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TECHNICAL ADDENDUM
COLORADO SPRINGS RANCH
MASTER DRAINAGE PLAN

Prepared For
Harris Development, Inc.
First Service Corporation, Inc.

PART 2 OF 3

sla

TECHNICAL ADDENDUM
COLORADO SPRINGS RANCH
MASTER DRAINAGE PLAN

Prepared For

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DESIGN POINT A - 12.7 AC (100% PRD)

SOIL GROUP B - 100%

CN = 89

FROM SCS $Q_5 = 1.11''$ (2.1" OF RAINFALL)
 $Q_{100} = 2.35''$ (3.5" OF RAINFALL)

TIME OF CONCENTRATION: LENGTH = 1000'

 $\Delta h = 65'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$ FROM FIG III-6, $t_c = 0.07 \text{ HR} + 0.17 = 0.24 \text{ HR}$ FROM FIG III-4, $q_p = 1005 \text{ cfs/mi}^2/\text{INCH}$

$$\begin{aligned} 5\text{-YR (6 HR) PEAK RUNOFF} &= 1.11 \times \frac{12.7}{240} \times 1005 \\ &= 22.1 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100\text{-YR (6 HR) PEAK RUNOFF} &= 2.35 \times \frac{12.7}{240} \times 1005 \\ &= 46.9 \text{ cfs} \end{aligned}$$

DESIGN POINT B - 12.4 AC OF PRD

SOIL GROUP B - 100%

CN = 89

FROM SCS $Q_5 = 1.11''$
 $Q_{100} = 2.35''$

TIME OF CONCENTRATION: LENGTH = 730'

 $\Delta h = 37'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$ FROM FIG III-6, $t_c = 0.06 + 0.17 = 0.23 \text{ HR}$ FROM FIG III-4, $q_p = 1040 \text{ cfs/mi}^2/\text{INCH}$

$$\begin{aligned} 5\text{-YR (6 HR) PEAK RUNOFF} &= 1.11 \times \frac{12.4}{240} \times 1040 \\ &= 22.4 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100\text{-YR (6 HR) PEAK RUNOFF} &= 2.35 \times \frac{12.4}{240} \times 1040 \\ &= 47.4 \text{ cfs} \end{aligned}$$



DESIGN POINT C - 22.2 AC, 100% SOIL GROUP B

13.3 AC PRD CN = 89

8.9 AC SF CN = 80

COMPOSITE CN = 85.4

FROM SCS, $Q_5 = 0.89''$

$Q_{100} = 2.05''$

TIME OF CONCENTRATION: LENGTH = 1220'

$\Delta h = 82'$ INITIAL $t_c = 10 \text{ MIN.} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.09 + 0.17 = 0.26 \text{ HR}$

FROM FIG III-4, $q_p = 975 \text{ cfs/mi}^2/\text{INCH}$

$$\begin{aligned} 5 \text{ YR (.6 HR) PEAK RUNOFF} &= 0.89 \times \frac{22.2}{640} \times 975 \\ &= 30.1 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (.6 HR) PEAK RUNOFF} &= 2.05 \times \frac{22.2}{640} \times 975 \\ &= 69.3 \text{ cfs} \end{aligned}$$

DESIGN POINT D - 3.3 AC SOIL GROUP B

100% SF, CN = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 480'

$\Delta h = 13'$ INITIAL $t_c = 10 \text{ MIN.} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.06 + 0.17 = 0.23 \text{ HR}$

FROM FIG III-4, $q_p = 1040 \text{ cfs/mi}^2/\text{IN}$

$$\begin{aligned} 5 \text{ -YR (.6 HR) PEAK RUNOFF} &= 0.62 \times \frac{3.3}{640} \times 1040 \\ &= 3.3 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (.6 HR) PEAK RUNOFF} &= 1.64 \times \frac{3.3}{640} \times 1040 \\ &= 8.8 \text{ cfs} \end{aligned}$$



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DESIGN POINT E - 63.4 AC SOIL GROUP B

20.9 AC PRD CU = 89

42.5 AC SF CU = 80

COMPOSITE CU = 83.0

FROM SCS, $Q_5 = 0.76''$

$Q_{100} = 1.86''$

TIME OF CONCENTRATION: LENGTH = 2400'

AH = 130' INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.16 + 0.17 = 0.33 \text{ HR}$

FROM FIG III-4, $q_p = 885 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.76 \times \frac{63.4}{240} \times 885 \\ = 66.6 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.86 \times \frac{63.4}{240} \times 885 \\ = 163 \text{ cfs}$$

DESIGN POINT F - 129 AC + 63.4 AC (D.P.E) SOIL GROUP B

21.7 AC PRD CU = 89

110.1 AC SF CU = 80

60.6 AC MOBIL DEV CU = 83.3

COMPOSITE CU = 82.1

FROM SCS, $Q_5 = 0.72''$

$Q_{100} = 1.79''$

TIME OF CONCENTRATION: LENGTH = 3040'

AH = 57' TRAVEL TIME FROM D.P.E = 0.33 HR

FROM FIG III-6, $t_c = 0.28 \text{ HR} + 0.33 = 0.61 \text{ HR}$

FROM FIG III-3, $q_p = 660 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.72 \times \frac{192.4}{240} \times 660 \\ = 143 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.79 \times \frac{192.4}{240} \times 660 \\ = 355 \text{ cfs}$$



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DESIGN POINT G - 2.6 AC, SOIL GROUP B

100% SF, CU = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 500'

$\Delta h = 26'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.05 + 0.17 = 0.22 \text{ HR}$

FROM FIG III-4, $q_p = 1040 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{2.6}{240} \times 1040 = 2.6 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{2.6}{240} \times 1040 = 6.9 \text{ cfs}$$

DESIGN POINT H - 13.7 AC + I = 13.7 + 3.6 = 17.3 SOIL GROUP B

100% SF

CU = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 500'

$\Delta h = 10'$ t_c FROM I = 0.26 HR

FROM FIG III-6, $t_c = 0.07 + 0.26 = 0.33$

FROM FIG III-4, $q_p = 885 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{17.3}{240} \times 885 = 14.8 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{17.3}{240} \times 885 = 39.2 \text{ cfs}$$



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DESIGN POINT I - 3.6 AC - SOIL GROUP B

100% SF, CN=80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 700'

$A_h = 11'$ initial $t_c = 10 \text{ min} = 0.17 \text{ hr}$

FROM FIG III-6, $t_c = 0.09 + 0.17 = 0.26 \text{ hr}$

FROM FIG III-4, $q_p = 975 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{3.6}{640} \times 975 = 3.4 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{3.6}{640} \times 975 = 9.7 \text{ cfs}$$

DESIGN POINT J - 5.9 AC + XY = 5.9 + 39.5 = 45.4 AC

13.3 AC, PRP, CN=89; 32.1 AC, SF, CN=80, COMPOSITE CN=82.6

FROM SCS, $Q_5 = 0.74''$

$Q_{100} = 1.83''$

TIME OF CONCENTRATION: LENGTH = 600'

$A_h = 1.2'$ t_c FROM D.P. XY = 0.40 HR

FROM FIG III-6, $t_c = 0.08 + 0.40 = 0.48 \text{ hr}$

FROM FIG III-4, $q_p = 745 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.74 \times \frac{45.4}{640} \times 745 = 39.1 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.83 \times \frac{45.4}{640} \times 745 = 96.7 \text{ cfs}$$



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DESIGN POINT K - 8.5 Ac + J = 8.5 + 45.4 = 53.9 Ac

13.3 Ac PRD, CN = 89 } COMPOSITE
 40.6 Ac SF, CN = 80 } CN = 82.2
 FROM SCS, $Q_5 = 0.72''$
 $Q_{100} = 1.80''$

TIME OF CONCENTRATION: LENGTH = 1800

$\Delta h = 45'$ t_c FROM D.P. J = 0.34 HR

FROM FIG III-6, $t_c = 0.16 + 0.34 = 0.50$ HR

FROM FIG III-4, $q_p = 730$ cfs/mi²/in

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.72 \times \frac{53.9}{2.40} \times 730 = 44.3 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.80 \times \frac{53.9}{2.40} \times 730 = 111 \text{ cfs}$$

DESIGN POINT L - 10.4 Ac SOIL GROUP B

100% PRD, CN = 89

FROM SCS, $Q_5 = 1.11''$

$Q_{100} = 2.35''$

TIME OF CONCENTRATION: LENGTH = 1300'

$\Delta h = 75'$ initial $t_c = 10.17 \text{ in} = 0.17$ HR

FROM FIG III-6, $t_c = 0.10 + 0.17 = 0.27$ HR

FROM FIG III-4, $q_p = 960$ cfs/mi²/in

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.11 \times \frac{10.4}{2.40} \times 960 = 17.3 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.35 \times \frac{10.4}{2.40} \times 960 = 36.7 \text{ cfs}$$



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DESIGN POINT M-15.0 AC SOIL GROUP B

100% SF, CU=80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH=1140'

$\Delta h = 75'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.08 + 0.17 = 0.25 \text{ HR}$

FROM FIG III-4, $q_p = 990 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{15.0}{640} \times 990 = 14.4 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{15.0}{640} \times 990 = 38.1 \text{ cfs}$$

DESIGN POINT N-26.7 AC SOIL GROUP B

100% SF CU=80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH=1520'

$\Delta h = 71'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.12 + 0.17 = 0.29 \text{ HR}$

FROM FIG III-4, $q_p = 935 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{26.7}{640} \times 935 = 24.2 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{26.7}{640} \times 935 = 64.0 \text{ cfs}$$



DESIGN POINT O - 12.9 AC + M = 12.9 + 15.0 = 27.9 AC

SOIL GROUP B

15.0 AC SF, CN = 80

12.9 AC COMMERCIAL, CN = 92

COMPOSITE CN = 85.5

FROM SCS, $Q_5 = 0.90''$

$Q_{100} = 2.06''$

TIME OF CONCENTRATION: LENGTH = 1080'

$\Delta h = 23'$ t_c FROM D.P. M = 0.25 HR

FROM FIG III-6, $t_c = 0.12 + 0.25 = 0.37$ HR

FROM FIG III-4, $q_p = 845 \text{ cfs}/(\text{mi}^2/\text{IN})$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.90 \times \frac{27.9}{640} \times 845 \\ &= 33.2 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 2.06 \times \frac{27.9}{640} \times 845 \\ &= 75.9 \text{ cfs} \end{aligned}$$

DESIGN POINT P - 22.8 + M + N + O + W = 22.8 + 15.0 + 26.7 + 17.4 = 238.9 AC

SOIL GROUP B

17.4 AC COMMERCIAL, CN = 92 5.9 AC OPS, CN = 92

35.2 AC PRD, CN = 89 5 AC SCHOOL, CN = 69

167.9 AC SF, CN = 80 7.5 AC PARK, CN = 61

COMPOSITE CN = 81.7

FROM SCS, $Q_5 = 0.70''$

$Q_{100} = 1.76''$

TIME OF CONCENTRATION: LENGTH = 640'

$\Delta h = 20'$ t_c FROM D.P. O = 0.57 HR

FROM FIG III-6, $t_c = 0.07 + 0.57 = 0.64$ HR

FROM FIG III-4, $q_p = 622 \text{ cfs}/(\text{mi}^2/\text{IN})$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.70 \times \frac{238.9}{640} \times 622 \\ &= 163 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 1.76 \times \frac{238.9}{640} \times 622 \\ &= 409 \text{ cfs} \end{aligned}$$



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DESIGN POINT Q - 18.4 AC SOIL GROUP B

11.4 AC PRD, CN = 89

7.0 AC SF, CN = 80

COMPOSITE CN = 85.6

FROM SCS, $Q_5 = 0.90''$

$Q_{100} = 2.07''$

TIME OF CONCENTRATION: LENGTH = 1520'

$\Delta h = 73'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.12 + 0.17 = 0.29 \text{ HR}$

FROM FIG III-4, $q_p = 935 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.90 \times \frac{18.4}{640} \times 935 = 24.2 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.07 \times \frac{18.4}{640} \times 935 = 55.6 \text{ cfs}$$

DESIGN POINT R - 4.64 AC -

4.64 AC COMMERCIAL, CN = 92

FROM SCS - 6 HR, $Q_5 = 1.33''$

$Q_{100} = 2.64''$

TIME OF CONCENTRATION: LENGTH = 560'

$\Delta h = 20'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.06 + 0.17 = 0.23 \text{ HR}$

FROM FIG III-4, $q_p = 1020 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.33 \times \frac{4.64}{640} \times 1020 = 9.8 \text{ cfs}$$

$$100 \text{ YR (24 HR) PEAK RUNOFF} = 2.64 \times \frac{4.64}{640} \times 1020 = 19.5 \text{ cfs}$$



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DESIGN POINT S - 19.6 AC SOIL GROUP B

5 AC SCHOOL CN = 69

7.5 AC PARK CN = 61

7.1 AC SF CN = 80

COMPOSITE CN = 69.9

FROM SCS, $Q_5 = 0.28''$ $Q_{100} = 1.00''$

TIME OF CONCENTRATION: LENGTH = 900'

 $\Delta h = 35'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$ FROM FIG III-6, $t_c = 0.08 + 0.17 = 0.25 \text{ HR}$ FROM FIG III-4, $q_p = 990 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.28 \times \frac{19.6}{640} \times 990$$

$$= 8.5 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.00 \times \frac{19.6}{640} \times 990$$

$$= 30.3 \text{ cfs}$$

DESIGN POINT T - 22.8 AC + S = 22.8 + 19.6 = 42.4 AC

SOIL GROUP B, 5 AC SCHOOL, CN = 69

7.5 AC PARK, CN = 61

29.9 AC SF, CN = 80

COMPOSITE CN = 75.3

FROM SCS, $Q_5 = 0.44''$ $Q_{100} = 1.32''$

TIME OF CONCENTRATION: LENGTH = 750'

 $\Delta h = 25'$ t_c FROM D.P. S = 0.25FROM FIG III-6, $t_c = 0.08 + 0.25 = 0.33 \text{ HR}$ FROM FIG III-4, $q_p = 885 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.44 \times \frac{42.4}{640} \times 885$$

$$= 25.8 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.32 \times \frac{42.4}{640} \times 885$$

$$= 77.4 \text{ cfs}$$



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DESIGN POINT U - 14.3 AC SOIL GROUP B

100% SF, CN = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 1120'

$\Delta h = 60'$ initial $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.09 + 0.17 = 0.26 \text{ HR}$

FROM FIG III-4, $q_p = 975 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{14.3}{640} \times 975 = 13.5 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{14.3}{640} \times 975 = 35.7 \text{ cfs}$$

DESIGN POINT V - 42.4 AC + T + U = 42.4 + 42.4 + 14.3 = 99.1

SOIL GROUP B

7 AC PRD, CN = 89

5 AC School, CN = 69

4.5 AC COMMERCIAL, CN = 92

7.5 AC PARK, CN = 61

75.1 AC SF, CN = 80

COMPOSITE CN = 79.2

FROM SCS, $Q_5 = 0.59''$

$Q_{100} = 1.58''$

TIME OF CONCENTRATION: LENGTH = 900'

$\Delta h = 25'$ t_c FROM D.P.T = 0.33 HR

FROM FIG III-6, $t_c = 0.09 + 0.33 = 0.42 \text{ HR}$

FROM FIG III-4, $q_p = 800 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.59 \times \frac{99.1}{640} \times 800 = 73.1 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.58 \times \frac{99.1}{640} \times 800 = 196 \text{ cfs}$$



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DESIGN POINT W - 25.8 + 21.6 = 47.4 AC
 5.9 AC OPS, CN = 92
 5.4 AC PRD, CN = 89
 36.1 AC SF, CN = 80
 COMPOSITE CN = 82.5
 FROM SCS, $Q_5 = 0.74''$ (6 HR)
 $Q_{100} = 1.82$

TIME OF CONCENTRATION: LENGTH = 2040'
 $\Delta h = 55'$ t_c FROM D.P. X = 0.27
 FROM FIG III-6, $t_c = 0.18 + 0.27 = 0.45$ HR
 FROM FIG III-4, $q_p = 770$ cfs/mi²/IN

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.74 \times \frac{47.4}{640} \times 770 = 42.5 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.82 \times \frac{47.4}{640} \times 770 = 10.4 \text{ cfs}$$

DESIGN POINT X - 21.6 AC, SOIL GROUP B
 100% S.F., CN = 80
 FROM SCS, $Q_5 = 0.62''$ (6 HR)
 $Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 1100'
 $\Delta h = 40'$ initial $t_c = 10 \text{ min} = 0.17$ HR
 FROM FIG III-6, $t_c = 0.10 + 0.17 = 0.27$
 FROM FIG III-4, $q_p = 960$ cfs/mi²/IN

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{21.6}{640} \times 960 = 19.4 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{21.6}{640} \times 960 = 53.1 \text{ cfs}$$



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CAREFREE ALTERNATE: (AS SHOWN ON PLAN)

$$\text{DESIGN POINT } O-W-O + W + V = 27.9 + 47.4 + 99.1 = 174.4 \text{ AC}$$

SOIL GROUP B

$$17.4 \text{ AC COMMERCIAL, } CN = 92 \quad 5 \text{ AC School, } CN = 69$$

$$12.4 \text{ AC PRD, } CN = 89 \quad 7.5 \text{ AC PARK, } CN = 61$$

$$5.9 \text{ AC OPS, } CN = 92$$

$$126.2 \text{ AC SF, } CN = 80$$

$$\text{COMPOSITE } CN = 81.1$$

$$\text{FROM SCS, } Q_5 = 0.67''$$

$$Q_{100} = 1.72''$$

TIME OF CONCENTRATION: LENGTH = 880

$$A_h = 10' \quad t_c \text{ FROM D.P. } V = 0.42 \text{ HR}$$

$$\text{FROM FIG III-6, } t_c = 0.15 + 0.42 = 0.57 \text{ HR}$$

$$\text{FROM FIG III-4, } q_p = 685 \text{ cfs/MI}^2/\text{IN}$$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.67 \times \frac{174.4}{6.70} \times 685 \\ &= 125 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 1.72 \times \frac{174.4}{6.70} \times 685 \\ &= 321 \text{ cfs} \end{aligned}$$

NOTE: INITIALLY, THE ALIGNMENT OF NORTH CAREFREE DEVIATED FROM THE ENCLOSED PLAN BETWEEN PETERSON ROAD AND MARTSHEFFEL ROAD. THE ALIGNMENT WAS APPROXIMATELY 1300 FT SOUTH OF THE ALIGNMENT SHOWN ON THE DRAINAGE PLAN. BUT, THE ALIGNMENT SHOWN, IS THE SELECTED ALTERNATIVE.



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DESIGN POINT Y - 11.9 AC SOIL GROUP B

100% Single Family - CN = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 960'

$A_h = 40'$

initial $t_c = 10 \text{ min} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.08 + 0.17 = 0.25 \text{ HR}$

FROM FIG III-4, $q_p = 990 \text{ cfs/mi}^2/\text{in}$

$$5\text{-YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{11.9}{640} \times 990 = 11.4 \text{ cfs}$$

$$100\text{-YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{11.9}{640} \times 990 = 30.2 \text{ cfs}$$

DESIGN POINT Z - 34.0 AC + Y = 34.0 + 11.9 = 45.9 AC

SOIL GROUP B

1.1 AC OPS, CN = 92

7.6 AC PRD, CN = 89

37.2 AC SF, CN = 80

COMPOSITE CN = 81.8

FROM SCS, $Q_5 = 0.70''$

$Q_{100} = 1.77''$

TIME OF CONCENTRATION: LENGTH = 1700

$A_h = 42'$

t_c FROM Y = 0.25 HR

FROM FIG III-6, $t_c = 0.16 + 0.25 = 0.41 \text{ HR}$

FROM FIG III-4, $q_p = 805 \text{ cfs/mi}^2/\text{in}$

$$5\text{-YR (6 HR) PEAK RUNOFF} = 0.70 \times \frac{45.9}{640} \times 805 = 40.4 \text{ cfs}$$

$$100\text{-YR (6 HR) PEAK RUNOFF} = 1.77 \times \frac{45.9}{640} \times 805 = 102 \text{ cfs}$$



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DESIGN POINT AA - 25.5 AC + PRD + 2 = 25.5 + 238.9 + 16.7 + 45.9 = 327.0 AC

7.0 AC OPS, CN = 92

5 AC SCHOOL, CN = 69

42.8 AC PRD, CN = 89

7.5 AC PARK, CN = 61

26.8 AC C, CN = 92

237.9 AC SF, CN = 80

COMPOSITE CN = 81.8

FROM SCS, $Q_5 = 0.70''$

$Q_{100} = 1.76''$

TIME OF CONCENTRATION: LENGTH = 1840'

$\Delta h = 35'$ t_c TO D.P.P. = 0.64 HR

FROM FIG III-6, $t_c = 0.20$ HR + 0.64 = 0.84 HR

FROM FIG III-4, $q_p = 5.50$ cfs / mi² / in

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.70 \times \frac{327.0}{640} \times 550 = 197 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.76 \times \frac{327.0}{640} \times 550 = 495 \text{ cfs}$$

DESIGN POINT BB - 34.8 AC

5 AC SCHOOL, CN = 69

10 AC PARK, CN = 61

19.8 AC SF, CN = 80

COMPOSITE CN = 73.0

FROM SCS, $Q_5 = 0.37''$

$Q_{100} = 1.18''$

TIME OF CONCENTRATION: LENGTH = 2120'

$\Delta h = 65'$ initial $t_c = 10$ MIN = 0.17 HR

FROM FIG III-6, $t_c = 0.18$ + 0.17 = 0.35 HR

FROM FIG III-4, $q_p = 865$ cfs

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.37 \times \frac{34.8}{640} \times 865 = 17.4 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.18 \times \frac{34.8}{640} \times 865 = 55.5 \text{ cfs}$$



DESIGN POINT CC - 30.8 AC, SOIL GROUP B

100% SF, CN = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 1080'

$\Delta h = 37'$ initial $t_c = 10 \text{ min} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.10 + 0.17 = 0.27 \text{ HR}$

FROM FIG III-4, $q_p = 960 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{30.8}{640} \times 1080 = 32.2 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{30.8}{640} \times 1080 = 85.2 \text{ cfs}$$

DESIGN POINT DD - 28.5 AC + BB + CC + EE + FF = 113.1 AC

5 AC SCHOOL, CN = 69

10 AC PARK, CN = 61

98.1 AC SF, CN = 80

COMPOSITE CN = 77.8

FROM SCS, $Q_5 = 0.53''$

$Q_{100} = 1.49''$

TIME OF CONCENTRATION: LENGTH = 1000'

$\Delta h = 27'$ t_c FROM D.P. = 0.35 HR

FROM FIG III-6, $t_c = 0.10 + 0.35 = 0.45 \text{ HR}$

FROM FIG III-4, $q_p = 770 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.53 \times \frac{113.1}{640} \times 770 = 72.1 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.49 \times \frac{113.1}{640} \times 770 = 203 \text{ cfs}$$



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DESIGN POINT EE - 7.0 AC SOIL GROUP B

100% SF, CN = 80
 FROM SCS, $Q_5 = 0.62$ "
 $Q_{100} = 1.64$ "

TIME OF CONCENTRATION: LENGTH = 1100'
 $\Delta h = 35'$ initial $t_c = 10 \text{ min} = 0.17 \text{ hr}$
 FROM FIG III-6, $t_c = 0.11 + 0.17 = 0.28 \text{ hr}$
 FROM FIG III-4, $q_p = 950 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{7.0}{640} \times 950 = 6.4 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{7.0}{640} \times 950 = 17.0 \text{ cfs}$$

DESIGN POINT FF - 12.0 AC SOIL GROUP B

100% SF, CN = 80
 FROM SCS, $Q_5 = 0.62$ "
 $Q_{100} = 1.64$ "

TIME OF CONCENTRATION: LENGTH = 1240'
 $\Delta h = 42'$ initial $t_c = 10 \text{ min} = 0.17 \text{ hr}$
 FROM FIG III-6, $t_c = 0.12 + 0.17 = 0.29 \text{ hr}$
 FROM FIG III-4, $q_p = 935 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{12.0}{640} \times 935 = 10.9 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{12.0}{640} \times 935 = 28.8 \text{ cfs}$$



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DESIGN POINT GG-7.5 AC SOIL GROUP B

100% SF, CN = 80
 FROM SCS, $Q_5 = 0.62"$
 $Q_{100} = 1.64"$

TIME OF CONCENTRATION: LENGTH = 1000'
 $\Delta h = 35'$ initial $t_c = 10 \text{ min} = 0.17 \text{ HR}$
 FROM FIG III-6, $t_c = 0.10 + 0.17 = 0.27 \text{ HR}$
 FROM FIG III-4, $q_p = 960 \text{ cfs/MI}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{7.5}{640} \times 960 = 7.0 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{7.5}{640} \times 960 = 18.5 \text{ cfs}$$

DESIGN POINT HH - 58.5 AC + DD + GG = 58.5 + 113.1 + 7.5 = 179.1 AC

SOIL GROUP B
 5 AC School, CN = 69
 10 AC PARK, CN = 61
 164.1 AC SF, CN = 80
 COMPOSITE CN = 78.6
 FROM SCS, $Q_5 = 0.56"$
 $Q_{100} = 1.54"$

TIME OF CONCENTRATION: LENGTH = 1960'
 $\Delta h = 28'$ t_c FROM D.P. DD = 0.45
 FROM FIG III-6, $t_c = 0.22 + 0.45 = 0.67 \text{ HR}$
 FROM FIG III-4, $q_p = 625 \text{ cfs/MI}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.56 \times \frac{179.1}{640} \times 625 = 97.9 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.54 \times \frac{179.1}{640} \times 625 = 269 \text{ cfs}$$



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DESIGN POINT II - 8.6 AC + HH = 8.6 + 179.1 = 187.7 AC

ASSUME SOIL GROUP B

6.3 AC SCHOOL, CN = 6.9

12.5 AC PARK, CN = 61

168.9 AC SF, CN = 80

COMPOSITE CN = 78.4

FROM SCS, $C_s = 0.56''$

$C_{100} = 1.53''$

TIME OF CONCENTRATION: LENGTH = 760'

$\Delta h = 10'$ AC FROM D.P. HH = 0.67 HR

FROM FIG III-6, $t_c = 0.11 + 0.67 = 0.78$ HR

FROM FIG III-4, $q_p = 575 \text{ cfs/mi}^2/\text{IN}$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.56 \times \frac{187.7}{240} \times 575 \\ &= 94.4 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 1.53 \times \frac{187.7}{240} \times 575 \\ &= 258 \text{ cfs} \end{aligned}$$

DESIGN POINT JJ - 20.5 AC SOIL GROUP B

100% SF, CN = 80

FROM SCS, $Q_s = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 1500'

$\Delta h = 67'$ INITIAL $t_c = 10 \text{ min} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.12 + 0.17 = 0.29$ HR

FROM FIG III-4, $q_p = 935 \text{ cfs/mi}^2/\text{IN}$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.62 \times \frac{20.5}{240} \times 935 \\ &= 18.6 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 1.64 \times \frac{20.5}{240} \times 935 \\ &= 49.1 \text{ cfs} \end{aligned}$$



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DESIGN POINT KK - 10.8 Ac + JJ = 10.8 + 20.5 = 31.3 Ac

Soil Group B

100% SF, CN = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 920'

$\Delta h = 30'$ t_c FROM D.P. JJ = 0.29 HR

FROM FIG III-6, $t_c = 0.09 + 0.29 = 0.38$ HR

FROM FIG III-4, $q_p = 835 \text{ cfs}/(\text{mi}^2/\text{in})$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{31.3}{640} \times 835 = 25.3 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{31.3}{640} \times 835 = 67.0 \text{ cfs}$$

DESIGN POINT LL - 24.6 Ac + OS9 = 24.6 + 61.6 = 86.2 Ac

6.2 Ac MULTI FAMILY, CN = 89

80.0 Ac SF, CN = 80

COMPOSITE CN = 80.6

FROM SCS, $Q_5 = 0.65''$

$Q_{100} = 1.69''$

TIME OF CONCENTRATION: LENGTH = 1120'

$\Delta h = 25'$ t_c FROM D.P. OS9 = 0.35 HR

FROM FIG III-6, $t_c = 0.13 + 0.35 = 0.48$ HR

FROM FIG III-4, $q_p = 750 \text{ cfs}/(\text{mi}^2/\text{in})$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.65 \times \frac{86.2}{640} \times 750 = 65.7 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.69 \times \frac{86.2}{640} \times 750 = 171 \text{ cfs}$$



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DESIGN POINT MM - 5.1 AC + LL = 5.1 + 86.2 = 91.3 AC

5.1 AC P.R.D - SOIL GROUP A, CN = 83

6.2 AC MULTI F. - SOIL GROUP B, CN = 89

80.0 AC SF - SOIL GROUP B, CN = 80

COMPOSITE CN = 80.8

FROM SCS, $Q_5 = 0.66''$

$Q_{100} = 1.69''$

TIME OF CONCENTRATION: LENGTH = 400'

$\Delta h = 25'$ t_c FROM P.P. LL = 0.48 HR

FROM FIG III-6, $t_c = 0.04 + 0.48 = 0.52$ HR

FROM FIG III-4, $q_p = 720 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.66 \times \frac{91.3}{640} \times 720 = 67.8 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.69 \times \frac{91.3}{640} \times 720 = 174 \text{ cfs}$$

DESIGN POINT NN - 4.7 AC SOIL GROUP B

100% SF, CN = 80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 300'

$\Delta h = 15'$ INITIAL $t_c = 10 \text{ MIN} = 0.17$ HR

FROM FIG III-6, $t_c = 0.03 + 0.17 = 0.20$ HR

FROM FIG III-4, $q_p = 1060 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.62 \times \frac{4.7}{640} \times 1060 = 4.8 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.64 \times \frac{4.7}{640} \times 1060 = 12.8 \text{ cfs}$$



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DESIGN POINT 00 - 8.0 AC - SOIL GROUP B

100% SF, CN=80

FROM SCS, $Q_5 = 0.62''$

$Q_{100} = 1.64''$

TIME OF CONCENTRATION: LENGTH = 700'

$\Delta h = 30'$ initial $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.07 + 0.17 = 0.24 \text{ HR}$

FROM FIG III-4, $q_p = 1000 \text{ cfs/MI}^2/\text{IN}$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.62 \times \frac{8.0}{640} \times 1000 \\ &= 7.8 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 1.64 \times \frac{8.0}{640} \times 1000 \\ &= 20.5 \text{ cfs} \end{aligned}$$



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DESIGN POINT PP - 3.6 AC + 0.52 = 3.6 + 55.6 = 59.2 AC

- Ignoring Stetson Hills Drainage Plan.

100% OFF/COMB

20.3 AC, GROUP D, CU = 95

38.9 AC, GROUP B, CU = 92

COMPOSITE CU = 93.0

FROM SCS, $Q_5 = 1.41''$

$Q_{100} = 2.73''$

TIME OF CONCENTRATION: LENGTH = 240'

$\Delta h = 15'$ t_c FROM D.P. 0.52 = 0.36 HR

FROM FIG III-6, $t_c = 0.02 + 0.36 = 0.38$ HR

FROM FIG III-4, $q_p = 835$ cfs/mi²/IN

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.41 \times \frac{59.2}{640} \times 835 = 109 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.73 \times \frac{59.2}{640} \times 835 = 211 \text{ cfs}$$

Using Stetson Hills Drainage Plan

OFFSITE $Q_5 = 185$ cfs

$Q_{100} = 345$ cfs

$t_c = 0.02 + 0.40$ (FROM Stetson) = 0.42 HR

$q_p = 800$ cfs/mi²/IN

AREA = 3.6 AC

ADDITIONAL ONSITE RUNOFF (CU = 92)

$$5 \text{ YR (6 HR)} = 1.33'' \times \frac{3.6}{640} \times 800 = 6.0 \text{ cfs}$$

$$100 \text{ YR (6 HR)} = 2.64'' \times \frac{3.6}{640} \times 800 = 11.9 \text{ cfs}$$

TOTAL RUNOFF TO D.P. PP

$$5 \text{ YR} = 185 + 6 = 191 \text{ cfs}$$

$$100 \text{ YR} = 345 + 11.9 = 357 \text{ cfs}$$



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DESIGN POINT QQ (excluding PP) - $40 \text{ Ac} + 0.53 = 40 + 170 = 210 \text{ Ac}$

100% ONSITE = OFF/CONAM

17.6 Ac CN = 93.3

152.4 Ac CN = 83.9

40.0 Ac CN = 92

COMPOSITE CN = 86.2

FROM SCS, $Q_5 = 0.93''$

$Q_{100} = 2.12''$

TIME OF CONCENTRATION: LENGTH = 1680'

ASSUME $V = 6.5 \text{ fps}$, t_c FROM OS3 = 0.44 HR

$t_c = ((1680/6.5)/60 \times 60) + 0.44 = 0.51 \text{ HR}$

FROM FIG III-4, $q_p = 725 \text{ cfs}/\text{mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.93 \times \frac{210}{640} \times 725 = 226 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.12 \times \frac{210}{640} \times 725 = 504 \text{ cfs}$$

POINT QQ including PP w/ Stetson Hills Flows

TOTAL AREA = $210 + 3.6 + 91.6 = 305.2 \text{ Ac}$

210 Ac CN = 86.2

3.6 Ac CN = 92

91.6 Ac CN = 95

COMPOSITE CN = 88.9

FROM SCS, $Q_5 = 1.10''$

$Q_{100} = 2.34''$

TIME OF CONCENTRATION:

SAME AS ABOVE, $t_c = 0.51 \text{ HR}$

$q_p = 725 \text{ cfs}/\text{mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.10 \times \frac{305.2}{640} \times 725 = 380 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.34 \times \frac{305.2}{640} \times 725 = 809 \text{ cfs}$$



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DESIGN POINT RR-32.2A+QQ = 32.2+305.2 = 337.4 AC
 32.2 Ac Park, CN=61
 210.0 Ac CN=86.2
 3.6 Ac CN=92
 91.6 Ac CN=95
 COMPOSITE CN=86.2
 FROM SCS, $Q_5 = 0.93''$
 $Q_{100} = 2.12''$

TIME OF CONCENTRATION: LENGTH = 1100'
 ASSUME $V = 8$ FPS t_c FROM D.P. QQ = 0.51 HR
 $t_c = ((1100/8)/60 \times 60) + 0.51 = 0.55$ HR
 FROM FIG III-4, $q_p = 700$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.93 \times \frac{337.4}{640} \times 700 = 343 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.12 \times \frac{337.4}{640} \times 700 = 782 \text{ cfs}$$

DESIGN POINT SS-36.5 Ac + OSCC = 36.5+90.0 = 126.5 Ac
 15.9 Ac SOIL GROUP B/D, CN=93.3
 23.9 Ac SOIL GROUP B, CN=92
 20.4 Ac SF, B, CN=80
 1.7 Ac RESIDENTIAL B, CN=80
 64.6 Ac RESIDENTIAL B/D, CN=83.9
 COMPOSITE CN=85.5
 FROM SCS, $Q_5 = 0.90''$
 $Q_{100} = 2.06''$

TIME OF CONCENTRATION: LENGTH = 1400'
 $\Delta h = 44'$ t_c FROM OSCC = 0.33 HR
 FROM FIG III-6, $t_c = 0.13 + 0.33 = 0.46$ HR
 FROM FIG III-4, $q_p = 763 \text{ cfs/mi}^2/\text{in}$

$$5\text{-YR (6 HR) PEAK RUNOFF} = 0.90 \times \frac{126.5}{640} \times 763 = 136 \text{ cfs}$$

$$100\text{-YR (6 HR) PEAK RUNOFF} = 2.06 \times \frac{126.5}{640} \times 763 = 311 \text{ cfs}$$



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DESIGN POINT RR - COMPARISON TO GREINER'S
 STETSON HILLS REPORT.

SLA - CALCULATIONS - WITH PARK LAND

COMPOSITE CU = 86.2
 AREA = 0.53 MI² (INCLUDING OS2)
 $t_c = 0.55$ HR
 5 YR (6 HR) FLOW = 343 cfs
 100 YR (6 HR) FLOW = 782 cfs

SLA - CALCULATIONS - ASSUME PARK LAND IS COMMERCIAL

COMPOSITE CU = 89.2
 AREA = 0.53 MI² (INCLUDING OS2)
 $t_c = 0.55$ HR
 5 YR (6 HR) FLOW = 410 cfs
 100 YR (6 HR) FLOW = 879 cfs

FROM MASTER DRAINAGE STUDY FOR STETSON HILLS
 BY GREINER ENGINEERING - MARCH, 1985

COMPOSITE CU = 91.3
 AREA = 0.53 MI²
 $t_c = 0.38$ HR
 5 YR (6 HR) FLOW = 324 cfs
 100 YR (6 HR) FLOW = 660 cfs

EXCLUDING OS2 - GREINER'S PROPOSED CHANNEL WILL
 DIVERT OS2 TO SAND CREEK

SLA - CALCULATIONS - WITH PARK LAND

COMPOSITE CU = 82.9
 AREA = 242.2 AC = 0.378 MI²
 $t_c = 0.55$ HR
 5 YR (6 HR) FLOW = 201 cfs
 100 YR (6 HR) FLOW = 490 cfs

SLA - CALCULATIONS - ASSUME COMMERCIAL FOR PARK LAND

COMPOSITE CU = 87.0
 AREA = 242.2 AC = 0.378 MI²
 $t_c = 0.55$ HR
 5 YR (6 HR) FLOW = 244 cfs
 100 YR (6 HR) FLOW = 556 cfs

FROM SAND CREEK MASTER DRAINAGE STUDY

CU = 89.1 AREA = 0.396 $t_c = 0.47$
 5 YR (6 HR) FLOW = 409 cfs (339 cfs by hand)
 100 YR (6 HR) FLOW = 921 cfs (710 cfs by hand)



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DESIGN POINT TT- 36.6 Ac + SS = 30.0 + 126.5 = 156.5 Ac

21.6 Ac B/D, CN = 93.3

48.2 Ac B, CN = 92

20.4 Ac SF, B, CN = 80

1.7 Ac RES., B, CN = 80

64.6 Ac RES., B/D, CN = 83.9

COMPOSITE CN = 87.1

FROM SCS, $Q_5 = 1.00''$

$Q_{100} = 2.20''$

TIME OF CONCENTRATION: LENGTH = 620'

$\Delta h = 10'$ t_c FROM SS = 0.46 HR

FROM FIG III-6, $t_c = 0.09 + 0.46 = 0.55$ HR

FROM FIG III-4, $q_p = 700 \text{ cfs/mi}^2/\text{IN}$

$$\begin{aligned} 5\text{-YR. (6 HR) PEAK RUNOFF} &= 1.00'' \times \frac{156.5}{640} \times 700 \\ &= 17 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100\text{ YR. (6 HR) PEAK RUNOFF} &= 2.20'' \times \frac{156.5}{640} \times 700 \\ &= 377 \text{ cfs} \end{aligned}$$



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DESIGN POINT ULL = 61.0 AC - SOIL GROUP B

4.2 AC OFFICE, CU = 92

41.8 AC INDUSTRIAL, CU = 88

15.0 AC MULTI FAMILY, CU = 89

COMPOSITE CU = 88.5

FROM SCS, $Q_5 = 1.08"$

$Q_{100} = 2.31"$

TIME OF CONCENTRATION: LENGTH = 3300'

ASSUME $V_{STREET} = 5fps$ - INITIAL $L_c = 10min = 0.17 HR$

$\Delta L_c = (\frac{3300}{5}) + (60 \times 60) = 0.18, L_c = 0.18 + 0.17 = 0.35 HR$

FROM FIG III-4, $q_p = 865 cfs/mi = 1in$

$$5 YR (6 HR) PEAK RUNOFF = 1.08 \times \frac{61.0}{640} \times 865 = 89.0 cfs$$

$$100 YR (6 HR) PEAK RUNOFF = 2.31 \times \frac{61.0}{640} \times 865 = 190 cfs$$



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DESIGN POINT VV - LOW POINT IN NORTH CAREFREE
 AREA FROM D.P. WW = 33.5 AC
 AREA FROM D.P. TT = 156.5 AC
 TOTAL = 190.0 AC

156.5 AC, CN = 87.1

33.5 AC, CN = 74.6

COMPOSITE CN = 84.9

FROM SCS, $Q_5 = 0.87''$

$Q_{100} = 2.01''$

TIME OF CONCENTRATION: LENGTH = 500'

$\Delta h = 5'$ t_c FROM D.P. = 0.55 HR

FROM FIG III-6, $t_c = 0.09 + 0.55 = 0.64$ HR

FROM FIG III-4, $q_p = 643 \text{ cfs/ha}^2/\text{hr}$

$$5\text{-YR (6 HR) PEAK DISCHARGE} = 0.87 \times \frac{190}{640} \times 643 = 166 \text{ cfs}$$

$$100\text{ YR (6 HR) PEAK DISCHARGE} = 2.01 \times \frac{190}{640} \times 643 = 384 \text{ cfs}$$



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DESIGN POINT WW - 33.5 AC - SOIL (GROUP B)

24.1 AC HS, $CN = 69$

9.4 AC PRD, $CN = 89$

COMPOSITE $CN = 74.6$

FROM SCS, $Q_5 = 0.42$

$Q_{100} = 1.28$

TIME OF CONCENTRATION: LENGTH = 1800'

$\Delta H = 35'$ initial $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.20 + 0.17 = 0.37 \text{ HR}$

FROM FIG III-4, $q_p = 875 \text{ cfs/mi}^2/\text{IN}$

$$\begin{aligned} 5\text{-YR (6 HR) PEAK RUNOFF} &= 0.42 \times \frac{33.5}{640} \times 875 \\ &= 19.2 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100\text{-YR (6 HR) PEAK RUNOFF} &= 1.28 \times \frac{33.5}{640} \times 875 \\ &= 58.6 \text{ cfs} \end{aligned}$$



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DESIGN POINT XX - 51.5 AC

51.5 AC SOIL (GROUP B, COMM, CN=92)

COMPOSITE CN=92.0

FROM SCS, $Q_5 = 1.45''$

$Q_{100} = 2.64''$

TIME OF CONCENTRATION: LENGTH = 2000'

$\Delta h = 40'$ initial $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.20 + 0.17 = 0.37 \text{ HR}$

FROM FIG III-4, $q_p = 845 \text{ cfs/mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.45 \times \frac{363.7}{640} \times 845$$

$$= 96.6 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.64 \times \frac{363.7}{640} \times 845$$

$$= 180 \text{ cfs}$$



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DESIGN POINT $YY = \text{Sum } C + H + I = 22.2 + 13.7 + 3.6 = 39.5A$
 SOIL GROUP B

26.2 Ac SF, $CN = 80$

13.3 Ac PRD, $CN = 89$

COMPOSITE $CN = 83.0$

FROM SCS, $Q_5 = 0.76''$

$Q_{100} = 1.86''$

TIME OF CONCENTRATION: LENGTH = 500'

$\Delta h = 10'$ t_c from H = 0.33 HR

FROM FIG III-6, $t_c = 0.07 + 0.33 = 0.40$ HR

FROM FIG III-4, $q_p = 815 \text{ cfs } (1 \text{ in})^2 / 1 \text{ in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.76 \times \frac{39.5}{640} \times 815 = 38.2 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.86 \times \frac{39.5}{640} \times 815 = 93.6 \text{ cfs}$$



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DESIGN POINT Z Z - COMBINED AREA - ULI + OS6
AREA = 61.0 + 263.2 = 324.2 AC
61.0 AC, CU = 88.5
263.2 AC, CU = 85.9
COMPOSITE CU = 86.4
FROM SCS, $Q_5 = 0.95$ "
 $Q_{100} = 2.14$ "
TIME OF CONCENTRATION: $t_c = t_c @ OS6 = 0.39$ HR
FROM FIG III-4, $g_p = 835$ cfs / mi² / in
5 YR (6 HR) FLOW = $0.95 \times 324.2 / 640 \times 835$
= 402 cfs
100 YR (6 HR) FLOW = $2.14 \times 324.2 / 640 \times 835$
= 905 cfs



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DESIGN POINT OS1-74.1 AC, 33.1 AC B, 41.0 AC B-D
 100% OFFICE/COMM

56.5 AC GROUP B, CN = 92
 17.6 AC GROUP D, CN = 95
 COMPOSITE CN = 92.7
 FROM SCS, $Q_5 = 1.39''$
 $Q_{100} = 2.70''$

TIME OF CONCENTRATION: LENGTH = 3800'
 $\Delta h = 270'$ initial $t_c = 10 \text{ min} = 0.17 \text{ HR}$
 FROM FIG III-6, $t_c = 0.20 + 0.17 = 0.37 \text{ HR}$
 FROM FIG III-4, $q_p = 845 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.39 \times \frac{74.1}{640} \times 845 = 136 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.70 \times \frac{74.1}{640} \times 845 = 264 \text{ cfs}$$

DESIGN POINT OS2-55.6 AC, 8.3 AC B, 47.3 AC B-D
 100% OFFICE/COMM

35.3 AC B, CN = 92
 20.3 AC D, CN = 95
 COMPOSITE CN = 93.1
 FROM SCS, $Q_5 = 1.42''$
 $Q_{100} = 2.74''$

TIME OF CONCENTRATION: LENGTH = 3500'
 $\Delta h = 280'$ initial $t_c = 10 \text{ min} = 0.17 \text{ HR}$
 FROM FIG III-6, $t_c = 0.19 + 0.17 = 0.36 \text{ HR}$
 FROM FIG III-4, $q_p = 855 \text{ cfs/mi}^2/\text{in}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.42 \times \frac{55.6}{640} \times 855 = 105 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.74 \times \frac{55.6}{640} \times 855 = 204 \text{ cfs}$$



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DESIGN POINT $OS1 + OS2 = 74.1 \text{ Ac} + 55.6 \text{ Ac} = 129.7 \text{ Ac}$
 100% OFFICE/COMPA,
 91.8 Ac GROUP B, CN=92
 37.9 Ac GROUP D, CN=95
 COMPOSITE CN=92.9
 FROM SCS, $Q_5 = 1.40''$
 $Q_{100} = 2.72''$

TIME OF CONCENTRATION:

t_c FROM D.P. OS1 = 0.37 HR
 FROM FIG III-4, $Q_P = 845 \text{ cfs}/\text{mi}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 1.40 \times \frac{129.7}{640} \times 845 = 240 \text{ cfs}$$

$$100 \text{ YR (6 HR) PEAK RUNOFF} = 2.72 \times \frac{129.7}{640} \times 845 = 466 \text{ cfs}$$

FLOWS FROM GREINER ENR.

5 YR = 185 cfs
 100 YR = 345 cfs



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OFFSITE DESIGN POINT OS3-170 AC

4/9 SOIL GROUP B

3/7 SOIL GROUP D

	B	D	COMPOSITE
17.6 AC COMMERCIAL	CN = 92, 95		CN = 93.3
152.4 AC SF	CN = 89, 89		CN = 83.9

COMPOSITE CN = 84.9

FROM SCS - 6 HR $Q_5 = 0.87''$ (P = 2.1")

$Q_{100} = 2.01''$ (P = 3.5")

TIME OF CONCENTRATION: LENGTH = 5000'

$\Delta h = 265'$ initial $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.27 + 0.17 = 0.44 \text{ HR}$

FROM FIG III-4, $q_p = 780 \text{ cfs/mi}^2/\text{IN}$

$$\begin{aligned} 5 \text{ YR (6-HR) PEAK RUNOFF} &= 0.87 \times \frac{170}{640} \times 780 \\ &= 180 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6-HR) PEAK RUNOFF} &= 2.01 \times \frac{170}{640} \times 780 \\ &= 416 \text{ cfs} \end{aligned}$$



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DESIGN POINT $056 - 92.5 A_c + 057 = 92.5 + 170.7 = 263.2 A_c$

$92.5 A_c - CN = 91.8$

$170.7 A_c - CN = 82.7$

COMPOSITE $CN = 85.9$

FROM SCS, $Q_5 = 0.92''$

$Q_{100} = 2.09''$

TIME OF CONCENTRATION: DIST 057 TO 056 = 1500'

SLOPE = 0.5% ASSUME VEL IN PIPE = 12 FPS

$\Delta t_c = (1500/12) \sqrt{60 \times 60} = 0.03 \text{ HR}$ $L_c @ 057 = 0.35 \text{ HR}$

$t_c = 0.03 + 0.35 = 0.38 \text{ HR}$

FROM FIG III-4, $q_p = 835 \text{ cfs/in}^2/\text{in}$

5-YR (6HR) FLOW = $0.92 \times \frac{263.2}{640} \times 835$
 $= 316 \text{ cfs}$

100 YR (6HR) FLOW = $2.09 \times \frac{263.2}{640} \times 835$
 $= 718 \text{ cfs}$



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OFFSITE DESIGN POINT OS7 - 170.7 AC
 - 100 YR FLOW @ OSCL WILL BE CONVEYED
 DOWN N. CAREFREE

- 10 AC OFF/COMM, B, CN = 92.0
- 15.1 AC OFF/COMM, B/D, CN = 93.3
- 35.9 AC SF, B/D, CN = 83.9
- 109.7 AC SF, B, CN = 80.0
- COMPOSITE CN = 82.7
- FROM SCS, $Q_5 = 0.75''$
- $Q_{100} = 1.84''$

TIME OF CONCENTRATION: LENGTH = 2800

$\Delta h = 130$ initial $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.18 + 0.17 = 0.35 \text{ HR}$

FROM FIG III-4, $q_p = 865 \text{ cfs/MI}^2/\text{IN}$

5 YR (6 HR) FLOW = $0.75 \times \frac{170.7}{640} \times 865$

= 173 cfs

100 YR (6 HR) FLOW = $1.84 \times \frac{170.7}{640} \times 865$

= 425 cfs



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DESIGN POINT OS9-61.6 AC SOIL GROUP B

6.2 AC MULTI-FAMILY, CN=89

55.4 AC SF, CN=80

COMPOSITE CN=80.9

FROM SCS, $Q_5 = 0.67''$

$Q_{100} = 1.70''$

TIME OF CONCENTRATION: LENGTH = 2400'

$\Delta h = 90'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.18 + 0.17 = 0.35 \text{ HR}$

FROM FIG III-4, $q_p = 865 \text{ cfs/MI}^2/\text{IN}$

$$\begin{aligned} 5 \text{ YR (6 HR) PEAK RUNOFF} &= 0.67 \times \frac{61.6}{240} \times 865 \\ &= 558 \text{ cfs} \end{aligned}$$

$$\begin{aligned} 100 \text{ YR (6 HR) PEAK RUNOFF} &= 1.70 \times \frac{61.6}{240} \times 865 \\ &= 142 \text{ cfs} \end{aligned}$$



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DESIGN POINT OSCC - 90.0 AC

22.1 AC GROUP B,

67.9 AC (GROUP B/D),

3.3 AC COMMERCIAL, B/D, CN = 93.3

20.4 AC SF, B, CN = 80

1.7 AC RESIDENTIAL, B, CN = 80

64.6 AC RESIDENTIAL, B/D, CN = 83.9

COMPOSITE CN = 83.3

FROM SCS, $Q_5 = 0.78''$

$Q_{100} = 1.88''$

TIME OF CONCENTRATION: LENGTH = 2800'

$\Delta h = 200'$ INITIAL $t_c = 10 \text{ MIN} = 0.17 \text{ HR}$

FROM FIG III-6, $t_c = 0.16 + 0.17 = 0.33 \text{ HR}$

FROM FIG III-4, $q_p = 885 \text{ cfs}/\text{MI}^2/\text{IN}$

$$5 \text{ YR (6 HR) PEAK RUNOFF} = 0.78 \times \frac{90.0}{640} \times 885$$

$$= 97.1 \text{ cfs}$$

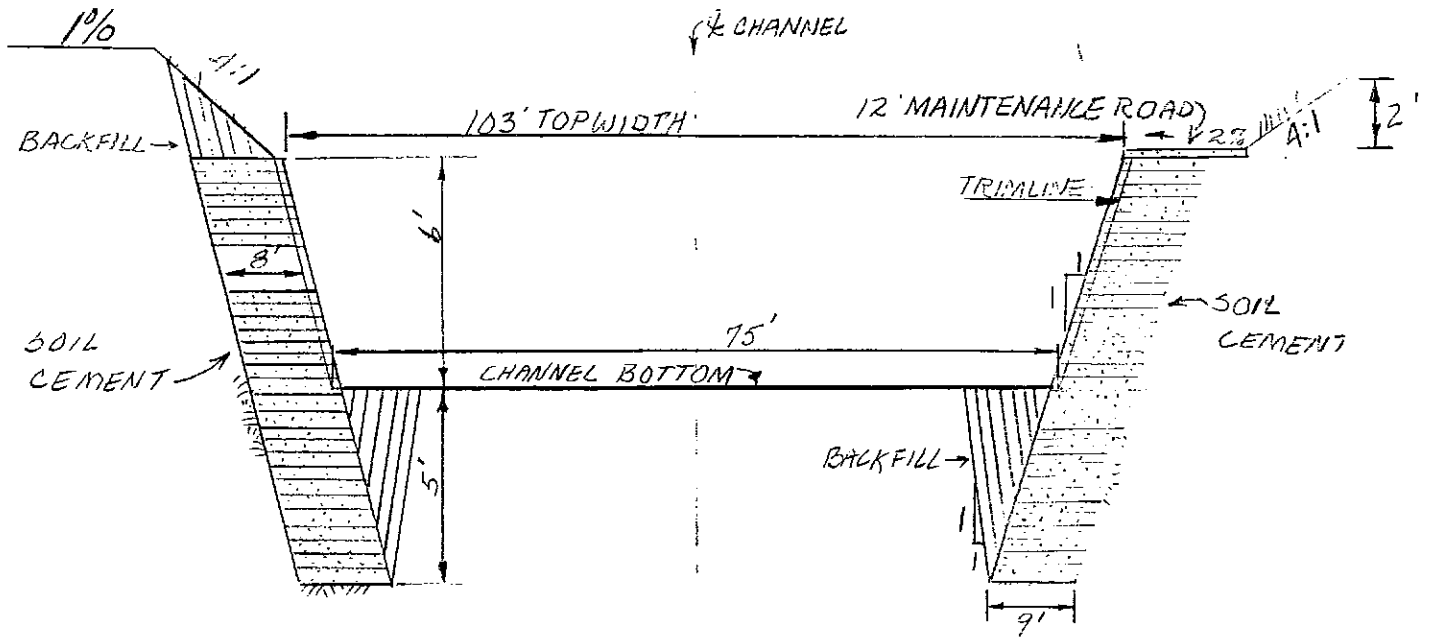
$$100 \text{ YR (6 HR) PEAK RUNOFF} = 1.88 \times \frac{90.0}{640} \times 885$$

$$= 234 \text{ cfs}$$

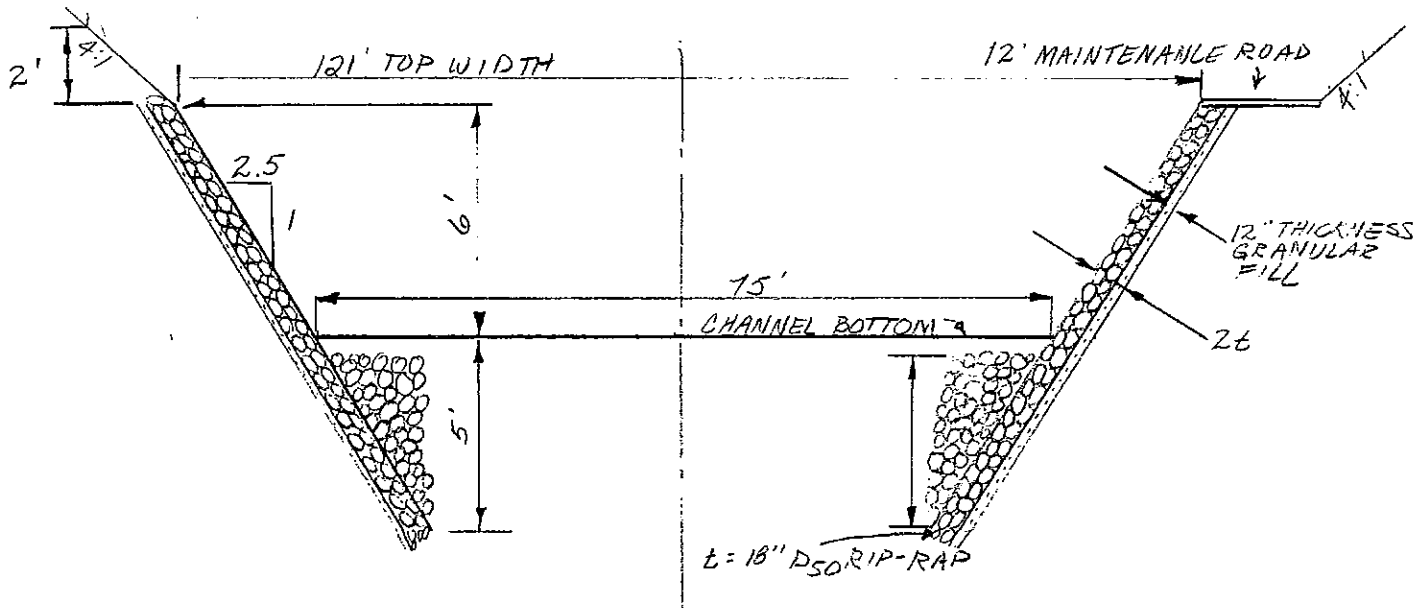
FROM COLORADO COUNTY FIGURE No 6, $Q_5 = 187 \text{ cfs}$



TYPICAL SOIL CEMENT SECTION
 1" = 20' H; 1" = 5' V



TYPICAL RIP-RAP CHANNEL SECTION
 1" = 20' H; 1" = 5' V





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DESIGN POINT C: Peterson Rd.

$$Q_5 = 30.1 \text{ cfs}$$

$$Q_{100} = 69.3 \text{ cfs}$$

CRITERIA: PROVIDE A CULVERT TO CONVEY
THE 100-YR FLOW UNDER PETERSON
ROAD AND PROVIDE A STORM SEWER
TO SAND CREEK

CULVERT DESIGN: $Q = 69.3 \text{ cfs}$

USE 36" RCP @ 1.5% ($H^w/D = 2.0$)

STORM SEWER: USE 36" RCP @ 0.5% MIN ($Q = 30.1 \text{ cfs}$)

($H^w/D = 0.9$)

NOTE: ACTUAL SLOPE WILL BE CLOSER TO
2% \therefore STORM SEWER WILL CONVEY
THE 100 YR STORM W/ AN OVERFLOW
CHANNEL



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DESIGN POINT E:

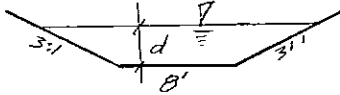
$Q_5 = 66.6 \text{ cfs}$
 $Q_{100} = 163 \text{ cfs}$

CRITERIA: PROVIDE A CULVERT UNDER THE ROAD TO CONVEY THE 5 YR FLOW - 100 YR FLOW WILL OVERTOP THE ROAD - AND PROVIDE A OPEN CHANNEL TO MOBIL LAND R.

CULVERT DESIGN: $Q = 66.6 \text{ cfs}$
 USE 36" RCP @ 1.3% MIN ($H^W/D = 1.8$)

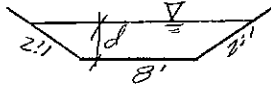
OPEN CHANNEL DESIGN:

FOR RIP-RAP CHANNEL DESIGN: $Q = 66.6 \text{ cfs}$



SLOPE = 1.3% MIN $n = 0.045$
 $d = 1.42'$
 $V = 3.8 \text{ fps}$
 USE 1.5' FREEBOARD
 TOTAL DEPTH = 2.92'

FOR CONCRETE LINED CHANNEL ALTERNATIVE: $Q = 66.6 \text{ cfs}$



SLOPE = 1.3% MIN $n = 0.015$
 $d = 0.81$ TOO LOW
 $V = 8.7 \text{ fps}$
 USE STORM SEWER ALT.

STORM SEWER ALT. - $Q = 66.6 \text{ cfs}$ SLOPE = 1.3%
 USE 36" RCP @ 1.3% MIN ($H^W/D = 1.8$)
 $V = 9.4 \text{ fps}$



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DESIGN POINT H: (PETERSON RD)

$$Q_5 = 14.8 \text{ cfs}$$

$$Q_{100} = 39.2 \text{ cfs}$$

CRITERIA: PROVIDE A CULVERT TO CONVEY
THE 100 YR FLOW UNDER PETERSON
ROAD.

CULVERT DESIGN: $Q = 39.2$
USE 30" RCP @ 1.3% ($H_w/D = 3.4$)

STORM SEWER DESIGN, $Q = 14.8$
USE 30" RCP @ 0.5% ($H_w/D = 1.0$)
 $Q_{CAP} = 25.2 \text{ fs}$

NOTE: IN FINAL DESIGN, THE SLOPE OF THE
CULVERT SHOULD BE EXTENDED ENOUGH TO
MINIMIZE THE BACKWATER EFFECT DURING
THE 100-YR STORM.



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DESIGN POINT J:
 $Q_5 = 39.1 \text{ cfs}$
 $Q_{100} = 96.7 \text{ cfs}$

CRITERIA: PROVIDE STORM SEWER TO
CONVEY 5-YR FLOW - 100 YR FLOW WILL
BE CONVEY BY THE STREET.

STORM SEWER DESIGN: $Q = 39.1 \text{ cfs}$
USE 36" RCP @ 0.5% MIN ($H_{w/d} = 1.1$)



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DESIGN POINT K:

$$Q_5 = 44.3 \text{ cfs}$$

$$Q_{100} = 111 \text{ cfs}$$

CRITERIA: PIPE THE 5-YR FLOW & PROVIDE
 A OVERFLOW-GRASS LINED-CHANNEL TO
 CONVEY THE 100 YR FLOW TO SAND CREEK.

PIPE SIZE: $Q_5 = 44.3 \text{ cfs}$

SLOPE = 0.5 TO 1%

USE 36" RCP @ 0.6% MIN (H/W/D = 1.2)

OVERFLOW CHANNEL: $Q = 111 \text{ cfs}$

SLOPE = 1.0%

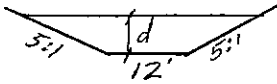
GRASS LINED, $n = 0.045$

$$d = 1.58'$$

$$v = 3.6 \text{ fps}$$

USE 1.5' FREEBOARD

$$\text{TOTAL DEPTH} = 3.08'$$



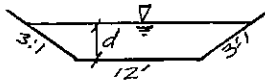
DESIGN POINT O & W+V
 $Q_5 = 125 \text{ cfs}$
 $Q_{100} = 321 \text{ cfs}$

CRITERIA: PROVIDE CHANNEL TO CONVEY 100 YR FLOW, & PROVIDE CULVERT UNDER PETERSON RD FOR 100-YR FLOW

CULVERT DESIGN: $Q = 321 \text{ cfs}$ HWID MAX = 1.5
 DESIGN SLOPE = 2.5%
 USE 2-60" RCP @ 0.5% MIN (HWID = 1.3)
 OR 1-5' x 7' WIDE BOX @ 0.6% MIN (HWID = 1.3)

CHANNEL SIZE:

ALT. 1 - RIP-RAP CHANNEL - $Q = 321 \text{ cfs}$



$n = 0.045$ SLOPE = 2.5%

$d = 2.33$

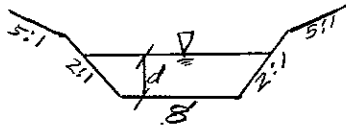
$V = 7.3 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 3.83'

D

ALT. 2 - CONCRETE LINED - $Q = 321 \text{ cfs}$



$n = 0.015$ SLOPE = 2.5%

$d = 1.62'$

$V = 17.7 \text{ fps}$

USE 4.8' FREEBOARD

TOTAL DEPTH = 6.42'

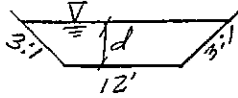
DESIGN POINT P:

$Q_5 = 163 \text{ cfs}$

$Q_{100} = 409 \text{ cfs}$

CRITERIA - PROVIDE CHANNEL TO CONVEY
100-YR FLOW.

ALT. 1 - RIP-RAP - Q=409 cfs



$n = 0.045$

SLOPE = 2.5%

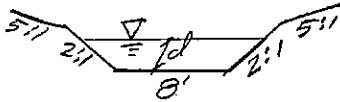
$d = 2.63'$

$v = 7.8 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 4.13'

ALT. 2 - CONCRETE CHANNEL - Q=409 cfs



$n = 0.015$

SLOPE = 2.5%

$d = 1.85'$

$v = 19.0$

USE 5.0' FREEBOARD

TOTAL DEPTH = 6.52'

CULVERT UNDER N. CAREFREE

$Q = 409 \text{ cfs}$

$HW/D = 1.3 \quad n = 0.015$

SLOPE = 2.5%

USE 1-6'x7' WIDE BOX @ 0.5% SLOPE MIN

USE SAME CULVERT FOR NEXT CROSSING OF
CHANNEL



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DESIGN POINT T:

$$Q_5 = 25.8 \text{ cfs}$$

$$Q_{100} = 77.4 \text{ cfs}$$

CRITERIA: PROVIDE STORM SEWER FOR 5-YR \bar{Q}
 PROVIDE OVERFLOW CHANNEL FOR
 100-YR FLOW

PIPE SIZE: $Q = 25.8 \text{ cfs}$

SLOPE = 0.5% (MIN)

USE 30" ϕ RCP @ 0.5% SLOPE ($V = 5.9 \text{ fps}$) ($\frac{HW}{D} = 1.1$)

OR 36" ϕ CMP @ 0.5% SLOPE ($V = 3.6 \text{ fps}$) ($\frac{HW}{D} = 0.8$)

OVERFLOW CHANNEL: $Q = 77.4 - 25.8 = 51.6 \text{ cfs}$

GRASS-LINED - $n = 0.045$

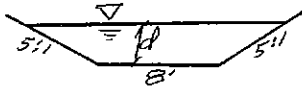
SLOPE = 1.0% MIN

$$d = 1.24'$$

$$V = 3.0 \text{ fps}$$

USE 1.5' FREEBOARD

$$\text{TOTAL DEPTH} = 2.74'$$



DESIGN POINT V:

$Q_5 = 73.1 \text{ cfs}$
 $Q_{100} = 196 \text{ cfs}$

CRITERIA: 5-YR FLOW TO BE CONVEY BY STORM SEWER, 100-YR BY STREET FLOW

PIPE SIZE: $Q = 73.1$

SLOPE = 0.5% MIN TO 1.0% MAX
 USING MANNING'S

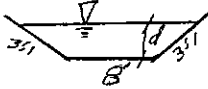
USE 48" RCP @ 0.5% MIN ($V = 8 \text{ fps}$) (HWD = 1.0)
 OR 48" CMP @ 0.9% MIN ($V = 5.9 \text{ fps}$) (HWD = 1.0)

STREET CAPACITY: $\approx 20 \text{ cfs}$

\therefore STORM SEWER OR CHANNEL MUST BE ABLE TO CONVEY 176 cfs

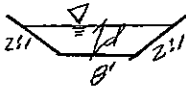
ALT. 1 - PIPE ENTIRE 100-YR FLOW ($Q = 196 \text{ cfs}$) $S = 0.5\%$ TO 1.0%
 USE 60" RCP @ 0.6% MIN ($V = 10.3 \text{ fps}$)
 HWD = 1.5

ALT. 2 - CHANNEL ENTIRE 100-YR FLOW



- RIP-RAP, $n = 0.045$, $S = 0.5\%$
 $d = 3.11'$
 $V = 3.7 \text{ fps}$
 USE 1.5' FREEBOARD
 TOTAL DEPTH = 4.61'

A



- CONCRETE LINED, $n = 0.015$, $S = 0.5\%$
 $d = 1.92'$
 $V = 8.7 \text{ fps}$
 USE 1.5' FREEBOARD
 TOTAL DEPTH = 2.42'



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DESIGN POINT W:

$$Q_5 = 42.5 \text{ cfs}$$

$$Q_{100} = 104 \text{ cfs}$$

CRITERIA: SINCE THE RUNOFF MUST CROSS
AN ARTERIAL STREET, PROVIDE A CULVERT
TO CONVEY THE 100-YR STORM

$$Q = 104 \text{ cfs} \quad \text{SLOPE} = 1.0\%$$

USE 48" RCP @ 0.7% MIN ($V^w/D = 1.4$)



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DESIGN POINT Z: (PETERSON ROAD)

$$Q_5 = 40.4 \text{ cfs}$$

$$Q_{100} = 102 \text{ cfs}$$

CRITERIA: PROVIDE STORM SEWER FOR 5-YR
FLOWS - 100-YR FLOW WILL BE DRAINED
BY THE STREETS.

PIPE SIZE: $Q = 40.4 \text{ cfs}$

$$\text{SLOPE} = 1.0\%$$

USE 30" RCP @ 1.0% MIN.

$$\text{HW/D} = 1.8$$

NOTE: FOR THE CROSSING OF PETERSON ROAD
USE A CULVERT CAPABLE OF CONVEYING
THE 100-YR FLOWS

$$Q = 102 \text{ cfs} \quad \text{SLOPE} = 1.0\%$$

USE 48" RCP @ 0.7% MIN ($\text{HW/D} = 1.4$)

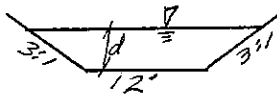
OR 54" CMP @ 1.0% MIN ($\text{HW/D} = 1.1$)

DESIGN POINT AA:

$Q_5 = 197 \text{ cfs}$
 $Q_{100} = 495 \text{ cfs}$

CRITERIA: PROVIDE CHANNEL TO CONVEY 100-YR FLOW - COMBINATION CHANNEL.

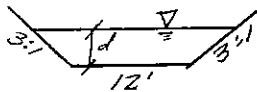
ALT 1: RIP-RAP CHANNEL FOR 100 YR FLOW



$Q = 495 \text{ cfs}$
 $n = 0.045$
 SLOPE = 1.5%
 $d = 3.30'$
 $V = 6.9 \text{ fps}$
 USE 1.5' FREEBOARD
 TOTAL DEPTH = 4.80'

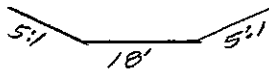
F

ALT 2: RIP-RAP CHANNEL FOR 5-YR FLOW - PROVIDE FREEBOARD FOR 100-YR FLOW



$Q = 197 \text{ cfs}$
 $n = 0.045$
 SLOPE = 1.5%
 $d = 2.06'$
 $V = 5.3 \text{ fps}$
 TOTAL DEPTH = ALT 1 = 4.80'

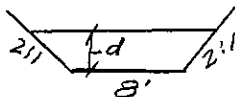
ALT 3: CONCRETE PIPE FOR THE 5 YR FLOW & GRASS LINED CHANNEL FOR THE 100-YR FLOW



PIPE DESIGN: $Q = 197 \text{ cfs}$ SLOPE = 1.5%
 USE 54" RCP @ 1.0% MIN
 CHANNEL DESIGN: $Q = 495 - 197 = 298 \text{ cfs}$
 SLOPE = 1.5% $n = 0.045$
 $d = 2.03'$
 $V = 5.3 \text{ fps}$
 USE 1.5' FREEBOARD
 TOTAL DEPTH = 3.53'

CULVERT DESIGN - 100 YR FLOW, $Q = 495 \text{ cfs}$ HW/D = 1.3 MAX
 USE 6' x 9' CONCRETE BOX @ 0.5% (HW/D = 1.25)

ALT 4: CONCRETE CHANNEL FOR 100 YR FLOW



$Q = 495 \text{ cfs}$ $n = 0.015$ SLOPE = 1.5%
 $d = 2.34'$
 $V = 16.7$
 USE 4.3' FREEBOARD

DESIGN POINT CC:

$Q_5 = 32.2 \text{ cfs}$
 $Q_{100} = 85.2 \text{ cfs}$

CRITERIA: PROVIDE STORM SEWER FOR 5-YR FLOW WITH A OVERFLOW CHANNEL OR STREET FOR 100-YR STORM.

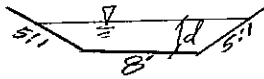
PIPE SIZE: $Q = 32.2 \text{ cfs}$

SLOPE = 1.5%

USE 30" ϕ RCP @ 0.7% MIN ($V = 7.0 \text{ fps}$) ($\frac{V}{D} = 1.4$)

OR 36" ϕ CMP @ 0.8% MIN ($V = 4.6 \text{ fps}$) ($\frac{V}{D} = 1.0$)

OVERFLOW CHANNEL: $Q = 85.2 - 32.2 = 53.0 \text{ cfs}$



GRASS-LINED CHANNEL $n = 0.045$

SLOPE = 1.5%

$d = 1.13'$

$V = 3.5 \text{ fps}$

USE 1.5 FT FREEBOARD

TOTAL DEPTH = 2.63'

DESIGN POINT DD - (PETERSON)

$$Q_5 = 72.1 \text{ cfs}$$

$$Q_{100} = 203 \text{ cfs}$$

CRITERIA - PIPE TO CONVEY 5 YR FLOW, STREETS.
 OR GRASS-LINED CHANNEL TO CONVEY
 100 YR STORM

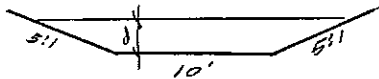
PIPE SIZE: INLETS AND A SMALLER PIPE SYSTEM
 WILL COLLECT THE RUNOFF AND CONVEY IT TO
 THIS POINT. INLET CONDITION DOES NOT
 APPLY. (USE MAXIMUMS)

$$Q_5 = 72.1 \text{ MIN SLOPE} = 1.0\%$$

$$\text{USE } 36" \text{ } \phi \text{ RCP @ } 1.2\% \text{ SLOPE (V} = 10.4 \text{ FPS) (} \frac{H_w}{D} = 2.0)$$

$$\text{OR } 48" \text{ } \phi \text{ CMP @ } 1.0\% \text{ SLOPE (V} = 6.2 \text{ FPS) (} \frac{H_w}{D} = 1.0)$$

$$\text{OVERFLOW CHANNEL: } Q = 203 - 72 = 131 \text{ cfs}$$



GRASS-LINED CHANNEL $n = 0.045$

MIN SLOPE = 1.5%

$$d = 1.65'$$

$$V = 4.4 \text{ FPS}$$

USE 1.5' FREEBOARD

$$\text{TOTAL DEPTH} = 3.15'$$

NOTE: CULVERT UNDER PETERSON ROAD NEEDS
 TO BE ABLE TO CONVEY THE 100-YR
 FLOWS

$$Q_{100} = 203 \text{ cfs} \quad \text{slope} = 1.0\% \text{ MIN}$$

$$\text{USE } 54" \text{ RCP @ } 1.5\% \text{ (} \frac{H_w}{D} = 2.2)$$

$$\text{OR } 60" \text{ CMP @ } 2.1\% \text{ (} \frac{H_w}{D} = 1.6)$$



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DESIGN POINT HH -

$$Q_5 = 97.9$$

$$Q_{100} = 269$$

CRITERIA: PIPE TO CONVEY 5YR FLOW, GRASS-LINED CHANNEL TO CONVEY 100 YR STORM

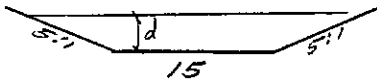
PIPE SIZE: INLETS TO COLLECT RUNOFF, PIPE TO CONVEY IT TO SAND CREEK, ∴ INLET CONDITIONS DOES NOT APPLY. (USE MANNING'S)

$$Q = 97.9 \text{ MIN SLOPE} = 0.5\%$$

$$\text{USE } 48" \text{ RCP @ } 0.5\% \text{ SLOPE } (V = 8.1 \text{ FPS}) \text{ HW/D} = 1.3$$

$$\text{OR } 54" \text{ CMP @ } 0.9\% \text{ SLOPE } (V = 6.4 \text{ FPS}) \text{ HW/D} = 1.0$$

OVERFLOW CHANNEL: $Q = 269 - 98 = 171 \text{ cfs}$



GRASS-LINED CHANNEL $n = 0.045$

$$\text{MIN SLOPE} = 1.5\%$$

$$d = 1.63'$$

$$V = 4.6 \text{ FPS}$$

USE 1.5' FREEBOARD

$$\text{TOTAL DEPTH} = 3.13'$$



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DESIGN POINT LL -

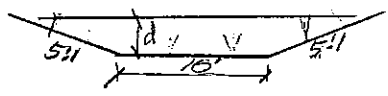
$Q_5 = 65.7 \text{ cfs}$
 $Q_{100} = 171 \text{ cfs}$

CRITERIA: PIPE TO CONVEY THE 5 YR STORM & PROVIDE GRASS-LINED OVERFLOW CHANNEL.

PIPE SIZE: FROM DESIGN POINT 059
 MIN. SIZE IS 48" ϕ HWID = 1.0
 USE 48" ϕ RCP @ 0.5% SLOPE (MIN)
 OR 48" ϕ CMP @ 0.7% SLOPE (MIN)

INLET SIZE: TO BE DETERMINE @ FINAL DRAINAGE STUDY WITH MINIMUM FLOW RATE = 9.9 cfs (65.7-55.8)

OVERFLOW CHANNEL: $Q = 171 - 65.7 = 105.3 \text{ cfs}$



GRASS-LINED CHANNEL $n = 0.045$
 MIN SLOPE = 1.5%
 MAX DEPTH = 1.48' (USING MANNING'S)
 $V = 5.1 \text{ fps}$
 USE 1.5 FT FREEBOARD
 TOTAL DEPTH = 3.0'

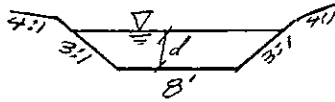


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DESIGN POINT Q Q: (INCLUDING PP) - SOUTH CAREFREE CR.
 $Q_5 = 380 \text{ cfs}$
 $Q_{100} = 809 \text{ cfs}$

CRITERIA: BOTH THE 5 YR & THE 100 YR FLOW WILL BE CHANNELIZED.

RIP-RAP CHANNEL ALT:



$Q = 809 \text{ cfs}$

SLOPE = 1.5%

$n = 0.045$

$d = 4.66$

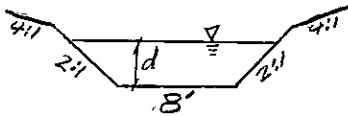
$V = 7.9 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 6.16'

CHANNEL SECTION B

CONCRETE CHANNEL ALT:



$Q = 809 \text{ cfs}$

SLOPE = 1.5%

$n = 0.015$

$d = 3.02'$

$V = 19.1$

USE 2.7' FREEBOARD

TOTAL DEPTH = 5.70'

CULVERTS UNDER SOUTH CAREFREE:

NOTE: TO CONVEY THE 100-YR STORM

USE 3-60" RCP @ 1.1% HW/D = 2.2' / HEADWALL

OR 1-6'x12' WIDE CONCRETE BOX HW/D = 1.5' / HEADWALL

SLOPE = 0.5%



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DESIGN POINT SS:

$$Q_5 = 129 \text{ cfs}$$

$$Q_{100} = 294 \text{ cfs}$$

CRITERIA: SINCE 100-YR MIGHT BE PIPED UNDER POWERS BLVD. PROVIDE STORM SEWER FOR 100-YR FLOW-INLETS DESIGN WILL BE DONE IN CONJUNCTION WITH POWERS BLVD CONSTRUCTION;

STORM SEWER DESIGN: $Q = 294 \text{ cfs}$

$$n = 0.015$$

$$\text{SLOPE} = 1.7\% \text{ MAX}$$

USE 60" RCP @ 1.7%

OR 72" RCP @ 0.7%

DESIGN POINT XX

$Q_5 = 76.6 \text{ cfs}$

$Q_{100} = 180 \text{ cfs}$

CRITERIA: BECAUSE THE CROSS-STREET WILL PROBABLY BE GRADED, WITHOUT A LOW (SUMP) POINT, TO DRAIN ONTO CONSTITUTIONAL AVE, IT IS RECOMMENDED TO PROVIDE A CULVERT / STORM SEWER TO CONVEY THE 100-YR STORM

CULVERT / STORM SEWER DESIGN

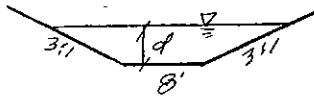
$Q = 180 \text{ cfs}$

$n = 0.013$

SLOPE = 0.5%

USE 60" RCP @ 0.5% (H/W/D = 1.4)

RIP-RAP CHANNEL ALT. DOWNSTREAM OF CULVERT



$Q = 180 \text{ cfs}$

$n = 0.045$

SLOPE = 0.5%

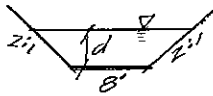
$d = 3.0'$

$V = 3.6 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 4.5'

CONCRETE CHANNEL ALT. DOWNSTREAM OF CULVERT



$Q = 180 \text{ cfs}$

$n = 0.015$

SLOPE = 0.5%

$d = 1.73'$

$V = 8.0 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 3.23'

CHANNEL SECTION A



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DESIGN POINT X.X:

$$Q_5 = 38.2 \text{ cfs}$$

$$Q_{100} = 93.6 \text{ cfs}$$

CRITERIA: PROVIDE A STORM SEWER SYSTEM
TO CONVEY THE 5-YR FLOW, THE 100-YR
FLOW WILL BE CONVEY BY THE STREET

STORM SEWER DESIGN: $Q = 38.2 \text{ cfs}$
USE 36" RCP @ 0.5% MIN ($H_w/D = 1.1$)

DESIGN POINT ZZ: (S. CAREFREE)

$Q_5 = 402 \text{ cfs}$

$Q_{100} = 905 \text{ cfs}$

CRITERIA: PROVIDE CULVERT & CHANNEL FOR 100 YR FLOW.

CULVERT UNDER S. CAREFREE CR.

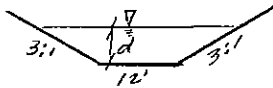
$Q_{100} = 905 \text{ cfs}$ $n = 0.013$

USE 2'-72" RCP @ 1.2% (H_W/D = 2.4)

OR 7' x 12' R.C. BOX @ 0.5% (H_W/D = 1.5)

ALT 1 - RIP-RAP CHANNEL

SECTION H



$Q = 905 \text{ cfs}$

$n = 0.045$

$S = 1.0\%$

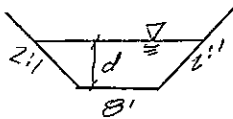
$d = 4.89'$

$V = 6.9 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 6.4'

ALT 2 - CONCRETE CHANNEL



$Q = 905$

$n = 0.015$

$S = 1.0\%$

$d = 3.54'$

$V = 17.0 \text{ fps}$

USE 2.2' FREEBOARD

TOTAL DEPTH = 5.74'

DESIGN POINT OS3; POWERS BLVD.

$Q_5 = 180 \text{ cfs}$

$Q_{100} = 416 \text{ cfs}$

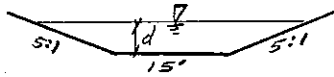
CRITERIA: THE 5 YR FLOW WILL BE PIPED, THE 100 YR FLOW WILL BE CHANNELLED

PIPE SIZE: $Q = 180 \text{ cfs}$

SLOPE RANGE 0.5% TO 2.0%

USE 60" ϕ RCP @ 0.5% ($V = 9.4 \text{ fps}$) } HW/D =
 OR 60" ϕ CMP @ 1.7% ($V = 9.4 \text{ fps}$) } 1.4' W/ HEADWALL

OVERFLOW CHANNEL: $Q = 416 - 180 = 236 \text{ cfs}$



GRASS-LINED - $n = 0.045$

MIN SLOPE = 1.5%

$d = 1.93'$

$V = 5.0 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 3.43'

ALTERNATE 1: RIP-RAP LINED CHANNEL FOR 5 & 100 YR FLOW

$Q = 416 \text{ cfs}$ $n = 0.045$

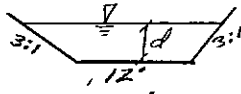
MIN SLOPE = 1.5%

$d = 3.03'$

$V = 6.5 \text{ fps}$

USE 1.5' FREEBOARD

TOTAL DEPTH = 4.53'



ALTERNATE 2: CONCRETE LINED CHANNEL FOR 5 & 100 YR FLOW

$Q = 416 \text{ cfs}$ $n = 0.015$

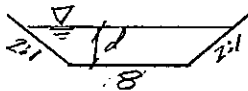
MIN SLOPE = 1.0% (USE 1.5 FOR DESIGN)

$d = 2.14'$

$V = 15.9$

USE 3.93' FREEBOARD ($\frac{V^2}{2g}$)

TOTAL DEPTH = 6.07'



CULVERT UNDER POWERS BLVD - $Q_{100} = 416 \text{ cfs}$ slope = 1.0%

USE 72" RCP @ 1.3% (HW/D = 2.1)

OR 2-60" RCP @ 0.9% (HW/D = 1.6)

(EXIST. CONDITION - 1-66" CMP FROM INLET CONTROL $Q_{CMP} = 250 \text{ cfs}$, HW/D = 1.5)

DESIGN POINT 059 -

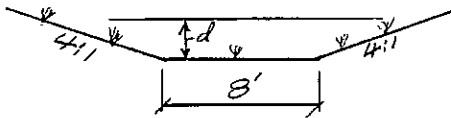
$Q_5 = 55.8 \text{ cfs}$
 $Q_{100} = 142 \text{ cfs}$

CRITERIA - PIPE THE 5YR FLOW & PROVIDE OVERFLOW CHANNEL BY MEANS OF RESIDENTIAL STREET OR GRASS LINED CHANNEL.

SIZE OF PIPE: $Q = 55.8 \text{ cfs}$ HW/D = 1.0 MAX
 FROM CHART 2
 USE 48" RCP @ 0.5% SLOPE MIN } W/ HENDWALL
 OR 48" CMP @ 0.5% SLOPE MIN }

CAR 48" PIPE @ HW/D = 72 cfs

OVERFLOW CHANNEL: $Q = 142 - 72 = 70 \text{ cfs}$

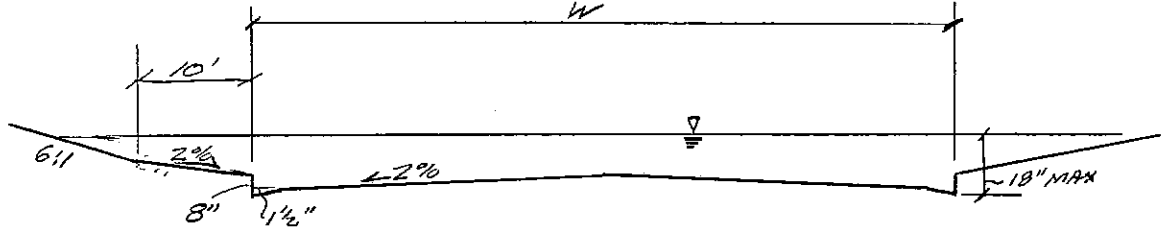


GRASS-LINED $n = 0.045$
 MIN SLOPE = 1.5%
 MAX DEPTH = 1.35' (USING MANNING'S)
 $V = 3.9 \text{ fps} \approx 5.0 \text{ MAX}$
 USE 1.5' FREEBOARD
 TOTAL DEPTH = 2.85

IF OFFSITE DEVELOPMENT OCCURS PRIOR TO DEVELOPMENT OF THIS AREA, STORM SEWER CAN BE:

USE 30" RCP @ 1.9% MIN.
 OR 36" CMP @ 2.4% MIN.

STREET CAPACITY - 100-YR



$W = 40'$ (COLLECTOR)

AREA = 2 [(CURB: $2' \cdot (1.5 + 1.395) / 2$) + (SIDEWALK: $1/2 (0.833 + 0.633) 10$) + (GRASS: $1/2 (0.633 \times 3.8)$) + $18' \times 1/2 (1.375 + 1.015)$]
 = 2 [2.875 + 7.33 + 1.203 + 21.51] = 2 [32.918]
 = 65.84 FT²

WETTED P = [18' + 2' + 0.667 + 10 + 3.85] × 2 = 69.035 FT

WEIGHTED $n = [(18 \times 0.02) + (2 \times 0.013) + (0.667 \times 0.013) + (10 \times 0.013) + (3.85 \times 0.045)] / 34.52$
 = 0.0198 USE 0.020

SLOPE	V	Q CAP	RESTRICTION FACTOR	Q ALLOW
0.5%	5.10	336	0.65	218
1.0	7.22	475	0.8	380
1.5	8.84	582	0.8	466
2.0	10.21	672	0.8	537
3.0	12.5	823	0.715	588
4.0	14.4	951	0.61	580
5.0	16.1	1063	0.49	521
6.0	17.7	1164	0.395	460


```
*****
* WATER SURFACE PROFILES *
* VERSION OF NOVEMBER 1976 *
* UPDATED MAY 1984 *
* *
* RUN DATE 22-MAR-85 TIME 09:52:08 *
*****
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*****
* U.S. ARMY CORPS OF ENGINEERS *
* THE HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET, SUITE D *
* DAVIS, CALIFORNIA 95616 *
* (916) 440-2105 (FTS) 448-2105 *
*****
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      X   X  XXXXXXXX  XXXXX          XXXXX
      X   X  X          X   X          X   X
      X   X  X          X             X
      XXXXXXXX  XXXX  X             XXXXX  XXXXX
      X   X  X          X             X
      X   X  X          X             X
      X   X  XXXXXXXX  XXXXX          XXXXXXXX
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THIS RUN EXECUTED 22-MAR-85 09:52:08

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55

T1 COFA03
 T2 PROPOSED CHANNEL-SUPERCritical RUN
 T3 SAND CREEK CHANNEL (UPSTREAM PROPERTY LINE TO POWERS BLVD.)

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FB
	0.	2.	0.	1.	0.011000	0.00	0.5	0.	6523.000	0.000
J2	NPROF	IFLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IRW	CHNIM	ITRACE
	-1.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
J6	IHLER	ICOPY								
	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.035	0.035	0.025	0.100	0.300	0.000	0.000	0.000	0.000	0.000
RT	1.000	6870.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	13000.000	4.000	0.000	89.000	500.000	500.000	500.000	0.000	6500.000	0.000
GR	20.450	0.000	13.450	7.000	13.450	82.000	20.450	89.000	0.000	0.000
X1	12500.000	0.000	0.000	0.000	500.000	500.000	500.000	0.000	-5.500	0.000
RT	1.000	7190.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12000.000	0.000	0.000	0.000	500.000	500.000	500.000	0.000	-5.500	0.000
X1	11500.000	0.000	0.000	0.000	346.500	346.500	346.500	0.000	-5.500	0.000
X1	11153.000	4.000	0.000	89.000	7.000	7.000	7.000	0.000	6400.000	0.000
GR	100.140	0.000	93.140	7.000	93.140	82.000	100.140	89.000	0.000	0.000
X1	11146.000	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	100.140	0.000	86.140	14.000	86.140	75.000	100.140	89.000	0.000	0.000
X1	11113.000	4.000	0.000	89.000	3.500	3.500	3.500	0.000	6399.960	0.000
GR	96.310	0.000	85.810	10.500	85.810	78.500	96.310	89.000	0.000	0.000
X1	11109.000	4.000	0.000	89.000	409.500	409.500	409.500	0.000	6399.970	0.000
GR	96.230	0.000	89.230	7.000	89.230	82.000	96.230	89.000	0.000	0.000

X1	10700.000	4.000	0.000	89.000	196.500	196.500	196.500	0.000	6400.000	0.000
GR	91.690	0.000	84.690	7.000	84.690	82.000	91.690	89.000	0.000	0.000
X1	10503.000	4.000	0.000	89.000	7.000	7.000	7.000	0.000	6400.000	0.000
GR	89.530	0.000	82.530	7.000	82.530	82.000	89.530	89.000	0.000	0.000
X1	10496.000	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	89.520	0.000	75.520	14.000	75.520	75.000	89.520	89.000	0.000	0.000
X1	10463.000	4.000	0.000	89.000	3.500	3.500	3.500	0.000	6400.290	0.000
GR	85.360	0.000	74.860	10.500	74.860	78.500	85.360	89.000	0.000	0.000
X1	10459.000	4.000	0.000	89.000	59.500	59.500	59.500	0.000	6400.300	0.000
GR	85.280	0.000	78.280	7.000	78.280	82.000	85.280	89.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	10400.000	4.000	0.000	89.000	115.120	115.120	115.120	0.000	6400.000	0.000
GR	84.920	0.000	77.920	7.000	77.920	82.000	84.920	89.000	0.000	0.000
X1	10284.000	6.000	0.000	74.330	101.250	101.250	101.250	0.000	6400.000	0.000
GR	88.650	0.000	79.650	0.000	79.650	9.000	76.650	10.000	76.650	74.330
GR	88.650	74.330	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	1.250	1.560	2.600	0.000	74.330	5.000	801.000	0.000	6476.650	6475.130
X1	10183.000	0.000	0.000	0.000	283.630	283.630	283.630	0.000	-1.520	0.000
X2	0.000	0.000	1.000	6488.650	6490.000	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	9900.000	4.000	0.000	89.000	297.500	297.500	297.500	0.000	6400.000	0.000
GR	79.000	0.000	72.000	7.000	72.000	82.000	79.000	89.000	0.000	0.000
X1	9602.500	4.000	0.000	89.000	5.000	5.000	5.000	0.000	6400.000	0.000
GR	75.740	0.000	68.740	7.000	68.740	82.000	75.740	89.000	0.000	0.000
X1	9597.500	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	75.740	0.000	63.740	12.000	63.740	77.000	75.740	89.000	0.000	0.000
X1	9564.000	4.000	0.000	89.000	2.500	2.500	2.500	0.000	6400.290	0.000
GR	72.580	0.000	63.080	9.500	63.080	79.500	72.580	89.000	0.000	0.000
X1	9561.500	4.000	0.000	89.000	359.000	359.000	359.000	0.000	6400.300	0.000
GR	72.520	0.000	65.520	7.000	65.520	82.000	72.520	89.000	0.000	0.000
X1	9202.500	4.000	0.000	89.000	5.000	5.000	5.000	0.000	6400.000	0.000
GR	68.870	0.000	61.870	7.000	61.870	82.000	68.870	89.000	0.000	0.000
X1	9197.500	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	68.870	0.000	56.870	12.000	56.870	77.000	68.870	89.000	0.000	0.000

X1	9164.000	4.000	0.000	89.000	2.500	2.500	2.500	0.000	6400.290	0.000
GR	65.710	0.000	56.210	9.500	56.210	79.500	65.710	89.000	0.000	0.000
X1	9161.500	4.000	0.000	89.000	461.500	461.500	461.500	0.000	6400.300	0.000
GR	65.650	0.000	58.650	7.000	58.650	82.000	65.650	89.000	0.000	0.000
RT	1.000	7360.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	8700.000	4.000	0.000	89.000	500.000	500.000	500.000	0.000	6400.000	0.000
GR	60.870	0.000	53.870	7.000	53.870	82.000	60.870	89.000	0.000	0.000
X1	8200.000	0.000	0.000	0.000	197.000	197.000	197.000	0.000	-5.500	0.000
X1	8003.000	0.000	0.000	0.000	6.000	6.000	6.000	0.000	-2.170	0.000
X1	7997.000	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	53.200	0.000	40.200	13.000	40.200	76.000	53.200	89.000	0.000	0.000
X1	7963.500	4.000	0.000	89.000	3.000	3.000	3.000	0.000	6400.290	0.000
GR	49.540	0.000	39.540	10.000	39.540	79.000	49.540	89.000	0.000	0.000
X1	7960.500	4.000	0.000	89.000	357.000	357.000	357.000	0.000	6400.290	0.000
GR	49.480	0.000	42.480	7.000	42.480	82.000	49.480	89.000	0.000	0.000
X1	7603.500	4.000	0.000	89.000	7.000	7.000	7.000	0.000	6400.000	0.000
GR	45.840	0.000	38.840	7.000	38.840	82.000	45.840	89.000	0.000	0.000
X1	7596.500	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	45.840	0.000	31.840	14.000	31.840	75.000	45.840	89.000	0.000	0.000
X1	7563.000	4.000	0.000	89.000	3.500	3.500	3.500	0.000	6400.290	0.000
GR	41.680	0.000	31.180	10.500	31.180	78.500	41.680	89.000	0.000	0.000
X1	7559.500	4.000	0.000	89.000	259.500	259.500	259.500	0.000	6400.300	0.000
GR	41.600	0.000	34.600	7.000	34.600	82.000	41.600	89.000	0.000	0.000
X1	7300.000	4.000	0.000	89.000	296.300	296.300	296.300	0.000	6400.000	0.000
GR	39.040	0.000	32.040	7.000	32.040	82.000	39.040	89.000	0.000	0.000
X1	7003.700	4.000	0.000	89.000	7.400	7.400	7.400	0.000	6400.000	0.000
GR	35.780	0.000	28.780	7.000	28.780	82.000	35.780	89.000	0.000	0.000
X1	6996.300	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6400.000	0.000
GR	35.780	0.000	21.390	14.400	21.390	74.600	35.780	89.000	0.000	0.000
X1	6962.800	4.000	0.000	89.000	3.700	3.700	3.700	0.000	6400.290	0.000
GR	31.430	0.000	20.730	10.700	20.730	78.300	31.430	89.000	0.000	0.000
X1	6959.100	4.000	0.000	89.000	459.100	459.100	459.100	0.000	6400.300	0.000
GR	31.340	0.000	24.340	7.000	24.340	82.000	31.340	89.000	0.000	0.000

X1	6500.000	4.000	0.000	89.000	500.000	500.000	500.000	0.000	6400.000	0.000
GR	26.590	0.000	19.590	7.000	19.590	82.000	26.590	89.000	0.000	0.000
X1	6000.000	0.000	0.000	0.000	500.000	500.000	500.000	0.000	-5.500	0.000
X1	5500.000	0.000	0.000	0.000	500.000	500.000	500.000	0.000	-5.500	0.000
X1	5000.000	0.000	0.000	0.000	396.300	396.300	396.300	0.000	-5.500	0.000
X1	4603.700	4.000	0.000	89.000	7.400	7.400	7.400	0.000	6300.000	0.000
GR	105.730	0.000	98.730	7.000	98.730	82.000	105.730	89.000	0.000	0.000
X1	4596.300	4.000	0.000	89.000	33.500	33.500	33.500	0.000	6300.000	0.000
GR	105.730	0.000	91.330	14.400	91.330	74.600	105.730	89.000	0.000	0.000
X1	4562.800	4.000	0.000	89.000	3.700	3.700	3.700	0.000	6300.290	0.000
GR	101.370	0.000	90.670	10.700	90.670	78.300	101.370	89.000	0.000	0.000
X1	4559.100	4.000	0.000	89.000	309.100	309.100	309.100	0.000	6300.300	0.000
GR	101.280	0.000	94.280	7.000	94.280	82.000	101.280	89.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	4250.000	4.000	0.000	89.000	129.800	129.800	129.800	0.000	6300.000	0.000
GR	98.180	0.000	91.180	7.000	91.180	82.000	98.180	89.000	0.000	0.000
X1	4120.200	4.000	0.000	78.000	120.000	120.000	120.000	0.000	6300.000	0.000
GR	102.750	0.000	89.750	0.000	89.750	78.000	102.750	78.000	0.000	0.000
SR	1.250	1.560	2.600	0.000	78.000	4.100	888.000	0.000	6389.750	6389.490
X1	4000.000	0.000	0.000	0.000	110.000	110.000	110.000	0.000	-0.260	0.000
X2	0.000	0.000	1.000	6401.800	6403.800	0.000	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
QT	1.000	8520.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3890.000	4.000	0.000	89.000	440.000	440.000	440.000	0.000	6300.000	0.000
GR	95.280	0.000	88.280	7.000	88.280	82.000	95.280	89.000	0.000	0.000
NC	0.000	0.000	0.000	0.300	0.500	0.000	0.000	0.000	0.000	0.000
X1	3450.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	-4.840	0.000
X1	3440.000	8.000	0.000	93.300	100.000	100.000	100.000	0.000	6300.000	0.000
GR	91.310	0.000	83.310	8.000	83.310	40.500	93.310	40.600	93.310	45.800
GR	83.310	45.900	83.310	85.300	91.310	93.300	0.000	0.000	0.000	0.000
NC	0.000	0.000	0.000	0.100	0.300	0.000	0.000	0.000	0.000	0.000
X1	3340.000	4.000	0.000	114.000	90.000	90.000	90.000	0.000	6300.000	0.000
GR	89.010	0.000	82.010	7.000	82.010	107.000	89.010	114.000	0.000	0.000

X1	3250.000	4.000	0.000	114.000	9.100	9.100	9.100	0.000	6300.000	0.000
GR	87.840	0.000	80.840	7.000	80.840	107.000	87.840	114.000	0.000	0.000
X1	3240.900	4.000	0.000	114.000	33.500	33.500	33.500	0.000	6300.000	0.000
GR	87.840	0.000	71.740	16.100	71.740	97.900	87.840	114.000	0.000	0.000
X1	3207.400	4.000	0.000	114.000	4.300	4.300	4.300	0.000	6300.000	0.000
GR	82.600	0.000	71.300	11.300	71.300	102.700	82.600	114.000	0.000	0.000
X1	3203.100	4.000	0.000	114.000	303.100	303.100	303.100	0.000	6300.000	0.000
GR	82.680	0.000	75.680	7.000	75.680	107.000	82.680	114.000	0.000	0.000
X1	2900.000	0.000	0.000	0.000	396.000	396.000	396.000	0.000	-3.940	0.000
X1	2504.000	4.000	0.000	114.000	8.000	8.000	8.000	0.000	6300.000	0.000
GR	73.590	0.000	66.590	7.000	66.590	107.000	73.590	114.000	0.000	0.000
X1	2496.000	4.000	0.000	114.000	33.500	33.500	33.500	0.000	6300.000	0.000
GR	73.590	0.000	58.590	15.000	58.590	99.000	73.590	114.000	0.000	0.000
X1	2462.500	4.000	0.000	114.000	4.000	4.000	4.000	0.000	6300.000	0.000
GR	69.160	0.000	58.160	11.000	58.160	103.000	69.160	114.000	0.000	0.000
X1	2458.500	4.000	0.000	114.000	458.500	458.500	458.500	0.000	6300.000	0.000
GR	69.050	0.000	62.050	7.000	62.050	107.000	69.050	114.000	0.000	0.000
QT	1.000	8620.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2000.000	0.000	0.000	0.000	400.000	400.000	400.000	0.000	-5.960	0.000
X1	1600.000	0.000	0.000	0.000	46.560	46.560	46.560	0.000	-5.200	0.000
X1	1553.400	4.000	0.000	114.000	6.880	6.880	6.880	0.000	6300.000	0.000
GR	57.290	0.000	50.290	7.000	50.290	107.000	57.290	114.000	0.000	0.000
X1	1546.500	4.000	0.000	114.000	33.500	33.500	33.500	0.000	6300.000	0.000
GR	57.290	0.000	43.410	13.880	43.410	100.120	57.290	114.000	0.000	0.000
X1	1513.100	4.000	0.000	114.000	3.440	3.440	3.440	0.000	6300.350	0.000
GR	53.070	0.000	42.630	10.440	42.630	103.560	53.070	114.000	0.000	0.000
X1	1509.600	4.000	0.000	114.000	109.600	109.600	109.600	0.000	6300.350	0.000
GR	52.980	0.000	45.980	7.000	45.980	107.000	52.980	114.000	0.000	0.000
X1	1400.000	0.000	0.000	0.000	47.000	47.000	47.000	0.000	-1.080	0.000
X1	1353.000	4.000	0.000	114.000	6.000	6.000	6.000	0.000	6300.000	0.000
GR	51.290	0.000	44.290	7.000	44.290	107.000	51.290	114.000	0.000	0.000

SECNO	DEPTH	CMSEL	CRWS	WSELK	EG	HV	HL	LOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

IHLEG = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

CCHV= 0.100 CEHV= 0.300

*SECNO 13000.000

13000.00	5.04	6518.49	6519.64	6523.00	6522.99	4.50	0.00	0.00	6520.45
6870.	0.	6870.	0.	0.	403.	0.	0.	0.	6520.45
0.00	0.00	17.03	0.00	0.000	0.025	0.000	0.000	6513.45	1.96
0.010986	0.	0.	0.	0	14	5	0.00	85.08	87.04

*SECNO 12500.000

12500.00	5.05	6513.00	6514.13	0.00	6517.50	4.50	5.49	0.00	6514.95
6870.	0.	6870.	0.	0.	403.	0.	5.	1.	6514.95
0.01	0.00	17.03	0.00	0.000	0.025	0.000	0.000	6507.95	1.96
0.010986	500.	500.	500.	0	11	0	0.00	85.08	87.04

*SECNO 12000.000

12000.00	5.28	6507.73	6508.82	0.00	6512.18	4.45	5.30	0.02	6509.45
7190.	0.	7190.	0.	0.	425.	0.	9.	2.	6509.45
0.02	0.00	16.93	0.00	0.000	0.025	0.000	0.000	6502.45	1.71
0.010235	500.	500.	500.	4	11	0	0.00	85.58	87.29

*SECNO 11500.000

11500.00	5.15	6502.10	6503.32	0.00	6506.81	4.70	5.35	0.03	6503.95
7190.	0.	7190.	0.	0.	413.	0.	14.	3.	6503.95
0.02	0.00	17.41	0.00	0.000	0.025	0.000	0.000	6496.95	1.85
0.011172	500.	500.	500.	4	11	0	0.00	85.31	87.15

*SECNO 11153.000

11153.00	5.18	6498.32	6499.51	0.00	6502.96	4.64	3.83	0.02	6500.14
7190.	0.	7190.	0.	0.	416.	0.	17.	4.	6500.14
0.03	0.00	17.28	0.00	0.000	0.025	0.000	0.000	6493.14	1.81
0.010923	347.	347.	347.	3	11	0	0.00	85.38	87.19

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 11146.000

3301 HV CHANGED MORE THAN HVINS

11146.00	3.99	6490.13	6493.38	0.00	6502.08	11.96	0.15	0.73	6500.14
7190.	0.	7190.	0.	0.	259.	0.	18.	4.	6500.14
0.03	0.00	27.75	0.00	0.000	0.025	0.000	0.000	6486.14	10.01
0.039717	7.	7.	7.	7	11	0	0.00	68.97	78.99

*SECNO 11113.000

3301 HV CHANGED MORE THAN HVINS

11113.00	3.78	6489.55	6492.54	0.00	6500.47	10.92	1.31	0.31	6496.27
7190.	0.	7190.	0.	0.	271.	0.	18.	4.	6496.27
0.03	0.00	26.51	0.00	0.000	0.025	0.000	0.000	6485.77	6.72
0.038218	34.	34.	34.	4	14	0	0.00	75.56	82.28

*SECNO 11109.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

11109.00	5.76	6494.96	6495.57	0.00	6498.67	3.71	0.03	0.40	6496.20
7190.	0.	7190.	0.	0.	465.	0.	18.	4.	6496.20
0.03	0.00	15.46	0.00	0.000	0.025	0.000	0.000	6489.20	1.24
0.007716	4.	4.	4.	20	14	0	0.00	86.52	87.76

*SECNO 10700.000

1645 INT SEC ADDED BY RAISING SEC 10700.00, 3.007FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	5.33	6493.03	6494.07	0.00	6497.40	4.38	1.20	0.07	6494.70
7190.	0.	7190.	0.	0.	428.	0.	19.	4.	6494.70
0.03	0.00	16.79	0.00	0.000	0.025	0.000	0.000	6487.70	1.67
0.009989	137.	137.	137.	5	8	0	0.00	85.66	87.33

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1645 INT SEC ADDED BY RAISING SEC 1.01, -1.503FT AND MULTIPLYING BY 1.000									
1.02	5.24	6491.43	6492.56	0.00	6495.98	4.55	1.41	0.02	6493.19
7190.	0.	7190.	0.	0.	420.	0.	21.	4.	6493.19
0.03	0.00	17.12	0.00	0.000	0.025	0.000	0.000	6486.19	1.77
0.010614	137.	137.	137.	4	11	0	0.00	85.47	87.23
1645 INT SEC ADDED BY RAISING SEC 1.02, -1.503FT AND MULTIPLYING BY 1.000									
10700.00	5.20	6489.89	6491.06	0.00	6494.51	4.62	1.47	0.01	6491.69
7190.	0.	7190.	0.	0.	417.	0.	22.	4.	6491.69
0.04	0.00	17.25	0.00	0.000	0.025	0.000	0.000	6484.69	1.80
0.010868	137.	137.	137.	4	11	0	0.00	85.39	87.20
*SECNO 10503.000									
10503.00	5.19	6487.72	6488.90	0.00	6492.36	4.65	2.14	0.00	6489.53
7190.	0.	7190.	0.	0.	416.	0.	24.	5.	6489.53
0.04	0.00	17.30	0.00	0.000	0.025	0.000	0.000	6482.53	1.82
0.010951	197.	197.	197.	3	11	0	0.00	85.37	87.18
*SECNO 10496.000									
3301 HV CHANGED MORE THAN HVINS									
10496.00	3.98	6479.50	6482.75	0.00	6491.48	11.98	0.15	0.73	6489.52
7190.	0.	7190.	0.	0.	259.	0.	24.	5.	6489.52
0.04	0.00	27.78	0.00	0.000	0.025	0.000	0.000	6475.52	10.02
0.039837	7.	7.	7.	7	11	0	0.00	68.97	78.98
*SECNO 10463.000									
3301 HV CHANGED MORE THAN HVINS									
10463.00	3.78	6478.93	6481.92	0.00	6489.86	10.93	1.31	0.31	6485.65
7190.	0.	7190.	0.	0.	271.	0.	24.	5.	6485.65
0.04	0.00	26.53	0.00	0.000	0.025	0.000	0.000	6475.13	6.72
0.038311	34.	34.	34.	4	14	0	0.00	75.55	82.28

SECNO	DEPTH	CWSEL	CRIMS	WSELK	EG	HV	HL	CLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VCL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLORB	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 10459.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

10459.00	5.64	6484.22	6484.95	0.00	6488.10	3.89	0.03	0.50	6485.58
7190.	0.	7190.	0.	0.	454.	0.	24.	5.	6485.58
0.04	0.00	15.82	0.00	0.000	0.025	0.000	0.000	6478.58	1.36
0.008291	4.	4.	4.	20	14	0	0.00	86.27	87.64

CCHV= 0.300 CEHV= 0.500

*SECNO 10400.000

1645 INT SEC ADDED BY RAISING SEC 10400.00, 0.330FT AND MULTIPLYING BY 1.000

1.01	5.95	6484.20	6484.63	0.00	6487.67	3.47	0.23	0.21	6485.25
7190.	0.	7190.	0.	0.	481.	0.	24.	5.	6485.25
0.04	0.00	14.94	0.00	0.000	0.025	0.000	0.000	6478.25	1.06
0.006940	30.	30.	30.	3	8	0	0.00	86.89	87.94

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.330FT AND MULTIPLYING BY 1.000

10400.00	6.29	6484.21	6484.29	0.00	6487.28	3.07	0.19	0.20	6484.92
7190.	0.	7190.	0.	0.	511.	0.	25.	5.	6484.92
0.04	0.00	14.07	0.00	0.000	0.025	0.000	0.000	6477.92	0.71
0.005761	30.	30.	30.	3	8	0	0.00	87.57	88.29

*SECNO 10284.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

10284.00	6.99	6483.64	6483.64	0.00	6486.97	3.33	0.70	0.14	6488.65
7190.	0.	7190.	0.	0.	491.	0.	26.	5.	6488.65
0.04	0.00	14.64	0.00	0.000	0.025	0.000	0.000	6476.65	0.00
0.006080	115.	115.	115.	20	8	0	0.00	74.33	74.33

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLORR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5290 UPSTREAM ELEV IS 6485.54 ,NOT 6483.64 NEW BACKWATER REQUIRED

SB	XK	XKOR	COFR	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	0.00	74.33	5.00	801.00	0.00	6476.65	6475.13

*SECNO 10183.000

3301 HV CHANGED MORE THAN HVINS

CLASS B LOW FLOW

3420 BRIDGE W.S.= 6482.83 BRIDGE VELOCITY=, 14.95 CALCULATED CHANNEL AREA=, 428.

EGFRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	
0.00	6486.29	0.00	0.	7190.	801.	832.	6488.65	6490.00	
10183.00	5.41	6480.54	0.00	0.00	6486.29	5.76	0.67	0.00	6487.13
7190.	0.	7190.	0.	0.	373.	0.	27.	5.	6487.13
0.05	0.00	17.26	0.00	0.000	0.025	0.000	0.000	6475.13	0.00
0.014431	101.	101.	101.	0	0	0	0.00	74.33	74.33

CCHV= 0.100 CEHV= 0.300

*SECNO 9900.000

9900.00	4.86	6476.86	6478.40	0.00	6482.19	5.34	3.97	0.13	6479.00
7190.	0.	7190.	0.	0.	388.	0.	29.	6.	6479.00
0.05	0.00	18.54	0.00	0.000	0.025	0.000	0.000	6472.00	2.14
0.013609	284.	284.	284.	6	8	0	0.00	84.71	86.86

*SECNO 9602.500

1645 INT SEC ADDED BY RAISING SEC 9602.50, 1.630FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	5.20	6475.57	6476.74	0.00	6480.17	4.60	1.80	0.22	6477.37
7190.	0.	7190.	0.	0.	418.	0.	31.	6.	6477.37
0.05	0.00	17.22	0.00	0.000	0.025	0.000	0.000	6470.37	1.79
0.010795	149.	149.	149.	4	11	0	0.00	85.41	87.20

SECND	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.630FT AND MULTIPLYING BY 1.000

9602.50	5.20	6473.94	6475.11	0.00	6478.56	4.62	1.61	0.00	6475.74
7190.	0.	7190.	0.	0.	417.	0.	32.	7.	6475.74
0.05	0.00	17.25	0.00	0.000	0.025	0.000	0.000	6468.74	1.80
0.010859	149.	149.	149.	0	11	0	0.00	85.40	87.20

*SECND 9597.500

3301 HV CHANGED MORE THAN HVINS

9597.50	4.08	6467.82	6470.70	0.00	6477.92	10.10	0.09	0.55	6475.74
7190.	0.	7190.	0.	0.	282.	0.	32.	7.	6475.74
0.05	0.00	25.50	0.00	0.000	0.025	0.000	0.000	6463.74	7.92
0.032339	5.	5.	5.	8	11	0	0.00	73.16	81.08

*SECND 9564.000

3301 HV CHANGED MORE THAN HVINS

9564.00	3.98	6467.35	6470.02	0.00	6476.62	9.26	1.05	0.25	6472.87
7190.	0.	7190.	0.	0.	294.	0.	33.	7.	6472.87
0.05	0.00	24.43	0.00	0.000	0.025	0.000	0.000	6463.37	5.52
0.030345	34.	34.	34.	3	14	0	0.00	77.96	83.48

*SECND 9561.500

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

9561.50	5.60	6471.42	6472.19	0.00	6475.36	3.94	0.02	0.91	6472.82
7190.	0.	7190.	0.	0.	451.	0.	33.	7.	6472.82
0.06	0.00	15.93	0.00	0.000	0.025	0.000	0.000	6465.82	1.40
0.008467	3.	3.	3.	20	14	0	0.00	86.20	87.60

*SECND 9202.500

SECNO	DEPTH	CWSEL	CRIMS	WSELK	EG	HV	HL	GLOSS	BANK	ELEV
Q	QLOB	QCH	QROR	ALOB	ACH	AROR	QVL	TWA	LEFT	RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CDRAR	TOPWID	ENDST	

1645 INT SEC ADDED BY RAISING SEC 9202.50, 1.975FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	5.26	6469.10	6470.23	0.00	6473.61	4.51	1.69	0.06	6470.85	
7190.	0.	7190.	0.	0.	422.	0.	34.	7.	6470.85	
0.06	0.00	17.05	0.00	0.000	0.025	0.000	0.000	6463.85	1.74	
0.010464	180.	180.	180.	6	8	0	0.00	85.51	87.26	

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.975FT AND MULTIPLYING BY 1.000

9202.50	5.20	6467.07	6468.24	0.00	6471.69	4.62	1.91	0.01	6468.87	
7190.	0.	7190.	0.	0.	417.	0.	36.	7.	6468.87	
0.06	0.00	17.25	0.00	0.000	0.025	0.000	0.000	6461.87	1.80	
0.010862	180.	180.	180.	4	11	0	0.00	85.39	87.20	

*SECNO 9197.500

3301 HV CHANGED MORE THAN HVINS

9197.50	4.08	6460.95	6463.83	0.00	6471.05	10.10	0.09	0.55	6468.87	
7190.	0.	7190.	0.	0.	282.	0.	36.	7.	6468.87	
0.06	0.00	25.50	0.00	0.000	0.025	0.000	0.000	6456.87	7.92	
0.032341	5.	5.	5.	8	11	0	0.00	73.16	81.08	

*SECNO 9164.000

3301 HV CHANGED MORE THAN HVINS

9164.00	3.98	6460.48	6463.15	0.00	6469.75	9.26	1.05	0.25	6466.00	
7190.	0.	7190.	0.	0.	294.	0.	36.	7.	6466.00	
0.06	0.00	24.43	0.00	0.000	0.025	0.000	0.000	6456.50	5.52	
0.030346	34.	34.	34.	3	14	0	0.00	77.96	83.48	

*SECNO 9161.500

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QRQB	ALOB	ACH	ARQB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	UROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3710 WSEL ASSUMED BASED ON MIN DIFF

9161.50	5.60	6464.55	6465.32	0.00	6468.49	3.94	0.02	0.91	6465.95
7190.	0.	7190.	0.	0.	452.	0.	36.	7.	6465.95
0.06	0.00	15.92	0.00	0.000	0.025	0.000	0.000	6458.95	1.40
0.008460	3.	3.	3.	20	14	0	0.00	86.20	87.60

*SECNO 8700.000

1645 INT SEC ADDED BY RAISING SEC 8700.00, 2.540FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	5.29	6461.70	6462.85	0.00	6466.25	4.56	2.17	0.06	6463.41
7275.	0.	7275.	0.	0.	425.	0.	39.	8.	6463.41
0.07	0.00	17.13	0.00	0.000	0.025	0.000	0.000	6456.41	1.71
0.010483	231.	231.	231.	5	8	0	0.00	85.58	87.29

1645 INT SEC ADDED BY RAISING SEC 1.01, -2.540FT AND MULTIPLYING BY 1.000

8700.00	5.30	6459.17	6460.34	0.00	6463.81	4.64	2.44	0.01	6460.87
7360.	0.	7360.	0.	0.	426.	0.	41.	8.	6460.87
0.07	0.00	17.28	0.00	0.000	0.025	0.000	0.000	6453.87	1.70
0.010634	231.	231.	231.	2	11	0	0.00	85.61	87.30

*SECNO 8200.000

8200.00	5.24	6453.61	6454.84	0.00	6458.37	4.76	5.43	0.01	6455.37
7360.	0.	7360.	0.	0.	420.	0.	46.	9.	6455.37
0.08	0.00	17.51	0.00	0.000	0.025	0.000	0.000	6448.37	1.76
0.011083	500.	500.	500.	4	11	0	0.00	85.48	87.24

*SECNO 8003.000

8003.00	5.24	6451.44	6452.67	0.00	6456.19	4.75	2.18	0.00	6453.20
7360.	0.	7360.	0.	0.	421.	0.	48.	10.	6453.20
0.08	0.00	17.48	0.00	0.000	0.025	0.000	0.000	6446.20	1.75
0.011031	197.	197.	197.	2	11	0	0.00	85.49	87.25

SECNO	DEPTH	CWSEL	CRIMS	WSELK	EG	HV	HL	QLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*SECNO 7997.000

3301 HV CHANGED MORE THAN HVINS

7997.00	4.10	6444.30	6447.40	0.00	6455.43	11.13	0.12	0.64	6453.20	
7360.	0.	7360.	0.	0.	275.	0.	18.	10.	6453.20	
0.08	0.00	26.77	0.00	0.000	0.025	0.000	0.000	6440.20	8.90	
0.035630	6.	6.	6.	7	11	0	0.00	71.19	80.10	

*SECNO 7963.500

3301 HV CHANGED MORE THAN HVINS

7963.50	3.93	6443.76	6446.64	0.00	6453.99	10.23	1.17	0.27	6449.83	
7360.	0.	7360.	0.	0.	287.	0.	18.	10.	6449.83	
0.08	0.00	25.67	0.00	0.000	0.025	0.000	0.000	6439.83	6.07	
0.034062	34.	34.	34.	4	14	0	0.00	76.86	82.93	

*SECNO 7960.500

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

7960.50	5.88	6448.65	6449.24	0.00	6452.38	3.73	0.02	1.70	6449.77	
7360.	0.	7360.	0.	0.	475.	0.	18.	10.	6450.13	
0.08	0.00	15.50	0.00	0.000	0.025	0.000	0.000	6442.77	1.12	
0.007562	3.	3.	3.	20	14	0	0.00	86.47	87.59	

*SECNO 7603.500

1645 INT SEC ADDED BY RAISING SEC 7603.50, 2.620FT AND MULTIPLYING BY 0.999

3301 HV CHANGED MORE THAN HVINS

1.01	5.44	6446.90	6447.94	0.00	6451.29	4.39	1.02	0.07	6448.46	
7360.	0.	7360.	0.	0.	438.	0.	19.	10.	6448.46	
0.08	0.00	16.82	0.00	0.000	0.025	0.000	0.000	6441.46	1.55	
0.009765	119.	119.	119.	7	8	0	0.00	85.79	87.34	

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	UROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.01; -1.310FT AND MULTIPLYING BY 1.001

1.02	5.34	6445.49	6446.62	0.00	6450.07	4.58	1.20	0.02	6447.15
7360.	0.	7360.	0.	0.	428.	0.	50.	10.	6447.15
0.08	0.00	17.18	0.00	0.000	0.025	0.000	0.000	6440.15	1.66
0.010443	119.	119.	119.	4	11	0	0.00	85.62	87.28

1645 INT SEC ADDED BY RAISING SEC 1.02; -1.310FT AND MULTIPLYING BY 1.001

7603.50	5.28	6444.12	6445.31	0.00	6448.80	4.68	1.26	0.01	6445.84
7360.	0.	7360.	0.	0.	424.	0.	52.	10.	6445.84
0.09	0.00	17.36	0.00	0.000	0.025	0.000	0.000	6438.84	1.72
0.010784	119.	119.	119.	4	11	0	0.00	85.56	87.28

*SECNO 7596.500

3301 HV CHANGED MORE THAN HVINS

7596.50	4.07	6435.91	6439.18	0.00	6447.92	12.02	0.14	0.73	6445.84
7360.	0.	7360.	0.	0.	265.	0.	52.	10.	6445.84
0.09	0.00	27.82	0.00	0.000	0.025	0.000	0.000	6431.84	9.93
0.038979	7.	7.	7.	7	11	0	0.00	69.13	79.07

*SECNO 7563.000

3301 HV CHANGED MORE THAN HVINS

7563.00	3.85	6435.32	6438.34	0.00	6446.34	11.02	1.29	0.30	6441.97
7360.	0.	7360.	0.	0.	276.	0.	52.	11.	6441.97
0.09	0.00	26.64	0.00	0.000	0.025	0.000	0.000	6431.47	6.65
0.037760	34.	34.	34.	4	14	0	0.00	75.69	82.35

*SECNO 7559.500

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLQBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CDRAR	TOPWID	ENDST
3710 WSEL ASSUMED BASED ON MIN DIFF									
7559.50	5.86	6440.76	6441.37	0.00	6444.51	3.75	0.03	2.34	6441.90
7360.	0.	7360.	0.	0.	474.	0.	52.	11.	6441.90
0.09	0.00	15.54	0.00	0.000	0.025	0.000	0.000	6434.90	1.14
0.007635	4.	4.	4.	20	14	0	0.00	86.72	87.86
*SECNO 7300.000									
1645 INT SEC ADDED BY RAISING SEC 7300.00, 1.430FT AND MULTIPLYING BY 1.000									
3301 HV CHANGED MORE THAN HVINS									
1.01	5.41	6438.88	6439.94	0.00	6443.31	4.43	1.13	0.07	6440.47
7360.	0.	7360.	0.	0.	436.	0.	53.	11.	6440.47
0.09	0.00	16.88	0.00	0.000	0.025	0.000	0.000	6433.47	1.58
0.009893	130.	130.	130.	6	8	0	0.00	85.84	87.42
1645 INT SEC ADDED BY RAISING SEC 1.01, -1.430FT AND MULTIPLYING BY 1.000									
7300.00	5.32	6437.36	6438.51	0.00	6441.97	4.61	1.32	0.02	6439.04
7360.	0.	7360.	0.	0.	427.	0.	54.	11.	6439.04
0.09	0.00	17.23	0.00	0.000	0.025	0.000	0.000	6432.04	1.68
0.010532	130.	130.	130.	4	11	0	0.00	85.64	87.32
*SECNO 7003.700									
7003.70	5.25	6434.03	6435.25	0.00	6438.77	4.74	3.19	0.01	6435.78
7360.	0.	7360.	0.	0.	421.	0.	57.	12.	6435.78
0.10	0.00	17.46	0.00	0.000	0.025	0.000	0.000	6428.78	1.75
0.010993	296.	296.	296.	4	11	0	0.00	85.50	87.25
*SECNO 6996.300									
3301 HV CHANGED MORE THAN HVINS									
6996.30	4.05	6425.44	6428.79	0.00	6437.85	12.40	0.16	0.77	6435.78
7360.	0.	7360.	0.	0.	260.	0.	57.	12.	6435.78
0.10	0.00	28.26	0.00	0.000	0.025	0.000	0.000	6421.39	10.34
0.040458	7.	7.	7.	7	11	0	0.00	68.31	78.66

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VBL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XL0BL	XLCH	XL0BR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 6962.800

3301 HV CHANGED MORE THAN HVINS

6962.80	3.82	6424.84	6427.91	0.00	6436.19	11.36	1.34	0.31	6431.72
7360.	0.	7360.	0.	0.	272.	0.	58.	12.	6431.72
0.10	0.00	27.04	0.00	0.000	0.025	0.000	0.000	6421.02	6.89
0.039372	34.	34.	34.	4	14	0	0.00	75.22	82.11

*SECNO 6959.100

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

6959.10	5.73	6430.37	6431.11	0.00	6434.30	3.93	0.03	2.44	6431.64
7360.	0.	7360.	0.	0.	463.	0.	58.	12.	6431.64
0.10	0.00	15.91	0.00	0.000	0.025	0.000	0.000	6424.64	1.27
0.008217	4.	4.	4.	20	14	0	0.00	86.46	87.73

*SECNO 6500.000

1645 INT SEC ADDED BY RAISING SEC 6500.00, 3.367FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	5.37	6428.33	6429.44	0.00	6432.84	4.51	1.40	0.06	6429.96
7360.	0.	7360.	0.	0.	432.	0.	59.	12.	6429.96
0.10	0.00	17.05	0.00	0.000	0.025	0.000	0.000	6422.96	1.63
0.010191	153.	153.	153.	6	8	0	0.00	85.74	87.37

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.683FT AND MULTIPLYING BY 1.000

1.02	5.29	6426.57	6427.74	0.00	6431.23	4.66	1.60	0.02	6428.27
7360.	0.	7360.	0.	0.	425.	0.	61.	12.	6428.27
0.10	0.00	17.33	0.00	0.000	0.025	0.000	0.000	6421.27	1.71
0.010726	153.	153.	153.	4	11	0	0.00	85.58	87.29

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	DLOSS	BANK	ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XML	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

1645 INT SEC ADDED BY RAISING SEC 1.02, -1.683FT AND MULTIPLYING BY 1.000

6500.00	5.28	6424.87	6426.06	0.00	6429.57	4.70	1.65	0.00	6426.59	
7360.	0.	7360.	0.	0.	423.	0.	62.	13.	6426.59	
0.10	0.00	17.40	0.00	0.000	0.025	0.000	0.000	6419.59	1.73	
0.010876	153.	153.	153.	3	11	0	0.00	85.54	87.27	

*SECNO 6000.000

6000.00	5.25	6419.34	6420.56	0.00	6424.09	4.75	5.48	0.00	6421.09	
7360.	0.	7360.	0.	0.	421.	0.	67.	14.	6421.09	
0.11	0.00	17.48	0.00	0.000	0.025	0.000	0.000	6414.09	1.75	
0.011031	500.	500.	500.	3	11	0	0.00	85.49	87.25	

*SECNO 5500.000

5500.00	5.26	6413.85	6415.06	0.00	6418.58	4.73	5.50	0.00	6415.59	
7360.	0.	7360.	0.	0.	422.	0.	72.	15.	6415.59	
0.12	0.00	17.46	0.00	0.000	0.025	0.000	0.000	6408.59	1.75	
0.010984	500.	500.	500.	0	11	0	0.00	85.51	87.25	

*SECNO 5000.000

5000.00	5.24	6408.33	6409.56	0.00	6413.08	4.75	5.50	0.00	6410.09	
7360.	0.	7360.	0.	0.	421.	0.	77.	16.	6410.09	
0.13	0.00	17.48	0.00	0.000	0.025	0.000	0.000	6403.09	1.75	
0.011029	500.	500.	500.	2	11	0	0.00	85.49	87.25	

*SECNO 4603.700

4603.70	5.25	6403.98	6405.20	0.00	6408.71	4.73	4.36	0.00	6405.73	
7360.	0.	7360.	0.	0.	422.	0.	81.	16.	6405.73	
0.13	0.00	17.46	0.00	0.000	0.025	0.000	0.000	6398.73	1.75	
0.010985	396.	396.	396.	2	11	0	0.00	85.51	87.25	

*SECNO 4596.300

3301 HV CHANGED MORE THAN HVINS

4596.30	4.05	6395.38	6398.73	0.00	6407.79	12.40	0.16	0.77	6405.73	
7360.	0.	7360.	0.	0.	260.	0.	81.	16.	6405.73	
0.13	0.00	28.26	0.00	0.000	0.025	0.000	0.000	6391.33	10.35	
0.040472	7.	7.	7.	7	11	0	0.00	68.31	78.65	

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VQL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IIC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4562.800

3301 HV CHANGED MORE THAN HVINS

4562.80	3.82	6394.78	6397.85	0.00	6406.14	11.36	1.34	0.31	6401.66
7360.	0.	7360.	0.	0.	272.	0.	81.	16.	6401.66
0.13	0.00	27.05	0.00	0.000	0.025	0.000	0.000	6390.96	6.89
0.039387	34.	34.	34.	4	14	0	0.00	75.22	92.11

*SECNO 4559.100

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

4559.10	5.93	6400.51	6401.05	0.00	6404.16	3.65	0.03	2.45	6401.58
7360.	0.	7360.	0.	0.	480.	0.	81.	16.	6401.58
0.13	0.00	15.32	0.00	0.000	0.025	0.000	0.000	6394.58	1.07
0.007313	4.	4.	4.	20	14	0	0.00	86.87	97.93

CCHV= 0.300 CEHV= 0.500

*SECNO 4250.000

1645 INT SEC ADDED BY RAISING SEC 4250.00, 2.267FT AND MULTIPLYING BY 1.000

1.01	5.60	6399.05	6399.92	0.00	6403.18	4.13	0.83	0.15	6400.45
7360.	0.	7360.	0.	0.	451.	0.	82.	17.	6400.45
0.14	0.00	16.32	0.00	0.000	0.025	0.000	0.000	6393.45	1.40
0.008896	103.	103.	103.	13	8	0	0.00	86.19	87.60

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.133FT AND MULTIPLYING BY 1.000

1.02	5.44	6397.75	6398.80	0.00	6402.14	4.39	0.96	0.08	6399.31
7360.	0.	7360.	0.	0.	438.	0.	83.	17.	6399.31
0.14	0.00	16.82	0.00	0.000	0.025	0.000	0.000	6392.31	1.56
0.009773	103.	103.	103.	8	8	0	0.00	85.88	87.44

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.02, -1.133FT AND MULTIPLYING BY 1.000

4250.00	5.36	6396.54	6397.65	0.00	6401.07	4.53	1.03	0.04	6398.18
7360.	0.	7360.	0.	0.	431.	0.	84.	17.	6398.18
0.14	0.00	17.08	0.00	0.000	0.025	0.000	0.000	6391.18	1.64
0.010260	103.	103.	103.	5	11	0	0.00	85.72	87.36

*SECNO 4120.200

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

4120.20	5.82	6395.57	6396.24	0.00	6399.65	4.09	1.11	0.26	6402.75
7360.	0.	7360.	0.	0.	454.	0.	85.	17.	6402.75
0.14	0.00	16.22	0.00	0.000	0.025	0.000	0.000	6389.75	0.00
0.008570	130.	130.	130.	20	11	0	0.00	78.00	78.00

SPECIAL BRIDGE

5290 UPSTREAM ELEV IS 6398.20 ,NOT 6395.57 NEW BACKWATER REQUIRED

SB	XK	XKOR	COFR	RDLEN	RWC	RWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	0.00	78.00	4.10	888.00	0.00	6389.75	6389.49

*SECNO 4000.000

3301 HV CHANGED MORE THAN HVINS

CLASS B LOW FLOW

3420 BRIDGE W.S.= 6396.37 BRIDGE VELOCITY=, 14.75 CALCULATED CHANNEL AREA=, 489.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	
0.00	6399.60	0.00	0.	7360.	888.	890.	6401.80	6403.80	
4000.00	5.44	6394.93	0.00	0.00	6399.60	4.67	0.05	0.00	6402.49
7360.	0.	7360.	0.	0.	424.	0.	87.	17.	6402.49
0.14	0.00	17.34	0.00	0.000	0.025	0.000	0.000	6389.49	0.00
0.010589	120.	120.	120.	0	0	0	0.00	78.00	78.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	UROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
 *SECNO 3890.000

1645 INT SEC ADDED BY RAISING SEC 3890.00, 0.807FT AND MULTIPLYING BY 0.980

3301 HV CHANGED MORE THAN HVINS

1.01	5.99	6395.08	6395.87	0.00	6399.19	4.11	0.24	0.17	6396.09
7747.	0.	7747.	0.	0.	476.	0.	87.	18.	6396.09
0.14	0.00	16.27	0.00	0.000	0.025	0.000	0.000	6389.09	0.98
0.008162	37.	37.	37.	5	11	0	0.00	85.24	86.22

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.403FT AND MULTIPLYING BY 1.010

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3710 WSEL ASSUMED BASED ON MIN DIFF

1.02	6.33	6395.02	6395.65	0.00	6398.97	3.95	0.27	0.12	6395.68
8133.	0.	8133.	0.	0.	510.	0.	87.	18.	6395.68
0.14	0.00	15.95	0.00	0.000	0.025	0.000	0.000	6388.68	0.66
0.007353	37.	37.	37.	20	8	0	0.00	86.78	87.44

1645 INT SEC ADDED BY RAISING SEC 1.02, -0.403FT AND MULTIPLYING BY 1.010

3280 CROSS SECTION 3890.00 EXTENDED 0.11 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

3890.00	7.11	6395.39	6395.39	0.00	6398.70	3.30	0.20	0.09	6395.28
8520.	0.	8520.	0.	0.	584.	0.	88.	18.	6395.28
0.15	0.00	14.59	0.00	0.000	0.025	0.000	0.000	6388.28	0.00
0.005349	37.	37.	37.	20	8	0	0.00	89.00	89.00

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
R	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.300 CEHV= 0.500
 *SECNO 3450.000

1645 INT SEC ADDED BY RAISING SEC 3450.00, 3.630FT AND MULTIPLYING BY 1.009

3301 HV CHANGED MORE THAN HVINS

1.01	6.19	6393.26	6394.13	0.00	6397.64	4.38	0.73	0.32	6394.07
8520.	0.	8520.	0.	0.	507.	0.	89.	18.	6394.07
0.15	0.00	16.79	0.00	0.000	0.025	0.000	0.000	6387.07	0.81
0.008345	110.	110.	110.	5	5	0	0.00	88.17	88.99

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.210FT AND MULTIPLYING BY 0.997

1.02	5.99	6391.85	6392.95	0.00	6396.57	4.72	0.97	0.10	6392.86
8520.	0.	8520.	0.	0.	489.	0.	90.	18.	6392.86
0.15	0.00	17.43	0.00	0.000	0.025	0.000	0.000	6385.86	1.01
0.009341	110.	110.	110.	5	8	0	0.00	87.52	88.53

1645 INT SEC ADDED BY RAISING SEC 1.02, -1.210FT AND MULTIPLYING BY 0.997

1.03	5.91	6390.56	6391.77	0.00	6395.46	4.89	1.06	0.05	6391.65
8520.	0.	8520.	0.	0.	480.	0.	92.	18.	6391.65
0.15	0.00	17.75	0.00	0.000	0.025	0.000	0.000	6384.63	1.09
0.009858	110.	110.	110.	4	8	0	0.00	87.09	88.18

1645 INT SEC ADDED BY RAISING SEC 1.03, -1.210FT AND MULTIPLYING BY 0.997

3450.00	5.86	6389.30	6390.54	0.00	6394.32	5.02	1.10	0.04	6390.44
8520.	0.	8520.	0.	0.	474.	0.	93.	19.	6390.44
0.15	0.00	17.97	0.00	0.000	0.025	0.000	0.000	6383.44	1.14
0.010208	110.	110.	110.	4	11	0	0.00	86.73	87.86

*SECNO 3440.000

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROR	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IIC	ICONT	CORAR	TOPWID	ENDST

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3710 WSEL ASSUMED BASED ON MIN DIFF

3440.00	6.14	6389.45	6390.60	0.00	6394.35	4.90	0.11	0.46	6391.31
8520.	0.	8520.	0.	0.	480.	0.	93.	19.	6391.31
0.15	0.00	17.76	0.00	0.000	0.025	0.000	0.000	6383.31	1.86
0.011257	10.	10.	10.	20	11	0	0.00	84.31	91.44

CCHV= 0.100 CEHV= 0.300

*SECNO 3340.000

1645 INT SEC ADDED BY RAISING SEC 3340.00, 0.975FT AND MULTIPLYING BY 0.826

3301 HV CHANGED MORE THAN HVINS

1.01	5.03	6388.01	6389.72	0.00	6393.93	5.92	0.32	0.10	6389.99
8520.	0.	8520.	0.	0.	436.	0.	93.	19.	6389.99
0.15	0.00	19.52	0.00	0.000	0.025	0.000	0.000	6382.99	1.63
0.014250	25.	25.	25.	17	8	0	0.00	90.94	92.56

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.325FT AND MULTIPLYING BY 1.070

1.02	4.60	6387.26	6389.10	0.00	6393.51	6.25	0.39	0.03	6389.66
8520.	0.	8520.	0.	0.	425.	0.	94.	19.	6389.66
0.15	0.00	20.07	0.00	0.000	0.025	0.000	0.000	6382.66	2.13
0.016729	25.	25.	25.	7	11	0	0.00	96.53	98.66

1645 INT SEC ADDED BY RAISING SEC 1.02, -0.325FT AND MULTIPLYING BY 1.066

1.03	4.27	6386.60	6388.52	0.00	6393.05	6.45	0.44	0.02	6389.34
8520.	0.	8520.	0.	0.	418.	0.	94.	19.	6389.34
0.15	0.00	20.37	0.00	0.000	0.025	0.000	0.000	6382.34	2.58
0.018823	25.	25.	25.	6	11	0	0.00	102.23	104.81

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	GRDP	ALDB	ACH	ARDB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLORR	ITRIAL	IDC	ICONT	CDRAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.03, -0.325FT AND MULTIPLYING BY 1.061

3340.00	4.00	6386.01	6387.96	0.00	6392.55	6.54	0.49	0.01	6389.01
8520.	0.	8520.	0.	0.	415.	0.	94.	19.	6389.01
0.15	0.00	20.52	0.00	0.000	0.025	0.000	0.000	6382.01	3.01
0.020589	25.	25.	25.	6	11	0	0.00	107.99	110.99

*SECNO 3250.000

1645 INT SEC ADDED BY RAISING SEC 3250.00, 0.780FT AND MULTIPLYING BY 0.999

1.01	4.14	6385.76	6387.59	0.00	6391.82	6.06	0.58	0.14	6388.62
8520.	0.	8520.	0.	0.	431.	0.	94.	19.	6388.62
0.15	0.00	19.75	0.00	0.000	0.025	0.000	0.000	6381.62	2.85
0.018203	30.	30.	30.	4	11	0	0.00	108.17	111.02

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.390FT AND MULTIPLYING BY 1.001

1.02	4.27	6385.50	6387.19	0.00	6391.19	5.70	0.52	0.11	6388.23
8520.	0.	8520.	0.	0.	415.	0.	95.	19.	6388.23
0.15	0.00	19.15	0.00	0.000	0.025	0.000	0.000	6381.23	2.73
0.016510	30.	30.	30.	4	11	0	0.00	108.47	111.20

1645 INT SEC ADDED BY RAISING SEC 1.02, -0.390FT AND MULTIPLYING BY 1.001

3250.00	4.36	6385.20	6386.79	0.00	6390.64	5.44	0.48	0.08	6387.84
8520.	0.	8520.	0.	0.	455.	0.	95.	19.	6387.84
0.16	0.00	18.71	0.00	0.000	0.025	0.000	0.000	6380.84	2.64
0.015328	30.	30.	30.	4	11	0	0.00	108.73	111.36

*SECNO 3240.900

3301 HV CHANGED MORE THAN HVINS

3240.90	3.29	6375.03	6378.48	0.00	6389.46	14.44	0.27	0.90	6387.84
8520.	0.	8520.	0.	0.	279.	0.	95.	19.	6387.84
0.16	0.00	30.49	0.00	0.000	0.025	0.000	0.000	6371.74	12.82
0.059047	9.	9.	9.	4	14	0	0.00	88.37	101.18

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QRQB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3207.400

3301 HV CHANGED MORE THAN HVINS

3207.40	3.17	6374.47	6377.60	0.00	6387.02	12.55	1.88	0.57	6382.60
8520.	0.	8520.	0.	0.	300.	0.	95.	19.	6382.60
0.16	0.00	28.43	0.00	0.000	0.025	0.000	0.000	6371.30	8.13
0.053199	34.	34.	34.	4	14	0	0.00	97.74	105.87

*SECNO 3203.100

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

3203.10	5.39	6381.07	6381.63	0.00	6384.56	3.50	0.03	2.20	6382.68
8520.	0.	8520.	0.	0.	568.	0.	95.	19.	6382.68
0.16	0.00	15.00	0.00	0.000	0.025	0.000	0.000	6375.68	1.61
0.007596	4.	4.	4.	20	14	0	0.00	110.78	112.39

*SECNO 2900.000

1645 INT SEC ADDED BY RAISING SEC 2900.00, 2.955FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	4.93	6379.63	6380.64	0.00	6383.83	4.20	0.67	0.07	6381.69
8520.	0.	8520.	0.	0.	518.	0.	96.	19.	6381.69
0.16	0.00	16.44	0.00	0.000	0.025	0.000	0.000	6374.69	2.06
0.010162	76.	76.	76.	7	8	0	0.00	109.87	111.94

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.985FT AND MULTIPLYING BY 1.000

1.02	4.78	6378.49	6379.65	0.00	6382.98	4.50	0.81	0.03	6380.71
8520.	0.	8520.	0.	0.	501.	0.	97.	20.	6380.71
0.16	0.00	17.02	0.00	0.000	0.025	0.000	0.000	6373.71	2.22
0.011331	76.	76.	76.	5	11	0	0.00	109.56	111.78

SECNO	DEPTH	CWSEL	CRINS	WSELK	EG	HV	HL	GLOSS	BANK ELEV
Q	QLOB	GCH	QRQB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VRQB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLQBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.02: -0.985FT AND MULTIPLYING BY 1.000

1.03	4.70	6377.42	6378.67	0.00	6382.08	4.66	0.88	0.02	6379.72
8520.	0.	8520.	0.	0.	492.	0.	98.	20.	6379.72
0.16	0.00	17.32	0.00	0.000	0.025	0.000	0.000	6372.72	2.30
0.011994	76.	76.	76.	4	11	0	0.00	109.39	111.70

1645 INT SEC ADDED BY RAISING SEC 1.03: -0.985FT AND MULTIPLYING BY 1.000

2900.00	4.65	6376.39	6377.68	0.00	6381.15	4.76	0.92	0.01	6378.74
8520.	0.	8520.	0.	0.	487.	0.	99.	20.	6378.74
0.16	0.00	17.51	0.00	0.000	0.025	0.000	0.000	6371.74	2.35
0.012405	76.	76.	76.	4	11	0	0.00	109.30	111.65

*SECNO 2504.000

2504.00	4.58	6371.17	6372.53	0.00	6376.09	4.92	5.05	0.02	6373.59
8520.	0.	8520.	0.	0.	479.	0.	103.	21.	6373.59
0.17	0.00	17.80	0.00	0.000	0.025	0.000	0.000	6366.59	2.42
0.013087	396.	396.	396.	4	11	0	0.00	109.15	111.58

*SECNO 2496.000

3301 HV CHANGED MORE THAN HVINS

2496.00	3.35	6361.94	6365.24	0.00	6375.06	13.12	0.21	0.82	6373.59
8520.	0.	8520.	0.	0.	293.	0.	103.	21.	6373.59
0.17	0.00	29.07	0.00	0.000	0.025	0.000	0.000	6358.59	11.64
0.052106	8.	8.	8.	5	11	0	0.00	90.71	102.36

*SECNO 2462.500

3301 HV CHANGED MORE THAN HVINS

2462.50	3.29	6361.45	6364.43	0.00	6372.92	11.46	1.65	0.50	6369.16
8520.	0.	8520.	0.	0.	314.	0.	103.	21.	6369.16
0.17	0.00	27.17	0.00	0.000	0.025	0.000	0.000	6358.16	7.71
0.046315	34.	34.	34.	3	14	0	0.00	98.58	106.29

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	QLOSS	BANK	ELEV
Q	QLOB	QCH	GRQB	ALOB	ACH	ARQB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VRQB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TQPWID	ENDST	

*SECNO 2458.500

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

2458.50	5.61	6367.66	6368.00	0.00	6370.87	3.21	0.03	2.06	6369.05	
8520.	0.	8520.	0.	0.	592.	0.	104.	21.	6369.05	
0.17	0.00	14.38	0.00	0.000	0.025	0.000	0.000	6362.05	1.39	
0.006644	4.	4.	4.	20	14	0	0.00	111.22	112.61	

*SECNO 2000.000

1645 INT SEC ADDED BY RAISING SEC 2000.00, 4.470FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	4.86	6365.42	6366.51	0.00	6369.79	4.37	0.97	0.12	6367.56	
8545.	0.	8545.	0.	0.	510.	0.	105.	21.	6367.56	
0.17	0.00	16.77	0.00	0.000	0.025	0.000	0.000	6360.56	2.14	
0.010776	115.	115.	115.	7	8	0	0.00	109.72	111.86	

1645 INT SEC ADDED BY RAISING SEC 1.01, -1.490FT AND MULTIPLYING BY 1.000

1.02	4.73	6363.80	6365.03	0.00	6368.46	4.66	1.30	0.03	6366.07	
8570.	0.	8570.	0.	0.	495.	0.	106.	22.	6366.07	
0.17	0.00	17.32	0.00	0.000	0.025	0.000	0.000	6359.07	2.28	
0.011906	115.	115.	115.	4	11	0	0.00	109.45	111.72	

1645 INT SEC ADDED BY RAISING SEC 1.02, -1.490FT AND MULTIPLYING BY 1.000

1.03	4.67	6362.25	6363.56	0.00	6367.05	4.80	1.39	0.01	6364.58	
8595.	0.	8595.	0.	0.	489.	0.	108.	22.	6364.58	
0.17	0.00	17.58	0.00	0.000	0.025	0.000	0.000	6357.58	2.33	
0.012433	115.	115.	115.	4	11	0	0.00	109.34	111.67	

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XLN	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.03, -1.490FT AND MULTIPLYING BY 1.000

2000.00	4.65	6360.74	6362.08	0.00	6365.60	4.86	1.44	0.01	6363.09
8620.	0.	8620.	0.	0.	487.	0.	109.	22.	6363.09
0.17	0.00	17.70	0.00	0.000	0.025	0.000	0.000	6356.09	2.35
0.012665	115.	115.	115.	2	11	0	0.00	109.31	111.65

*SECNO 1600.000

1600.00	4.63	6355.52	6356.88	0.00	6360.46	4.95	5.13	0.01	6357.89
8620.	0.	8620.	0.	0.	483.	0.	113.	23.	6357.89
0.18	0.00	17.85	0.00	0.000	0.025	0.000	0.000	6350.89	2.38
0.013006	400.	400.	400.	3	11	0	0.00	109.23	111.62

*SECNO 1553.400

1553.40	4.61	6354.90	6356.28	0.00	6359.85	4.96	0.61	0.00	6357.29
8620.	0.	8620.	0.	0.	482.	0.	114.	23.	6357.29
0.18	0.00	17.87	0.00	0.000	0.025	0.000	0.000	6350.29	2.39
0.013059	47.	47.	47.	2	11	0	0.00	109.22	111.61

*SECNO 1546.500

3301 HV CHANGED MORE THAN HVINS

1546.50	3.44	6346.85	6349.99	0.00	6358.97	12.12	0.17	0.72	6357.29
8620.	0.	8620.	0.	0.	309.	0.	114.	23.	6357.29
0.18	0.00	27.93	0.00	0.000	0.025	0.000	0.000	6343.41	10.44
0.046537	7.	7.	7.	6	11	0	0.00	93.12	103.56

*SECNO 1513.100

3301 HV CHANGED MORE THAN HVINS

1513.10	3.40	6346.38	6349.25	0.00	6357.07	10.69	1.47	0.43	6353.42
8620.	0.	8620.	0.	0.	329.	0.	114.	23.	6353.42
0.18	0.00	26.23	0.00	0.000	0.025	0.000	0.000	6342.98	7.04
0.041334	34.	34.	34.	3	14	0	0.00	99.93	106.96

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK	ELEV
Q	QLOB	QCH	QRQB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
TIME	VLOB	VCH	VRQB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLQBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

*SECNO 1509.600

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

1509.60	5.42	6351.75	6352.32	0.00	6355.28	3.53	0.03	2.19	6353.33	
8620.	0.	8620.	0.	0.	572.	0.	114.	23.	6353.33	
0.18	0.00	15.07	0.00	0.000	0.025	0.000	0.000	6346.33	1.58	
0.007606	3.	3.	3.	20	14	0	0.00	110.85	112.42	

*SECNO 1400.000

1400.00	5.15	6350.40	6351.24	0.00	6354.33	3.93	0.91	0.04	6352.25	
8620.	0.	8620.	0.	0.	542.	0.	116.	24.	6352.25	
0.18	0.00	15.91	0.00	0.000	0.025	0.000	0.000	6345.25	1.85	
0.009025	110.	110.	110.	6	8	0	0.00	110.31	112.15	

*SECNO 1353.000

3301 HV CHANGED MORE THAN HVINS

1353.00	4.70	6348.99	6350.30	0.00	6353.76	4.77	0.49	0.08	6351.29	
8620.	0.	8620.	0.	0.	492.	0.	116.	24.	6351.29	
0.18	0.00	17.53	0.00	0.000	0.025	0.000	0.000	6344.29	2.30	
0.012276	47.	47.	47.	7	8	0	0.00	109.39	111.70	

*SECNO 1347.000

3301 HV CHANGED MORE THAN HVINS

1347.00	3.51	6341.80	6344.79	0.00	6352.98	11.18	0.14	0.64	6351.29	
8620.	0.	8620.	0.	0.	321.	0.	116.	24.	6351.29	
0.18	0.00	26.83	0.00	0.000	0.025	0.000	0.000	6338.29	9.49	
0.041792	6.	6.	6.	7	11	0	0.00	95.02	104.51	

*SECNO 1313.500

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIMS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	MTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CDRAR	TDFWID	ENDST
1313.50	3.50	6341.36	6344.09	0.00	6351.29	9.93	1.32	0.37	6347.86
8620.	0.	8620.	0.	0.	341.	0.	116.	24.	6347.86
0.19	0.00	25.29	0.00	0.000	0.025	0.000	0.000	6337.86	6.50
0.037121	34.	34.	34.	2	14	0	0.00	100.99	107.50

*SECNO 1310.500

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

1310.50	5.56	6346.34	6346.77	0.00	6349.69	3.35	0.02	2.05	6347.78
8620.	0.	8620.	0.	0.	587.	0.	116.	24.	6347.78
0.19	0.00	14.68	0.00	0.000	0.025	0.000	0.000	6340.78	1.44
0.007000	3.	3.	3.	20	14	0	0.00	111.12	112.56

*SECNO 1150.000

1645 INT SEC ADDED BY RAISING SEC 1150.00, 0.870FT AND MULTIPLYING BY 1.000

3301 HV CHANGED MORE THAN HVINS

1.01	5.14	6345.05	6345.90	0.00	6348.99	3.94	0.64	0.06	6346.91
8620.	0.	8620.	0.	0.	541.	0.	118.	24.	6346.91
0.19	0.00	15.93	0.00	0.000	0.025	0.000	0.000	6339.91	1.85
0.009067	80.	80.	80.	7	8	0	0.00	110.29	112.15

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.870FT AND MULTIPLYING BY 1.000

1150.00	5.03	6344.07	6345.05	0.00	6348.21	4.14	0.76	0.02	6346.04
8620.	0.	8620.	0.	0.	528.	0.	119.	24.	6346.04
0.19	0.00	16.34	0.00	0.000	0.025	0.000	0.000	6339.04	1.98
0.009817	80.	80.	80.	4	8	0	0.00	110.05	112.02

*SECNO 1104.000

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	DLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IBC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

1104.00	4.63	6342.72	6344.08	0.00	6347.62	4.90	0.52	0.08	6345.09
8620.	0.	8620.	0.	0.	485.	0.	119.	24.	6345.09
0.19	0.00	17.77	0.00	0.000	0.025	0.000	0.000	6338.09	2.36
0.012832	46.	46.	46.	4	11	0	0.00	109.27	111.64

*SECNO 1096.000

3301 HV CHANGED MORE THAN HVINS

1096.00	3.39	6333.48	6336.79	0.00	6346.59	13.12	0.21	0.82	6345.09
8620.	0.	8620.	0.	0.	297.	0.	119.	24.	6345.09
0.19	0.00	29.06	0.00	0.000	0.025	0.000	0.000	6330.09	11.61
0.051369	8.	8.	8.	5	11	0	0.00	90.79	102.39

*SECNO 1062.500

3301 HV CHANGED MORE THAN HVINS

1062.50	3.33	6332.99	6335.98	0.00	6344.48	11.49	1.63	0.49	6340.66
8620.	0.	8620.	0.	0.	317.	0.	119.	24.	6340.66
0.19	0.00	27.20	0.00	0.000	0.025	0.000	0.000	6329.66	7.68
0.045852	34.	34.	34.	3	14	0	0.00	98.65	106.32

*SECNO 1058.500

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3710 WSEL ASSUMED BASED ON MIN DIFF

1058.50	5.35	6338.90	6339.54	0.00	6342.53	3.63	0.03	2.05	6340.55
8620.	0.	8620.	0.	0.	564.	0.	119.	24.	6340.55
0.19	0.00	15.29	0.00	0.000	0.025	0.000	0.000	6333.55	1.65
0.007955	4.	4.	4.	20	14	0	0.00	110.70	112.35

CCHV= 0.500 CEHV= 0.300

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROR	ALDR	ACH	AROR	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROR	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLDR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 900.000

1645 INT SEC ADDED BY RAISING SEC 900.00, 0.860FT AND MULTIPLYING BY 1.000

3235 SLOPE TOO STEEP,EXCEEDS 0.40

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

1.01	6.00	6338.69	6338.69	0.00	6341.54	2.86	62.16	22.89	6339.69
8620.	0.	8620.	0.	0.	636.	0.	120.	25.	6339.69
0.19	0.00	13.56	0.00	0.000	0.300	0.000	0.000	6332.69	1.00
0.784344	79.	79.	79.	20	8	0	0.00	111.99	113.00

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.860FT AND MULTIPLYING BY 1.000

3235 SLOPE TOO STEEP,EXCEEDS 0.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

900.00	5.99	6337.82	6337.82	0.00	6340.68	2.86	62.36	25.00	6338.83
8620.	0.	8620.	0.	0.	635.	0.	122.	25.	6338.83
0.19	0.00	13.57	0.00	0.000	0.300	0.000	0.000	6331.83	1.01
0.786844	79.	79.	79.	20	5	0	0.00	111.98	112.99

*SECNO 800.400

3235 SLOPE TOO STEEP,EXCEEDS 0.40

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

800.40	5.79	6335.99	6335.99	0.00	6338.89	2.90	83.43	28.50	6340.20
8620.	0.	8620.	0.	0.	631.	0.	123.	25.	6340.20
0.19	0.00	13.67	0.00	0.000	0.300	0.000	0.000	6330.20	0.00
0.838430	100.	100.	100.	20	8	0	0.00	109.00	109.00

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	UROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICQNT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5290 UPSTREAM ELEV IS 6337.92 ,NOT 6335.99 NEW BACKWATER REQUIRED

SB	XK	XKOR	COFR	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	0.00	109.00	9.00	1000.00	1.00	6330.20	6325.20

*SECNO 383.400

3235 SLOPE TOO STEEP,EXCEEDS 0.40

3301 HV CHANGED MORE THAN HVINS

CLASS B LOW FLOW

3420 BRIDGE W.S.= 6333.71 BRIDGE VELOCITY=, 13.54 CALCULATED CHANNEL AREA=, 363.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD
0.00	6334.38	0.00	0.	8620.	1000.	1100.	6340.20	6343.00
383.40	4.61	6329.81	0.00	0.00	6334.38	4.57	4.51	0.00
8620.	0.	8620.	0.	0.	502.	0.	129.	26.
0.20	0.00	17.16	0.00	0.000	0.300	0.000	0.000	6325.20
1.743729	417.	417.	417.	0	0	0	0.00	109.00

CCHV= 0.100 CEHV= 0.300

*SECNO 300.000

1645 INT SEC ADDED BY RAISING SEC 300.00, 0.333FT AND MULTIPLYING BY 1.839

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

1.01	6.90	6331.94	6331.94	0.00	6334.27	2.33	1.97	0.85	6336.33
8620.	0.	8620.	0.	0.	704.	0.	130.	27.	6338.33
0.20	0.00	12.25	0.00	0.000	0.040	0.000	0.000	6325.03	107.04
0.014140	139.	139.	139.	20	11	0	0.00	150.94	257.98

SECNO	DEPTH	CWSEL	CRISW	WSELK	EG	HV	HL	GLOSS	BANK ELEV
R	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1645 INT SEC ADDED BY RAISING SEC 1.01, -0.167FT AND MULTIPLYING BY 0.772

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

1.02	7.88	6332.75	6332.75	0.00	6335.37	2.62	1.93	1.19	6336.17
8620.	0.	8620.	0.	0.	663.	0.	133.	27.	6338.17
0.21	0.00	13.00	0.00	0.000	0.040	0.000	0.000	6324.87	80.19
0.013870	139.	139.	139.	20	8	0	0.00	127.42	207.61

1645 INT SEC ADDED BY RAISING SEC 1.02, -0.167FT AND MULTIPLYING BY 0.704

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

300.00	9.37	6334.07	6334.07	0.00	6337.20	3.13	1.88	1.26	6336.00
8620.	0.	8620.	0.	0.	607.	0.	135.	27.	6338.00
0.21	0.00	14.20	0.00	0.000	0.040	0.000	0.000	6324.70	53.56
0.013523	139.	139.	139.	20	11	0	0.00	98.38	151.95

THIS RUN EXECUTED 22-MAR-85 09:52:47

 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SAND CREEK CHANNEL (UPST

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*S	VCH	AREA	.01K
13000.000	0.00	0.00	0.00	6513.45	6870.00	6518.49	6519.64	6522.99	109.86	17.03	403.37	655.43
12500.000	500.00	0.00	0.00	6507.95	6870.00	6513.00	6514.13	6517.50	109.86	17.03	403.37	655.43
12000.000	500.00	0.00	0.00	6502.45	7190.00	6507.73	6508.82	6512.18	102.35	16.93	424.80	710.70
11500.000	500.00	0.00	0.00	6496.95	7190.00	6502.10	6503.32	6506.81	111.72	17.41	413.06	680.24
11153.000	346.50	0.00	0.00	6493.14	7190.00	6498.32	6499.51	6502.96	109.23	17.28	416.05	687.95
11146.000	7.00	0.00	0.00	6486.14	7190.00	6490.13	6493.38	6502.08	397.17	27.75	259.11	360.78
11113.000	33.50	0.00	0.00	6485.77	7190.00	6489.55	6492.54	6500.47	382.18	26.51	271.18	367.78
* 11109.000	3.50	0.00	0.00	6489.20	7190.00	6494.96	6495.57	6498.67	77.16	15.46	465.07	818.51
* 10700.000	409.50	0.00	0.00	6484.69	7190.00	6489.89	6491.06	6494.51	108.68	17.25	416.72	689.69
10503.000	196.50	0.00	0.00	6482.53	7190.00	6487.72	6488.90	6492.36	109.51	17.30	415.70	687.06
10496.000	7.00	0.00	0.00	6475.52	7190.00	6479.50	6482.75	6491.48	398.37	27.78	258.86	360.24
10463.000	33.50	0.00	0.00	6475.15	7190.00	6478.93	6481.92	6489.86	383.11	26.53	270.97	367.34
* 10459.000	3.50	0.00	0.00	6478.58	7190.00	6484.22	6484.95	6488.10	82.91	15.82	454.46	789.63
* 10400.000	59.50	0.00	0.00	6477.92	7190.00	6484.21	6484.29	6487.28	57.61	14.07	511.00	947.31
* 10284.000	115.12	0.00	0.00	6476.65	7190.00	6483.64	6483.64	6486.97	60.80	14.64	491.08	922.08
* 10183.000	101.25	6490.00	6488.65	6475.13	7190.00	6480.54	999999.00	6486.29	144.31	19.26	373.36	598.53
9900.000	283.63	0.00	0.00	6472.00	7190.00	6476.86	6478.40	6482.19	136.09	18.54	387.85	616.32

	SECND	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*8	VCH	AREA	.01K
*	9602.500	297.50	0.00	0.00	6468.74	7190.00	6473.94	6475.11	6478.56	108.59	17.25	416.83	689.98
	9597.500	5.00	0.00	0.00	6463.74	7190.00	6467.82	6470.70	6477.92	323.39	25.50	281.99	399.82
	9564.000	33.50	0.00	0.00	6463.37	7190.00	6467.35	6470.02	6476.62	303.45	24.43	294.37	412.75
*	9561.500	2.50	0.00	0.00	6465.82	7190.00	6471.42	6472.19	6475.36	84.67	15.93	451.41	781.40
*	9202.500	359.00	0.00	0.00	6461.87	7190.00	6467.07	6468.24	6471.69	108.62	17.25	416.79	689.88
	9197.500	5.00	0.00	0.00	6456.87	7190.00	6460.95	6463.83	6471.05	323.41	25.50	281.98	399.81
	9164.000	33.50	0.00	0.00	6456.50	7190.00	6460.48	6463.15	6469.75	303.46	24.43	294.36	412.74
*	9161.500	2.50	0.00	0.00	6458.95	7190.00	6464.55	6465.32	6468.49	84.60	15.92	451.53	781.71
*	8700.000	461.50	0.00	0.00	6453.87	7360.00	6459.17	6460.34	6463.81	106.34	17.28	425.95	713.72
	8200.000	500.00	0.00	0.00	6448.37	7360.00	6453.61	6454.84	6458.37	110.83	17.51	420.35	699.11
	8003.000	197.00	0.00	0.00	6446.20	7360.00	6451.44	6452.67	6456.19	110.31	17.48	420.98	700.75
	7997.000	6.00	0.00	0.00	6440.20	7360.00	6444.30	6447.40	6455.43	356.30	26.77	274.91	389.92
	7963.500	33.50	0.00	0.00	6439.83	7360.00	6443.76	6446.64	6453.99	340.62	25.67	286.74	398.79
*	7960.500	3.00	0.00	0.00	6442.77	7360.00	6448.65	6449.24	6452.38	75.62	15.50	474.81	846.38
*	7603.500	357.00	0.00	0.00	6438.84	7360.00	6444.12	6445.31	6448.80	107.84	17.36	424.05	708.76
	7596.500	7.00	0.00	0.00	6431.84	7360.00	6435.91	6439.18	6447.92	389.79	27.82	264.58	372.79
	7563.000	33.50	0.00	0.00	6431.47	7360.00	6435.32	6438.34	6446.34	377.60	26.64	276.27	378.76
*	7559.500	3.50	0.00	0.00	6434.90	7360.00	6440.76	6441.37	6444.51	76.35	15.54	473.73	842.33
*	7300.000	259.50	0.00	0.00	6432.04	7360.00	6437.36	6438.51	6441.97	105.32	17.23	427.27	717.18
	7003.700	296.30	0.00	0.00	6428.78	7360.00	6434.03	6435.25	6438.77	109.93	17.46	421.44	701.96
	6996.300	7.40	0.00	0.00	6421.39	7360.00	6425.44	6428.79	6437.85	404.58	28.26	260.43	365.91
	6962.800	33.50	0.00	0.00	6421.02	7360.00	6424.84	6427.91	6436.19	393.72	27.04	272.14	370.92
*	6959.100	3.70	0.00	0.00	6424.64	7360.00	6430.37	6431.11	6434.30	82.17	15.91	462.67	811.95
*	6500.000	459.10	0.00	0.00	6419.59	7360.00	6424.87	6426.06	6429.57	108.76	17.40	422.90	705.75
	6000.000	500.00	0.00	0.00	6414.09	7360.00	6419.34	6420.56	6424.09	110.31	17.48	420.98	700.75
	5500.000	500.00	0.00	0.00	6408.59	7360.00	6413.85	6415.06	6418.58	109.84	17.46	421.56	702.25

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	EG	10K*8	VCH	AREA	.01K
5000.000	500.00	0.00	0.00	6403.09	7360.00	6408.33	6409.56	6413.08	110.29	17.48	421.02	700.84
4603.700	396.30	0.00	0.00	6398.73	7360.00	6403.98	6405.20	6408.71	109.85	17.46	421.54	702.21
4596.300	7.40	0.00	0.00	6391.33	7360.00	6395.38	6398.73	6407.79	404.72	28.26	260.40	365.85
4562.800	33.50	0.00	0.00	6390.96	7360.00	6394.78	6397.85	6406.14	393.87	27.05	272.11	370.85
* 4559.100	3.70	0.00	0.00	6394.58	7360.00	6400.51	6401.05	6404.16	73.13	15.32	480.34	860.67
* 4250.000	309.10	0.00	0.00	6391.18	7360.00	6396.54	6397.65	6401.07	102.60	17.08	430.86	726.61
* 4120.200	129.80	0.00	0.00	6389.75	7360.00	6395.57	6396.24	6399.65	85.70	16.22	453.68	795.03
* 4000.000	120.00	6403.80	6401.80	6389.49	7360.00	6394.93	999999.00	6399.60	105.89	17.34	424.36	715.23
* 3890.000	110.00	0.00	0.00	6388.28	8520.00	6395.39	6395.39	6398.70	53.49	14.59	584.04	1164.90
* 3450.000	440.00	0.00	0.00	6383.44	8520.00	6389.30	6390.54	6394.32	102.08	17.97	474.07	843.24
* 3440.000	10.00	0.00	0.00	6383.31	8520.00	6389.45	6390.60	6394.35	112.57	17.76	479.81	803.02
* 3340.000	100.00	0.00	0.00	6382.01	8520.00	6386.01	6387.96	6392.55	205.89	20.52	415.24	593.77
* 3250.000	90.00	0.00	0.00	6380.84	8520.00	6385.20	6386.79	6390.64	153.28	18.71	455.38	688.16
3240.900	9.10	0.00	0.00	6371.74	8520.00	6375.03	6378.48	6389.46	590.47	30.49	279.40	350.62
3207.400	33.50	0.00	0.00	6371.30	8520.00	6374.47	6377.60	6387.02	531.99	28.43	299.69	369.39
* 3203.100	4.30	0.00	0.00	6375.68	8520.00	6381.07	6381.63	6384.56	75.96	15.00	567.90	977.57
* 2900.000	303.10	0.00	0.00	6371.74	8520.00	6376.39	6377.68	6381.15	124.05	17.51	486.62	764.96
2504.000	396.00	0.00	0.00	6366.59	8520.00	6371.17	6372.53	6376.09	130.87	17.80	478.52	744.78
2496.000	8.00	0.00	0.00	6358.59	8520.00	6361.94	6365.24	6375.06	521.06	29.07	293.12	373.25
2462.500	33.50	0.00	0.00	6358.16	8520.00	6361.45	6364.43	6372.92	463.15	27.17	313.58	395.89
* 2458.500	4.00	0.00	0.00	6362.05	8520.00	6367.66	6368.00	6370.87	66.44	14.38	592.46	1045.27
* 2000.000	458.50	0.00	0.00	6356.09	8620.00	6360.74	6362.08	6365.60	126.65	17.70	487.02	765.96
1600.000	400.00	0.00	0.00	6350.89	8620.00	6355.52	6356.88	6360.46	130.06	17.85	482.97	755.85
1553.400	46.56	0.00	0.00	6350.29	8620.00	6354.90	6356.28	6359.85	130.59	17.87	482.36	754.32
1546.500	6.88	0.00	0.00	6343.41	8620.00	6346.85	6349.99	6358.97	465.37	27.93	308.58	399.58
1513.100	33.50	0.00	0.00	6342.98	8620.00	6346.38	6349.25	6357.07	413.34	26.23	328.60	423.99

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
*	1509.600	3.44	0.00	0.00	6346.33	8620.00	6351.75	6352.32	6355.28	76.06	15.07	571.87	988.42
	1400.000	109.60	0.00	0.00	6345.25	8620.00	6350.40	6351.24	6354.33	90.25	15.91	541.81	907.39
	1353.000	47.00	0.00	0.00	6344.29	8620.00	6348.99	6350.30	6353.76	122.76	17.53	491.81	778.01
	1347.000	6.00	0.00	0.00	6338.29	8620.00	6341.80	6344.79	6352.98	417.92	26.83	321.28	421.66
	1313.500	33.50	0.00	0.00	6337.86	8620.00	6341.36	6344.09	6351.29	371.21	25.29	340.87	447.40
*	1310.500	3.00	0.00	0.00	6340.78	8620.00	6346.34	6346.77	6349.69	70.00	14.68	587.07	1030.28
*	1150.000	160.50	0.00	0.00	6339.04	8620.00	6344.07	6345.05	6348.21	98.17	16.34	527.63	870.00
	1104.000	46.00	0.00	0.00	6338.09	8620.00	6342.72	6344.08	6347.62	128.32	17.77	485.01	760.95
	1096.000	8.00	0.00	0.00	6330.09	8620.00	6333.48	6336.79	6346.59	513.69	29.06	296.58	380.33
	1062.500	33.50	0.00	0.00	6329.66	8620.00	6332.99	6335.98	6344.48	458.52	27.20	316.85	402.56
*	1058.500	4.00	0.00	0.00	6333.55	8620.00	6338.90	6339.54	6342.53	79.55	15.29	563.81	966.45
*	900.000	158.50	0.00	0.00	6331.83	8620.00	6337.82	6337.82	6340.68	7868.44	13.57	635.01	97.18
*	800.400	99.51	0.00	0.00	6330.20	8620.00	6335.99	6335.99	6338.89	8384.30	13.67	630.68	94.14
*	383.400	417.00	6343.00	6340.20	6325.20	8620.00	6329.81	999999.00	6334.38	17437.29	17.16	502.32	65.28
*	300.000	417.00	0.00	0.00	6324.70	8620.00	6334.07	6334.07	6337.20	135.23	14.20	607.15	741.27

SAND CREEK CHANNEL (UPST

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
13000.000	6870.00	6518.49	0.00	0.00	-4.51	85.08	0.00
12500.000	6870.00	6513.00	0.00	-5.49	0.00	85.08	500.00
12000.000	7190.00	6507.73	0.00	-5.26	0.00	85.58	500.00
11500.000	7190.00	6502.10	0.00	-5.63	0.00	85.31	500.00
11153.000	7190.00	6498.32	0.00	-3.78	0.00	85.38	346.50
11146.000	7190.00	6490.13	0.00	-8.20	0.00	68.97	7.00
11113.000	7190.00	6489.55	0.00	-0.58	0.00	75.56	33.50
* 11109.000	7190.00	6494.96	0.00	5.41	0.00	86.52	3.50
* 10700.000	7190.00	6489.89	0.00	-1.54	0.00	85.39	409.50
10503.000	7190.00	6487.72	0.00	-2.17	0.00	85.37	196.50
10496.000	7190.00	6479.50	0.00	-8.21	0.00	68.97	7.00
10463.000	7190.00	6478.93	0.00	-0.58	0.00	75.55	33.50
* 10459.000	7190.00	6484.22	0.00	5.29	0.00	86.27	3.50
* 10400.000	7190.00	6484.21	0.00	0.01	0.00	87.57	59.50
* 10284.000	7190.00	6483.64	0.00	-0.57	0.00	74.33	115.12
* 10183.000	7190.00	6480.54	0.00	-3.10	0.00	74.33	101.25
9900.000	7190.00	6476.86	0.00	-3.68	0.00	84.71	283.63
* 9602.500	7190.00	6473.94	0.00	-1.63	0.00	85.40	297.50
9597.500	7190.00	6467.82	0.00	-6.12	0.00	73.16	5.00
9564.000	7190.00	6467.35	0.00	-0.47	0.00	77.96	33.50
* 9561.500	7190.00	6471.42	0.00	4.07	0.00	86.20	2.50
* 9202.500	7190.00	6467.07	0.00	-2.03	0.00	85.39	359.00
9197.500	7190.00	6460.95	0.00	-6.12	0.00	73.16	5.00
9164.000	7190.00	6460.48	0.00	-0.47	0.00	77.96	33.50

	SECNO	R	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	9161.500	7190.00	6464.55	0.00	4.07	0.00	86.20	2.50
*	8700.000	7360.00	6459.17	0.00	-2.52	0.00	85.61	461.50
	8200.000	7360.00	6453.61	0.00	-5.56	0.00	85.48	500.00
	8003.000	7360.00	6451.44	0.00	-2.17	0.00	85.49	197.00
	7997.000	7360.00	6444.30	0.00	-7.14	0.00	71.19	6.00
	7963.500	7360.00	6443.76	0.00	-0.54	0.00	76.86	33.50
*	7960.500	7360.00	6448.65	0.00	4.89	0.00	86.47	3.00
*	7603.500	7360.00	6444.12	0.00	-1.37	0.00	85.56	357.00
	7596.500	7360.00	6435.91	0.00	-8.22	0.00	69.13	7.00
	7563.000	7360.00	6435.32	0.00	-0.59	0.00	75.69	33.50
*	7559.500	7360.00	6440.76	0.00	5.44	0.00	86.72	3.50
*	7300.000	7360.00	6437.36	0.00	-1.52	0.00	85.64	259.50
	7003.700	7360.00	6434.03	0.00	-3.33	0.00	85.50	296.30
	6996.300	7360.00	6425.44	0.00	-8.59	0.00	68.31	7.40
	6962.800	7360.00	6424.84	0.00	-0.61	0.00	75.22	33.50
*	6959.100	7360.00	6430.37	0.00	5.53	0.00	86.46	3.70
*	6500.000	7360.00	6424.87	0.00	-1.70	0.00	85.54	459.10
	6000.000	7360.00	6419.34	0.00	-5.52	0.00	85.49	500.00
	5500.000	7360.00	6413.85	0.00	-5.49	0.00	85.51	500.00
	5000.000	7360.00	6408.33	0.00	-5.52	0.00	85.49	500.00
	4603.700	7360.00	6403.98	0.00	-4.35	0.00	85.51	396.30
	4596.300	7360.00	6395.38	0.00	-8.59	0.00	68.31	7.40
	4562.800	7360.00	6394.78	0.00	-0.61	0.00	75.22	33.50
*	4559.100	7360.00	6400.51	0.00	5.74	0.00	86.87	3.70
*	4250.000	7360.00	6396.54	0.00	-1.21	0.00	85.72	309.10
*	4120.200	7360.00	6395.57	0.00	-0.97	0.00	78.00	129.80

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	4000.000	7360.00	6394.93	0.00	-0.64	0.00	78.00	120.00
*	3890.000	8520.00	6395.39	0.00	0.38	0.00	89.00	110.00
*	3450.000	8520.00	6389.30	0.00	-1.26	0.00	86.73	440.00
*	3440.000	8520.00	6389.45	0.00	0.15	0.00	84.31	10.00
*	3340.000	8520.00	6386.01	0.00	-0.59	0.00	107.99	100.00
*	3250.000	8520.00	6385.20	0.00	-0.29	0.00	108.73	90.00
	3240.900	8520.00	6375.03	0.00	-10.18	0.00	88.37	9.10
	3207.400	8520.00	6374.47	0.00	-0.56	0.00	97.74	33.50
*	3203.100	8520.00	6381.07	0.00	6.60	0.00	110.78	4.30
*	2900.000	8520.00	6376.39	0.00	-1.03	0.00	109.30	303.10
	2504.000	8520.00	6371.17	0.00	-5.22	0.00	109.15	396.00
	2496.000	8520.00	6361.94	0.00	-9.22	0.00	90.71	8.00
	2462.500	8520.00	6361.45	0.00	-0.49	0.00	98.58	33.50
*	2458.500	8520.00	6367.66	0.00	6.21	0.00	111.22	4.00
*	2000.000	8620.00	6360.74	0.00	-1.51	0.00	109.31	458.50
	1600.000	8620.00	6355.52	0.00	-5.22	0.00	109.23	400.00
	1553.400	8620.00	6354.90	0.00	-0.62	0.00	109.22	46.56
	1546.500	8620.00	6346.85	0.00	-8.04	0.00	93.12	6.88
	1513.100	8620.00	6346.38	0.00	-0.47	0.00	99.93	33.50
*	1509.600	8620.00	6351.75	0.00	5.37	0.00	110.85	3.44
	1400.000	8620.00	6350.40	0.00	-1.35	0.00	110.31	109.60
	1353.000	8620.00	6348.99	0.00	-1.42	0.00	109.39	47.00
	1347.000	8620.00	6341.80	0.00	-7.18	0.00	95.02	6.00
	1313.500	8620.00	6341.36	0.00	-0.45	0.00	100.99	33.50
*	1310.500	8620.00	6346.34	0.00	4.99	0.00	111.12	3.00
*	1150.000	8620.00	6344.07	0.00	-0.98	0.00	110.05	160.50

SECND	R	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1104.000	8620.00	6342.72	0.00	-1.35	0.00	109.27	46.00
1096.000	8620.00	6333.48	0.00	-9.24	0.00	90.79	8.00
1062.500	8620.00	6332.99	0.00	-0.49	0.00	98.65	33.50
* 1058.500	8620.00	6338.90	0.00	5.91	0.00	110.70	4.00
* 900.000	8620.00	6337.82	0.00	-0.87	0.00	111.98	158.50
* 800.400	8620.00	6335.99	0.00	-1.84	0.00	109.00	99.51
* 383.400	8620.00	6329.81	0.00	-6.18	0.00	109.00	417.00
* 300.000	8620.00	6334.07	0.00	1.32	0.00	98.38	417.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO=11109.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=11109.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=10700.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO=10459.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=10459.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=10400.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO=10284.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO=10284.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=10284.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=10183.000 PROFILE= 1 BRIDGE DROWNS U.S. PROFILE
NEW BACKWATER REQUIRED

CAUTION SECNO= 9602.500 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 9561.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 9561.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 9202.500 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 9161.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 9161.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 8700.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 7960.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 7960.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 7603.500 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 7559.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 7559.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 7300.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 6959.100 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 6959.100 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 6500.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 4559.100 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 4559.100 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 4250.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 4120.200 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 4120.200 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 4000.000 PROFILE= 1 BRIDGE DROWNS U.S. PROFILE
NEW BACKWATER REQUIRED

CAUTION SECNO= 3890.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 3450.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 3440.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 3440.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 3340.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 3250.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 3203.100 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 3203.100 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 2900.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 2458.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 2458.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 2000.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 1509.600 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 1509.600 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1310.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 1310.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 1150.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 1058.500 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 1058.500 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 900.000 PROFILE= 1 INTERPOLATED XSECTIONS USED

CAUTION SECNO= 800.400 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 800.400 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 800.400 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 800.400 PROFILE= 1 SLOPE TOO STEEP

CAUTION SECNO= 383.400 PROFILE= 1 SLOPE TOO STEEP
CAUTION SECNO= 383.400 PROFILE= 1 BRIDGE DROWNS U.S. PROFILE
NEW BACKWATER REQUIRED

CAUTION SECNO= 300.000 PROFILE= 1 INTERPOLATED XSECTIONS USED