Revised Preliminary Drainage Report
for
Forest Springs Mobilehome Community
Phase IV

APN's: 23-250-72, 23-280-13, and 23-280-12

December , 2014

Nevada City Engineering, Inc.
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Index

Introduction

This revised report has been prepared to address changes in the design concept since the original "Preliminary Drainage Report for Forest Springs Mobilehome Community Phase IV" dated January 2014. This report replaces and supersedes said report and its Addendums.

This report provides the preliminary hydrology under pre and post-development project conditions with detention facilities sizing and design for the proposed Forest Springs Mobilehome Community, Phase IV. This report has been prepared as a preliminary study to prove feasibility and will be updated and refined based on the final design, as required, prior to any construction.

The project is located within the northwest 1/4 of Section 12, Township 15 North, Range 7 East. A "Location Map" is included on the Pre & Post Construction Maps included within Appendix Three.

Overview

The project is located south of Grass Valley and is within Nevada County, California. The County of Nevada is the lead agency with jurisdiction over this project.

The proposed improvement area for this project is approximately 12.7 acres. The northerly 3.5 acres naturally drains northwesterly to an existing pair of 18" culverts which cross State Route 49. Said flow then drains westerly a little more than a half mile within a local natural swale until reaching Wolf Creek The remaining 9.2 acres naturally drains southeasterly a few thousand feet where it joins Rattlesnake Creek. This drainage includes portions within local natural drainages and portions within roadside ditches along Lady Jane Lane. Once reaching Rattlesnake Creek the flows continue southwesterly where at about 1 mile it crosses the state highway and at about 2 miles combines with Wolf Creek.

The following concerns have come to light since the preparation of the original report:

First, any changes to the northerly outfall would require offsite easements and most likely a encroachment permit from Caltrans. To avoid these issues, the area of the northerly drainage area is being decreased from 3.5 acres pre-development to 1.0 acre post-development. This will allow the post-development flows to be less than pre-development without the use of any basin or control structures.

Second, concerns were raised regarding the existing condition of currently inadequate flow paths along Lady Jane Road. Additionally there were also concerns raised regarding the basin outfall areas upslope of the oak grove within the open space. To address both of these issues the detention basin outfall will be via a single outlet control structure and storm drain conduit convening 100 percent of the proposed new developments southerly storm drainage outfall to Rattlesnake Creek within the lands of Forest Springs Mobilehome Community. This revision will eliminate the possibility of additional flows along Lady Jane Road and should in fact, reduce

the flows slightly by reducing the existing undeveloped runoff area flowing in and out of the State Route 49 drainage system.

This revised outfall system configuration will consist of a single outlet on the easterly end of the proposed detention basin. From there storm flows will travel via a 24" storm drain conduit (typical for all), easterly approximately 80 ft to a point adjacent to the original Forest Springs property, thence south about 400 ft to the installation of a new culvert crossing Lady Jane Road at an angle and entering the original Forest Springs property. From said new culvert, storm flows will continue easterly within the original Forest Springs property approximately 75 ft to a point where the fall line of the existing topography falls away to the southeast. At this point, a storm flow dissipater will be constructed to establish a sheet flow. Said sheet flow will transverse and fan out over the lands of the Forest Springs Mobilehome Community in a southerly and southeasterly direction approximately 450 ft. to Rattlesnake Creek.

It should also be noted that the post development storm flows from the post-development drainage area of 11.7 acres as regulated through the detention basin will be lower than the predevelopment flows for the original 9.2 acres drainage area for both the 10 year and 100 year design storms. Even with that being the case, the 24" outfall system described above will be sized for the unregulated, 100 year storm flow (23 cfs-24" ok w/ H=3') which will result in complete containment and transfer of storm flows in the case of a plugged outlet orifice or larger storm event.

This proposed reconfiguration, route overview, pond geometry and outlet control structure are shown on Post-Development Drainage Map and sketches within Appendix Three.

Appendix One herein contains the onsite storm design information utilized as base information within Appendix Two.

Appendix Two contains the preliminary design of the detention structures required to mitigate the increases in the 10 and 100 yr storm flows thereby meeting the jurisdictional requirements and eliminating the need for further improvements downstream.
The following method was used to calculate pre and post-development project conditions and development of the required detention facility.

1. The system was modeled under pre and post conditions with Pond Pack ver. 8i using the SCS Unit Hydrograph method. As this project lies at the very near top of the drainage basins, project run on and routing times were not a concern. Based on local design storm information, twenty four (24) hour 10 and 100 year storm hydrographs were developed using local data and SCS type 1A synthetic curve with runoff curve numbers as appropriate.
2. The pre-project runoff was determined using project areas and topography along with rainfall information and guidelines from the Nevada County LUDC. The post-development conditions were based upon the preliminary site plans for the Forest Springs Mobilehome Community, Phase IV. Rainfall utilized was identical to that of pre-development flows.

For the northerly drainage, as previously noted, basin area was reduced from 3.5 acres pre-development to 1.0 acre post-development so that the post-development flows are less than the pre-development flows without the need for any control basins or structures.

For the southerly drainage a long (approx. 750 lf) detention basin is proposed situate on contour, downslope from the new development within the open space portion of the project. The preliminary volume for this basin is 1.5 acre ft. The discharge will be regulated and de-centralized through the use of a single outlet structures at the easterly end of the basin. Said structure is proposed to be a CMP riser with discharge orifices and weir overflows. Through the use of the proposed outlet discharge location and substantial flow dissipater, as shown on the Post-Development Drainage Map within Appendix Three, natural sheet flows will be re-established and mimic the predevelopment flow conditions upon reaching Rattlesnake Creek.

Results

The results of the calculations outlined above show that, as noted below, the post development flow rates from the proposed project are below the existing runoff for both the 10 and 100 year storm events. While the total volume of runoff will be increased post development, the management of this volume through flows kept to pre development flow rates (but for longer durations) will not be an issue for the existing downstream, well established, offsite drainage courses.

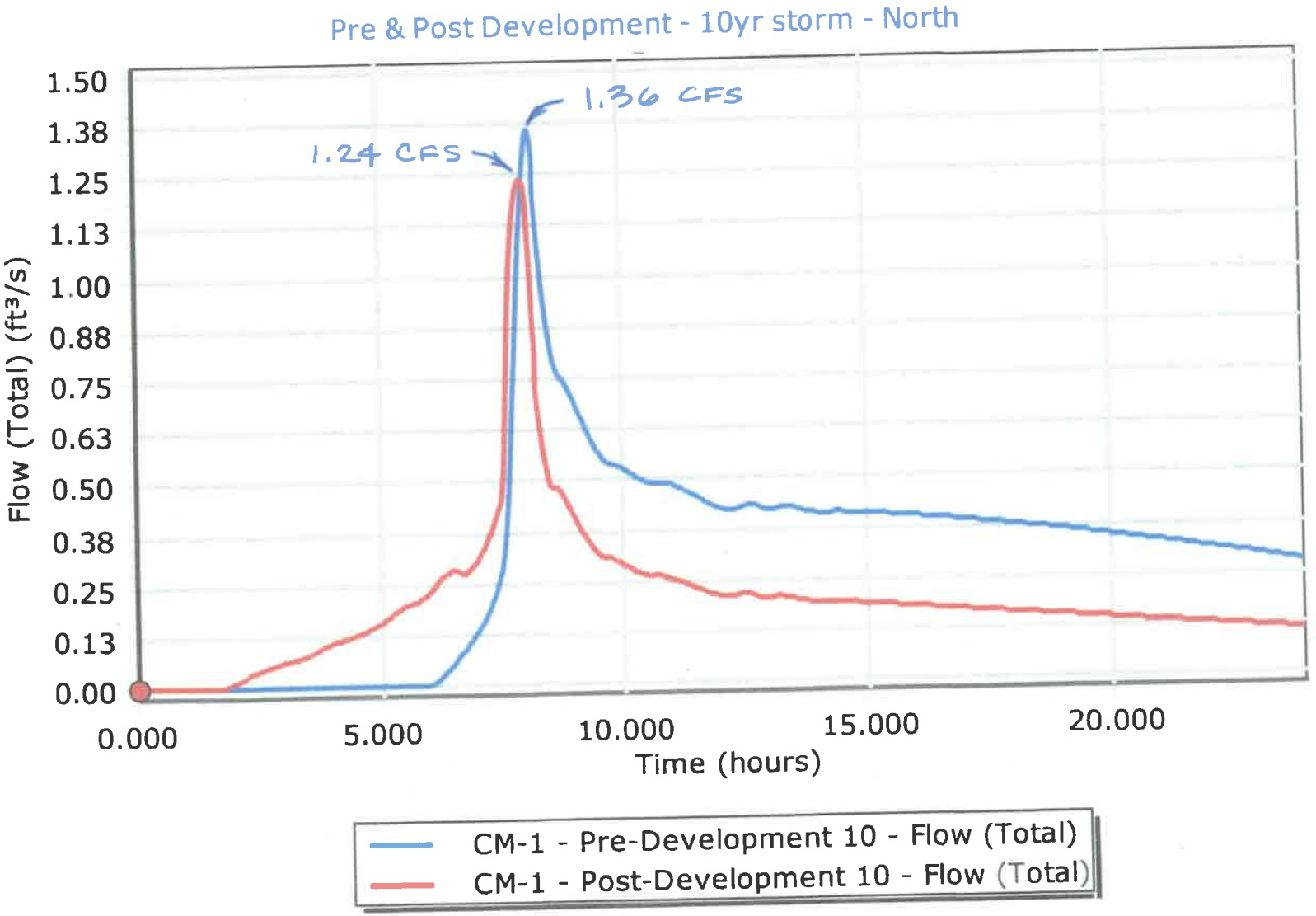
Total outfall results:

	pre-development			post-development		
design storm	**north** (cfs)	**south** (cfs)	**total** (cfs)	**north** (cfs)	**south** (cfs)	**total** (cfs)
10 year/24hr	1.36	3.48	4.84	1.24	3.43	4.67
100 year/24hr	2.98	7.68	10.66	1.86	7.20	9.06

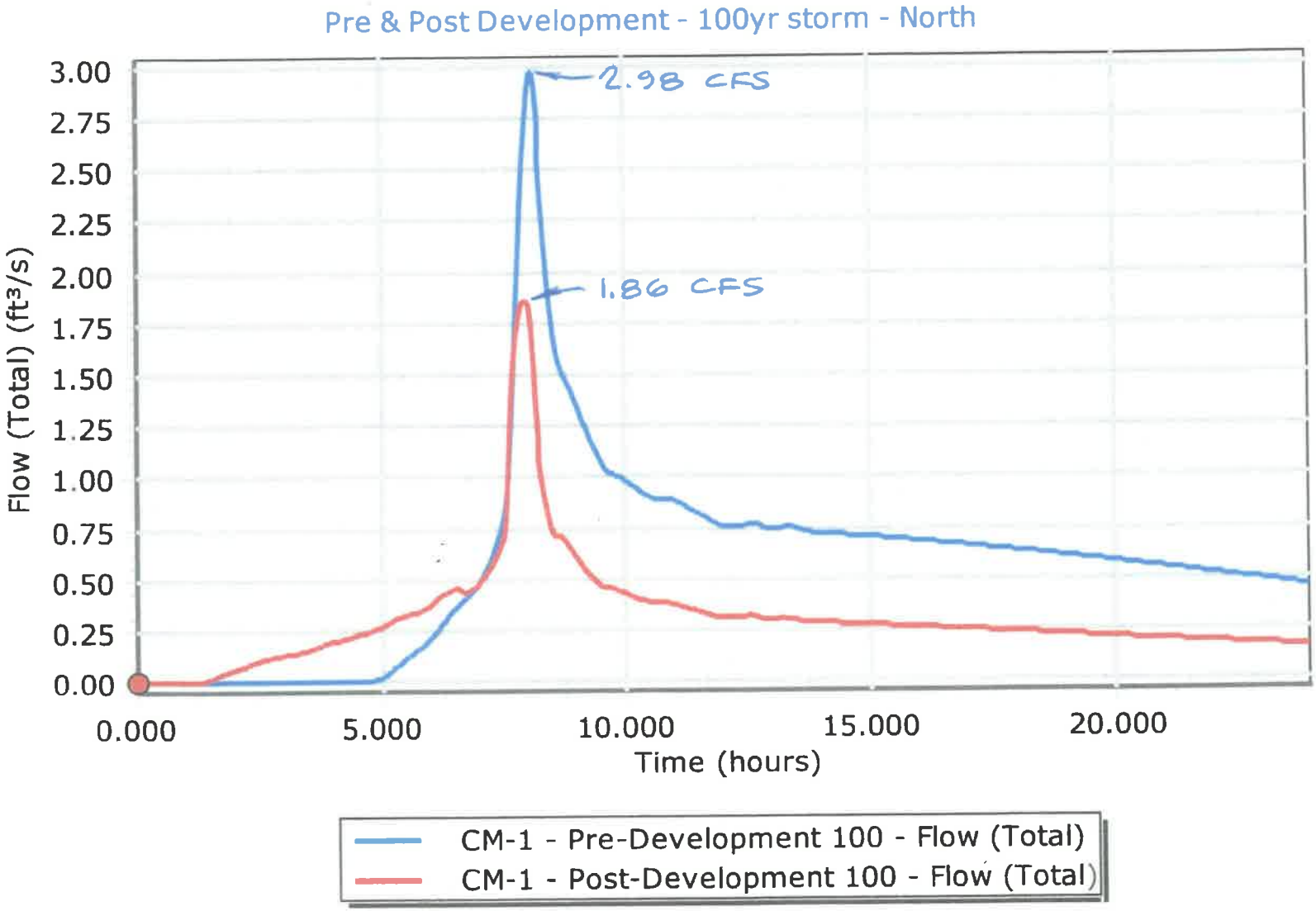
The above results are depicted on the following Graphs Numbered 1 through 4.

Graphs 5 and 6 depict the post-development flow management through the Detention Basin for the 10 and 100 yr storms respectively.

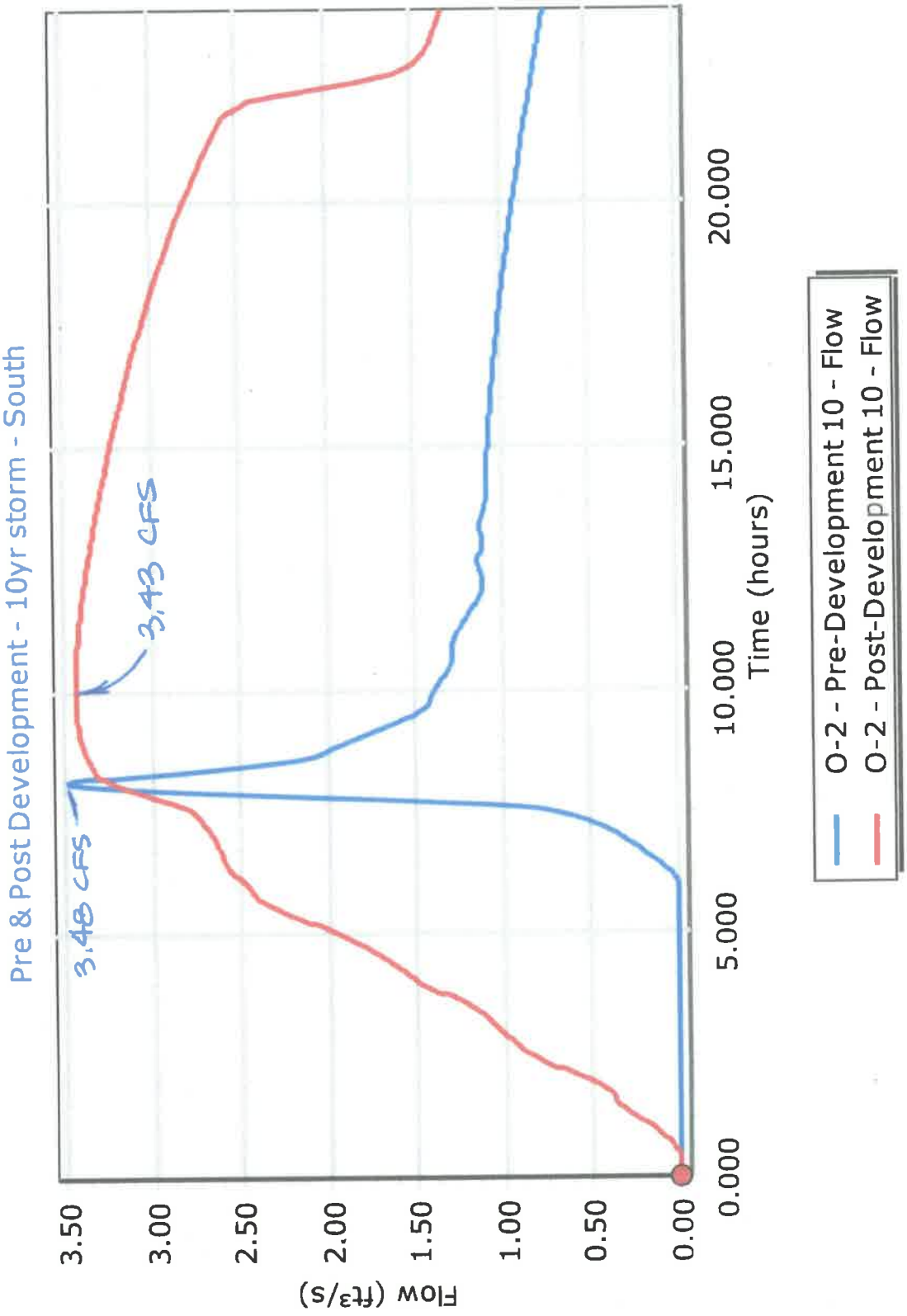
Graph 7 depicts the water surface requirements to provide the flow management shown within Graphs 5 and 6.


Pre & Post Development - 10yr storm - North
1.36 CFS
1.24 CFS
1.50
1.38
1.25
1.13
1.00
0.88
0.75
0.63
0.50
0.38
0.25
0.13
0.00
Flow (Total) (ft³/s)
0.000
5.000
10.000
15.000
20.000
Time (hours)
CM-1 - Pre-Development 10 - Flow (Total)
CM-1 - Post-Development 10 - Flow (Total)

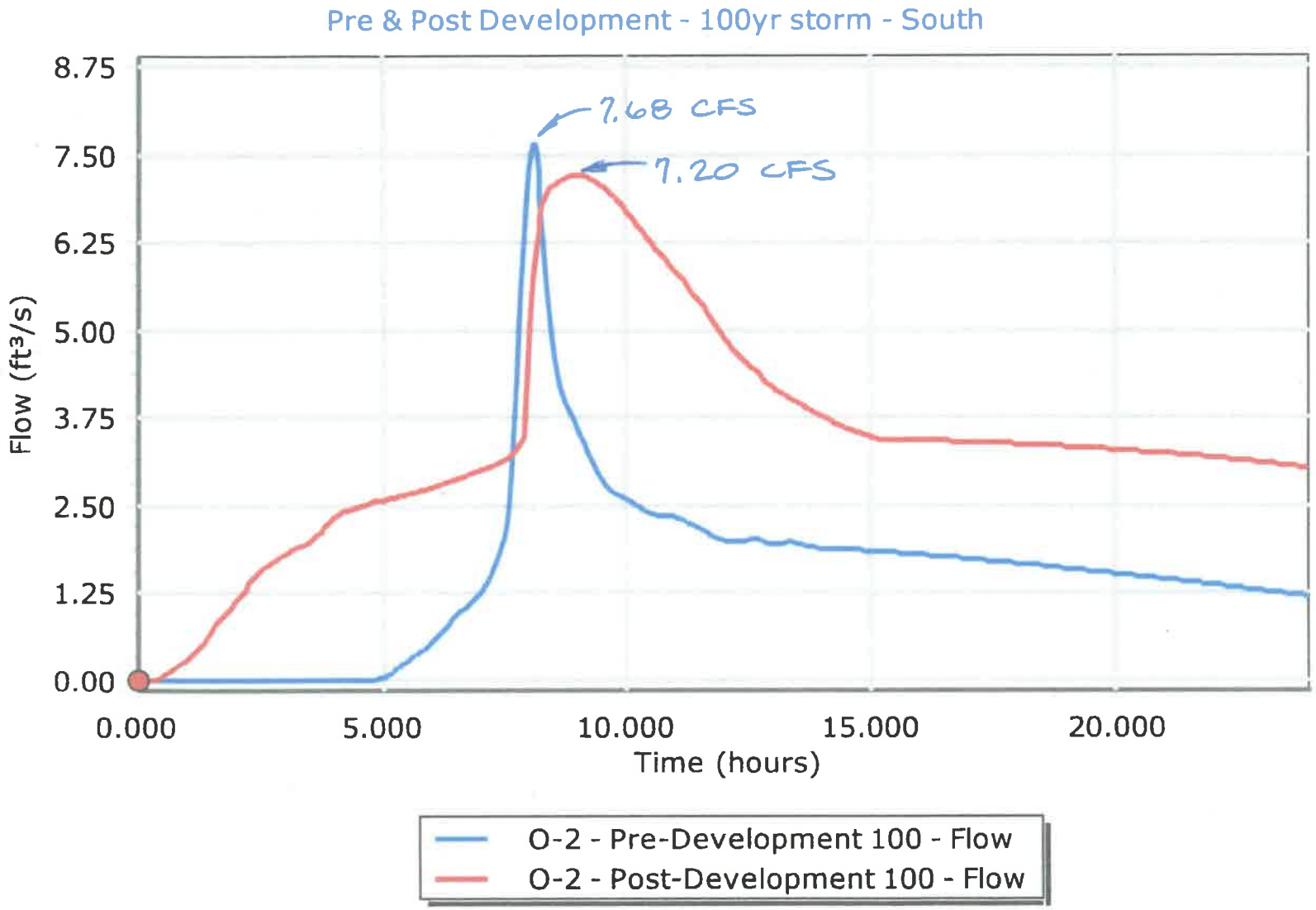
Graph 1


Pre & Post Development - 100yr storm - North
2.98 CFS
1.86 CFS
Flow (Total) (ft³/s)
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)
CM-1 - Pre-Development 100 - Flow (Total)
CM-1 - Post-Development 100 - Flow (Total)

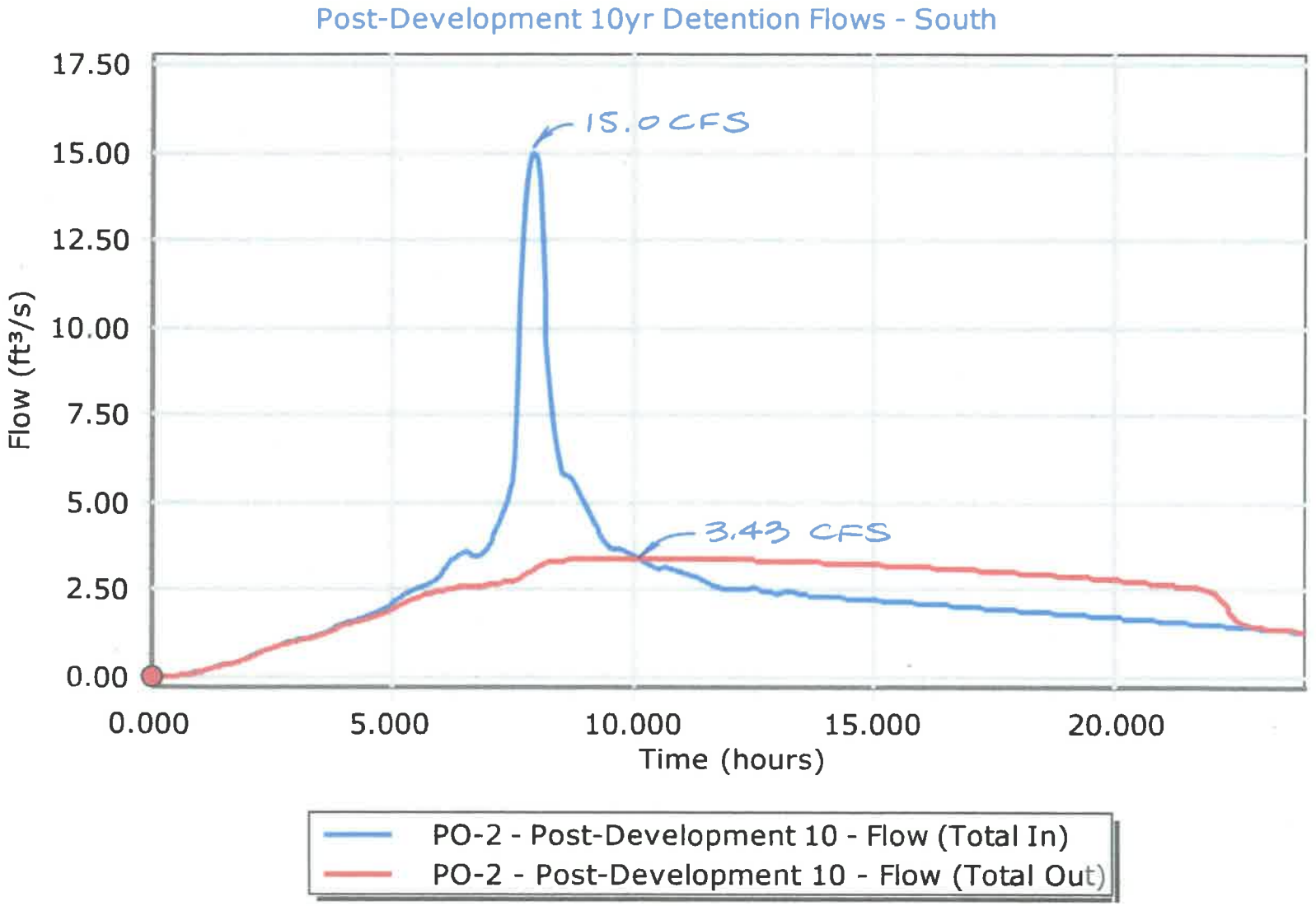
Graph 2


Pre & Post Development - 10yr storm - South
3.48 cfs
3.43 cfs
Flow (ft3/s)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)
O-2 - Pre-Development 10 - Flow
O-2 - Post-Development 10 - Flow

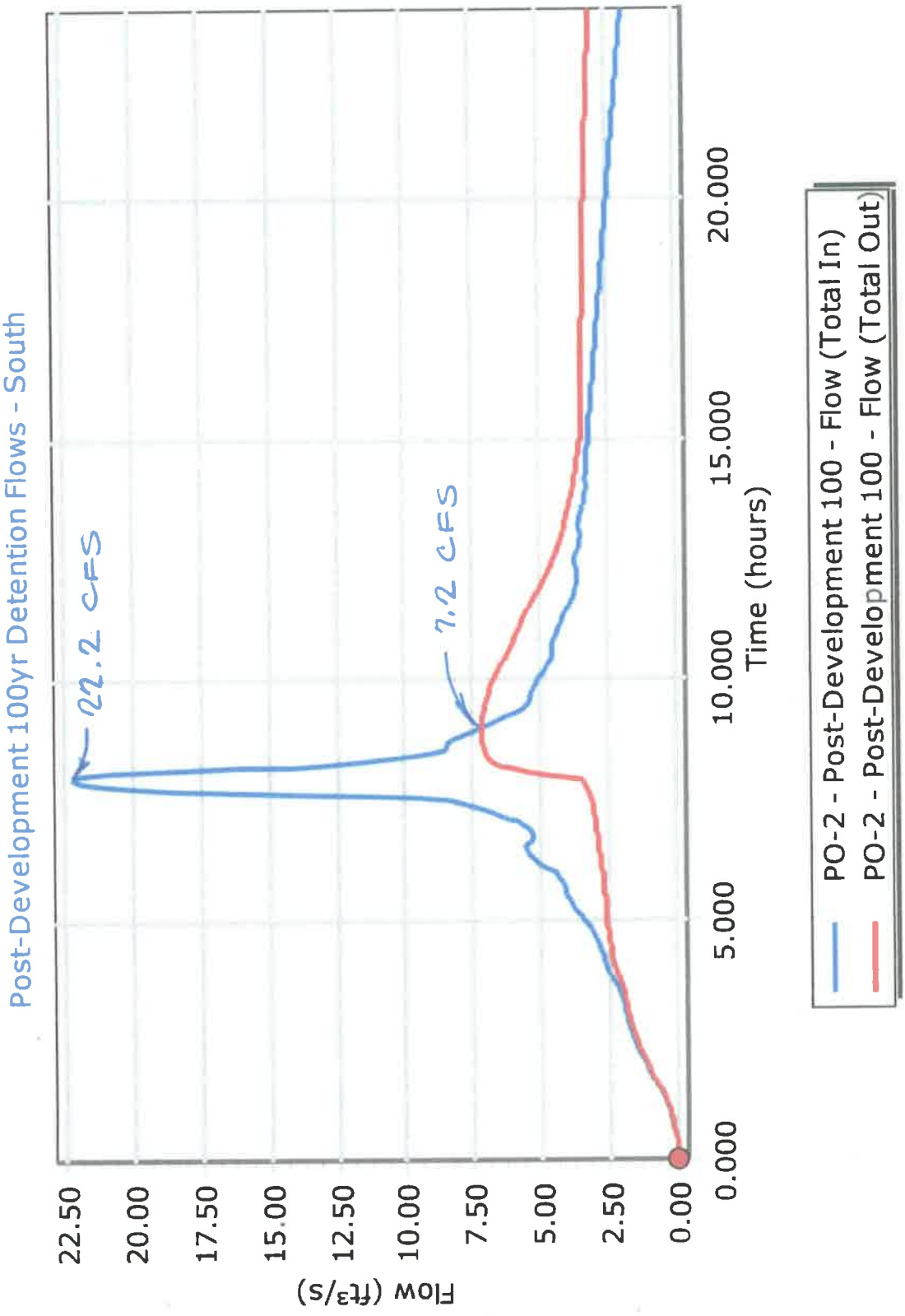
Graph 3


Pre & Post Development - 100yr storm - South
8.75
7.50
6.25
5.00
3.75
2.50
1.25
0.00
Flow (ft³/s)
7.68 CFS
7.20 CFS
0.000
5.000
10.000
15.000
20.000
Time (hours)
O-2 - Pre-Development 100 - Flow
O-2 - Post-Development 100 - Flow

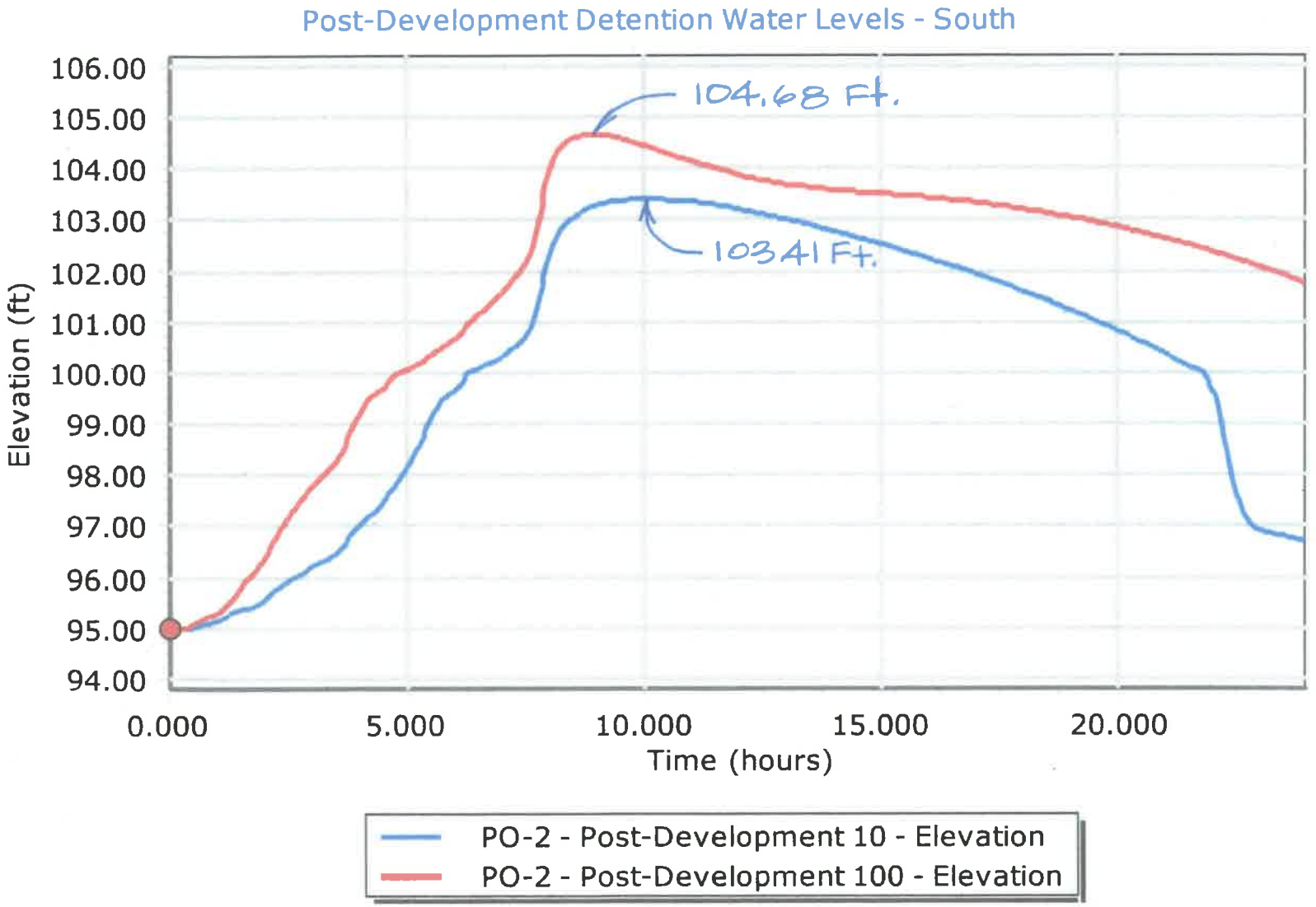
Graph 4


Post-Development 10yr Detention Flows - South
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
Flow (ft³/s)
15.0 CFS
3.43 CFS
0.000
5.000
10.000
15.000
20.000
Time (hours)
PO-2 - Post-Development 10 - Flow (Total In)
PO-2 - Post-Development 10 - Flow (Total Out)

Graph 5


Post-Development 100yr Detention Flows - South
22.2 cfs
7.2 cfs
Flow (ft3/s)
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
0.000
5.000
10.000
15.000
20.000
Time (hours)
PO-2 - Post-Development 100 - Flow (Total In)
PO-2 - Post-Development 100 - Flow (Total Out)

Graph 6

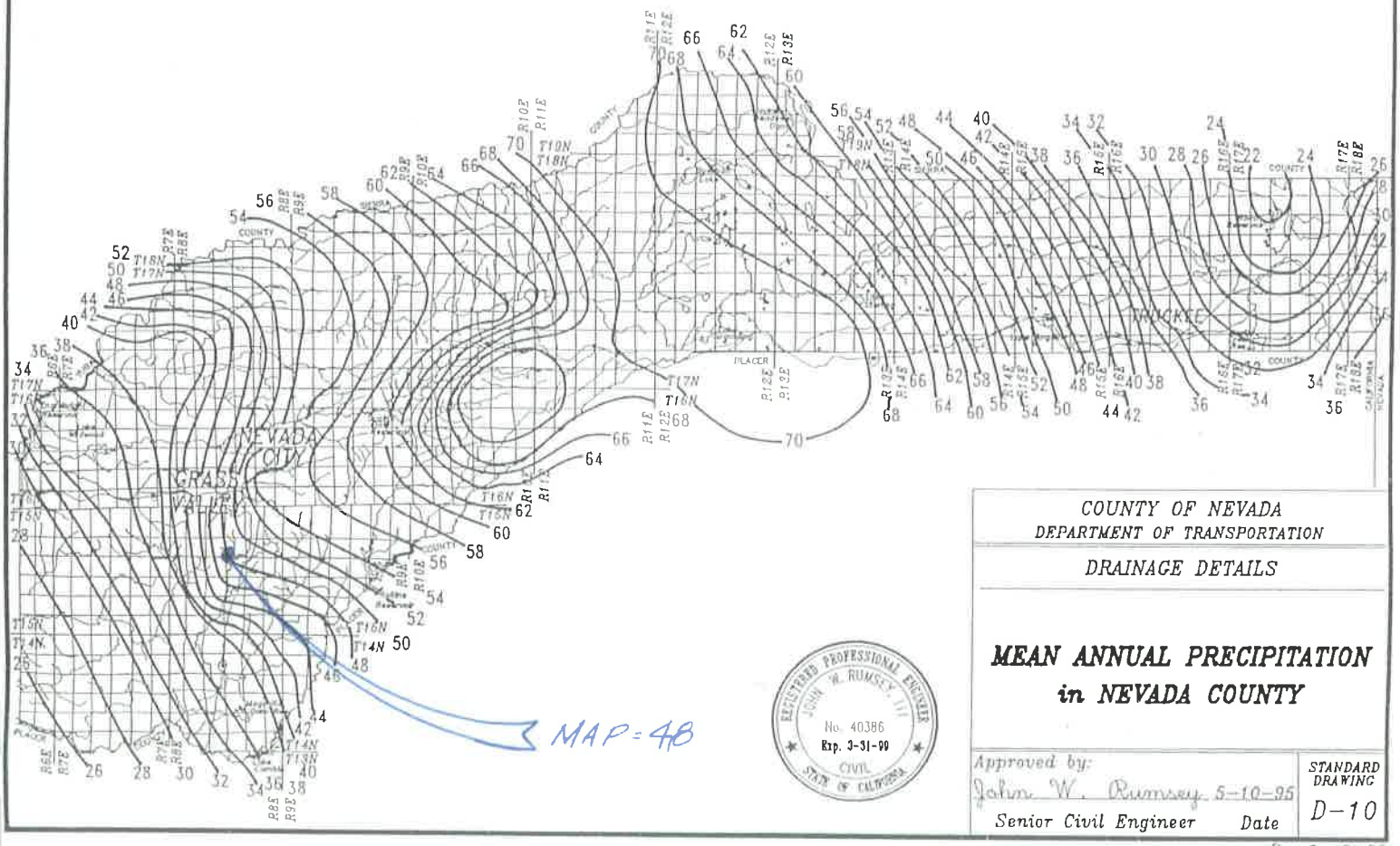

Post-Development Detention Water Levels - South
106.00
105.00
104.00
103.00
102.00
101.00
100.00
99.00
98.00
97.00
96.00
95.00
94.00
Elevation (ft)
104.68 Ft.
103.41 Ft.
0.000
5.000
10.000
15.000
20.000
Time (hours)
PO-2 - Post-Development 10 - Elevation
PO-2 - Post-Development 100 - Elevation

Graph 7

Appendix One

Applicable Standard Drawings

NEVADA COUNTY



REGISTERED PROFESSIONAL ENGINEER
JOHN W. RUMSEY III
No. 40386
Exp. 3-31-99
CIVIL
STATE OF CALIFORNIA

COUNTY OF NEVADA
DEPARTMENT OF TRANSPORTATION

DRAINAGE DETAILS

MEAN ANNUAL PRECIPITATION in NEVADA COUNTY

Approved by: John W. Rumsey 5-10-95
Senior Civil Engineer Date

STANDARD DRAWING
D-10

Rev 5-10-95

NEVADA COUNTY DESIGN STORM (DEPTH)

10 YEAR STORM DURATION IN MINUTES FOR NEVADA COUNTY

Mean Annual Precipitation Inches	5	10	15	30	60 1hr	120 2Hr	180 3Hr	360 6Hr	720 12Hr	1440 24Hr
	Design Storm Depth in inches									
20	.13	.19	.24	.35	.51	.75	.94	1.37	2.01	2.94
22	.14	.21	.26	.38	.55	.81	1.01	1.47	2.16	3.16
24	.15	.22	.27	.40	.59	.86	1.07	1.57	2.30	3.37
26	.16	.23	.29	.43	.62	.91	1.14	1.67	2.45	3.59
28	.17	.25	.31	.45	.66	.97	1.21	1.77	2.60	3.80
30	.18	.26	.33	.48	.70	1.02	1.28	1.87	2.74	4.01
32	.19	.27	.34	.50	.74	1.08	1.35	1.97	2.89	4.23
34	.20	.29	.36	.53	.77	1.13	1.42	2.07	3.03	4.44
36	.21	.30	.38	.55	.81	1.19	1.48	2.17	3.18	4.66
38	.22	.32	.40	.58	.85	1.24	1.55	2.27	3.33	4.87
40	.23	.33	.41	.60	.89	1.30	1.62	2.37	3.47	5.08
42	.24	.34	.43	.63	.92	1.35	1.69	2.47	3.62	5.30
44	.24	.36	.45	.66	.96	1.41	1.76	2.57	3.77	5.51
46	.25	.37	.47	.68	1.00	1.46	1.82	2.67	3.91	5.73
48	.26	.39	.48	.71	1.03	1.51	1.89	2.77	4.06	5.94
50	.27	.40	.50	.73	1.07	1.57	1.96	2.87	4.20	6.16
52	.28	.41	.52	.76	1.11	1.62	2.03	2.97	4.35	6.37
54	.29	.43	.53	.78	1.15	1.68	2.10	3.07	4.50	6.58
56	.30	.44	.55	.81	1.18	1.73	2.17	3.17	4.64	6.80
58	.31	.46	.57	.83	1.22	1.79	2.23	3.27	4.79	7.01
60	.32	.47	.59	.86	1.26	1.84	2.30	3.37	4.94	7.23
62	.33	.48	.60	.88	1.30	1.90	2.37	3.47	5.08	7.44
64	.34	.50	.62	.91	1.33	1.95	2.44	3.57	5.23	7.65
66	.35	.51	.64	.94	1.37	2.01	2.51	3.67	5.37	7.87
68	.36	.53	.66	.96	1.41	2.06	2.58	3.77	5.52	8.08
70	.37	.54	.67	.99	1.44	2.12	2.64	3.87	5.67	8.30
72	.38	.55	.69	1.01	1.48	2.17	2.71	3.97	5.81	8.51
74	.39	.57	.71	1.04	1.52	2.22	2.78	4.07	5.96	8.72
76	.40	.58	.73	1.06	1.56	2.28	2.85	4.17	6.11	8.94
78	.41	.59	.74	1.09	1.59	2.33	2.92	4.27	6.25	9.15
80	.42	.61	.76	1.11	1.63	2.39	2.98	4.37	6.40	9.37

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COUNTY OF NEVADA
DEPARTMENT OF TRANSPORTATION

DRAINAGE DETAIL

10 YEAR STORM DURATION IN MINUTES FOR NEVADA COUNTY

Approved by:
John W. Rumsey 5-11-95
Senior Civil Engineer Date

STANDARD DRAWING
D-13

Rev.5-11-95

NEVADA COUNTY DESIGN STORM (DEPTH)

100 YEAR STORM DURATION IN MINUTES FOR NEVADA COUNTY

Mean Annual Precipitation Inches	5	10	15	30	60 1hr	120 2hr	180 3hr	360 6hr	720 12hr	1440 24hr
	Design Storm depth in inches									
20	.19	.27	.34	.50	.73	1.06	1.33	1.95	2.85	4.17
22	.20	.29	.36	.53	.78	1.14	1.43	2.09	3.06	4.48
24	.21	.31	.39	.57	.83	1.22	1.52	2.23	3.27	4.78
26	.23	.33	.41	.60	.89	1.30	1.62	2.37	3.47	5.09
28	.24	.35	.44	.64	.94	1.37	1.72	2.51	3.68	5.39
30	.25	.37	.46	.68	.99	1.45	1.81	2.66	3.89	5.69
32	.27	.39	.49	.71	1.04	1.53	1.91	2.80	4.10	6.00
34	.28	.41	.51	.75	1.10	1.61	2.01	2.94	4.30	6.30
36	.29	.43	.54	.79	1.15	1.68	2.10	3.08	4.51	6.60
38	.31	.45	.56	.82	1.20	1.76	2.20	3.22	4.72	6.91
40	.32	.47	.59	.86	1.26	1.84	2.30	3.36	4.93	7.21
42	.33	.49	.61	.89	1.31	1.92	2.39	3.51	5.13	7.51
44	.35	.51	.64	.93	1.36	1.99	2.49	3.65	5.34	7.82
46	.36	.53	.66	.97	1.41	2.07	2.59	3.79	5.55	8.12
48	.37	.55	.68	1.00	1.47	2.15	2.68	3.93	5.76	8.43
50	.39	.57	.71	1.04	1.52	2.23	2.78	4.07	5.96	8.73
52	.40	.59	.73	1.07	1.57	2.30	2.88	4.21	6.17	9.03
54	.41	.61	.76	1.11	1.63	2.38	2.98	4.36	6.38	9.34
56	.43	.63	.78	1.15	1.68	2.46	3.07	4.50	6.58	9.64
58	.44	.65	.81	1.18	1.73	2.54	3.17	4.64	6.79	9.94
60	.45	.67	.83	1.22	1.78	2.61	3.27	4.78	7.00	10.25
62	.47	.69	.86	1.25	1.84	2.69	3.36	4.92	7.21	10.55
64	.48	.71	.88	1.29	1.89	2.77	3.46	5.06	7.41	10.86
66	.50	.73	.91	1.33	1.94	2.84	3.56	5.21	7.62	11.16
68	.51	.75	.93	1.36	2.00	2.92	3.65	5.35	7.83	11.46
70	.52	.76	.96	1.40	2.05	3.00	3.75	5.49	8.04	11.77
72	.54	.78	.98	1.44	2.10	3.08	3.85	5.63	8.24	12.07
74	.55	.80	1.01	1.47	2.15	3.15	3.94	5.77	8.45	12.37
76	.56	.82	1.03	1.51	2.21	3.23	4.04	5.91	8.66	12.68
78	.58	.84	1.05	1.54	2.26	3.31	4.14	6.06	8.87	12.98
80	.59	.86	1.08	1.58	2.31	3.39	4.23	6.20	9.07	13.28

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DEPARTMENT OF TRANSPORTATION

DRAINAGE DETAIL

100 YEAR STORM DURATION IN MINUTES FOR NEVADA COUNTY

Approved by:
John W. Rumsey 5-11-95
Senior Civil engineer Date

STANDARD DRAWING
D-14

Rev. 5-11-95

Appendix Two

Detention Sizing & Design

Forest Springs Unit IV - Revised Preliminary Drainage

Project Summary	
Title	Forest Springs Unit IV - Revised Preliminary Study
Engineer	William D Green
Company	Nevada City Engineering, Inc.
Date	12/19/2014

Notes

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Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
CM-1	Post-Development 10	10	0.398	7.950	1.24
CM-1	Pre-Development 10	10	0.617	8.100	1.36
CM-1	Post-Development 100	100	0.601	7.950	1.86
CM-1	Pre-Development 100	100	1.160	8.100	2.98
CM-2	Post-Development 10	10	4.882	7.950	15.00
CM-2	Pre-Development 10	10	1.619	8.100	3.48
CM-2	Post-Development 100	100	7.268	7.950	22.20
CM-2	Pre-Development 100	100	3.045	8.100	7.68

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
	Post-Development 10	10	0.398	7.950	1.24
	Pre-Development 10	10	0.617	8.100	1.36
	Pre-Development 100	100	1.160	8.100	2.98
O-2	Post-Development 10	10	4.878	10.100	3,43
O-2	Pre-Development 10	10	1.619	8.100	3.48
O-2	Post-Development 100	100	6.842	9.000	7.20
O-2	Pre-Development 100	100	3.045	8.100	7.68
O-1	Post-Development 100	100	0.601	7.950	1.86

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
	Post-Development 10	10	0.398	7.950	1.24	(N/A)	(N/A)
	Post-Development 10	10	0.398	7.950	1.24	0.00	0.000
PO-2 (IN)	Post-Development 10	10	4.882	7.950	15.00	(N/A)	(N/A)
PO-2 (OUT)	Post-Development 10	10	4.878	10.100	3.43	103.41	0.953

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
PO-2 (IN)	Post-Development 100	100	7.268	7.950	22.20	(N/A)	(N/A)
PO-2 (OUT)	Post-Development 100	100	6.842	9.000	7.20	104.68	1.488

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time-Depth Curve
Label: grass valley

Return Event: 10 years
Storm Event: 10 year storm

Time-Depth Curve: 10 year storm	
Label	10 year storm
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.2	0.2	0.2
1.500	0.2	0.2	0.2	0.3	0.3
2.000	0.3	0.3	0.3	0.4	0.4
2.500	0.4	0.4	0.4	0.4	0.5
3.000	0.5	0.5	0.5	0.5	0.6
3.500	0.6	0.6	0.6	0.6	0.7
4.000	0.7	0.7	0.7	0.8	0.8
4.500	0.8	0.8	0.9	0.9	0.9
5.000	0.9	1.0	1.0	1.0	1.0
5.500	1.1	1.1	1.1	1.2	1.2
6.000	1.2	1.3	1.3	1.3	1.4
6.500	1.4	1.4	1.5	1.5	1.6
7.000	1.6	1.6	1.7	1.7	1.8
7.500	1.8	2.0	2.1	2.2	2.4
8.000	2.5	2.6	2.7	2.7	2.8
8.500	2.9	2.9	3.0	3.0	3.0
9.000	3.1	3.1	3.2	3.2	3.2
9.500	3.3	3.3	3.3	3.4	3.4
10.000	3.4	3.5	3.5	3.5	3.5
10.500	3.6	3.6	3.6	3.7	3.7
11.000	3.7	3.7	3.8	3.8	3.8
11.500	3.8	3.9	3.9	3.9	3.9
12.000	3.9	4.0	4.0	4.0	4.0
12.500	4.1	4.1	4.1	4.1	4.1
13.000	4.2	4.2	4.2	4.2	4.3
13.500	4.3	4.3	4.3	4.3	4.4
14.000	4.4	4.4	4.4	4.4	4.5
14.500	4.5	4.5	4.5	4.5	4.5
15.000	4.6	4.6	4.6	4.6	4.6
15.500	4.7	4.7	4.7	4.7	4.7
16.000	4.8	4.8	4.8	4.8	4.8
16.500	4.8	4.9	4.9	4.9	4.9
17.000	4.9	5.0	5.0	5.0	5.0

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	5.0	5.0	5.1	5.1	5.1
18.000	5.1	5.1	5.1	5.2	5.2
18.500	5.2	5.2	5.2	5.2	5.3
19.000	5.3	5.3	5.3	5.3	5.3
19.500	5.3	5.4	5.4	5.4	5.4
20.000	5.4	5.4	5.5	5.5	5.5
20.500	5.5	5.5	5.5	5.5	5.6
21.000	5.6	5.6	5.6	5.6	5.6
21.500	5.6	5.6	5.7	5.7	5.7
22.000	5.7	5.7	5.7	5.7	5.7
22.500	5.8	5.8	5.8	5.8	5.8
23.000	5.8	5.8	5.8	5.9	5.9
23.500	5.9	5.9	5.9	5.9	5.9
24.000	5.9	(N/A)	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time-Depth Curve
Label: grass valley

Return Event: 100 years
Storm Event: 100 year storm

Time-Depth Curve: 100 year storm	
Label	100 year storm
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.1	0.1
0.500	0.1	0.1	0.1	0.1	0.1
1.000	0.2	0.2	0.2	0.2	0.3
1.500	0.3	0.3	0.3	0.4	0.4
2.000	0.4	0.4	0.5	0.5	0.5
2.500	0.6	0.6	0.6	0.6	0.7
3.000	0.7	0.7	0.7	0.8	0.8
3.500	0.8	0.9	0.9	0.9	0.9
4.000	1.0	1.0	1.0	1.1	1.1
4.500	1.1	1.2	1.2	1.2	1.3
5.000	1.3	1.4	1.4	1.4	1.5
5.500	1.5	1.6	1.6	1.6	1.7
6.000	1.7	1.8	1.8	1.9	1.9
6.500	2.0	2.0	2.1	2.1	2.2
7.000	2.3	2.3	2.4	2.5	2.5
7.500	2.6	2.8	3.0	3.2	3.4
8.000	3.6	3.7	3.8	3.9	4.0
8.500	4.0	4.1	4.2	4.3	4.3
9.000	4.4	4.4	4.5	4.5	4.6
9.500	4.6	4.7	4.7	4.8	4.8
10.000	4.9	4.9	4.9	5.0	5.0
10.500	5.1	5.1	5.1	5.2	5.2
11.000	5.3	5.3	5.3	5.4	5.4
11.500	5.4	5.5	5.5	5.5	5.6
12.000	5.6	5.6	5.7	5.7	5.7
12.500	5.8	5.8	5.8	5.8	5.9
13.000	5.9	5.9	6.0	6.0	6.0
13.500	6.1	6.1	6.1	6.1	6.2
14.000	6.2	6.2	6.3	6.3	6.3
14.500	6.3	6.4	6.4	6.4	6.5
15.000	6.5	6.5	6.5	6.6	6.6
15.500	6.6	6.6	6.7	6.7	6.7
16.000	6.8	6.8	6.8	6.8	6.9
16.500	6.9	6.9	6.9	7.0	7.0
17.000	7.0	7.0	7.1	7.1	7.1

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time-Depth Curve
Label: grass valley

Return Event: 100 years
Storm Event: 100 year storm

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.500	7.1	7.2	7.2	7.2	7.2
18.000	7.2	7.3	7.3	7.3	7.3
18.500	7.4	7.4	7.4	7.4	7.5
19.000	7.5	7.5	7.5	7.5	7.6
19.500	7.6	7.6	7.6	7.7	7.7
20.000	7.7	7.7	7.7	7.8	7.8
20.500	7.8	7.8	7.8	7.9	7.9
21.000	7.9	7.9	7.9	8.0	8.0
21.500	8.0	8.0	8.0	8.1	8.1
22.000	8.1	8.1	8.1	8.1	8.2
22.500	8.2	8.2	8.2	8.2	8.2
23.000	8.3	8.3	8.3	8.3	8.3
23.500	8.3	8.4	8.4	8.4	8.4
24.000	8.4	(N/A)	(N/A)	(N/A)	(N/A)

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): At = Ai+Ap
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate (time^-1)
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of 0.1333Tc, rtm, and th (Smallest dt is then adjusted to match up with Tp)
UDdt	User specified override computational main time increment (only used if UDdt is => .1333Tc)
D(t)	Point on distribution curve (fraction of P) for time step t
K	2 / (1 + (Tr/Tp)): default K = 0.75: (for Tr/Tp = 1.67)
Ks	Hydrograph shape factor = Unit Conversions * K: = ((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K Default Ks = 645.333 * 0.75 = 484
Lag	Lag time from center of excess runoff (dt) to Tp: Lag = 0.6Tc
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = (Ks * A * Q) / Tp (where Q = 1in. runoff, A=sq.mi.)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: Si = (1000/CNi) - 10
Sp	S for pervious area: Sp = (1000/CNp) - 10
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: Tb = Tp + Tr
Tp	Time (hrs) to peak of a unit hydrograph: Tp = (dt/2) + Lag
Tr	Time (hrs) of receding limb of unit hydrograph: Tr = ratio of Tp

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method
Computational Notes
Precipitation

Column (1)	Time for time step t
Column (2)	D(t) = Point on distribution curve for time step t
Column (3)	Pi(t) = Pa(t) - Pa(t-1): Col.(4) - Preceding Col.(4)
Column (4)	Pa(t) = D(t) x P: Col.(2) x P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5)	Rap(t) = Accumulated pervious runoff for time step t
	If (Pa(t) is <= 0.2Sp) then use: Rap(t) = 0.0
	If (Pa(t) is > 0.2Sp) then use:
	
	Rap(t) = (Col.(4)-0.2Sp)**2 / (Col.(4)+0.8Sp)

Column (6)	Rip(t) = Incremental pervious runoff for time step t Rip(t) = Rap(t) - Rap(t-1) Rip(t) = Col.(5) for current row - Col.(5) for preceding row.

Impervious Area Runoff

Column (7 & 8)...	Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9)	R(t) = (Ap/At) x Rip(t) + (Ai/At) x Rii(t) R(t) = (Ap/At) x Col.(6) + (Ai/At) x Col.(8)

SCS Unit Hydrograph Method

Column (10)	Q(t) is computed with the SCS unit hydrograph method using R(t) and Qu(t).

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-1

Return Event: 10 years
Storm Event: 10 year storm

Storm Event	10 year storm
Return Event	10 years
Duration	24.000 hours
Depth	5.9 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	1.000 acres
Computational Time Increment	0.023 hours
Time to Peak (Computed)	7.933 hours
Flow (Peak, Computed)	1.24 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.950 hours
Flow (Peak Interpolated Output)	1.24 ft³/s
Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.8 in
Runoff Volume (Pervious)	0.399 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.398 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.170 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	6.66 ft³/s

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-1

Return Event: 10 years
Storm Event: 10 year storm

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.113 hours
Unit receding limb, Tr	0.453 hours
Total unit time, Tb	0.567 hours

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-1

Return Event: 10 years
Storm Event: 10 year storm

Storm Event	10 year storm
Return Event	10 years
Duration	24.000 hours
Depth	5.9 in
Time of Concentration (Composite)	0.330 hours
Area (User Defined)	3.500 acres
Computational Time Increment	0.044 hours
Time to Peak (Computed)	8.096 hours
Flow (Peak, Computed)	1.36 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	8.100 hours
Flow (Peak Interpolated Output)	1.36 ft³/s

Drainage Area	
SCS CN (Composite)	63.000
Area (User Defined)	3.500 acres
Maximum Retention (Pervious)	5.9 in
Maximum Retention (Pervious, 20 percent)	1.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	0.623 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.617 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.330 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	12.02 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.220 hours
Unit receding limb, Tr	0.880 hours
Total unit time, Tb	1.100 hours

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	1.000 acres
Computational Time Increment	0.023 hours
Time to Peak (Computed)	7.933 hours
Flow (Peak, Computed)	1.86 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.950 hours
Flow (Peak Interpolated Output)	1.86 ft³/s
Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	1.000 acres
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.2 in
Runoff Volume (Pervious)	0.602 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.601 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.170 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	6.66 ft³/s

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.113 hours
Unit receding limb, Tr	0.453 hours
Total unit time, Tb	0.567 hours

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	1.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
1.300	0.00	0.00	0.01	0.01	0.02
1.550	0.02	0.03	0.03	0.04	0.04
1.800	0.04	0.05	0.05	0.06	0.06
2.050	0.07	0.07	0.08	0.08	0.08
2.300	0.09	0.09	0.10	0.10	0.10
2.550	0.11	0.11	0.11	0.12	0.12
2.800	0.12	0.12	0.13	0.13	0.13
3.050	0.13	0.13	0.14	0.14	0.14
3.300	0.14	0.15	0.15	0.15	0.15
3.550	0.16	0.16	0.17	0.17	0.18
3.800	0.18	0.19	0.19	0.19	0.20
4.050	0.20	0.20	0.20	0.21	0.21
4.300	0.21	0.21	0.22	0.22	0.23
4.550	0.23	0.23	0.24	0.24	0.25
4.800	0.25	0.25	0.26	0.26	0.27
5.050	0.27	0.28	0.29	0.29	0.30
5.300	0.30	0.31	0.31	0.32	0.32
5.550	0.33	0.33	0.33	0.34	0.34
5.800	0.34	0.35	0.36	0.36	0.37
6.050	0.38	0.39	0.41	0.42	0.43
6.300	0.43	0.44	0.44	0.45	0.45
6.550	0.45	0.45	0.44	0.43	0.43
6.800	0.44	0.45	0.45	0.46	0.48
7.050	0.49	0.51	0.52	0.54	0.56
7.300	0.59	0.61	0.64	0.67	0.70
7.550	0.79	1.06	1.35	1.56	1.69
7.800	1.78	1.83	1.86	1.86	1.84
8.050	1.76	1.57	1.36	1.20	1.08
8.300	0.99	0.92	0.85	0.79	0.75
8.550	0.72	0.71	0.72	0.71	0.69
8.800	0.68	0.66	0.64	0.62	0.60
9.050	0.58	0.57	0.55	0.54	0.52
9.300	0.51	0.49	0.48	0.47	0.46
9.550	0.45	0.45	0.46	0.45	0.45

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.800	0.45	0.44	0.44	0.43	0.43
10.050	0.43	0.42	0.41	0.41	0.40
10.300	0.40	0.39	0.39	0.39	0.39
10.550	0.38	0.39	0.39	0.39	0.39
10.800	0.38	0.38	0.38	0.37	0.37
11.050	0.37	0.36	0.36	0.36	0.35
11.300	0.35	0.35	0.34	0.34	0.34
11.550	0.33	0.33	0.32	0.32	0.32
11.800	0.32	0.31	0.31	0.31	0.31
12.050	0.31	0.31	0.31	0.31	0.31
12.300	0.31	0.31	0.31	0.32	0.32
12.550	0.32	0.31	0.31	0.30	0.30
12.800	0.30	0.30	0.30	0.30	0.30
13.050	0.30	0.30	0.30	0.30	0.30
13.300	0.30	0.30	0.30	0.29	0.29
13.550	0.29	0.29	0.29	0.29	0.28
13.800	0.28	0.28	0.28	0.28	0.28
14.050	0.28	0.28	0.28	0.28	0.28
14.300	0.28	0.28	0.28	0.28	0.28
14.550	0.28	0.28	0.28	0.28	0.27
14.800	0.27	0.27	0.27	0.27	0.27
15.050	0.27	0.27	0.27	0.27	0.27
15.300	0.27	0.27	0.27	0.27	0.27
15.550	0.26	0.26	0.26	0.26	0.26
15.800	0.26	0.26	0.26	0.26	0.26
16.050	0.26	0.26	0.26	0.26	0.26
16.300	0.26	0.25	0.25	0.25	0.25
16.550	0.25	0.25	0.25	0.25	0.25
16.800	0.25	0.25	0.25	0.25	0.25
17.050	0.25	0.25	0.25	0.24	0.24
17.300	0.24	0.24	0.24	0.24	0.24
17.550	0.24	0.24	0.24	0.24	0.24
17.800	0.24	0.24	0.24	0.23	0.23
18.050	0.23	0.23	0.23	0.23	0.23
18.300	0.23	0.23	0.23	0.23	0.23
18.550	0.23	0.23	0.23	0.23	0.23
18.800	0.22	0.22	0.22	0.22	0.22
19.050	0.22	0.22	0.22	0.22	0.22
19.300	0.22	0.22	0.22	0.22	0.22
19.550	0.22	0.21	0.21	0.21	0.21
19.800	0.21	0.21	0.21	0.21	0.21
20.050	0.21	0.21	0.21	0.21	0.21
20.300	0.21	0.21	0.20	0.20	0.20

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
20.550	0.20	0.20	0.20	0.20	0.20
20.800	0.20	0.20	0.20	0.20	0.20
21.050	0.20	0.20	0.20	0.19	0.19
21.300	0.19	0.19	0.19	0.19	0.19
21.550	0.19	0.19	0.19	0.19	0.19
21.800	0.19	0.19	0.19	0.19	0.18
22.050	0.18	0.18	0.18	0.18	0.18
22.300	0.18	0.18	0.18	0.18	0.18
22.550	0.18	0.18	0.18	0.18	0.18
22.800	0.17	0.17	0.17	0.17	0.17
23.050	0.17	0.17	0.17	0.17	0.17
23.300	0.17	0.17	0.17	0.17	0.17
23.550	0.16	0.16	0.16	0.16	0.16
23.800	0.16	0.16	0.16	0.16	0.16

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.330 hours
Area (User Defined)	3.500 acres
Computational Time Increment	0.044 hours
Time to Peak (Computed)	8.096 hours
Flow (Peak, Computed)	2.99 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	8.100 hours
Flow (Peak Interpolated Output)	2.98 ft³/s

Drainage Area	
SCS CN (Composite)	63.000
Area (User Defined)	3.500 acres
Maximum Retention (Pervious)	5.9 in
Maximum Retention (Pervious, 20 percent)	1.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	1.170 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.160 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.330 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	12.02 ft³/s

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.220 hours
Unit receding limb, Tr	0.880 hours
Total unit time, Tb	1.100 hours

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.330 hours
Area (User Defined)	3.500 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
4.700	0.00	0.00	0.00	0.01	0.01
4.950	0.02	0.02	0.03	0.04	0.04
5.200	0.05	0.06	0.07	0.08	0.09
5.450	0.10	0.11	0.12	0.13	0.14
5.700	0.15	0.16	0.17	0.18	0.19
5.950	0.20	0.21	0.22	0.24	0.25
6.200	0.27	0.28	0.30	0.32	0.33
6.450	0.35	0.36	0.38	0.39	0.40
6.700	0.41	0.41	0.42	0.43	0.44
6.950	0.46	0.48	0.50	0.52	0.54
7.200	0.57	0.60	0.63	0.67	0.71
7.450	0.75	0.80	0.88	1.01	1.22
7.700	1.50	1.80	2.08	2.34	2.56
7.950	2.74	2.89	2.97	2.98	2.89
8.200	2.73	2.54	2.35	2.17	2.02
8.450	1.89	1.77	1.67	1.60	1.54
8.700	1.51	1.48	1.46	1.44	1.41
8.950	1.38	1.35	1.31	1.28	1.25
9.200	1.22	1.19	1.17	1.14	1.11
9.450	1.09	1.06	1.04	1.03	1.02
9.700	1.01	1.01	1.01	1.00	1.00
9.950	0.99	0.99	0.98	0.97	0.96
10.200	0.95	0.94	0.93	0.92	0.92
10.450	0.91	0.90	0.90	0.90	0.89
10.700	0.90	0.90	0.90	0.89	0.89
10.950	0.89	0.88	0.88	0.87	0.87
11.200	0.86	0.85	0.85	0.84	0.84
11.450	0.83	0.82	0.82	0.81	0.80
11.700	0.79	0.79	0.78	0.77	0.77
11.950	0.76	0.76	0.76	0.75	0.75
12.200	0.75	0.75	0.75	0.76	0.76
12.450	0.76	0.77	0.77	0.77	0.77
12.700	0.77	0.76	0.75	0.75	0.75
12.950	0.74	0.74	0.74	0.74	0.74

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
13.200	0.75	0.75	0.75	0.75	0.75
13.450	0.75	0.74	0.74	0.74	0.73
13.700	0.73	0.73	0.72	0.72	0.72
13.950	0.72	0.71	0.71	0.71	0.71
14.200	0.71	0.71	0.71	0.71	0.71
14.450	0.71	0.71	0.71	0.71	0.71
14.700	0.71	0.71	0.71	0.71	0.71
14.950	0.71	0.70	0.70	0.70	0.70
15.200	0.70	0.70	0.70	0.70	0.70
15.450	0.70	0.69	0.69	0.69	0.69
15.700	0.69	0.69	0.69	0.69	0.69
15.950	0.69	0.68	0.68	0.68	0.68
16.200	0.68	0.68	0.68	0.68	0.68
16.450	0.67	0.67	0.67	0.67	0.67
16.700	0.67	0.67	0.67	0.67	0.66
16.950	0.66	0.66	0.66	0.66	0.66
17.200	0.66	0.66	0.65	0.65	0.65
17.450	0.65	0.65	0.65	0.65	0.65
17.700	0.64	0.64	0.64	0.64	0.64
17.950	0.64	0.64	0.64	0.63	0.63
18.200	0.63	0.63	0.63	0.63	0.63
18.450	0.63	0.62	0.62	0.62	0.62
18.700	0.62	0.62	0.62	0.61	0.61
18.950	0.61	0.61	0.61	0.61	0.61
19.200	0.60	0.60	0.60	0.60	0.60
19.450	0.60	0.60	0.59	0.59	0.59
19.700	0.59	0.59	0.59	0.59	0.58
19.950	0.58	0.58	0.58	0.58	0.58
20.200	0.58	0.57	0.57	0.57	0.57
20.450	0.57	0.57	0.57	0.56	0.56
20.700	0.56	0.56	0.56	0.56	0.56
20.950	0.55	0.55	0.55	0.55	0.55
21.200	0.55	0.54	0.54	0.54	0.54
21.450	0.54	0.54	0.53	0.53	0.53
21.700	0.53	0.53	0.53	0.53	0.52
21.950	0.52	0.52	0.52	0.52	0.52
22.200	0.51	0.51	0.51	0.51	0.51
22.450	0.51	0.50	0.50	0.50	0.50
22.700	0.50	0.50	0.50	0.49	0.49
22.950	0.49	0.49	0.49	0.49	0.48
23.200	0.48	0.48	0.48	0.48	0.48
23.450	0.47	0.47	0.47	0.47	0.47
23.700	0.47	0.46	0.46	0.46	0.46

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-1

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
23.950	0.46	0.45	(N/A)	(N/A)	(N/A)

Storm Event	10 year storm
Return Event	10 years
Duration	24.000 hours
Depth	5.9 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	8.700 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	7.933 hours
Flow (Peak, Computed)	15.02 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.950 hours
Flow (Peak Interpolated Output)	15.00 ft³/s

Pervious Area			Directly Connected Impervious Area		
SCS CN (Composite)	90.000		Runoff CN (Directly Connected Impervious)	98.000	
Area (User Defined)	8.700	acres	Area (Directly Connected Impervious)	3.000	acres
Maximum Retention (Pervious)	1.1	in	Maximum Retention (Impervious)	0.2	in
Maximum Retention (Pervious, 20 percent)	0.2	in	Maximum Retention (Impervious, 20 percent)	0.0	in

Cumulative Pervious Runoff			Cumulative Impervious Area		
Cumulative Runoff Depth (Pervious)	4.8	in	Cumulative Runoff Depth (Impervious)	5.7	in
Runoff Volume (Pervious)	3.471	ac-ft	Runoff Volume (Impervious)	1.425	ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.882 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.170 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 10 years
Storm Event: 10 year storm

SCS Unit Hydrograph Parameters	
Unit peak, qp	57.99 ft^3/s
Unit peak time, Tp	0.113 hours
Unit receding limb, Tr	0.453 hours
Total unit time, Tb	0.567 hours

Storm Event	10 year storm
Return Event	10 years
Duration	24.000 hours
Depth	5.9 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	8.700 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.350	0.00	0.00	0.01	0.02	0.03
0.600	0.04	0.06	0.07	0.08	0.10
0.850	0.11	0.12	0.14	0.15	0.17
1.100	0.20	0.23	0.25	0.28	0.30
1.350	0.32	0.33	0.35	0.36	0.37
1.600	0.38	0.38	0.39	0.42	0.44
1.850	0.47	0.50	0.53	0.56	0.59
2.100	0.62	0.66	0.69	0.72	0.75
2.350	0.78	0.80	0.83	0.86	0.88
2.600	0.90	0.92	0.94	0.96	0.98
2.850	1.00	1.02	1.03	1.05	1.07
3.100	1.08	1.09	1.10	1.12	1.14
3.350	1.16	1.18	1.20	1.23	1.26
3.600	1.29	1.34	1.37	1.41	1.44
3.850	1.46	1.49	1.52	1.55	1.57
4.100	1.59	1.60	1.62	1.64	1.66
4.350	1.69	1.72	1.75	1.78	1.80
4.600	1.84	1.87	1.90	1.93	1.97
4.850	2.00	2.04	2.08	2.12	2.16
5.100	2.21	2.27	2.31	2.36	2.40
5.350	2.44	2.48	2.52	2.56	2.59
5.600	2.61	2.62	2.65	2.68	2.73
5.850	2.77	2.82	2.87	2.93	3.00
6.100	3.11	3.21	3.30	3.37	3.43
6.350	3.48	3.53	3.57	3.60	3.60
6.600	3.54	3.47	3.45	3.46	3.49
6.850	3.55	3.62	3.70	3.80	3.91
7.100	4.04	4.18	4.34	4.50	4.69
7.350	4.88	5.10	5.32	5.58	6.36
7.600	8.49	10.81	12.48	13.56	14.27
7.850	14.72	14.96	15.00	14.85	14.24
8.100	12.68	10.97	9.67	8.75	8.01
8.350	7.41	6.88	6.43	6.05	5.80
8.600	5.77	5.80	5.75	5.63	5.49

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 10 years
Storm Event: 10 year storm

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
8.850	5.34	5.18	5.03	4.88	4.75
9.100	4.61	4.48	4.35	4.24	4.12
9.350	4.02	3.92	3.83	3.74	3.69
9.600	3.69	3.70	3.70	3.68	3.64
9.850	3.61	3.57	3.54	3.50	3.46
10.100	3.41	3.36	3.31	3.28	3.24
10.350	3.21	3.19	3.16	3.14	3.13
10.600	3.14	3.15	3.15	3.14	3.12
10.850	3.09	3.07	3.04	3.02	2.99
11.100	2.97	2.94	2.91	2.89	2.86
11.350	2.84	2.81	2.78	2.76	2.73
11.600	2.69	2.65	2.62	2.59	2.57
11.850	2.56	2.54	2.53	2.53	2.52
12.100	2.52	2.51	2.52	2.52	2.53
12.350	2.54	2.56	2.57	2.59	2.59
12.600	2.56	2.51	2.48	2.46	2.44
12.850	2.43	2.42	2.42	2.41	2.42
13.100	2.45	2.48	2.48	2.47	2.46
13.350	2.44	2.42	2.40	2.39	2.37
13.600	2.36	2.34	2.33	2.32	2.31
13.850	2.30	2.30	2.29	2.29	2.28
14.100	2.29	2.29	2.29	2.29	2.29
14.350	2.28	2.28	2.27	2.27	2.26
14.600	2.26	2.25	2.25	2.24	2.24
14.850	2.23	2.23	2.22	2.22	2.21
15.100	2.21	2.20	2.20	2.20	2.19
15.350	2.18	2.18	2.17	2.17	2.16
15.600	2.16	2.15	2.15	2.14	2.14
15.850	2.14	2.13	2.13	2.12	2.11
16.100	2.11	2.10	2.10	2.09	2.09
16.350	2.08	2.08	2.07	2.07	2.07
16.600	2.06	2.05	2.05	2.05	2.04
16.850	2.03	2.03	2.03	2.02	2.02
17.100	2.01	2.01	2.00	1.99	1.99
17.350	1.98	1.98	1.97	1.97	1.97
17.600	1.96	1.96	1.95	1.95	1.94
17.850	1.94	1.93	1.92	1.92	1.91
18.100	1.91	1.90	1.90	1.89	1.89
18.350	1.89	1.88	1.88	1.87	1.86
18.600	1.86	1.85	1.85	1.84	1.84
18.850	1.83	1.83	1.82	1.82	1.81
19.100	1.81	1.80	1.80	1.79	1.79
19.350	1.78	1.78	1.77	1.77	1.76

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
19.600	1.76	1.75	1.75	1.74	1.74
19.850	1.73	1.72	1.72	1.72	1.71
20.100	1.71	1.70	1.70	1.69	1.69
20.350	1.68	1.67	1.67	1.66	1.66
20.600	1.65	1.65	1.64	1.64	1.64
20.850	1.63	1.63	1.62	1.61	1.61
21.100	1.60	1.60	1.59	1.59	1.58
21.350	1.58	1.57	1.57	1.56	1.56
21.600	1.55	1.55	1.54	1.54	1.53
21.850	1.53	1.52	1.52	1.51	1.51
22.100	1.50	1.50	1.49	1.49	1.48
22.350	1.47	1.47	1.46	1.46	1.46
22.600	1.45	1.45	1.44	1.44	1.43
22.850	1.42	1.42	1.41	1.41	1.40
23.100	1.40	1.39	1.39	1.38	1.38
23.350	1.37	1.37	1.36	1.36	1.35
23.600	1.35	1.34	1.34	1.33	1.33
23.850	1.32	1.32	1.31	1.30	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 10 years
Storm Event: 10 year storm

Storm Event	10 year storm
Return Event	10 years
Duration	24.000 hours
Depth	5.9 in
Time of Concentration (Composite)	0.370 hours
Area (User Defined)	9.200 acres
Computational Time Increment	0.049 hours
Time to Peak (Computed)	8.140 hours
Flow (Peak, Computed)	3.49 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	8.100 hours
Flow (Peak Interpolated Output)	3.48 ft³/s

Drainage Area	
SCS CN (Composite)	63.000
Area (User Defined)	9.200 acres
Maximum Retention (Pervious)	5.9 in
Maximum Retention (Pervious, 20 percent)	1.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	1.637 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.619 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.370 hours
Computational Time Increment	0.049 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	28.17 ft³/s

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 10 years
Storm Event: 10 year storm

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.247 hours
Unit receding limb, Tr	0.987 hours
Total unit time, Tb	1.233 hours

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 10 years
Storm Event: 10 year storm

Storm Event	10 year storm
Return Event	10 years
Duration	24.000 hours
Depth	5.9 in
Time of Concentration (Composite)	0.370 hours
Area (User Defined)	9.200 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.950	0.00	0.00	0.01	0.01	0.02
6.200	0.04	0.05	0.07	0.08	0.10
6.450	0.12	0.14	0.16	0.18	0.20
6.700	0.22	0.23	0.25	0.27	0.29
6.950	0.31	0.33	0.35	0.38	0.41
7.200	0.44	0.47	0.51	0.55	0.60
7.450	0.65	0.70	0.78	0.91	1.11
7.700	1.38	1.70	2.04	2.38	2.68
7.950	2.96	3.20	3.38	3.48	3.47
8.200	3.38	3.22	3.04	2.85	2.68
8.450	2.52	2.38	2.26	2.16	2.09
8.700	2.04	2.00	1.98	1.95	1.92
8.950	1.88	1.84	1.81	1.77	1.73
9.200	1.69	1.66	1.62	1.59	1.56
9.450	1.52	1.50	1.47	1.45	1.43
9.700	1.42	1.42	1.42	1.41	1.41
9.950	1.40	1.39	1.38	1.38	1.37
10.200	1.35	1.34	1.33	1.32	1.31
10.450	1.30	1.30	1.29	1.29	1.28
10.700	1.29	1.29	1.29	1.29	1.29
10.950	1.28	1.28	1.27	1.27	1.26
11.200	1.25	1.25	1.24	1.23	1.22
11.450	1.22	1.21	1.20	1.19	1.18
11.700	1.17	1.16	1.15	1.14	1.13
11.950	1.13	1.12	1.12	1.11	1.11
12.200	1.11	1.11	1.11	1.12	1.12
12.450	1.13	1.13	1.14	1.14	1.14
12.700	1.14	1.13	1.13	1.12	1.11
12.950	1.11	1.11	1.11	1.11	1.11
13.200	1.12	1.12	1.13	1.13	1.13
13.450	1.12	1.12	1.12	1.11	1.11
13.700	1.10	1.10	1.09	1.09	1.09
13.950	1.08	1.08	1.08	1.08	1.08
14.200	1.08	1.08	1.08	1.08	1.08

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 10 years
Storm Event: 10 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
14.450	1.08	1.08	1.08	1.08	1.08
14.700	1.08	1.08	1.08	1.08	1.08
14.950	1.08	1.08	1.08	1.07	1.07
15.200	1.07	1.07	1.07	1.07	1.07
15.450	1.07	1.07	1.07	1.06	1.06
15.700	1.06	1.06	1.06	1.06	1.06
15.950	1.06	1.06	1.05	1.05	1.05
16.200	1.05	1.05	1.05	1.05	1.04
16.450	1.04	1.04	1.04	1.04	1.04
16.700	1.04	1.04	1.03	1.03	1.03
16.950	1.03	1.03	1.03	1.03	1.02
17.200	1.02	1.02	1.02	1.02	1.02
17.450	1.01	1.01	1.01	1.01	1.01
17.700	1.01	1.01	1.00	1.00	1.00
17.950	1.00	1.00	0.99	0.99	0.99
18.200	0.99	0.99	0.99	0.98	0.98
18.450	0.98	0.98	0.98	0.98	0.97
18.700	0.97	0.97	0.97	0.97	0.96
18.950	0.96	0.96	0.96	0.96	0.96
19.200	0.95	0.95	0.95	0.95	0.95
19.450	0.94	0.94	0.94	0.94	0.94
19.700	0.93	0.93	0.93	0.93	0.93
19.950	0.92	0.92	0.92	0.92	0.92
20.200	0.91	0.91	0.91	0.91	0.91
20.450	0.90	0.90	0.90	0.90	0.89
20.700	0.89	0.89	0.89	0.89	0.88
20.950	0.88	0.88	0.88	0.87	0.87
21.200	0.87	0.87	0.87	0.86	0.86
21.450	0.86	0.86	0.85	0.85	0.85
21.700	0.85	0.84	0.84	0.84	0.84
21.950	0.84	0.83	0.83	0.83	0.83
22.200	0.82	0.82	0.82	0.82	0.81
22.450	0.81	0.81	0.81	0.80	0.80
22.700	0.80	0.80	0.80	0.79	0.79
22.950	0.79	0.79	0.78	0.78	0.78
23.200	0.77	0.77	0.77	0.77	0.77
23.450	0.76	0.76	0.76	0.76	0.75
23.700	0.75	0.75	0.75	0.74	0.74
23.950	0.74	0.73	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	8.700 acres

Computational Time Increment	0.023 hours
Time to Peak (Computed)	7.933 hours
Flow (Peak, Computed)	22.23 ft^3/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	7.950 hours
Flow (Peak Interpolated Output)	22.20 ft^3/s

Pervious Area			Directly Connected Impervious Area		
SCS CN (Composite)	90.000		Runoff CN (Directly Connected Impervious)	98.000	
Area (User Defined)	8.700	acres	Area (Directly Connected Impervious)	3.000	acres
Maximum Retention (Pervious)	1.1	in	Maximum Retention (Impervious)	0.2	in
Maximum Retention (Pervious, 20 percent)	0.2	in	Maximum Retention (Impervious, 20 percent)	0.0	in

Cumulative Pervious Runoff			Cumulative Impervious Area		
Cumulative Runoff Depth (Pervious)	7.2	in	Cumulative Runoff Depth (Impervious)	8.2	in
Runoff Volume (Pervious)	5.241	ac-ft	Runoff Volume (Impervious)	2.048	ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	7.268 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.170 hours
Computational Time Increment	0.023 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

SCS Unit Hydrograph Parameters	
Unit peak, qp	57.99 ft^3/s
Unit peak time, Tp	0.113 hours
Unit receding limb, Tr	0.453 hours
Total unit time, Tb	0.567 hours

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.170 hours
Area (User Defined)	8.700 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.250	0.00	0.00	0.02	0.04	0.06
0.500	0.09	0.11	0.13	0.15	0.17
0.750	0.19	0.21	0.23	0.26	0.28
1.000	0.30	0.33	0.37	0.42	0.46
1.250	0.49	0.52	0.57	0.63	0.69
1.500	0.76	0.82	0.86	0.90	0.94
1.750	0.98	1.03	1.07	1.11	1.16
2.000	1.20	1.25	1.30	1.36	1.41
2.250	1.45	1.49	1.54	1.57	1.61
2.500	1.65	1.68	1.71	1.73	1.76
2.750	1.78	1.81	1.83	1.86	1.88
3.000	1.90	1.92	1.94	1.95	1.96
3.250	1.98	2.01	2.04	2.07	2.10
3.500	2.14	2.18	2.24	2.30	2.36
3.750	2.41	2.45	2.49	2.53	2.57
4.000	2.61	2.64	2.66	2.68	2.71
4.250	2.73	2.77	2.80	2.84	2.88
4.500	2.92	2.97	3.01	3.06	3.10
4.750	3.15	3.20	3.25	3.31	3.36
5.000	3.42	3.48	3.56	3.63	3.71
5.250	3.77	3.84	3.89	3.95	4.00
5.500	4.05	4.10	4.12	4.13	4.17
5.750	4.22	4.28	4.34	4.41	4.49
6.000	4.57	4.68	4.83	4.99	5.12
6.250	5.22	5.31	5.38	5.44	5.49
6.500	5.54	5.53	5.43	5.32	5.28
6.750	5.29	5.34	5.41	5.52	5.64
7.000	5.78	5.94	6.13	6.34	6.57
7.250	6.81	7.09	7.37	7.68	8.01
7.500	8.39	9.55	12.73	16.18	18.65
7.750	20.21	21.24	21.87	22.17	22.20
8.000	21.94	21.00	18.67	16.14	14.22
8.250	12.85	11.76	10.86	10.08	9.42
8.500	8.85	8.49	8.44	8.48	8.40

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
8.750	8.23	8.02	7.79	7.56	7.34
9.000	7.13	6.92	6.72	6.53	6.34
9.250	6.17	6.01	5.85	5.71	5.57
9.500	5.45	5.37	5.36	5.39	5.38
9.750	5.35	5.30	5.25	5.19	5.14
10.000	5.08	5.02	4.95	4.87	4.81
10.250	4.75	4.70	4.66	4.62	4.59
10.500	4.56	4.54	4.55	4.57	4.57
10.750	4.55	4.52	4.48	4.45	4.41
11.000	4.37	4.33	4.29	4.26	4.22
11.250	4.18	4.14	4.10	4.07	4.03
11.500	3.99	3.94	3.89	3.83	3.79
11.750	3.75	3.72	3.70	3.68	3.66
12.000	3.65	3.64	3.64	3.63	3.64
12.250	3.65	3.66	3.68	3.70	3.72
12.500	3.74	3.75	3.70	3.63	3.58
12.750	3.55	3.53	3.51	3.50	3.49
13.000	3.48	3.49	3.53	3.57	3.58
13.250	3.57	3.55	3.52	3.49	3.47
13.500	3.44	3.42	3.40	3.38	3.36
13.750	3.34	3.33	3.32	3.31	3.30
14.000	3.29	3.29	3.30	3.30	3.30
14.250	3.30	3.29	3.29	3.28	3.27
14.500	3.27	3.26	3.25	3.25	3.24
14.750	3.23	3.22	3.21	3.21	3.20
15.000	3.19	3.19	3.18	3.17	3.17
15.250	3.16	3.15	3.14	3.14	3.13
15.500	3.12	3.11	3.11	3.10	3.09
15.750	3.09	3.08	3.07	3.07	3.06
16.000	3.05	3.04	3.03	3.03	3.02
16.250	3.01	3.01	3.00	2.99	2.98
16.500	2.98	2.97	2.96	2.95	2.95
16.750	2.94	2.93	2.93	2.92	2.91
17.000	2.90	2.90	2.89	2.88	2.88
17.250	2.87	2.86	2.85	2.84	2.84
17.500	2.83	2.83	2.82	2.81	2.80
17.750	2.80	2.79	2.78	2.77	2.76
18.000	2.76	2.75	2.74	2.73	2.73
18.250	2.72	2.72	2.71	2.70	2.69
18.500	2.68	2.68	2.67	2.66	2.65
18.750	2.65	2.64	2.63	2.62	2.62
19.000	2.61	2.60	2.60	2.59	2.58
19.250	2.57	2.57	2.56	2.55	2.55

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
19.500	2.54	2.53	2.52	2.52	2.51
19.750	2.50	2.49	2.48	2.47	2.47
20.000	2.46	2.46	2.45	2.44	2.44
20.250	2.43	2.42	2.41	2.40	2.39
20.500	2.39	2.38	2.37	2.36	2.36
20.750	2.35	2.35	2.34	2.33	2.32
21.000	2.32	2.31	2.30	2.29	2.28
21.250	2.28	2.27	2.26	2.26	2.25
21.500	2.24	2.23	2.23	2.22	2.21
21.750	2.20	2.20	2.19	2.18	2.18
22.000	2.17	2.16	2.15	2.15	2.14
22.250	2.13	2.12	2.11	2.10	2.10
22.500	2.09	2.09	2.08	2.07	2.07
22.750	2.06	2.05	2.04	2.03	2.02
23.000	2.02	2.01	2.00	1.99	1.99
23.250	1.98	1.98	1.97	1.96	1.95
23.500	1.94	1.94	1.93	1.92	1.91
23.750	1.91	1.90	1.89	1.88	1.88
24.000	1.87	(N/A)	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.370 hours
Area (User Defined)	9.200 acres
Computational Time Increment	0.049 hours
Time to Peak (Computed)	8.091 hours
Flow (Peak, Computed)	7.69 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	8.100 hours
Flow (Peak Interpolated Output)	7.68 ft³/s

Drainage Area	
SCS CN (Composite)	63.000
Area (User Defined)	9.200 acres
Maximum Retention (Pervious)	5.9 in
Maximum Retention (Pervious, 20 percent)	1.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	3.074 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.045 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.370 hours
Computational Time Increment	0.049 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	28.17 ft³/s

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph Summary
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

SCS Unit Hydrograph Parameters	
Unit peak time, Tp	0.247 hours
Unit receding limb, Tr	0.987 hours
Total unit time, Tb	1.233 hours

Storm Event	100 year storm
Return Event	100 years
Duration	24.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.370 hours
Area (User Defined)	9.200 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
4.700	0.00	0.00	0.01	0.01	0.02
4.950	0.04	0.05	0.07	0.09	0.11
5.200	0.13	0.15	0.17	0.19	0.22
5.450	0.24	0.27	0.29	0.32	0.34
5.700	0.37	0.39	0.42	0.45	0.47
5.950	0.50	0.53	0.57	0.60	0.64
6.200	0.68	0.72	0.77	0.81	0.85
6.450	0.89	0.93	0.97	1.00	1.03
6.700	1.05	1.07	1.09	1.12	1.15
6.950	1.19	1.23	1.27	1.33	1.39
7.200	1.46	1.53	1.61	1.70	1.80
7.450	1.90	2.02	2.19	2.48	2.96
7.700	3.60	4.32	5.05	5.75	6.36
7.950	6.87	7.29	7.57	7.68	7.57
8.200	7.27	6.86	6.41	5.96	5.55
8.450	5.19	4.87	4.59	4.36	4.19
8.700	4.07	3.98	3.91	3.84	3.76
8.950	3.68	3.59	3.51	3.43	3.34
9.200	3.26	3.19	3.11	3.04	2.97
9.450	2.90	2.84	2.79	2.74	2.71
9.700	2.68	2.67	2.66	2.65	2.63
9.950	2.62	2.60	2.58	2.56	2.54
10.200	2.51	2.49	2.46	2.44	2.42
10.450	2.40	2.38	2.37	2.36	2.36
10.700	2.36	2.36	2.36	2.35	2.34
10.950	2.34	2.32	2.31	2.30	2.28
11.200	2.27	2.26	2.24	2.22	2.21
11.450	2.19	2.18	2.16	2.14	2.12
11.700	2.10	2.08	2.06	2.04	2.03
11.950	2.01	2.00	1.99	1.99	1.98
12.200	1.98	1.98	1.98	1.99	1.99
12.450	2.00	2.01	2.02	2.03	2.03
12.700	2.02	2.00	1.99	1.98	1.97
12.950	1.96	1.95	1.95	1.95	1.95

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
13.200	1.96	1.97	1.98	1.98	1.97
13.450	1.97	1.96	1.95	1.94	1.93
13.700	1.92	1.91	1.91	1.90	1.89
13.950	1.89	1.88	1.88	1.88	1.88
14.200	1.88	1.88	1.88	1.88	1.88
14.450	1.88	1.88	1.87	1.87	1.87
14.700	1.87	1.87	1.86	1.86	1.86
14.950	1.86	1.85	1.85	1.85	1.85
15.200	1.84	1.84	1.84	1.84	1.83
15.450	1.83	1.83	1.83	1.82	1.82
15.700	1.82	1.81	1.81	1.81	1.81
15.950	1.80	1.80	1.80	1.80	1.79
16.200	1.79	1.79	1.78	1.78	1.78
16.450	1.77	1.77	1.77	1.77	1.76
16.700	1.76	1.76	1.75	1.75	1.75
16.950	1.74	1.74	1.74	1.74	1.73
17.200	1.73	1.73	1.72	1.72	1.72
17.450	1.71	1.71	1.71	1.70	1.70
17.700	1.70	1.69	1.69	1.69	1.68
17.950	1.68	1.68	1.67	1.67	1.66
18.200	1.66	1.66	1.65	1.65	1.65
18.450	1.65	1.64	1.64	1.63	1.63
18.700	1.63	1.62	1.62	1.62	1.61
18.950	1.61	1.61	1.60	1.60	1.59
19.200	1.59	1.59	1.58	1.58	1.58
19.450	1.57	1.57	1.57	1.56	1.56
19.700	1.55	1.55	1.55	1.54	1.54
19.950	1.53	1.53	1.53	1.52	1.52
20.200	1.52	1.51	1.51	1.51	1.50
20.450	1.50	1.49	1.49	1.48	1.48
20.700	1.48	1.47	1.47	1.46	1.46
20.950	1.46	1.45	1.45	1.45	1.44
21.200	1.44	1.43	1.43	1.42	1.42
21.450	1.42	1.41	1.41	1.40	1.40
21.700	1.40	1.39	1.39	1.38	1.38
21.950	1.38	1.37	1.37	1.36	1.36
22.200	1.36	1.35	1.35	1.34	1.34
22.450	1.33	1.33	1.33	1.32	1.32
22.700	1.31	1.31	1.31	1.30	1.30
22.950	1.29	1.29	1.28	1.28	1.27
23.200	1.27	1.27	1.26	1.26	1.25
23.450	1.25	1.25	1.24	1.24	1.23
23.700	1.23	1.22	1.22	1.21	1.21

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Unit Hydrograph (Hydrograph Table)
Label: CM-2

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
23.950	1.21	1.20	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time vs. Elevation
Label: PO-2 (OUT)

Return Event: 10 years
Storm Event: 10 year storm

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	95.00	95.00	95.00	95.00	95.00
0.250	95.00	95.00	95.00	95.00	95.00
0.500	95.01	95.02	95.04	95.05	95.07
0.750	95.08	95.09	95.11	95.12	95.14
1.000	95.15	95.17	95.20	95.22	95.25
1.250	95.28	95.30	95.32	95.34	95.36
1.500	95.38	95.39	95.40	95.40	95.41
1.750	95.43	95.45	95.48	95.51	95.54
2.000	95.58	95.62	95.65	95.70	95.73
2.250	95.77	95.81	95.84	95.88	95.91
2.500	95.94	95.97	96.00	96.03	96.05
2.750	96.07	96.10	96.13	96.16	96.19
3.000	96.21	96.24	96.27	96.29	96.31
3.250	96.33	96.35	96.38	96.41	96.45
3.500	96.48	96.52	96.56	96.62	96.68
3.750	96.75	96.81	96.87	96.93	96.98
4.000	97.03	97.08	97.12	97.16	97.21
4.250	97.25	97.29	97.34	97.39	97.44
4.500	97.50	97.55	97.60	97.66	97.72
4.750	97.78	97.85	97.93	98.00	98.07
5.000	98.14	98.22	98.31	98.40	98.50
5.250	98.59	98.68	98.77	98.87	98.97
5.500	99.06	99.15	99.24	99.32	99.40
5.750	99.48	99.52	99.55	99.58	99.62
6.000	99.66	99.70	99.75	99.81	99.87
6.250	99.94	100.00	100.03	100.05	100.07
6.500	100.09	100.11	100.14	100.16	100.18
6.750	100.20	100.22	100.24	100.26	100.28
7.000	100.31	100.33	100.37	100.40	100.43
7.250	100.47	100.52	100.56	100.60	100.65
7.500	100.71	100.77	100.86	101.00	101.16
7.750	101.33	101.53	101.71	101.89	102.07
8.000	102.23	102.39	102.53	102.64	102.73
8.250	102.80	102.87	102.92	102.97	103.01
8.500	103.05	103.07	103.10	103.13	103.16
8.750	103.18	103.21	103.23	103.25	103.27
9.000	103.29	103.31	103.32	103.33	103.34
9.250	103.35	103.36	103.37	103.38	103.38
9.500	103.39	103.39	103.39	103.40	103.40
9.750	103.40	103.40	103.41	103.41	103.41
10.000	103.41	103.41	103.41	103.41	103.41
10.250	103.41	103.41	103.40	103.40	103.40

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time vs. Elevation
Label: PO-2 (OUT)

Return Event: 10 years
Storm Event: 10 year storm

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.500	103.40	103.39	103.39	103.39	103.38
10.750	103.38	103.38	103.37	103.37	103.36
11.000	103.36	103.35	103.35	103.34	103.34
11.250	103.33	103.33	103.32	103.31	103.31
11.500	103.30	103.29	103.28	103.28	103.27
11.750	103.26	103.25	103.24	103.23	103.22
12.000	103.21	103.20	103.19	103.18	103.17
12.250	103.16	103.15	103.14	103.13	103.12
12.500	103.12	103.11	103.10	103.09	103.08
12.750	103.07	103.06	103.05	103.04	103.03
13.000	103.02	103.01	102.99	102.98	102.97
13.250	102.96	102.95	102.94	102.93	102.92
13.500	102.91	102.89	102.88	102.87	102.86
13.750	102.85	102.83	102.82	102.81	102.80
14.000	102.78	102.77	102.76	102.75	102.73
14.250	102.72	102.71	102.70	102.68	102.67
14.500	102.66	102.65	102.63	102.62	102.61
14.750	102.60	102.58	102.57	102.56	102.55
15.000	102.53	102.52	102.51	102.49	102.48
15.250	102.47	102.45	102.44	102.42	102.41
15.500	102.39	102.38	102.37	102.35	102.34
15.750	102.32	102.31	102.29	102.28	102.26
16.000	102.25	102.23	102.22	102.21	102.19
16.250	102.18	102.16	102.15	102.13	102.12
16.500	102.10	102.09	102.07	102.06	102.04
16.750	102.03	102.01	102.00	101.98	101.96
17.000	101.95	101.93	101.91	101.90	101.88
17.250	101.86	101.85	101.83	101.81	101.80
17.500	101.78	101.76	101.75	101.73	101.71
17.750	101.70	101.68	101.66	101.64	101.63
18.000	101.61	101.59	101.58	101.56	101.54
18.250	101.53	101.51	101.49	101.47	101.45
18.500	101.43	101.41	101.39	101.38	101.36
18.750	101.34	101.32	101.30	101.28	101.26
19.000	101.24	101.22	101.20	101.18	101.16
19.250	101.14	101.13	101.11	101.09	101.07
19.500	101.05	101.03	101.01	100.99	100.97
19.750	100.95	100.92	100.90	100.88	100.86
20.000	100.84	100.81	100.79	100.77	100.75
20.250	100.73	100.71	100.68	100.66	100.64
20.500	100.62	100.60	100.58	100.55	100.53
20.750	100.51	100.49	100.46	100.44	100.41

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time vs. Elevation
Label: PO-2 (OUT)

Return Event: 10 years
Storm Event: 10 year storm

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
21.000	100.39	100.37	100.34	100.32	100.29
21.250	100.27	100.24	100.22	100.20	100.17
21.500	100.15	100.12	100.10	100.08	100.05
21.750	100.03	100.00	99.92	99.84	99.75
22.000	99.66	99.58	99.50	99.23	98.99
22.250	98.73	98.50	98.25	98.04	97.82
22.500	97.64	97.50	97.35	97.24	97.16
22.750	97.10	97.05	97.01	96.97	96.94
23.000	96.92	96.90	96.89	96.88	96.87
23.250	96.85	96.85	96.84	96.83	96.82
23.500	96.81	96.80	96.79	96.78	96.77
23.750	96.76	96.74	96.74	96.73	96.72
24.000	96.71	(N/A)	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time vs. Elevation
Label: PO-2 (OUT)

Return Event: 100 years
Storm Event: 100 year storm

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
0.000	95.00	95.00	95.00	95.00	95.00
0.250	95.00	95.00	95.01	95.03	95.05
0.500	95.08	95.11	95.13	95.15	95.18
0.750	95.20	95.22	95.24	95.26	95.28
1.000	95.31	95.34	95.38	95.42	95.47
1.250	95.51	95.55	95.60	95.66	95.73
1.500	95.81	95.88	95.94	95.99	96.04
1.750	96.08	96.14	96.21	96.28	96.34
2.000	96.41	96.49	96.55	96.63	96.71
2.250	96.80	96.89	96.97	97.04	97.11
2.500	97.18	97.25	97.33	97.39	97.46
2.750	97.51	97.56	97.62	97.67	97.73
3.000	97.78	97.84	97.89	97.94	97.98
3.250	98.02	98.06	98.11	98.16	98.21
3.500	98.28	98.34	98.42	98.51	98.60
3.750	98.69	98.79	98.89	99.00	99.09
4.000	99.18	99.27	99.36	99.45	99.51
4.250	99.54	99.57	99.60	99.63	99.67
4.500	99.71	99.75	99.79	99.84	99.89
4.750	99.94	100.00	100.01	100.03	100.05
5.000	100.07	100.09	100.11	100.13	100.16
5.250	100.18	100.21	100.24	100.27	100.30
5.500	100.33	100.36	100.40	100.43	100.46
5.750	100.50	100.53	100.56	100.59	100.63
6.000	100.66	100.70	100.74	100.79	100.83
6.250	100.88	100.93	100.98	101.03	101.07
6.500	101.12	101.17	101.21	101.26	101.30
6.750	101.34	101.38	101.43	101.47	101.51
7.000	101.56	101.60	101.65	101.70	101.75
7.250	101.81	101.87	101.94	102.01	102.07
7.500	102.14	102.23	102.34	102.50	102.67
7.750	102.88	103.09	103.29	103.51	103.69
8.000	103.88	104.04	104.17	104.28	104.36
8.250	104.43	104.48	104.52	104.55	104.58
8.500	104.60	104.61	104.62	104.63	104.64
8.750	104.65	104.66	104.67	104.67	104.68
9.000	104.68	104.67	104.67	104.67	104.66
9.250	104.65	104.64	104.63	104.62	104.61
9.500	104.60	104.58	104.57	104.55	104.54
9.750	104.53	104.51	104.50	104.48	104.47
10.000	104.45	104.44	104.42	104.41	104.39
10.250	104.38	104.36	104.34	104.33	104.31

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time vs. Elevation
Label: PO-2 (OUT)

Return Event: 100 years
Storm Event: 100 year storm

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
10.500	104.29	104.28	104.26	104.25	104.23
10.750	104.22	104.21	104.19	104.18	104.17
11.000	104.15	104.14	104.12	104.11	104.10
11.250	104.08	104.07	104.06	104.04	104.03
11.500	104.02	104.00	103.99	103.97	103.96
11.750	103.94	103.93	103.91	103.90	103.89
12.000	103.87	103.86	103.85	103.84	103.83
12.250	103.82	103.80	103.80	103.79	103.78
12.500	103.77	103.76	103.75	103.75	103.74
12.750	103.73	103.72	103.71	103.71	103.70
13.000	103.69	103.68	103.68	103.67	103.67
13.250	103.66	103.66	103.65	103.65	103.64
13.500	103.63	103.63	103.62	103.62	103.61
13.750	103.61	103.60	103.60	103.59	103.59
14.000	103.58	103.58	103.57	103.57	103.56
14.250	103.56	103.56	103.55	103.55	103.55
14.500	103.54	103.54	103.54	103.53	103.53
14.750	103.53	103.52	103.52	103.52	103.51
15.000	103.51	103.51	103.50	103.50	103.50
15.250	103.49	103.49	103.49	103.48	103.48
15.500	103.48	103.47	103.47	103.47	103.46
15.750	103.46	103.45	103.45	103.45	103.44
16.000	103.44	103.43	103.43	103.42	103.42
16.250	103.42	103.41	103.41	103.40	103.40
16.500	103.39	103.39	103.38	103.38	103.37
16.750	103.36	103.36	103.35	103.35	103.34
17.000	103.34	103.33	103.33	103.32	103.31
17.250	103.31	103.30	103.30	103.29	103.28
17.500	103.28	103.27	103.26	103.26	103.25
17.750	103.24	103.24	103.23	103.22	103.22
18.000	103.21	103.20	103.19	103.19	103.18
18.250	103.17	103.17	103.16	103.15	103.14
18.500	103.14	103.13	103.12	103.11	103.10
18.750	103.10	103.09	103.08	103.07	103.06
19.000	103.05	103.05	103.04	103.03	103.02
19.250	103.01	103.00	102.99	102.98	102.97
19.500	102.96	102.95	102.94	102.93	102.92
19.750	102.91	102.90	102.89	102.88	102.87
20.000	102.86	102.85	102.84	102.83	102.82
20.250	102.81	102.80	102.79	102.78	102.77
20.500	102.75	102.74	102.73	102.72	102.71
20.750	102.70	102.69	102.67	102.66	102.65

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Time vs. Elevation
Label: PO-2 (OUT)

Return Event: 100 years
Storm Event: 100 year storm

Time vs. Elevation (ft)

Output Time increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)	Elevation (ft)
21.000	102.64	102.63	102.62	102.60	102.59
21.250	102.58	102.57	102.56	102.54	102.53
21.500	102.52	102.51	102.49	102.48	102.47
21.750	102.45	102.44	102.42	102.41	102.40
22.000	102.38	102.37	102.35	102.34	102.32
22.250	102.31	102.29	102.28	102.27	102.25
22.500	102.24	102.22	102.21	102.19	102.18
22.750	102.16	102.15	102.13	102.12	102.10
23.000	102.08	102.07	102.05	102.04	102.02
23.250	102.01	101.99	101.97	101.96	101.94
23.500	101.92	101.90	101.88	101.87	101.85
23.750	101.83	101.81	101.79	101.78	101.76
24.000	101.74	(N/A)	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Elevation-Area Volume Curve
Label: PO-2

Return Event: 10 years
Storm Event: 10 year storm

Elevation (ft)	Planimeter (ft^2)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
95.00	0.0	0.001	0.000	0.000	0.000
99.75	0.0	0.016	0.021	0.033	0.033
100.00	0.0	0.167	0.235	0.020	0.053
105.00	0.0	0.500	0.956	1.593	1.646
114.00	0.0	0.500	1.500	4.500	6.146

Pond Volume Equations
* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Elevation-Area Volume Curve
Label: PO-2

Return Event: 100 years
Storm Event: 100 year storm

Elevation (ft)	Planimeter (ft^2)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
95.00	0.0	0.001	0.000	0.000	0.000
99.75	0.0	0.016	0.021	0.033	0.033
100.00	0.0	0.167	0.235	0.020	0.053
105.00	0.0	0.500	0.956	1.593	1.646
114.00	0.0	0.500	1.500	4.500	6.146

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Volume Equations
Label: PO-2

Return Event: 100 years
Storm Event: 100 year storm

Pond Volume Equations
* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2 - El1) * (Area1 + Area2 + sqr(Area1 * Area2))

where:	EL1, EL2	Lower and upper elevations of the increment
	Area1, Area2	Areas computed for EL1, EL2, respectively
	Volume	Incremental volume between EL1 and EL2

Requested Pond Water Surface Elevations	
Minimum (Headwater)	95.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	105.52 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice - 1	Forward	Culvert - 1	95.00	105.52
Orifice-Circular	Orifice - 2	Forward	Culvert - 1	103.50	105.52
Stand Pipe	Riser - 1	Forward	Culvert - 1	109.00	105.52
Orifice-Circular	Orifice - 3	Forward	Culvert - 1	95.00	105.52
Culvert-Circular	Culvert - 1	Forward	TW	95.00	105.52
Tailwater Settings	Tailwater			(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Outlet Input Data
Label: Composite Outlet Structure - 2

Return Event: 100 years
Storm Event: 100 year storm

Structure ID: Culvert - 1 Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	24.0 in
Length	20.00 ft
Length (Computed Barrel)	20.02 ft
Slope (Computed)	0.050 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.600
Kb	0.012
Kr	0.600
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0078
M	2.0000
C	0.0379
Y	0.6900
T1 ratio (HW/D)	1.111
T2 ratio (HW/D)	1.271
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	97.22 ft	T1 Flow	15.55 ft^3/s
T2 Elevation	97.54 ft	T2 Flow	17.77 ft^3/s

Structure ID: Orifice - 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	95.00 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: Orifice - 2 Structure Type: Orifice-Circular	
Number of Openings	4
Elevation	103.50 ft
Orifice Diameter	6.0 in
Orifice Coefficient	0.600

Structure ID: Riser - 1 Structure Type: Stand Pipe	
Number of Openings	1
Elevation	109.00 ft
Diameter	36.0 in
Orifice Area	7.1 ft²
Orifice Coefficient	0.600
Weir Length	9.42 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: Orifice - 3 Structure Type: Orifice-Circular	
Number of Openings	2
Elevation	95.00 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30

Convergence Tolerances	
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 2

Return Event: 100 years
Storm Event: 100 year storm

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Culvert - 1 (Culvert-Circular)

Mannings open channel maximum capacity: 54.41 ft³/s
Upstream ID = Orifice - 1, Orifice - 2, Riser - 1, Orifice - 3
Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Device Flow (ft³/s)	(into) Headwater Hydraulic Grade Line (ft)	Converge Downstream Hydraulic Grade Line (ft)	Next Downstream Hydraulic Grade Line (ft)	Downstream Hydraulic Grade Line Error (ft)	Convergence Error (ft³/s)	Downstream Channel Tailwater (ft)	Tailwater Error (ft)
95.00	0.00	0.00	0.00	Free Outfall	0.00	0.00	(N/A)	0.00
95.50	0.47	95.36	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
96.00	0.89	95.50	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
96.50	1.20	95.59	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
97.00	1.47	95.65	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
97.50	1.70	95.71	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
98.00	1.89	95.75	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
98.50	2.09	95.79	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
99.00	2.25	95.82	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
99.50	2.41	95.85	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
100.00	2.56	95.88	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
100.50	2.70	95.90	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
101.00	2.85	95.93	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
101.50	2.97	95.95	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
102.00	3.09	95.97	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
102.50	3.21	95.99	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
103.00	3.33	96.01	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
103.50	3.44	96.03	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
104.00	5.38	96.31	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
104.50	6.83	96.50	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
105.00	7.87	96.63	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
105.50	8.73	96.73	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
105.52	8.76	96.73	Free Outfall	Free Outfall	0.00	0.00	(N/A)	0.00
109.00	12.98	97.20	Free Outfall	Free Outfall	0.00	0.01	(N/A)	0.00

Message
WS below an invert; no flow.
CRIT.DEPTH CONTROL Vh= .080ft Dcr= .235ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .112ft Dcr= .324ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .132ft Dcr= .378ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .147ft Dcr= .418ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .159ft Dcr= .451ft CRIT.DEPTH Hev= .00ft

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Culvert - 1 (Culvert-Circular)

Mannings open channel maximum capacity: 54.41 ft^3/s
Upstream ID = Orifice - 1, Orifice - 2, Riser - 1, Orifice - 3
Downstream ID = Tailwater (Pond Outfall)

Message
CRIT.DEPTH CONTROL Vh= .168ft Dcr= .476ft CRIT.DEPTH Hev= .00ft
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
CRIT.DEPTH CONTROL Vh= .193ft Dcr= .540ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .199ft Dcr= .557ft CRIT.DEPTH Hev= .00ft
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
CRIT.DEPTH CONTROL Vh= .231ft Dcr= .638ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .236ft Dcr= .649ft CRIT.DEPTH Hev= .00ft
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
CRIT.DEPTH CONTROL Vh= .392ft Dcr= .998ft CRIT.DEPTH Hev= .00ft
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Culvert - 1 (Culvert-Circular)

Mannings open channel maximum capacity: 54.41 ft^3/s
Upstream ID = Orifice - 1, Orifice - 2, Riser - 1, Orifice - 3
Downstream ID = Tailwater (Pond Outfall)

Message
FLOW PRECEDENCE SET TO UPSTREAM CONTROLLING STRUCTURE
CRIT.DEPTH CONTROL Vh= .564ft Dcr= 1.296ft CRIT.DEPTH Hev= .00ft

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 1 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Water Surface Elevation (ft)	Device Flow (ft^3/s)	(into) Headwater Hydraulic Grade Line (ft)	Converge Downstream Hydraulic Grade Line (ft)	Next Downstream Hydraulic Grade Line (ft)	Downstream Hydraulic Grade Line Error (ft)	Convergence Error (ft^3/s)	Downstream Channel Tailwater (ft)	Tailwater Error (ft)
95.00	0.00	0.00	0.00	0.00	0.00	0.00	(N/A)	0.00
95.50	0.16	95.50	95.36	95.36	0.00	0.00	(N/A)	0.00
96.00	0.30	96.00	95.50	95.50	0.00	0.00	(N/A)	0.00
96.50	0.40	96.50	95.59	95.59	0.00	0.00	(N/A)	0.00
97.00	0.49	97.00	95.65	95.65	0.00	0.00	(N/A)	0.00
97.50	0.56	97.50	95.70	95.71	0.00	0.00	(N/A)	0.00
98.00	0.63	98.00	95.75	95.75	0.00	0.00	(N/A)	0.00
98.50	0.69	98.50	95.79	95.79	0.00	0.00	(N/A)	0.00
99.00	0.75	99.00	95.82	95.82	0.00	0.00	(N/A)	0.00
99.50	0.80	99.50	95.85	95.85	0.00	0.00	(N/A)	0.00
100.00	0.85	100.00	95.88	95.88	0.00	0.00	(N/A)	0.00
100.50	0.90	100.50	95.90	95.90	0.00	0.00	(N/A)	0.00
101.00	0.95	101.00	95.93	95.93	0.00	0.00	(N/A)	0.00
101.50	0.99	101.50	95.95	95.95	0.00	0.00	(N/A)	0.00
102.00	1.03	102.00	95.97	95.97	0.00	0.00	(N/A)	0.00
102.50	1.07	102.50	95.99	95.99	0.00	0.00	(N/A)	0.00
103.00	1.11	103.00	96.01	96.01	0.00	0.00	(N/A)	0.00
103.50	1.15	103.50	96.03	96.03	0.00	0.00	(N/A)	0.00
104.00	1.16	104.00	96.31	96.31	0.00	0.00	(N/A)	0.00
104.50	1.19	104.50	96.50	96.50	0.00	0.00	(N/A)	0.00
105.00	1.22	105.00	96.63	96.63	0.00	0.00	(N/A)	0.00
105.50	1.24	105.50	96.73	96.73	0.00	0.00	(N/A)	0.00
105.52	1.25	105.52	96.73	96.73	0.00	0.00	(N/A)	0.00
109.00	1.44	109.00	97.20	97.20	0.00	0.00	(N/A)	0.00

Message
WS below an invert; no flow.
H =.14
H =.50
H =.91
H =1.35
H =1.80
H =2.25
H =2.71
H =3.18
H =3.65
H =4.12

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 1 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Message
H =4.60
H =5.07
H =5.55
H =6.03
H =6.51
H =6.99
H =7.47
H =7.69
H =8.00
H =8.37
H =8.77
H =8.79
H =11.80

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 2 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Water Surface Elevation (ft)	Device Flow (ft^3/s)	(into) Headwater Hydraulic Grade Line (ft)	Converge Downstream Hydraulic Grade Line (ft)	Next Downstream Hydraulic Grade Line (ft)	Downstream Hydraulic Grade Line Error (ft)	Convergence Error (ft^3/s)	Downstream Channel Tailwater (ft)	Tailwater Error (ft)
95.00	0.00	0.00	0.00	0.00	0.00	0.00	(N/A)	0.00
95.50	0.00	0.00	0.00	95.36	0.00	0.00	(N/A)	0.00
96.00	0.00	0.00	0.00	95.50	0.00	0.00	(N/A)	0.00
96.50	0.00	0.00	0.00	95.59	0.00	0.00	(N/A)	0.00
97.00	0.00	0.00	0.00	95.65	0.00	0.00	(N/A)	0.00
97.50	0.00	0.00	0.00	95.71	0.00	0.00	(N/A)	0.00
98.00	0.00	0.00	0.00	95.75	0.00	0.00	(N/A)	0.00
98.50	0.00	0.00	0.00	95.79	0.00	0.00	(N/A)	0.00
99.00	0.00	0.00	0.00	95.82	0.00	0.00	(N/A)	0.00
99.50	0.00	0.00	0.00	95.85	0.00	0.00	(N/A)	0.00
100.00	0.00	0.00	0.00	95.88	0.00	0.00	(N/A)	0.00
100.50	0.00	0.00	0.00	95.90	0.00	0.00	(N/A)	0.00
101.00	0.00	0.00	0.00	95.93	0.00	0.00	(N/A)	0.00
101.50	0.00	0.00	0.00	95.95	0.00	0.00	(N/A)	0.00
102.00	0.00	0.00	0.00	95.97	0.00	0.00	(N/A)	0.00
102.50	0.00	0.00	0.00	95.99	0.00	0.00	(N/A)	0.00
103.00	0.00	0.00	0.00	96.01	0.00	0.00	(N/A)	0.00
103.50	0.00	0.00	0.00	96.03	0.00	0.00	(N/A)	0.00
104.00	1.89	104.00	Free Outfall	96.31	0.00	0.00	(N/A)	0.00
104.50	3.27	104.50	Free Outfall	96.50	0.00	0.00	(N/A)	0.00
105.00	4.23	105.00	Free Outfall	96.63	0.00	0.00	(N/A)	0.00
105.50	5.00	105.50	Free Outfall	96.73	0.00	0.00	(N/A)	0.00
105.52	5.03	105.52	Free Outfall	96.73	0.00	0.00	(N/A)	0.00
109.00	8.66	109.00	Free Outfall	97.20	0.00	0.00	(N/A)	0.00

Message
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 2 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Message
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
H =.25
H =.75
H =1.25
H =1.75
H =1.77
H =5.25

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 2

Return Event: 100 years
Storm Event: 100 year storm

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser - 1 (Stand Pipe)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Water Surface Elevation (ft)	Device Flow (ft^3/s)	(into) Headwater Hydraulic Grade Line (ft)	Converge Downstream Hydraulic Grade Line (ft)	Next Downstream Hydraulic Grade Line (ft)	Downstream Hydraulic Grade Line Error (ft)	Convergence Error (ft^3/s)	Downstream Channel Tailwater (ft)	Tailwater Error (ft)	Message
95.00	0.00	0.00	0.00	0.00	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
95.50	0.00	0.00	0.00	95.36	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
96.00	0.00	0.00	0.00	95.50	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
96.50	0.00	0.00	0.00	95.59	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
97.00	0.00	0.00	0.00	95.65	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
97.50	0.00	0.00	0.00	95.71	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
98.00	0.00	0.00	0.00	95.75	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
98.50	0.00	0.00	0.00	95.79	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
99.00	0.00	0.00	0.00	95.82	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
99.50	0.00	0.00	0.00	95.85	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
100.00	0.00	0.00	0.00	95.88	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
100.50	0.00	0.00	0.00	95.90	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
101.00	0.00	0.00	0.00	95.93	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
101.50	0.00	0.00	0.00	95.95	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
102.00	0.00	0.00	0.00	95.97	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
102.50	0.00	0.00	0.00	95.99	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
103.00	0.00	0.00	0.00	96.01	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
103.50	0.00	0.00	0.00	96.03	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
104.00	0.00	0.00	0.00	96.31	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
104.50	0.00	0.00	0.00	96.50	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
105.00	0.00	0.00	0.00	96.63	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
105.50	0.00	0.00	0.00	96.73	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
105.52	0.00	0.00	0.00	96.73	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.
109.00	0.00	0.00	0.00	97.20	0.00	0.00	(N/A)	0.00	WS below an invert; no flow.

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser - 1 (Stand Pipe)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Message
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.
WS below an invert; no flow.

Subsection: Individual Outlet Curves
Label: Composite Outlet Structure - 2

Return Event: 100 years
Storm Event: 100 year storm

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 3 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Water Surface Elevation (ft)	Device Flow (ft^3/s)	(into) Headwater Hydraulic Grade Line (ft)	Converge Downstream Hydraulic Grade Line (ft)	Next Downstream Hydraulic Grade Line (ft)	Downstream Hydraulic Grade Line Error (ft)	Convergence Error (ft^3/s)	Downstream Channel Tailwater (ft)	Tailwater Error (ft)
95.00	0.00	0.00	0.00	0.00	0.00	0.00	(N/A)	0.00
95.50	0.31	95.50	95.36	95.36	0.00	0.00	(N/A)	0.00
96.00	0.59	96.00	95.50	95.50	0.00	0.00	(N/A)	0.00
96.50	0.80	96.50	95.59	95.59	0.00	0.00	(N/A)	0.00
97.00	0.98	97.00	95.65	95.65	0.00	0.00	(N/A)	0.00
97.50	1.13	97.50	95.71	95.71	0.00	0.00	(N/A)	0.00
98.00	1.26	98.00	95.75	95.75	0.00	0.00	(N/A)	0.00
98.50	1.38	98.50	95.79	95.79	0.00	0.00	(N/A)	0.00
99.00	1.50	99.00	95.82	95.82	0.00	0.00	(N/A)	0.00
99.50	1.61	99.50	95.85	95.85	0.00	0.00	(N/A)	0.00
100.00	1.71	100.00	95.88	95.88	0.00	0.00	(N/A)	0.00
100.50	1.80	100.50	95.90	95.90	0.00	0.00	(N/A)	0.00
101.00	1.89	101.00	95.93	95.93	0.00	0.00	(N/A)	0.00
101.50	1.98	101.50	95.95	95.95	0.00	0.00	(N/A)	0.00
102.00	2.06	102.00	95.97	95.97	0.00	0.00	(N/A)	0.00
102.50	2.14	102.50	95.99	95.99	0.00	0.00	(N/A)	0.00
103.00	2.22	103.00	96.01	96.01	0.00	0.00	(N/A)	0.00
103.50	2.30	103.50	96.03	96.03	0.00	0.00	(N/A)	0.00
104.00	2.33	104.00	96.31	96.31	0.00	0.00	(N/A)	0.00
104.50	2.38	104.50	96.50	96.50	0.00	0.00	(N/A)	0.00
105.00	2.43	105.00	96.63	96.63	0.00	0.00	(N/A)	0.00
105.50	2.49	105.50	96.73	96.73	0.00	0.00	(N/A)	0.00
105.52	2.49	105.52	96.73	96.73	0.00	0.00	(N/A)	0.00
109.00	2.89	109.00	97.20	97.20	0.00	0.00	(N/A)	0.00

Message
WS below an invert; no flow.
H =.14
H =.50
H =.91
H =1.35
H =1.79
H =2.25
H =2.71
H =3.18
H =3.65
H =4.12

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice - 3 (Orifice-Circular)

Upstream ID = (Pond Water Surface)
Downstream ID = Culvert - 1 (Culvert-Circular)

Message
H =4.60
H =5.07
H =5.55
H =6.03
H =6.51
H =6.99
H =7.47
H =7.69
H =8.00
H =8.37
H =8.77
H =8.79
H =11.80

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Composite Rating Curve
Label: Composite Outlet Structure - 2

Return Event: 100 years
Storm Event: 100 year storm

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)	Contributing Structures
95.00	0.00	(N/A)	0.00	(no Q: Orifice - 1,Orifice - 2,Riser - 1,Orifice - 3,Culvert - 1)
95.50	0.47	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
96.00	0.89	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
96.50	1.20	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
97.00	1.46	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
97.50	1.69	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
98.00	1.89	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
98.50	2.08	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
99.00	2.25	(N/A)	0.00	Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
99.50	2.41	(N/A)	0.00	
100.00	2.56	(N/A)	0.00	
100.50	2.70	(N/A)	0.00	
101.00	2.84	(N/A)	0.00	
101.50	2.97	(N/A)	0.00	
102.00	3.09	(N/A)	0.00	
102.50	3.22	(N/A)	0.00	
103.00	3.33	(N/A)	0.00	
103.50	3.44	(N/A)	0.00	
104.00	5.38	(N/A)	0.00	
104.50	6.84	(N/A)	0.00	
105.00	7.87	(N/A)	0.00	
105.50	8.73	(N/A)	0.00	
105.52	8.77	(N/A)	0.00	
109.00	12.98	(N/A)	0.00	

Composite Outflow Summary

Contributing Structures
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 3,Culvert - 1 (no Q: Orifice - 2,Riser - 1)
Orifice - 1,Orifice - 2,Orifice - 3,Culvert - 1 (no Q: Riser - 1)
Orifice - 1,Orifice - 2,Orifice - 3,Culvert - 1 (no Q: Riser - 1)
Orifice - 1,Orifice - 2,Orifice - 3,Culvert - 1 (no Q: Riser - 1)
Orifice - 1,Orifice - 2,Orifice - 3,Culvert - 1 (no Q: Riser - 1)
Orifice - 1,Orifice - 2,Orifice - 3,Culvert - 1 (no Q: Riser - 1)
Orifice - 1,Orifice - 2,Orifice - 3,Culvert - 1 (no Q: Riser - 1)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Diverted Hydrograph
Label: Outlet-2

Return Event: 10 years
Storm Event: 10 year storm

Peak Discharge	3.43 ft³/s
Time to Peak	10.100 hours
Hydrograph Volume	4.878 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.400	0.00	0.00	0.01	0.02	0.04
0.650	0.05	0.06	0.08	0.09	0.10
0.900	0.12	0.13	0.15	0.16	0.19
1.150	0.21	0.24	0.26	0.29	0.31
1.400	0.32	0.34	0.36	0.37	0.38
1.650	0.38	0.39	0.41	0.43	0.46
1.900	0.48	0.51	0.54	0.57	0.61
2.150	0.64	0.67	0.70	0.73	0.76
2.400	0.79	0.82	0.84	0.87	0.89
2.650	0.91	0.93	0.94	0.96	0.97
2.900	0.99	1.01	1.03	1.05	1.06
3.150	1.07	1.09	1.10	1.12	1.13
3.400	1.15	1.18	1.20	1.22	1.24
3.650	1.27	1.30	1.34	1.37	1.40
3.900	1.43	1.46	1.48	1.50	1.52
4.150	1.54	1.56	1.58	1.60	1.62
4.400	1.64	1.67	1.69	1.71	1.73
4.650	1.76	1.78	1.81	1.84	1.87
4.900	1.90	1.92	1.95	1.98	2.01
5.150	2.05	2.08	2.11	2.14	2.18
5.400	2.21	2.24	2.27	2.30	2.33
5.650	2.36	2.38	2.41	2.42	2.43
5.900	2.44	2.45	2.46	2.47	2.49
6.150	2.51	2.53	2.55	2.57	2.57
6.400	2.58	2.58	2.59	2.60	2.60
6.650	2.61	2.62	2.62	2.63	2.63
6.900	2.64	2.65	2.65	2.66	2.67
7.150	2.68	2.69	2.70	2.71	2.72
7.400	2.74	2.75	2.76	2.78	2.81
7.650	2.85	2.89	2.93	2.98	3.03
7.900	3.07	3.12	3.16	3.19	3.23
8.150	3.25	3.27	3.29	3.31	3.32
8.400	3.33	3.34	3.35	3.35	3.36
8.650	3.37	3.37	3.38	3.38	3.39
8.900	3.39	3.40	3.40	3.41	3.41
9.150	3.41	3.42	3.42	3.42	3.42
9.400	3.42	3.42	3.42	3.43	3.43
9.650	3.43	3.43	3.43	3.43	3.43

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Diverted Hydrograph
Label: Outlet-2

Return Event: 10 years
Storm Event: 10 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.900	3.43	3.43	3.43	3.43	3.43
10.150	3.43	3.43	3.43	3.43	3.43
10.400	3.43	3.43	3.43	3.43	3.43
10.650	3.42	3.42	3.42	3.42	3.42
10.900	3.42	3.42	3.42	3.42	3.42
11.150	3.42	3.41	3.41	3.41	3.41
11.400	3.41	3.41	3.41	3.40	3.40
11.650	3.40	3.40	3.40	3.39	3.39
11.900	3.39	3.39	3.39	3.38	3.38
12.150	3.38	3.38	3.37	3.37	3.37
12.400	3.37	3.37	3.36	3.36	3.36
12.650	3.36	3.35	3.35	3.35	3.35
12.900	3.35	3.34	3.34	3.34	3.34
13.150	3.33	3.33	3.33	3.33	3.32
13.400	3.32	3.32	3.32	3.31	3.31
13.650	3.31	3.30	3.30	3.30	3.30
13.900	3.29	3.29	3.29	3.28	3.28
14.150	3.28	3.27	3.27	3.27	3.27
14.400	3.26	3.26	3.26	3.25	3.25
14.650	3.25	3.25	3.24	3.24	3.24
14.900	3.23	3.23	3.23	3.23	3.22
15.150	3.22	3.22	3.21	3.21	3.21
15.400	3.20	3.20	3.19	3.19	3.19
15.650	3.18	3.18	3.18	3.17	3.17
15.900	3.17	3.16	3.16	3.16	3.15
16.150	3.15	3.15	3.14	3.14	3.14
16.400	3.13	3.13	3.12	3.12	3.12
16.650	3.11	3.11	3.11	3.10	3.10
16.900	3.10	3.09	3.09	3.08	3.08
17.150	3.07	3.07	3.07	3.06	3.06
17.400	3.05	3.05	3.04	3.04	3.04
17.650	3.03	3.03	3.02	3.02	3.01
17.900	3.01	3.01	3.00	3.00	2.99
18.150	2.99	2.98	2.98	2.98	2.97
18.400	2.97	2.96	2.96	2.95	2.95
18.650	2.94	2.94	2.93	2.93	2.92
18.900	2.92	2.91	2.91	2.90	2.90
19.150	2.89	2.89	2.88	2.88	2.87
19.400	2.87	2.86	2.86	2.85	2.85
19.650	2.84	2.84	2.83	2.82	2.82
19.900	2.81	2.81	2.80	2.79	2.79
20.150	2.78	2.78	2.77	2.76	2.76
20.400	2.75	2.75	2.74	2.73	2.73

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Diverted Hydrograph
Label: Outlet-2

Return Event: 10 years
Storm Event: 10 year storm

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
20.650	2.72	2.72	2.71	2.70	2.70
20.900	2.69	2.68	2.68	2.67	2.66
21.150	2.66	2.65	2.64	2.63	2.63
21.400	2.62	2.61	2.61	2.60	2.59
21.650	2.59	2.58	2.57	2.57	2.54
21.900	2.52	2.49	2.46	2.44	2.41
22.150	2.33	2.25	2.16	2.08	1.99
22.400	1.91	1.83	1.75	1.69	1.63
22.650	1.58	1.54	1.51	1.49	1.47
22.900	1.46	1.44	1.43	1.42	1.41
23.150	1.40	1.40	1.39	1.39	1.38
23.400	1.38	1.37	1.37	1.36	1.36
23.650	1.35	1.35	1.34	1.34	1.33
23.900	1.33	1.32	1.32	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Diverted Hydrograph
Label: Outlet-2

Return Event: 100 years
Storm Event: 100 year storm

Peak Discharge	7.20 ft³/s
Time to Peak	9.000 hours
Hydrograph Volume	6.842 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.250	0.00	0.00	0.01	0.03	0.05
0.500	0.08	0.10	0.12	0.14	0.16
0.750	0.18	0.20	0.22	0.24	0.27
1.000	0.29	0.32	0.35	0.39	0.44
1.250	0.47	0.51	0.55	0.60	0.66
1.500	0.72	0.79	0.84	0.88	0.91
1.750	0.94	0.98	1.02	1.06	1.10
2.000	1.15	1.19	1.23	1.27	1.31
2.250	1.36	1.40	1.45	1.48	1.51
2.500	1.54	1.58	1.61	1.64	1.67
2.750	1.69	1.71	1.74	1.76	1.78
3.000	1.80	1.83	1.85	1.87	1.88
3.250	1.90	1.91	1.93	1.95	1.97
3.500	1.99	2.02	2.05	2.08	2.11
3.750	2.14	2.18	2.21	2.25	2.28
4.000	2.31	2.33	2.36	2.39	2.41
4.250	2.42	2.43	2.44	2.45	2.46
4.500	2.47	2.48	2.50	2.51	2.53
4.750	2.54	2.56	2.56	2.57	2.57
5.000	2.58	2.58	2.59	2.60	2.60
5.250	2.61	2.62	2.63	2.64	2.64
5.500	2.65	2.66	2.67	2.68	2.69
5.750	2.70	2.71	2.72	2.73	2.74
6.000	2.75	2.76	2.77	2.78	2.79
6.250	2.80	2.82	2.83	2.84	2.86
6.500	2.87	2.88	2.89	2.91	2.92
6.750	2.93	2.94	2.95	2.96	2.97
7.000	2.98	2.99	3.01	3.02	3.03
7.250	3.05	3.06	3.08	3.10	3.11
7.500	3.13	3.15	3.18	3.21	3.26
7.750	3.30	3.35	3.40	3.47	4.20
8.000	4.90	5.50	5.89	6.20	6.44
8.250	6.63	6.79	6.88	6.95	7.00
8.500	7.03	7.06	7.09	7.11	7.14
8.750	7.16	7.17	7.19	7.20	7.20
9.000	7.20	7.20	7.19	7.18	7.17
9.250	7.15	7.13	7.11	7.09	7.06
9.500	7.04	7.01	6.98	6.95	6.92

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Diverted Hydrograph
Label: Outlet-2

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.750	6.89	6.87	6.84	6.79	6.75
10.000	6.71	6.66	6.62	6.57	6.52
10.250	6.48	6.43	6.38	6.33	6.29
10.500	6.24	6.20	6.15	6.11	6.07
10.750	6.03	5.99	5.95	5.91	5.87
11.000	5.83	5.79	5.75	5.71	5.67
11.250	5.63	5.59	5.55	5.51	5.47
11.500	5.43	5.39	5.33	5.28	5.22
11.750	5.16	5.11	5.05	5.00	4.95
12.000	4.90	4.85	4.80	4.75	4.71
12.250	4.67	4.63	4.59	4.55	4.52
12.500	4.49	4.46	4.43	4.40	4.37
12.750	4.34	4.31	4.28	4.25	4.22
13.000	4.19	4.16	4.13	4.11	4.09
13.250	4.07	4.05	4.03	4.01	3.99
13.500	3.97	3.95	3.93	3.90	3.88
13.750	3.86	3.84	3.82	3.80	3.78
14.000	3.76	3.75	3.73	3.71	3.69
14.250	3.68	3.66	3.65	3.64	3.62
14.500	3.61	3.59	3.58	3.57	3.55
14.750	3.54	3.53	3.52	3.51	3.49
15.000	3.48	3.47	3.46	3.45	3.44
15.250	3.44	3.44	3.44	3.44	3.44
15.500	3.44	3.44	3.44	3.44	3.44
15.750	3.44	3.43	3.43	3.43	3.43
16.000	3.43	3.43	3.43	3.43	3.43
16.250	3.43	3.42	3.42	3.42	3.42
16.500	3.42	3.42	3.42	3.42	3.42
16.750	3.41	3.41	3.41	3.41	3.41
17.000	3.41	3.41	3.41	3.40	3.40
17.250	3.40	3.40	3.40	3.40	3.40
17.500	3.39	3.39	3.39	3.39	3.39
17.750	3.39	3.39	3.38	3.38	3.38
18.000	3.38	3.38	3.38	3.37	3.37
18.250	3.37	3.37	3.37	3.37	3.36
18.500	3.36	3.36	3.36	3.36	3.36
18.750	3.35	3.35	3.35	3.35	3.35
19.000	3.34	3.34	3.34	3.34	3.34
19.250	3.33	3.33	3.33	3.33	3.33
19.500	3.32	3.32	3.32	3.32	3.31
19.750	3.31	3.31	3.31	3.30	3.30
20.000	3.30	3.30	3.29	3.29	3.29
20.250	3.29	3.28	3.28	3.28	3.28

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Diverted Hydrograph
Label: Outlet-2

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
20.500	3.27	3.27	3.27	3.27	3.26
20.750	3.26	3.26	3.26	3.25	3.25
21.000	3.25	3.25	3.24	3.24	3.24
21.250	3.23	3.23	3.23	3.23	3.22
21.500	3.22	3.22	3.21	3.21	3.21
21.750	3.20	3.20	3.20	3.19	3.19
22.000	3.19	3.18	3.18	3.18	3.17
22.250	3.17	3.17	3.16	3.16	3.16
22.500	3.15	3.15	3.14	3.14	3.14
22.750	3.13	3.13	3.13	3.12	3.12
23.000	3.12	3.11	3.11	3.10	3.10
23.250	3.10	3.09	3.09	3.08	3.08
23.500	3.07	3.07	3.07	3.06	3.06
23.750	3.05	3.05	3.04	3.04	3.03
24.000	3.03	(N/A)	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Elevation-Volume-Flow Table (Pond)
Label: PO-2

Return Event: 10 years
Storm Event: 10 year storm

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	95.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
95.00	0.00	0.000	0.001	0.00	0.00	0.00
95.50	0.48	0.001	0.002	0.00	0.48	0.80
96.00	0.89	0.002	0.003	0.00	0.89	1.75
96.50	1.21	0.003	0.004	0.00	1.21	2.84
97.00	1.47	0.006	0.005	0.00	1.47	4.17
97.50	1.69	0.009	0.007	0.00	1.69	5.82
98.00	1.90	0.012	0.008	0.00	1.90	7.84
98.50	2.08	0.017	0.010	0.00	2.08	10.28
99.00	2.25	0.023	0.012	0.00	2.25	13.20
99.50	2.41	0.029	0.015	0.00	2.41	16.65
100.00	2.56	0.053	0.167	0.00	2.56	28.12
100.50	2.71	0.143	0.192	0.00	2.71	71.70
101.00	2.85	0.245	0.219	0.00	2.85	121.61
101.50	2.97	0.362	0.248	0.00	2.97	178.28
102.00	3.10	0.494	0.279	0.00	3.10	242.14
102.50	3.22	0.641	0.311	0.00	3.22	313.62
103.00	3.34	0.805	0.345	0.00	3.34	393.15
103.50	3.45	0.987	0.381	0.00	3.45	481.18
104.00	5.39	1.187	0.419	0.00	5.39	579.95
104.50	6.84	1.406	0.459	0.00	6.84	687.58
105.00	7.88	1.646	0.500	0.00	7.88	804.58
105.50	8.74	1.896	0.500	0.00	8.74	926.44
105.52	8.77	1.906	0.500	0.00	8.77	931.32
109.00	12.99	3.646	0.500	0.00	12.99	1,777.69

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Elevation-Volume-Flow Table (Pond)
Label: PO-2

Return Event: 100 years
Storm Event: 100 year storm

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	95.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (acres)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
95.00	0.00	0.000	0.001	0.00	0.00	0.00
95.50	0.47	0.001	0.002	0.00	0.47	0.79
96.00	0.89	0.002	0.003	0.00	0.89	1.74
96.50	1.20	0.003	0.004	0.00	1.20	2.83
97.00	1.46	0.006	0.005	0.00	1.46	4.17
97.50	1.69	0.009	0.007	0.00	1.69	5.81
98.00	1.89	0.012	0.008	0.00	1.89	7.83
98.50	2.08	0.017	0.010	0.00	2.08	10.27
99.00	2.25	0.023	0.012	0.00	2.25	13.19
99.50	2.41	0.029	0.015	0.00	2.41	16.64
100.00	2.56	0.053	0.167	0.00	2.56	28.12
100.50	2.70	0.143	0.192	0.00	2.70	71.70
101.00	2.84	0.245	0.219	0.00	2.84	121.61
101.50	2.97	0.362	0.248	0.00	2.97	178.27
102.00	3.09	0.494	0.279	0.00	3.09	242.13
102.50	3.22	0.641	0.311	0.00	3.22	313.61
103.00	3.33	0.805	0.345	0.00	3.33	393.15
103.50	3.44	0.987	0.381	0.00	3.44	481.17
104.00	5.38	1.187	0.419	0.00	5.38	579.94
104.50	6.84	1.406	0.459	0.00	6.84	687.58
105.00	7.87	1.646	0.500	0.00	7.87	804.57
105.50	8.73	1.896	0.500	0.00	8.73	926.44
105.52	8.77	1.906	0.500	0.00	8.77	931.31
109.00	12.98	3.646	0.500	0.00	12.98	1,777.68

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Level Pool Pond Routing Summary
Label: PO-2 (IN)

Return Event: 10 years
Storm Event: 10 year storm

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	95.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	15.00 ft³/s	Time to Peak (Flow, In)	7.950 hours
Flow (Peak Outlet)	3.43 ft³/s	Time to Peak (Flow, Outlet)	10.100 hours

Elevation (Water Surface, Peak)	103.41 ft
Volume (Peak)	0.953 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	4.882 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	4.878 ac-ft
Volume (Retained)	0.001 ac-ft
Volume (Unrouted)	-0.004 ac-ft
Error (Mass Balance)	0.1 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	95.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	22.20 ft³/s	Time to Peak (Flow, In)	7.950 hours
Flow (Peak Outlet)	7.20 ft³/s	Time to Peak (Flow, Outlet)	9.000 hours

Elevation (Water Surface, Peak)	104.68 ft
Volume (Peak)	1.488 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	7.268 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	6.842 ac-ft
Volume (Retained)	0.411 ac-ft
Volume (Unrouted)	-0.014 ac-ft
Error (Mass Balance)	0.2 %

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Routed Hydrograph (total out)
Label: PO-2 (OUT)

Return Event: 10 years
Storm Event: 10 year storm

Peak Discharge	3.43 ft³/s
Time to Peak	10.100 hours
Hydrograph Volume	4.878 ac-ft

HYDROGRAPH ORDINATES (ft³/s)

Output Time Increment = 0.050 hours

Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.400	0.00	0.00	0.01	0.02	0.04
0.650	0.05	0.06	0.08	0.09	0.10
0.900	0.12	0.13	0.15	0.16	0.19
1.150	0.21	0.24	0.26	0.29	0.31
1.400	0.32	0.34	0.36	0.37	0.38
1.650	0.38	0.39	0.41	0.43	0.46
1.900	0.48	0.51	0.54	0.57	0.61
2.150	0.64	0.67	0.70	0.73	0.76
2.400	0.79	0.82	0.84	0.87	0.89
2.650	0.91	0.93	0.94	0.96	0.97
2.900	0.99	1.01	1.03	1.05	1.06
3.150	1.07	1.09	1.10	1.12	1.13
3.400	1.15	1.18	1.20	1.22	1.24
3.650	1.27	1.30	1.34	1.37	1.40
3.900	1.43	1.46	1.48	1.50	1.52
4.150	1.54	1.56	1.58	1.60	1.62
4.400	1.64	1.67	1.69	1.71	1.73
4.650	1.76	1.78	1.81	1.84	1.87
4.900	1.90	1.92	1.95	1.98	2.01
5.150	2.05	2.08	2.11	2.14	2.18
5.400	2.21	2.24	2.27	2.30	2.33
5.650	2.36	2.38	2.41	2.42	2.43
5.900	2.44	2.45	2.46	2.47	2.49
6.150	2.51	2.53	2.55	2.57	2.57
6.400	2.58	2.58	2.59	2.60	2.60
6.650	2.61	2.62	2.62	2.63	2.63
6.900	2.64	2.65	2.65	2.66	2.67
7.150	2.68	2.69	2.70	2.71	2.72
7.400	2.74	2.75	2.76	2.78	2.81
7.650	2.85	2.89	2.93	2.98	3.03
7.900	3.07	3.12	3.16	3.19	3.23
8.150	3.25	3.27	3.29	3.31	3.32
8.400	3.33	3.34	3.35	3.35	3.36
8.650	3.37	3.37	3.38	3.38	3.39
8.900	3.39	3.40	3.40	3.41	3.41
9.150	3.41	3.42	3.42	3.42	3.42
9.400	3.42	3.42	3.42	3.43	3.43
9.650	3.43	3.43	3.43	3.43	3.43

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Routed Hydrograph (total out)
Label: PO-2 (OUT)

Return Event: 10 years
Storm Event: 10 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.900	3.43	3.43	3.43	3.43	3.43
10.150	3.43	3.43	3.43	3.43	3.43
10.400	3.43	3.43	3.43	3.43	3.43
10.650	3.42	3.42	3.42	3.42	3.42
10.900	3.42	3.42	3.42	3.42	3.42
11.150	3.42	3.41	3.41	3.41	3.41
11.400	3.41	3.41	3.41	3.40	3.40
11.650	3.40	3.40	3.40	3.39	3.39
11.900	3.39	3.39	3.39	3.38	3.38
12.150	3.38	3.38	3.37	3.37	3.37
12.400	3.37	3.37	3.36	3.36	3.36
12.650	3.36	3.35	3.35	3.35	3.35
12.900	3.35	3.34	3.34	3.34	3.34
13.150	3.33	3.33	3.33	3.33	3.32
13.400	3.32	3.32	3.32	3.31	3.31
13.650	3.31	3.30	3.30	3.30	3.30
13.900	3.29	3.29	3.29	3.28	3.28
14.150	3.28	3.27	3.27	3.27	3.27
14.400	3.26	3.26	3.26	3.25	3.25
14.650	3.25	3.25	3.24	3.24	3.24
14.900	3.23	3.23	3.23	3.23	3.22
15.150	3.22	3.22	3.21	3.21	3.21
15.400	3.20	3.20	3.19	3.19	3.19
15.650	3.18	3.18	3.18	3.17	3.17
15.900	3.17	3.16	3.16	3.16	3.15
16.150	3.15	3.15	3.14	3.14	3.14
16.400	3.13	3.13	3.12	3.12	3.12
16.650	3.11	3.11	3.11	3.10	3.10
16.900	3.10	3.09	3.09	3.08	3.08
17.150	3.07	3.07	3.07	3.06	3.06
17.400	3.05	3.05	3.04	3.04	3.04
17.650	3.03	3.03	3.02	3.02	3.01
17.900	3.01	3.01	3.00	3.00	2.99
18.150	2.99	2.98	2.98	2.98	2.97
18.400	2.97	2.96	2.96	2.95	2.95
18.650	2.94	2.94	2.93	2.93	2.92
18.900	2.92	2.91	2.91	2.90	2.90
19.150	2.89	2.89	2.88	2.88	2.87
19.400	2.87	2.86	2.86	2.85	2.85
19.650	2.84	2.84	2.83	2.82	2.82
19.900	2.81	2.81	2.80	2.79	2.79
20.150	2.78	2.78	2.77	2.76	2.76
20.400	2.75	2.75	2.74	2.73	2.73

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Routed Hydrograph (total out)
Label: PO-2 (OUT)

Return Event: 10 years
Storm Event: 10 year storm

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
20.650	2.72	2.72	2.71	2.70	2.70
20.900	2.69	2.68	2.68	2.67	2.66
21.150	2.66	2.65	2.64	2.63	2.63
21.400	2.62	2.61	2.61	2.60	2.59
21.650	2.59	2.58	2.57	2.57	2.54
21.900	2.52	2.49	2.46	2.44	2.41
22.150	2.33	2.25	2.16	2.08	1.99
22.400	1.91	1.83	1.75	1.69	1.63
22.650	1.58	1.54	1.51	1.49	1.47
22.900	1.46	1.44	1.43	1.42	1.41
23.150	1.40	1.40	1.39	1.39	1.38
23.400	1.38	1.37	1.37	1.36	1.36
23.650	1.35	1.35	1.34	1.34	1.33
23.900	1.33	1.32	1.32	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Routed Hydrograph (total out)
Label: PO-2 (OUT)

Return Event: 100 years
Storm Event: 100 year storm

Peak Discharge	7.20 ft³/s
Time to Peak	9.000 hours
Hydrograph Volume	6.842 ac-ft

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
0.250	0.00	0.00	0.01	0.03	0.05
0.500	0.08	0.10	0.12	0.14	0.16
0.750	0.18	0.20	0.22	0.24	0.27
1.000	0.29	0.32	0.35	0.39	0.44
1.250	0.47	0.51	0.55	0.60	0.66
1.500	0.72	0.79	0.84	0.88	0.91
1.750	0.94	0.98	1.02	1.06	1.10
2.000	1.15	1.19	1.23	1.27	1.31
2.250	1.36	1.40	1.45	1.48	1.51
2.500	1.54	1.58	1.61	1.64	1.67
2.750	1.69	1.71	1.74	1.76	1.78
3.000	1.80	1.83	1.85	1.87	1.88
3.250	1.90	1.91	1.93	1.95	1.97
3.500	1.99	2.02	2.05	2.08	2.11
3.750	2.14	2.18	2.21	2.25	2.28
4.000	2.31	2.33	2.36	2.39	2.41
4.250	2.42	2.43	2.44	2.45	2.46
4.500	2.47	2.48	2.50	2.51	2.53
4.750	2.54	2.56	2.56	2.57	2.57
5.000	2.58	2.58	2.59	2.60	2.60
5.250	2.61	2.62	2.63	2.64	2.64
5.500	2.65	2.66	2.67	2.68	2.69
5.750	2.70	2.71	2.72	2.73	2.74
6.000	2.75	2.76	2.77	2.78	2.79
6.250	2.80	2.82	2.83	2.84	2.86
6.500	2.87	2.88	2.89	2.91	2.92
6.750	2.93	2.94	2.95	2.96	2.97
7.000	2.98	2.99	3.01	3.02	3.03
7.250	3.05	3.06	3.08	3.10	3.11
7.500	3.13	3.15	3.18	3.21	3.26
7.750	3.30	3.35	3.40	3.47	4.20
8.000	4.90	5.50	5.89	6.20	6.44
8.250	6.63	6.79	6.88	6.95	7.00
8.500	7.03	7.06	7.09	7.11	7.14
8.750	7.16	7.17	7.19	7.20	7.20
9.000	7.20	7.20	7.19	7.18	7.17
9.250	7.15	7.13	7.11	7.09	7.06
9.500	7.04	7.01	6.98	6.95	6.92

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Routed Hydrograph (total out)
Label: PO-2 (OUT)

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.750	6.89	6.87	6.84	6.79	6.75
10.000	6.71	6.66	6.62	6.57	6.52
10.250	6.48	6.43	6.38	6.33	6.29
10.500	6.24	6.20	6.15	6.11	6.07
10.750	6.03	5.99	5.95	5.91	5.87
11.000	5.83	5.79	5.75	5.71	5.67
11.250	5.63	5.59	5.55	5.51	5.47
11.500	5.43	5.39	5.33	5.28	5.22
11.750	5.16	5.11	5.05	5.00	4.95
12.000	4.90	4.85	4.80	4.75	4.71
12.250	4.67	4.63	4.59	4.55	4.52
12.500	4.49	4.46	4.43	4.40	4.37
12.750	4.34	4.31	4.28	4.25	4.22
13.000	4.19	4.16	4.13	4.11	4.09
13.250	4.07	4.05	4.03	4.01	3.99
13.500	3.97	3.95	3.93	3.90	3.88
13.750	3.86	3.84	3.82	3.80	3.78
14.000	3.76	3.75	3.73	3.71	3.69
14.250	3.68	3.66	3.65	3.64	3.62
14.500	3.61	3.59	3.58	3.57	3.55
14.750	3.54	3.53	3.52	3.51	3.49
15.000	3.48	3.47	3.46	3.45	3.44
15.250	3.44	3.44	3.44	3.44	3.44
15.500	3.44	3.44	3.44	3.44	3.44
15.750	3.44	3.43	3.43	3.43	3.43
16.000	3.43	3.43	3.43	3.43	3.43
16.250	3.43	3.42	3.42	3.42	3.42
16.500	3.42	3.42	3.42	3.42	3.42
16.750	3.41	3.41	3.41	3.41	3.41
17.000	3.41	3.41	3.41	3.40	3.40
17.250	3.40	3.40	3.40	3.40	3.40
17.500	3.39	3.39	3.39	3.39	3.39
17.750	3.39	3.39	3.38	3.38	3.38
18.000	3.38	3.38	3.38	3.37	3.37
18.250	3.37	3.37	3.37	3.37	3.36
18.500	3.36	3.36	3.36	3.36	3.36
18.750	3.35	3.35	3.35	3.35	3.35
19.000	3.34	3.34	3.34	3.34	3.34
19.250	3.33	3.33	3.33	3.33	3.33
19.500	3.32	3.32	3.32	3.32	3.31
19.750	3.31	3.31	3.31	3.30	3.30
20.000	3.30	3.30	3.29	3.29	3.29
20.250	3.29	3.28	3.28	3.28	3.28

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Routed Hydrograph (total out)
Label: PO-2 (OUT)

Return Event: 100 years
Storm Event: 100 year storm

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
20.500	3.27	3.27	3.27	3.27	3.26
20.750	3.26	3.26	3.26	3.25	3.25
21.000	3.25	3.25	3.24	3.24	3.24
21.250	3.23	3.23	3.23	3.23	3.22
21.500	3.22	3.22	3.21	3.21	3.21
21.750	3.20	3.20	3.20	3.19	3.19
22.000	3.19	3.18	3.18	3.18	3.17
22.250	3.17	3.17	3.16	3.16	3.16
22.500	3.15	3.15	3.14	3.14	3.14
22.750	3.13	3.13	3.13	3.12	3.12
23.000	3.12	3.11	3.11	3.10	3.10
23.250	3.10	3.09	3.09	3.08	3.08
23.500	3.07	3.07	3.07	3.06	3.06
23.750	3.05	3.05	3.04	3.04	3.03
24.000	3.03	(N/A)	(N/A)	(N/A)	(N/A)

Forest Springs Unit IV - Revised Preliminary Drainage

Subsection: Pond Inflow Summary
Label: PO-2 (IN)

Return Event: 10 years
Storm Event: 10 year storm

Summary for Hydrograph Addition at 'PO-2'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-2

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	CM-2	4.882	7.950	15.00
Flow (In)	PO-2	4.882	7.950	15.00

Summary for Hydrograph Addition at 'PO-2'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	CM-2

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	CM-2	7.268	7.950	22.20
Flow (In)	PO-2	7.268	7.950	22.20

Forest Springs Unit IV - Revised Preliminary Drainage

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Forest Springs Unit IV - Revised Preliminary Drainage

Appendix Three

Drainage Maps and Basin Sketches

FOREST SPRINGS MOBILEHOME PARK
PHASE I

NORTH
3.5 AC.

PHASE IV

SOUTH
9.2 AC.

HIGHWAY 49

LADY JANE ROAD

RATTLESNAKE CREEK

CLIFTON
Doc.# 85-029836

PICKARD
Doc.# 07-011073

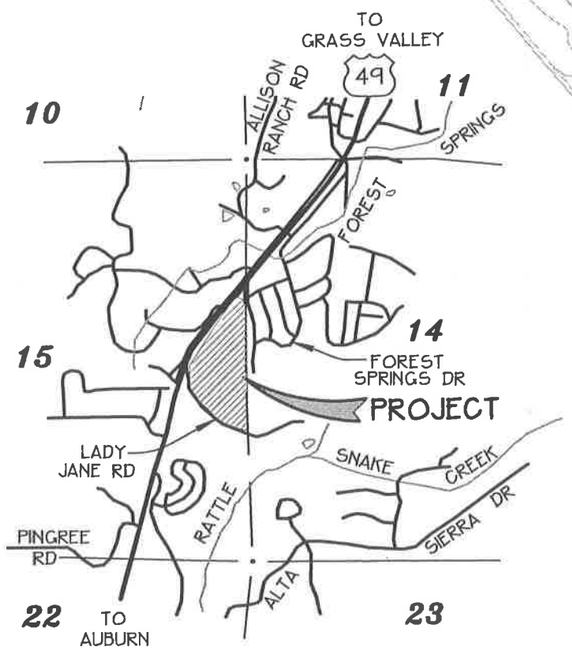
HADLEY
Doc.# 12-009399

GOODBAN
Doc.# 04-023134

BLACKWELL
Doc.# 11-028702

SCALE: 1" = 200'
CONTOUR INTERVAL = 2'

T. 15 N. R. 8 E.



LOCATION MAP

SCALE: 1" = 2000'

PRE-DEVELOPMENT DRAINAGE MAP

FOREST SPRINGS MOBILEHOME COMMUNITY PHASE IV

NEVADA COUNTY , CALIFORNIA
SCALE: 1"=200' DECEMBER, 2014

NEVADA CITY ENGINEERING, INC.
505 COYOTE STREET * P.O. BOX 1437 * NEVADA CITY * CALIFORNIA

07-026-01

FOREST SPRINGS MOBILEHOME PARK
PHASE I

CLIFTON
Doc.# 85-029836

SCALE: 1" = 200'
CONTOUR INTERVAL = 2'

NORTH
1.0 AC.

*PROPOSED 24" STORM CONDUIT. FINAL ROUTE TO MINIMIZE TREE IMPACTS

PROPOSED DISSIPATOR

RATTLESNAKE CREEK

HIGHWAY

PHASE IV

SOUTH
8.7 AC. NON-DIRECT
3.0 AC. DIRECT CONN.

OUTLET STRUCTURE

PROPOSED DETENTION BASIN

PICKARD
Doc.# 07-011073

HADLEY
Doc.# 12-009399

GOODBAN
Doc.# 04-023134

ROAD

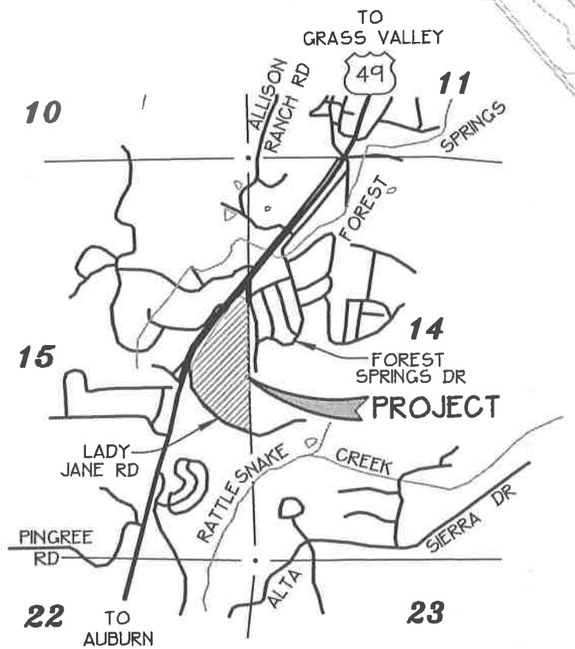
LADY JANE

49

BLACKWELL
Doc.# 11-028702

ONSITE COLLECTION SYSTEM
12" OR 18" CULVERTS
SIZE TO BE DETERMINED BY
FINAL GRADING PLAN "TRIB" AREAS
(Q_{10} w/ NO HEAD
Q_{100} BELOW GRADE)

T. 15 N. R. 8 E.



LOCATION MAP
SCALE: 1" = 2000'

POST-DEVELOPMENT DRAINAGE MAP

FOREST SPRINGS MOBILEHOME COMMUNITY PHASE IV

NEVADA COUNTY . CALIFORNIA
SCALE: 1"=200' DECEMBER, 2014

NEVADA CITY ENGINEERING, INC.
505 COYOTE STREET * P.O. BOX 1437 * NEVADA CITY * CALIFORNIA

07-026-01

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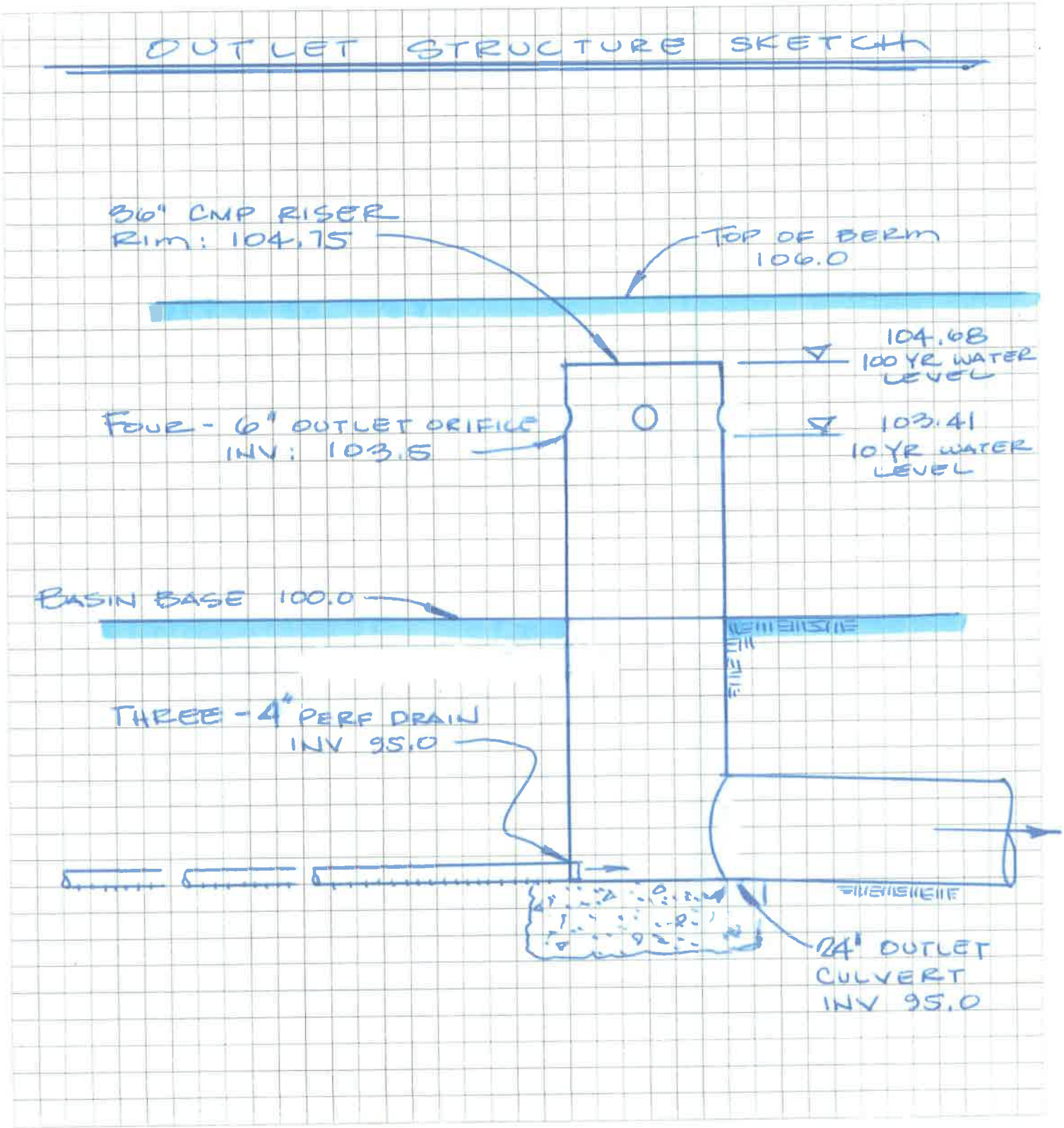
Engineering • Surveying • Planning



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