APPENDIX B

WEST STORMWATER POND

B

KLEINFELDER
Bright People. Right Solutions.

CALCULATION COVER SHEET

Date: 7/21/08 **Page** 1 **of** 1

Project No.: 89241 **Project Title:** Piñon Ridge Mill Design

Calculation No.: 89241.6-2

Calculation Title: West Stormwater Pond Design

Design Verification Required: ☐ Yes ☒ No

Calculation Type: ☐ Scoping ☐ Preliminary ☒ Final ☐ Voided
☐ Superseded by Calculation No.: _____

ORIGINAL AND REVISED CALCULATIONS/ANALYSIS APPROVAL

	Rev. 1 Printed Name/Signature/Date	Rev. ____ Printed Name/Signature/Date	Rev. ____ Printed Name/Signature/Date
Originator:	T. Kluthe 7/21/08		
Checked By:	C. Larson 10/14/08		
Approved By:	C. Larson 12/1/08		
Other:			

AFFECTED DOCUMENTS

Document Number	Document Title	Rev. No.	Responsible Project Manager Initials
DON8R179	SITE DRAINAGE ANALYSIS & DESIGN REPORT - PIÑON RIDGE MILL		LA

RECORD OF REVISION

Rev.	Reason for Revision

ATTACHMENTS

Attachment No.	Title	Total Pages
1	West Pond Design	30

KLEINFELDER

Sheet ____ of ____ 1

PROJECT Piñon Ridge MTN Design PROJECT NO. 89241

SUBJECT West Pond Design BY TAK DATE 7/21/08

REVIEWED BY CGR DATE 12/1/08

Objective: Determine West Stormwater Pond size and outlet works configuration for 100yr and 1,000yr storms.

Assumptions: 1) Use SCS Type II Dimensionless rainfall distribution
2) Use 100yr + 1,000yr rainfall depths of 3.0 in and 4.4 in respectively.

* Rainfall distributions and basin characteristics attached. Basin characteristics measured digitally.

Pinon Ridge Uranium Mill Hydrologic Analysis

Rainfall Distribution

SCS Rainfall Distribution: Type II

Frequency (yr): 100

Total 24-hour Rainfall Depth (in): 3

Hour, t	t/24	P_t/P_{24}	SCS Cumul P	Hour	HEC-1 Cumul P	P_t/P_{24} Type I	Type IA	Type II	Type III
0.00	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000
2.00	0.083	0.022	0.066	1	0.033	0.035	0.050	0.022	0.020
4.00	0.167	0.048	0.144	2	0.066	0.076	0.116	0.048	0.043
6.00	0.250	0.080	0.240	3	0.105	0.125	0.206	0.080	0.072
7.00	0.292	0.098	0.294	4	0.144	0.156	0.268	0.098	0.089
8.00	0.333	0.120	0.360	5	0.192	0.194	0.425	0.120	0.115
8.50	0.354	0.133	0.399	6	0.240	0.219	0.480	0.133	0.130
9.00	0.375	0.147	0.441	7	0.294	0.254	0.520	0.147	0.148
9.50	0.396	0.163	0.489	8	0.360	0.303	0.550	0.163	0.167
9.75	0.406	0.172	0.516	9	0.441	0.362	0.564	0.172	0.178
10.00	0.417	0.181	0.543	10	0.543	0.515	0.577	0.181	0.189
10.50	0.438	0.204	0.612	11	0.705	0.583	0.601	0.204	0.216
11.00	0.458	0.235	0.705	12	1.989	0.624	0.624	0.235	0.250
11.50	0.479	0.283	0.849	13	2.316	0.654	0.645	0.283	0.298
11.75	0.490	0.357	1.071	14	2.460	0.669	0.655	0.357	0.339
12.00	0.500	0.663	1.989	15	2.550	0.682	0.664	0.663	0.500
12.50	0.521	0.735	2.205	16	2.640	0.706	0.683	0.735	0.702
13.00	0.542	0.772	2.316	17	2.694	0.727	0.701	0.772	0.751
13.50	0.563	0.799	2.397	18	2.748	0.748	0.719	0.799	0.785
14.00	0.583	0.820	2.460	19	2.802	0.767	0.736	0.820	0.811
16.00	0.667	0.880	2.640	20	2.856	0.830	0.800	0.880	0.886
20.00	0.833	0.952	2.856	21	2.892	0.926	0.906	0.952	0.957
24.00	1.000	1.000	3.000	22	2.928	1.000	1.000	1.000	1.000
				23	2.964				
				24	3.000				

100-yr

Impervious/Pond Area (ac) =	0.88	1.1	0.54	0.68	0.37	0.75
Impervious/Pond Area (ft^2) =	38333	47916	23522	29621	16117	32670

Time Hour	Time (sec)	Inc. Depth (ft)	Basin 1 (cfs)	Basin 2 (cfs)	Basin 3 (cfs)	Basin 4 (cfs)	Basin 5 (cfs)	Pond (cfs)
0	3600	0.000	0.00	0.00	0.00	0.00	0.00	0.00
1	3600	0.003	0.03	0.04	0.02	0.02	0.01	0.02
2	3600	0.003	0.03	0.04	0.02	0.02	0.01	0.02
3	3600	0.003	0.03	0.04	0.02	0.03	0.01	0.03
4	3600	0.003	0.03	0.04	0.02	0.03	0.01	0.03
5	3600	0.004	0.04	0.05	0.03	0.03	0.02	0.04
6	3600	0.004	0.04	0.05	0.03	0.03	0.02	0.04
7	3600	0.005	0.05	0.06	0.03	0.04	0.02	0.04
8	3600	0.006	0.06	0.07	0.04	0.05	0.02	0.05
9	3600	0.007	0.07	0.09	0.04	0.06	0.03	0.06
10	3600	0.009	0.09	0.11	0.06	0.07	0.04	0.08
11	3600	0.014	0.14	0.18	0.09	0.11	0.06	0.12
12	3600	0.107	1.14	1.42	0.70	0.88	0.48	0.97
13	3600	0.027	0.29	0.36	0.18	0.22	0.12	0.25
14	3600	0.012	0.13	0.16	0.08	0.10	0.05	0.11
15	3600	0.007	0.08	0.10	0.05	0.06	0.03	0.07
16	3600	0.008	0.08	0.10	0.05	0.06	0.03	0.07
17	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04
18	3600	0.005	0.05	0.06	0.03	0.04	0.02	0.04
19	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04
20	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04
21	3600	0.003	0.03	0.04	0.02	0.02	0.01	0.03
22	3600	0.003	0.03	0.04	0.02	0.02	0.01	0.03
23	3600	0.003	0.03	0.04	0.02	0.02	0.01	0.03
24	3600	0.003	0.03	0.04	0.02	0.02	0.01	0.03

CGL 12/1/05

21

Pinon Ridge Uranium Mill Hydrologic Analysis

Rainfall Distribution

SCS Rainfall Distribution: Type II

Frequency (yr): 1000

Total 24-hour Rainfall Depth (in): 4.43

Hour, t	t/24	P_t/P_{24}	SCS Cumul P	Hour	HEC-1 Cumul P	P_t/P_{24} Type I	Type IA	Type II	Type III
0.00	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000
2.00	0.083	0.022	0.097	1	0.049	0.035	0.050	0.022	0.020
4.00	0.167	0.048	0.213	2	0.097	0.076	0.116	0.048	0.043
6.00	0.250	0.080	0.354	3	0.155	0.125	0.206	0.080	0.072
7.00	0.292	0.098	0.434	4	0.213	0.156	0.268	0.098	0.089
8.00	0.333	0.120	0.532	5	0.284	0.194	0.425	0.120	0.115
8.50	0.354	0.133	0.589	6	0.354	0.219	0.480	0.133	0.130
9.00	0.375	0.147	0.651	7	0.434	0.254	0.520	0.147	0.148
9.50	0.396	0.163	0.722	8	0.532	0.303	0.550	0.163	0.167
9.75	0.406	0.172	0.762	9	0.651	0.362	0.564	0.172	0.178
10.00	0.417	0.181	0.802	10	0.802	0.515	0.577	0.181	0.189
10.50	0.438	0.204	0.904	11	1.041	0.583	0.601	0.204	0.216
11.00	0.458	0.235	1.041	12	2.937	0.624	0.624	0.235	0.250
11.50	0.479	0.283	1.254	13	3.420	0.654	0.645	0.283	0.298
11.75	0.490	0.357	1.582	14	3.633	0.669	0.655	0.357	0.339
12.00	0.500	0.663	2.937	15	3.766	0.682	0.664	0.663	0.500
12.50	0.521	0.735	3.256	16	3.898	0.706	0.683	0.735	0.702
13.00	0.542	0.772	3.420	17	3.978	0.727	0.701	0.772	0.751
13.50	0.563	0.799	3.540	18	4.058	0.748	0.719	0.799	0.785
14.00	0.583	0.820	3.633	19	4.138	0.767	0.736	0.820	0.811
16.00	0.667	0.880	3.898	20	4.217	0.830	0.800	0.880	0.886
20.00	0.833	0.952	4.217	21	4.271	0.926	0.906	0.952	0.957
24.00	1.000	1.000	4.430	22	4.324	1.000	1.000	1.000	1.000
				23	4.377				
				24	4.430				

1000-yr

Impervious/Pond Area (ac) =	0.88	1.1	0.54	0.68	0.37	0.75
Impervious/Pond Area (ft^2) =	38333	47916	23522	29621	16117	32670

Time Hour	Time (sec)	Inc. Depth (ft)	Basin 1 (cfs)	Basin 2 (cfs)	Basin 3 (cfs)	Basin 4 (cfs)	Basin 5 (cfs)	Pond (cfs)
0	3600	0.000	0.00	0.00	0.00	0.00	0.00	0.00
1	3600	0.004	0.04	0.05	0.03	0.03	0.02	0.04
2	3600	0.004	0.04	0.05	0.03	0.03	0.02	0.04
3	3600	0.005	0.05	0.06	0.03	0.04	0.02	0.04
4	3600	0.005	0.05	0.06	0.03	0.04	0.02	0.04
5	3600	0.006	0.06	0.08	0.04	0.05	0.03	0.05
6	3600	0.006	0.06	0.08	0.04	0.05	0.03	0.05
7	3600	0.007	0.07	0.09	0.04	0.05	0.03	0.06
8	3600	0.008	0.09	0.11	0.05	0.07	0.04	0.07
9	3600	0.010	0.11	0.13	0.07	0.08	0.04	0.09
10	3600	0.013	0.13	0.17	0.08	0.10	0.06	0.11
11	3600	0.020	0.21	0.27	0.13	0.16	0.09	0.18
12	3600	0.158	1.68	2.10	1.03	1.30	0.71	1.43
13	3600	0.040	0.43	0.54	0.26	0.33	0.18	0.37
14	3600	0.018	0.19	0.24	0.12	0.15	0.08	0.16
15	3600	0.011	0.12	0.15	0.07	0.09	0.05	0.10
16	3600	0.011	0.12	0.15	0.07	0.09	0.05	0.10
17	3600	0.007	0.07	0.09	0.04	0.05	0.03	0.06
18	3600	0.007	0.07	0.09	0.04	0.05	0.03	0.06
19	3600	0.007	0.07	0.09	0.04	0.05	0.03	0.06
20	3600	0.007	0.07	0.09	0.04	0.05	0.03	0.06
21	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04
22	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04
23	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04
24	3600	0.004	0.05	0.06	0.03	0.04	0.02	0.04

CBC 7/1/08

CB 12/1/08

4/

West Detention Basin Drainage Characteristics

Basin 1

L =	850	ft	0.161	mi
S =	0.5	%		
A_1 =	3.68	ac	0.006	mi^2
A_2 =	2.29	ac	0.004	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	0.88	ac	0.001	mi^2
A_T =	6.85	ac	0.011	mi^2
A_{EFF} =	5.97		0.009	mi^2

SCS T_{LAG} =	0.42	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	78	

Basin 2

L =	600	ft	0.114	mi
S =	0.6	%		
A_1 =	2.06	ac	0.003	mi^2
A_2 =	0	ac	0.000	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	1.1	ac	0.002	mi^2
A_T =	3.16	ac	0.005	mi^2
A_{EFF} =	2.06		0.003	mi^2

SCS T_{LAG} =	0.23	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	85	

Basin 3

L =	480	ft	0.091	mi
S =	0.4	%		
A_1 =	1.28	ac	0.002	mi^2
A_2 =	0	ac	0.000	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	0.54	ac	0.001	mi^2
A_T =	1.82	ac	0.003	mi^2
A_{EFF} =	1.28		0.002	mi^2

SCS T_{LAG} =	0.24	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	85	

Basin 4

L =	500	ft	0.095	mi
S =	0.6	%		
A_1 =	2.89	ac	0.005	mi^2
A_2 =	0	ac	0.000	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	0.68	ac	0.001	mi^2
A_T =	3.57	ac	0.006	mi^2
A_{EFF} =	2.89		0.005	mi^2

SCS T_{LAG} =	0.20	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	85	

Basin 5

L =	320	ft	0.061	mi
S =	0.5	%		
A_1 =	0.69	ac	0.001	mi^2
A_2 =	0	ac	0.000	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	0.37	ac	0.001	mi^2
A_T =	1.06	ac	0.002	mi^2
A_{EFF} =	0.69		0.001	mi^2

SCS T_{LAG} =	0.15	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	85	

Basin 6A

L =	330	ft	0.063	mi
S =	3	%		
A_1 =	0	ac	0.000	mi^2
A_2 =	0.38	ac	0.001	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	0	ac	0.000	mi^2
A_T =	0.38	ac	0.001	mi^2
A_{EFF} =	0.38		0.001	mi^2

SCS T_{LAG} =	0.11	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	67	

Basin 6B

L =	550	ft	0.104	mi
S =	2.9	%		
A_1 =	0	ac	0.000	mi^2
A_2 =	2.94	ac	0.005	mi^2
A_3 =	0	ac	0.000	mi^2
A_{IMP} =	0	ac	0.000	mi^2
A_T =	2.94	ac	0.005	mi^2
A_{EFF} =	2.94		0.005	mi^2

SCS T_{LAG} =	0.17	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	67	

Basin 7

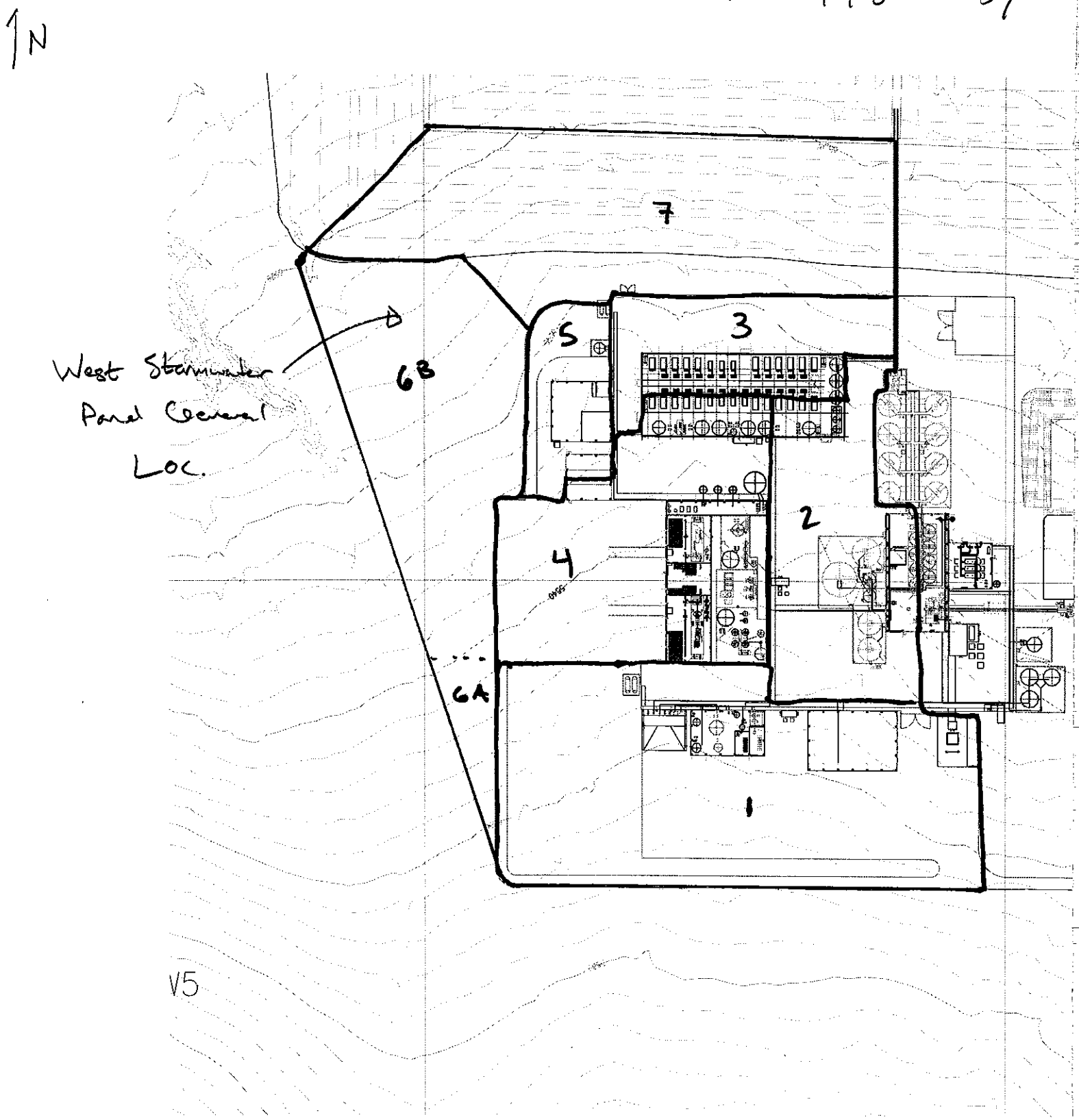
L =	700	ft	0.133	mi
S =	0.5	%		
A_1 =	0	ac	0.000	mi^2
A_2 =	1.61	ac	0.003	mi^2
A_3 =	1.99	ac	0.003	mi^2
A_{IMP} =	0	ac	0.000	mi^2
A_T =	3.6	ac	0.006	mi^2
A_{EFF} =	3.6		0.006	mi^2

SCS T_{LAG} =	0.36	hrs
CN_1 =	85	Hard Pack Gravel
CN_2 =	67	Natural Soil 56 (Group B)
CN_3 =	86	Tailing Cell Slope
CN_{EFF} =	78	

Total Drainage Area = 23.380 ac

A_{EFF} = Subbasin area contributing to SCS unit hydrograph. Impervious area runoff included in separate Q1 record.

12/1/08 5/



6/

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                    *
*** FREE ***
                    *DIAGRAM
          1         ID    PINON RIDGE WEST DETENTION POND SIZING
          2         ID
          3         ID    USE 100 YR 24 HR RAINFALL EVENT WITH DEPTH OF 3.00 IN
          4         ID
          5         ID    DIRECT RUNOFF METHOD USED FOR BUILDINGS CONCRETE SLABS AND
          6         ID    OTHER IMPERVIOUS STRUCTURES
          7         ID
          8         ID    KLEINFELDER PROJECT NUMBER 83088 TASK 1.6.1
          9         ID    MAY 5 2008
                    *
         10         IT       3       0       0     500
         11         IO       5       0       0
                    *

         12         KK      B1
         13         KM   BASIN 1
         14         IN      60
         15         PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
         16         PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
         17         PC    2.89    2.93    2.96    3.00
         18         BA   0.009
         19         LS       0      78       0
         20         UD   0.42
                    *

         21         KK   B1IMP
         22         KM   B1 IMPERVIOUS AREA
         23         BA   0.001
         24         QI    0.03    0.03    0.03    0.03    0.04    0.04    0.05    0.06    0.07    0.09
         25         QI    0.14    1.14    0.29    0.13    0.08    0.08    0.05    0.05    0.05    0.05
         26         QI    0.03    0.03    0.03    0.03
                    *

         27         KK   COMB1
         28         KM   COMBINE B1 WITH B1 IMPERVIOUS
         29         HC       2
                    *

         30         KK  B1CULV
         31         KM   CULVERT FROM B1 TO B6
         32         RD      50   0.005   0.016            CIRC       2
                    *
1                                                HEC-1 INPUT                                                PAGE  2

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

         33         KK     B6A
         34         KM   BASIN 6A
         35         IN      60
         36         PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
         37         PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
         38         PC    2.89    2.93    2.96    3.00
         39         BA   0.001
         40         LS       0      67       0
         41         UD    0.11
                    *

         42         KK   COMB2
         43         KM   COMBINE BASIN6A WITH CULVERT OUTFLOW
         44         HC       2
                    *

         45         KK      B4
         46         KM   BASIN 4
         47         PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
         48         PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
         49         PC    2.89    2.93    2.96    3.00
         50         BA   0.005
         51         LS       0      85       0
         52         UD    0.20
                    *

         53         KK   B4IMP
         54         KM   B4 IMPERVIOUS AREA
         55         BA   0.001
         56         QI    0.02    0.02    0.03    0.03    0.03    0.03    0.04    0.05    0.06    0.07
         57         QI    0.11    0.88    0.22    0.10    0.06    0.06    0.04    0.04    0.04    0.04
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7/

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 58          QI    0.02    0.02    0.02    0.02
             *

 59          KK   COMB3
 60          KM   COMBINE BASIN 4 WITH B4IMP
 61          HC       2
             *

 62          KK  B6CHAN
 63          KM   CHANNEL IN BASIN 6B
 64          RD     550   0.029   0.025            TRAP       6       2
             *

 65          KK   COMB4
 66          KM   COMBINE B4 RUNOFF WITH CHANNEL
 67          HC       2
             *
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 68          KK     B6B
 69          KM   BASIN 6B
 70          IN      60
 71          PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
 72          PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
 73          PC    2.89    2.93    2.96    3.00
 74          BA   0.005
 75          LS       0      67       0
 76          UD    0.17
             *

 77          KK   COMB5
 78          KM   COMBINE BASIN 6B WITH CHANNEL FLOW
 79          HC       2
             *

 80          KK      B2
 81          KM   BASIN 2
 82          IN      60
 83          PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
 84          PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
 85          PC    2.89    2.93    2.96    3.00
 86          BA   0.003
 87          LS       0      85       0
 88          UD    0.23
             *

 89          KK   B2IMP
 90          KM   B2 IMPERVIOUS AREA
 91          BA   0.002
 92          QI    0.04    0.04    0.04    0.04    0.05    0.05    0.06    0.07    0.09    0.11
 93          QI    0.18    1.42    0.36    0.16    0.10    0.10    0.06    0.06    0.06    0.06
 94          QI    0.04    0.04    0.04    0.04
             *

 95          KK   COMB5
 96          KM   COMBINE B2 WITH B2IMP
 97          HC       2
             *

 98          KK  B3CURB
 99          KM   COLLECTION CURB ALONG NORTH BOUNDARY OF BASIN 3
100          RD     480   0.004   0.016            TRAP       0       3
             *

101          KK      B3
102          KM   BASIN 3
103          IN      60
104          PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
105          PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
106          PC    2.89    2.93    2.96    3.00
107          BA   0.002
108          LS       0      85       0
109          UD    0.24
             *
```



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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
```

8/

```
110          KK   B3IMP
111          KM   B3 IMPERVIOUS AREA
112          BA   0.001
113          QI    0.02    0.02    0.02    0.02    0.03    0.03    0.03    0.04    0.04    0.06
114          QI    0.09    0.70    0.18    0.08    0.05    0.05    0.03    0.03    0.03    0.03
115          QI    0.02    0.02    0.02    0.02
             *

116          KK   COMB7
117          KM   COMBINE B3 WITH B3IMP
118          HC       3
             *

119          KK      B5
120          KM   BASIN 5
121          IN      60
122          PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
123          PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
124          PC    2.89    2.93    2.96    3.00
125          BA   0.001
126          LS       0      85       0
127          UD    0.15
             *

128          KK   B5IMP
129          KM   B5 IMPERVIOUS AREA
130          BA   0.001
131          QI    0.01    0.01    0.01    0.01    0.02    0.02    0.02    0.02    0.03    0.04
132          QI    0.06    0.48    0.12    0.05    0.03    0.03    0.02    0.02    0.02    0.02
133          QI    0.01    0.01    0.01    0.01
             *

134          KK   COMB8
135          KM   COMBINE B5 AND B5IMP
136          HC       2
             *

137          KK  B5CURB
138          KM   COLLECTION CURB ALONG WEST SIDE OF BASIN 5
139          RD     280   0.005   0.016            TRAP       0       3
             *

140          KK   COMB9
141          KM   COMBINE BASIN 5 WITH BASIN 3
142          HC       2
             *

143          KK    PIPE
144          KM   COLLECTION PIPE IN B5 AND B3 TO WEST DET POND
145          RD     200    0.05   0.016            CIRC       2
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

146          KK PONDSUR
147          KM   RAIN COLLECTION FROM POND SURFACE
148          BA   0.001
149          QI    0.02    0.02    0.03    0.03    0.04    0.04    0.04    0.05    0.06    0.08
150          QI    0.12    0.97    0.25    0.11    0.07    0.07    0.04    0.04    0.04    0.04
151          QI    0.03    0.03    0.03    0.03
             *

152          KK      B7
153          KM   BASIN 7
154          IN      60
155          PC    0.03    0.07    0.11    0.14    0.19    0.24    0.29    0.36    0.44    0.54
156          PC    0.71    1.99    2.35    2.46    2.55    2.64    2.69    2.75    2.80    2.86
157          PC    2.89    2.93    2.96    3.00
158          BA   0.006
159          LS       0      78       0
160          UD    0.36
             *

161          KK  COMB12
162          KM   COMBINE ALL INFLOW TO WEST DET POND
163          HC       4
164          KO       1
             *
```

9/

```
          165          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    12          B1
                 .
                 .
    21           .       B1IMP
                 .           .
                 .           .
    27       COMB1............
                V
                V
    30      B1CULV
                 .
                 .
    33           .         B6A
                 .           .
                 .           .
    42       COMB2............
                 .
                 .
    45           .          B4
                 .           .
                 .           .
    53           .           .       B4IMP
                 .           .           .
                 .           .           .
    59           .       COMB3............
                 .           V
                 .           V
    62           .      B6CHAN
                 .           .
                 .           .
    65       COMB4............
                 .
                 .
    68           .         B6B
                 .           .
                 .           .
    77       COMB5............
                 .
                 .
    80           .          B2
                 .           .
                 .           .
    89           .           .       B2IMP
                 .           .           .
                 .           .           .
    95           .       COMB5............
                 .           V
                 .           V
    98           .      B3CURB
                 .           .
                 .           .
   101           .           .          B3
                 .           .           .
                 .           .           .
   110           .           .           .       B3IMP
                 .           .           .           .
                 .           .           .           .
   116           .       COMB7......................
                 .           .
                 .           .
   119           .           .          B5
                 .           .           .
                 .           .           .
   128           .           .           .       B5IMP
                 .           .           .           .
                 .           .           .           .
   134           .           .       COMB8............
                 .           .           V
                 .           .           V
   137           .           .      B5CURB
                 .           .           .
                 .           .           .
   140           .       COMB9............
```

10/

```
                .          V
                .          V
  143           .        PIPE
                .          .
                .          .
  146           .          .     PONDSUR
                .          .          .
                .          .          .
  152           .          .          .          B7
                .          .          .           .
                .          .          .           .
  161      COMB12.................................
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   06MAY08  TIME  11:32:44  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

PINON RIDGE WEST DETENTION POND SIZING

USE 100 YR 24 HR RAINFALL EVENT WITH DEPTH OF 3.00 IN

DIRECT RUNOFF METHOD USED FOR BUILDINGS CONCRETE SLABS AND
OTHER IMPERVIOUS STRUCTURES

KLEINFELDER PROJECT NUMBER 83088 TASK 1.6.1
MAY 5 2008

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

     IT          HYDROGRAPH TIME DATA
                        NMIN           3  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         500  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0057  ENDING TIME
                       ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .05 HOURS
                      TOTAL TIME BASE   24.95 HOURS

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

*** ***

```
            **************
            *            *
  161 KK    *    COMB12  *
            *            *
            **************

  164 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

  163 HC          HYDROGRAPH COMBINATION
```

ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

***

HYDROGRAPH AT STATION COMB12
SUM OF 4 HYDROGRAPHS

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	126	0.	1		1230	251	3.	1		1845	376	1.
1		0003	2	0.	1		0618	127	0.	1		1233	252	3.	1		1848	377	1.
1		0006	3	0.	1		0621	128	0.	1		1236	253	3.	1		1851	378	1.
1		0009	4	0.	1		0624	129	0.	1		1239	254	3.	1		1854	379	1.
1		0012	5	0.	1		0627	130	0.	1		1242	255	3.	1		1857	380	1.
1		0015	6	0.	1		0630	131	0.	1		1245	256	3.	1		1900	381	1.
1		0018	7	0.	1		0633	132	0.	1		1248	257	2.	1		1903	382	1.
1		0021	8	0.	1		0636	133	0.	1		1251	258	2.	1		1906	383	1.
1		0024	9	0.	1		0639	134	0.	1		1254	259	2.	1		1909	384	1.
1		0027	10	0.	1		0642	135	0.	1		1257	260	2.	1		1912	385	1.
1		0030	11	0.	1		0645	136	0.	1		1300	261	2.	1		1915	386	1.
1		0033	12	0.	1		0648	137	0.	1		1303	262	2.	1		1918	387	1.
1		0036	13	0.	1		0651	138	0.	1		1306	263	2.	1		1921	388	1.
1		0039	14	0.	1		0654	139	0.	1		1309	264	2.	1		1924	389	1.
1		0042	15	0.	1		0657	140	0.	1		1312	265	2.	1		1927	390	1.
1		0045	16	0.	1		0700	141	0.	1		1315	266	2.	1		1930	391	1.
1		0048	17	0.	1		0703	142	0.	1		1318	267	2.	1		1933	392	1.
1		0051	18	0.	1		0706	143	0.	1		1321	268	2.	1		1936	393	1.
1		0054	19	0.	1		0709	144	0.	1		1324	269	2.	1		1939	394	1.
1		0057	20	0.	1		0712	145	0.	1		1327	270	2.	1		1942	395	1.
1		0100	21	0.	1		0715	146	0.	1		1330	271	2.	1		1945	396	1.
1		0103	22	0.	1		0718	147	0.	1		1333	272	2.	1		1948	397	1.
1		0106	23	0.	1		0721	148	0.	1		1336	273	2.	1		1951	398	1.
1		0109	24	0.	1		0724	149	0.	1		1339	274	2.	1		1954	399	1.
1		0112	25	0.	1		0727	150	0.	1		1342	275	2.	1		1957	400	1.
1		0115	26	0.	1		0730	151	0.	1		1345	276	2.	1		2000	401	1.
1		0118	27	0.	1		0733	152	0.	1		1348	277	2.	1		2003	402	1.
1		0121	28	0.	1		0736	153	0.	1		1351	278	2.	1		2006	403	1.
1		0124	29	0.	1		0739	154	0.	1		1354	279	2.	1		2009	404	1.
1		0127	30	0.	1		0742	155	0.	1		1357	280	2.	1		2012	405	1.
1		0130	31	0.	1		0745	156	0.	1		1400	281	2.	1		2015	406	1.
1		0133	32	0.	1		0748	157	0.	1		1403	282	2.	1		2018	407	1.
1		0136	33	0.	1		0751	158	0.	1		1406	283	2.	1		2021	408	1.
1		0139	34	0.	1		0754	159	0.	1		1409	284	2.	1		2024	409	1.
1		0142	35	0.	1		0757	160	0.	1		1412	285	2.	1		2027	410	1.
1		0145	36	0.	1		0800	161	0.	1		1415	286	2.	1		2030	411	1.
1		0148	37	0.	1		0803	162	0.	1		1418	287	2.	1		2033	412	1.
1		0151	38	0.	1		0806	163	0.	1		1421	288	2.	1		2036	413	1.
1		0154	39	0.	1		0809	164	0.	1		1424	289	2.	1		2039	414	1.
1		0157	40	0.	1		0812	165	0.	1		1427	290	2.	1		2042	415	1.
1		0200	41	0.	1		0815	166	0.	1		1430	291	2.	1		2045	416	1.
1		0203	42	0.	1		0818	167	0.	1		1433	292	2.	1		2048	417	1.
1		0206	43	0.	1		0821	168	0.	1		1436	293	2.	1		2051	418	1.
1		0209	44	0.	1		0824	169	0.	1		1439	294	2.	1		2054	419	1.
1		0212	45	0.	1		0827	170	0.	1		1442	295	2.	1		2057	420	1.
1		0215	46	0.	1		0830	171	0.	1		1445	296	2.	1		2100	421	1.
1		0218	47	0.	1		0833	172	0.	1		1448	297	2.	1		2103	422	1.
1		0221	48	0.	1		0836	173	0.	1		1451	298	2.	1		2106	423	1.
1		0224	49	0.	1		0839	174	0.	1		1454	299	2.	1		2109	424	1.
1		0227	50	0.	1		0842	175	0.	1		1457	300	2.	1		2112	425	1.
1		0230	51	0.	1		0845	176	0.	1		1500	301	2.	1		2115	426	1.
1		0233	52	0.	1		0848	177	1.	1		1503	302	2.	1		2118	427	1.
1		0236	53	0.	1		0851	178	1.	1		1506	303	2.	1		2121	428	1.
1		0239	54	0.	1		0854	179	1.	1		1509	304	2.	1		2124	429	1.
1		0242	55	0.	1		0857	180	1.	1		1512	305	2.	1		2127	430	1.
1		0245	56	0.	1		0900	181	1.	1		1515	306	1.	1		2130	431	1.
1		0248	57	0.	1		0903	182	1.	1		1518	307	1.	1		2133	432	1.
1		0251	58	0.	1		0906	183	1.	1		1521	308	1.	1		2136	433	1.
1		0254	59	0.	1		0909	184	1.	1		1524	309	1.	1		2139	434	1.
1		0257	60	0.	1		0912	185	1.	1		1527	310	1.	1		2142	435	1.
1		0300	61	0.	1		0915	186	1.	1		1530	311	1.	1		2145	436	1.
1		0303	62	0.	1		0918	187	1.	1		1533	312	1.	1		2148	437	1.
1		0306	63	0.	1		0921	188	1.	1		1536	313	1.	1		2151	438	1.
1		0309	64	0.	1		0924	189	1.	1		1539	314	1.	1		2154	439	1.
1		0312	65	0.	1		0927	190	1.	1		1542	315	1.	1		2157	440	1.
1		0315	66	0.	1		0930	191	1.	1		1545	316	1.	1		2200	441	1.
1		0318	67	0.	1		0933	192	1.	1		1548	317	1.	1		2203	442	1.
1		0321	68	0.	1		0936	193	1.	1		1551	318	1.	1		2206	443	1.

12/

1	0324	69	0.	*	1	0939	194	1.	*	1	1554	319	1.	*	1	2209	444	1.
1	0327	70	0.	*	1	0942	195	1.	*	1	1557	320	1.	*	1	2212	445	1.
1	0330	71	0.	*	1	0945	196	1.	*	1	1600	321	1.	*	1	2215	446	1.
1	0333	72	0.	*	1	0948	197	1.	*	1	1603	322	1.	*	1	2218	447	1.
1	0336	73	0.	*	1	0951	198	1.	*	1	1606	323	1.	*	1	2221	448	1.
1	0339	74	0.	*	1	0954	199	1.	*	1	1609	324	1.	*	1	2224	449	1.
1	0342	75	0.	*	1	0957	200	1.	*	1	1612	325	1.	*	1	2227	450	1.
1	0345	76	0.	*	1	1000	201	1.	*	1	1615	326	1.	*	1	2230	451	1.
1	0348	77	0.	*	1	1003	202	1.	*	1	1618	327	1.	*	1	2233	452	1.
1	0351	78	0.	*	1	1006	203	1.	*	1	1621	328	1.	*	1	2236	453	1.
1	0354	79	0.	*	1	1009	204	2.	*	1	1624	329	1.	*	1	2239	454	1.
1	0357	80	0.	*	1	1012	205	3.	*	1	1627	330	1.	*	1	2242	455	1.
1	0400	81	0.	*	1	1015	206	3.	*	1	1630	331	1.	*	1	2245	456	1.
1	0403	82	0.	*	1	1018	207	4.	*	1	1633	332	1.	*	1	2248	457	1.
1	0406	83	0.	*	1	1021	208	5.	*	1	1636	333	1.	*	1	2251	458	1.
1	0409	84	0.	*	1	1024	209	6.	*	1	1639	334	1.	*	1	2254	459	1.
1	0412	85	0.	*	1	1027	210	7.	*	1	1642	335	1.	*	1	2257	460	1.
1	0415	86	0.	*	1	1030	211	8.	*	1	1645	336	1.	*	1	2300	461	1.
1	0418	87	0.	*	1	1033	212	9.	*	1	1648	337	1.	*	1	2303	462	1.
1	0421	88	0.	*	1	1036	213	10.	*	1	1651	338	1.	*	1	2306	463	1.
1	0424	89	0.	*	1	1039	214	11.	*	1	1654	339	1.	*	1	2309	464	1.
1	0427	90	0.	*	1	1042	215	12.	*	1	1657	340	1.	*	1	2312	465	1.
1	0430	91	0.	*	1	1045	216	13.	*	1	1700	341	1.	*	1	2315	466	1.
1	0433	92	0.	*	1	1048	217	14.	*	1	1703	342	1.	*	1	2318	467	1.
1	0436	93	0.	*	1	1051	218	15.	*	1	1706	343	1.	*	1	2321	468	0.
1	0439	94	0.	*	1	1054	219	15.	*	1	1709	344	1.	*	1	2324	469	0.
1	0442	95	0.	*	1	1057	220	16.	*	1	1712	345	1.	*	1	2327	470	0.
1	0445	96	0.	*	1	1100	221	17.	*	1	1715	346	1.	*	1	2330	471	0.
1	0448	97	0.	*	1	1103	222	17.	*	1	1718	347	1.	*	1	2333	472	0.
1	0451	98	0.	*	1	1106	223	17.	*	1	1721	348	1.	*	1	2336	473	0.
1	0454	99	0.	*	1	1109	224	17.	*	1	1724	349	1.	*	1	2339	474	0.
1	0457	100	0.	*	1	1112	225	16.	*	1	1727	350	1.	*	1	2342	475	0.
1	0500	101	0.	*	1	1115	226	15.	*	1	1730	351	1.	*	1	2345	476	0.
1	0503	102	0.	*	1	1118	227	14.	*	1	1733	352	1.	*	1	2348	477	0.
1	0506	103	0.	*	1	1121	228	13.	*	1	1736	353	1.	*	1	2351	478	0.
1	0509	104	0.	*	1	1124	229	12.	*	1	1739	354	1.	*	1	2354	479	0.
1	0512	105	0.	*	1	1127	230	11.	*	1	1742	355	1.	*	1	2357	480	0.
1	0515	106	0.	*	1	1130	231	10.	*	1	1745	356	1.	*	2	0000	481	0.
1	0518	107	0.	*	1	1133	232	10.	*	1	1748	357	1.	*	2	0003	482	0.
1	0521	108	0.	*	1	1136	233	9.	*	1	1751	358	1.	*	2	0006	483	0.
1	0524	109	0.	*	1	1139	234	8.	*	1	1754	359	1.	*	2	0009	484	0.
1	0527	110	0.	*	1	1142	235	8.	*	1	1757	360	1.	*	2	0012	485	0.
1	0530	111	0.	*	1	1145	236	8.	*	1	1800	361	1.	*	2	0015	486	0.
1	0533	112	0.	*	1	1148	237	7.	*	1	1803	362	1.	*	2	0018	487	0.
1	0536	113	0.	*	1	1151	238	7.	*	1	1806	363	1.	*	2	0021	488	0.
1	0539	114	0.	*	1	1154	239	7.	*	1	1809	364	1.	*	2	0024	489	0.
1	0542	115	0.	*	1	1157	240	7.	*	1	1812	365	1.	*	2	0027	490	0.
1	0545	116	0.	*	1	1200	241	6.	*	1	1815	366	1.	*	2	0030	491	0.
1	0548	117	0.	*	1	1203	242	6.	*	1	1818	367	1.	*	2	0033	492	0.
1	0551	118	0.	*	1	1206	243	6.	*	1	1821	368	1.	*	2	0036	493	0.
1	0554	119	0.	*	1	1209	244	6.	*	1	1824	369	1.	*	2	0039	494	0.
1	0557	120	0.	*	1	1212	245	5.	*	1	1827	370	1.	*	2	0042	495	0.
1	0600	121	0.	*	1	1215	246	5.	*	1	1830	371	1.	*	2	0045	496	0.
1	0603	122	0.	*	1	1218	247	5.	*	1	1833	372	1.	*	2	0048	497	0.
1	0606	123	0.	*	1	1221	248	4.	*	1	1836	373	1.	*	2	0051	498	0.
1	0609	124	0.	*	1	1224	249	4.	*	1	1839	374	1.	*	2	0054	499	0.
1	0612	125	0.	*	1	1227	250	4.	*	1	1842	375	1.	*	2	0057	500	0.
				*					*					*				

****

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.95-HR
+		(CFS)				
+ 17.	11.05		5.	2.	1.	1.
		(INCHES)	1.110	1.473	1.478	1.478
		(AC-FT)	2.	3.	3.	3.

100-yr Storm Volume

CUMULATIVE AREA = .04 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	B1	3.	11.20	1.	0.	0.	.01		

+	HYDROGRAPH AT	B1IMP	1.	11.00	0.	0.	0.	.00	
+	2 COMBINED AT	COMB1	4.	11.15	1.	0.	0.	.01	
+	ROUTED TO	B1CULV	4.	11.20	1.	0.	0.	.01	Comb 1 + Comb 3
+	HYDROGRAPH AT	B6A	0.	11.00	0.	0.	0.	.00	$Q_{100} \simeq 4 + 4 \simeq 8$ cfs
+	2 COMBINED AT	COMB2	4.	11.15	1.	0.	0.	.01	use 8 cfs as
+	HYDROGRAPH AT	B4	3.	11.05	1.	0.	0.	.00	$\simeq Q_{100}$ for
+	HYDROGRAPH AT	B4IMP	1.	11.00	0.	0.	0.	.00	Southmost rundown
+	2 COMBINED AT	COMB3	4.	11.00	1.	0.	0.	.01	into west
+	ROUTED TO	B6CHAN	4.	11.05	1.	0.	0.	.01	stormwater pond.
+	2 COMBINED AT	COMB4	8.	11.05	2.	1.	1.	.02	
+	HYDROGRAPH AT	B6B	1.	11.05	0.	0.	0.	.00	
+	2 COMBINED AT	COMB5	9.	11.05	2.	1.	1.	.02	
+	HYDROGRAPH AT	B2	2.	11.05	0.	0.	0.	.00	
+	HYDROGRAPH AT	B2IMP	1.	11.00	0.	0.	0.	.00	
+	2 COMBINED AT	COMB5	3.	11.00	1.	0.	0.	.00	
+	ROUTED TO	B3CURB	3.	11.05	1.	0.	0.	.00	
+	HYDROGRAPH AT	B3	1.	11.05	0.	0.	0.	.00	
+	HYDROGRAPH AT	B3IMP	1.	11.00	0.	0.	0.	.00	
+	3 COMBINED AT	COMB7	5.	11.05	1.	0.	0.	.01	
+	HYDROGRAPH AT	B5	1.	11.00	0.	0.	0.	.00	
+	HYDROGRAPH AT	B5IMP	0.	11.00	0.	0.	0.	.00	
+	2 COMBINED AT	COMB8	1.	11.00	0.	0.	0.	.00	Comb 9
+	ROUTED TO	B5CURB	1.	11.05	0.	0.	0.	.00	$Q_{100} \simeq 6$ cfs use
+	2 COMBINED AT	COMB9	6.	11.05	2.	1.	0.	.01	as north-most
+	ROUTED TO	PIPE	6.	11.05	2.	1.	0.	.01	rundown into
+	HYDROGRAPH AT	PONDSUR	1.	11.00	0.	0.	0.	.00	west stormwater
+	HYDROGRAPH AT	B7	2.	11.15	1.	0.	0.	.01	pond.

14/

```
        4 COMBINED AT
+                       COMB12        17.   11.05          5.          2.          1.        .04
1
                                    SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                        (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                  INTERPOLATED TO
                                                                                COMPUTATION INTERVAL
          ISTAQ    ELEMENT      DT       PEAK    TIME TO     VOLUME      DT       PEAK    TIME TO     VOLUME
                                                   PEAK                                      PEAK

                               (MIN)     (CFS)     (MIN)      (IN)     (MIN)     (CFS)     (MIN)       (IN)

           B1CULV  MANE          .19      3.93    671.95      1.41      3.00      3.93    672.00       1.41

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .7530E+00 EXCESS= .0000E+00 OUTFLOW= .7530E+00 BASIN STORAGE= .1229E-06 PERCENT ERROR=    .0

           B6CHAN  MANE         2.28      3.58    662.13      1.84      3.00      3.58    663.00       1.84

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5878E+00 EXCESS= .0000E+00 OUTFLOW= .5878E+00 BASIN STORAGE= .0000E+00 PERCENT ERROR=    .0

           B3CURB  MANE         2.73      2.99    662.32      1.98      3.00      2.99    663.00       1.98

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5269E+00 EXCESS= .0000E+00 OUTFLOW= .5268E+00 BASIN STORAGE= .0000E+00 PERCENT ERROR=    .0

           B5CURB  MANE         1.91      1.03    662.73      1.63      3.00      1.03    663.00       1.63

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1734E+00 EXCESS= .0000E+00 OUTFLOW= .1734E+00 BASIN STORAGE= .1796E-10 PERCENT ERROR=    .0

             PIPE  MANE          .28      5.76    663.16      1.89      3.00      5.75    663.00       1.89

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1006E+01 EXCESS= .0000E+00 OUTFLOW= .1006E+01 BASIN STORAGE= .0000E+00 PERCENT ERROR=    .0

1                                                    HEC-1 INPUT                                                PAGE  1

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

                        *
                        *
                        *
                        *
                        *
                        *
 *** FREE ***
                        *DIAGRAM
             1          ID    PINON RIDGE WEST DETENTION POND SIZING
             2          ID
             3          ID    USE 1000 YR 24 HR RAINFALL EVENT WITH DEPTH OF 4.43 IN
             4          ID
             5          ID    DIRECT RUNOFF METHOD USED FOR BUILDINGS CONCRETE SLABS AND
             6          ID    OTHER IMPERVIOUS STRUCTURES
             7          ID
             8          ID    KLEINFELDER PROJECT NUMBER 83088 TASK 1.6.1
             9          ID    MAY 5 2008
                        *
            10          IT       3       0       0     500
            11          IO       5       0       0
                        *

            12          KK      B1
            13          KM   BASIN 1
            14          IN      60
            15          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
            16          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
            17          PC    4.27    4.32    4.38    4.43
            18          BA   0.009
            19          LS       0      78       0
            20          UD   0.42
                        *

            21          KK   B1IMP
```

15/

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   03OCT08  TIME  12:38:26  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

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

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

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

1 HEC-1 INPUT PAGE 1

```
          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
                        *DIAGRAM
            1           ID    PINON RIDGE WEST DETENTION POND OUTLET SIZING
            2           ID
            3           ID    USE 1000 YR 24 HR RAINFALL EVENT WITH DEPTH OF 4.43 IN
            4           ID
            5           ID    DIRECT RUNOFF METHOD USED FOR BUILDINGS CONCRETE SLABS AND
            6           ID    OTHER IMPERVIOUS STRUCTURES
            7           ID
            8           ID    KLEINFELDER PROJECT NUMBER 83088 TASK 1.6.1
            9           ID    MAY 20 2008
                        *
           10           IT       3       0       0     500
           11           IO       5       0       0
           12           JP       3
                        *

           13           KK      B1
           14           KM   BASIN 1
           15           IN      60
           16           PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
           17           PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
           18           PC    4.27    4.32    4.38    4.43
           19           BA   0.009
           20           LS       0      78       0
           21           UD   0.42
                        *

           22           KK   B1IMP
           23           KM   B1 IMPERVIOUS AREA
           24           BA   0.001
           25           QI    0.04    0.04    0.05    0.05    0.06    0.06    0.07    0.09    0.11    0.13
           26           QI    0.21    1.68    0.43    0.19    0.12    0.12    0.07    0.07    0.07    0.07
           27           QI    0.05    0.05    0.05    0.05    0.05
                        *

           28           KK   COMB1
           29           KM   COMBINE B1 WITH B1 IMPERVIOUS
           30           HC       2
                        *

           31           KK  B1CULV
           32           KM   CULVERT FROM B1 TO B6
```

```
 33          RD      50   0.005   0.024            CIRC       2
             *

 34          KK     B6A
 35          KM   BASIN 6A
 36          IN      60
 37          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
 38          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
 39          PC    4.27    4.32    4.38    4.43
 40          BA   0.001
 41          LS       0      67       0
 42          UD    0.11
             *
1                                          HEC-1 INPUT                                          PAGE  2

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

 43          KK   COMB2
 44          KM   COMBINE B1 AND B6
 45          HC       2
             *

 46          KK  B4PIPE
 47          KM   PIPE ALONG B4 WEST BOUNDARY
 48          RD     280   0.009   0.012            CIRC       2
             *

 49          KK      B4
 50          KM   BASIN 4
 51          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
 52          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
 53          PC    4.27    4.32    4.38    4.43
 54          BA   0.005
 55          LS       0      85       0
 56          UD    0.20
             *

 57          KK   B4IMP
 58          KM   B4 IMPERVIOUS AREA
 59          BA   0.001
 60          QI    0.03    0.03    0.04    0.04    0.05    0.05    0.05    0.07    0.08    0.10
 61          QI    0.16    1.30    0.33    0.15    0.09    0.09    0.05    0.05    0.05    0.05
 62          QI    0.04    0.04    0.04    0.04
             *

 63          KK   COMB3
 64          KM   COMBINE B1 WITH B4
 65          HC       3
             *

 66          KK  B5PIPE
 67          KM   PIPE ALONG B5 WEST BOUNDARY
 68          RD     330   0.030   0.012            CIRC       2
             *

 69          KK      B5
 70          KM   BASIN 5
 71          IN      60
 72          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
 73          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
 74          PC    4.27    4.32    4.38    4.43
 75          BA   0.001
 76          LS       0      85       0
 77          UD    0.15
             *
1                                          HEC-1 INPUT                                          PAGE  3

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

 78          KK   B5IMP
 79          KM   B5 IMPERVIOUS AREA
 80          BA   0.001
 81          QI    0.02    0.02    0.02    0.02    0.03    0.03    0.03    0.04    0.04    0.06
 82          QI    0.09    0.71    0.18    0.08    0.05    0.05    0.03    0.03    0.03    0.03
 83          QI    0.02    0.02    0.02    0.02
             *

 84          KK   COMB4
 85          KM   COMBINE B5 AND B5IMP AND PIPE FLOW
```

```
 86          HC       3
             *

 87          KK      B2
 88          KM   BASIN 2
 89          IN      60
 90          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
 91          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
 92          PC    4.27    4.32    4.38    4.43
 93          BA   0.003
 94          LS       0      85       0
 95          UD    0.23
             *

 96          KK   B2IMP
 97          KM   B2 IMPERVIOUS AREA
 98          BA   0.002
 99          QI    0.05    0.05    0.06    0.06    0.08    0.08    0.09    0.11    0.13    0.17
100          QI    0.27    2.10    0.54    0.24    0.15    0.15    0.09    0.09    0.09    0.09
101          QI    0.06    0.06    0.06    0.06
             *

102          KK   COMB5
103          KM   COMBINE B2 WITH B2IMP
104          HC       2
             *

105          KK  B3CURB
106          KM   COLLECTION CURB ALONG NORTH BOUNDARY OF BASIN 3
107          RD     480   0.004   0.016            TRAP       0       3
             *

108          KK      B3
109          KM   BASIN 3
110          IN      60
111          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
112          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
113          PC    4.27    4.32    4.38    4.43
114          BA   0.002
115          LS       0      85       0
116          UD    0.24
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

117          KK   B3IMP
118          KM   B3 IMPERVIOUS AREA
119          BA   0.001
120          QI    0.03    0.03    0.03    0.03    0.04    0.04    0.04    0.05    0.07    0.08
121          QI    0.13    1.03    0.26    0.12    0.07    0.07    0.04    0.04    0.04    0.04
122          QI    0.03    0.03    0.03    0.03
             *

123          KK   COMB6
124          KM   COMBINE B3 WITH B3IMP AND B5 PIPE FLOW
125          HC       4
             *

126          KK  B7PIPE
127          KM   PIPE TO DROP INLET ON NORTHEST CORNER OF WEST POND
128          RD     150   0.020   0.012            CIRC       2
             *

129          KK      B7
130          KM   BASIN 7
131          IN      60
132          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
133          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
134          PC    4.27    4.32    4.38    4.43
135          BA   0.006
136          LS       0      78       0
137          UD    0.36
             *

138          KK     B6B
139          KM   BASIN 6B
140          IN      60
141          PC    0.05    0.10    0.16    0.21    0.28    0.35    0.43    0.53    0.65    0.80
142          PC    1.04    2.94    3.42    3.63    3.77    3.90    3.98    4.06    4.14    4.22
```

18/

```
143          PC    4.27    4.32    4.38    4.43
144          BA   0.005
145          LS       0      67       0
146          UD    0.17
             *

147          KK PONDSUR
148          KM   RAIN COLLECTION FROM POND SURFACE
149          BA   0.001
150          QI    0.04    0.04    0.04    0.04    0.05    0.05    0.06    0.07    0.09    0.11
151          QI    0.18    1.43    0.37    0.16    0.10    0.10    0.06    0.06    0.06    0.06
152          QI    0.04    0.04    0.04    0.04
             *

153          KK   COMB7
154          KM   COMBINE ALL INFLOW TO WEST POND PLUS POND SURFACE COLLECTION
155          HC       4
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

156          KK  OUTLET
157          KP       1
158          KM   18 INCH OUTLET PIPE AND 1X2FT WEIR TO ROUTE 1000YR STORM THRU 150X150FT POND
159          KM   POND CREST ELEVATION OF 5524 WEIR CREST ELEVATION OF 5522   5522.5
160          RS       1    FLOW       0
161          SV       0     0.2     0.6     1.1     1.6
162          SE  5522.5    5523    5524    5525    5526
163          SQ       0      14      29      30      31
164          KO       3
             *
165          KP       2
166          KM   18 INCH OUTLET PIPE AND 2X2FT WEIR TO ROUTE 1000YR STORM THRU 150X150FT POND
167          KM   POND CREST ELEVATION OF 5524 WEIR CREST ELEVATION OF 5522
168          RS       1    FLOW       0
169          SV       0     0.2     0.5     0.7     1.0
170          SE    5522  5522.5    5523  5523.5    5524
171          SQ       0       6      18      29      29
172          KO       3
             *
173          KP       3
174          KM   18 INCH OUTLET PIPE AND 2X1FT WEIR TO ROUTE 1000YR STORM THRU 175X150FT POND
175          KM   POND CREST ELEVATION OF 5524 WEIR CREST ELEVATION OF 5521
176          RS       1    FLOW       0
177          SV       0     0.2     0.5     0.8     1.1     1.3     1.6
178          SE    5521  5521.5    5522  5522.5    5523  5523.5    5524
179          SQ       0       4      12      20      28      29      29
180          KO       3
             *
181          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   13         B1
               .
               .
   22          .        B1IMP
               .            .
               .            .
   28      COMB1............
               V
               V
   31     B1CULV
               .
               .
   34          .          B6A
               .            .
               .            .
   43      COMB2............
               V
               V
   46     B4PIPE
               .
               .
   49          .           B4
```

19/

```
                .          .
                .          .
   57           .          .       B4IMP
                .          .           .
                .          .           .
   63       COMB3.......................
                V
                V
   66      B5PIPE
                .
                .
   69           .          B5
                .          .
                .          .
   78           .          .       B5IMP
                .          .           .
                .          .           .
   84       COMB4.......................
                .
                .
   87           .          B2
                .          .
                .          .
   96           .          .       B2IMP
                .          .           .
                .          .           .
  102           .       COMB5...........
                .          V
                .          V
  105           .      B3CURB
                .          .
                .          .
  108           .          .          B3
                .          .           .
                .          .           .
  117           .          .           .       B3IMP
                .          .           .           .
                .          .           .           .
  123       COMB6...................................
                V
                V
  126      B7PIPE
                .
                .
  129           .          B7
                .          .
                .          .
  138           .          .         B6B
                .          .           .
                .          .           .
  147           .          .           .     PONDSUR
                .          .           .           .
                .          .           .           .
  153       COMB7...................................
                V
                V
  156      OUTLET
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *           VERSION 4.1                *
 *                                      *
 *  RUN DATE   03OCT08  TIME  12:38:26  *
 *                                      *
 ****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

PINON RIDGE WEST DETENTION POND OUTLET SIZING

USE 1000 YR 24 HR RAINFALL EVENT WITH DEPTH OF 4.43 IN

DIRECT RUNOFF METHOD USED FOR BUILDINGS CONCRETE SLABS AND
OTHER IMPERVIOUS STRUCTURES

KLEINFELDER PROJECT NUMBER 83088 TASK 1.6.1

20/

```
                    MAY 20 2008

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

     IT        HYDROGRAPH TIME DATA
                      NMIN          3  MINUTES IN COMPUTATION INTERVAL
                     IDATE     1    0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        500  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     2    0  ENDING DATE
                    NDTIME       0057  ENDING TIME
                    ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .05 HOURS
                      TOTAL TIME BASE   24.95 HOURS

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

     JP        MULTI-PLAN OPTION
                     NPLAN          3  NUMBER OF PLANS

     JR        MULTI-RATIO OPTION
                   RATIOS OF RUNOFF
                  1.00


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 156 KK     *    OUTLET  *
            *            *
            **************

 164 KO        OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

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

 161 SV          STORAGE          .0        .2        .6       1.1       1.6

 162 SE        ELEVATION     5522.50   5523.00   5524.00   5525.00   5526.00

 163 SQ        DISCHARGE          0.       14.       29.       30.       31.

                                                                ***

      ***           ***           ***           ***           ***

                       HYDROGRAPH AT STATION   OUTLET
                         FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.95-HR
+   (CFS)       (HR)
                          (CFS)
+      26.     11.25                  8.          3.          3.          3.
                       (INCHES)     2.004       2.614       2.620       2.620
                        (AC-FT)       4.          5.          5.          5.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
```

```
                                        6-HR        24-HR        72-HR      24.95-HR
+  (AC-FT)      (HR)
       1.      11.20                     0.           0.           0.           0.

  PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
                                        6-HR        24-HR        72-HR      24.95-HR
+   (FEET)      (HR)
   5523.83     11.25                 5522.86      5522.60      5522.59      5522.59

                          CUMULATIVE AREA =      .04 SQ MI


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

  165 KP        PLAN  2 FOR STATION   OUTLET
                          18 INCH OUTLET PIPE AND 2X2FT WEIR TO ROUTE 1000YR STORM THRU 150X150FT POND
                          POND CREST ELEVATION OF 5524 WEIR CREST ELEVATION OF 5522

  172 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           3  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

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

  169 SV            STORAGE          .0         .2         .5         .7        1.0

  170 SE          ELEVATION     5522.00    5522.50    5523.00    5523.50    5524.00

  171 SQ          DISCHARGE          0.         6.        18.        29.        29.

                                                                   ***

      ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION   OUTLET
                            FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.95-HR
+   (CFS)       (HR)
                          (CFS)
+      28.      11.20                     8.           3.           3.           3.
                        (INCHES)      1.999        2.613        2.618        2.618
                         (AC-FT)         4.           5.           5.           5.

 PEAK STORAGE   TIME                              MAXIMUM AVERAGE STORAGE
                                        6-HR        24-HR        72-HR      24.95-HR
+  (AC-FT)      (HR)
       1.      11.20                     0.           0.           0.           0.

  PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
                                        6-HR        24-HR        72-HR      24.95-HR
+   (FEET)      (HR)
   5523.44     11.20                 5522.56      5522.17      5522.16      5522.16

                          CUMULATIVE AREA =      .04 SQ MI


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

  173 KP        PLAN  3 FOR STATION   OUTLET
                          18 INCH OUTLET PIPE AND 2X1FT WEIR TO ROUTE 1000YR STORM THRU 175X150FT POND
                          POND CREST ELEVATION OF 5524 WEIR CREST ELEVATION OF 5521

  180 KO          OUTPUT CONTROL VARIABLES
                        IPRNT           3  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA

  176 RS          STORAGE ROUTING
```

22/

```
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       FLOW  TYPE OF INITIAL CONDITION
                   RSVRIC        .00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

 177 SV          STORAGE          .0        .2        .5        .8       1.1       1.3       1.6

 178 SE        ELEVATION     5521.00   5521.50   5522.00   5522.50   5523.00   5523.50   5524.00

 179 SQ        DISCHARGE          0.        4.       12.       20.       28.       29.       29.

                                                                  ***

     ***           ***            ***            ***            ***

                      HYDROGRAPH AT STATION   OUTLET
                        FOR PLAN 3, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.95-HR
+   (CFS)      (HR)
                          (CFS)
+     24.     11.30                  8.          3.          3.           3.
                       (INCHES)    1.991       2.611       2.615        2.615
                        (AC-FT)      4.          5.          5.           5.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                    6-HR       24-HR       72-HR     24.95-HR
+  (AC-FT)      (HR)
       1.     11.30                  0.          0.          0.           0.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                    6-HR       24-HR       72-HR     24.95-HR
+   (FEET)      (HR)
  5522.73     11.30              5521.75     5521.29     5521.27      5521.27

                      CUMULATIVE AREA =     .04 SQ MI

1

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

                                                                  RATIOS APPLIED TO FLOWS
 OPERATION       STATION     AREA    PLAN              RATIO 1
                                                          1.00

 HYDROGRAPH AT
+                    B1       .01     1   FLOW            6.
                                         TIME         11.20
                                      2   FLOW            6.
                                         TIME         11.20
                                      3   FLOW            6.
                                         TIME         11.20

 HYDROGRAPH AT
+                 B1IMP       .00     1   FLOW            2.
                                         TIME         11.00
                                      2   FLOW            2.
                                         TIME         11.00
                                      3   FLOW            2.
                                         TIME         11.00

  2 COMBINED AT
+                 COMB1       .01     1   FLOW            7.
                                         TIME         11.15
                                      2   FLOW            7.
                                         TIME         11.15
                                      3   FLOW            7.
                                         TIME         11.15

 ROUTED TO
+                B1CULV       .01     1   FLOW            7.
                                         TIME         11.15
                                      2   FLOW            7.
                                         TIME         11.15
                                      3   FLOW            7.
                                         TIME         11.15
```

231

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 HYDROGRAPH AT
+                  B6A       .00     1   FLOW          1.
                                         TIME       11.00
                                     2   FLOW          1.
                                         TIME       11.00
                                     3   FLOW          1.
                                         TIME       11.00

  2 COMBINED AT
+                 COMB2       .01     1   FLOW          8.
                                         TIME       11.10
                                     2   FLOW          8.
                                         TIME       11.10
                                     3   FLOW          8.
                                         TIME       11.10

 ROUTED TO
+                B4PIPE       .01     1   FLOW          8.
                                         TIME       11.10
                                     2   FLOW          8.
                                         TIME       11.10
                                     3   FLOW          8.
                                         TIME       11.10

 HYDROGRAPH AT
+                   B4        .00     1   FLOW          5.
                                         TIME       11.00
                                     2   FLOW          5.
                                         TIME       11.00
                                     3   FLOW          5.
                                         TIME       11.00

 HYDROGRAPH AT
+                 B4IMP       .00     1   FLOW          1.
                                         TIME       11.00
                                     2   FLOW          1.
                                         TIME       11.00
                                     3   FLOW          1.
                                         TIME       11.00

  3 COMBINED AT
+                 COMB3       .02     1   FLOW         14.
                                         TIME       11.05
                                     2   FLOW         14.
                                         TIME       11.05
                                     3   FLOW         14.
                                         TIME       11.05

 ROUTED TO
+                B5PIPE       .02     1   FLOW         14.
                                         TIME       11.05
                                     2   FLOW         14.
                                         TIME       11.05
                                     3   FLOW         14.
                                         TIME       11.05

 HYDROGRAPH AT
+                   B5        .00     1   FLOW          1.
                                         TIME       11.00
                                     2   FLOW          1.
                                         TIME       11.00
                                     3   FLOW          1.
                                         TIME       11.00

 HYDROGRAPH AT
+                 B5IMP       .00     1   FLOW          1.
                                         TIME       11.00
                                     2   FLOW          1.
                                         TIME       11.00
                                     3   FLOW          1.
                                         TIME       11.00

  3 COMBINED AT
+                 COMB4       .02     1   FLOW         15.
                                         TIME       11.05
                                     2   FLOW         15.
                                         TIME       11.05
                                     3   FLOW         15.
                                         TIME       11.05

 HYDROGRAPH AT
```

24/

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+                    B2        .00     1   FLOW          3.
                                           TIME       11.05
                                       2   FLOW          3.
                                           TIME       11.05
                                       3   FLOW          3.
                                           TIME       11.05

 HYDROGRAPH AT
+                 B2IMP        .00     1   FLOW          2.
                                           TIME       11.00
                                       2   FLOW          2.
                                           TIME       11.00
                                       3   FLOW          2.
                                           TIME       11.00

  2 COMBINED AT
+                 COMB5        .00     1   FLOW          5.
                                           TIME       11.00
                                       2   FLOW          5.
                                           TIME       11.00
                                       3   FLOW          5.
                                           TIME       11.00

 ROUTED TO
+                B3CURB        .00     1   FLOW          5.
                                           TIME       11.05
                                       2   FLOW          5.
                                           TIME       11.05
                                       3   FLOW          5.
                                           TIME       11.05

 HYDROGRAPH AT
+                    B3        .00     1   FLOW          2.
                                           TIME       11.05
                                       2   FLOW          2.
                                           TIME       11.05
                                       3   FLOW          2.
                                           TIME       11.05

 HYDROGRAPH AT
+                 B3IMP        .00     1   FLOW          1.
                                           TIME       11.00
                                       2   FLOW          1.
                                           TIME       11.00
                                       3   FLOW          1.
                                           TIME       11.00

  4 COMBINED AT
+                 COMB6        .03     1   FLOW         23.
                                           TIME       11.05
                                       2   FLOW         23.
                                           TIME       11.05
                                       3   FLOW         23.
                                           TIME       11.05

 ROUTED TO
+                B7PIPE        .03     1   FLOW         23.
                                           TIME       11.05
                                       2   FLOW         23.
                                           TIME       11.05
                                       3   FLOW         23.
                                           TIME       11.05

 HYDROGRAPH AT
+                    B7        .01     1   FLOW          4.
                                           TIME       11.15
                                       2   FLOW          4.
                                           TIME       11.15
                                       3   FLOW          4.
                                           TIME       11.15

 HYDROGRAPH AT
+                   B6B        .00     1   FLOW          3.
                                           TIME       11.05
                                       2   FLOW          3.
                                           TIME       11.05
                                       3   FLOW          3.
                                           TIME       11.05

 HYDROGRAPH AT
+               PONDSUR        .00     1   FLOW          1.
```

25/

```
                                        TIME        11.00
                                    2   FLOW           1.
                                        TIME        11.00
                                    3   FLOW           1.
                                        TIME        11.00

  4 COMBINED AT
+                 COMB7       .04     1   FLOW          31.
                                        TIME        11.05
                                    2   FLOW          31.
                                        TIME        11.05
                                    3   FLOW          31.
                                        TIME        11.05

 ROUTED TO
+                 OUTLET      .04     1   FLOW          26.
                                        TIME        11.25
                                    2   FLOW          28.
                                        TIME        11.20
                                    3   FLOW          24.
                                        TIME        11.30

                                    ** PEAK STAGES IN FEET **
                                    1   STAGE     5523.83
                                        TIME        11.25
                                    2   STAGE     5523.44
                                        TIME        11.20
                                    3   STAGE     5522.73
                                        TIME        11.30
1
                                        SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                            (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                  INTERPOLATED TO
                                                                                COMPUTATION INTERVAL
          ISTAQ    ELEMENT      DT       PEAK    TIME TO     VOLUME      DT       PEAK    TIME TO     VOLUME
                                                   PEAK                                     PEAK

                               (MIN)     (CFS)     (MIN)      (IN)     (MIN)     (CFS)     (MIN)       (IN)

         FOR PLAN = 1  RATIO=  .00
           B1CULV  MANE          .23      7.50    668.98      2.59      3.00      7.50    669.00       2.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1382E+01 EXCESS= .0000E+00 OUTFLOW= .1382E+01 BASIN STORAGE= .8035E-05 PERCENT ERROR=    .0

         FOR PLAN = 2  RATIO=  .00
           B1CULV  MANE          .23      7.50    668.98      2.59      3.00      7.50    669.00       2.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1382E+01 EXCESS= .0000E+00 OUTFLOW= .1382E+01 BASIN STORAGE= .8035E-05 PERCENT ERROR=    .0

         FOR PLAN = 3  RATIO=  .00
           B1CULV  MANE          .23      7.50    668.98      2.59      3.00      7.50    669.00       2.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1382E+01 EXCESS= .0000E+00 OUTFLOW= .1382E+01 BASIN STORAGE= .8035E-05 PERCENT ERROR=    .0

         FOR PLAN = 1  RATIO=  .00
           B4PIPE  MANE          .59      7.88    666.38      2.48      3.00      7.87    666.00       2.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1456E+01 EXCESS= .0000E+00 OUTFLOW= .1456E+01 BASIN STORAGE= .2051E-04 PERCENT ERROR=    .0

         FOR PLAN = 2  RATIO=  .00
           B4PIPE  MANE          .59      7.88    666.38      2.48      3.00      7.87    666.00       2.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1456E+01 EXCESS= .0000E+00 OUTFLOW= .1456E+01 BASIN STORAGE= .2051E-04 PERCENT ERROR=    .0

         FOR PLAN = 3  RATIO=  .00
           B4PIPE  MANE          .59      7.88    666.38      2.48      3.00      7.87    666.00       2.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1456E+01 EXCESS= .0000E+00 OUTFLOW= .1456E+01 BASIN STORAGE= .2051E-04 PERCENT ERROR=    .0
```

```
FOR PLAN = 1  RATIO=  .00
  B5PIPE  MANE          .38     13.84    663.21      2.71      3.00     13.83    663.00        2.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2456E+01 EXCESS= .0000E+00 OUTFLOW= .2456E+01 BASIN STORAGE= .2626E-04 PERCENT ERROR=    .0

FOR PLAN = 2  RATIO=  .00
  B5PIPE  MANE          .38     13.84    663.21      2.71      3.00     13.83    663.00        2.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2456E+01 EXCESS= .0000E+00 OUTFLOW= .2456E+01 BASIN STORAGE= .2626E-04 PERCENT ERROR=    .0

FOR PLAN = 3  RATIO=  .00
  B5PIPE  MANE          .38     13.84    663.21      2.71      3.00     13.83    663.00        2.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2456E+01 EXCESS= .0000E+00 OUTFLOW= .2456E+01 BASIN STORAGE= .2626E-04 PERCENT ERROR=    .0

FOR PLAN = 1  RATIO=  .00
  B3CURB  MANE         2.41      4.89    663.37      3.23      3.00      4.89    663.00        3.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8606E+00 EXCESS= .0000E+00 OUTFLOW= .8605E+00 BASIN STORAGE= .8620E-04 PERCENT ERROR=    .0

FOR PLAN = 2  RATIO=  .00
  B3CURB  MANE         2.41      4.89    663.37      3.23      3.00      4.89    663.00        3.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8606E+00 EXCESS= .0000E+00 OUTFLOW= .8605E+00 BASIN STORAGE= .8620E-04 PERCENT ERROR=    .0

FOR PLAN = 3  RATIO=  .00
  B3CURB  MANE         2.41      4.89    663.37      3.23      3.00      4.89    663.00        3.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8606E+00 EXCESS= .0000E+00 OUTFLOW= .8605E+00 BASIN STORAGE= .8620E-04 PERCENT ERROR=    .0

FOR PLAN = 1  RATIO=  .00
  B7PIPE  MANE          .18     23.23    663.03      2.85      3.00     23.23    663.00        2.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4104E+01 EXCESS= .0000E+00 OUTFLOW= .4104E+01 BASIN STORAGE= .1771E-04 PERCENT ERROR=    .0

FOR PLAN = 2  RATIO=  .00
  B7PIPE  MANE          .18     23.23    663.03      2.85      3.00     23.23    663.00        2.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4104E+01 EXCESS= .0000E+00 OUTFLOW= .4104E+01 BASIN STORAGE= .1771E-04 PERCENT ERROR=    .0

FOR PLAN = 3  RATIO=  .00
  B7PIPE  MANE          .18     23.23    663.03      2.85      3.00     23.23    663.00        2.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4104E+01 EXCESS= .0000E+00 OUTFLOW= .4104E+01 BASIN STORAGE= .1771E-04 PERCENT ERROR=    .0


*** NORMAL END OF HEC-1 ***
```

Pinon Ridge West Stormwater Pond
Outlet Works
18-inch HDPE Pipe

RATING CURVE FOR A DROP INLET (TRANSITIONS FROM WEIR FLOW TO PRESSURIZED PIPE FLOW)

Bernoulli's Flow
A*SQRT(2*g*H/K)

Intake Weir Crest El. =	**5,522.5**	feet
Outlet Invert Elevation =	**5,508.0**	feet
Outlet Pipe Midpoint =	**5,508.8**	feet
Orifice Coef. =	**0.6**	
Inlet Invert El. =	**5,519.0**	
Pipe Diameter, D =	**1.5**	feet
Area =	1.8	sq.ft.
Net area through trashrack bars (ft^2) =	15.4	**95%**
Gross trashrack area (ft^2) =	**16.2**	
Velocity through trashrack (ft/s) =	2.3	= **Avg**
Trashrack Loss, Kt =	0.12	
Entrance Loss, Ke =	**0.5**	
Bend Loss, Kbend =	**0**	
Expansion Loss, Kex =	**0**	
Contraction Loss, Kc =	**0**	
Friction Coefficient =	**0.012**	feet
Pipe Length = 165	**250**	feet
Gate Loss, Kg =	**0**	
Exit Loss, Kv =	1	
SUM OF AREA-ADJUSTED LOSS COEF. =		**3.6**

SIMPLE PIPE (NO GATE, NO Δ DIAMETER)

COMPLEX PIPE (CONTRACT, MULTIGATE)
Must do friction loss by segment and relate flow areas by ratios. See p. 456, Design of Small Dams.

Exp. =	**1.5**
Inlet Box Length (ft) =	**5.6**
Inlet Box Width (ft) =	**2.9**
Avg. Weir Length (ft) =	**4.7**
No. of Weirs =	**3**
Number of Contracted Sides/Weir =	**3**
Reduction factor (Red), Leff = L - (Red)*H	0.45
Wall Thickness of Box (ft) =	**0.5**

Headwater Elevation (feet)	Headwater above Weir Crest (feet)	Headwater above Intake Invert (feet)	Weir Coeff.	Total Effective Weir Length	Orifice Flow (cfs)	Bernoulli's Flow (cfs)	Weir Flow (cfs)	Governing Flow Rate (cfs)	Velocity (fps)
5522.5	0.0	3.5	0.00	14.1	32	28	0	0	0.0
5523.0	0.5	4.0	2.80	13.9	32	28	14	14	7.8
5523.5	1.0	4.5	3.32	13.7	33	29	45	29	16.2
5524.0	1.5	5.0	3.32	13.4	33	29	82	29	16.5
5524.5	2.0	5.5	3.32	13.2	34	30	124	30	16.7
5525.0	2.5	6.0	3.32	13.0	34	30	170	30	17.0
5525.5	3.0	6.5	3.32	12.8	35	31	220	31	17.3
5526.0	3.5	7.0	3.32	12.5	35	31	272	31	17.5
5526.1	3.6	7.1	3.32	12.5	35	31	283	31	17.6
5526.2	3.7	7.2	3.32	12.4	36	31	294	31	17.6
5526.3	3.8	7.3	3.32	12.4	36	31	305	31	17.7
5526.4	3.9	7.4	3.32	12.3	36	31	316	31	17.7
5526.5	4.0	7.5	3.32	12.3	36	31	327	31	17.8
5526.6	4.1	7.6	3.32	12.3	36	31	338	31	17.8
5526.7	4.2	7.7	3.32	12.2	36	32	349	32	17.9
5526.8	4.3	7.8	3.32	12.2	36	32	360	32	17.9
5526.9	4.4	7.9	3.32	12.1	36	32	371	32	18.0
5527.0	4.5	8.0	3.32	12.1	36	32	383	32	18.0
5527.1	4.6	8.1	3.32	12.0	36	32	394	32	18.1
5527.2	4.7	8.2	3.32	12.0	37	32	405	32	18.1
5527.3	4.8	8.3	3.32	11.9	37	32	417	32	18.2

FOR PLOT

Headwater Elevation (feet)	Flow Rate (cfs)
5522.5	0
5523.0	14
5523.5	29
5524.0	29
5524.5	30
5525.0	30
5525.5	31
5526.0	31
5526.1	31
5526.2	31
5526.3	31
5526.4	31
5526.5	31
5526.6	31
5526.7	32
5526.8	32
5526.9	32
5527.0	32
5527.1	32
5527.2	32
5527.3	32

FINAL FOR REPORT

ELEVATION (feet)	DISCHARGE (cfs)
5522.5	0
5525.0	30
5526.3	31
5526.8	32
5527.3	32

Broad Crested Weir Coeff Lookup (W = 0.50 ft)

H_e	B&K C
0.2	2.80
0.4	2.92
0.6	3.08
0.8	3.30
1.0	3.32
1.2	3.32
1.4	3.32
1.6	3.32
1.8	3.32
2.0	3.32

CGR 12/1/08

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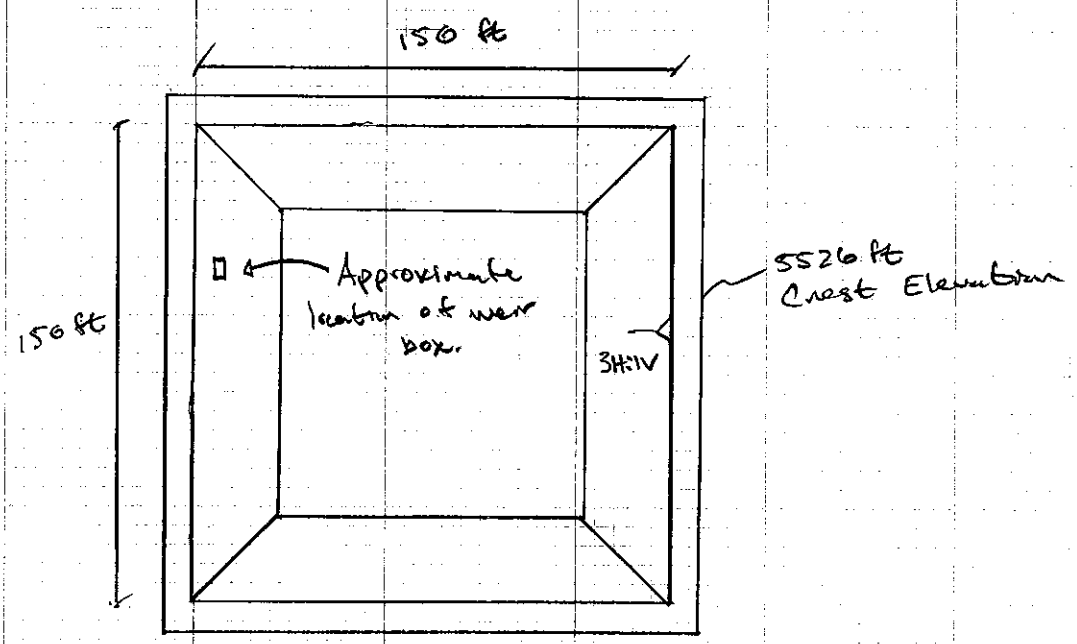
Sheet ____ of ____

2-B/

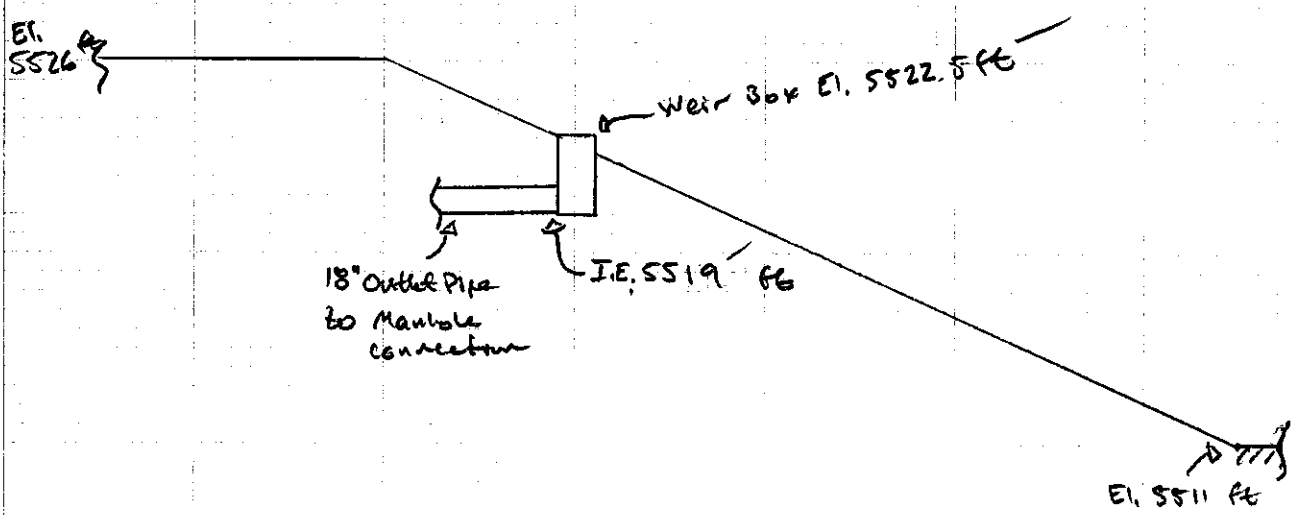
PROJECT Pinon Ridge Mill Design PROJECT NO. 89241

SUBJECT West Pond Outlet Works BY TAK DATE 7/21/08

REVIEWED BY CGL DATE 12/1/08



West Pond Plan View



Pinon Ridge West Stormwater Pond Sizing

Assuming 3H:1V Side Slope	
Crest El. (ft) =	5526
Bottom El. (ft) =	5511
Length (ft) =	150
Width (ft) =	150
Depth (ft) =	15

Elevation (SE) (ft)	Length (ft)	Width (ft)	Volume (ac-ft)	Cum. Vol. (ac-ft)	1000-Yr Storm Cum. Vol. (SV) (ac-ft)	
5526	150	150	0.26	4.5	1.6	1000-Yr Overflow Capacity
5525.5	147	147	0.25	4.2	1.3	
5525	144	144	0.24	4.0	1.1	
5524.5	141	141	0.23	3.7	0.9	
5524	138	138	0.22	3.5	0.6	
5523.5	135	135	0.21	3.3	0.4	
5523	132	132	0.20	3.1	0.2	
5522.5	129	129	0.19	2.9	0.0	100-Yr Storage Capacity (Weir elev)
5522	126	126	0.36	2.7	0.0	
5521.5	120	120	0.33	2.3	0.0	
5521	114	114	0.30	2.0	0.0	
5520.5	108	108	0.27	1.7	0.0	
5520	102	102	0.24	1.4	0.0	
5519.5	96	96	0.21	1.2	0.0	
5519	90	90	0.19	1.0	0.0	
5518.5	84	84	0.16	0.8	0.0	
5518	78	78	0.14	0.6	0.0	
5517	72	72	0.12	0.5	0.0	
5516	66	66	0.10	0.4	0.0	
5515	60	60	0.08	0.3	0.0	
5514	54	54	0.07	0.2	0.0	
5513	48	48	0.05	0.1	0.0	
5512	42	42	0.04	0.1	0.0	
5511	36	36	0.03	0.0	0.0	

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Bright People. Right Solutions.

Sheet 1 of 1

PROJECT Pinion Ridge PROJECT NO. 82241

SUBJECT W & E Stormwater Pond Rundowns BY CGL DATE 11/21/08

REVIEWED BY DATE

2 rundowns for W. Pond
1 rundown for E. Pond
Max design flow is combined, routed total from subbasins 1 and 4.

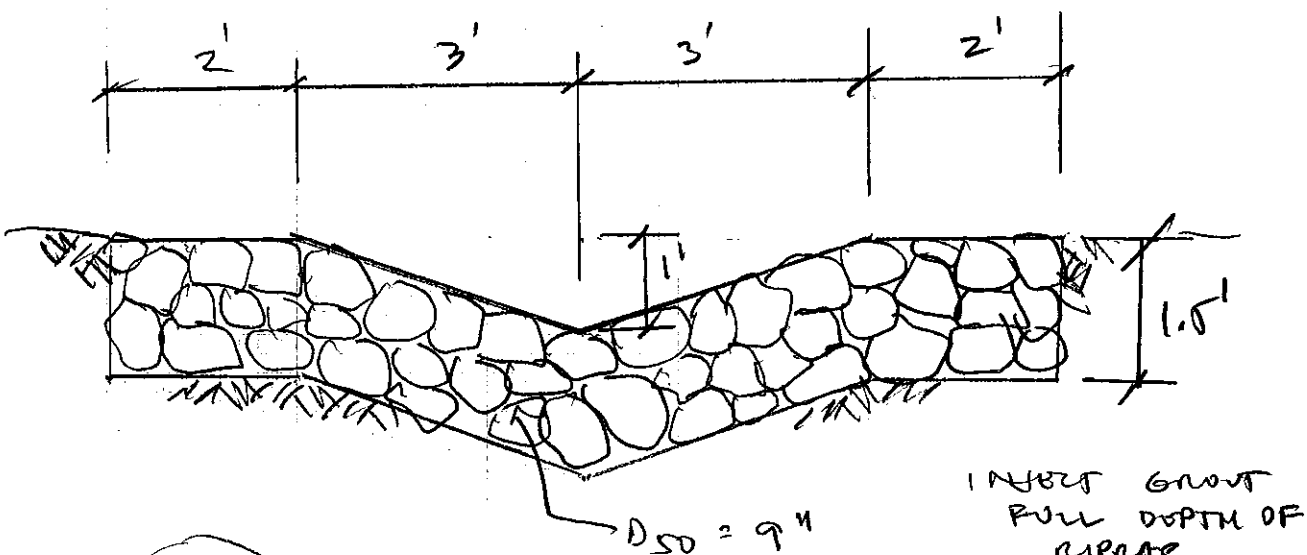
From HEC-1, Q_{100} max ≈ 8 cfs (very conservative)

Using Surface Mining Water Diversion Design Manual, Fig 5.3 for V-channel, S = 0.33

D_{50} ≈ 1' to 1.5' too large.

Using Flowmaster, depth = 0.55 ft
Vel = 8.8 ft/s

Use D_{50} = 9", grout riprap as shown below:



G/C5 GROUTED RIPRAP RUNDOWN DETAIL

ENG-07 REV 05/08