COIT PLAZA WAL-MART

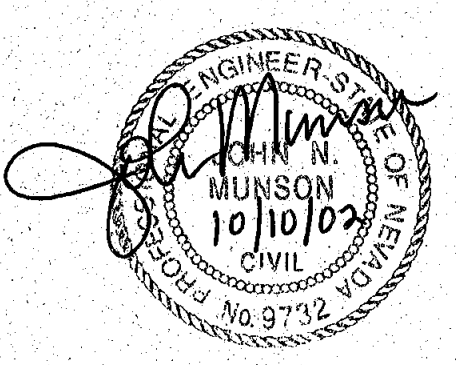
HYDROLOGY REPORT

ADDENDUM 0001

PREPARED FOR: CEI Engineering Associates, Inc.
4237 W. Swift Avenue
Fresno, CA 93722

PREPARED BY: John Munson, P.E.

JEFF CODEGA
PLANNING/DESIGN, INC.



planners/landscape architects/ engineers

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October 10, 2002

2002.0003

JEFF CODEGA
PLANNING/DESIGN, INC.
engineers/landscape architects/planners/land surveyors/construction services

Job No. 2002.0003

October 10, 2002

City of Reno
P.O. Box 1900
Reno, NV 89505

Re: Coit Plaza Wal-Mart
Addendum 001 to the Hydrology Report

Jeff Codega Planning/Design, Inc. (JCP/D) has prepared this addendum to the original hydrology report for the above referenced project. The original report prepared by JCP/D dated June 7,2002, is already on file with the City of Reno as part of the project building permit submittal. This addendum was prepared following plan revisions made by CEI Engineering Associates, Inc., affecting only the public storm drain system within the project. The elements of this addendum are as follows:

1. The public storm drain system perpetuates approximately 217 cfs of off-site 100-year flow through the site to the existing sixty (60) inch culvert under McCarran Blvd. The existing culvert headwall entrance is being replaced by a multi-grate drop inlet structure (the original design has not changed). The new inlet structure will be placed within a sump inlet basin that coincidentally provides some detention of the off-site flow (the original design has not changed). This off-site flow originates from upstream drainage areas that currently discharge into the undeveloped Wal-Mart site at four (4) locations. Figure 1 illustrates the drainage areas and the existing discharge locations (points D, E, F and CB7th). The off-site areas and existing pipes are fully described in the original project hydrology report by JCP/D.

2. The original design consisted of two (2) separate public storm drain systems to perpetuate the off-site flow through the site to the McCarran Inlet Basin. This addendum was prepared to analyze the consolidation of the off-site flow into one (1) public storm drain system. As per the original design, the on-site flow will remain in a separate pipe system which is piped to the private on-site detention basin located adjacent to the McCarran Inlet Basin. Figure 1 also illustrates the proposed pipe systems. Line DEFG represents the proposed consolidated public system analyzed in this addendum.

3. The HEC-1 model included in the original hydrology report was prepared using an older DOS version of the HEC program. JCP/D is now using the current HEC-HMS version of the program. HMS provides all the functions of HEC-1 but has increased capabilities in runoff transform and the capability to model different storm events within the same project file. In order to preserve the original report model but to bring this analysis into current JCP/D format, a new HEC-HMS model was prepared for the project to address the plan revisions.

Figure 2 illustrates the HMS model schematic. Figures 3 and 4 illustrate the 5 and 100-year rainfall data used in the HMS model schematic. Tables 1 and 2 summarize the 5 and 100-year results from the HMS Model.

4. As stated previously, there are two detention basins located on the project. The inflow and outflow to these basins was not impacted by the proposed storm drain pipe revisions, however, all pertinent calculations and results for the basins are included in this addendum for reference. Tables 3A and 3B summarize the results of routing through the McCarran Inlet and the private detention basins. Per the tables, the final results for the McCarran inlet are Q100(in)=213.55 cfs and Q100(out)=190.57 cfs. Storage = 0.476 ac-ft at Peak Stage Elev. 862.14. Available freeboard to overflow into the private detention basin (elevation 865) is 2.86 feet or 0.69 ac-feet of storage. The final results for the private detention basin are Q100(in)=72.04 cfs and Q100(out)=23.25 cfs. Storage = 1.41 ac-ft at Peak Stage Elev. 860.66. Available freeboard to overflow into the McCarran inlet (elevation 865) is 4.34 feet and 1.92 ac-feet of storage. If the freeboard to elevation 865 is exceeded in both basins, the basins will act as a single basin and the water can safely rise to elevation 872.00 before it will overflow onto McCarran Blvd. This additional 7 feet in elevation provides an additional 8.40 ac-feet of storage. Total emergency storage between the 100-year water surface and overflow to McCarran is (0.69 + 1.92 + 8.40) = 11.01 acre-feet.

5. Table 4 summarizes the detention basin storage and outflow rating calculations calculated by JCP/D based on the final detention area grading plan by CEI Engineering.

6. A StormCad Model was prepared for the revised public storm drain system based on plan and profiles prepared by CEI Engineering. StormCad was run for the 5 and 100-year storms. Flow and hydraulic grade line information from StormCad was transferred to the CEI design plan and profiles. The StormCad Model results are also included in this addendum.

Sincerely,

Jeff Codega Planning/Design, Inc.

John Munson, P.E.
Senior Engineer

A. Silverado Ranch Estates Detention Basin SREDB

B. Inlet Sump for Rip-Rap ditch and outflow SREDB Junction-1

C. Junction-2

D. Bully's Pipe #4

E. COIT 1 Pipes #2 & 3 Junction-3

F. COIT 2 Pipe #1 Junction-4

G. McCarran Inlet Basin MCI

H Private Detention Basin CTPLDB

I. Original Design for conveying Bully's to Inlet Basin. Replaced with 30" To North (section D to E).

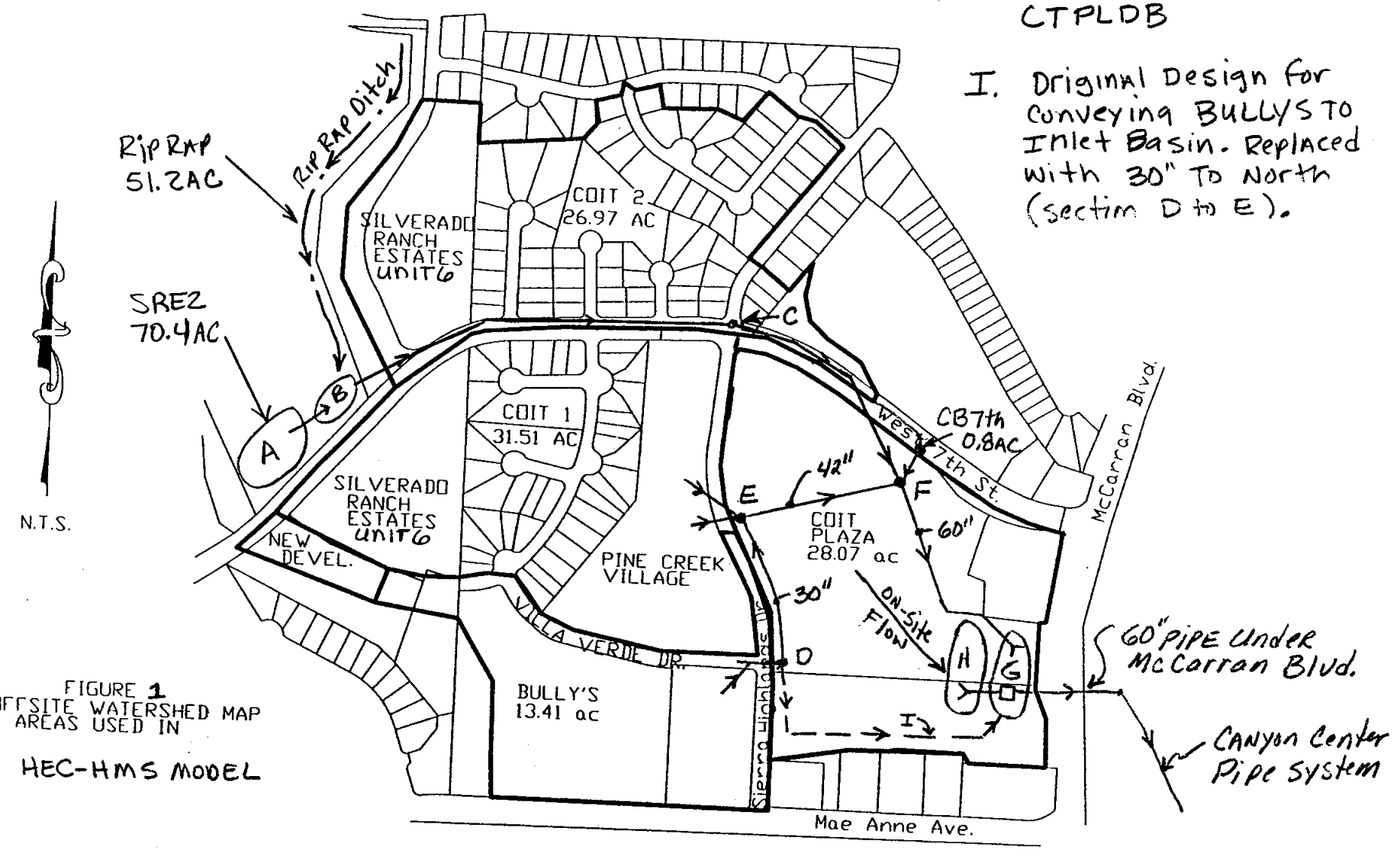

FIGURE 1
OFFSITE WATERSHED MAP
AREAS USED IN
HEC-HMS MODEL

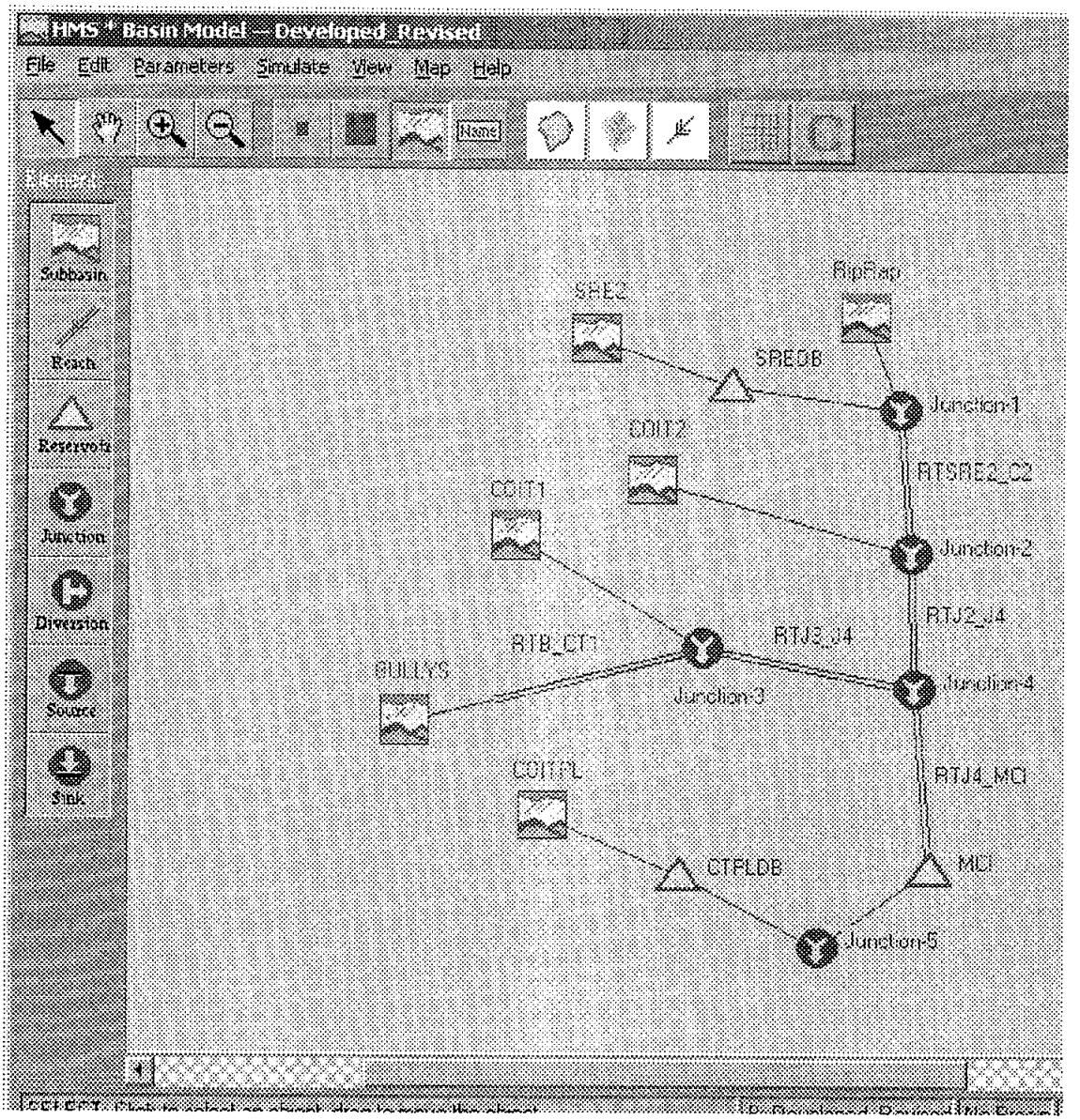
HMS - Basin Model – Developed_Revised
File Edit Parameters Simulate View Map Help
None
Elements
Subbasin
Reach
Reservoir
Junction
Diversion
Source
Sink
SRE2
RipRap
SREDB
Junction-1
COIT2
RTSRE2_C2
COIT1
Junction-2
RTJ2_J4
RTB_CT1
RTJ3_J4
BULLYS
Junction-3
Junction-4
COITPL
RTJ4_MCI
CTPLDB
MCI
Junction-5

Figure 2

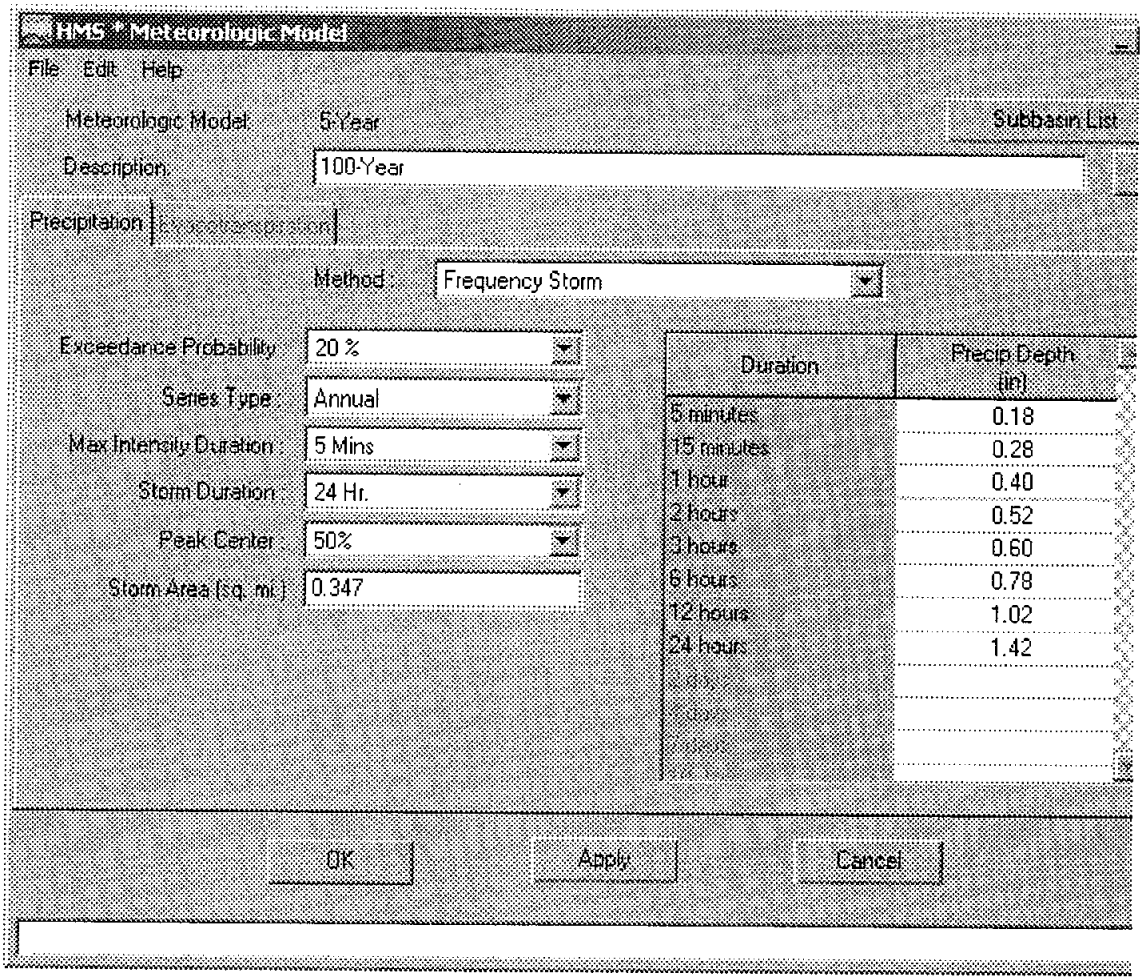
HMS * Meteorologic Model
File Edit Help
Meteorologic Model: 5-Year
Subbasin List
Description: 100-Year
Precipitation
Method: Frequency Storm
Exceedance Probability: 20 %
Series Type: Annual
Max Intensity Duration: 5 Mins
Storm Duration: 24 Hr.
Peak Center: 50%
Storm Area (sq. mi.): 0.347
Duration
Precip Depth (in)
5 minutes 0.18
15 minutes 0.28
1 hour 0.40
2 hours 0.52
3 hours 0.60
6 hours 0.78
12 hours 1.02
24 hours 1.42
OK
Apply
Cancel

Figure 3

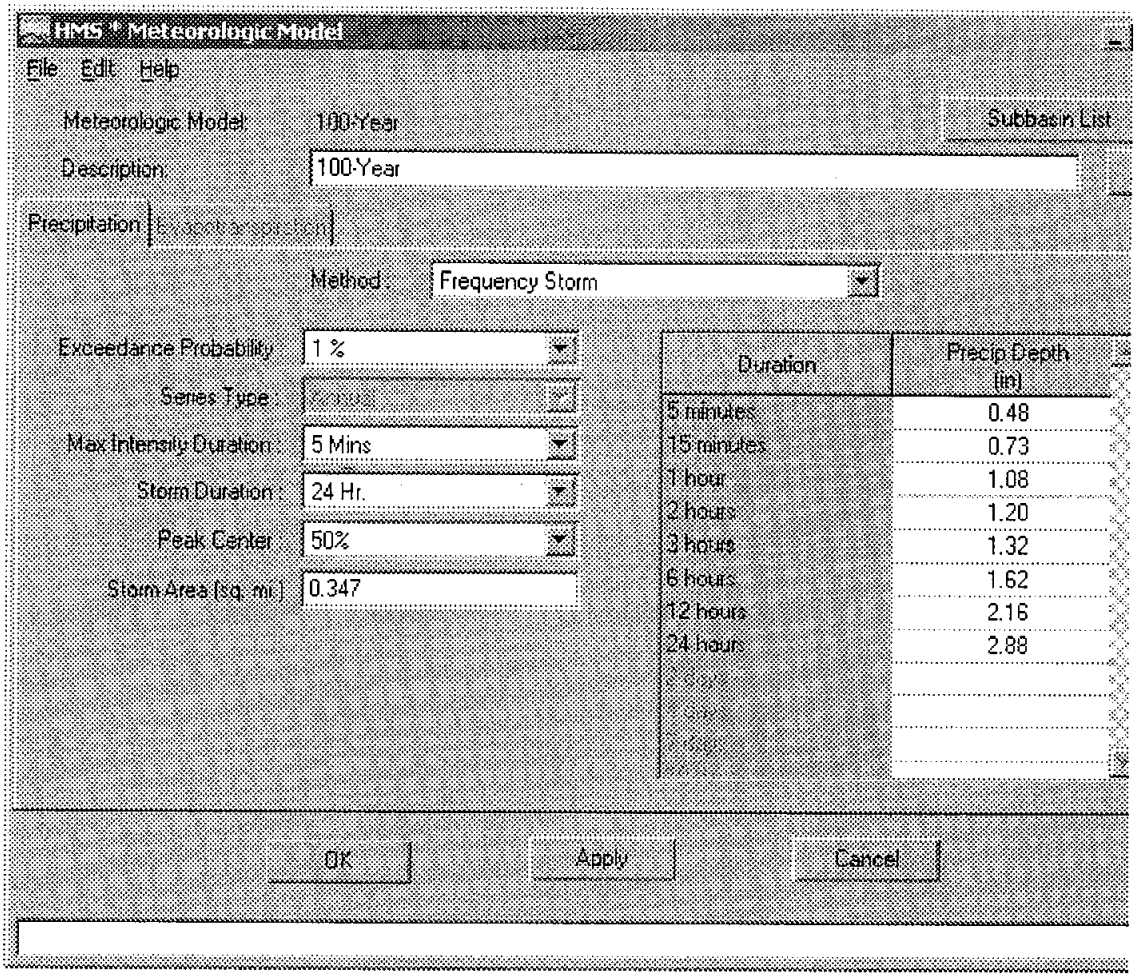
HMS * Meteorologic Model
File Edit Help
Meteorologic Model: 100-Year
Subbasin List
Description: 100-Year
Precipitation
Method: Frequency Storm
Exceedance Probability: 1 %
Series Type:
Max Intensity Duration: 5 Mins
Storm Duration: 24 Hr.
Peak Center: 50%
Storm Area (sq. mi): 0.347
Duration
Precip Depth (in)
5 minutes 0.48
15 minutes 0.73
1 hour 1.08
2 hours 1.20
3 hours 1.32
6 hours 1.62
12 hours 2.16
24 hours 2.88
OK
Apply
Cancel

Figure 4

TABLE 1

HMS * Summary of Results

Project: CoitPlaza Run Name: Ru

Start of Run: 26Sep02 0000 Basin Model: Developed_Revise
End of Run: 27Sep02 0000 Met. Model: 5-Year
Execution Time: 07Oct02 1147 Control Specs: Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Total Volume (ac ft)	Drainage Area (sq mi)
COITPL	22.051	26 Sep 02 1212	2.1145	0.045
CTPLDB	9.1702	26 Sep 02 1224	2.0984	0.045
BULLYS	10.291	26 Sep 02 1212	0.98677	0.021
RTB_CT1	10.208	26 Sep 02 1212	0.98550	0.021
COIT1	11.353	26 Sep 02 1212	1.1454	0.049
Junction-3	21.561	26 Sep 02 1212	2.1309	0.070
RTJ3_J4	21.182	26 Sep 02 1212	2.1293	0.070
SRE2	20.126	26 Sep 02 1212	2.1344	0.110
SREDB	3.0862	26 Sep 02 1306	1.9484	0.110
RipRap	14.637	26 Sep 02 1212	1.5523	0.080
Junction-1	16.407	26 Sep 02 1212	3.5007	0.190
RTSRE2_C2	16.277	26 Sep 02 1214	3.4953	0.190
COIT2	7.5376	26 Sep 02 1218	0.97739	0.042
Junction-2	23.468	26 Sep 02 1214	4.4727	0.232
RTJ2_J4	23.204	26 Sep 02 1216	4.4687	0.232
Junction-4	44.301	26 Sep 02 1214	6.5981	0.302
RTJ4_MCI	43.808	26 Sep 02 1214	6.5920	0.302
MCI	43.722	26 Sep 02 1214	6.5913	0.302
Junction-5	51.903	26 Sep 02 1216	8.6896	0.347

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TABLE 2

HMS * Summary of Results

Project: ColtPlaza Run Name: Ru

Start of Run: 26Sep02 0000 Basin Model: Developed_Revise
End of Run: 27Sep02 0000 Met. Model: 100-Year
Execution Time: 07Oct02 1437 Control Specs: Control 1

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Total Volume (ac-ft)	Drainage Area (sq mi)
COITPL	72.036	26 Sep 02 1212	5.5692	0.045
CTPLDB	23.246	26 Sep 02 1228	5.5374	0.045
BULLYS	33.617	26 Sep 02 1212	2.5990	0.021
RTB_CT1	33.515	26 Sep 02 1212	2.5964	0.021
COIT1	57.556	26 Sep 02 1212	4.2438	0.049
Junction-3	91.071	26 Sep 02 1212	6.8403	0.070
RTJ3_J4	90.333	26 Sep 02 1212	6.8377	0.070
SRE2	117.41	26 Sep 02 1212	8.6687	0.110
SREDB	8.0806	26 Sep 02 1252	7.3391	0.110
RipRap	85.392	26 Sep 02 1212	6.3045	0.080
Junction-1	91.528	26 Sep 02 1212	13.644	0.190
RTSRE2_C2	90.780	26 Sep 02 1212	13.630	0.190
COIT2	38.525	26 Sep 02 1216	3.6270	0.042
Junction-2	126.01	26 Sep 02 1214	17.257	0.232
RTJ2_J4	125.72	26 Sep 02 1214	17.246	0.232
Junction-4	213.73	26 Sep 02 1214	24.084	0.302
RTJ4_MCI	213.55	26 Sep 02 1214	24.071	0.302
MCI	190.57	26 Sep 02 1218	24.069	0.302
Junction-5	208.62	26 Sep 02 1218	29.606	0.347

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TABLE 3A

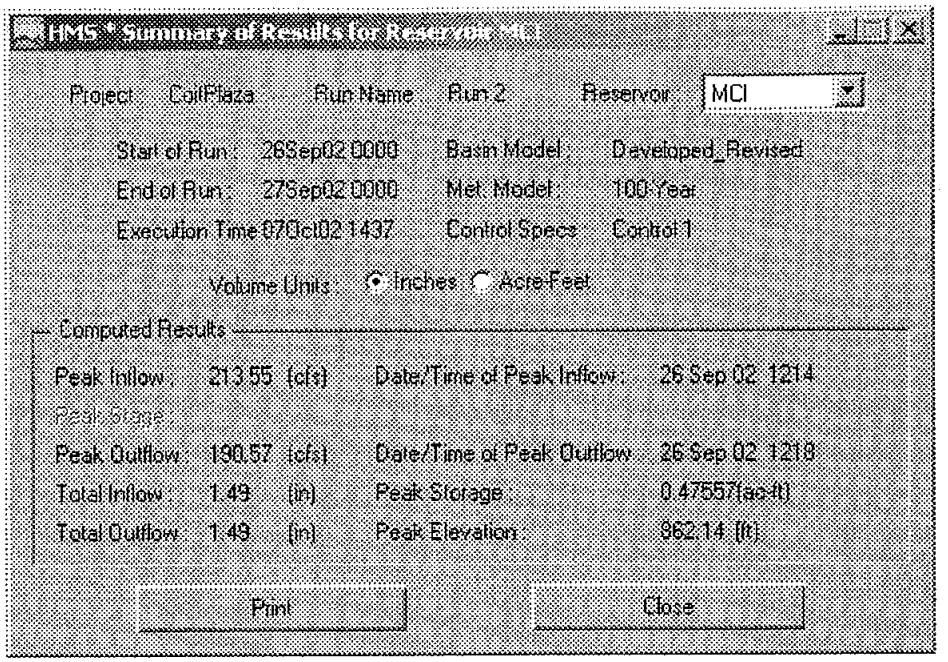


TABLE 3B

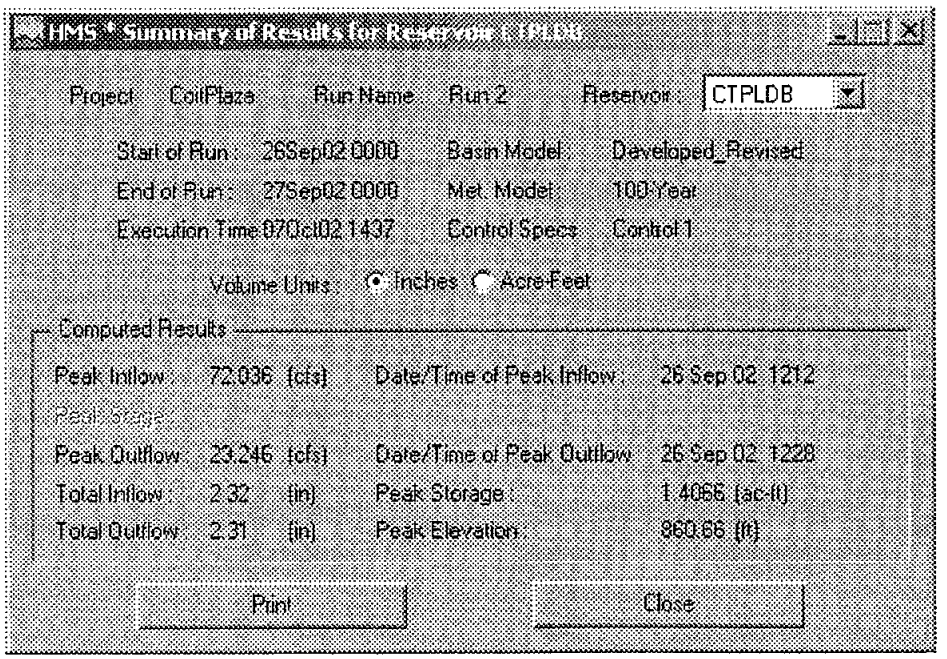
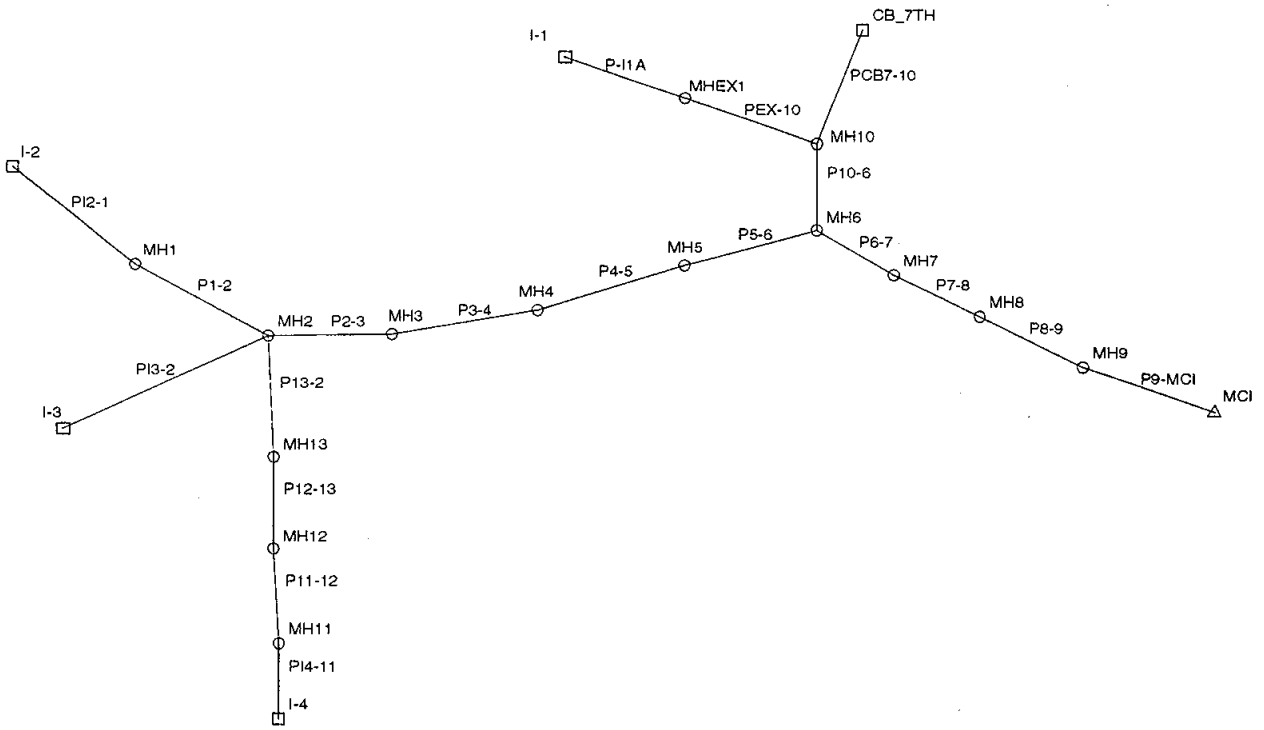


TABLE 4

Coit Plaza Private Detention Basin								
Elevation (ft)	Area (s.f.)	Area (acres)	Volume (acre-ft)	Storage (acre-ft)	Head (ft)	15" RCP Q(cfs)	Overflow Grate (cfs)	Basin Outlow (cfs)
854	0	0.000	0	0	0	0.0		0
855	5718.23	0.131	0.066	0.066	1	3.0		3
856	7253.64	0.167	0.149	0.215	2	7.3		7
857	8845.29	0.203	0.185	0.399	3	10.0		10
858	10493.2	0.241	0.222	0.621	4	12.5		13
859	12197.36	0.280	0.260	0.882	5	14.5		15
860	13957.78	0.320	0.300	1.182	6	16.0		16
861	15774.45	0.362	0.341	1.523	7	18.0	8.7	27
862	17647.37	0.405	0.384	1.907	8	19.0	16.8	36
863	19576.54	0.449	0.427	2.334	9	20.0	22.2	42
864	21561.97	0.495	0.472	2.806	10	21.0	26.5	47
865	23603.17	0.542	0.518	3.325	11	22.0	30.2	52

McCarran Inlet Structure								
Elevation (ft)	Area (s.f.)	Area (acres)	Volume (acre-ft)	Storage (acre-ft)	Head (ft)	Grate Capacity Q(cfs)	60" Pipe Capacity (cfs)	Basin Outlow (cfs)
857	0	0.000	0	0	0	0.00	0.00	0
858	1500.07	0.034	0.017	0.017	1	84.26	195.00	84
859	3124.24	0.072	0.053	0.070	2	119.16	220.00	119
860	4652.8	0.107	0.089	0.160	3	145.95	240.00	146
861	6237.18	0.143	0.125	0.285	4	168.52	255.00	169
862	7877.39	0.181	0.162	0.447	5	188.42	280.00	188
863	9574.14	0.220	0.200	0.647	6	206.40	290.00	206
864	11327.43	0.260	0.240	0.887	7	222.94	300.00	223
865	13134.88	0.302	0.281	1.168	8	238.33	330.00	238

Emergency Overflow Storage								
Elevation (ft)	Area (s.f.)	Area (acres)	Volume (acre-ft)	Storage (acre-ft)	Head (ft)	Grate Capacity Q(cfs)	60" Pipe Capacity (cfs)	Basin Outlow (cfs)
865		0.844	0.799	4.493	8	238.33	0.00	238
866	45384.8	1.042	0.943	5.436	9	252.79	340.00	253
868	51669.61	1.186	2.228	7.664	10	266.46	350.00	266
870	57006.43	1.309	2.495	10.159	11	279.47	360.00	279
872	62283.84	1.430	2.739	12.897	12	291.89	370.00	292


CB_7TH
I-1
P-I1A
MHEX1
PCB7-10
PEX-10
MH10
I-2
P10-6
PI2-1
MH6
P5-6
MH1
MH5
P6-7
MH7
P4-5
P1-2
MH4
P7-8
MH8
MH2
P2-3
MH3
P3-4
P8-9
MH9
PI3-2
P9-MCI
MCI
P13-2
I-3
MH13
P12-13
MH12
P11-12
MH11
PI4-11
I-4

Network Quick View

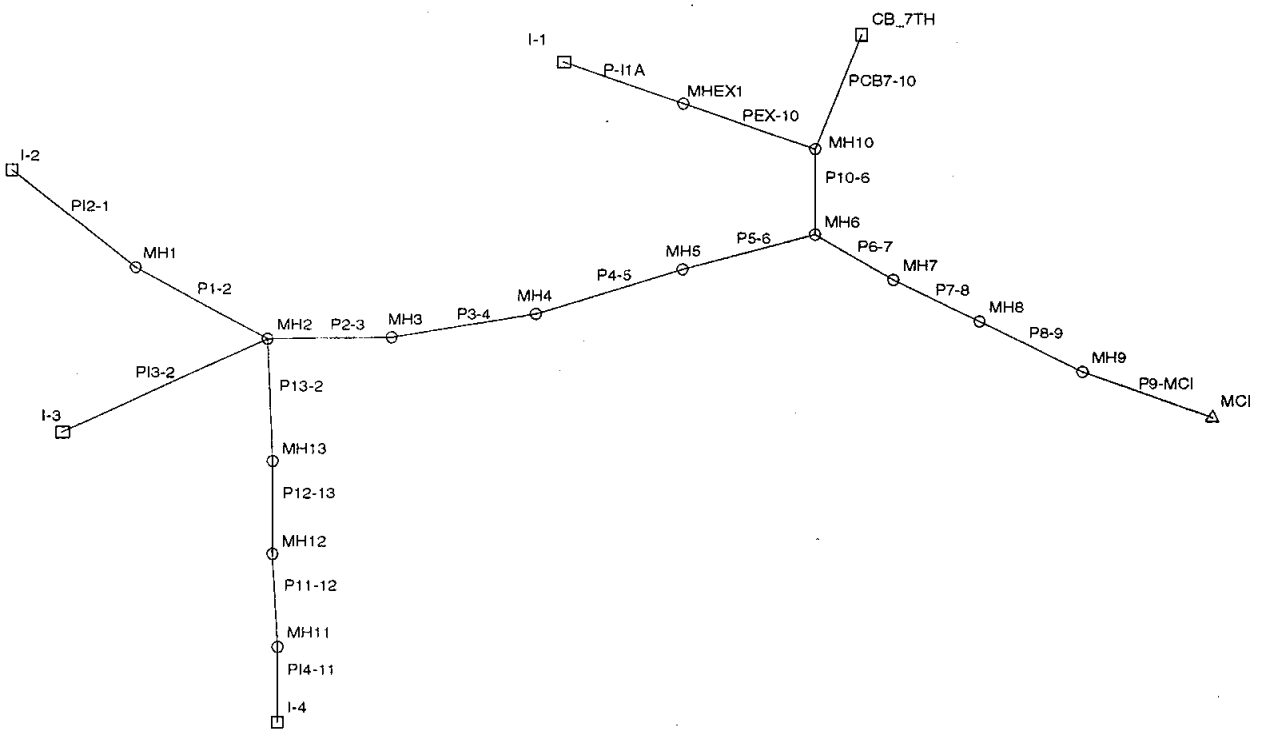
Label	Length	Size	Discharge	Hydraulic Grade Upstream	Hydraulic Grade Downstream
P9-MCI	48.00	60 inch	46.30	862.16	862.15
P7-8	211.00	60 inch	46.30	870.85	869.10
P8-9	218.00	60 inch	46.30	862.48	862.28
P-I1A	296.00	36 inch	23.20	906.75	893.20
PEX-10	220.00	36 inch	23.20	893.72	891.23
PCB7-10	42.00	12 inch	1.40	891.94	890.28
P10-6	107.00	48 inch	24.60	883.43	882.49
P6-7	322.00	60 inch	46.30	875.11	872.58
P4-5	132.00	42 inch	21.70	877.18	876.08
P5-6	132.00	42 inch	21.70	875.76	875.82
P3-4	151.00	42 inch	21.70	878.19	877.50
P2-3	205.00	42 inch	21.70	882.17	879.14
P1-2	50.00	24 inch	5.70	890.49	889.29
PI2-1	120.00	24 inch	5.70	893.95	891.30
P13-2	120.00	30 inch	10.30	887.84	887.28
PI3-2	57.00	24 inch	5.70	889.95	889.54
P12-13	209.00	30 inch	10.30	888.92	888.05
P11-12	209.00	30 inch	10.30	890.09	889.13
PI4-11	20.00	24 inch	10.30	890.79	890.42

Label	Discharge	Elevations Ground	Elevations Upstream HGL	Elevations Downstream HGL
MCI	46.30	867.00	862.15	862.15
MH9	46.30	867.00	862.28	862.16
MH8	46.30	881.68	863.19	862.48
MH7	46.30	881.20	871.56	870.85
I-1	23.20	913.08	907.37	906.75
MHEX1	23.20	901.18	893.72	893.72
MH10	24.60	895.00	883.97	883.43
CB_7TH	1.40	897.40	892.14	891.94
MH6	46.30	887.33	875.82	875.11
MH5	21.70	885.80	876.08	875.76
MH4	21.70	885.52	877.50	877.18
MH3	21.70	885.57	878.73	878.19
MH2	21.70	899.15	882.71	882.17
MH1	5.70	901.05	890.81	890.49
I-3	5.70	900.69	890.27	889.95
I-2	5.70	901.00	894.27	893.95
MH13	10.30	900.02	888.05	887.84
MH12	10.30	899.24	889.13	888.92
MH11	10.30	899.70	890.42	890.09
I-4	10.30	899.48	891.26	890.79

Elapsed: 0 minute(s) 1 second(s)

COIT PLAZA REPORT

Pipe	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	Section Size	-Section- Discharge Capacity (cfs)	Roughness	Length (ft)	Average Velocity (ft/s)
PI4-11	I-4	899.48	890.79	889.64	0.023810	24 inch	10.30	0.014	20.00	5.18
	MH11	899.70	890.42	889.14	0.025000		33.21			
P11-12	MH11	899.70	890.09	889.02	0.005045	30 inch	10.30	0.014	209.00	4.83
	MH12	899.24	889.13	887.95	0.005124		27.26			
PI2-1	I-2	901.00	893.95	893.11	0.017841	24 inch	5.70	0.014	120.00	5.91
	MH1	901.05	891.30	890.71	0.020000		29.71			
P12-13	MH12	899.24	888.92	887.85	0.004782	30 inch	10.30	0.014	209.00	4.67
	MH13	900.02	888.05	886.81	0.004976		26.87			
PI3-2	I-3	900.69	889.95	889.11	0.006409	24 inch	5.70	0.014	57.00	4.69
	MH2	899.15	889.54	888.74	0.006491		16.92			
P1-2	MH1	901.05	890.49	889.65	0.014630	24 inch	5.70	0.014	50.00	5.82
	MH2	899.15	889.29	888.69	0.019200		29.11			
P13-2	MH13	900.02	887.84	886.71	0.004209	30 inch	10.30	0.014	120.00	4.95
	MH2	899.15	887.28	886.21	0.004167		24.58			
P2-3	MH2	899.15	882.17	880.74	0.011656	42 inch	21.70	0.014	205.00	7.29
	MH3	885.57	879.14	878.07	0.013024		106.61			
P-I1A	I-1	913.08	906.75	905.20	0.037810	36 inch	23.20	0.014	296.00	10.06
	MHEX1	901.18	893.20	892.34	0.043446		129.09			
P3-4	MH3	885.57	878.19	876.76	0.005678	42 inch	21.70	0.014	151.00	5.37
	MH4	885.52	877.50	875.85	0.006026		72.52			
PEX-10	MHEX1	901.18	893.72	892.17	0.009431	36 inch	23.20	0.014	220.00	7.22
	MH10	895.00	891.23	889.96	0.010045		62.07			
PCB7-10	CB_7TH	897.40	891.94	891.45	0.029206	12 inch	1.40	0.014	42.00	4.95
	MH10	895.00	890.28	889.96	0.035476		6.95			
P4-5	MH4	885.52	877.18	875.75	0.009601	42 inch	21.70	0.014	132.00	5.37
	MH5	885.80	876.08	874.43	0.010000		93.42			
P10-6	MH10	895.00	883.43	881.96	0.006453	48 inch	24.60	0.014	107.00	6.51
	MH6	887.33	882.49	881.21	0.007009		111.66			
P5-6	MH5	885.80	875.76	874.33	0.002581	42 inch	21.70	0.014	132.00	4.41
	MH6	887.33	875.82	873.31	0.007727		82.12			
P6-7	MH6	887.33	875.11	873.21	0.006702	60 inch	46.30	0.014	322.00	7.55
	MH7	881.20	872.58	870.95	0.007019		202.60			
P7-8	MH7	881.20	870.85	868.95	0.006532	60 inch	46.30	0.014	211.00	7.55
	MH8	881.68	869.10	867.47	0.007014		202.53			
P8-9	MH8	881.68	862.48	860.58	0.003364	60 inch	46.30	0.014	218.00	5.07
	MH9	867.00	862.28	859.00	0.007248		205.88			
P9-MCI	MH9	867.00	862.16	859.00	0.000650	60 inch	46.30	0.014	48.00	3.45
	MCI	867.00	862.15	858.84	0.003333		139.62			


CB_7TH
I-1
P-I1A
MHEX1
PCB7-10
PEX-10
MH10
I-2
P10-6
PI2-1
MH6
MH1
P5-6
MH5
P6-7
P1-2
P4-5
MH7
MH4
P7-8
MH2
P2-3
MH3
P3-4
MH8
P8-9
MH9
PI3-2
P9-MCI
MCI
P13-2
I-3
MH13
P12-13
MH12
P11-12
MH11
PI4-11
I-4

Information: MH13 Known flow propagated from upstream junctions.
Information: P12-13 Surcharged condition
Information: MH12 Known flow propagated from upstream junctions.
Information: P11-12 Surcharged condition
Information: MH11 Known flow propagated from upstream junctions.
Information: PI4-11 Surcharged condition
Information: MH1 Known flow propagated from upstream junctions.
---------- Calculations Complete ----------

** Analysis Options **
Friction method: Manning's Formula
Hydraulic Grade Convergence Test: 0.001000
Maximum Network Traversals: 5
Number of Flow Profile Steps: 5
Discharge Convergence Test: 0.001000
Maximum Design Passes: 3

---------- Network Quick View ----------

				Hydraulic Grade	
Label	Length	Size	Discharge	Upstream	Downstream
P9-MCI	48.00	60 inch	217.00	863.78	863.02
P7-8	211.00	60 inch	217.00	873.44	871.65
P8-9	218.00	60 inch	217.00	866.71	864.96
P-I1A	296.00	36 inch	123.00	913.30	901.62
PEX-10	220.00	36 inch	123.00	901.62	892.91
PCB7-10	42.00	12 inch	3.00	892.19	890.44
P10-6	107.00	48 inch	126.00	885.71	884.58
P6-7	322.00	60 inch	217.00	877.80	875.56
P4-5	132.00	42 inch	91.00	883.19	881.94
P5-6	132.00	42 inch	91.00	881.11	879.85
P3-4	151.00	42 inch	91.00	885.46	884.03
P2-3	205.00	42 inch	91.00	887.52	885.57
P1-2	50.00	24 inch	28.50	891.49	890.33
PI2-1	120.00	24 inch	28.50	894.95	892.87
P13-2	120.00	30 inch	34.00	889.86	888.91
PI3-2	57.00	24 inch	28.50	891.72	890.58
P12-13	209.00	30 inch	34.00	891.97	890.31
P11-12	209.00	30 inch	34.00	894.01	892.35
PI4-11	20.00	24 inch	34.00	895.13	894.61

		Elevations		
Label	Discharge	Ground	Upstream HGL	Downstream HGL
MCI	217.00	867.00	862.15	862.15
MH9	217.00	867.00	864.96	863.78
MH8	217.00	881.68	868.61	866.71
MH7	217.00	881.20	875.56	873.44
I-1	123.00	913.08	913.08	913.08
MHEX1	123.00	901.18	901.62	901.62
MH10	126.00	895.00	887.35	885.71
CB_7TH	3.00	897.40	892.52	892.19
MH6	217.00	887.33	879.85	877.80
MH5	91.00	885.80	881.94	881.11
MH4	91.00	885.52	884.03	883.19
MH3	91.00	885.57	885.57	885.46
MH2	91.00	899.15	888.91	887.52
MH1	28.50	901.05	892.87	891.49
I-3	28.50	900.69	893.00	891.72
I-2	28.50	901.00	896.33	894.95
MH13	34.00	900.02	890.31	889.86
MH12	34.00	899.24	892.35	891.97
MH11	34.00	899.70	894.61	894.01
I-4	34.00	899.48	896.95	895.13

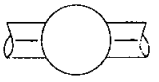
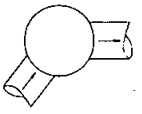
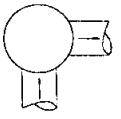
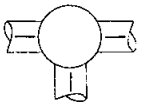
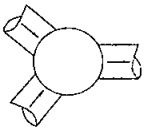
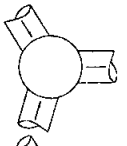
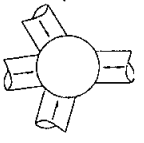
Elapsed: 0 minute(s) 1 second(s)

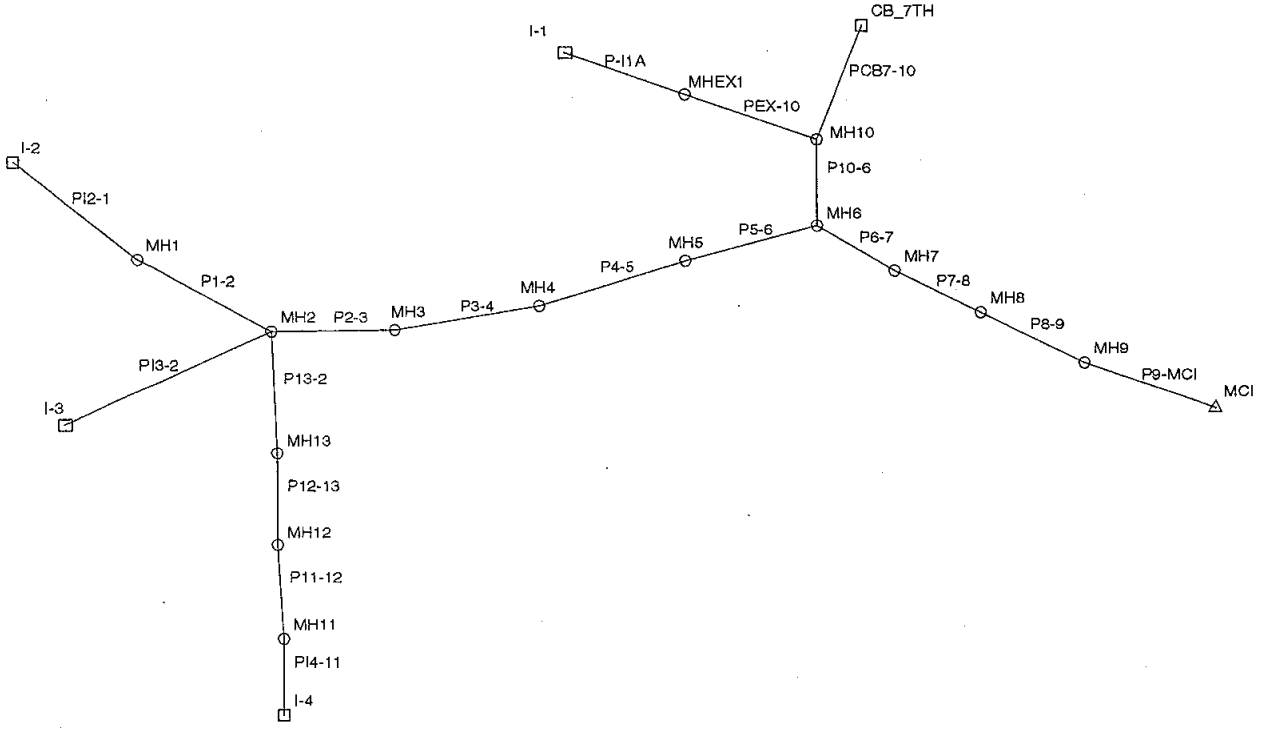
COIT PLAZA REPORT

Pipe	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	Section Size	-Section- Discharge Capacity (cfs)	Roughness	Length (ft)	Average Velocity (ft/s)
PI4-11	I-4	899.48	895.13	889.64	0.026200	24 inch	34.00	0.014	20.00	10.82
	MH11	899.70	894.61	889.14	0.025000		33.21			
P11-12	MH11	899.70	894.01	889.02	0.007970	30 inch	34.00	0.014	209.00	6.93
	MH12	899.24	892.35	887.95	0.005124		27.26			
P12-13	MH12	899.24	891.97	887.85	0.007970	30 inch	34.00	0.014	209.00	6.93
	MH13	900.02	890.31	886.81	0.004976		26.87			
PI2-1	I-2	901.00	894.95	893.11	0.018175	24 inch	28.50	0.014	120.00	9.25
	MH1	901.05	892.87	890.71	0.020000		29.71			
PI3-2	I-3	900.69	891.72	889.11	0.018234	24 inch	28.50	0.014	57.00	9.25
	MH2	899.15	890.58	888.74	0.006491		16.92			
P13-2	MH13	900.02	889.86	886.71	0.007970	30 inch	34.00	0.014	120.00	6.93
	MH2	899.15	888.91	886.21	0.004167		24.58			
P1-2	MH1	901.05	891.49	889.65	0.017578	24 inch	28.50	0.014	50.00	9.89
	MH2	899.15	890.33	888.69	0.019200		29.11			
P2-3	MH2	899.15	887.52	880.74	0.009489	42 inch	91.00	0.014	205.00	9.46
	MH3	885.57	885.57	878.07	0.013024		106.61			
P-I1A	I-1	913.08	913.30	905.20	0.039445	36 inch	123.00	0.014	296.00	17.40
	MHEX1	901.18	901.62	892.34	0.043446		129.09			
P3-4	MH3	885.57	885.46	876.76	0.009489	42 inch	91.00	0.014	151.00	9.46
	MH4	885.52	884.03	875.85	0.006026		72.52			
PCB7-10	CB_7TH	897.40	892.19	891.45	0.026965	12 inch	3.00	0.014	42.00	6.24
	MH10	895.00	890.44	889.96	0.035476		6.95			
PEX-10	MHEX1	901.18	901.62	892.17	0.039440	36 inch	123.00	0.014	220.00	17.43
	MH10	895.00	892.91	889.96	0.010045		62.07			
P4-5	MH4	885.52	883.19	875.75	0.009489	42 inch	91.00	0.014	132.00	9.46
	MH5	885.80	881.94	874.43	0.010000		93.42			
P10-6	MH10	895.00	885.71	881.96	0.007867	48 inch	126.00	0.014	107.00	10.73
	MH6	887.33	884.58	881.21	0.007009		111.66			
P5-6	MH5	885.80	881.11	874.33	0.009489	42 inch	91.00	0.014	132.00	9.46
	MH6	887.33	879.85	873.31	0.007727		82.12			
P6-7	MH6	887.33	877.80	873.21	0.006993	60 inch	217.00	0.014	322.00	11.49
	MH7	881.20	875.56	870.95	0.007019		202.60			
P7-8	MH7	881.20	873.44	868.95	0.007239	60 inch	217.00	0.014	211.00	12.02
	MH8	881.68	871.65	867.47	0.007014		202.53			
P8-9	MH8	881.68	866.71	860.58	0.008052	60 inch	217.00	0.014	218.00	11.05
	MH9	867.00	864.96	859.00	0.007248		205.88			
P9-MCI	MH9	867.00	863.78	859.00	0.007083	60 inch	217.00	0.014	48.00	11.79
	MCI	867.00	863.02	858.84	0.003333		139.62			

Headloss Coefficients for Manholes and Junctions

These are typical headloss coefficients used in the standard method for estimating headloss through manholes and junctions.

Type of Manhole	Diagram	Headloss Coefficient
Trunkline only with no bend at the junction		0.5
Trunkline only with 45 degree bend at junction		0.6
Trunkline only with 90 degree bend at junction		0.8
Trunkline with one lateral		Small 0.6 Large 0.7
Two roughly equivalent entrance lines with angle of < 90 degrees between lines		0.8
Two roughly equivalent entrance lines with angle of > 90 degrees between lines		0.9
Three or more entrance lines		1.0


CB_7TH
I-1
P-I1A
MHEX1
PCB7-10
PEX-10
MH10
I-2
P10-6
PI2-1
MH6
P5-6
P6-7
MH1
MH5
MH7
P4-5
P1-2
P7-8
MH4
MH8
MH2
P2-3
MH3
P3-4
P8-9
MH9
PI3-2
P9-MCI
MCI
P13-2
I-3
MH13
P12-13
MH12
P11-12
MH11
PI4-11
I-4

Network Quick View

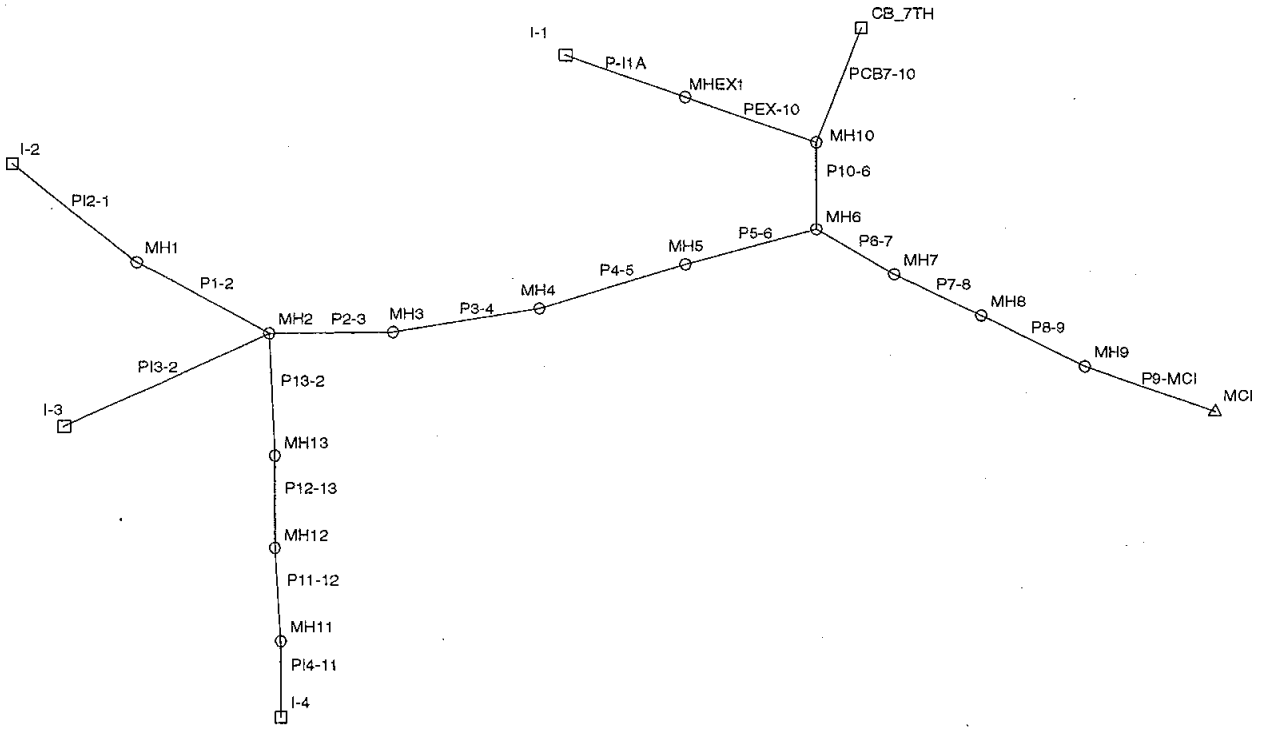
Label	Length	Size	Discharge	Hydraulic Grade Upstream	Hydraulic Grade Downstream
P9-MCI	48.00	60 inch	46.30	862.16	862.15
P7-8	211.00	60 inch	46.30	870.85	869.10
P8-9	218.00	60 inch	46.30	862.48	862.28
P-I1A	296.00	36 inch	23.20	906.75	893.20
PEX-10	220.00	36 inch	23.20	893.72	891.23
PCB7-10	42.00	12 inch	1.40	891.94	890.28
P10-6	107.00	48 inch	24.60	883.43	882.49
P6-7	322.00	60 inch	46.30	875.11	872.58
P4-5	132.00	42 inch	21.70	877.18	876.08
P5-6	132.00	42 inch	21.70	875.76	875.82
P3-4	151.00	42 inch	21.70	878.19	877.50
P2-3	205.00	42 inch	21.70	882.17	879.14
P1-2	50.00	24 inch	5.70	890.49	889.29
PI2-1	120.00	24 inch	5.70	893.95	891.30
P13-2	120.00	30 inch	10.30	887.84	887.28
PI3-2	57.00	24 inch	5.70	889.95	889.54
P12-13	209.00	30 inch	10.30	888.92	888.05
P11-12	209.00	30 inch	10.30	890.09	889.13
PI4-11	20.00	24 inch	10.30	890.79	890.42

Label	Discharge	Elevations Ground	Elevations Upstream HGL	Elevations Downstream HGL
MCI	46.30	867.00	862.15	862.15
MH9	46.30	867.00	862.28	862.16
MH8	46.30	881.68	863.19	862.48
MH7	46.30	881.20	871.56	870.85
I-1	23.20	913.08	907.37	906.75
MHEX1	23.20	901.18	893.72	893.72
MH10	24.60	895.00	883.97	883.43
CB_7TH	1.40	897.40	892.14	891.94
MH6	46.30	887.33	875.82	875.11
MH5	21.70	885.80	876.08	875.76
MH4	21.70	885.52	877.50	877.18
MH3	21.70	885.57	878.73	878.19
MH2	21.70	899.15	882.71	882.17
MH1	5.70	901.05	890.81	890.49
I-3	5.70	900.69	890.27	889.95
I-2	5.70	901.00	894.27	893.95
MH13	10.30	900.02	888.05	887.84
MH12	10.30	899.24	889.13	888.92
MH11	10.30	899.70	890.42	890.09
I-4	10.30	899.48	891.26	890.79

Elapsed: 0 minute(s) 1 second(s)

COIT PLAZA REPORT

Pipe	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	Section Size	-Section- Discharge Capacity (cfs)	Roughness	Length (ft)	Average Velocity (ft/s)
PI4-11	I-4	899.48	890.79	889.64	0.023810	24 inch	10.30	0.014	20.00	5.18
	MH11	899.70	890.42	889.14	0.025000		33.21			
P11-12	MH11	899.70	890.09	889.02	0.005045	30 inch	10.30	0.014	209.00	4.83
	MH12	899.24	889.13	887.95	0.005124		27.26			
PI2-1	I-2	901.00	893.95	893.11	0.017841	24 inch	5.70	0.014	120.00	5.91
	MH1	901.05	891.30	890.71	0.020000		29.71			
P12-13	MH12	899.24	888.92	887.85	0.004782	30 inch	10.30	0.014	209.00	4.67
	MH13	900.02	888.05	886.81	0.004976		26.87			
PI3-2	I-3	900.69	889.95	889.11	0.006409	24 inch	5.70	0.014	57.00	4.69
	MH2	899.15	889.54	888.74	0.006491		16.92			
P1-2	MH1	901.05	890.49	889.65	0.014630	24 inch	5.70	0.014	50.00	5.82
	MH2	899.15	889.29	888.69	0.019200		29.11			
P13-2	MH13	900.02	887.84	886.71	0.004209	30 inch	10.30	0.014	120.00	4.95
	MH2	899.15	887.28	886.21	0.004167		24.58			
P2-3	MH2	899.15	882.17	880.74	0.011656	42 inch	21.70	0.014	205.00	7.29
	MH3	885.57	879.14	878.07	0.013024		106.61			
P-I1A	I-1	913.08	906.75	905.20	0.037810	36 inch	23.20	0.014	296.00	10.06
	MHEX1	901.18	893.20	892.34	0.043446		129.09			
P3-4	MH3	885.57	878.19	876.76	0.005678	42 inch	21.70	0.014	151.00	5.37
	MH4	885.52	877.50	875.85	0.006026		72.52			
PEX-10	MHEX1	901.18	893.72	892.17	0.009431	36 inch	23.20	0.014	220.00	7.22
	MH10	895.00	891.23	889.96	0.010045		62.07			
PCB7-10	CB_7TH	897.40	891.94	891.45	0.029206	12 inch	1.40	0.014	42.00	4.95
	MH10	895.00	890.28	889.96	0.035476		6.95			
P4-5	MH4	885.52	877.18	875.75	0.009601	42 inch	21.70	0.014	132.00	5.37
	MH5	885.80	876.08	874.43	0.010000		93.42			
P10-6	MH10	895.00	883.43	881.96	0.006453	48 inch	24.60	0.014	107.00	6.51
	MH6	887.33	882.49	881.21	0.007009		111.66			
P5-6	MH5	885.80	875.76	874.33	0.002581	42 inch	21.70	0.014	132.00	4.41
	MH6	887.33	875.82	873.31	0.007727		82.12			
P6-7	MH6	887.33	875.11	873.21	0.006702	60 inch	46.30	0.014	322.00	7.55
	MH7	881.20	872.58	870.95	0.007019		202.60			
P7-8	MH7	881.20	870.85	868.95	0.006532	60 inch	46.30	0.014	211.00	7.55
	MH8	881.68	869.10	867.47	0.007014		202.53			
P8-9	MH8	881.68	862.48	860.58	0.003364	60 inch	46.30	0.014	218.00	5.07
	MH9	867.00	862.28	859.00	0.007248		205.88			
P9-MCI	MH9	867.00	862.16	859.00	0.000650	60 inch	46.30	0.014	48.00	3.45
	MCI	867.00	862.15	858.84	0.003333		139.62			


CB_7TH
I-1
P-I1A
MHEX1
PCB7-10
PEX-10
MH10
I-2
P10-6
PI2-1
MH6
MH1
P5-6
P6-7
MH5
MH7
P1-2
P4-5
P7-8
MH4
MH8
MH2
P2-3
MH3
P3-4
P8-9
MH9
PI3-2
P9-MCI
MCI
P13-2
I-3
MH13
P12-13
MH12
P11-12
MH11
PI4-11
I-4

Information: MH13 Known flow propagated from upstream junctions.
Information: P12-13 Surcharged condition
Information: MH12 Known flow propagated from upstream junctions.
Information: P11-12 Surcharged condition
Information: MH11 Known flow propagated from upstream junctions.
Information: PI4-11 Surcharged condition
Information: MH1 Known flow propagated from upstream junctions.
---------- Calculations Complete ----------

** Analysis Options **
Friction method: Manning's Formula
Hydraulic Grade Convergence Test: 0.001000
Maximum Network Traversals: 5
Number of Flow Profile Steps: 5
Discharge Convergence Test: 0.001000
Maximum Design Passes: 3

---------- Network Quick View ----------

				Hydraulic Grade	
Label	Length	Size	Discharge	Upstream	Downstream
P9-MCI	48.00	60 inch	217.00	863.78	863.02
P7-8	211.00	60 inch	217.00	873.44	871.65
P8-9	218.00	60 inch	217.00	866.71	864.96
P-I1A	296.00	36 inch	123.00	913.30	901.62
PEX-10	220.00	36 inch	123.00	901.62	892.91
PCB7-10	42.00	12 inch	3.00	892.19	890.44
P10-6	107.00	48 inch	126.00	885.71	884.58
P6-7	322.00	60 inch	217.00	877.80	875.56
P4-5	132.00	42 inch	91.00	883.19	881.94
P5-6	132.00	42 inch	91.00	881.11	879.85
P3-4	151.00	42 inch	91.00	885.46	884.03
P2-3	205.00	42 inch	91.00	887.52	885.57
P1-2	50.00	24 inch	28.50	891.49	890.33
PI2-1	120.00	24 inch	28.50	894.95	892.87
P13-2	120.00	30 inch	34.00	889.86	888.91
PI3-2	57.00	24 inch	28.50	891.72	890.58
P12-13	209.00	30 inch	34.00	891.97	890.31
P11-12	209.00	30 inch	34.00	894.01	892.35
PI4-11	20.00	24 inch	34.00	895.13	894.61

		Elevations		
Label	Discharge	Ground	Upstream HGL	Downstream HGL
MCI	217.00	867.00	862.15	862.15
MH9	217.00	867.00	864.96	863.78
MH8	217.00	881.68	868.61	866.71
MH7	217.00	881.20	875.56	873.44
I-1	123.00	913.08	913.08	913.08
MHEX1	123.00	901.18	901.62	901.62
MH10	126.00	895.00	887.35	885.71
CB_7TH	3.00	897.40	892.52	892.19
MH6	217.00	887.33	879.85	877.80
MH5	91.00	885.80	881.94	881.11
MH4	91.00	885.52	884.03	883.19
MH3	91.00	885.57	885.57	885.46
MH2	91.00	899.15	888.91	887.52
MH1	28.50	901.05	892.87	891.49
I-3	28.50	900.69	893.00	891.72
I-2	28.50	901.00	896.33	894.95
MH13	34.00	900.02	890.31	889.86
MH12	34.00	899.24	892.35	891.97
MH11	34.00	899.70	894.61	894.01
I-4	34.00	899.48	896.95	895.13

Elapsed: 0 minute(s) 1 second(s)

COIT PLAZA REPORT

Pipe	-Node- Upstream Downstream	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	Section Size	-Section- Discharge Capacity (cfs)	Roughness	Length (ft)	Average Velocity (ft/s)
PI4-11	I-4	899.48	895.13	889.64	0.026200	24 inch	34.00	0.014	20.00	10.82
	MH11	899.70	894.61	889.14	0.025000		33.21			
P11-12	MH11	899.70	894.01	889.02	0.007970	30 inch	34.00	0.014	209.00	6.93
	MH12	899.24	892.35	887.95	0.005124		27.26			
P12-13	MH12	899.24	891.97	887.85	0.007970	30 inch	34.00	0.014	209.00	6.93
	MH13	900.02	890.31	886.81	0.004976		26.87			
PI2-1	I-2	901.00	894.95	893.11	0.018175	24 inch	28.50	0.014	120.00	9.25
	MH1	901.05	892.87	890.71	0.020000		29.71			
PI3-2	I-3	900.69	891.72	889.11	0.018234	24 inch	28.50	0.014	57.00	9.25
	MH2	899.15	890.58	888.74	0.006491		16.92			
P13-2	MH13	900.02	889.86	886.71	0.007970	30 inch	34.00	0.014	120.00	6.93
	MH2	899.15	888.91	886.21	0.004167		24.58			
P1-2	MH1	901.05	891.49	889.65	0.017578	24 inch	28.50	0.014	50.00	9.89
	MH2	899.15	890.33	888.69	0.019200		29.11			
P2-3	MH2	899.15	887.52	880.74	0.009489	42 inch	91.00	0.014	205.00	9.46
	MH3	885.57	885.57	878.07	0.013024		106.61			
P-I1A	I-1	913.08	913.30	905.20	0.039445	36 inch	123.00	0.014	296.00	17.40
	MHEX1	901.18	901.62	892.34	0.043446		129.09			
P3-4	MH3	885.57	885.46	876.76	0.009489	42 inch	91.00	0.014	151.00	9.46
	MH4	885.52	884.03	875.85	0.006026		72.52			
PCB7-10	CB_7TH	897.40	892.19	891.45	0.026965	12 inch	3.00	0.014	42.00	6.24
	MH10	895.00	890.44	889.96	0.035476		6.95			
PEX-10	MHEX1	901.18	901.62	892.17	0.039440	36 inch	123.00	0.014	220.00	17.43
	MH10	895.00	892.91	889.96	0.010045		62.07			
P4-5	MH4	885.52	883.19	875.75	0.009489	42 inch	91.00	0.014	132.00	9.46
	MH5	885.80	881.94	874.43	0.010000		93.42			
P10-6	MH10	895.00	885.71	881.96	0.007867	48 inch	126.00	0.014	107.00	10.73
	MH6	887.33	884.58	881.21	0.007009		111.66			
P5-6	MH5	885.80	881.11	874.33	0.009489	42 inch	91.00	0.014	132.00	9.46
	MH6	887.33	879.85	873.31	0.007727		82.12			
P6-7	MH6	887.33	877.80	873.21	0.006993	60 inch	217.00	0.014	322.00	11.49
	MH7	881.20	875.56	870.95	0.007019		202.60			
P7-8	MH7	881.20	873.44	868.95	0.007239	60 inch	217.00	0.014	211.00	12.02
	MH8	881.68	871.65	867.47	0.007014		202.53			
P8-9	MH8	881.68	866.71	860.58	0.008052	60 inch	217.00	0.014	218.00	11.05
	MH9	867.00	864.96	859.00	0.007248		205.88			
P9-MCI	MH9	867.00	863.78	859.00	0.007083	60 inch	217.00	0.014	48.00	11.79
	MCI	867.00	863.02	858.84	0.003333		139.62			

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