SEP 0530	71	25.	7.9	1332.4	* 28 SEP 1615	114	4.	2.6	1330.8
27 SEP 1900	29	1.	.5	1330.2	* 28 SEP 0545	72	23.	7.6	1332.3	* 28 SEP 1630	115	4.	2.5	1330.8
27 SEP 1915	30	1.	.6	1330.2	* 28 SEP 0600	73	22.	7.3	1332.2	* 28 SEP 1645	116	4.	2.5	1330.8
27 SEP 1930	31	1.	.6	1330.2	* 28 SEP 0615	74	20.	7.1	1332.2	* 28 SEP 1700	117	4.	2.4	1330.7
27 SEP 1945	32	1.	.7	1330.2	* 28 SEP 0630	75	19.	6.9	1332.1	* 28 SEP 1715	118	4.	2.3	1330.7
27 SEP 2000	33	1.	.7	1330.2	* 28 SEP 0645	76	18.	6.7	1332.0	* 28 SEP 1730	119	4.	2.2	1330.7
27 SEP 2015	34	1.	.8	1330.2	* 28 SEP 0700	77	17.	6.5	1332.0	* 28 SEP 1745	120	4.	2.1	1330.7
27 SEP 2030	35	1.	.8	1330.3	* 28 SEP 0715	78	17.	6.3	1331.9	* 28 SEP 1800	121	3.	2.1	1330.6
27 SEP 2045	36	1.	.9	1330.3	* 28 SEP 0730	79	16.	6.2	1331.9	* 28 SEP 1815	122	3.	2.0	1330.6
27 SEP 2100	37	2.	1.0	1330.3	* 28 SEP 0745	80	15.	6.0	1331.9	* 28 SEP 1830	123	3.	1.9	1330.6
27 SEP 2115	38	2.	1.1	1330.3	* 28 SEP 0800	81	15.	5.9	1331.8	* 28 SEP 1845	124	3.	1.9	1330.6
27 SEP 2130	39	2.	1.2	1330.4	* 28 SEP 0815	82	14.	5.8	1331.8	* 28 SEP 1900	125	3.	1.8	1330.6
27 SEP 2145	40	2.	1.3	1330.4	* 28 SEP 0830	83	14.	5.7	1331.7	* 28 SEP 1915	126	3.	1.8	1330.5
27 SEP 2200	41	2.	1.4	1330.4	* 28 SEP 0845	84	13.	5.5	1331.7	* 28 SEP 1930	127	3.	1.7	1330.5
27 SEP 2215	42	3.	1.6	1330.5	* 28 SEP 0900	85	13.	5.4	1331.7	* 28 SEP 1945	128	3.	1.6	1330.5
27 SEP 2230	43	3.	1.7	1330.5	* 28 SEP 0915	86	12.	5.3	1331.6	* 28 SEP 2000	129	3.	1.6	1330.5

\*\*\*\*\*

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	32.00-HR
+ (CFS)	(HR)	(CFS)			
+ 58.	13.50	41.	16.	12.	12.
		(INCHES)			
		3.596	5.500	5.554	5.554
		(AC-FT)			
		21.	31.	32.	32.
PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
+ (AC-FT)	(HR)	6-HR	24-HR	72-HR	32.00-HR
+ 14.	13.50	11.	5.	4.	4.
PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
+ (FEET)	(HR)	6-HR	24-HR	72-HR	32.00-HR
+ 1334.33	13.50	1333.34	1331.64	1331.25	1331.25
CUMULATIVE AREA =		.11 SQ MI			

\*\*\* \*\*

```

*****
*
51 KK * BASI-7 *
*
*****
    
```

```

52 KO      OUTPUT CONTROL VARIABLES
          IPRNT      5 PRINT CONTROL
          IPLOT      5 PLOT CONTROL
          QSCAL      0. HYDROGRAPH PLOT SCALE
    
```

\*\*\* \*\*

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

\*\*\*\*\*  
 \* \* \*  
 67 KK \* W-COMB \*  
 \* \* \*  
 \*\*\*\*\*

68 KO OUTPUT CONTROL VARIABLES  
 IPRNT 5 PRINT CONTROL  
 IPLOT 5 PLOT CONTROL  
 QSCAL 0. HYDROGRAPH PLOT SCALE

\*\*\* \*\* \*\* \*\* \*\*

\*\*\*\*\*  
 \* \* \*  
 70 KK \* POND7 \*  
 \* \* \*  
 \*\*\*\*\*

### HYDROGRAPH ROUTING DATA

71 RS STORAGE ROUTING  
 NSTPS 1 NUMBER OF SUBREACHES  
 ITYP ELEV TYPE OF INITIAL CONDITION  
 RSVRIC 1330.00 INITIAL CONDITION  
 X .00 WORKING R AND D COEFFICIENT

72 SA AREA 11.5 15.8

73 SE ELEVATION 1330.00 1335.00

74 SQ DISCHARGE 0. 10. 20. 30. 40. 50. 60. 70. 80. 90.  
 100.

76 SE ELEVATION 1332.30 1332.77 1333.05 1333.28 1333.49 1333.68 1333.86 1334.03 1334.19 1334.34  
 1334.50

\*\*\*

### COMPUTED STORAGE-ELEVATION DATA

STORAGE .00 67.97  
 ELEVATION 1330.00 1335.00

### COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE .00 28.60 34.99 38.89 42.14 45.15 47.91 50.55 53.07 55.47  
 OUTFLOW .00 .00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00  
 ELEVATION 1330.00 1332.30 1332.77 1333.05 1333.28 1333.49 1333.68 1333.86 1334.03 1334.19

STORAGE 57.74 60.18 67.97  
 OUTFLOW 90.00 100.00 131.24  
 ELEVATION 1334.34 1334.50 1335.00

\*\*\*\*\*

### HYDROGRAPH AT STATION POND7 PLAN 1, RATIO = 7.80

\*\*\*\*\*

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
27	SEP	1200	1	0.	.0	1330.0	*	27	SEP	2245	44	0.	7.6	1330.6	*	28	SEP	0930	87	35.	43.7	1333.4
27	SEP	1215	2	0.	.0	1330.0	*	27	SEP	2300	45	0.	8.3	1330.7	*	28	SEP	0945	88	34.	43.4	1333.4
27	SEP	1230	3	0.	.1	1330.0	*	27	SEP	2315	46	0.	9.2	1330.7	*	28	SEP	1000	89	33.	43.2	1333.4
27	SEP	1245	4	0.	.1	1330.0	*	27	SEP	2330	47	0.	10.3	1330.8	*	28	SEP	1015	90	33.	42.9	1333.3
27	SEP	1300	5	0.	.2	1330.0	*	27	SEP	2345	48	0.	12.7	1331.0	*	28	SEP	1030	91	32.	42.6	1333.3
27	SEP	1315	6	0.	.3	1330.0	*	28	SEP	0000	49	0.	19.8	1331.6	*	28	SEP	1045	92	31.	42.4	1333.3
27	SEP	1330	7	0.	.3	1330.0	*	28	SEP	0015	50	1.	29.2	1332.3	*	28	SEP	1100	93	30.	42.2	1333.3
27	SEP	1345	8	0.	.4	1330.0	*	28	SEP	0030	51	11.	35.4	1332.8	*	28	SEP	1115	94	29.	41.9	1333.3
27	SEP	1400	9	0.	.5	1330.0	*	28	SEP	0045	52	20.	38.9	1333.1	*	28	SEP	1130	95	29.	41.7	1333.3
27	SEP	1415	10	0.	.6	1330.0	*	28	SEP	0100	53	27.	41.2	1333.2	*	28	SEP	1145	96	28.	41.5	1333.2
27	SEP	1430	11	0.	.6	1330.1	*	28	SEP	0115	54	33.	43.0	1333.3	*	28	SEP	1200	97	27.	41.3	1333.2
27	SEP	1445	12	0.	.7	1330.1	*	28	SEP	0130	55	38.	44.4	1333.4	*	28	SEP	1215	98	27.	41.1	1333.2

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

27 SEP 1500	13	0.	.8	1330.1	* 28 SEP 0145	56	42.	45.6	1333.5	* 28 SEP 1230	99	26.	40.8	1333.2
27 SEP 1515	14	0.	.9	1330.1	* 28 SEP 0200	57	45.	46.6	1333.6	* 28 SEP 1245	100	25.	40.4	1333.2
27 SEP 1530	15	0.	1.0	1330.1	* 28 SEP 0215	58	48.	47.5	1333.6	* 28 SEP 1300	101	24.	40.1	1333.1
27 SEP 1545	16	0.	1.1	1330.1	* 28 SEP 0230	59	51.	48.1	1333.7	* 28 SEP 1315	102	23.	39.7	1333.1
27 SEP 1600	17	0.	1.2	1330.1	* 28 SEP 0245	60	53.	48.6	1333.7	* 28 SEP 1330	103	22.	39.4	1333.1
27 SEP 1615	18	0.	1.3	1330.1	* 28 SEP 0300	61	54.	49.0	1333.8	* 28 SEP 1345	104	21.	39.1	1333.1
27 SEP 1630	19	0.	1.4	1330.1	* 28 SEP 0315	62	55.	49.3	1333.8	* 28 SEP 1400	105	20.	38.8	1333.0
27 SEP 1645	20	0.	1.5	1330.1	* 28 SEP 0330	63	56.	49.5	1333.8	* 28 SEP 1415	106	19.	38.5	1333.0
27 SEP 1700	21	0.	1.6	1330.1	* 28 SEP 0345	64	57.	49.6	1333.8	* 28 SEP 1430	107	18.	38.3	1333.0
27 SEP 1715	22	0.	1.7	1330.1	* 28 SEP 0400	65	57.	49.7	1333.8	* 28 SEP 1445	108	18.	38.0	1333.0
27 SEP 1730	23	0.	1.8	1330.1	* 28 SEP 0415	66	57.	49.7	1333.8	* 28 SEP 1500	109	17.	37.8	1333.0
27 SEP 1745	24	0.	1.9	1330.2	* 28 SEP 0430	67	56.	49.6	1333.8	* 28 SEP 1515	110	16.	37.5	1333.0
27 SEP 1800	25	0.	2.1	1330.2	* 28 SEP 0445	68	56.	49.4	1333.8	* 28 SEP 1530	111	16.	37.3	1332.9
27 SEP 1815	26	0.	2.2	1330.2	* 28 SEP 0500	69	55.	49.1	1333.8	* 28 SEP 1545	112	15.	37.1	1332.9
27 SEP 1830	27	0.	2.3	1330.2	* 28 SEP 0515	70	54.	48.9	1333.7	* 28 SEP 1600	113	15.	36.8	1332.9
27 SEP 1845	28	0.	2.5	1330.2	* 28 SEP 0530	71	53.	48.6	1333.7	* 28 SEP 1615	114	14.	36.6	1332.9
27 SEP 1900	29	0.	2.7	1330.2	* 28 SEP 0545	72	51.	48.3	1333.7	* 28 SEP 1630	115	14.	36.4	1332.9
27 SEP 1915	30	0.	2.9	1330.2	* 28 SEP 0600	73	50.	48.0	1333.7	* 28 SEP 1645	116	13.	36.2	1332.9
27 SEP 1930	31	0.	3.1	1330.2	* 28 SEP 0615	74	49.	47.7	1333.7	* 28 SEP 1700	117	13.	36.0	1332.8
27 SEP 1945	32	0.	3.2	1330.3	* 28 SEP 0630	75	48.	47.4	1333.6	* 28 SEP 1715	118	12.	35.9	1332.8
27 SEP 2000	33	0.	3.4	1330.3	* 28 SEP 0645	76	47.	47.0	1333.6	* 28 SEP 1730	119	12.	35.7	1332.8
27 SEP 2015	34	0.	3.7	1330.3	* 28 SEP 0700	77	46.	46.7	1333.6	* 28 SEP 1745	120	11.	35.5	1332.8
27 SEP 2030	35	0.	3.9	1330.3	* 28 SEP 0715	78	45.	46.4	1333.6	* 28 SEP 1800	121	11.	35.4	1332.8
27 SEP 2045	36	0.	4.2	1330.3	* 28 SEP 0730	79	44.	46.1	1333.6	* 28 SEP 1815	122	11.	35.2	1332.8
27 SEP 2100	37	0.	4.5	1330.4	* 28 SEP 0745	80	43.	45.9	1333.5	* 28 SEP 1830	123	10.	35.1	1332.8
27 SEP 2115	38	0.	4.8	1330.4	* 28 SEP 0800	81	42.	45.6	1333.5	* 28 SEP 1845	124	10.	34.9	1332.8
27 SEP 2130	39	0.	5.1	1330.4	* 28 SEP 0815	82	41.	45.3	1333.5	* 28 SEP 1900	125	10.	34.8	1332.8
27 SEP 2145	40	0.	5.5	1330.4	* 28 SEP 0830	83	39.	45.0	1333.5	* 28 SEP 1915	126	9.	34.7	1332.7
27 SEP 2200	41	0.	5.9	1330.5	* 28 SEP 0845	84	38.	44.7	1333.5	* 28 SEP 1930	127	9.	34.5	1332.7
27 SEP 2215	42	0.	6.4	1330.5	* 28 SEP 0900	85	37.	44.3	1333.4	* 28 SEP 1945	128	9.	34.4	1332.7
27 SEP 2230	43	0.	6.9	1330.6	* 28 SEP 0915	86	36.	44.0	1333.4	* 28 SEP 2000	129	9.	34.3	1332.7

\*\*\*\*\*

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	32.00-HR
+ (CFS)	(HR)	(CFS)			
+ 57.	16.00	51.	26.	19.	19.
		(INCHES)	1.791	3.601	3.601
		(AC-FT)	25.	51.	51.
PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	32.00-HR
+ (AC-FT)	(HR)				
+ 50.	16.00	48.	36.	27.	27.
PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	32.00-HR
+ (FEET)	(HR)				
+ 1333.80	16.00	1333.70	1332.81	1332.13	1332.13

CUMULATIVE AREA = .27 SQ MI

# HEC-1 Analysis of the 100-Yr Storm for Developed Conditions-Avalon Park 2nd Addition

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS  
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES  
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	
					7.80
HYDROGRAPH AT					
+ W-BAS1	.06	1	FLOW	80.	
			TIME	12.75	
HYDROGRAPH AT					
+ W-BAS2	.05	1	FLOW	149.	
			TIME	12.00	
2 COMBINED AT					
+ W-COMB	.11	1	FLOW	173.	
			TIME	12.00	
ROUTED TO					
+ W-PND	.11	1	FLOW	58.	
			TIME	13.50	
			** PEAK STAGES IN FEET **		
		1	STAGE	1334.33	
			TIME	13.50	
HYDROGRAPH AT					
+ BAS1-7	.16	1	FLOW	502.	
			TIME	12.00	
2 COMBINED AT					
+ W-COMB	.27	1	FLOW	517.	
			TIME	12.00	
ROUTED TO					
+ POND7	.27	1	FLOW	57.	
			TIME	16.00	
			** PEAK STAGES IN FEET **		
		1	STAGE	1333.80	
			TIME	16.00	

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

100.0 Maximum Q (cfs)  
10.000 Weir Width (feet)  
1332.30 Weir Elevation

<u>Q</u> <u>(cfs)</u>	<u>Weir</u> <u>Width</u> <u>(feet)</u>	<u>Weir</u> <u>Elevation</u>	<u>q</u>	<u>Critical</u> <u>Depth</u> <u>(feet)</u>	<u>Energy</u> <u>Head</u> <u>(feet)</u>	<u>Water</u> <u>Surface</u> <u>Elevation</u>
0.0	10.000	1332.30	0.0	0.00	0.00	1332.30
10.0	10.000	1332.30	1.0	0.31	0.47	1332.77
20.0	10.000	1332.30	2.0	0.50	0.75	1333.05
30.0	10.000	1332.30	3.0	0.65	0.98	1333.28
40.0	10.000	1332.30	4.0	0.79	1.19	1333.49
50.0	10.000	1332.30	5.0	0.92	1.38	1333.68
60.0	10.000	1332.30	6.0	1.04	1.56	1333.86
70.0	10.000	1332.30	7.0	1.15	1.73	1334.03
80.0	10.000	1332.30	8.0	1.26	1.89	1334.19
90.0	10.000	1332.30	9.0	1.36	2.04	1334.34
100.0	10.000	1332.30	10.0	1.46	2.19	1334.49

# Rating Curve for Proposed 36" RCP under Railroad

CURRENT DATE: 10-16-2003  
CURRENT TIME: 11:03:34

FILE DATE: 10-16-2003  
FILE NAME: AVALON

-----  
FWHA CULVERT ANALYSIS  
HY-8, VERSION 3.2  
-----

C	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
U								
L	INLET	OUTLET	CULVERT	BARRELS				
V	ELEV.	ELEV.	LENGTH	SHAPE	SPAN	RISE	MANNING	INLET
	(FT)	(FT)	(FT)	MATERIAL	(FT)	(FT)	n	TYPE
1	1330.00	1329.99	50.00	1 RCP	3.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

-----  
SUMMARY OF CULVERT FLOWS (CFS)                      FILE: AVALON                      DATE: 10-16-2003  
-----

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1330.00	0	0	0	0	0	0	0	0	1
1331.13	6	6	0	0	0	0	0	0	1
1331.61	12	12	0	0	0	0	0	0	1
1332.03	18	18	0	0	0	0	0	0	1
1332.37	24	24	0	0	0	0	0	0	1
1332.69	30	30	0	0	0	0	0	0	1
1333.03	36	36	0	0	0	0	0	0	1
1333.34	42	42	0	0	0	0	0	0	1
1333.68	48	48	0	0	0	0	0	0	1
1334.02	54	54	0	0	0	0	0	0	1
1334.46	60	60	0	0	0	0	0	0	1
1335.00	68	68	0	0	0	0	0	0	OVERTOPPING

-----  
SUMMARY OF ITERATIVE SOLUTION ERRORS                      FILE: AVALON                      DATE: 10-16-2003  
-----

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1330.00	0.00	0	0	0.00
1331.13	0.00	6	0	0.00
1331.61	0.00	12	0	0.00
1332.03	0.00	18	0	0.00
1332.37	0.00	24	0	0.00
1332.69	0.00	30	0	0.00
1333.03	0.00	36	0	0.00
1333.34	0.00	42	0	0.00
1333.68	0.00	48	0	0.00
1334.02	0.00	54	0	0.00
1334.46	0.00	60	0	0.00

-----  
<1> TOLERANCE (FT) = 0.010                      <2> TOLERANCE (%) = 1.000  
-----

# Rating Curve for Proposed 36" RCP under Railroad

CURRENT DATE: 10-16-2003  
 CURRENT TIME: 11:03:34

FILE DATE: 10-16-2003  
 FILE NAME: AVALON

-----  
 CULVERT # 1  
 -----

PERFORMANCE CURVE FOR 1 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1330.00	1330.00	0.00	0.00	0-NF	0.00	1330.00	0.00	0.00
6	1331.13	1330.00	1.04	1.13	2-M2	0.00	0.00	0.00	4.26
12	1331.61	1330.00	1.51	1.61	2-M2	0.00	0.00	0.00	5.15
18	1332.03	1330.00	1.92	2.03	2-M2	0.00	0.00	0.00	5.85
24	1332.37	1330.00	2.26	2.37	2-M2	0.00	0.00	0.00	6.42
30	1332.69	1330.00	2.56	2.69	2-M2	0.00	0.00	0.00	6.91
36	1333.03	1330.00	2.86	3.03	2-M2	0.00	0.00	0.00	7.44
42	1333.34	1330.00	3.17	3.34	2-M2	0.00	0.00	0.00	7.91
48	1333.68	1330.00	3.51	3.68	2-M2	0.00	0.00	0.00	8.47
54	1334.02	1330.00	3.88	4.02	2-M2	0.00	0.00	0.00	8.97
60	1334.46	1330.00	4.29	4.46	7-FP	0.00	0.00	0.00	9.61

El. inlet face invert 1330.00 ft El. outlet invert 1329.99 ft  
 El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

\*\*\*\*\* SITE DATA \*\*\*\*\* CULVERT INVERT \*\*\*\*\*  
 INLET STATION (FT) 0.00  
 INLET ELEVATION (FT) 1330.00  
 OUTLET STATION (FT) 50.00  
 OUTLET ELEVATION (FT) 1329.99  
 NUMBER OF BARRELS 1.00  
 SLOPE (V-FT/H-FT) 0.0002  
 CULVERT LENGTH ALONG SLOPE (FT) 50.00

\*\*\*\*\* CULVERT DATA SUMMARY \*\*\*\*\*  
 BARREL SHAPE CIRCULAR  
 BARREL DIAMETER 3.00 FT  
 BARREL MATERIAL CONCRETE  
 BARREL MANNING'S N 0.012  
 INLET TYPE CONVENTIONAL  
 INLET EDGE AND WALL GROOVED END IN HEADWALL  
 INLET DEPRESSION NONE

# Rating Curve for Proposed 36" RCP under Railroad

3

CURRENT DATE: 10-16-2003  
CURRENT TIME: 11:03:34

FILE DATE: 10-16-2003  
FILE NAME: AVALON

-----  
-----  
TAILWATER  
-----  
-----

CONSTANT WATER SURFACE ELEVATION  
1330.00

-----  
-----  
ROADWAY OVERTOPPING DATA  
-----  
-----

WEIR COEFFICIENT	3.00
EMBANKMENT TOP WIDTH (FT)	20.00
CREST LENGTH (FT)	100.00
OVERTOPPING CREST ELEVATION (FT)	1335.00

-----  
-----