Appendix D:
FEMA Flood Insurance Study
(Duplicate Effective Model)

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HEC2 RELEASE DATED NOV 74 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50.51.52
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THIS RUN EXECUTED

Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

10/24/77

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T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHIC-SHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK    INQ      NINV     IDIR     STRT    METRIC    HVINS     Q      WSEL     FQ
       0.      4.       0.       0.  -1.000000    0.0       0.0      0.   638.000    0.0

J2  NRDF      IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC     IBW    CHNIM    IT CF
    1.000     0.0     -1.000    0.0      0.0      0.0      0.0      0.0     0.0      0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT:

   38.000   43.000    1.000    9.000   50.000    3.000   61.000   38.000   21.000   22.000

   27.000   28.000    4.000    0.0     38.000   49.000   43.000    1.000    3.000   11.000

    1.000   10.000   26.000   20.000   50.000   51.000    4.000    0.0    200.000    0.0

QT      5.000  660.000 1100.000 2200.000 2200.000 3790.000    0.0      0.0      0.0      0.0
NC      0.080    0.080    0.080    0.100    0.080    0.0      0.0      0.0      0.0      0.0
ET      0.0      0.0      0.0      0.0     10.400    0.0      0.0      0.0      0.0      0.0

X1     25.000   18.000 1652.000 1666.000  256.000  319.000  296.000    0.0      0.0      0.0
GR    645.200 1000.000  643.900 1147.000  641.700 1264.000  640.300 1397.000  637.200 1599.000
GR    638.300 1652.000  629.800 1665.000  629.000 1662.000  629.000 1668.000  629.000 1675.000
GR    629.500 1677.000  631.900 1685.000  639.000 1754.000  640.700 1798.000  655.700 1879.000
GR    656.000 1897.000  655.400 1965.000  658.100 2027.000    0.0      0.0      0.0      0.0
ET      0.0      0.0      0.0      0.0      9.100    0.0      0.0      0.0   1560.000 1690.000

X1     28.000   28.000 1880.000 1900.000  276.000  375.000  440.000    0.0      0.0      0.0
GR    645.400 1000.000  644.600 1100.000  645.100 1240.000  645.600 1300.000  648.300 1340.000
GR    640.300 1495.000  638.300 1580.000  636.300 1587.000  635.000 1590.000  635.000 1595.000
GR    635.000 1597.000  636.400 1598.000  637.500 1600.000  639.100 1700.000  640.600 1740.000
GR    645.500 1830.000  650.700 1860.000  653.400 1950.000  658.700 2100.000  654.100 2200.000
GR    653.500 2300.000  655.300 2390.000  658.100 2475.000  655.300 2500.000  670.400 2550.000
GR    770.100 2628.000    0.0      0.0      0.0      0.0      0.0      0.0      0.0      0.0
NC      0.080    0.080    0.080    0.300    0.700    0.0      0.0      0.0      0.0      0.0
ET      0.0      0.0      0.0      0.0      9.400    0.0      0.0      0.0      0.0      0.0

X1     27.000   19.000 1150.000 1200.000  178.000  210.000  190.000    0.0      0.0      0.0
GR    645.200 1000.000  641.400 1100.000  638.100 1180.000  636.500 1165.000  638.000 1170.000
GR    636.500 1185.000  637.300 1190.000  640.200 1305.000  644.600 1380.000  [illegible] 1450.000
GR    [illegible] 1550.000  654.500 1650.000  657.700 1750.000  659.2[illegible] [illegible] 660.1[illegible] 181[illegible].000
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BGT

BGU

BGV

Bridge - Private Drive

BGW

BGX

BGY

BGZ

RT	0.0	0.0	0.0	0.0	9.100	7.700	0.0	0.0	1160.000	1260.000
XI	27.100	20.000	1167.000	1173.800	60.000	170.000	118.000	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	639.800	639.800	0.0
GR	645.600	1000.000	641.400	1100.000	640.200	1119.000	638.400	1150.000	636.800	1165.000
GR	636.000	1167.000	636.000	1167.000	636.000	1173.500	636.000	1173.500	636.800	1185.000
GR	637.600	1200.000	639.800	1280.000	640.800	1308.000	645.000	1370.000	645.500	1380.000
GR	655.700	1450.000	658.000	1500.000	658.800	1580.000	659.000	1590.000	659.400	1850.000
SR	0.0	1.500	2.500	0.0	8.500	0.0	22.100	0.0	636.000	636.000
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1160.000	1260.000
XI	27.800	0.0	0.0	0.0	11.000	11.000	11.000	0.0	0.0	0.0
XB	0.0	0.0	1.000	639.400	640.200	0.0	0.0	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	640.200	640.200	0.0
RT	20.000	1000.000	645.500	645.500	1100.000	641.800	641.800	1119.000	640.800	640.200
RT	1150.000	640.200	638.400	1165.000	640.200	636.800	1167.000	640.200	636.000	1167.000
RT	640.200	639.400	1173.800	640.200	639.400	1173.800	640.200	638.000	1185.000	640.400
RT	636.800	1200.000	640.600	637.600	1280.000	641.700	639.800	1308.000	642.400	640.600
RT	1372.000	645.000	648.000	1380.000	648.800	648.800	1450.000	655.700	658.700	1850.000
RT	658.900	658.900	1650.000	658.800	658.800	1780.000	658.000	658.080	1850.000	659.500
RT	659.500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0	0.0	0.0
XI	20.000	30.000	2020.000	2055.000	115.000	184.000	354.000	0.0	0.0	0.0
GR	651.700	1150.000	651.700	1150.000	649.100	1250.000	649.300	1350.000	648.500	1450.000
GR	648.600	1550.000	646.600	1650.000	645.400	1735.000	643.600	1900.000	640.100	1890.000
GR	638.300	1960.000	637.500	1965.000	638.400	1970.000	640.200	2000.000	639.400	2020.000
GR	637.200	2025.000	636.000	2026.000	636.000	2030.000	636.000	2047.000	637.300	2050.000
GR	638.500	2055.000	647.300	2100.000	651.300	2200.000	660.600	2300.000	661.600	2400.000
GR	661.100	2500.000	664.640	2600.000	670.100	2700.000	680.70	2800.000	700.600	2860.000
NC	0.060	0.080	0.090	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	30.000	27.000	2010.000	2040.000	55.000	70.000	70.000	0.0	0.0	0.0
GR	650.900	1100.000	650.500	1100.000	649.300	1200.000	649.600	1400.000	648.500	1400.000
GR	645.400	1700.000	640.440	1850.000	637.300	1945.000	637.300	1951.000	637.500	1955.000
GR	640.500	1980.000	639.200	2010.000	637.500	2015.000	636.000	2018.000	636.000	2025.000
GR	636.000	2024.000	637.600	2031.000	639.300	2040.000	650.200	2080.000	650.500	2150.000
GR	661.700	2300.000	662.100	2800.000	665.100	2615.000	676.700	2700.000	686.800	2760.000
GR	690.300	2800.000	700.400	2830.000	0.0	0.0	0.0	0.0	0.0	0.0
XI	31.000	23.000	2005.000	2030.000	75.000	100.000	95.000	0.0	0.0	0.0
GR	650.500	1100.000	650.500	1100.000	649.300	1200.000	648.400	1400.000	648.500	1400.000
GR	644.500	1800.000	640.400	1900.000	640.500	1940.000	637.400	1950.000	638.300	1900.000
GR	640.400	1990.000	639.500	2005.000	638.500	2010.000	636.500	2015.000	638.100	2020.000
GR	639.300	2030.000	650.600	2070.000	661.600	2150.000	664.700	2300.000	665.100	2400.000
GR	670.700	2900.000	676.000	2962.000	700.700	2955.000	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0	0.0	0.0
XI	32.000	23.000	2015.000	2040.000	150.000	145.000	140.000	0.0	0.0	0.0
GR	647.800	1200.000	647.800	1200.000	645.300	1300.000	649.500	1600.000	645.400	1800.000
GR	645.440	2020.000	640.600	2040.000	637.600	2105.000	640.700	2160.000	640.300	2190.000
GR	640.400	2215.000	638.200	2222.000	636.500	2228.000	638.700	2235.000	640.600	2240.000
GR	655.400	2295.000	666.400	2600.000	664.500	2900.000	655.700	2950.000	670.100	2600.000
GR	675.500	2650.000	690.600	2740.000	700.100	2790.000	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	12.400	0.0	0.0	0.0	0.0	0.0
XI	33.000	23.000	2020.000	2040.000	150.000	170.000	250.000	0.0	0.0	0.0

BHA

	660.800	2600.000	640.600	2610.000	646.100	2700.000	657.800	2730.000	650.100	2700.000
	660.400	2900.000	670.400	2980.000	670.800	3010.000	673.600	3020.000	680.400	3060.000
	687.300	3100.000	690.600	3140.000	703.800	3200.000	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2550.000	2600.000

BHB

	34.000	21.000	2658.000	2689.000	175.000	175.000	140.000	0.0	0.0	0.0
	650.500	1630.000	650.100	1665.000	649.200	1600.000	649.700	1900.000	649.800	2000.000
	649.100	2054.000	648.300	2130.000	649.200	2230.000	645.700	2315.000	642.400	2500.000
	640.100	2659.000	638.200	2665.000	637.000	2669.000	637.000	2673.000	638.500	2660.000
	640.100	2689.000	653.600	2730.000	663.500	2800.000	665.500	2893.000	687.260	2970.000
	700.400	3050.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.090	0.090	0.085	0.100	0.300	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2550.000	2600.000

BHC

	34.100	0.0	0.0	0.0	100.000	100.000	150.000	0.0	0.800	0.0
	5.000	550.000	1370.000	1860.000	1860.000	3100.000	0.0	0.0	0.0	0.0
	0.100	0.100	0.055	0.300	0.700	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1810.000	1930.000

Bridge – Cemetery Road

	36.010	40.000	1910.000	1922.000	50.000	50.000	125.000	0.0	0.0	0.0
	10.000	0.0	0.0	0.0	0.0	0.0	0.0	643.000	644.800	0.0
	650.000	1000.000	649.600	1030.000	649.600	1070.000	649.100	1150.000	649.700	1210.000
	650.000	1260.000	649.700	1315.000	649.000	1400.000	648.700	1460.000	647.100	1535.000
	645.700	1600.000	647.100	1700.000	644.000	1715.000	644.400	1780.000	644.000	1780.000
	642.200	1830.000	640.500	1880.000	640.000	1897.000	640.000	1897.000	639.500	1910.000
	639.000	1911.000	638.600	1912.000	638.200	1913.000	639.100	1914.000	638.100	1918.000
	638.100	1916.000	638.100	1917.000	638.100	1918.000	638.100	1919.000	638.100	1920.000
	638.000	1921.000	640.000	1922.000	640.000	1935.000	640.000	1935.000	640.100	1982.000
	648.800	2008.000	695.000	2040.000	682.300	2100.000	654.700	2140.000	674.800	2220.000
	0.0	2.300	0.500	440.0	18.000	0.0	60.000	0.0	638.100	638.100
	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1810.000	1930.000

	36.020	0.0	0.0	0.0	23.000	23.000	23.000	0.0	0.0	0.0
	0.0	0.0	1.000	644.600	646.200	0.0	0.0	0.0	0.0	0.0
	10.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	40.000	1000.000	650.000	650.000	1030.000	649.600	649.600	1070.000	646.800	0.0
	1150.000	649.100	649.100	1210.000	649.700	649.700	1210.000	650.000	649.600	649.600
	649.700	649.700	1400.000	649.000	649.000	1460.000	648.700	648.700	650.000	1315.000
	647.100	1600.000	647.100	649.700	1700.000	647.600	645.000	1715.000	1535.000	647.100
	1750.000	646.200	644.400	1780.000	646.200	643.900	1810.000	646.200	647.200	644.900
	646.200	644.800	1881.000	644.800	644.000	1897.000	640.100	642.000	644.800	1880.000
	639.500	1911.000	649.500	642.100	1912.000	649.800	643.100	1913.000	1910.000	649.400
	1916.000	649.800	644.300	1915.000	649.900	644.500	1916.000	650.000	649.700	643.800
	649.900	644.500	1918.000	649.800	644.300	1919.000	649.700	643.900	644.600	1917.000
	643.100	1921.000	649.500	642.300	1922.000	649.400	640.000	1935.000	1920.000	649.600
	1935.000	646.800	640.000	1982.000	646.800	640.100	2008.000	646.800	668.400	640.000
	646.000	640.000	2100.000	652.300	652.000	2140.000	654.700	654.700	646.800	2040.000
	674.800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2220.000	674.800
	0.0	0.0	0.0	0.0	15.400	0.0	0.0	0.0	0.0	0.0

BHD

	36.000	24.000	1905.000	1989.000	125.000	75.000	47.000	0.0	0.0	0.0
	650.400	1000.000	650.000	1030.000	650.000	1070.000	649.800	1150.000	650.100	1210.000
	650.400	1260.000	650.100	1315.000	649.400	1400.000	649.100	1460.000	646.100	1600.000
	645.300	1715.000	649.300	1780.000	645.200	1830.000	645.600	1880.000	640.900	1905.000
	639.000	1915.000	640.100	1982.000	646.400	2040.000	652.700	2100.000	655.100	2140.000
	675.200	2220.000	687.800	2300.000	700.000	2380.000	714.600	2460.000	0.0	0.0
	0.050	0.050	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2060.000	2140.000

BHE

Bridge – Private Drive

BHF

BHG

BHH

Bridge – Private Road

Bridge – Private Road

BHI

BHJ

Bridge – Market Street

BHK

FT	0.0	0.0	0.0	0.0	0.400	0.0	0.0	0.0	0.0	0.0
XI	46.000	36.000	1650.000	1670.000	175.000	[illegible]	145.000	0.0	0.0	0.0
GR	700.200	1000.000	695.600	1040.000	692.300	1[illegible]	690.300	1170.000	665.300	1210.000
GR	684.400	1240.000	685.700	1340.000	682.400	1[illegible]	680.400	1440.000	677.700	1490.000
GR	675.600	1530.000	670.400	1555.000	665.100	1580.000	660.100	1610.000	655.200	1640.000
GR	650.200	1650.000	647.800	1660.000	650.100	1670.000	652.500	1750.000	658.600	1830.000
GR	664.600	1870.000	655.[illegible]	1900.000	640.100	1925.000	640.300	2100.000	665.700	2240.000
GR	667.500	2450.000	670.400	2625.000	675.400	2720.000	680.100	2760.000	685.300	2900.000
GR	690.300	2830.000	695.100	2844.000	700.200	2900.000	705.200	2940.000	710.200	3010.000
GR	715.200	3100.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1390.000	1510.000

BHL

XI	47.000	28.000	1410.000	1440.000	220.000	240.000	400.000	0.0	0.0	0.0
GR	687.300	1000.000	685.600	1050.000	680.600	1090.000	675.200	1110.000	670.400	1130.000
GR	665.300	1150.000	660.100	1210.000	656.300	1250.000	652.500	1350.000	650.100	1410.000
GR	660.000	1450.000	650.400	1440.000	655.100	1580.000	657.400	1605.000	660.200	1630.000
GR	662.500	1750.000	665.200	1860.000	667.300	2000.000	668.100	2100.000	668.600	2180.000
GR	670.100	2300.000	675.100	2450.000	675.000	2540.000	685.100	2640.000	690.000	2700.000
GR	700.100	2750.000	705.400	2800.000	710.200	2920.000	0.0	0.0	0.0	0.0
NC	0.000	0.000	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1445.000	1735.000

Bridge - Private Road

XI	49.000	28.000	1700.000	1710.000	350.000	374.000	450.000	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	653.700	653.700	0.0
GR	725.000	1000.000	720.000	1035.000	715.200	1080.000	709.900	1120.000	704.800	1152.000
GR	700.300	1200.000	695.300	1238.000	690.300	1270.000	685.100	1290.000	680.400	1340.000
GR	675.400	1402.000	669.800	1445.000	664.900	1480.000	660.200	1530.000	654.500	1590.000
GR	654.400	1609.000	651.700	1709.000	650.400	1709.500	650.200	1710.500	654.400	1711.500
GR	651.700	1712.000	654.400	1800.000	655.000	1930.000	660.500	2080.000	663.900	2200.000
GR	664.100	2300.000	663.900	2400.000	665.400	2500.000	0.0	0.0	0.0	0.0
SR	0.0	1.500	2.500	0.0	3.000	0.0	7.100	0.0	650.200	650.200
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1645.000	1735.000

BHM

XI	49.000	0.0	0.0	0.0	20.000	20.000	20.000	0.0	0.0	0.0
XI	0.0	0.0	1.000	653.200	654.400	0.0	0.0	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	654.400	654.400	0.0
RT	16.000	1480.000	664.900	664.900	1530.000	660.200	660.200	1590.000	654.900	654.900
RT	1609.000	654.400	654.400	1709.000	654.400	651.700	1709.500	654.400	653.000	1710.500
RT	654.400	653.200	1711.500	654.400	653.000	1712.000	654.400	651.700	1890.000	654.400
RT	654.400	1930.000	655.000	655.000	2000.000	660.400	660.900	2200.000	663.000	663.900
RT	2300.000	664.100	664.100	2400.000	663.900	663.900	2500.000	665.400	665.400	0.0
FT	0.0	0.0	0.0	0.0	15.400	0.0	0.0	0.0	0.0	0.0

BHN

XI	50.000	[illegible]	1740.000	1765.000	300.000	175.000	275.000	0.0	[illegible]	0.0
GR	725.300	1000.000	720.100	1035.000	715.400	1060.000	710.100	1080.000	[illegible]	[illegible]
GR	700.300	1165.000	695.600	1100.000	690.000	1220.000	685.700	1265.000	[illegible]	
GR	675.300	1380.000	670.400	1470.000	665.900	1528.000	660.200	1570.000		
GR	652.500	1680.000	652.100	1740.000	651.500	1752.000	652.100	1765.000		
GR	[illegible]	2305.000	[illegible]	2330.000	0.0	0.0	0.0	0.0		

BHO

BT	5.000	480.000	1180.000	1640.000	1640.000	3600.000	0.0	0.0	0.0	0.0
NR	0.060	0.060	0.080	0.180	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2390.000	2800.000
X1	51.000	23.000	2715.000	2750.000	1200.000	209.000	740.000	0.0	0.0	0.0
GR	690.100	1000.000	687.300	1100.000	685.100	1230.000	680.200	1275.000	675.600	1340.000
GR	670.800	1480.000	665.200	1635.000	660.500	1798.000	652.300	2030.000	656.600	2295.000
GR	695.100	2298.000	656.700	2300.000	656.700	2460.000	658.100	2470.000	656.700	2478.000
GR	655.800	2600.000	655.100	2715.000	653.000	2740.000	655.300	2760.000	658.100	2860.000
GR	660.400	3230.000	665.400	3345.000	665.200	3360.000	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0

BHP

X1	52.400	34.000	2145.000	2268.000	600.000	390.000	330.000	0.0	0.0	0.0
GR	725.100	1000.000	720.100	1030.000	715.400	1080.000	710.900	1108.000	705.300	1130.000
GR	700.200	1150.000	695.300	1170.000	690.300	1195.000	685.400	1225.000	680.000	1240.000
GR	675.300	1295.000	670.700	1400.000	667.500	1500.000	665.300	1590.000	664.100	1630.000
GR	665.100	1700.000	665.700	1735.000	665.200	1772.000	660.000	1828.000	660.400	1888.000
GR	658.100	2100.000	658.100	2145.000	654.000	2260.000	654.200	2268.000	659.200	2380.000
GR	660.600	2440.000	662.100	2600.000	665.300	2735.000	667.300	2755.000	668.100	2900.000
GR	668.300	3100.000	670.600	3280.000	672.100	3350.000	675.400	3465.000	0.0	0.0
NC	0.060	0.040	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2160.000	2280.000

Bridge – Private Road

X1	52.100	20.000	2247.000	2253.000	175.000	80.000	133.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	657.000	657.000	0.0
GR	666.200	1735.000	666.700	1772.000	660.500	1826.000	660.900	1888.000	659.200	2045.000
GR	658.600	2100.000	655.600	2145.000	654.600	2247.000	654.600	2247.000	654.600	2253.000
GR	654.600	2253.000	655.700	2268.000	657.700	2380.000	659.200	2390.000	661.100	2440.000
GR	662.600	2600.000	665.800	2735.000	667.800	2755.000	668.600	2900.000	668.800	3100.000
GR	0.0	1.500	2.500	0.0	6.000	0.0	23.400	0.0	654.600	654.600
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2160.000	2280.000
X1	52.200	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	650.000	650.000	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	659.200	659.200	0.0
BT	20.000	1735.000	666.200	666.200	1772.000	665.700	665.700	1825.000	660.500	660.900
BT	1888.000	660.900	660.900	2045.000	659.200	659.200	2100.000	659.200	658.600	2145.000
BT	659.200	655.600	2247.000	659.200	654.600	2247.000	659.200	658.500	2253.000	659.200
BT	658.500	2253.000	659.200	654.600	2260.000	659.200	655.700	2350.000	659.200	657.700
BT	2390.000	659.200	659.200	2440.000	661.100	661.100	2460.000	662.600	662.600	2735.000
BT	665.800	665.800	2755.000	667.800	667.800	2900.000	668.600	668.600	3100.000	668.800
BT	668.800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0

BHQ

X1	54.000	35.000	1818.000	1837.000	300.000	250.000	245.000	0.0	0.0	0.0
GR	725.200	1000.000	720.700	1120.000	715.200	1198.000	710.100	1242.000	705.100	1262.000
GR	700.600	1268.000	695.300	1300.000	690.300	1312.000	685.300	1328.000	680.100	1350.000
GR	675.100	1368.000	672.200	1470.000	670.300	1588.000	669.800	1595.000	668.100	1669.000
GR	657.500	1760.000	657.000	1818.100	655.800	1830.000	657.000	1837.000	657.800	1880.000
GR	663.600	2000.000	665.400	2100.000	668.100	2260.000	667.400	2300.000	670.400	2465.000
GR	672.400	2380.000	675.500	2719.000	680.300	2760.000	685.300	2805.000	690.000	2840.000
GR	695.700	2855.000	700.700	2875.000	705.100	2900.000	710.000	2980.000	715.100	3015.000
NC	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	55.000	29.000	1510.000	1530.000	340.000	290.000	330.000	0.0	0.0	0.0
GR	725.000	1000.000	720.600	1095.000	715.500	1110.000	710.100	1210.000	705.100	1269.000
GR	700.300	1290.000	695.800	1300.000	690.600	1315.000	685.200	1330.000	680.200	1355.000
GR	675.700	1385.000	670.500	1405.000	665.700	1425.000	657.600	1510.000	656.700	1530.000

BHR

BHS

BHT

BHU

Bridge – Market Street

BR	681.500	1930.000	662.700	1670.000	666.100	1894.000	661.300	1820.000	670.400	1970.000
BR	672.100	2070.000	675.400	2178.000	680.100	2210.000	685.300	2240.000	690.700	2285.000
BR	695.600	2310.000	700.100	2395.000	705.100	2420.000	710.100	2525.000	0.0	0.0
NC	0.090	0.040	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
X1	56.000	29.000	1443.000	1440.000	300.000	325.000	310.000	0.0	0.0	0.0
BR	795.400	1000.000	720.100	1095.000	715.900	1140.000	710.600	1170.000	705.200	1220.000
BR	700.400	1275.000	695.900	1285.000	690.300	1305.000	685.100	1320.000	680.700	1338.000
BR	675.400	1360.000	665.300	1428.000	660.000	1443.000	658.000	1448.000	659.100	1460.000
BR	659.700	1550.000	665.600	1680.000	665.000	1705.000	667.500	1800.000	670.200	1970.000
BR	675.400	2042.000	680.900	2070.000	685.800	2100.000	690.100	2125.000	699.700	2149.000
BR	700.200	2162.000	705.600	2190.000	710.600	2225.000	715.100	2260.000	0.0	0.0
NC	0.090	0.040	0.050	0.100	0.000	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	4.400	0.0	0.0	0.0	0.0	0.0
X1	57.000	32.000	1507.000	1520.000	160.000	170.000	160.000	0.0	0.0	0.0
BR	795.000	1000.000	720.100	1055.000	715.900	1095.000	710.200	1155.000	705.600	1190.000
BR	700.900	1260.000	695.400	1280.000	690.000	1327.000	685.700	1362.000	680.800	1398.000
BR	675.100	1428.000	665.100	1502.000	661.000	1507.000	659.000	1510.000	660.600	1520.000
BR	662.200	1600.000	665.800	1735.000	667.100	1750.000	666.500	1770.000	667.100	1850.000
BR	670.100	1975.000	675.500	2090.000	680.100	2125.000	685.100	2180.000	690.900	2200.000
BR	695.100	2222.000	700.700	2252.000	705.400	2262.000	710.600	2285.000	715.200	2325.000
BR	720.700	2372.000	725.100	2415.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.040	0.050	0.400	0.000	0.0	0.0	0.0	0.0	0.0
X1	58.000	31.000	1412.000	1440.000	250.000	175.000	250.000	0.0	0.0	0.0
BR	795.100	1000.000	720.000	1022.000	715.600	1052.000	710.200	1085.000	705.200	1110.000
BR	700.100	1160.000	690.300	1172.000	685.400	1200.000	680.500	1290.000	675.600	1318.000
BR	670.100	1340.000	665.700	1410.000	661.000	1430.000	665.000	1440.000	666.600	1500.000
BR	668.000	1550.000	667.800	1580.000	666.900	1650.000	670.200	1760.000	675.100	1830.000
BR	677.300	1900.000	680.700	1980.000	685.400	2035.000	690.200	2055.000	695.300	2080.000
BR	700.200	2095.000	705.400	2108.000	710.400	2118.000	715.200	2130.000	720.100	2140.000
BR	725.100	2150.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.090	0.050	0.500	0.000	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1616.000	1780.000
X1	60.010	17.000	1616.000	1634.000	250.000	25.000	105.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	670.900	668.400	0.0
BR	679.500	1242.000	674.700	1335.000	672.700	1372.000	671.700	1390.000	668.900	1490.000
BR	668.000	1520.000	667.600	1616.000	660.000	1630.000	661.000	1680.000	662.800	1684.000
BR	662.800	1634.000	657.800	1740.000	668.700	1820.000	669.700	1910.000	674.800	1960.000
BR	679.700	2040.000	684.600	2125.000	0.0	0.0	0.0	0.0	0.0	0.0
SR	0.0	1.500	2.500	0.0	18.000	0.0	143.000	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1616.000	1780.000
X1	60.020	0.0	0.0	0.0	41.000	41.000	41.000	0.0	0.0	0.0
X3	0.0	0.0	1.000	670.100	668.700	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	671.300	668.700	0.0
RT	17.000	1242.000	679.500	679.500	1335.000	674.700	674.700	1372.000	672.700	672.700
RT	1390.000	672.600	671.700	1490.000	672.200	668.800	1520.000	672.000	668.900	1616.000
RT	671.300	668.600	1616.000	679.100	670.100	1634.000	672.100	670.100	1634.000	672.100
RT	670.100	1634.000	671.300	662.800	1.40.000	670.400	667.800	1820.000	668.700	668.700
RT	1910.000	669.700	669.700	1940.000	674.800	674.800	2040.000	679.700	679.700	2125.000
RT	684.600	684.600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	4.400	0.0	0.0	0.0	0.0	0.0
X1	60.000	20.000	1620.000	1630.000	90.000	125.000	100.000	0.0	0.0	0.0
BR	725.600	1000.000	720.000	1030.000	715.200	1060.000	710.200	1062.000	705.700	1090.000

BHV

QR	700.400	1102.800	698.100	1128.000	690.400	1150.000	685.300	1205.000	684.100	1242.000
QR	675.300	1338.000	672.300	1390.000	668.600	1520.000	665.100	1620.000	663.000	1625.000
QR	665.600	1630.000	668.400	1740.000	670.300	1910.000	675.400	1960.000	680.300	2040.000
QR	685.200	2125.000	690.100	2162.000	695.500	2188.000	700.100	2210.000	705.300	2220.000
QR	715.200	2245.000	715.600	2258.000	720.500	2270.000	725.100	2290.000	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0

BHW

XI	61.000	29.000	1730.000	1765.000	225.000	225.000	260.000	0.0	0.0	0.0
QR	725.400	1000.000	720.500	1032.000	715.000	1042.000	710.300	1075.000	704.300	1100.000
QR	700.100	1130.000	695.000	1158.000	690.200	1180.000	685.400	1210.000	680.300	1262.000
QR	675.000	1370.000	670.100	1400.000	670.200	1470.000	668.300	1600.000	666.000	1730.000
QR	664.000	1835.000	668.200	1745.000	667.200	1800.000	675.000	1820.000	680.400	1870.000
QR	685.400	1945.000	690.650	1985.000	695.000	2015.000	700.500	2045.000	705.300	2060.000
QR	710.100	2075.000	715.000	2105.000	720.300	2152.000	725.100	2215.000	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	8.400	0.0	0.0	0.0	0.0	0.0

BHX

XI	62.000	33.000	1890.000	1940.000	125.000	225.000	240.000	0.0	0.0	0.0
QR	725.400	1000.000	720.600	1020.000	715.000	1038.000	710.200	1050.000	705.200	1058.000
QR	704.500	1060.000	700.000	1100.000	695.600	1148.000	690.300	1208.000	689.500	1315.000
QR	685.500	1500.000	684.500	1670.000	680.500	1820.000	674.500	1905.000	675.000	1910.000
QR	672.500	1980.000	670.100	1990.000	668.500	2100.000	665.500	2220.000	664.500	2230.000
QR	665.300	2240.000	670.300	2280.000	675.000	2300.000	680.400	2320.000	685.000	2360.000
QR	690.200	2420.000	695.000	2450.000	700.300	2480.000	705.200	2510.000	710.100	2560.000
QR	715.000	2648.000	720.200	2740.000	725.200	2790.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0

BHY

XI	63.000	31.000	1860.000	1880.000	200.000	225.000	240.000	0.0	0.0	0.0
QR	725.400	1000.000	720.600	1015.000	715.000	1030.000	710.600	1080.000	705.300	1080.000
QR	702.500	1080.000	700.200	1110.000	695.400	1140.000	690.100	1146.000	687.600	1280.000
QR	685.100	1390.000	684.500	1430.000	685.200	1470.000	680.300	1670.000	675.600	1660.000
QR	670.390	1690.000	668.600	1860.000	665.000	1870.000	667.300	1880.000	670.200	2000.000
QR	675.400	2020.000	680.600	2042.000	685.200	2075.000	690.200	2120.000	695.500	2175.000
QR	700.100	2215.000	705.100	2240.000	710.400	2280.000	715.200	2330.000	720.000	2355.000
QR	725.400	2410.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0

BHZ

XI	64.000	33.000	1430.000	1450.000	275.000	225.000	255.000	0.0	0.0	0.0
QR	725.400	1000.000	720.300	1010.000	715.300	1022.000	710.400	1055.000	705.200	1075.000
QR	700.200	1100.000	695.600	1120.000	690.500	1140.000	685.500	1180.000	690.100	1185.000
QR	685.500	1270.000	677.500	1300.000	675.600	1315.000	670.100	1390.000	668.400	1430.000
QR	667.000	1440.000	669.400	1450.000	670.400	1465.000	670.300	1485.000	668.500	1540.000
QR	670.200	1610.000	675.300	1635.000	680.200	1662.000	690.500	1685.000	687.500	1725.000
QR	693.200	1750.000	695.200	1770.000	700.100	1780.000	705.100	1810.000	710.500	1835.000
QR	715.100	1850.000	720.100	1870.000	725.200	1895.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.300	0.500	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	4.400	0.0	0.0	0.0	0.0	0.0

BIA

XI	65.000	29.000	1420.000	1448.000	125.000	90.000	105.000	0.0	0.0	0.0
QR	725.400	1000.000	710.100	1050.000	705.300	1070.000	700.400	1120.000	695.600	1130.000
QR	690.400	1160.000	685.400	1185.000	680.200	1220.000	674.300	1255.000	678.300	1275.000
QR	675.600	1285.000	670.300	1305.000	669.100	1350.000	668.200	1420.000	667.500	1430.000
QR	670.200	1448.000	672.600	1500.000	675.200	1540.000	677.500	1570.000	680.200	1590.000
QR	685.000	1605.000	690.100	1640.000	695.300	1662.000	700.100	1680.000	705.400	1695.000
QR	710.200	1720.000	715.200	1740.000	720.300	1755.000	725.000	1765.000	0.0	0.0
FJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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                                                                                THIS RUN EXECUTED
**********************************************************
 HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
 ERROR CORR -  01
 MODIFICATION -  50,51,52
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T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOM RUN-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOODWAY RUN

J1   ICHECK    INQ     NINV    IDIR    STRT    METRIC  HVINS   Q       WSEL    FQ
        0.      5.      0.      0.     0.0      0.0     0.0     0.     836.280  0.0

J2   NPROF     IPLOT   PRFVS   XSECV   XSECH   FN      ALLDC   IBW     CHNTH   ITRACE
     15.000    0.0     -1.000  0.0     0.0     0.0     0.0     0.0     0.0     0.0
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WALKER RUN - 100 YR, 6 D

SUMMARY PRINTOUT

SECNO	FLOW	Q	CWSEL	FR	HI	DLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
25.000	290.00	2200.00	635.68	636.94	0.0	0.0	1.69	10.99	1.00	0.0	0.0	94.18
25.000	290.00	2200.00	636.20	637.09	0.0	0.0	1.71	10.48	0.0	1.00	0.0	34.00
26.000	440.00	2200.00	641.04	641.39	4.32	0.13	0.35	7.19	0.0	0.0	5.77	294.41
26.000	440.00	2200.00	641.73	642.18	4.07	0.13	0.45	7.43	0.0	0.68	5.48	130.00
27.000	190.00	2200.00	641.99	642.17	0.78	0.00	0.18	4.18	0.0	0.0	0.94	243.03
27.000	190.00	2200.00	642.73	643.01	0.78	0.05	0.28	4.67	0.0	0.74	1.06	99.28
27.100	115.00	2200.00	642.33	642.47	0.29	0.01	0.14	4.70	0.0	0.0	0.34	246.61
27.100	115.00	2200.00	643.13	643.41	0.40	0.00	0.28	5.86	0.0	0.80	0.40	100.00
27.200	11.00	2200.00	643.32	643.40	0.03	0.0	0.08	3.46	0.0	0.0	0.99	288.19
27.200	11.00	2200.00	643.64	643.80	0.28	0.0	0.85	6.52	0.0	0.11	0.31	100.00
29.000	354.00	2200.00	643.61	643.70	0.29	0.01	0.09	3.20	0.0	0.0	0.28	281.35
29.000	354.00	2200.00	644.07	644.21	0.50	0.03	0.14	4.54	0.0	0.47	0.64	136.80
30.000	70.00	2200.00	643.66	643.76	0.06	0.01	0.11	3.47	0.0	0.0	0.05	258.67
30.000	70.00	2200.00	644.14	644.31	0.09	0.01	0.17	3.88	0.0	0.48	0.88	110.33
31.000	95.00	2200.00	643.78	643.91	0.13	0.02	0.16	4.32	0.0	0.0	0.09	227.59
31.000	95.00	2200.00	644.25	644.53	0.18	0.03	0.28	4.78	0.0	0.80	0.11	102.77
32.000	140.00	2200.00	644.09	644.34	0.40	0.03	0.25	5.32	0.0	0.0	0.34	199.65
32.000	140.00	2200.00	644.71	645.02	0.68	0.01	0.31	5.21	0.0	0.61	0.46	99.18
33.000	250.00	2200.00	644.81	644.91	0.55	0.01	0.10	3.46	0.0	0.0	0.71	403.69
33.000	250.00	2200.00	645.54	645.73	0.70	0.01	0.19	4.07	0.0	0.73	0.83	125.79
34.000	140.00	2200.00	645.00	645.10	0.19	0.00	0.10	3.56	0.0	0.0	0.17	349.47
34.000	140.00	2200.00	645.82	645.96	0.83	0.00	0.14	3.64	0.0	0.83	0.28	139.00
34.100	150.00	2200.00	645.14	645.37	0.24	0.04	0.24	5.40	0.0	0.0	0.14	310.27
34.100	150.00	2200.00	646.00	646.23	0.24	0.03	0.23	4.98	0.0	0.86	0.18	139.00
36.010	125.00	1860.00	645.43	645.61	0.19	0.05	0.07	3.87	0.0	0.0	0.40	379.36
36.010	125.00	1860.00	646.29	646.49	0.88	0.01	0.20	5.97	0.0	0.76	0.89	120.00
36.020	23.00	1860.00	647.87	647.89	2.28	0.0	0.02	2.05	0.0	0.0	2.34	513.68
36.020	23.00	1860.00	647.82	647.93	1.44	0.0	0.12	4.28	0.0	-0.05	1.52	120.00
36.000	47.00	1860.00	647.89	647.93	0.03	0.02	0.05	2.03	0.0	0.0	0.02	498.00
36.000	47.00	1860.00	647.90	648.01	0.07	0.00	0.11	2.70	0.0	0.01	0.09	109.14
37.000	190.00	1860.00	647.96	648.01	0.07	0.00	0.05	2.33	0.0	0.0	0.07	431.91
37.000	190.00	1860.00	648.02	648.19	0.16	0.02	0.17	3.61	0.0	0.06	0.12	100.00
37.100	305.00	1860.00	648.17	648.28	0.23	0.04	0.11	4.12	0.0	0.0	0.22	346.83
37.100	305.00	1860.00	648.85	649.13	0.65	0.29	0.58	8.25	0.0	0.37	0.52	80.00
37.200	12.00	1860.00	648.69	648.77	0.48	0.0	0.07	3.34	0.0	0.0	0.52	403.94
37.200	12.00	1860.00	648.55	649.13	0.0	0.0	0.58	8.23	0.0	-0.18	0.00	80.00

	SECNO	XLCH	Q	ELEL	EG	HL	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSX	TOPWID
	39.000	208.00	1860.00	648.91	649.16	0.27	0.12	0.25	4.83	0.0	0.0	0.22	171.11
	39.000	208.00	1860.00	649.59	649.93	0.49	0.07	0.35	5.04	0.0	0.67	1.03	80.40
	40.000	220.00	1860.00	649.56	649.87	0.49	0.02	0.31	5.63	0.0	0.0	0.68	188.70
	40.000	220.00	1860.00	650.22	650.68	0.72	0.04	0.67	6.22	0.0	0.66	0.60	72.75
	41.000	275.00	1860.00	650.66	650.87	1.00	0.01	0.22	4.83	0.0	0.0	1.10	149.53
	41.000	275.00	1860.00	651.01	651.81	1.19	0.01	0.40	5.74	0.0	0.78	1.19	68.18
	41.100	190.00	1860.00	651.71	651.91	1.03	0.00	0.20	5.51	0.0	0.0	1.05	178.68
	41.100	190.00	1860.00	652.61	652.79	0.91	0.07	0.18	4.76	0.0	0.90	1.28	128.00
	41.200	18.00	1860.00	652.96	653.05	1.16	0.0	0.10	3.60	0.0	0.0	1.28	195.87
	41.200	18.00	1860.00	653.34	653.05	0.65	0.0	0.14	4.85	0.0	0.19	0.60	120.00
	43.000	52.00	1860.00	653.09	653.13	0.15	0.02	0.03	2.28	0.0	0.0	0.14	291.94
	43.000	52.00	1860.00	653.30	653.38	0.11	0.02	0.08	3.04	0.0	0.20	0.10	132.61
BHJ	44.000	260.00	1860.00	653.39	653.38	0.21	0.04	0.09	4.72	0.0	0.0	0.19	289.32
	44.000	260.00	1860.00	653.75	653.98	0.40	0.00	0.20	5.35	0.0	0.43	0.44	136.01
Bridge	44.010	230.00	1860.00	655.16	655.39	1.91	0.10	0.23	4.40	0.0	0.0	1.87	212.91
	44.010	230.00	1860.00	656.20	656.36	2.39	0.01	0.16	5.67	0.0	1.04	2.44	140.00
Market	46.020	30.00	1860.00	656.55	656.64	1.25	0.0	0.09	4.36	0.0	0.0	1.30	204.49
	46.020	30.00	1860.00	656.69	656.88	0.68	0.0	0.19	4.95	0.0	0.15	0.49	140.00
BHK	46.000	145.00	1860.00	656.64	656.78	0.11	0.03	0.14	4.63	0.0	0.0	0.10	278.00
	46.000	145.00	1860.00	656.82	656.99	0.14	0.03	0.18	5.52	0.0	0.17	0.13	110.71
BHL	47.000	400.00	1860.00	657.02	657.08	0.27	0.02	0.06	2.89	0.0	0.0	0.37	353.68
	47.000	400.00	1860.00	657.52	657.40	0.48	0.01	0.16	4.05	0.0	0.23	0.81	120.00
Bridge	49.010	650.00	1860.00	657.31	657.34	0.29	0.01	0.03	2.60	0.0	0.0	0.30	432.83
	49.010	650.00	1860.00	658.04	658.28	0.75	0.04	0.22	5.96	0.0	0.75	0.74	90.00
Private	49.020	20.00	1860.00	657.43	657.46	0.12	0.0	0.02	2.31	0.0	0.0	0.12	437.45
	49.020	20.00	1860.00	658.06	658.06	0.0	0.0	0.02	6.04	0.0	0.00	0.0	90.00
BHM	49.000	30.00	1860.00	657.43	657.59	0.04	0.09	0.15	4.84	0.0	0.0	0.60	313.19
	49.000	30.00	1860.00	658.14	658.50	0.12	0.10	0.36	6.31	0.0	0.71	0.98	80.98
BHN	50.000	279.00	1860.00	657.78	657.80	0.21	0.01	0.02	2.01	0.0	0.0	0.38	808.78
	50.000	279.00	1860.00	658.76	658.81	0.98	0.04	0.06	2.53	0.0	0.00	0.60	241.34
BHO	51.000	740.00	1640.00	658.18	658.20	0.40	0.00	0.02	1.85	0.0	0.0	0.40	1002.32
	51.000	740.00	1640.00	659.14	659.16	0.35	0.00	0.02	1.66	0.0	0.95	0.37	650.00
BHP	52.000	330.00	1640.00	658.50	658.58	0.36	0.02	0.08	2.55	0.0	0.0	0.31	320.80
	52.000	330.00	1640.00	659.33	659.48	0.26	0.03	0.19	2.80	0.0	0.03	0.19	180.00
Bridge	52.100	133.00	1640.00	658.71	658.90	0.21	0.01	0.09	3.45	0.0	0.0	0.21	286.53
	52.100	133.00	1640.00	659.55	659.70	0.23	0.02	0.15	3.96	0.0	0.84	0.22	120.00
Private	52.200	12.00	1640.00	660.45	660.49	1.60	0.0	0.02	1.82	0.0	0.0	1.76	493.38
	52.200	12.00	1640.00	660.41	660.51	0.81	0.0	0.11	3.31	0.0	0.08	0.86	180.00

	SECNO	XLCH	Q	CWSEL	EG	HL	QLOSS	HV	VCH	CASE	DIFMSP	DIFMSX	TOPWID
BHQ	54.000	245.00	1640.00	660.64	660.79	0.22	0.08	0.14	4.14	0.0	0.0	0.18	219.35
	54.000	245.00	1640.00	660.94	661.20	0.60	0.19	0.31	5.85	0.0	0.30	0.54	97.94
BHR	55.000	330.00	1640.00	661.77	662.04	1.22	0.04	0.27	5.92	0.0	0.0	1.13	193.70
	55.000	330.00	1640.00	662.61	663.11	1.80	0.06	0.50	6.42	0.0	0.84	1.67	61.61
BHS	56.000	310.00	1640.00	663.10	663.25	1.20	0.01	0.15	4.24	0.0	0.0	1.33	120.68
	56.000	310.00	1640.00	664.13	664.31	1.18	0.03	0.17	3.79	0.0	1.03	1.82	101.17
BHT	57.000	160.00	1640.00	664.03	664.55	1.00	0.20	0.52	8.48	0.0	0.0	0.93	162.83
	57.000	160.00	1640.00	664.85	665.35	0.78	0.06	0.50	7.04	0.0	0.82	0.72	78.01
BHU	58.000	250.00	1640.00	667.97	668.76	3.41	0.21	0.78	8.50	4097.00	0.0	3.94	297.12
	58.000	250.00	1640.00	668.16	668.97	3.43	0.20	1.18	9.44	0.0	0.19	3.31	78.09
Bridge	0.010	105.00	1640.00	669.20	669.39	0.41	0.24	0.18	4.91	0.0	0.0	1.24	249.55
Market	0.010	105.00	1640.00	669.86	669.99	0.32	0.30	0.13	4.13	0.0	0.65	1.70	164.00
	0.020	41.00	1640.00	670.43	671.29	0.28	0.55	0.86	8.54	4097.00	0.0	1.28	301.15
	60.000	41.00	1640.00	669.61	671.59	0.10	1.76	2.02	12.89	0.0	0.88	50.85	184.00
BHV	60.000	109.00	1640.00	671.72	671.75	0.20	0.26	0.03	2.71	0.0	0.0	1.29	513.37
	60.000	109.00	1640.00	672.73	672.76	0.15	0.69	0.02	2.45	0.0	1.01	3.13	294.78
BHW	61.000	260.00	1640.00	671.87	671.91	0.16	0.00	0.04	2.86	0.0	0.0	0.15	369.84
	61.000	260.00	1640.00	672.84	672.88	0.12	0.00	0.04	2.40	0.0	0.97	0.11	[illegible]
BHX	62.000	200.00	1640.00	671.99	672.04	0.13	0.01	0.05	3.14	0.0	0.5	0.11	228.79
	62.000	200.00	1640.00	672.94	672.99	0.11	0.00	0.06	2.82	0.0	0.95	0.10	176.46
BHY	63.000	240.00	1640.00	672.22	672.31	0.25	0.01	0.08	3.90	0.0	0.0	0.23	328.65
	63.000	240.00	1640.00	673.15	673.26	0.18	0.02	0.12	4.14	0.0	0.93	0.21	142.66
BHZ	64.000	250.00	1640.00	672.75	672.86	0.95	0.01	0.11	4.47	0.0	0.0	0.53	268.62
	64.000	250.00	1640.00	673.63	673.79	0.51	0.01	0.17	4.90	0.0	0.08	0.48	151.78
BIA	65.000	105.00	1640.00	673.06	673.21	0.33	0.02	0.18	4.56	0.0	0.0	0.31	213.65
	65.000	105.00	1640.00	673.91	674.07	0.27	0.00	0.16	4.40	0.0	0.88	0.28	125.85

SUMMARY OF ERRORS

CAUTION SECNO= 25.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 58.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 58.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 60.020 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.020 PROFILE= 1 MINIMUM SPECIFIC ENERGY

THIS RUN EXECUTED OCT 26 1977

Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

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**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
FLOOD FORD - 1.
MODIFICATION - 50,51,52
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T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-RET TCK-CHIT/SUMMY BEACH
T3      WALKER RUN - 1.5 SQ.MI.FLOOD

J1  ICHECK   INQ    NINV   IDAY   START  METRIC  HVINS   Q      WSEL   FN
     0.      0.      0.     0.    0.0     0.0     0.0     0.   481.800  0.0

J2  UNITS    IPLOT   PRNTR  ASCII  ASCII  IN      ALLOC   IBW    CHNIM  ITRACE
    1.000    0.0    -1.000   0.0    0.0    0.0     0.0     0.0    0.0    0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    34.000  39.000  21.000  42.000  43.000  40.000  41.000  43.000   1.000   4.000

    [illegible]

    10.000  24.000  20.000  51.000  51.000   4.000   0.0   291.000   0.0     0.0

QT      9.000  640.000 1400.000 2200.000 2300.000 3700.000   0.0     0.0     0.0     0.0
WU      0.040   0.040   0.040   0.100   0.300   0.0     0.0     0.0     0.0     0.0
FT      0.0     0.0     0.0     0.0     0.400   0.0     0.0     0.0     0.0     0.0

X1      1.010  15.000 1147.000 1161.000   0.0     0.0     0.0     0.0    -7.600   0.0
GR    494.900 1000.000 495.500 1024.000 495.100 1057.000 498.000 1094.000 495.800 1116.000
GR    491.800 1147.000 490.700 1161.000 491.400 1184.000 491.400 1164.000 491.500 1167.000
GR    492.300 1172.000 493.700 1181.000 494.700 1203.000 502.100 1256.000 506.200 1303.000

X1      1.000   0.0     0.0     0.0   100.000 300.000 215.000   0.0     7.600   0.0
NC      0.040   0.040   0.040   0.100   0.300   0.0     0.0     0.0     0.0     0.0

X1      2.000  17.000 1190.000 1172.000 240.000 240.000 240.000   0.0     0.0     0.0
GR    490.300 1000.000 500.700 1006.000 498.700 1020.000 497.500 1090.000 495.300 1131.000
GR    494.300 1150.000 493.400 1194.000 492.300 1158.000 492.800 1160.000 492.500 1160.000
GR    493.400 1168.000 494.500 1172.000 496.900 1194.000 500.[illegible] 1252.000 504.400 1312.000
GR    500.400 [illegible]
FT      0.0     0.0     0.0     0.0     8.400   0.0     0.0     0.0     0.0     0.0

X1      3.000  15.000 1176.000 1152.000 280.000 280.000 280.000   0.0     0.0     0.0
GR    500.600 1000.000 497.400 1040.000 497.400 1090.000 500.800 1098.000 500.500 1113.000
GR    499.700 1174.000 499.100 1172.000 498.000 1148.000 497.500 1144.000 498.600 1150.000
GR    498.000 1172.000 501.400 1193.000 502.600 1262.000 507.500 1242.000 510.600 1392.000
NC      0.060   0.060   0.040   0.100   0.300   0.0     0.0     0.0     0.0     0.0
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X1	6.000	14.000	1330.000	1254.000	300.300	125.000	190.000	0.0	0.0	0.0
RP	508.500	970.000	505.000	1150.000	500.000	1195.000	499.600	1200.000	495.400	1221.000
RP	499.100	1239.000	498.500	1244.000	499.100	1254.000	500.500	1261.000	502.100	1320.000
RP	504.400	1264.000	506.100	1397.000	510.700	1445.000	510.700	1486.000	0.0	0.0
MC	0.060	0.040	0.040	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1340.000	1460.000
X1	6.010	36.000	1371.000	1382.500	175.000	150.000	220.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	508.000	508.000	0.0
RP	518.000	1080.000	517.000	1082.000	517.500	1101.000	518.000	1161.000	515.500	1214.000
RP	512.500	1269.000	511.000	1371.000	509.800	1361.000	509.300	1353.000	509.300	1353.000
RP	537.000	1361.000	504.700	1383.000	504.700	1371.000	504.400	1371.500	504.400	1371.300
RP	504.400	1371.000	504.300	1374.000	504.300	1376.000	504.300	1376.000	504.400	1377.000
RP	504.800	1378.000	505.200	1379.000	506.700	1380.000	506.200	1381.000	508.500	1382.000
RP	508.100	1382.500	507.800	1389.000	507.800	1389.000	509.200	1397.000	509.100	1459.000
RP	588.600	1562.000	509.200	1646.000	510.500	1723.000	512.500	1779.000	513.200	1802.000
RP	514.000	1802.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RP	0.0	1.500	2.500	0.0	11.500	0.0	32.000	0.0	504.300	504.300
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1340.000	1460.000
X1	6.020	0.0	0.0	0.0	25.000	25.000	25.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	505.000	512.500	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	512.500	512.500	0.0
RT	38.000	1080.000	514.000	518.000	1150.000	517.000	512.500	1161.000	517.000	517.000
RT	1161.000	518.000	518.000	1214.000	515.500	518.000	1269.000	512.500	512.500	1301.000
RT	512.500	511.000	1341.000	512.500	509.800	1353.000	512.500	509.300	1353.000	515.000
RT	509.300	1361.000	515.000	501.000	1363.000	515.000	504.100	1371.000	515.000	504.700
RT	1371.500	515.000	500.400	1372.000	515.000	501.200	1373.000	515.000	508.100	1374.000
RT	515.000	508.700	1375.000	517.000	509.100	1376.000	515.000	509.400	1377.000	516.000
RT	509.400	1378.000	516.000	510.400	1379.000	516.000	510.000	1380.000	516.000	506.500
RT	1381.000	515.000	507.900	1382.000	515.000	507.100	1382.500	15.000	506.600	1309.000
RT	515.000	507.800	1389.000	512.500	507.800	1397.000	512.500	89.700	1459.000	512.000
RT	509.100	1562.000	512.500	502.800	1646.000	517.500	501.700	1723.000	512.500	510.500
RT	1779.000	512.500	512.500	1802.000	513.300	513.300	1802.000	516.000	516.000	0.0
MC	0.050	0.090	0.040	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1340.000	1460.000
X1	6.000	20.000	1368.000	1382.000	75.000	50.000	65.000	0.0	0.0	0.0
RP	523.100	1080.000	522.600	1082.000	522.600	1103.000	523.000	1161.000	520.500	1214.000
RP	517.500	1269.000	516.000	1371.000	514.800	1341.000	514.600	1353.000	512.500	1361.000
RP	512.500	1368.000	507.500	1377.000	510.500	1380.000	510.500	1384.000	514.700	1397.000
RP	514.100	1459.000	513.800	1542.000	514.200	1635.000	515.600	1723.000	518.300	1802.000
MC	0.800	0.050	0.035	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	16.400	0.0	0.0	0.0	0.0	0.0
X1	0.010	10.000	1538.000	1556.000	90.000	65.000	85.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	528.600	528.600	0.0
RP	544.500	1080.000	540.600	1115.000	534.900	1307.000	533.700	1256.000	533.300	1286.000
RP	531.500	1324.000	530.700	1372.000	530.600	1439.000	529.800	1468.000	529.800	1535.000
RP	517.800	1535.000	517.800	1556.000	529.800	1556.500	529.000	1579.000	531.700	1526.000
RP	535.100	1660.000	540.600	1711.000	544.900	1773.000	548.900	1821.000	0.0	0.0
RP	0.0	1.500	0.0	0.0	0.0	0.0	0.0	0.0	517.000	517.000
X1	9.020	0.0	0.0	0.0	10.000	16.000	10.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	527.400	529.800	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	529.800	529.800	0.0
RT	19.000	1080.000	544.600	544.600	1115.000	540.600	540.600	1307.000	534.000	533.000
RT	1256.000	533.700	533.700	1286.000	533.300	533.300	1324.000	531.500	531.500	1372.000
RT	530.700	530.700	1439.000	530.600	530.600	1468.000	529.100	529.800	1535.000	529.800
RT	529.800	1535.000	529.800	534.000	1556.000	529.800	534.000	1556.000	529.800	540.600

BT	1570.000	499.800	599.800	1586.000	551.700	551.700	1440.000	535.100	535.100	1711.000
BT	540.600	540.600	1773.000	544.800	544.800	1821.000	548.900	548.900	0.0	0.0
X1	0.030	19.000	1537.000	1454.000	7.000	7.000	7.000	0.0	0.0	0.0
GR	544.800	1000.000	540.900	1115.000	535.200	1207.000	534.000	1256.000	533.600	1286.000
GR	531.800	1326.000	531.000	1372.000	530.400	1439.000	530.100	1468.000	527.300	1517.000
GR	517.800	1537.000	517.800	1554.000	527.300	1554.000	530.100	1579.000	537.000	1586.000
GR	535.400	1640.000	540.900	1711.000	545.400	1773.000	549.100	1821.000	0.0	0.0
X1	0.040	20.000	1539.000	1551.700	8.000	8.000	8.000	0.0	0.0	0.0
X3	13.000	0.0	0.0	0.0	0.0	0.0	0.0	528.300	525.300	0.0
GR	545.100	1000.000	541.200	1115.000	535.400	1207.000	534.300	1256.000	533.900	1286.000
GR	532.100	1326.000	531.300	1372.000	531.200	1439.000	530.000	1468.000	530.000	1517.000
GR	519.300	1539.000	519.300	1551.700	530.000	1551.700	530.000	1575.000	530.000	1577.000
GR	532.300	1586.000	535.700	1640.000	541.200	1711.000	[illegible]	1773.000	549.500	1821.000
SP	0.0	1.300	2.900	300.000	[illegible]	0	135.000	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	30.100	0.	0.0	0.0	0.0	0.0
X1	0.050	0.0	0.0	0.0	66.000	66.000	66.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	529.800	532.300	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	532.300	532.300	0.0
NC	0.060	0.060	0.059	0.300	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	50.400	0.0	0.0	0.0	0.0	0.0
X1	0.000	24.000	1538.000	1553.000	26.000	26.000	26.000	0.0	0.0	0.0
GR	546.100	1000.000	542.200	1115.000	536.500	1207.000	535.300	1256.000	534.900	1286.000
GR	533.100	1326.000	532.900	1372.000	532.200	1439.000	530.600	1468.000	529.800	1517.000
GR	525.700	1527.000	520.200	1532.000	519.200	1538.000	518.000	1545.000	518.000	1548.000
GR	518.000	1646.000	518.000	1653.000	520.600	1661.000	531.000	1637.000	533.300	1586.000
GR	536.700	1640.000	542.200	1711.000	546.400	1773.000	550.800	1821.000	0.0	0.0
NC	0.070	0.070	0.055	0.400	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
X1	0.100	29.000	[illegible]	1558.000	175.000	175.000	200.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	536.500	537.400	0.0
GR	552.000	1104.000	547.900	1247.000	542.300	1332.000	537.700	1396.000	537.000	1445.000
GR	537.800	1500.000	538.100	1516.000	536.100	1516.000	534.400	1521.000	530.000	1526.500
GR	529.300	1531.500	526.000	1537.000	529.000	1543.000	533.400	1547.500	535.500	1552.500
GR	536.900	1558.000	538.900	1558.000	540.600	1586.000	544.000	1640.000	549.500	1711.000
GR	553.700	1773.000	557.800	1821.000	0.0	0.0	0.0	0.0	0.0	0.0
SP	0.0	1.500	2.500	0.0	15.000	0.0	231.000	0.0	0.0	0.0
X1	0.200	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	536.900	537.000	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	537.000	538.900	0.0
BT	22.000	1106.000	552.000	552.000	1247.000	547.900	547.900	1332.000	542.300	542.300
BT	1396.000	537.700	537.700	1445.000	537.000	537.000	1800.000	537.800	537.800	1516.000
BT	538.100	538.100	1516.000	538.100	536.100	1521.000	538.200	536.200	1526.500	538.300
BT	536.300	1531.500	538.400	536.400	1537.000	538.500	536.500	1542.000	538.600	536.600
BT	1547.500	538.700	536.700	1552.500	538.800	536.800	1558.000	538.900	536.900	1558.000
BT	538.900	538.900	1586.000	540.600	540.600	1640.000	544.000	544.000	1711.000	549.800
BT	549.500	1773.000	553.700	553.700	1821.000	557.800	557.800	0.0	0.0	0.0
NC	0.060	0.060	0.050	0.100	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
X1	11.000	14.000	1538.000	1313.000	200.000	200.000	200.000	0.0	0.0	0.0
GR	552.000	1000.000	552.700	1086.000	551.400	1143.000	551.400	1165.000	549.[illegible]	1204.000
GR	545.500	1260.000	540.600	1285.000	534.200	1290.000	537.000	1293.000	537.000	1294.000
GR	537.000	1280.000	538.300	1302.000	534.000	1313.000	[illegible]	1336.000	558.400	1365.000

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CR   ASBCRO   1577.000   561.300   1494.000   542.450   1820.000   0.0   0.0   0.0   0.0
PU     0.0       0.0       0.0       0.0       0.0       0.0       0.0   0.0   0.0   0.0

*NOF 1

CCHV= 0.100 CEHV= 0.300
*SECNO 1.01
   SECNO   DEPTH   CWSEL   CRIWS   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  IOC     ICONT   CORAR   TOPWID  ENDST

3720 CRITICAL DEPTH ASSUMED
   1.01    1.03    486.93    .97    483.80    497.89    0.06    0.0    0.0    486.20
   660.      6.      650.     4.      .       82.       3.      0.     0.     486.10
   0.0     1.62     7.98     .79    0.060     0.040    0.060   0.0   483.90  1133.17
0.016470    0.      0.0      0.      0.        0.       0.      0.0   53.30   1187.07

*SECNO 1.000
   SECNO   DEPTH   CWSEL   CRIWS   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  IOC     ICONT   CORAR   TOPWID  ENDST

3685 20 TRIALS ATTEMPTED WSEL.GWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   1.00    1.02    494.57    494.80    0.0    498.40    0.07    1.88    0.00    493.80
   660.      6.      650.      4.       .      82.       2.      0.      0.     493.70
   0.01    1.62     7.95     1.75    0.060    0.040    0.060   0.040   491.50  1133.26
0.016661    100.     215.     300.      20       8        0      0.0    53.76   1187.02

CCHV= 0.100 CEHV= 0.300
*SECNO 2.000

3301 HV CHANGED MORE THAN HVINS

   2.00    4.47    490.97    0.0      0.0    497.33    0.30    1.78    0.06    494.30
   660.    148.     455.     40.      40.     80.      40.     44.     11.    494.30
   0.02    2.19     5.62    1.97    0.060    0.040    0.060   0.040   492.50  1099.78
0.004170   240.     240.     240.      3        0        0      0.0    95.39   1195.16

*SECNO 3.000

3265 DIVIDED FLOW

   3.00    2.90    498.90    0.0      0.0    499.34    0.44    1.99    0.02    497.70
   660.    263.     342.     55.      79.     51.      20.      2.      1.     498.00
   0.04    3.32     6.49    2.69    0.060    0.040    0.060   0.040   496.00  1024.25
0.014748   280.     280.     280.      4        0        0      0.0    127.27  1177.86

CCHV= 0.100 CEHV= 0.300
*SECNO 4.000
   SECNO   DEPTH   CWSEL   CRIWS   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  IOC     ICONT   CORAR   TOPWID  ENDST
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                                                                    THIS RUN EXECUTED
**********************************************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
**********************************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 50-YR. FLOOD

J1  ICHECK    INQ     NINV    IDAY    NRST    NETRIC   HVINS    Q      WSEL     FQ
     0.       3.      0.      0.   0.0        0.0      0.0     0.   444.000   0.0

J2  NPROF    IPLOT   PRFVS   XSECV   XSEGH    FN      ALLOC    IBW    CHNIM    ITRACE
    2.000    0.0    -1.000   0.0     0.0     0.0      0.0     0.0    0.0      0.0
```

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                                                                    THIS RUN EXECUTED
**********************************************************************
HECP RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - A1
MODIFICATION - 50.51.52
**********************************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK    INQ     NINV     IDIQ     STRT    METRIC    KVINS     Q      NSEL     IPA
        0.      4.       0.       0.   0.0       0.0       0.0      0.   464.100    0.0

J2  NPROF     IPLOT    PRVS     XSECN    XSECH     FN     ALLOC     IBW    CHNIM    ITRACE
    1.000      0.0    -1.000     0.0      0.0      0.0      0.0      0.0     0.0      0.0
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                                                                    THIS RUN EXECUTED
**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
**********************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 500 YR. FLOOD

J1  ICHECK    INP     NINV    IDIR    STRT    METRIC  HVINR   IO      MSEL    PS
     0.       0.      0.      0.  0.0     0.0     0.0     0.   484.500   0.0
J2  NPROF   IPLOT   PRFVS   XSECV   XSECH     FN    ALLDC    IBW    CHNIM   ITRACE
   15.000    0.0    +1.000   0.0     0.0     0.0     0.0     0.0     0.0     0.0
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WALKER RUN - 10 YR. FLOD

SUMMARY PRINTOUT

RECNO	XLCH	Q	CWSEL	FR	HL	DLOSS	HV	VCH	CASE	DIFWSP	DIFWSK	TOPWID
1.010	0.0	660.00	486.[illegible]	487.60	0.0	0.0	0.96	7.92	1.00	0.0	0.0	93.90
1.010	0.0	1600.00	488.[illegible]	489.69	0.0	0.0	0.98	8.74	1.00	1.74	0.0	137.10
1.010	0.0	2200.00	489.[illegible]	490.78	0.0	0.0	1.07	9.54	1.00	0.53	0.0	171.93
1.010	0.0	3790.00	490.19	491.86	0.0	0.0	1.37	11.45	1.00	0.98	0.0	198.88
1.000	215.00	660.00	494.62	495.49	3.55	0.00	0.97	7.95	11.00	0.0	3.89	53.16
1.000	215.00	1600.00	496.24	497.25	1.53	0.00	0.97	8.69	11.00	1.78	7.00	107.93
1.000	215.00	2200.00	495.[illegible]	497.80	1.77	0.00	1.07	9.52	11.00	0.53	7.00	171.47
1.000	215.00	3790.00	497.[illegible]	499.14	1.[illegible]	0.00	1.34	11.34	11.00	1.00	7.00	199.00
2.000	240.00	660.00	496.07	497.33	1.78	0.06	0.36	5.62	0.0	0.0	2.45	95.38
2.000	240.00	1600.00	498.33	498.82	1.41	0.04	0.57	7.74	0.0	1.36	2.08	174.25
2.000	240.00	2200.00	498.95	499.36	1.43	0.05	0.61	8.40	0.0	0.62	2.13	206.94
2.000	240.00	3790.00	500.20	500.88	1.65	0.07	0.67	9.44	0.0	1.26	2.39	238.86
3.000	280.00	660.00	498.00	499.36	1.98	0.02	0.44	6.69	0.0	0.0	1.94	127.27
3.000	280.00	1600.00	500.26	500.71	1.81	0.01	0.46	7.25	0.0	1.36	1.93	163.06
3.000	280.00	2200.00	500.82	501.34	1.78	0.01	0.52	7.87	0.0	0.54	1.87	188.45
3.000	280.00	3790.00	501.98	502.60	1.78	0.00	0.68	9.21	0.0	1.18	1.71	214.90
4.000	190.00	660.00	501.50	501.[illegible]	[illegible]	[illegible]	0.36	4.88	0.0	0.0	2.60	114.08
4.000	190.00	1600.00	502.40	503.10	2.31	0.07	0.70	9.44	0.0	0.89	2.14	153.88
4.000	190.00	2200.00	502.97	503.69	2.26	0.09	0.81	10.61	0.0	0.48	2.05	165.63
4.000	190.00	3790.00	503.98	504.92	2.22	0.10	1.03	12.38	0.0	1.02	1.98	192.12
6.010	220.00	660.00	509.83	509.82	2.26	0.00	1.29	10.50	11.00	0.0	6.72	34.09
6.010	220.00	1600.00	510.10	510.[illegible]	[illegible]	0.04	0.85	9.06	11.00	1.91	7.24	358.94
6.010	220.00	2200.00	510.35	511.05	1.90	0.04	0.69	10.80	11.00	0.23	7.45	372.62
6.010	220.00	3790.00	510.99	511.74	2.01	0.08	0.77	12.30	11.00	0.62	7.09	404.79
6.020	25.00	660.00	512.73	512.74	3.21	0.0	0.00	0.97	0.0	0.0	4.50	521.14
6.020	25.00	1600.00	513.[illegible]	513.44	2.77	0.0	0.01	1.69	0.0	0.71	3.31	550.41
6.020	25.00	2200.00	513.74	513.[illegible]	2.71	0.0	0.04	2.35	0.0	0.30	3.37	558.70
6.020	25.00	3790.00	514.37	514.42	2.66	0.0	0.05	3.35	0.0	0.63	3.38	567.32
6.000	65.00	660.00	514.60	514.97	0.01	0.35	0.36	6.43	11.00	0.0	1.87	297.45
6.000	65.00	1600.00	515.11	515.63	0.03	0.35	0.51	8.71	11.00	0.51	1.87	384.22
6.000	65.00	2200.00	515.41	515.93	0.04	0.05	0.52	9.11	11.00	0.30	1.87	379.64
6.000	65.00	3790.00	515.90	516.[illegible]	0.07	0.40	0.68	10.73	11.00	0.46	1.83	401.38
9.010	95.00	660.00	520.93	522.50	1.68	0.84	1.57	10.04	11.00	0.0	6.32	21.00
9.010	95.00	1600.00	523.45	526.27	1.96	1.62	2.83	13.90	11.00	2.52	8.33	21.00
9.010	95.00	2200.00	524.77	528.28	1.37	2.10	3.52	15.06	11.00	1.31	9.35	21.00
9.010	95.00	3790.00	527.80	532.84	1.59	3.06	5.06	18.04	11.00	3.04	11.00	21.00
9.020	18.00	660.00	522.04	522.90	0.19	0.21	0.85	7.41	0.0	0.0	1.11	21.00
9.020	18.00	1600.00	525.18	524.86	0.21	0.34	1.66	10.33	0.0	3.14	1.74	21.00
9.020	18.00	2200.00	526.85	528.94	0.23	0.53	2.08	11.58	0.0	1.67	2.10	21.00
9.020	18.00	3790.00	528.20	532.80	0.0	0.0	4.68	17.36	12.00	1.34	0.40	21.00
9.030	7.00	660.00	521.94	528.01	0.06	0.41	0.48	1.35	0.0	0.0	-0.09	17.00
9.030	7.00	1600.00	524.95	527.64	0.08	0.72	2.69	13.16	0.0	2.99	-0.23	17.00
9.030	7.00	2200.00	526.56	529.94	0.09	0.[illegible]	3.40	14.80	0.0	1.59	-0.31	17.00
9.030	7.00	3790.00	[illegible]	[illegible]	0.[illegible]	[illegible]	[illegible]	[illegible]	0.0	7.[illegible]	[illegible]	264.03

	SECNO	XLEN	Q	CNSEL	EG	HL	GLOSS	HV	VGH	CASE	DIFWSP	DIFWSX	TOPWID
*	9.040	8.00	660.00	523.66	525.87	0.13	0.60	2.20	11.91	11.00	.0	1.71	12.70
*	9.040	8.00	1600.00	527.18	531.74	0.19	0.60	3.07	15.90	11.00	.52	2.07	12.70
*	9.040	8.00	2200.00	529.04	533.98	0.18	1.06	4.91	17.78	11.00	1.87	2.50	12.70
	9.040	8.00	3790.00	534.02	534.32	0.01	0.07	0.30	4.40	0.0	4.97	0.02	336.02
	9.050	66.00	660.00	520.08	526.99	0.18	0.19	0.91	7.67	0.0	0.0	[illegible]	12.70
	9.050	66.00	1600.00	531.96	533.19	1.53	0.82	2.24	12.00	0.0	4.88	[illegible]	12.70
	9.050	66.00	2200.00	530.60	535.04	0.00	[illegible]	[illegible]	9.18	0.0	2.07	[illegible]	308.78
	9.050	66.00	3790.00	534.50	534.76	0.44	0.0	0.20	5.28	0.0	0.73	0.54	376.63
	9.000	26.00	660.00	527.19	527.27	0.04	0.25	0.09	2.75	0.0	0.0	[illegible]	47.82
	9.000	26.00	1600.00	533.81	533.87	0.02	0.65	0.05	2.55	0.0	4.63	2.86	284.00
	9.000	26.00	2800.00	533.87	533.97	0.02	0.01	0.10	3.47	0.0	0.06	0.04	206.38
	9.000	26.00	3790.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0	[illegible]	[illegible]	313.98
*	9.100	200.00	660.00	530.44	532.10	0.37	1.10	1.66	10.34	11.00	0.0	3.25	19.39
	9.100	206.00	1600.00	533.25	535.72	0.16	1.69	2.47	12.61	0.0	2.81	-0.97	25.34
*	9.100	200.00	2200.00	534.65	537.41	0.27	1.86	2.76	13.33	11.00	1.40	0.77	30.18
*	9.100	200.00	3790.00	538.71	540.19	0.44	0.80	1.48	10.35	11.00	4.07	4.13	176.10
	9.200	12.00	660.00	531.81	532.61	0.25	0.26	0.79	7.14	0.0	0.0	1.38	22.28
	9.200	12.00	1600.00	535.09	536.34	0.25	0.37	1.24	8.94	0.0	3.28	1.85	32.55
	9.200	12.00	2200.00	536.77	538.19	0.28	0.40	1.42	9.67	0.0	1.67	2.12	41.44
	9.200	12.00	3790.00	539.32	540.33	0.14	0.0	1.01	8.84	0.0	2.55	0.81	101.47
*	11.000	283.00	660.00	543.04	543.08	0.14	0.04	1.04	8.98	11.00	0.0	0.84	33.43
*	11.000	283.00	1600.00	543.11	544.96	4.67	0.18	1.85	11.30	11.00	2.07	8.01	48.29
*	11.000	283.00	2200.00	544.09	546.20	6.44	0.21	2.11	12.28	4097.00	0.98	7.32	95.33
*	11.000	283.00	3790.00	546.25	548.65	2.94	0.42	[illegible]	13.68	11.00	2.14	6.93	78.79

SUMMARY OF ERRORS

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CAUTION  SECNO=   1.010  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.010  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.010  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.010  PROFILE= 4  CRITICAL DEPTH ASSUMED

CAUTION  SECNO=   1.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.000  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   1.000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   1.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.000  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   1.000  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   1.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.000  PROFILE= 3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   1.000  PROFILE= 3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   1.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   1.000  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   1.000  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=   4.010  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   4.010  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   4.010  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION  SECNO=   4.010  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=   4.010  PROFILE= 2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=   4.010  PROFILE= 2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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THIS RUN EXECUTED

HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52

Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, PA 17105

10/24/77

T1 SUSQUEHANNA RIVER BASIN COMMISSION
T2 BLOOMSBURG BERWICK SHICKSHINNY REACH
T3 WALKER RUN - 10 YR. FLOOD

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	1.	-1.000000	0.0	0.0	0.	629.500	0.0

J2	NROU	NPLOT	PMAX	ASECV	ASEC	FN	ALLOC	IAU	CHNIM	ITRACE
	1.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

34.000	39.000	21.000	22.000	42.000	40.000	41.000	43.000	1.000	4.000

53.000	54.000	0.0	0.0	30.000	0.0	1.000	3.000	11.000	12.000

10.000	26.000	28.000	50.000	51.000	4.000	0.0	201.000	0.0	0.0

NC	0.060	0.050	0.030	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.000	440.0	1000.000	0200.000	0800.000	01004.000	0.0	0.0	0.0	0.0

XI	26.000	26.000	1560.000	1600.000	275.000	375.000	440.000	0.0	0.0	0.0
GR	645.400	1000.000	644.400	1100.000	645.100	1240.000	645.500	1300.000	645.300	1340.000
GR	640.300	1495.000	636.300	1580.000	636.300	1587.000	636.000	1590.000	635.000	1595.000
NC	0.100	1697.000	636.440	1500.000	637.500	1400.000	639.100	1700.000	640.600	1700.000
GR	643.500	1830.000	650.700	1860.000	653.490	1950.000	655.700	2100.000	654.100	2200.000
GR	653.500	2300.000	655.300	2390.000	655.100	2475.000	655.300	2500.000	670.400	2550.000
GR	700.100	2625.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

XI	24.000	18.000	1640.000	1684.000	300.000	340.000	320.000	0.0	0.0	0.0
GR	645.200	1000.000	643.900	1147.000	641.700	1264.000	640.300	1397.000	637.200	599.000
GR	633.300	1552.000	629.500	1641.000	629.000	1642.000	629.000	1668.000	629.000	1675.000
GR	629.000	1677.000	631.900	1686.000	639.000	1756.000	640.700	1795.000	655.700	1879.000
GR	656.000	1897.000	655.400	1965.000	655.100	2027.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.400	0.500	0.0	0.0	0.0	0.0	0.0

XI	26.000	18.000	1600.000	1622.000	300.000	340.000	320.000	0.0	0.0	0.0
GR	645.600	1000.000	643.700	1203.000	640.600	1326.000	637.200	1437.000	637.600	1520.000
GR	635.400	1546.000	625.800	1600.000	623.500	1607.000	623.000	1609.000	623.000	1611.000
GR	628.000	1612.000	623.500	1614.000	625.600	1622.000	627.600	1673.000	639.600	1745.000
GR	639.600	1763.000	645.600	1798.000	654.000	1881.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0

X1	23.000	17.000	1410.000	1638.000	200.000	300.000	280.000	0.0	0.0	0.0
QR	644.100	1000.000	642.200	1129.000	637.300	1296.000	638.000	1432.000	628.000	1499.000
QR	623.700	1556.000	619.300	1610.000	617.700	1619.000	617.000	1629.000	617.000	1625.000
QR	617.000	1630.000	617.700	1631.000	620.100	1638.000	638.200	1660.000	638.200	1676.000
QR	637.800	1689.000	641.000	1709.000	0.0	0.0	0.0	0.0	0.0	0.0
MC	0.110	0.110	0.060	0.600	0.400	0.0	0.0	0.0	0.0	0.0
X1	22.000	17.000	1503.000	1460.000	130.000	170.000	140.000	0.0	0.0	0.0
QR	643.700	1000.000	639.800	1150.000	632.000	1269.000	636.000	1379.000	631.300	1408.000
QR	611.600	1493.000	610.500	1503.000	608.100	1510.000	608.000	1513.000	608.000	1519.000
QR	608.000	1522.000	609.800	1527.000	611.000	1540.000	625.600	1579.000	651.100	1680.000
QR	653.600	1712.000	653.600	1721.000	0.0	0.0	0.0	0.0	0.0	0.0
X1	21.000	19.000	1412.000	1460.000	200.000	250.000	250.000	0.0	0.0	0.0
QR	645.100	1000.000	639.400	1129.000	635.200	1279.000	631.300	1353.000	625.500	1388.000
QR	605.600	1419.000	603.200	1419.000	602.600	1421.000	602.600	1424.000	602.600	1427.000
QR	603.200	1430.000	605.300	1440.000	610.900	1500.000	624.900	1544.000	638.800	1594.000
QR	652.200	1669.000	658.400	1730.000	659.300	1747.000	659.300	1756.000	0.0	0.0
X1	20.000	16.000	1349.000	1380.000	200.000	150.000	190.000	0.0	0.0	0.0
QR	639.000	1000.000	634.300	1127.000	627.200	1192.000	608.400	1271.000	606.700	1313.000
QR	602.800	1348.000	601.600	1357.000	601.000	1361.000	601.000	1366.000	601.000	1370.000
QR	631.600	1374.000	602.800	1380.000	625.180	1419.000	651.200	1487.000	656.500	1555.000
QR	660.400	1600.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	19.000	13.000	1227.000	1279.000	135.000	225.000	230.000	0.0	0.0	0.0
QR	639.200	1000.000	633.600	1064.000	631.800	1187.000	601.200	1287.000	600.500	1236.000
QR	600.000	1243.000	600.500	1251.000	601.200	1270.000	601.500	1357.000	624.200	1383.000
QR	668.700	1666.000	680.000	1667.000	660.000	1667.000	0.0	0.0	0.0	0.0
X1	18.000	17.000	1270.000	1301.000	225.000	225.000	275.000	0.0	0.0	0.0
QR	630.300	1000.000	630.300	1017.000	626.800	1068.000	619.400	1091.000	616.100	1110.000
QR	650.200	1170.000	594.000	1233.000	591.100	1270.000	590.500	1281.000	590.000	1286.000
QR	590.400	1294.000	591.400	1301.000	595.500	1313.000	624.700	1348.000	630.500	1367.000
QR	658.800	1422.000	664.000	1442.000	0.0	0.0	0.0	0.0	0.0	0.0
X1	17.200	15.000	1256.000	1310.000	10.000	10.000	10.000	0.0	0.0	0.0
QR	642.000	1000.000	638.200	1009.000	638.000	1034.000	636.800	1119.000	635.000	1147.000
QR	624.000	1188.000	600.100	1222.000	581.500	1256.000	581.300	1269.000	581.300	1276.000
QR	582.200	1310.000	588.200	1338.000	592.000	1376.000	607.100	1424.000	632.300	1498.000
MC	0.110	0.110	0.060	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	17.100	20.000	1256.000	1281.000	20.000	20.000	20.000	0.0	0.500	0.0
QR	641.200	1000.000	637.400	1009.000	638.100	1034.000	636.000	1119.000	634.200	1147.000
QR	625.200	1188.000	599.300	1222.000	580.800	1256.000	578.700	1266.000	578.000	1269.000
QR	578.000	1271.000	578.000	1276.000	578.700	1277.000	580.000	1281.000	581.400	1310.000
QR	587.400	1338.000	592.000	1376.000	606.300	1424.000	631.600	1498.000	634.200	1557.000
MC	0.090	0.090	0.040	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	17.000	20.000	1256.000	1281.000	225.000	200.000	210.000	0.0	0.0	0.0
QR	641.200	1000.000	637.400	1009.000	638.100	1034.000	636.100	1119.000	634.200	1147.000
QR	625.200	1188.000	599.300	1222.000	580.800	1256.000	578.700	1266.000	578.000	1269.000
QR	578.000	1271.000	578.000	1276.000	578.700	1277.000	580.000	1281.000	581.400	1310.000
QR	587.400	1338.000	592.000	1376.000	606.300	1424.000	631.600	1498.000	634.200	1557.000
MC	0.110	0.110	0.060	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	16.000	16.000	1262.000	1288.000	180.000	225.000	210.000	0.0	0.0	0.0

AR	641.300	1086.000	637.300	1044.000	630.800	1145.000	600.900	1191.000	576.700	1262.000
AR	575.300	1274.000	574.700	1279.000	574.000	1264.000	574.000	1286.000	574.000	1289.000
AR	574.700	1292.000	574.400	1293.000	578.000	1352.000	605.300	1435.000	605.000	1497.000
AR	631.200	1529.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.100	0.0	0.0	0.0	0.0	0.0
XI	15.000	17.000	1316.000	1347.000	176.000	225.000	210.000	0.0	0.0	0.0
AR	641.000	1040.000	637.300	1140.000	638.400	1184.000	600.800	1186.000	571.700	1246.000
AR	572.700	1291.000	571.400	1314.000	570.600	1325.000	570.000	1331.000	570.000	1337.000
AR	570.000	1332.000	570.600	1339.000	571.200	1347.000	573.000	1379.000	588.200	1447.000
AR	691.100	1484.000	623.600	1538.000	0.0	0.0	0.0	0.0	0.0	0.0
XI	14.000	17.000	1347.000	1388.000	200.000	225.000	285.000	0.0	0.0	0.0
AR	634.700	1000.000	672.000	1089.000	609.600	1159.000	600.100	1188.000	570.900	1246.000
AR	568.800	1310.000	566.100	1347.000	566.500	1359.000	566.000	1367.000	566.000	1366.000
AR	566.000	1372.000	566.500	1374.000	568.300	1382.000	572.200	1430.000	590.400	1490.000
AR	594.200	1536.000	593.600	1547.000	0.0	0.0	0.0	0.0	0.0	0.0
XI	13.000	21.000	1241.000	1265.000	250.000	100.000	225.000	0.0	0.0	0.0
AR	599.000	1000.000	599.100	1017.000	600.200	1086.000	599.000	1095.000	596.200	1128.000
AR	595.300	1152.000	594.000	1196.000	594.000	1199.000	575.300	1215.000	562.500	1241.000
AR	560.800	1248.000	560.000	1251.000	560.000	1253.000	560.000	1253.000	560.000	1257.000
AR	562.200	1245.000	562.700	1321.000	562.500	1384.000	562.100	1422.000	575.100	1456.000
AR	580.900	1494.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
XI	12.000	17.000	1194.000	1228.000	200.000	260.000	220.000	0.0	0.0	0.0
AR	564.100	1000.000	565.300	1082.000	565.300	1074.000	568.700	1116.000	565.600	1138.000
AR	557.300	1159.000	553.400	1185.000	551.800	1204.000	551.000	1208.000	551.000	1211.000
AR	551.000	1219.000	551.000	1221.000	554.200	1228.000	560.300	1247.000	561.500	1273.000
AR	567.800	1317.000	576.800	1367.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.070	0.070	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	12.010	17.000	1195.000	1228.000	10.000	10.000	10.000	0.0	-8.500	0.0
AR	564.100	1000.000	565.300	1082.000	565.300	1074.000	568.700	1116.000	565.600	1138.000
AR	557.300	1159.000	553.400	1185.000	551.800	1204.000	551.000	1208.000	551.000	1211.000
AR	551.000	1219.000	551.000	1221.000	554.200	1228.000	560.300	1247.000	561.500	1273.000
AR	567.800	1317.000	576.800	1367.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	11.100	18.000	1285.000	1313.000	85.000	85.000	88.000	0.0	3.400	0.0
AR	552.000	1000.000	552.700	1086.000	551.400	1143.000	551.400	1165.000	549.100	1204.000
AR	545.500	1260.000	540.500	1285.000	538.200	1290.000	537.000	1293.000	537.000	1294.000
AR	537.000	1294.000	538.200	1302.000	539.800	1313.000	550.300	1336.000	555.400	1365.000
AR	555.400	1377.000	561.300	1424.000	562.400	1486.000	0.0	0.0	0.0	0.0
XI	11.000	18.000	1285.000	1313.000	200.000	260.000	283.000	0.0	0.0	0.0
AR	552.000	1000.000	552.700	1086.000	551.400	1143.000	551.400	1165.000	549.100	1204.000
AR	545.500	1260.000	540.500	1285.000	538.200	1290.000	537.000	1293.000	537.000	1294.000
AR	537.000	1294.000	538.200	1302.000	539.800	1313.000	550.300	1336.000	555.400	1365.000
AR	555.400	1377.000	561.300	1424.000	562.400	1486.000	0.0	0.0	0.0	0.0
EJ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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                                                                                  THIS RUN EXECUTED
**********************************************************************
  HEC2 RELEASE DATED NOV 74 UPDATED FEB 1977
  ERROR CODE -  01
  MODIFICATION -  50.51.52
**********************************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 50 YR. FLOOD

J1  ICHECK    INQ     NINV     IDTW     BTAT    METRIC    NVINS     D      NSEL     FQ
     0.       3.       0.      1.  -1.000000    0.0       0.0      0.     440.500   0.0

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH     FN     ALLOC    IBW    CHNIM    ITRACE
    2.000     0.0     -1.000    0.0      0.0      0.0     0.0     0.0     0.0      0.0
```

```
                                                                    THIS RUN EXECUTED
**********************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
  ERROR CODE =  0(
  MODIFICATION -  80.61.52
**********************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK    INQ     NINV    IDTW     STRT     WPTRIC   WPTNR    Q       WSEL     FQ
     0.       4.      0.      1. -1.000000     0.0      0.0      0.     641.000   0.0

J2  NPROF    IPLOT   PRFVR    ASEQN    ASECN     FN     ALLOC    JBW     OMMIN    ITRACE
    3.000     0.0    -1.000    0.0      0.0      0.0     0.0     0.0     0.0      0.0
```

```
                                                                    THIS RUN EXECUTED
**********************************************************
HECR RELEASE DATED NOV 74 UPDATED FEB 1977
ERROR CODE -  01
MODIFICATION -  SP,SL,RP
**********************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 500 YR. FLOOD
T4
J1  ICHECK    INP     NINV    IDIM    STRT    METRIC  NVINS   D       NSEL    FD
        0.      0.      0.      1. -1.000000    0.0     0.0     0.  442.000     0.0
J2  NPRNT   IPLOT   PRVEL   XSECV   XSECH   FN      ALLDC   IBW     CHNIM   ITRACE
    15.000     0.0  -1.000     0.0     0.0     0.0     1.0     0.0     0.0     0.0
```

THIS RUN EXECUTED

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**********************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
**********************************************
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NOTE-- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

WALKER RUN - 10 YR. FLOO

SUMMARY PRINTOUT

	SECNO	XLCH	STCHL	STCHR	ELMIN	ELTRD	ELLC	Q	CWSEL	TOPWID	SSTA	ENDST
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	660.00	639.27	168.03	1538.73	1706.18
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	1600.00	640.11	237.74	1502.48	1740.24
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	2200.00	640.83	269.07	1487.98	1757.05
*	26.000	0.0	1580.00	1600.00	635.00	0.0	0.0	3790.00	641.11	297.26	1469.98	1767.24
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	660.00	632.29	38.49	1654.38	1689.86
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	1600.00	634.38	72.61	1637.79	1710.13
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	2200.00	635.65	94.85	1624.00	1718.85
*	25.000	440.00	1652.00	1686.00	629.00	0.0	0.0	3790.00	636.98	134.04	1602.00	1736.06
*	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	660.00	627.18	72.50	1591.93	1664.51
	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	1600.00	628.68	97.93	1583.15	1680.19
	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	2200.00	629.17	102.00	1580.32	1682.13
	24.000	290.00	1600.00	1622.00	623.00	0.0	0.0	3790.00	630.40	117.79	1570.48	1688.27
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	660.00	620.62	48.50	1595.13	1638.64
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	1600.00	622.56	72.40	1568.52	1640.92
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	2200.00	623.40	85.32	1556.79	1642.11
*	23.000	320.00	1610.00	1638.00	617.00	0.0	0.0	3790.00	625.27	112.47	1537.32	1649.79
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	660.00	613.91	40.81	1499.26	1539.67
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	1600.00	612.00	51.50	1491.23	1542.73
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	2200.00	612.60	55.69	1488.66	1544.35
	22.000	280.00	1503.00	1540.00	608.00	0.0	0.0	3790.00	614.00	66.09	1482.30	1548.39
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	660.00	606.38	40.25	1411.44	1452.18
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	1600.00	608.44	67.23	1409.00	1476.23
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	2200.00	609.38	79.30	1407.69	1487.03
*	21.000	190.00	1413.00	1440.00	602.60	0.0	0.0	3790.00	611.39	97.86	1404.86	1502.71
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	660.00	603.09	65.23	1337.34	1382.57
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	1600.00	604.85	64.91	1320.83	1385.74
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	2200.00	606.81	77.20	1310.24	1387.44
*	20.000	250.00	1348.00	1380.00	601.00	0.0	0.0	3790.00	608.72	120.81	1269.93	1390.74
*	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	660.00	602.27	132.27	1225.41	1357.68
*	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	1600.00	603.18	134.81	1224.41	1358.92
*	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	2200.00	603.68	136.68	1223.80	1360.48
	19.000	190.00	1227.00	1270.00	600.00	0.0	0.0	3790.00	604.22	137.06	1223.06	1360.11

SECND	WCH	STCHL	STCHR	ELMIN	ELTRD	ELLG	Q	CWSEL	TOPWID	SSTA	ENDST
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	660.00	597.84	57.16	1251.19	1303.35
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	1600.00	594.09	74.26	1232.11	1308.39
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	2200.00	594.81	83.03	1224.78	1307.82
18.000	230.00	1270.00	1301.00	590.00	0.0	0.0	3790.00	596.65	105.42	1206.08	1311.50
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	660.00	583.20	62.10	1242.92	1316.02
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	1600.00	584.22	68.24	1241.18	1319.43
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	2200.00	584.84	70.49	1240.41	1321.40
17.200	275.00	1256.00	1310.00	581.30	0.0	0.0	3790.00	585.58	77.08	1248.69	1325.76
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	660.00	581.69	50.38	1255.28	1305.66
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	1600.00	583.50	65.49	1251.96	1317.45
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	2200.00	584.27	70.83	1250.54	1321.07
17.100	10.00	1256.00	1281.00	578.50	0.0	0.0	3790.00	585.16	80.43	1247.06	1329.89
17.000	20.00	1256.00	1281.00	578.00	0.0	0.0	660.00	581.54	56.02	1254.54	1310.66
17.000	20.00	1256.00	1281.00	578.00	0.0	0.0	1600.00	582.93	65.08	1252.08	1317.16
17.000	20.00	1256.00	1281.00	578.00	0.0	0.0	2200.00	583.68	69.94	1250.70	1320.65
17.000	[illegible].00	1256.00	1281.00	578.00	0.0	0.0	3790.00	585.39	81.04	1247.57	1328.61
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	660.00	577.37	71.19	1259.97	1331.16
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	1600.00	578.65	98.83	1256.11	1354.94
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	2200.00	579.11	102.39	1254.73	1357.02
16.000	210.00	1262.00	1299.00	574.00	0.0	0.0	3790.00	579.96	108.66	1252.18	1360.84
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	660.00	572.90	134.24	1243.38	1377.50
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	1600.00	573.85	141.50	1241.32	1382.82
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	2200.00	574.38	145.02	1240.17	1385.19
15.000	210.00	1316.00	1347.00	570.00	0.0	0.0	3790.00	575.41	151.88	1237.92	1389.80
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	660.00	569.14	94.72	1299.58	1394.30
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	1600.00	570.47	154.64	1259.18	1413.60
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	2200.00	571.04	177.02	1245.64	1422.66
14.000	210.00	1347.00	1382.00	566.00	0.0	0.0	3790.00	572.21	195.42	1243.40	1439.03
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	660.00	563.08	184.69	1239.83	1424.52
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	1600.00	563.83	187.36	1238.69	1426.98
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	2200.00	564.20	188.43	1238.28	1428.04
13.000	235.00	1241.00	1265.00	560.00	0.0	0.0	3790.00	564.53	191.44	1236.83	1428.89
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	660.00	553.92	36.95	1190.22	1227.18
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	1600.00	555.37	61.25	1172.81	1233.47
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	2200.00	556.13	73.53	1163.16	1236.69
12.000	225.00	1195.00	1228.00	551.00	0.0	0.0	3790.00	558.09	88.29	1144.78	1240.69
12.010	[illegible].00	1195.00	1228.00	542.50	0.0	0.0	660.00	545.61	30.41	1188.28	1227.70
12.010	20.00	1195.00	1228.00	542.50	0.0	0.0	1600.00	546.80	51.38	1179.35	1230.03
12.010	220.00	1195.00	1228.00	542.50	0.0	0.0	2200.00	547.00	57.65	1176.81	1232.52
12.010	220.00	1195.00	1228.00	542.50	0.0	0.0	3790.00	548.20	71.71	1168.58	1240.21
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	660.00	543.68	28.48	1285.52	1314.01
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	1600.00	545.22	39.39	1278.15	1317.54
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	2200.00	545.95	44.31	1274.73	1319.03
11.100	10.00	1285.00	1313.00	540.40	0.0	0.0	3790.00	547.43	54.90	1267.36	1322.26

SECNO	KLCH	STCHL	STCHR	ELMIN	ELTHD	ELLO	Q	CWSEL	TOPWID	SSTA	ENDST
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	660.00	1.64	33.43	1282.29	1315.72
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	1000.00	542.58	43.89	1275.01	1318.91
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	2200.00	543.17	48.74	1271.64	1320.39
11.000	85.00	1285.00	1313.00	537.00	0.0	0.0	3700.00	544.58	58.83	1264.63	1323.46

THIS RUN EXECUTED 10/21/77 Copy 2

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**********************************************
TECP RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR = .01
MODIFICATION - 50,51,52
**********************************************
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Michael Baker, Jr., Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

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T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      VALUES RUN: 100YR. FLOOD
```

	ICHECK	INO	NINV	IDIR	STRT	METRIC	MVINS	Q	WSEL	FO
J1	0.	2.	0.	0.	-1.000000	10.0	0.0	0.	633.000	0.0

	NPROF	IPLOT	PREVS	XSECV	XSECH	FN	ALLDC	IBN	CHNIM	ITRACE
J2	1.000	0.0	-1.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38.000	39.000	21.000	22.000	42.000	40.000	41.000	48.000	1.000	4.000
	53.000	54.000	0.0	38.000	30.000	43.000	1.000	3.000	11.000	12.000
	10.000	26.000	20.000	50.000	51.000	4.000	0.0	201.000	0.0	0.0

QT	5.000	660.000	1400.000	2200.000	2200.000	3790.000	0.0	0.0	0.0	0.0
NC	0.060	0.080	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
X1	28.000	18.000	1662.000	1686.000	250.000	310.000	200.000	0.0	0.0	0.0
GR	645.200	1000.000	643.900	1147.000	641.700	1264.000	640.300	1397.000	637.200	1599.000
GR	633.300	1652.000	629.500	1661.000	629.000	1662.000	629.000	1668.000	629.000	1675.000
GR	629.500	1677.000	631.000	1686.000	639.000	1788.000	640.700	1798.000	655.700	1879.000
GR	656.000	1897.000	655.400	1968.000	655.100	2087.000	0.0	0.0	0.0	0.0
ET	4.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1560.000	1690.000
X1	26.000	26.000	1580.000	1600.000	275.000	375.000	440.000	0.0	0.0	0.0
GR	645.400	1000.000	644.600	1100.000	645.100	1240.000	645.500	1300.000	648.300	1340.000
GR	640.300	1495.000	638.300	1580.000	636.300	1587.000	635.000	1590.000	635.000	1598.000
GR	638.000	1687.000	636.400	1698.000	637.800	1800.000	639.100	1700.000	640.600	1787.000
GR	645.500	1850.000	650.700	1860.000	653.400	1980.000	655.700	2100.000	654.100	2200.000
GR	653.500	2300.000	655.300	2390.000	655.100	2475.000	656.300	2800.000	670.400	2850.000
GR	700.100	2829.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.060	0.080	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0	0.0	0.0
X1	27.000	19.000	1150.000	1200.000	175.000	210.000	190.000	0.0	0.0	0.0
GR	645.200	1000.000	641.500	1100.000	638.100	1150.000	636.500	1165.000	635.500	1170.000
GR	636.500	1185.000	637.300	1200.000	640.200	1305.000	645.600	1380.000	655.400	1450.000
GR	658.600	1540.000	658.500	1650.000	657.700	1750.000	660.200	1880.000	660.100	1910.000
GR	660.100	2010.000	680.100	2055.000	680.100	2085.000	700.400	2110.000	0.0	0.0
ET	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1150.000	1260.000

XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	639.800	639.800	0.0
GR	645.500	1000.000	641.800	1100.000	640.200	1119.000	638.400	1150.000	636.800	1165.000
GR	636.000	1167.000	638.000	1169.000	636.900	1173.800	638.000	1173.500	636.800	1185.000
GR	637.600	1200.000	639.800	1280.000	640.500	1308.000	645.000	1378.000	649.900	1380.000
GR	655.700	1450.000	658.900	1550.000	658.800	1650.000	658.000	1750.000	659.500	1850.000
SR	0.0	1.500	0.000	0.0	6.500	0.0	22.100	0.0	636.000	636.000
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1360.000	1360.000
XI	27.800	0.0	0.0	0.0	11.000	11.000	11.000	0.0	0.0	0.0
RP	0.0	0.0	1.000	639.400	640.200	0.0	0.0	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	640.200	640.200	0.0
RT	20.000	1000.000	648.800	648.800	1100.000	641.800	641.800	1119.000	640.200	640.200
RT	1150.000	645.200	638.400	1165.000	640.200	638.800	1167.000	640.000	636.000	1167.000
RT	640.200	638.400	1173.500	640.200	638.400	1173.500	640.200	636.000	1185.000	640.400
RT	636.800	1200.000	640.600	637.600	1280.000	641.700	639.800	1308.000	648.600	640.800
RT	1372.000	645.000	648.000	1380.000	645.900	645.900	1450.000	655.700	655.700	1550.000
RT	658.500	658.000	1650.000	658.800	658.800	1750.000	658.000	658.000	1850.000	659.500
RT	659.800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0	0.0	0.0
XI	29.000	30.000	2020.000	2055.000	375.000	175.000	354.000	0.0	0.0	0.0
GR	651.700	1150.000	651.700	1150.000	649.100	1230.000	649.300	1390.000	648.800	1450.000
GR	648.600	1550.000	646.600	1650.000	648.400	1735.000	643.600	1800.000	640.100	1890.000
GR	638.300	1960.000	637.500	1965.000	638.400	1970.000	640.200	2000.000	639.400	2020.000
GR	637.800	2025.000	636.000	2025.000	636.300	2038.000	636.000	2047.000	637.300	2055.000
GR	638.500	2095.000	643.300	2100.000	657.300	2200.000	660.400	2300.000	661.800	2400.000
GR	661.100	2500.000	664.600	2600.000	670.160	2700.000	685.100	2800.000	700.600	2860.000
NC	0.060	0.080	0.090	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	30.000	27.000	2010.000	2040.000	55.000	70.000	70.000	0.0	0.0	0.0
GR	650.500	1100.000	650.500	1150.000	648.300	1200.000	649.600	1400.000	645.800	1600.000
GR	645.400	1725.000	648.400	1850.000	637.300	1945.000	637.300	1951.000	637.900	1955.000
GR	640.800	1980.000	639.200	2010.000	637.900	2015.000	636.000	2016.000	636.000	2025.000
GR	636.000	2026.000	637.600	2031.000	639.300	2040.000	650.800	2080.000	660.500	2180.000
GR	661.700	2300.000	661.100	2500.000	665.100	2615.000	678.700	2703.000	686.800	2760.000
GR	690.300	2800.000	700.400	2830.000	0.0	0.0	0.0	0.0	0.0	0.0
XI	31.000	23.000	2005.000	2030.000	75.000	100.000	95.000	0.0	0.0	0.0
GR	650.500	1100.000	650.500	1100.000	649.300	1200.000	648.400	1400.000	645.500	1600.000
GR	644.500	1800.000	648.400	1900.000	640.500	1930.000	637.400	1980.000	638.300	1960.000
GR	640.400	1990.000	639.500	2005.000	638.800	2010.000	638.800	2015.000	638.100	2020.000
GR	639.300	2030.000	640.600	2070.000	661.600	2150.000	664.200	2300.000	668.100	2460.000
GR	670.700	2500.000	679.900	2562.000	700.200	2565.000	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	5.400	0.0	0.0	0.0	0.0	0.0
XI	32.000	23.000	2215.000	2240.000	150.000	145.000	140.000	0.0	0.0	0.0
GR	647.800	1200.000	647.800	1200.000	645.300	1390.000	645.800	1600.000	645.400	1800.000
GR	645.400	2020.000	640.500	2145.000	637.500	2155.000	640.200	2160.000	640.300	2190.000
GR	640.400	2215.000	638.200	2228.000	636.600	2228.000	638.700	2235.000	640.600	2240.000
GR	655.400	2295.000	646.800	2400.000	664.500	2500.000	665.100	2650.000	670.100	2600.000
GR	675.500	2680.000	680.400	2740.000	700.100	2790.000	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	12.400	0.0	0.0	0.0	0.0	0.0
XI	33.000	23.000	2570.000	2610.000	390.000	170.000	250.000	0.0	0.0	0.0
GR	652.000	1750.000	650.000	2000.000	648.500	2060.000	645.800	2280.000	641.800	2480.000
GR	640.500	2570.000	638.300	2577.000	636.700	2582.000	638.700	2587.000	636.700	2589.000
GR	638.800	2600.000	640.400	2610.000	648.100	2700.000	657.500	2750.000	668.100	2790.000
GR	668.100	2900.000	670.500	2980.000	670.500	3010.000	675.600	3020.000	680.400	3050.000
GR	687.300	3100.000	690.400	3140.000	700.300	3200.000	0.0	0.0	0.0	0.0

XI	34.000	21.000	2458.000	2689.000	175.000	175.000	140.000	0.0	0.0	0.0
GR	650.500	1630.000	650.100	1665.000	649.200	1800.000	649.700	1900.000	649.800	2080.000
GR	649.100	2055.000	645.300	2130.000	645.800	2270.000	645.700	2315.000	642.400	2500.000
GR	640.100	2658.000	638.200	2665.000	637.000	2668.000	637.000	2673.000	638.500	2680.000
GR	640.100	2689.000	641.600	2730.000	643.800	2800.000	648.800	2898.000	647.800	2970.000
GR	700.400	3050.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MC	0.080	0.080	0.080	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	2850.000	2689.000
XI	34.100	0.0	0.0	0.0	100.000	100.000	150.000	0.0	0.000	0.0
GT	5.000	860.000	1320.000	1860.000	1860.000	3100.000	0.0	0.0	0.0	0.0
MC	0.100	0.100	0.080	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1810.000	1930.000
XI	36.010	60.000	1915.000	1922.000	50.000	50.000	125.000	0.0	0.0	0.0
XS	10.000	0.0	0.0	0.0	0.0	0.0	0.0	643.000	644.800	0.0
GR	650.000	1000.000	649.600	1030.000	649.600	1070.000	649.100	1150.000	649.700	1210.000
GR	650.000	1260.000	649.700	1315.000	649.000	1400.000	648.700	1460.000	647.100	1535.000
GR	645.700	1600.000	645.000	1700.000	644.900	1715.000	644.400	1750.000	643.900	1780.000
GR	642.200	1830.000	640.500	1880.000	640.000	1897.000	640.000	1897.000	639.500	1910.000
GR	639.000	1911.000	638.800	1912.000	638.200	1913.000	638.100	1914.000	638.100	1915.000
GR	638.100	1914.000	638.100	1917.000	638.100	1918.000	638.100	1919.000	638.100	1920.000
GR	638.000	1921.000	640.000	1922.000	640.000	1935.000	640.000	1935.000	640.100	1982.000
GR	646.800	2008.000	655.000	2040.000	652.300	2100.000	654.700	2140.000	674.800	2220.000
SR	0.0	2.300	2.500	0.0	12.000	0.0	60.000	0.0	638.100	630.100
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1810.300	1930.000
XI	38.020	0.0	0.0	0.0	23.000	23.000	23.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	644.600	646.200	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RT	40.500	1000.000	650.000	650.000	1030.000	649.600	649.600	1070.000	649.600	649.690
RT	1150.000	649.100	649.100	1210.000	649.700	649.700	1210.000	650.000	650.000	1315.000
RT	649.700	649.700	1400.000	649.000	649.000	1400.000	648.700	648.700	1535.000	647.100
RT	647.100	1600.000	647.100	645.700	1700.000	647.600	645.000	1715.000	647.700	644.000
RT	1780.000	646.200	644.400	1780.000	646.200	643.900	1830.000	646.200	644.800	1880.000
RT	646.200	645.200	1897.000	646.200	642.000	1897.000	646.100	642.000	1910.000	649.400
RT	639.500	1911.000	649.800	642.100	1912.000	649.600	643.100	1913.000	649.700	643.800
RT	1914.000	649.800	644.300	1918.000	649.900	644.500	1916.000	650.000	644.650	1917.000
RT	649.900	644.500	1918.000	649.800	644.300	1919.000	649.700	643.800	1920.000	649.800
RT	643.100	1921.000	649.800	644.300	1922.000	645.400	650.000	1935.000	640.300	645.000
RT	1935.000	646.800	640.000	1982.000	646.800	640.100	2008.000	646.800	646.800	2040.000
RT	655.000	654.000	2100.000	652.300	652.300	2140.000	654.700	654.700	2220.000	674.800
RT	674.800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	15.400	0.0	0.0	0.0	0.0	0.0
XI	38.000	24.000	1905.000	1982.000	125.000	75.000	47.000	0.0	0.0	0.0
GR	650.400	1000.000	650.000	1030.000	650.000	1070.000	649.600	1150.000	650.100	1210.000
GR	650.400	1260.000	650.100	1315.000	649.400	1400.000	649.100	1460.000	646.100	1600.000
GR	645.300	1715.000	644.300	1780.000	645.200	1830.000	645.600	1880.000	640.900	1905.000
GR	639.000	1915.000	640.100	1982.000	648.400	2040.000	652.700	2100.000	655.100	2140.000
GR	674.700	2220.000	687.300	2300.000	700.000	2380.000	714.000	2460.000	0.0	0.0
MC	0.080	0.080	0.080	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	2060.000	2160.000
XI	37.000	21.000	2074.000	2119.000	175.000	175.000	190.000	0.0	0.0	0.0
GR	650.500	1000.000	652.300	1200.000	653.400	1400.000	652.000	1550.000	650.300	1645.000
GR	649.600	1705.000	647.300	1800.000	645.800	1905.000	644.500	1915.000	645.100	1925.000
GR	647.200	1970.000	645.600	2015.000	642.000	2025.000	640.500	2090.000	642.000	2119.000

BT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AR	719.600	2560.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.050	0.080	0.045	0.300	0.700	0.0	0.0	0.0	0.0	0.0
BT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	0.0	0.0
RT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2020.000	2100.000
X1	37.100	30.000	2086.000	2094.000	300.000	300.000	305.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	645.200	645.200	0.0
AR	694.700	1400.000	684.600	1890.000	651.600	1645.000	680.700	1705.000	648.600	1806.000
AR	647.100	1908.000	648.600	1915.000	647.400	1925.000	648.600	1970.000	646.000	2035.000
AR	646.000	2044.000	642.000	2086.000	642.000	2086.000	642.000	2094.000	642.000	2094.000
AR	646.900	2190.000	651.000	2212.000	656.400	2240.000	672.000	2300.000	687.000	2400.000
BR	0.0	1.800	2.500	0.0	8.000	0.0	24.000	0.0	642.000	642.000
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2020.000	2100.000
X1	37.200	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	645.000	645.400	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	645.400	645.400	0.0
BT	19.000	1400.000	684.700	684.700	1890.000	684.200	684.200	1645.000	681.600	651.600
AT	1705.000	650.700	680.700	1800.000	648.600	648.600	1905.000	647.100	647.100	1915.000
AT	645.600	645.600	1925.000	646.400	646.400	1970.000	648.600	648.600	2035.000	646.000
AT	646.900	2044.000	646.000	646.000	2086.000	648.400	642.000	2086.000	645.400	645.000
AT	2094.000	645.400	645.000	2094.000	645.400	642.000	2190.000	650.000	646.900	2212.000
AT	651.000	651.000	2240.000	656.400	656.400	2300.000	672.000	672.000	0.0	0.0
RT	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0	0.0	0.0
X1	39.000	15.000	1284.000	1320.000	250.000	178.000	208.000	0.0	0.0	0.0
AR	700.700	1000.000	680.100	1050.000	665.500	1090.000	668.100	1107.000	660.400	1140.000
AR	650.300	1210.000	645.400	1284.000	642.000	1295.000	645.100	1320.000	645.200	1365.000
AR	650.200	1415.000	668.100	1490.000	680.800	1565.000	698.100	1640.000	708.100	1730.000
NC	0.050	0.080	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	7.400	0.0	0.0	0.0	0.0	0.0
X1	40.000	19.000	1338.000	1370.000	175.000	250.000	220.000	0.0	0.0	0.0
AR	700.300	1000.000	685.100	1048.000	670.300	1100.000	665.100	1120.000	660.200	1148.000
AR	650.000	1228.000	647.700	1298.000	642.300	1338.000	642.000	1348.000	645.400	1358.000
AR	645.200	1360.000	642.400	1362.000	645.100	1370.000	650.000	1440.000	655.700	1550.000
AR	665.200	1610.000	664.600	1640.000	668.100	1670.000	668.800	1700.000	0.0	0.0
NC	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
X1	41.000	24.000	1705.000	1738.000	275.000	278.000	278.000	0.0	0.0	0.0
AR	728.400	1000.000	720.400	1088.000	715.300	1138.000	710.100	1200.000	700.600	1290.000
AR	690.300	1360.000	675.100	1440.000	660.300	1500.000	659.300	1525.000	650.000	1625.000
AR	645.100	1705.000	644.000	1712.000	646.700	1714.000	645.500	1725.000	645.000	1725.000
AR	645.500	1738.000	650.200	1785.000	660.200	1840.000	662.500	1930.000	665.400	1990.000
AR	667.500	2040.300	670.400	2160.000	672.500	2200.000	676.200	2280.000	0.0	0.0
NC	0.060	0.060	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1640.000	1760.000
X1	41.100	25.000	1710.000	1713.000	275.000	200.000	190.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	649.500	649.500	0.0
AR	724.200	1000.000	721.200	1088.000	716.100	1138.000	710.500	1200.000	701.400	1290.000
AR	691.100	1360.000	675.900	1440.000	661.100	1500.000	660.100	1525.000	650.800	1625.000
AR	650.100	1436.000	647.600	1677.000	647.600	1700.000	647.500	1710.000	646.400	1710.500
AR	646.100	1711.500	646.300	1712.500	647.600	1713.000	647.600	1720.000	647.600	1740.000
AR	651.000	1785.000	651.800	1790.000	661.000	1840.000	663.300	1930.000	666.200	1990.000
BR	0.0	1.800	2.500	0.0	9.000	0.0	7.100	0.0	646.100	646.100
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1640.000	1760.000

XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XB	0.0	0.0	1.000	1049.100	690.000	0.000	0.0	0.0	0.0	[illegible]
XS	10.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AZ	95.000	1000.000	720.200	726.200	1085.000	721.200	721.200	1138.000	716.100	716.100
AZ	1200.000	710.900	710.900	1290.000	701.400	701.400	1360.000	691.100	601.100	1440.000
RT	675.900	675.900	1400.000	661.100	661.100	1925.000	660.100	680.100	1625.000	680.600
RT	650.000	1635.000	680.100	680.100	1677.000	680.100	647.600	1700.000	680.100	647.600
RT	1710.000	680.100	647.600	1710.000	680.100	[illegible]	1711.000	650.100	640.100	1718.000
RT	650.100	648.900	1713.000	650.100	647.600	[illegible]	650.100	647.600	1740.000	650.900
RT	647.600	1785.000	651.400	651.000	1790.000	[illegible]	651.600	1840.000	651.000	651.000
RT	1930.000	663.300	663.300	1990.000	666.200	666.200	0.0	0.0	0.0	0.0
NC	0.090	0.090	0.090	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	20.400	0.0	0.0	0.0	0.0	0.0
XI	43.000	29.000	1440.000	1988.000	50.000	65.000	57.000	0.0	0.0	0.0
QR	728.100	1000.000	715.100	1140.000	710.600	1198.000	708.300	1240.000	700.600	1310.000
QR	695.200	1385.000	690.100	1505.000	685.100	1580.000	680.400	1610.000	675.300	1640.000
QR	670.300	1692.000	665.000	1740.000	660.300	1820.000	658.400	1840.000	653.100	1860.000
QR	650.400	1890.000	647.200	1950.000	646.300	1982.000	647.400	1985.000	645.500	2050.000
QR	645.800	2113.000	640.100	2115.000	650.200	2130.000	655.200	2190.000	650.300	2240.000
QR	655.200	2275.000	670.100	2290.000	673.200	2400.000	675.000	2498.000	0.0	0.0
RT	0.0	0.0	0.0	0.0	15.400	0.0	0.0	0.0	0.0	0.0
XI	44.000	22.000	1405.000	1412.000	225.000	200.000	260.000	0.0	0.0	0.0
QR	685.100	1000.000	680.300	1092.000	675.100	1128.000	670.100	1170.000	665.300	1230.000
QR	680.200	1310.000	656.300	1330.000	655.400	1350.000	650.800	1372.000	648.000	1405.000
QR	646.500	1408.000	648.700	1412.000	650.400	1450.000	650.000	1490.000	650.100	1525.000
QR	649.800	1570.000	650.600	1610.000	655.100	1675.000	660.100	1712.000	665.600	1740.000
QR	670.100	1750.000	675.600	1790.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.090	0.090	0.050	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1655.000	1815.000
XI	46.010	40.000	1695.500	1664.500	100.000	850.000	230.000	0.0	0.0	0.0
XS	10.000	0.0	0.0	0.0	0.0	0.0	0.0	653.000	653.000	0.0
QR	699.600	1000.000	695.000	1040.000	691.700	1100.000	689.700	1170.000	684.700	1210.000
QR	682.600	[illegible]	686.100	1340.000	681.800	1400.000	679.800	1440.000	677.100	1490.000
QR	675.000	[illegible]	669.800	1555.000	664.600	1580.000	659.500	1610.000	654.400	1638.000
QR	652.900	[illegible]	652.900	1640.000	648.100	1655.500	647.700	1656.000	646.800	1657.000
QR	646.700	[illegible]	646.700	1659.000	646.700	1660.000	646.700	1661.000	646.700	1662.000
QR	646.700	[illegible]	667.000	1665.000	647.600	1664.500	649.500	1670.000	649.800	1680.000
QR	649.800	[illegible]	651.900	1780.000	654.400	1815.000	655.000	1830.000	656.000	1870.000
QR	654.900	1900.000	652.500	1925.000	661.700	2100.000	665.100	2240.000	666.900	2480.000
QR	0.0	1.500	2.500	0.0	0.000	0.0	42.000	0.0	646.700	646.700
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1655.000	1815.000
XI	46.020	0.0	0.0	0.0	30.000	30.000	30.000	0.0	0.0	0.0
XB	0.000	0.0	1.000	682.500	654.400	0.0	0.0	0.0	0.0	0.0
XS	10.000	0.0	0.0	0.0	0.0	0.0	0.0	654.400	0.0	0.0
RT	30.000	1530.000	675.000	675.000	1555.000	669.800	649.400	1580.000	664.500	664.500
RT	1610.000	650.900	649.900	1635.000	654.400	654.400	1640.000	654.400	652.900	1640.000
RT	656.000	652.900	1655.900	657.800	648.100	1656.000	657.600	650.300	1657.000	657.700
RT	651.400	1658.000	657.800	658.100	1659.000	657.900	652.400	1660.000	658.000	652.500
RT	1661.000	657.900	652.400	1662.000	657.800	652.100	1663.000	657.700	651.300	1664.000
RT	657.600	650.000	1654.500	657.900	647.400	1670.000	657.800	649.500	1680.000	656.000
RT	649.800	1680.000	654.400	649.800	1780.000	654.400	651.900	1815.000	654.400	654.400
RT	1830.000	655.000	655.000	1870.000	656.000	656.000	1900.000	654.900	654.900	1925.000
RT	659.500	659.500	2100.000	661.700	661.700	2240.000	665.100	665.100	2480.000	666.900
RT	668.900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.000	0.090	0.080	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0

XT	48.000	36.000	1650.000	1675.000	176.000	40.000	144.000	0.0	[illegible]	[illegible]
RP	700.200	1000.000	698.600	1040.000	672.300	1100.000	690.300	1170.000	698.300	1210.000
RP	683.400	1260.000	685.700	1340.000	682.400	1400.000	680.400	1440.000	677.700	1490.000
RP	675.600	1530.000	670.400	1555.000	665.100	1580.000	660.100	1610.000	658.200	1640.000
RP	650.200	1650.000	647.500	1660.000	650.100	1670.000	652.500	1700.000	655.600	1830.000
RP	654.600	1870.000	655.500	1900.000	660.100	1925.000	662.300	2180.000	665.700	2240.000
RP	667.500	2450.000	670.400	2625.000	675.400	2720.000	680.100	2760.000	685.300	2800.000
RP	690.300	2838.000	695.100	2860.000	700.200	2900.000	705.200	2940.000	710.000	3010.000
RP	715.200	3100.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.400	0.0	0.0	0.0	1300.000	1510.000
XI	47.000	28.000	1410.000	1440.000	220.000	240.000	400.000	0.0	0.0	0.0
RP	687.300	1000.000	665.600	1050.000	680.600	1090.000	675.200	1110.000	670.400	1130.000
RP	665.300	1180.000	660.100	1210.000	655.300	1250.000	652.500	1350.000	650.100	1330.000
RP	645.600	1430.000	650.400	1440.000	[illegible]	1550.000	657.400	1605.000	660.200	[illegible]
RP	662.500	1780.000	665.200	1860.000	667.300	2000.000	668.100	2100.000	668.600	2180.000
RP	670.100	2265.000	672.100	2450.000	675.300	2540.000	685.100	2640.000	690.300	2700.000
RP	700.100	2750.000	705.400	2800.000	710.200	2920.000	0.0	0.0	0.0	0.0
RT	0.090	0.090	0.080	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1645.000	1735.000
XI	49.010	28.000	1700.000	1712.000	350.000	275.000	450.000	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	653.700	653.700	0.0
RP	725.000	1000.000	720.000	1035.000	715.200	1088.000	709.900	1120.000	704.800	1152.000
RP	700.300	1200.000	695.400	1238.000	690.300	1270.000	685.100	1290.000	680.400	1340.000
RP	675.400	1407.000	669.800	1445.000	664.000	1480.000	660.200	1530.000	654.900	1590.000
RP	654.400	1609.000	651.700	1709.000	690.400	1709.800	650.200	1710.500	650.400	1711.500
RP	651.700	1712.000	654.400	1890.000	655.000	1930.000	660.300	2080.000	663.900	2200.000
RP	664.100	2300.000	663.900	2400.000	665.400	2500.000	0.0	0.0	0.0	0.0
RP	0.0	1.500	2.900	0.0	3.000	0.0	7.100	0.0	680.200	680.200
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1645.000	1735.000
XI	56.020	0.0	0.0	0.0	20.000	20.000	20.000	0.0	0.0	0.0
XP	0.0	0.0	1.000	653.200	654.400	0.0	0.0	0.0	0.0	0.0
XI	10.000	0.0	0.0	0.0	0.0	0.0	0.0	654.400	654.400	0.0
RT	18.000	1480.000	664.900	664.900	1530.000	660.200	660.200	1590.000	654.900	654.900
RT	1609.000	654.400	654.400	1709.000	654.400	651.700	1709.500	654.400	653.000	1710.400
RT	654.400	651.200	1712.900	654.400	653.000	1712.000	654.400	651.700	1890.000	654.400
RT	654.400	1930.000	655.000	655.000	2080.000	660.300	660.300	2200.000	663.900	663.900
RT	2300.000	664.100	664.100	2400.000	663.900	663.900	2500.000	668.400	668.400	0.0
RT	0.0	0.0	0.0	0.0	18.400	0.0	0.0	0.0	0.0	0.0
RT	49.000	28.000	1700.000	1720.000	30.000	30.000	30.000	0.0	0.0	0.0
RP	725.000	1000.000	720.300	1035.000	715.500	1088.000	710.200	1120.000	705.100	1152.000
RP	700.400	1200.000	695.600	1278.000	690.600	1270.000	685.400	1290.000	680.700	1340.000
RP	675.700	1492.000	670.100	1445.000	665.500	1480.000	660.500	1530.000	655.200	1590.000
RP	651.700	1700.000	650.500	1710.000	651.600	1720.000	655.300	1780.000	657.800	1900.000
RP	660.400	2080.000	665.200	2200.000	664.400	2300.000	664.200	2405.000	665.700	2500.000
RP	664.100	2500.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RT	0.000	0.000	0.090	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	18.400	0.0	0.0	0.0	0.0	0.0
RT	51.000	22.000	1740.000	1745.000	300.000	175.000	275.000	0.0	0.0	0.0
RP	725.300	1000.000	720.100	1035.000	715.400	1060.000	710.100	1080.000	705.800	1130.000
RP	700.300	1185.000	695.600	1190.000	690.300	1225.000	685.700	1265.000	680.300	1345.000
RP	675.300	1380.000	670.400	1470.000	665.900	1528.000	660.200	1570.000	655.500	1610.000
RP	652.500	1680.000	652.100	1740.000	651.500	1752.000	652.100	1765.000	695.000	1980.000
RP	660.000	2205.000	665.000	2330.000	0.0	0.0	0.0	0.0	0.0	0.0
RT	0.000	680.000	1100.000	1640.000	1640.000	3600.000	0.0	0.0	0.0	0.0
RT	0.040	0.000	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2350.000	2800.000

X1	51.000	23.000	2715.000	2750.000	1200.000	200.000	740.000	0.0	0.0	0.0
QR	690.100	1000.000	687.300	1100.000	685.100	1230.000	680.200	1275.000	675.600	1340.000
QR	676.000	1480.000	665.200	1635.000	660.500	1790.000	657.300	2030.000	656.600	2295.000
QR	655.100	2290.000	656.700	2300.000	656.700	2460.000	659.100	2470.000	656.700	2475.000
QR	655.500	2600.000	655.100	2715.000	653.000	2740.000	685.300	2750.000	658.100	2960.000
QR	680.600	3230.000	665.600	3245.000	669.200	3360.000	0.0	0.0	0.0	0.0
MC	0.060	0.060	0.080	0.100	0.300	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
X1	52.000	34.000	2145.000	2268.000	600.000	350.000	330.000	0.0	0.0	0.0
QR	725.100	1000.000	720.100	1030.000	715.400	1080.000	710.900	1106.000	708.300	1130.000
QR	700.200	1150.000	698.300	1170.000	690.300	1198.000	685.400	1225.000	680.000	1240.000
QR	678.300	1265.000	678.700	1400.000	667.600	1460.000	666.300	1490.000	664.100	1630.000
QR	665.100	1700.000	665.700	1735.000	665.700	1772.000	660.000	1825.000	660.400	1888.000
QR	658.100	2100.000	655.100	2145.000	654.000	2250.000	655.700	2268.000	657.200	2350.000
QR	660.600	2440.000	667.100	2600.000	665.300	2735.000	667.300	2755.000	660.100	2900.000
QR	668.300	3100.000	670.600	3250.000	672.100	3350.000	675.400	3645.000	0.0	0.0
MC	0.040	0.060	0.080	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2160.000	2280.000
X1	52.100	20.000	2247.000	2253.000	175.000	80.000	133.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	657.000	657.000	0.0
QR	666.700	1735.000	665.700	1772.000	660.500	1825.000	660.900	1880.000	659.200	2045.000
QR	658.600	2100.000	655.600	2145.000	654.600	2247.000	654.600	2247.000	654.600	2253.000
QR	654.600	2253.000	655.700	2268.000	657.700	2350.000	659.200	2390.000	661.100	2440.000
QR	662.600	2600.000	665.800	2735.000	667.800	2755.000	668.600	2900.000	668.800	3100.000
QR	0.0	1.500	2.500	0.0	0.000	0.0	93.400	0.0	654.600	654.600
RT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	2160.000	2280.000
X1	92.200	5.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	658.800	659.200	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	659.200	659.200	0.0
RT	20.000	1735.000	666.200	666.200	1772.000	665.700	665.700	1825.000	660.500	660.500
RT	1888.000	660.900	660.900	2045.000	659.200	659.200	2100.000	659.200	658.600	2145.000
RT	659.200	654.600	2247.000	659.200	654.600	2247.000	654.600	654.600	2253.000	654.200
RT	658.600	2253.000	659.200	654.600	2268.000	659.200	655.700	2350.000	659.200	657.700
RT	2390.000	659.200	659.200	2440.000	661.100	661.100	2600.000	662.600	662.600	2735.000
RT	665.800	665.800	2755.000	667.800	667.800	2900.000	668.600	668.600	3100.000	668.800
RT	668.800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MC	0.040	0.060	0.080	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
X1	54.000	35.000	1818.000	1837.000	300.000	250.000	245.000	0.0	0.0	0.0
QR	725.700	1000.000	720.700	1120.000	715.200	1198.000	710.100	1242.000	705.100	1262.000
QR	700.600	1268.000	695.300	1300.000	690.300	1312.000	685.300	1320.000	680.100	1350.000
QR	678.100	1368.000	672.900	1470.000	670.300	1588.000	665.800	1598.000	665.100	1660.000
QR	657.500	1760.000	657.000	1818.000	655.500	1830.000	657.000	1837.000	657.500	1880.000
QR	663.400	2000.000	665.100	2180.000	668.100	2220.000	667.800	2300.000	670.400	2465.000
QR	672.400	2580.000	675.500	2718.000	680.300	2760.000	685.300	2805.000	690.000	2840.000
QR	695.700	2855.000	700.700	2875.000	705.100	2900.000	710.000	2980.000	715.100	3015.000
MC	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
X1	55.000	29.000	1510.000	1530.000	340.000	320.000	330.000	0.0	0.0	0.0
QR	725.000	1000.000	720.600	1095.000	715.500	1110.000	710.100	1210.000	705.100	1268.000
QR	700.300	1290.000	695.800	1300.000	690.600	1315.000	685.200	1330.000	680.200	1356.000
QR	675.700	1385.000	670.500	1405.000	665.300	1425.000	657.500	1510.000	656.700	1520.000
QR	667.600	1530.000	662.200	1670.000	665.100	1805.000	667.300	1828.000	670.400	1978.000
QR	672.100	2070.000	675.600	2170.000	680.100	2210.000	685.300	2248.000	690.700	2285.000
QR	695.600	2310.000	700.100	2355.000	705.100	2420.000	710.100	2525.000	0.0	0.0

NC	0.000	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.400	0.0	0.0	0.0	0.0	0.0
X1	56.000	29.000	1443.000	1460.000	300.000	325.000	310.000	0.0	0.0	0.0
GR	725.400	1000.000	720.100	1095.000	715.200	1140.000	710.600	1178.000	705.200	1228.000
GR	700.400	1275.000	695.900	1285.000	690.300	1305.000	685.100	1320.000	680.700	1338.000
GR	675.400	1360.000	665.300	1428.000	660.000	1443.000	658.000	1448.000	659.100	1460.000
GR	699.700	1550.000	665.600	1600.000	665.800	1705.000	667.900	1800.000	670.900	1878.000
GR	675.400	2067.000	680.900	2070.000	688.800	2100.000	690.100	2125.000	695.700	2140.000
GR	700.200	2169.000	705.600	2190.000	710.600	2225.000	715.100	2260.000	0.0	0.0
NC	0.010	0.000	0.000	0.400	0.400	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.400	0.0	0.0	0.0	0.0	0.0
X1	57.000	32.000	1447.000	1520.000	160.000	170.000	160.000	0.0	0.0	0.0
GR	725.000	1000.000	720.100	1055.000	715.900	1095.000	710.200	1155.000	705.600	1190.000
GR	700.200	1240.000	695.800	1280.000	690.300	1337.000	685.700	1362.000	680.300	1398.000
GR	675.100	1428.000	665.100	1502.000	661.000	1507.000	659.000	1510.000	660.600	1520.000
GR	662.000	1600.000	665.800	1730.000	667.100	1750.000	666.600	1770.000	667.100	1850.000
GR	670.100	1975.000	675.900	2091.000	680.300	2125.000	682.100	2180.000	690.900	2200.000
GR	695.100	2229.000	700.700	2252.000	705.400	2262.000	710.600	2265.000	715.200	2326.000
GR	720.700	2379.000	725.100	2415.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.090	0.055	0.400	0.800	0.0	0.0	0.0	0.0	0.0
X1	58.000	31.000	1412.000	1440.000	250.000	175.000	250.000	0.0	0.0	0.0
GR	725.100	1000.000	720.000	1022.000	715.600	1055.000	710.200	1085.000	705.200	1110.000
GR	700.100	1140.000	690.300	1172.000	685.600	1260.000	680.500	1290.000	675.600	1318.000
GR	670.100	1360.000	665.700	1417.000	661.000	1430.000	665.700	1440.000	666.600	1500.000
GR	668.000	1550.000	667.600	1589.000	666.900	1650.000	670.200	1760.000	675.100	1850.000
GR	677.300	1900.000	680.300	1980.000	685.600	2035.000	690.200	2085.000	695.300	2080.000
GR	700.200	2095.000	705.400	2100.000	710.600	2110.000	715.200	2190.000	720.100	2140.000
GR	725.100	2180.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.090	0.080	0.400	0.800	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1616.000	1780.000
X1	60.010	17.000	1616.000	1630.000	250.000	25.000	105.000	0.0	0.0	0.0
X2	10.000	0.0	0.0	0.0	0.0	0.0	0.0	670.900	668.400	0.0
GR	679.900	1242.000	674.700	1315.000	672.700	1372.000	671.700	1390.000	668.900	1490.000
GR	668.000	1520.000	662.600	1616.000	662.600	1616.000	661.600	1625.000	662.800	1634.000
GR	662.800	1634.000	667.800	1740.000	668.700	1820.000	669.700	1910.000	674.800	1960.000
GR	679.700	2040.000	684.600	2125.000	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.0	1.000	0.500	0.0	10.000	0.0	143.000	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.100	0.0	0.0	0.0	1616.000	1780.000
X1	60.070	0.0	0.0	0.0	41.000	41.000	41.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	670.100	668.700	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	671.300	668.700	0.0
RT	17.000	1242.000	679.500	670.500	1335.000	674.700	674.700	1372.000	672.900	672.700
RT	1390.000	672.600	671.700	1490.000	672.200	668.900	1520.000	672.000	668.000	1616.000
RT	671.300	662.600	1616.000	672.100	670.100	1625.000	672.100	670.100	1634.000	672.100
RT	670.100	1634.000	671.300	662.800	1740.000	670.400	667.800	1820.000	668.700	668.700
RT	1910.000	669.700	669.700	1960.000	674.800	674.800	2040.000	679.700	679.700	2125.000
RT	684.600	684.600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.090	0.300	0.700	0.0	0.0	0.0	0.0	0.0
RT	0.0	0.0	0.0	0.0	0.400	0.0	0.0	0.0	0.0	0.0
X1	60.000	29.000	1420.000	1630.000	90.000	125.000	109.000	0.0	0.0	0.0
GR	725.800	1000.000	720.000	1030.000	715.200	1048.000	710.200	1062.000	705.700	1090.000
GR	700.400	1102.000	695.100	1128.000	690.400	1155.000	685.300	1205.000	680.100	1242.000
GR	675.300	1335.000	672.300	1390.000	668.600	1520.000	665.100	1620.000	663.000	1625.000
GR	665.600	1630.000	668.600	1740.000	670.300	1910.000	675.400	1960.000	680.100	2040.000

AR	685.200	2125.000	690.100	2162.000	695.500	2188.000	700.100	2210.000	705.200	2230.000
AR	710.200	2245.000	715.600	2258.000	720.500	2270.000	725.100	2290.000	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
XI	61.000	29.000	1730.000	1745.000	225.000	225.000	260.000	0.0	0.0	0.0
AR	725.400	1000.000	720.400	1032.000	715.000	1052.000	710.300	1075.000	705.300	1100.000
AR	700.100	1130.000	695.000	1158.000	690.200	1180.000	685.400	1210.000	680.300	1232.000
AR	675.000	1270.000	672.100	1285.000	670.200	1470.000	668.300	1400.000	666.000	1730.000
AR	664.000	1735.000	666.200	1745.000	667.200	1800.000	675.000	1829.000	680.400	1878.000
AR	685.400	1955.000	690.400	1985.000	695.000	2015.000	700.300	2045.000	105.300	2060.000
AR	710.100	2075.000	715.000	2105.000	720.300	2152.000	725.100	2215.000	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
XI	62.000	33.000	2220.000	2240.000	125.000	225.000	200.000	0.0	0.0	0.0
AR	725.400	1000.000	720.000	1020.000	715.000	1038.000	710.200	1050.000	705.200	1058.000
AR	704.500	1080.000	700.000	1100.000	695.600	1148.000	690.300	1208.000	689.600	1315.000
AR	685.500	1500.000	684.500	1670.000	680.500	1820.000	674.500	1905.000	675.000	1910.000
AR	672.500	1950.000	670.100	1990.000	668.500	2100.000	665.500	2220.000	664.500	2230.000
AR	665.300	2240.000	670.300	2280.000	675.000	2300.000	680.400	2320.000	685.000	2360.000
AR	690.200	2420.000	695.000	2450.000	700.300	2480.000	705.200	2515.000	710.100	2560.000
AR	715.000	2645.000	720.200	2740.000	725.200	2790.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	63.000	31.000	1860.000	1880.000	200.000	225.000	240.000	0.0	0.0	0.0
AR	725.400	1000.000	720.400	1015.000	715.300	1032.000	710.600	1058.000	705.300	1068.000
AR	702.500	1080.000	700.200	1110.000	695.400	1140.000	690.100	1186.000	687.500	1280.000
AR	685.100	1390.000	684.500	1430.000	685.200	1470.000	680.300	1620.000	675.400	1660.000
AR	670.300	1690.000	668.600	1860.000	665.000	1870.000	667.300	1880.000	670.800	2000.000
AR	675.400	2020.000	680.600	2040.000	685.200	2075.000	690.200	2120.000	695.500	2170.000
AR	700.100	2225.000	705.100	2240.000	710.400	2280.000	715.200	2330.000	720.000	2355.000
AR	725.400	2410.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
XI	64.000	33.000	1430.000	1450.000	275.000	225.000	245.000	0.0	0.0	0.0
AR	725.300	1000.000	720.300	1010.000	715.300	1022.000	710.400	1055.000	705.200	1075.000
AR	700.200	1100.000	695.600	1120.000	692.500	1140.000	692.900	1150.000	690.100	1180.000
AR	685.500	1270.000	677.500	1300.000	675.600	1315.000	670.100	1390.000	668.400	1430.000
AR	667.000	1440.000	669.400	1450.000	670.400	1485.000	670.300	1485.000	668.500	1540.000
AR	670.200	1610.000	675.300	1635.000	680.200	1662.000	690.200	1685.000	687.500	1725.000
AR	690.200	1750.000	695.200	1770.000	700.100	1780.000	705.100	1810.000	710.500	1835.000
AR	715.100	1850.000	720.100	1870.000	725.200	1895.000	0.0	0.0	0.0	0.0
NC	0.100	0.100	0.050	0.300	0.500	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	6.400	0.0	0.0	0.0	0.0	0.0
XI	65.000	29.000	1420.000	1440.000	125.000	90.000	105.000	0.0	0.0	0.0
AR	725.400	1000.000	710.300	1050.000	705.300	1070.000	700.400	1120.000	695.600	1138.000
AR	690.400	1160.000	685.400	1185.000	680.200	1220.000	678.300	1255.000	678.300	1275.000
AR	675.600	1285.000	670.300	1305.000	669.100	1350.000	668.500	1420.000	667.500	1430.000
AR	670.200	1440.000	672.500	1500.000	675.200	1540.000	677.500	1570.000	680.200	1590.000
AR	685.000	1605.000	690.100	1640.000	695.300	1662.000	700.100	1680.000	705.400	1695.000
AR	710.200	1720.000	715.200	1740.000	720.300	1755.000	725.400	1765.000	0.0	0.0
FT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

THIS RUN EXECUTED

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**********************************************
HECQ RELEASE DATED NOV 75 UPDATED FEB 1977
ERROR CORR # 01
MODIFICATION # 80.91.92
**********************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 50 YR FLOOD

JR  ICHECK    INQ     NINV    IDIR    STAT    METRIC  NVINR   O       WSEL    FQ
    0.        3.      0.      0.      -1.000000 0.0   0.0     0.      634.000 0.0

JP  NPROF     IPLOT   PRINT   XSECN   XSECH   FN      ALTQ    INV     CHNIM   ITRACE
    2.000     0.0     -1.000  0.0     0.0     0.0     0.0     0.0     0.0     0.0
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THIS RUN EXECUTED

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*****************************************
 HEC2 RELEASE DATED NOV 76 UPDATED FEB 1982
 ERROR CORR - 01
 MODIFICATION - 80.81.82
*****************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK   INQ    NINV   IDIM   STRT   METRIC  HVINS   Q     WSEL   FQ
     0.      4.     0.     0.  -1.000000  0.0     0.0     0.  635.000  0.0

J8  NPROF   IPLOT   PRFVS  XSECV  XSECH   FN    ALLOC   IBW   CHNIM  ITRACE
    3.000   0.0    -1.000  0.0    0.0    0.0    0.0    0.0    0.0    0.0
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**********************************************                    THIS RUN EXECUTED
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
EPROB CORD - 01
MODIFICATION - 80,81,82
**********************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      WOODSBURG-BERWICK-BRICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOOD

J1  ICHECK    INQ     NINV    IDIR     STRT    METRIC    HVINS     Q      WSEL     FQ
        0.      0.      0.      0. -1.000000     0.0       0.0      0.   636.000    0.0
J2  NPROF    IPLOT   PRFVS   XSECV   XSECH      FN    ALLDC     IBW    CHNIM   ITRACE
       15.000   0.0    -1.000   0.0     0.0     0.0     0.0     0.0     0.0     0.0
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WALKER HOW - 10 YR. FLOO

SUMMARY PRINTOUT

SECNO	XLCH	Q	CWSEL	FO	FE	DLOSS	WV	VCH	CAVE	DIFWSP	DIFWSX	TOPWID
26.000	290.00	660.00	632.[illegible]	633.47	0.[illegible]	0.0	1.10	8.73	1.00	0.0	0.0	35.49
26.000	290.00	1600.00	634.[illegible]	635.92	0.0	0.0	1.57	10.37	1.00	2.06	0.0	72.50
26.000	290.00	2200.00	635.[illegible]	636.94	0.0	0.[illegible]	1.66	10.99	1.00	0.92	0.0	94.15
26.000	290.00	3790.00	638.47	638.88	0.0	0.[illegible]	1.86	12.33	1.00	1.69	0.0	133.86
26.000	440.00	660.00	639.[illegible]	639.[illegible]	0.[illegible]	0.[illegible]	0.10	5.92	0.0	0.0	7.1[illegible]	187.[illegible]
26.000	440.00	1600.00	640.[illegible]	640.[illegible]	0.[illegible]	0.1[illegible]	0.39	6.92	0.0	1.11	6.2[illegible]	270.[illegible]
26.000	440.00	2200.00	641.[illegible]	641.39	0.1[illegible]	0.15	0.39	7.19	0.0	0.49	5.7[illegible]	294.61
26.000	440.00	3790.00	642.16	642.51	0.5[illegible]	0.15	0.39	7.52	0.0	1.12	5.14	345.26
27.000	190.00	660.00	640.31	640.37	0.40	0.[illegible]	0.07	2.41	0.0	0.0	0.87	189.9[illegible]
27.000	190.00	1600.00	641.[illegible]	641.[illegible]	0.4[illegible]	0.0[illegible]	0.1[illegible]	3.60	0.0	1.1[illegible]	0.9[illegible]	222.6[illegible]
27.000	190.00	2200.00	641.[illegible]	642.1[illegible]	0.7[illegible]	0.0[illegible]	0.1[illegible]	4.1[illegible]	0.0	0.50	0.9[illegible]	245.0[illegible]
27.000	190.00	3790.00	643.00	643.31	0.70	0.0[illegible]	0.2[illegible]	5.2[illegible]	0.0	1.05	0.88	288.70
27.100	115.00	660.00	640.50	640.58	0.10	0.00	0.5[illegible]	3.06	0.0	0.0	0.19	189.39
27.100	115.00	1600.00	641.7[illegible]	641.[illegible]	0.2[illegible]	0.01	0.11	4.16	0.0	1.2[illegible]	0.2[illegible]	223.8[illegible]
27.100	115.00	2200.00	642.3[illegible]	642.47	0.3[illegible]	0.01	0.1[illegible]	4.70	0.0	0.9[illegible]	0.1[illegible]	248.6[illegible]
27.100	115.00	3790.00	643.[illegible]	643.[illegible]	0.38	0.0[illegible]	0.2[illegible]	5.70	0.0	1.1[illegible]	0.0[illegible]	2[illegible].80
27.200	11.00	660.00	641.7[illegible]	641.77	1.21	0.0	0.02	1.73	0.0	0.0	1.25	223.19
27.200	11.00	1600.00	642.03	642.09	1.00	0.0[illegible]	0.0[illegible]	2.91	0.0	1.09	1.09	267.62
27.200	11.00	2200.00	643.3[illegible]	643.4[illegible]	0.93	0.0[illegible]	0.0[illegible]	3.46	0.0	0.1[illegible]	0.0[illegible]	288.19
27.200	11.00	3790.00	64[illegible]	64[illegible]	0.0[illegible]	0.0	0.1[illegible]	4.0[illegible]	0.0	[illegible]	0.0[illegible]	332.6[illegible]
29.000	354.00	660.00	641.85	641.88	0.11	0.01	0.03	1.48	0.0	0.[illegible]	0.11	227.21
29.000	354.00	1600.00	643.06	643.12	0.23	0.01	0.07	2.72	0.0	1.20	0.22	264.30
29.000	354.00	2200.00	643.61	643.70	0.29	0.01	0.09	3.20	0.0	0.55	0.28	281.35
29.000	354.00	3790.00	644.78	644.98	0.39	0.01	0.14	4.08	0.0	1.17	0.30	329.44
30.000	70.00	660.00	641.88	641.91	0.03	0.00	0.03	1.84	0.0	0.0	0.02	189.60
30.000	70.00	1600.00	643.10	643.18	0.09	0.00	0.08	2.96	0.0	1.28	0.04	233.34
30.000	70.00	2200.00	643.66	643.74	0.06	0.01	0.11	3.47	0.0	0.56	0.05	258.67
30.000	70.00	3790.00	644.84	645.01	0.08	0.01	0.17	4.44	0.0	1.16	0.06	311.99
31.000	95.00	660.00	641.9[illegible]	641.9[illegible]	0.07	0.0[illegible]	0.0[illegible]	2.85	0.0	0.0	0.0[illegible]	176.7[illegible]
31.000	95.00	1600.00	643.1[illegible]	643.30	0.11	0.01	0.1[illegible]	3.77	0.0	1.2[illegible]	0.0[illegible]	211.4[illegible]
31.000	95.00	2200.00	643.78	643.91	0.13	0.02	0.16	4.32	0.0	0.57	0.0[illegible]	227.8[illegible]
31.000	95.00	3790.00	644.96	645.19	0.14	0.02	0.2[illegible]	5.31	0.0	1.21	0.12	343.37
32.000	140.00	660.00	642.14	642.26	0.26	0.0[illegible]	0.11	3.38	0.0	0.0	0.[illegible]	142.69
32.000	140.00	1600.00	643.49	643.6[illegible]	0.3[illegible]	0.0[illegible]	0.2[illegible]	4.73	0.0	1.3[illegible]	0.1[illegible]	181.91
32.000	140.00	2200.00	644.09	644.34	0.40	[illegible]	0.3[illegible]	5.35	0.0	0.61	0.3[illegible]	199.6[illegible]
32.000	140.00	3790.00	645.34	645.60	0.46	0.0[illegible]	0.35	6.47	0.0	1.2[illegible]	0.38	280.51
33.000	250.00	660.00	642.63	642.71	0.49	0.00	0.07	2.57	0.0	0.0	0.49	233.11
33.000	250.00	1600.00	644.13	644.23	0.93	0.01	0.09	3.21	0.0	1.50	0.65	351.26
33.000	250.00	2200.00	644.81	644.91	0.85	0.01	0.10	3.46	0.0	0.67	0.7[illegible]	403.49
33.000	250.00	3790.00	646.16	646.26	0.98	0.0[illegible]	0.11	3.76	0.0	1.35	0.82	4[illegible].7[illegible]
34.000	140.00	660.00	642.81	642.88	0.17	0.00	0.07	2.68	0.0	0.0	0.18	220.30
34.000	140.00	1600.00	644.32	644.41	0.19	0.00	0.09	3.29	0.0	1.51	0.19	309.49
34.000	140.00	2200.00	645.00	645.10	0.19	0.00	0.10	3.56	0.0	0.67	0.19	349.47
34.000	140.00	3790.00	646.34	646.44	0.18	0.00	0.11	3.9[illegible]	0.0	1.34	0.18	5[illegible].48

SECND	XLCH	Q	CWSEL	RO	HI	OLOBR	MV	VOH	CASE	DIFMSA	DIFMSE	TOPWID
34.100	150.00	660.00	642.98	643.18	0.26	0.04	0.21	4.19	0.0	0.0	0.17	180.18
34.100	150.00	1400.00	644.47	644.69	0.24	0.04	0.23	5.06	0.0	1.49	0.14	270.33
34.100	150.00	2200.00	645.14	645.37	0.24	0.04	0.24	5.40	0.0	0.67	0.14	310.27
34.100	150.00	3700.00	646.45	646.71	0.22	0.05	0.26	6.12	0.0	1.31	0.11	442.70
36.010	125.00	580.00	643.41	643.53	0.12	0.05	0.12	3.46	0.0	0.7	0.43	127.65
36.010	125.00	1320.00	644.87	644.93	0.16	0.08	0.06	3.86	0.0	1.46	0.40	283.28
36.010	125.00	1860.00	645.53	645.61	0.19	0.05	0.07	3.87	0.0	0.67	0.40	379.36
36.010	125.00	3100.00	646.86	646.94	0.18	0.05	0.09	4.43	0.0	1.32	0.41	461.92
36.020	23.00	580.00	646.30	646.31	2.18	0.0	0.0	1.41	0.0	0.0	2.88	349.90
36.020	23.00	1320.00	647.51	647.53	2.60	0.0	0.01	1.84	0.0	1.22	2.58	496.[illegible]
36.020	23.00	1860.00	647.87	647.89	2.98	0.0	0.02	2.08	0.0	0.36	2.34	513.68
36.020	23.00	3100.00	648.50	648.53	1.89	0.0	0.04	2.96	0.0	0.63	1.64	545.14
36.000	47.00	580.00	646.31	646.32	0.01	0.00	0.01	0.88	0.0	0.0	0.01	415.14
36.000	47.00	1320.00	647.82	647.86	0.02	0.01	0.03	1.97	0.0	1.82	0.01	476.68
36.000	47.00	1860.00	647.89	647.93	0.03	0.02	0.08	2.03	0.0	0.36	0.02	498.00
36.000	47.00	3100.00	648.54	648.63	0.06	0.04	0.09	2.92	0.0	0.68	0.04	527.66
37.000	190.00	580.00	646.32	646.34	0.02	0.00	0.02	1.30	0.0	0.0	0.02	272.09
37.000	190.00	1320.00	647.57	647.61	0.05	0.00	0.04	1.92	0.0	1.28	0.08	412.20
37.000	190.00	1860.00	647.95	648.01	0.07	0.00	0.05	2.33	0.0	0.39	0.07	451.81
37.000	190.00	3100.00	648.67	648.75	0.12	0.00	0.08	3.08	0.0	0.71	0.13	467.45
37.100	305.00	580.00	646.43	646.48	0.12	0.02	0.05	2.62	0.0	0.0	0.11	156.85
37.100	305.00	1320.00	647.73	647.82	0.18	0.03	0.08	3.82	0.0	1.30	0.16	286.24
37.100	305.00	1860.00	648.17	648.28	0.83	0.04	0.11	4.12	0.0	0.44	0.22	346.83
37.100	305.00	3100.00	648.87	649.03	0.33	0.08	0.16	4.97	0.0	0.79	0.30	417.70
37.200	12.00	580.00	647.23	647.25	0.77	0.0	0.02	1.83	0.0	0.0	0.79	216.77
37.200	12.00	1320.00	648.26	648.31	0.50	0.0	0.05	2.82	0.0	1.03	0.53	358.97
37.200	12.00	1860.00	648.69	648.77	0.48	0.0	0.07	3.34	0.0	0.43	0.82	403.94
37.200	12.00	3100.00	649.46	649.57	0.44	0.0	0.13	4.13	0.0	0.77	0.49	442.73
39.000	208.00	580.00	647.33	647.40	0.11	0.04	0.08	2.55	0.0	0.0	0.10	131.30
39.000	208.00	1320.00	648.43	648.61	0.81	0.08	0.17	3.98	0.0	1.11	0.17	159.39
39.000	208.00	1860.00	648.91	649.14	0.27	0.12	0.25	4.83	0.0	0.48	0.22	171.11
39.000	208.00	3100.00	649.74	650.15	0.37	0.21	0.41	6.34	0.0	0.63	0.28	191.93
40.000	220.00	580.00	647.63	647.82	0.39	0.03	0.14	3.69	0.0	0.0	0.33	110.66
40.000	220.00	1320.00	648.95	649.21	0.58	0.03	0.26	4.99	0.0	1.30	0.52	163.72
40.000	220.00	1860.00	649.56	649.87	0.69	0.02	0.31	5.63	0.0	0.61	0.68	188.70
40.000	220.00	3100.00	650.82	651.01	0.88	0.08	0.39	6.55	0.0	1.06	0.68	221.76
41.000	275.00	580.00	648.54	648.64	0.82	0.01	0.10	3.14	0.0	0.0	0.88	118.32
41.000	275.00	1320.00	649.99	650.17	0.94	0.01	0.18	4.33	0.0	1.45	1.04	157.48
41.000	275.00	1860.00	650.66	650.87	1.00	0.01	0.27	4.80	0.0	0.67	1.10	169.83
41.000	275.00	3100.00	651.79	652.09	1.08	0.01	0.31	5.73	0.0	1.13	1.17	187.92
41.100	190.00	580.00	649.58	649.71	1.05	0.02	0.13	4.73	0.0	0.0	1.04	125.25
41.100	190.00	1320.00	651.03	651.20	1.03	0.00	0.17	5.14	0.0	1.48	1.04	162.73
41.100	190.00	1860.00	651.71	651.91	1.03	0.00	0.20	5.51	0.0	0.68	1.05	175.68
41.100	190.00	3100.00	652.91	653.19	1.08	0.01	0.27	4.25	0.0	1.21	1.13	195.16

SECNO	XLCH	Q	CWSEL	CW	HV	QLOSS	HV	VOM	CASE	DIPWSP	DIPWSX	TOPWID
41.200	18.00	550.00	651.47	651.49	1.70	0.0	0.02	1.78	0.0	0.0	1.89	171.89
41.200	18.00	1320.00	652.42	652.49	1.20	0.0	0.08	3.06	0.0	0.99	1.46	187.33
41.200	18.00	1860.00	652.90	653.05	1.19	0.0	0.16	3.69	0.0	0.53	1.25	195.87
41.200	18.00	3100.00	654.00	654.18	0.97	0.0	0.10	4.73	0.0	1.04	1.00	213.58
43.000	52.00	550.00	651.50	651.51	0.01	0.00	0.01	0.[illegible]	0.0	0.0	0.03	262.69
43.000	52.00	1320.00	652.58	652.56	0.04	0.01	0.02	1.78	0.0	1.[illegible]	0.10	281.40
43.000	52.00	1860.00	653.09	653.15	0.08	0.02	0.03	2.24	0.0	0.47	0.14	291.94
43.000	52.00	3100.00	654.21	654.27	0.08	0.03	0.06	3.00	0.0	1.12	0.21	312.51
44.000	260.00	550.00	651.[illegible]	651.51	0.01	0.01	0.[illegible]	3.[illegible]	0.0	0.0	0.06	286.64
44.000	260.00	1320.00	652.67	652.74	0.15	0.04	0.08	4.39	0.0	1.[illegible]	0.15	277.60
44.000	260.00	1860.00	653.29	653.38	0.21	0.04	0.09	4.78	0.0	0.62	0.19	289.32
44.000	260.00	3100.00	654.48	654.59	0.28	0.04	0.12	5.45	0.0	1.19	0.28	311.84
46.010	230.00	550.00	653.06	654.54	2.12	2.03	1.89	9.99	12.0	0.0	1.44	9.00
46.010	230.00	1320.00	654.39	656.69	1.75	0.09	0.20	8.40	0.0	1.40	1.75	179.77
46.010	230.00	1860.00	655.17	656.38	1.41	0.10	0.23	6.48	0.0	0.77	1.67	212.01
46.010	230.00	3100.00	656.50	656.76	2.06	0.10	0.24	7.36	0.0	1.34	2.02	283.89
46.020	30.00	550.00	654.97	654.99	0.48	0.0	0.02	2.02	0.0	0.0	1.97	199.28
46.020	30.00	1320.00	656.05	656.14	1.52	0.0	0.06	3.24	0.0	1.08	1.46	279.38
46.020	30.00	1860.00	656.[illegible]	656.[illegible]	1.[illegible]	0.0	0.0[illegible]	4.[illegible]	0.0	0.50	1.19	284.45
46.020	30.00	3100.00	657.[illegible]	657.02	0.40	0.0	0.15	5.78	0.0	0.92	0.97	214.00
46.000	145.00	550.00	655.00	655.04	0.03	0.01	0.04	2.08	0.0	0.0	0.03	173.93
46.000	145.00	1320.00	655.12	656.23	0.08	0.03	0.10	3.42	0.0	1.18	0.07	237.01
46.000	145.00	1860.00	656.64	656.78	0.11	0.03	0.14	4.43	0.0	0.82	0.10	275.06
46.000	145.00	3100.00	657.41	657.63	0.19	0.03	0.22	5.[illegible]	0.0	0.97	0.[illegible]	288.[illegible]
47.000	400.00	550.00	655.12	655.14	0.10	0.01	0.02	1.48	0.0	0.0	0.12	269.17
47.000	400.00	1320.00	656.40	656.45	0.21	0.02	0.04	2.42	0.0	1.28	0.28	332.06
47.000	400.00	1860.00	657.02	657.08	0.27	0.02	0.06	2.86	0.0	0.63	0.37	353.65
47.000	400.00	3100.00	658.15	658.24	0.37	0.04	0.09	3.70	0.0	1.13	0.54	381.12
49.010	450.00	550.00	655.27	655.28	0.14	0.00	0.01	1.[illegible]	0.0	0.0	0.15	351.75
49.010	450.00	1320.00	656.65	656.67	0.22	0.01	0.02	2.19	0.0	1.36	0.25	406.48
49.010	450.00	1860.00	657.31	657.34	0.25	0.01	0.03	2.40	0.0	0.68	0.30	432.83
49.010	450.00	3100.00	658.58	658.56	0.31	0.02	0.04	2.81	0.0	1.21	0.38	480.81
49.020	20.00	550.00	655.38	655.39	0.11	0.0	0.01	1.68	0.0	0.0	0.11	356.30
49.020	20.00	1320.00	656.75	656.79	0.10	0.0	0.02	2.08	0.0	1.37	0.10	410.02
49.020	20.00	1860.00	657.43	657.46	0.12	0.0	0.02	2.31	0.0	0.68	0.12	437.45
49.020	20.00	3100.00	658.67	658.71	0.15	0.0	0.04	2.70	0.0	1.24	0.15	486.71
49.000	30.00	550.00	655.39	655.42	0.03	0.00	0.00	3.10	0.0	0.0	0.01	167.80
49.000	30.00	1320.00	656.75	656.89	0.04	0.08	0.19	4.01	0.0	1.37	0.00	264.80
49.000	30.00	1860.00	657.43	657.50	0.04	0.09	0.18	4.44	0.0	0.68	0.00	313.19
49.000	30.00	3100.00	658.67	658.89	0.04	0.10	0.18	5.51	0.0	1.24	0.0	405.51
50.000	275.00	550.00	655.62	655.63	0.16	0.01	0.01	1.31	0.0	0.0	0.24	381.90
50.000	275.00	1320.00	657.07	657.09	0.19	0.01	0.02	1.77	0.0	1.45	0.38	464.65
50.000	275.00	1860.00	657.78	657.80	0.21	0.01	0.02	2.01	0.0	0.71	0.38	508.78
50.000	275.00	3100.00	659.05	659.08	0.23	0.01	0.03	2.43	0.0	1.27	0.38	578.88

SECND	XLCH	Q	CWSPL	PB	NL	OLOBS	HV	VOX	CASE	DIFMBP	DIFMSH	TORMID
51.000	740.00	480.00	656.16	656.28	0.62	0.03	0.12	3.84	0.0	0.0	0.08	297.56
51.000	740.00	1180.00	657.53	657.96	0.47	0.00	0.03	2.20	0.0	1.37	0.46	903.99
51.000	740.00	1640.00	658.18	658.20	0.40	0.00	0.02	1.85	0.0	0.66	0.40	1002.32
51.000	740.00	3600.00	659.45	659.47	0.39	0.00	0.02	1.03	0.0	1.27	0.40	1262.88
52.000	330.00	480.00	656.91	656.94	0.65	0.01	0.05	1.48	0.0	0.0	0.75	220.83
52.000	330.00	1180.00	657.97	658.03	0.46	0.01	0.07	2.23	0.0	1.06	0.49	268.38
52.000	330.00	1640.00	658.50	658.58	0.36	0.02	0.08	2.55	0.0	0.53	0.31	320.80
52.000	330.00	3600.00	659.73	659.90	0.38	0.04	0.16	3.73	0.0	1.24	0.28	487.69
52.100	133.00	480.00	657.07	657.14	0.17	0.01	0.06	2.37	0.0	0.0	0.10	201.27
52.100	133.00	1180.00	658.17	658.25	0.21	0.01	0.08	3.14	0.0	1.10	0.20	256.19
52.100	133.00	1640.00	658.71	658.00	0.21	0.01	0.09	3.45	0.0	0.53	0.21	286.82
52.100	133.00	3600.00	660.04	660.19	0.29	0.00	0.18	4.60	0.0	1.30	0.30	443.77
52.200	12.00	480.00	659.60	659.61	2.49	0.0	0.00	0.71	0.0	0.0	2.53	393.86
52.200	12.00	1180.00	660.19	660.20	1.98	0.0	0.01	1.43	0.0	0.58	2.01	463.04
52.200	12.00	1640.00	660.45	660.48	1.68	0.0	0.02	1.82	0.0	0.87	1.78	493.65
52.200	12.00	3600.00	661.26	661.32	1.14	0.0	0.06	3.08	0.0	0.81	1.23	640.37
54.000	245.00	480.00	659.64	659.67	0.05	0.02	0.03	1.80	0.0	0.0	0.04	187.83
54.000	245.00	1180.00	660.31	660.41	0.18	0.06	0.09	3.43	0.0	0.67	0.12	208.91
54.000	245.00	1640.00	660.64	660.80	0.22	0.08	0.14	4.19	0.0	0.33	0.10	219.38
54.000	245.00	3600.00	661.57	662.01	0.49	0.10	0.33	6.81	0.0	1.03	0.67	252.00
55.000	330.00	480.00	660.07	660.21	0.31	0.03	0.14	3.87	0.0	0.0	0.43	124.81
55.000	330.00	1180.00	661.22	661.45	1.06	0.04	0.23	5.34	0.0	1.18	0.91	171.50
55.000	330.00	1640.00	661.77	662.04	1.22	0.04	0.27	5.82	0.0	0.55	1.13	193.70
55.000	330.00	3600.00	663.38	663.91	1.52	0.01	0.20	7.23	0.0	1.67	1.80	274.07
56.000	310.00	480.00	661.21	661.29	1.07	0.01	0.07	2.92	0.0	0.0	1.14	143.90
56.000	310.00	1180.00	662.50	662.63	1.16	0.01	0.12	3.80	0.0	1.29	1.28	175.77
56.000	310.00	1640.00	663.10	663.25	1.20	0.01	0.15	4.24	0.0	0.60	1.33	190.68
56.000	310.00	3600.00	664.79	668.06	1.34	0.01	0.27	5.75	0.0	1.69	1.45	232.63
57.000	160.00	480.00	662.34	662.87	1.11	0.36	0.52	7.55	4097.00	0.0	1.13	98.88
57.000	160.00	1180.00	663.48	663.97	1.02	0.32	0.52	8.29	0.0	1.10	0.94	141.16
57.000	160.00	1640.00	664.03	664.55	1.00	0.29	0.59	8.48	0.0	0.56	0.93	162.83
57.000	160.00	3600.00	665.74	666.34	1.05	0.23	0.56	9.38	0.0	1.75	0.99	232.15
58.000	250.00	480.00	666.32	666.80	3.92	0.02	0.48	5.63	0.0	0.0	3.98	76.66
58.000	250.00	1180.00	667.51	668.26	3.71	0.19	0.76	7.87	4097.00	1.18	4.06	232.23
58.000	250.00	1640.00	667.97	668.74	3.41	0.21	0.78	8.50	4097.00	0.46	3.94	297.12
58.000	250.00	3600.00	669.06	669.98	3.10	0.29	0.99	10.67	4097.00	1.09	3.28	349.67
60.010	105.00	480.00	667.13	667.58	0.16	0.01	0.44	5.35	0.0	0.0	0.81	18.00
60.010	105.00	1180.00	668.73	668.87	0.36	0.29	0.14	4.17	0.0	1.60	1.23	206.78
60.010	105.00	1640.00	669.20	669.39	0.41	0.34	0.14	4.01	0.0	0.47	1.24	249.89
60.010	105.00	3600.00	670.57	670.72	0.13	0.31	0.15	5.53	0.0	1.36	1.51	488.05
60.020	41.00	480.00	667.39	667.76	0.20	0.02	0.40	5.08	0.0	0.0	0.26	18.00
60.020	41.00	1180.00	668.64	670.22	0.20	1.16	1.58	10.10	0.0	1.25	-0.09	18.00
60.020	41.00	1640.00	670.43	671.29	0.28	0.55	0.86	8.54	4097.00	1.79	1.29	301.19
60.020	41.00	3600.00	672.01	672.48	0.19	0.47	0.47	9.61	11.00	1.58	1.44	548.15

SECNO	XLCH	Q	CWSEL	CO	HI	OLOSS	HV	VCH	CASE	DIFWSP	DIFWSK	TOPWID
60.000	109.00	480.00	668.20	668.31	0.44	0.09	0.11	4.28	0.0	0.0	0.81	201.10
60.000	109.00	1180.00	670.88	670.90	0.21	0.47	0.03	2.65	0.0	2.67	2.24	475.92
60.000	109.00	1640.00	671.78	671.79	0.20	0.25	0.03	2.71	0.0	0.88	1.89	513.37
60.000	109.00	3600.00	673.13	673.18	0.31	0.10	0.06	3.93	0.0	1.41	1.12	862.79
61.000	260.00	480.00	668.84	668.89	0.51	0.11	0.06	2.91	0.0	0.0	0.64	240.86
61.000	260.00	1180.00	671.04	671.08	0.17	0.00	0.03	2.66	0.0	2.20	0.17	353.92
61.000	260.00	1640.00	671.87	671.91	0.16	0.00	0.04	2.86	0.0	0.83	0.15	369.89
61.000	260.00	3600.00	673.38	673.46	0.27	0.01	0.08	4.33	0.0	1.51	0.25	398.92
62.000	200.00	480.00	669.09	669.14	0.05	0.00	0.06	2.66	0.0	0.0	0.05	210.53
62.000	200.00	1180.00	671.16	671.21	0.13	0.00	0.04	2.89	0.0	2.07	0.12	311.57
62.000	200.00	1640.00	671.99	672.04	0.13	0.01	0.05	3.14	0.0	0.82	0.11	328.79
62.000	200.00	3600.00	673.57	673.69	0.22	0.01	0.11	4.73	0.0	1.59	0.19	361.13
63.000	240.00	480.00	669.49	669.77	0.56	0.07	0.29	5.22	0.0	0.0	0.40	199.47
63.000	240.00	1180.00	671.41	671.50	0.20	0.01	0.05	3.02	0.0	1.92	0.25	320.93
63.000	240.00	1640.00	672.22	672.31	0.25	0.01	0.06	3.90	0.0	0.81	0.23	328.65
63.000	240.00	3600.00	673.94	674.07	0.38	0.01	0.14	5.19	0.0	1.72	0.36	344.98
64.000	255.00	480.00	670.84	670.97	1.13	0.02	0.08	3.31	0.0	0.0	1.35	233.42
64.000	255.00	1180.00	672.04	672.15	0.64	0.00	0.11	3.28	0.0	1.20	0.63	255.53
64.000	255.00	1640.00	672.79	672.86	0.55	0.01	0.11	3.47	0.0	0.71	0.53	268.62
64.000	255.00	3600.00	674.56	674.75	0.66	0.01	0.19	4.91	0.0	1.81	0.62	302.24
65.000	105.00	480.00	671.16	671.22	0.29	0.00	0.06	2.74	0.0	0.0	0.32	167.88
65.000	105.00	1180.00	672.38	672.51	0.34	0.01	0.13	4.09	0.0	1.22	0.31	200.06
65.000	105.00	1640.00	673.06	673.21	0.33	0.02	0.19	4.86	0.0	0.68	0.31	213.68
65.000	105.00	3600.00	675.00	675.19	0.38	0.04	0.27	6.32	0.0	1.84	0.34	247.93

SUMMARY OF ERRORS

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CAUTION  SECNO=  25.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  25.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  25.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  25.000  PROFILE= 4  CRITICAL DEPTH ASSUMED

CAUTION  SECNO=  46.010  PROFILE= 1  WSEL ASSUMED BASED ON MIN DIFF
CAUTION  SECNO=  46.010  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=  57.000  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  57.000  PROFILE= 1  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  58.000  PROFILE= 2  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  58.000  PROFILE= 2  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  58.000  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  58.000  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  58.000  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  58.000  PROFILE= 4  MINIMUM SPECIFIC ENERGY

CAUTION  SECNO=  60.020  PROFILE= 3  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  60.020  PROFILE= 3  MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  60.020  PROFILE= 4  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=  60.020  PROFILE= 4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=  60.020  PROFILE= 4  20 TRIALS ATTEMPTED TO BALANCE WSEL
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**********************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CORR - 01
MODIFICATION - 50,51,52
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THIS RUN EXECUTED

Michael Baker, Jr. Inc.
2763 N. Fourth St.
Box 3225
Harrisburg, Pa. 17105

NOV 2 1977

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T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      MAJOR RUN - 100 YR. FLOOD
J1  ICHECK   INQ    NINV   IDIR   STRT   METRIC  HVINC   IBW    WSEL   FQ
    0.       4.     0.     0.     0.0    0.0     0.0     0.     484.100  0.0
J2  NROP   IPLOT   PRVNS  TRECV  MSCH   XNM     ALDOD   IBNA   CHNIM  ITRACE
    1.000  0.0     -1.000 0.0    0.0    0.0     0.0     0.0    0.0    0.0
J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    30.000 47.000  1.000  4.000  30.000 3.000   45.000  30.000 21.000 28.000
    27.000 28.000  4.000  0.0    29.000 19.000  42.000  1.000  3.000  11.000
    12.000 10.000  24.000 20.000 50.000 81.000  4.000   0.0    500.000 0.0
NT  5.000  460.000 1600.000 2200.000 2200.000 3790.000 0.0    0.0    0.0    0.0
NC  0.060  0.060   0.030  0.100  0.300  0.0    0.0    0.0    0.0    0.0
ET  0.0    0.0     0.0    0.0    0.400  0.0    0.0    0.0    0.0    0.0
X1  1.000  15.000  1163.000 1181.000 0.0    0.0    0.0    0.0    -7.600 0.0
GR  494.000 1000.000 498.000 1026.000 498.100 1057.000 498.600 1076.000 495.800 1116.000
GR  493.300 1141.000 492.300 1151.000 491.500 1158.000 491.500 1161.000 491.500 1167.000
GR  492.300 1172.000 493.700 1182.000 496.700 1203.000 502.100 1256.000 506.200 1300.000
X1  1.000  0.0     0.0    0.0    100.000 300.000 219.000 0.0    7.600  0.0
NC  0.050  0.060   0.040  0.100  0.300  0.0    0.0    0.0    0.0    0.0
X1  2.000  17.000  1150.000 1170.000 240.000 240.000 240.000 0.0    0.0    0.0
GR  499.300 1000.000 500.700 1009.000 495.700 1020.700 497.800 1090.000 498.300 1131.000
GR  494.300 1150.000 493.400 1154.000 492.000 1160.000 492.500 1160.000 492.500 1160.000
GR  492.400 1166.000 494.300 1172.000 496.900 1184.000 500.700 1252.000 500.400 1312.000
GR  500.000 1373.000 510.600 [illegible] 0.0    0.0    0.0    0.0    0.0    0.0
ET  0.0    0.0     0.0    0.0    0.400  0.0    0.0    0.0    0.0    0.0
X1  3.000  18.000  1170.000 1170.000 290.000 290.000 290.000 0.0    0.0    0.0
GR  500.000 1000.000 497.800 1010.000 497.400 1090.000 500.800 1098.000 500.800 1113.000
GR  497.700 1124.000 497.100 1132.000 498.000 1138.000 497.100 1140.000 498.000 1152.000
GR  498.000 1172.000 501.600 1203.000 502.400 1260.000 507.800 1340.000 510.500 1392.000
NC  0.150  0.060   0.040  0.100  0.300  0.0    0.0    0.0    0.0    0.0
X1  4.000  16.000  1230.000 1254.000 320.000 320.000 320.000 0.0    0.0    0.0
```

QR	[illegible]	1269.000	498.500	1246.000	499.100	1254.000	500.900	1261.000	502.000	1320.000
QR	504.800	1364.000	505.100	1397.000	510.200	1445.000	510.700	1484.000	0.0	0.0
MC	0.060	0.060	0.060	0.300	0.700	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1340.000	1460.000
X1	6.010	36.000	1373.000	1382.500	175.000	150.000	220.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	508.000	508.000	0.0
QR	518.000	1000.000	517.400	1052.000	517.400	1103.000	518.000	1161.000	515.600	1214.000
QR	512.500	1269.000	511.900	1321.000	509.800	1341.000	509.300	1353.000	509.300	1353.000
QR	507.000	1361.000	504.700	1363.000	504.700	1371.000	504.400	1371.500	504.400	1372.000
QR	504.300	1373.000	504.300	1374.000	504.300	1375.000	504.300	1376.000	504.400	1377.000
QR	504.800	1378.000	505.700	1379.000	505.700	1380.000	506.200	1381.000	506.500	1382.000
QR	506.600	1382.500	507.800	1389.000	507.800	1389.000	509.700	1397.000	509.100	1489.000
QR	509.000	1542.000	509.200	1635.000	510.000	1723.000	512.500	1779.000	513.300	1802.000
QR	514.000	1802.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR	0.0	1.500	2.500	0.0	11.500	0.0	38.000	0.0	504.300	504.300
ET	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1340.000	1460.000
X1	6.120	0.0	0.0	0.0	25.000	25.000	25.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	509.400	512.800	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	512.500	512.500	0.0
QT	34.000	1000.000	518.000	518.000	1052.000	517.500	517.500	1103.000	517.400	517.600
QT	1161.000	518.000	518.000	1214.000	515.500	518.500	1269.000	512.500	512.800	1321.000
QT	512.500	511.900	1341.000	512.500	509.800	1353.000	512.500	509.300	1363.000	515.000
QT	509.700	1361.000	519.000	507.000	1363.000	515.000	504.700	1371.000	515.000	504.700
QT	1371.500	515.000	504.400	1372.000	515.000	507.200	1373.000	515.000	508.100	1374.000
QT	515.000	504.700	1375.000	515.000	509.100	1376.000	515.000	509.400	1377.000	515.000
QT	509.400	1378.000	515.000	509.600	1379.000	515.000	509.000	1380.000	515.000	508.500
QT	1381.000	515.000	507.900	1382.000	515.000	507.100	1382.500	515.000	506.600	1389.000
QT	515.000	507.800	389.000	512.500	507.800	1397.000	512.500	509.700	1489.000	510.800
QT	509.100	1542.000	512.500	508.800	1635.000	512.500	509.200	1723.000	512.500	510.800
QT	1779.000	512.500	512.500	1802.000	513.300	513.300	1802.000	516.000	516.000	0.0
MC	0.050	0.050	0.040	0.300	0.700	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1340.000	1460.000
X1	6.000	20.000	1360.000	1382.000	78.000	70.000	65.000	0.0	0.0	0.0
QR	523.100	1000.000	522.600	1052.000	522.600	1103.000	523.000	1161.000	520.500	1214.000
QR	517.900	1269.000	516.900	1321.000	514.800	1341.000	514.600	1353.000	512.900	1361.000
QR	512.500	1368.000	511.200	1377.000	512.500	1387.000	513.200	1389.000	514.700	1397.000
QR	514.100	1489.000	513.000	1542.000	513.200	1635.000	516.600	1723.000	518.300	1802.000
MC	0.050	0.050	0.035	0.300	0.700	0.0	0.0	0.0	0.0	0.0
ET	0.0	0.0	0.0	0.0	10.800	0.0	0.0	0.0	0.0	0.0
X1	0.010	10.000	1535.000	1556.000	95.000	95.000	95.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	528.600	528.600	0.0
QR	544.500	1000.000	540.600	1118.000	534.900	1207.000	533.700	1256.000	533.300	1288.000
QR	531.900	1324.000	530.700	1370.000	530.600	1419.000	529.800	1468.000	529.800	1535.000
QR	517.000	1535.000	517.800	1556.000	529.800	1586.000	529.800	1579.000	531.700	1586.000
QR	535.100	1640.000	540.600	1711.000	544.800	1773.000	548.900	1821.000	0.0	0.0
SR	0.0	1.500	2.500	0.0	21.000	0.0	201.600	0.0	517.800	517.800
X1	9.020	0.0	0.0	0.0	18.000	18.000	18.000	0.0	0.0	0.0
X2	0.0	0.0	1.000	527.400	529.800	0.0	0.0	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	529.800	529.800	0.0
QT	10.000	1001.000	544.500	544.500	1115.000	540.600	540.600	1207.000	534.900	534.900
QT	1254.000	533.700	533.700	1286.000	533.300	533.300	1326.000	531.800	531.800	1372.000
QT	530.700	530.700	1439.000	530.600	530.600	1468.000	529.800	529.800	1535.000	529.800
QT	529.800	1535.000	529.800	527.600	1556.000	529.800	527.400	1556.000	529.800	529.800
QT	1579.000	529.800	529.800	1586.000	531.700	1640.000	531.700	1640.000	535.100	1711.000
QT	540.600	540.600	1773.000	544.800	544.800	821.000	548.900	548.900	0.0	0.0

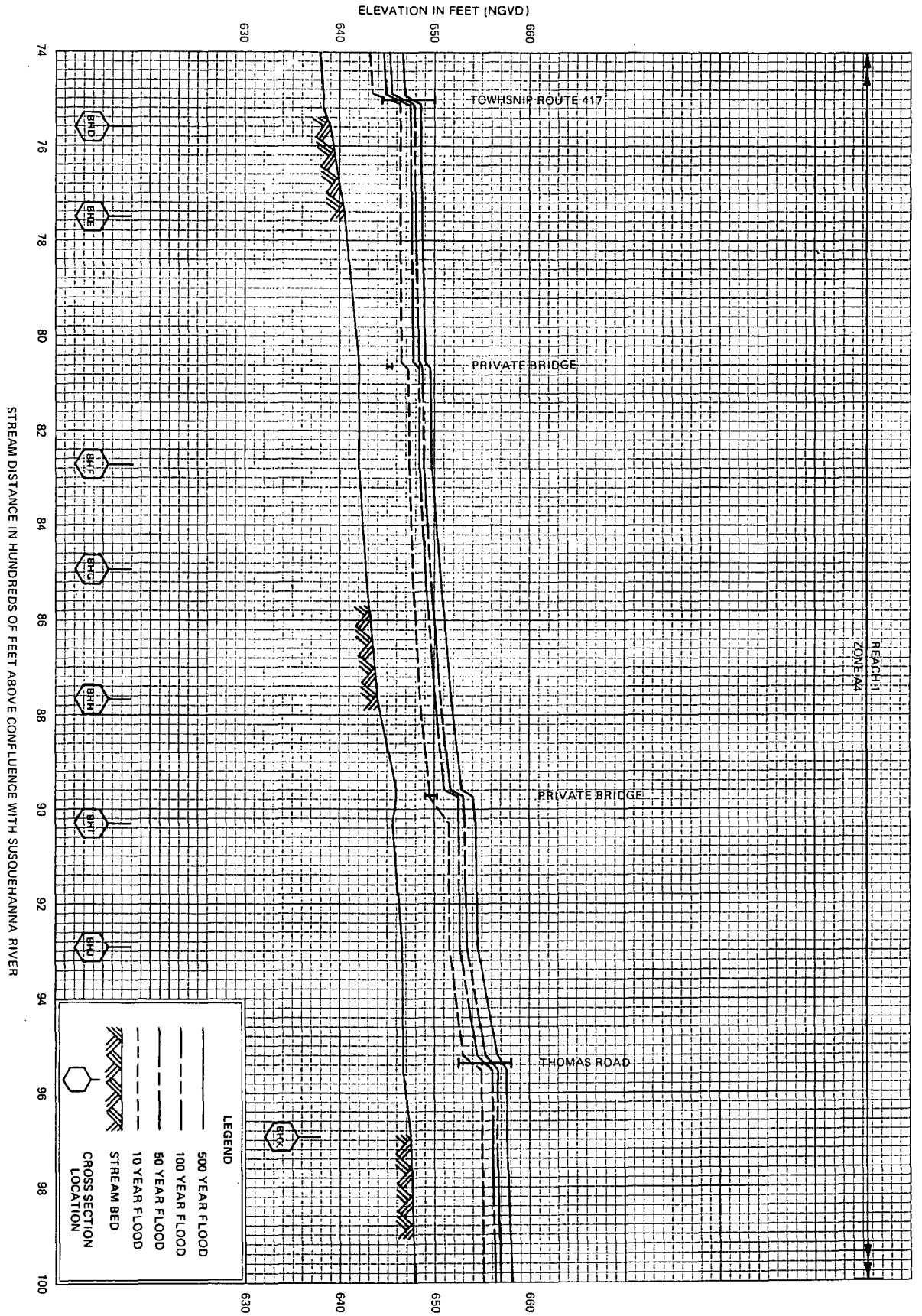
Y1	9.030	19.000	1537.000	1554.000	7.000	7.000	7.000	0.0	0.0	0.0
BP	544.000	1000.000	540.900	1115.000	535.200	1207.000	534.000	1256.000	533.600	1286.000
BP	531.800	1326.000	531.000	1372.000	530.900	1439.000	530.100	1468.000	527.300	1537.000
BP	517.800	1537.000	517.800	1554.000	527.300	1554.000	530.100	1579.000	532.000	1586.000
BP	535.400	1640.000	540.900	1711.000	545.100	1773.000	549.100	1821.000	0.0	0.0
Y1	9.040	20.000	1539.000	1551.700	0.000	0.000	0.000	0.0	0.0	0.0
Y3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	525.300	525.300	0.0
BP	544.100	1000.000	541.200	1115.000	535.500	1207.000	534.300	1256.000	533.900	1286.000
BP	532.100	1326.000	531.300	1372.000	531.200	1439.000	530.000	1496.000	530.000	1539.000
BP	519.300	1439.000	519.300	1551.700	530.000	1551.700	530.000	1575.000	530.000	1577.000
BP	532.300	1586.000	535.700	1640.000	541.200	1711.000	545.400	1773.000	549.800	1821.000
BP	0.0	1.300	2.800	300.000	12.700	0.0	139.000	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	9.100	0.0	0.0	0.0	1539.000	1551.700
Y1	9.050	0.0	0.0	0.0	66.000	66.000	66.000	0.0	0.0	0.0
Y2	0.0	0.0	1.000	529.800	532.300	0.0	0.0	0.0	0.0	0.0
Y3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	532.300	532.300	0.0
BP	0.060	0.060	0.055	0.400	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	80.400	0.0	0.0	0.0	0.0	0.0
Y1	9.000	24.000	1538.000	1553.000	26.000	26.000	26.000	0.0	0.0	0.0
BP	544.100	1000.000	542.200	1115.000	530.500	1207.000	539.300	1256.000	534.900	1286.000
BP	532.100	1326.000	532.300	1372.000	532.200	1439.000	530.600	1496.000	529.600	1517.000
BP	519.700	1527.000	520.200	1532.000	519.200	1539.000	518.000	1545.000	518.000	1545.000
BP	519.000	1546.000	519.200	1553.000	529.500	1561.000	531.000	1577.000	533.300	1586.000
BP	536.700	1669.000	542.200	1711.000	546.400	1773.000	550.500	1821.000	0.0	0.0
BP	0.070	0.070	0.055	0.300	0.700	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
Y1	9.100	22.000	1516.000	1558.000	175.000	175.000	200.000	0.0	0.0	0.0
Y2	0.000	0.0	0.0	0.0	0.0	0.0	0.0	536.500	537.400	0.0
BP	537.000	1106.000	547.300	1247.000	542.300	1332.000	537.700	1396.000	537.000	1445.000
BP	537.800	1500.000	538.100	1516.000	538.100	1516.000	534.400	1521.900	528.000	1526.500
BP	528.300	1531.500	526.000	1537.000	529.000	1542.000	533.400	1547.500	535.500	1552.500
BP	536.000	1560.000	539.900	1558.000	560.400	1596.000	544.000	1640.000	549.800	1711.000
BP	553.200	1773.000	557.800	1821.000	0.0	0.0	0.0	0.0	0.0	0.0
BP	0.0	1.500	2.500	0.0	18.000	0.0	231.000	0.0	0.0	0.0
Y1	9.200	0.0	0.0	0.0	12.000	12.000	12.000	0.0	0.0	0.0
Y2	0.0	0.0	1.000	536.900	537.000	0.0	0.0	0.0	0.0	0.0
Y3	0.000	0.0	0.0	0.0	0.0	0.0	0.0	537.000	537.000	0.0
BT	22.000	1136.000	552.000	1552.000	1247.000	547.000	547.000	1332.000	542.300	542.300
BT	1396.000	537.700	537.700	1445.000	537.000	537.000	1520.000	537.000	537.000	1516.000
BT	528.100	539.100	516.000	538.100	536.100	[illegible]	539.200	536.200	1528.500	538.300
BT	536.200	1531.500	539.400	536.400	1537.000	538.[illegible]	536.500	1542.000	538.600	536.600
BT	1547.000	539.000	536.400	1552.500	538.000	536.[illegible]	1558.000	536.000	538.000	1558.000
BT	536.500	1560.000	1596.000	540.500	540.500	1640.000	545.000	545.500	1711.000	545.500
BT	540.500	1773.000	553.700	553.700	1821.000	557.800	557.800	0.0	0.0	0.0
BP	0.060	0.060	0.050	0.100	0.300	0.0	0.0	0.0	0.0	0.0
FT	0.0	0.0	0.0	0.0	10.400	0.0	0.0	0.0	0.0	0.0
Y1	11.030	14.000	1205.000	1412.000	240.000	240.000	240.000	0.0	0.0	0.0
BP	552.000	1000.000	552.700	1086.000	551.400	1143.000	551.600	1165.000	549.100	1224.000
BP	535.100	1248.000	545.500	1285.000	536.200	1290.000	537.000	1293.000	537.000	1294.000
BP	537.000	1294.000	538.200	1302.000	539.000	1312.000	550.300	1336.000	559.600	1345.000
BP	0.0	1377.000	571.700	1424.000	582.400	1500.000	0.0	0.0	0.0	0.0
				0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
                                                                    THIS RUN EXECUTED
**********************************************************
HEC2 RELEASE DATED NOV 76 UPDATED FEB 1977
ERROR CODE - 01
MODIFICATION - NO 51 152
**********************************************************

T1      SUSQUEHANNA RIVER BASIN COMMISSION
T2      BLOOMSBURG-BERWICK-SHICKSHINNY REACH
T3      WALKER RUN - 100 YR. FLOODWAY

J   ICHECK    INQ    NRNV    NDIM    STRT    METRIC    HVINS    Q    WSEL    FQ
    0.        5.     0.      0.      0.0     0.0       0.0      0.   490.210 0.0

J2  NPROF     IPLOT  PRINTS  WSELV   WSECH   FN        ALLOC    IBW  CHNIM   ITRACE
    10.000    0.0    -1.000  0.0     0.0     0.0       0.0      0.0  0.0     0.0
```



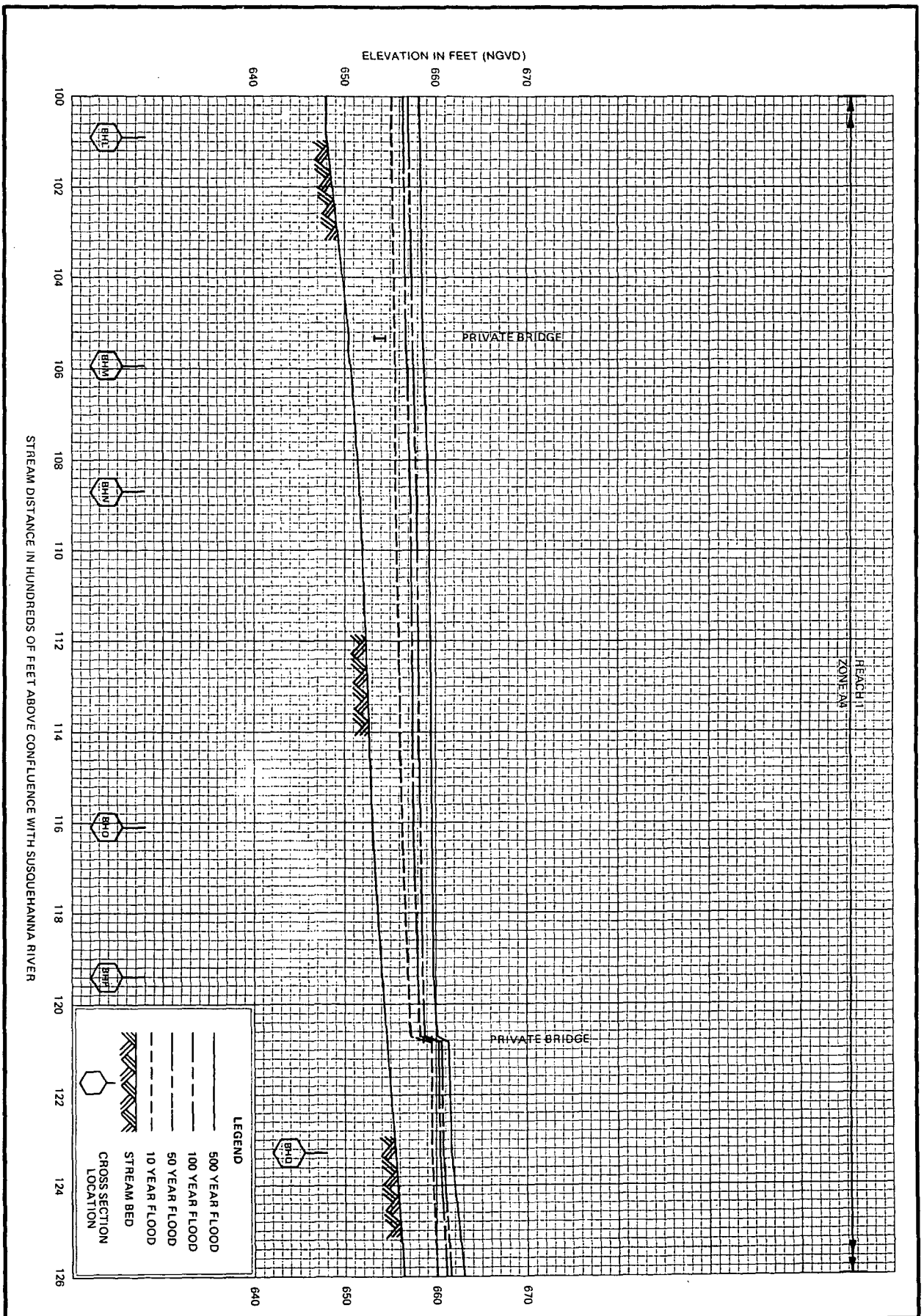
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF SALEM, PA
(LUZERNE CO.)

FLOOD PROFILES

WALKER RUN

14P



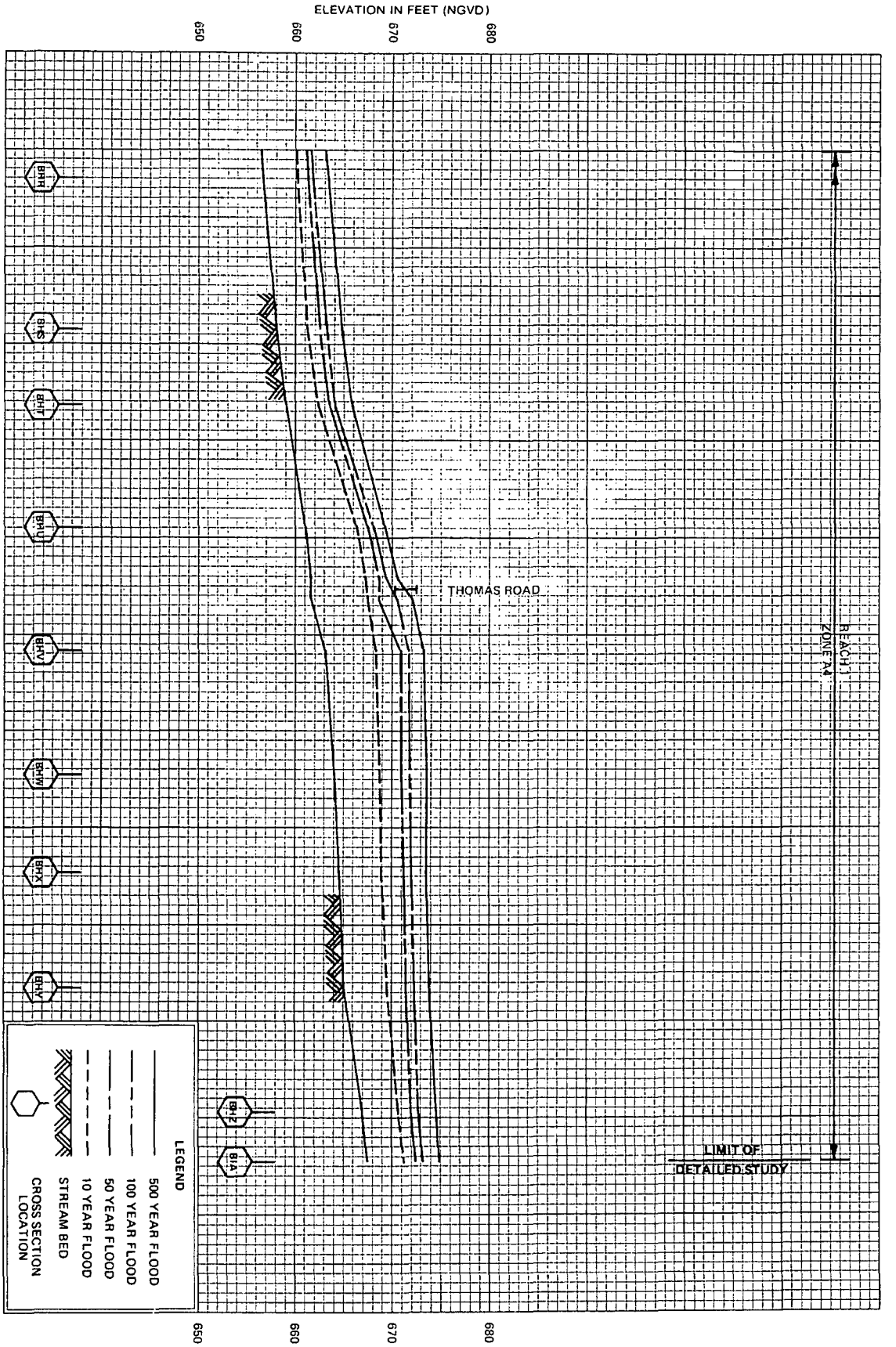
15P

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF SALEM, PA
(LUZERNE CO.)

FLOOD PROFILES

WALKER RUN



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWNSHIP OF SALEM, PA
(LUZERNE CO.)

FLOOD PROFILES

WALKER RUN

16P

FEMAFldStudy

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
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PROJECT DATA
Project Title: FEMA FldStudy
Project File : FEMAFldStudy.prj
Run Date and Time: 11/29/2010 1:56:05 PM

Project in English units

PLAN DATA

Plan Title: FEMA FIS HEC-RAS
Plan File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.p07

Geometry Title: FEMA FIS HEC-RAS
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.g05

Flow Title : FEMA Flow Data
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.f04

Plan Summary Information:

Number of:					
Cross Sections	=	18	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	4	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FEMA Flow Data
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.f04

Flow Data (cfs)

River	Reach	RS	PF 1
Walker Run	1	5198	1640
Walker Run	1	1208	1860

Boundary Conditions

River	Reach	Profile	Upstream	Downstream

Walker Run 1 PF 1 Known WS = 673.06 Known WS = 653.29

GEOMETRY DATA

Geometry Title: FEMA FIS HEC-RAS
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\FEMAFldStudy.g05

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5198

INPUT
Description: BIA
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1050	709.54	1070	704.54	1120	699.65	1130	694.84
1160	689.65	1185	684.65	1220	679.45	1265	677.54	1275	677.54
1285	674.84	1305	669.54	1350	668.34	1420	667.74	1430	666.74
1448	669.45	1500	671.74	1540	674.45	1570	676.74	1590	679.45
1605	684.24	1640	689.34	1662	694.54	1680	699.34	1695	704.65
1720	710.04	1740	714.45	1755	719.54	1765	724.24		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1420	.05	1448	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1420	1448	125	105	90	.3	.5

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4995

INPUT
Description: BHZ
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1010	719.54	1022	714.54	1055	709.65	1075	704.45
1100	699.45	1120	694.84	1140	691.74	1150	691.74	1180	689.34
1270	684.74	1300	676.74	1315	674.84	1390	669.34	1430	667.65
1440	666.24	1450	668.65	1465	669.65	1485	669.54	1540	667.74
1610	669.45	1635	674.54	1662	679.45	1685	690.04	1725	686.74
1750	689.45	1770	694.45	1780	699.34	1810	704.34	1835	709.84
1850	714.34	1870	719.34	1895	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1430	.05	1450	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1430	1450	275	255	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4735

INPUT
Description: BHY
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1015	719.65	1030	714.54	1058	709.84	1068	704.54
1080	701.74	1110	699.45	1140	694.65	1186	689.34	1280	686.74
1390	684.34	1430	683.74	1478	684.45	1620	679.54	1660	674.84
1690	669.54	1860	667.84	1870	664.24	1880	666.54	2000	669.45
2020	674.65	2042	679.84	2075	684.45	2120	689.45	2175	694.74
2225	699.34	2240	704.34	2280	709.65	2330	714.45	2355	719.24
2410	724.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1860	.05	1880	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1860	1880	200	240	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4495

INPUT
Description: BHX
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1020	719.24	1038	714.24	1050	709.45	1058	704.45
1060	703.74	1100	699.24	1148	694.84	1208	689.54	1315	688.74
1500	684.74	1670	683.74	1820	679.74	1905	673.74	1910	674.24
1950	671.74	1990	669.34	2100	667.74	2220	664.74	2230	663.74
2240	664.54	2280	669.54	2300	674.24	2320	679.65	2360	684.24
2420	689.45	2450	694.24	2480	699.24	2510	704.45	2560	709.34
2645	714.24	2740	719.45	2790	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	2220	.05	2240	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2220	2240	125	200	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4295

INPUT
Description: BHW
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.84	1032	719.74	1052	714.24	1075	709.54	1100	704.54
1130	699.34	1158	694.24	1180	689.45	1210	684.65	1262	679.54
1370	674.24	1408	669.34	1470	669.45	1600	667.54	1730	665.24
1735	663.24	1745	665.45	1800	666.45	1820	674.24	1875	679.65
1955	684.65	1985	689.74	2015	694.24	2045	699.24	2060	704.54
2075	709.34	2105	714.24	2152	719.54	2215	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1730	.05	1745	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1730	1745	225	260	225	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4043

INPUT
Description: BHV
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1030	719.24	1048	714.45	1062	709.45	1080	704.95
1102	699.65	1128	694.34	1150	689.65	1205	684.54	1242	679.34
1330	674.54	1390	671.54	1520	667.84	1620	664.34	1625	662.24
1630	664.84	1740	667.24	1910	669.54	1960	674.65	2040	679.54
2125	684.45	2162	689.34	2188	694.74	2210	699.34	2220	704.54
2245	714.45	2258	714.84	2270	719.74	2295	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1620	.05	1630	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1620	1630	381	255	191	.3	.7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 3914

INPUT
Description: Market Street u/s
Distance from Upstream XS = 128.4
Deck/Roadway Width = 43.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1242	678.745	678.745	1335	673.945	673.945	1372	671.945	671.945
1390	671.845	670.945	1490	671.445	668.145	1520	671.245	667.245
1616	670.545	661.845	1616	671.345	669.345	1625	671.345	669.345
1634	671.345	669.345	1634	670.545	662.045	1740	669.645	667.045
1820	667.945	667.945	1910	668.945	668.945	1960	674.045	674.045
2040	678.945	678.945	2125	683.845	683.845			

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1242	678.745	1335	673.945	1378	671.945	1390	670.945	1490	668.145
1520	667.245	1616	661.845	1625	660.845	1634	662.045	1740	667.045
1820	667.945	1910	668.945	1960	674.045	2040	678.945	2125	683.845

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1242	.1	1616	.05	1634	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1616	1634	.3	.7

Downstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1242	678.745	678.745	1335	673.945	673.945	1372	671.945	671.945
1390	671.845	670.945	1490	671.445	668.145	1520	671.245	667.245
1616	670.545	661.845	1616	671.345	669.345	1625	671.345	669.345
1634	671.345	669.345	1634	670.545	662.045	1740	669.645	667.045
1820	667.945	667.945	1910	668.945	668.945	1960	674.045	674.045
2040	678.945	678.945	2125	683.845	683.845			

Downstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1242	678.745	1335	673.945	1378	671.945	1390	670.945	1490	668.145
1520	667.245	1616	661.845	1625	660.845	1634	662.045	1740	667.045
1820	667.945	1910	668.945	1960	674.045	2040	678.945	2125	683.845

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1242	.1	1616	.05	1634	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1616	1634	.4	.8

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 668.7
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 670.1

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3785

INPUT
Description: BHU
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1022	719.24	1052	714.84	1085	709.45	1110	704.45
1140	699.34	1172	689.54	1260	684.65	1290	679.74	1318	674.84
1360	669.34	1412	664.95	1430	660.24	1440	665.95	1500	665.84
1550	667.24	1580	666.74	1650	666.15	1760	669.45	1800	674.34
1900	676.54	1980	679.54	2035	684.65	2055	689.45	2080	694.54
2095	699.45	2108	707.65	2118	709.65	2130	714.45	2140	719.34
2150	724.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1412	.055	1440	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1412	1440	250	250	175	.4	.8

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3532

INPUT
Description: BHT
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1055	719.34	1095	715.15	1155	709.45	1190	704.84
1240	699.45	1280	694.84	1330	689.54	1368	684.95	1390	679.74
1428	674.34	1502	664.34	1507	660.24	1510	658.24	1520	659.84
1600	661.45	1730	665.04	1750	666.34	1770	665.74	1850	666.34
1975	669.34	2000	674.74	2125	679.34	2180	684.34	2200	690.15
2222	694.34	2232	699.95	2262	704.84	2285	709.84	2325	714.45
2372	719.95	2415	724.34						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1507	.06	1520	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1507	1520	160	160	170	.4	.8

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3375

INPUT
Description: BHS
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1095	719.34	1140	714.45	1170	709.84	1220	704.45
1275	699.65	1285	694.45	1305	689.54	1320	684.34	1338	679.95
1360	674.65	1420	664.54	1443	659.24	1448	657.24	1460	658.34
1550	658.95	1680	664.84	1705	664.24	1800	666.74	1978	669.45
2042	674.65	2080	679.74	2100	685.04	2125	689.34	2140	694.95
2162	699.45	2180	704.84	2225	709.84	2260	714.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1443	.05	1460	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1443	1460	300	310	325	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3065

INPUT
Description: BHR
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1095	719.84	1110	714.74	1210	709.34	1260	704.34
1290	699.54	1300	695.04	1315	689.84	1330	684.45	1355	679.45
1385	674.95	1405	669.74	1425	664.54	1510	656.74	1520	655.95
1530	656.15	1670	661.45	1805	664.34	1828	666.54	1978	669.65
2070	671.34	2178	674.65	2210	679.34	2248	687.54	2285	689.95
2310	694.84	2355	699.34	2420	704.34	2525	709.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1510	.05	1530	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1510	1530	340	330	320	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2730

INPUT
Description: BHQ
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.45	1120	719.95	1198	714.45	1242	709.34	1262	704.34
1268	699.84	1300	694.54	1312	689.54	1328	684.54	1350	679.34
1368	674.34	1470	671.45	1588	669.54	1595	669.04	1669	664.34
1760	656.74	1818	656.24	1830	654.74	1837	656.24	1880	656.74
2000	662.24	2180	664.34	2220	667.34	2300	666.24	2465	669.65
2680	671.65	2718	674.74	2760	679.54	2805	684.54	2840	689.24
2855	694.95	2875	699.95	2900	704.34	2980	709.24	3015	714.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1818	.05	1837	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1818	1837	487	390	342	.3	.7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 2480

INPUT
Description:
Distance from Upstream XS = 251
Deck/Roadway Width = 12.5
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1735	665.445	665.445	1772	664.945	664.945	1825	659.745	659.745
1888	660.145	660.145	2045	658.445	658.445	2100	658.445	657.845
2145	658.445	654.845	2247	658.445	653.845	2247	658.445	657.745
2253	658.445	657.745	2253	658.445	653.845	2268	658.445	654.945
2350	658.445	656.945	2390	658.445	658.445	2440	660.345	660.345
2600	661.845	661.845	2735	665.045	665.045	2755	667.045	667.045
2900	667.845	667.845	3100	668.045	668.045			

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1735	665.445	1772	664.945	1825	659.745	1888	660.145	2045	658.445
2100	657.845	2145	654.845	2247	653.845	2253	653.845	2268	654.945

```
    2350 656.945    2390 658.445    2440 660.345    2600 661.845    2735 665.045
    2755 667.045    2900 667.845    3100 668.045

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1735     .06    2247     .05    2253     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2247    2253             .3       .7

Downstream  Deck/Roadway Coordinates
    num=      20
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1735 665.445 665.445    1772 664.945 664.945    1825 659.745 659.745
    1888 660.145 660.145    2045 658.445 658.445    2100 658.445 657.845
    2145 658.445 654.845    2247 658.445 653.845    2247 658.445 657.745
    2253 658.445 657.745    2253 658.445 653.845    2268 658.445 654.945
    2350 658.445 656.945    2390 658.445 658.445    2440 660.345 660.345
    2600 661.845 661.845    2735 665.045 665.045    2755 667.045 667.045
    2900 667.845 667.845    3100 668.045 668.045

Downstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1735 665.445    1772 664.945    1825 659.745    1888 660.145    2045 658.445
    2100 657.845    2145 654.845    2247 653.845    2253 653.845    2268 654.945
    2350 656.945    2390 658.445    2440 660.345    2600 661.845    2735 665.045
    2755 667.045    2900 667.845    3100 668.045

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1735     .06    2247     .05    2253     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2247    2253             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   659.2
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
          Submerged Inlet Cd          =     1.5
          Submerged Inlet + Outlet Cd =      .8
          Max Low Cord                =   658.5

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 2339

INPUT
Description: BHP
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  724.34    1030  719.34    1080  714.65    1108  710.15    1130  704.54
    1150  699.45    1170  694.54    1195  689.54    1225  684.65    1240  679.24
    1295  674.54    1400  669.95    1500  666.74    1590  664.54    1630  663.34
    1700  664.34    1735  664.95    1772  664.45    1825  659.24    1888  659.65
    2100  657.34    2145  655.34    2250  653.24    2268  654.45    2350  656.45
    2440  659.84    2600  661.34    2735  664.54    2755  666.54    2900  667.34
```

3100	667.54	3250	669.24	3350	671.34	3465	674.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2145	.05	2268	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2145	2268	600	330	350	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2010

INPUT
Description: BHO
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	689.34	1100	686.54	1230	684.34	1275	679.45	1340	674.84
1450	670.04	1635	664.45	1798	659.74	2030	656.54	2295	655.65
2298	654.34	2300	655.95	2460	655.95	2470	654.34	2475	655.95
2600	654.74	2715	654.34	2740	652.24	2750	654.54	2960	657.34
3230	659.65	3345	664.65	3360	664.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2715	.05	2750	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2715	2750	1200	809	740	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 1208

INPUT
Description: BHN
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.34	1060	714.65	1080	709.34	1165	699.54
1190	694.84	1225	689.54	1265	684.95	1380	674.54	1470	669.65
1528	665.15	1570	659.45	1680	651.74	1740	651.34	1752	650.74
1765	651.34	2205	659.24	2220	664.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1740	.05	1765	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1740	1765	300	275	175	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 933

INPUT
Description: BHM
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.54	1088	714.74	1120	710.04	1152	704.34
1200	699.74	1238	694.84	1270	689.84	1290	684.65	1340	679.95
1402	674.95	1445	669.34	1480	664.45	1530	659.74	1590	654.45
1700	650.95	1710	649.74	1720	650.65	1750	654.54	1900	657.04
2080	659.84	2200	663.45	2300	663.65	2400	663.45	2500	664.95
2590	664.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1700	.05	1720	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1700	1720	400	500	325	.3	.7

BRIDGE

```
RIVER: Walker Run
REACH: 1                    RS: 875

INPUT
Description: Private Farm Road
Distance from Upstream XS =       50
Deck/Roadway Width        =     14.9
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=       16
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1400 664.145 664.145    1530 659.445 659.445    1590 654.145 654.145
    1609 653.645 653.645    1709 653.645 650.945  1709.5 653.645 652.245
  1710.5 653.645 652.445  1711.5 653.645 652.245    1712 653.645 650.945
    1890 653.645 653.645    1930 654.245 654.245    2080 659.545 659.545
    2200 663.145 663.145    2300 663.345 663.345    2400 663.145 663.145
    2500 664.645 664.645

Upstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 724.245    1035 719.245    1088 714.445    1120 709.145    1152 704.045
    1200 699.545    1238 694.545    1270 689.545    1290 684.345    1340 679.645
    1402 674.645    1445 669.045    1480 664.145    1530 659.445    1590 654.145
    1608 653.645    1709 650.945  1709.5 649.645  1710.5 649.445  1711.5 650.645
    1712 650.945    1890 653.645    1930 654.245    2080 659.545    2200 662.245
    2300 663.345    2400 663.145    2500 664.645

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1709     .05    1712     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1709    1712              .3       .7

Downstream  Deck/Roadway Coordinates
    num=       16
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1400 664.145 664.145    1530 659.445 659.445    1590 654.145 654.145
    1609 653.645 653.645    1709 653.645 650.945  1709.5 653.645 652.245
  1710.5 653.645 652.445  1711.5 653.645 652.245    1712 653.645 650.945
    1890 653.645 653.645    1930 654.245 654.245    2080 659.545 659.545
    2200 663.145 663.145    2300 663.345 663.345    2400 663.145 663.145
    2500 664.645 664.645

Downstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 724.245    1035 719.245    1088 714.445    1120 709.145    1152 704.045
    1200 699.545    1238 694.545    1270 689.545    1290 684.345    1340 679.645
    1402 674.645    1445 669.045    1480 664.145    1530 659.445    1590 654.145
    1608 653.645    1709 650.945  1709.5 649.645  1710.5 649.445  1711.5 650.645
    1712 650.945    1890 653.645    1930 654.245    2080 659.545    2200 662.245
    2300 663.345    2400 663.145    2500 664.645

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1709     .05    1712     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
          1709    1712              .3       .7

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   654.4
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
```

```
        Pressure and Weir flow
            Submerged Inlet Cd          =     1.5
            Submerged Inlet + Outlet Cd =      .8
            Max Low Cord                =   653.2

Additional Bridge Parameters
        Add Friction component to Momentum
        Do not add Weight component to Momentum
        Class B flow critical depth computations use critical depth
            inside the bridge at the upstream end
        Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 428

INPUT
Description: BHL
Station Elevation Data      num=       28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  686.54    1050  684.84    1090  679.84    1110  674.45    1130  669.65
    1150  664.54    1210  659.34    1250  655.54    1350  651.74    1410  649.34
    1430  647.24    1440  649.65    1550  654.34    1605  656.65    1630  659.45
    1750  661.74    1860  664.45    2000  666.54    2100  667.34    2180  667.84
    2365  669.34    2450  671.34    2540  674.54    2640  684.34    2700  689.54
    2750  699.34    2800  704.65    2920  709.45

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1410     .05    1440     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1410    1440              220     400     240              .3       .7

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 147

INPUT
Description: BHK
Station Elevation Data      num=       36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  699.45    1040  694.84    1100  691.54    1170  689.54    1210  687.54
    1260  682.65    1340  684.95    1400  681.65    1440  679.65    1490  676.95
    1530  674.84    1555  669.65    1580  664.34    1610  659.24    1640  655.04
    1650  649.45    1660  646.74    1670  649.34    1750  651.74    1830  654.84
    1870  655.84    1900  654.74    1925  659.34    2100  661.54    2240  664.95
    2450  666.74    2623  669.65    2720  674.65    2760  679.34    2800  684.54
    2838  689.54    2848  694.34    2900  699.45    2940  704.45    3010  709.45
    3100  714.45

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1650     .05    1670     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1650    1670              305     380     405              .3       .7

BRIDGE


RIVER: Walker Run
REACH: 1                    RS: -10

INPUT
Description: Market Street
Distance from Upstream XS =      163
Deck/Roadway Width        =     23.7
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=       30
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1530 674.245 674.245    1555 669.045 669.045    1560 663.745 663.745
    1610 658.745 658.745    1635 653.645 653.645    1640 653.645 651.645
    1640 655.245 652.145  1655.5 656.745 647.345    1656 656.745 649.545
```

1657	656.945	650.645	1658	657.045	651.345	1659	657.145	651.645
1660	657.245	651.745	1661	657.045	651.645	1662	657.045	651.345
1663	656.945	650.545	1664	656.845	649.245	1664.5	656.745	646.645
1670	656.245	648.745	1680	655.245	649.045	1680	653.645	649.045
1750	653.645	651.145	1845	653.645	653.645	1860	654.245	654.245
1870	655.245	655.245	1900	656.745	656.745	1925	658.745	658.745
2100	660.945	660.945	2240	664.345	664.345	2480	666.145	666.145

Upstream Bridge Cross Section Data
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	698.845	1040	694.245	1100	690.945	1170	688.945	1210	683.945
1260	682.045	1340	684.345	1400	681.045	1440	679.045	1490	676.345
1530	674.245	1555	669.045	1580	664.045	1610	658.745	1635	653.645
1640	652.145	1641	652.145	1655.5	647.345	1656	646.945	1657	645.845
1658	645.945	1659	645.945	1660	645.945	1661	645.945	1662	645.945
1663	645.945	1664	646.245	1664.5	646.645	1670	648.745	1680	649.045
1750	651.145	1815	653.645	1830	654.245	1870	655.245	1900	654.145
1925	658.745	2100	660.945	2240	664.345	2450	663.245		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1640	.05	1655.5	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1655.5	1664.5	.3	.7

Downstream Deck/Roadway Coordinates
num= 30

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1530	674.245	674.245	1555	669.045	669.045	1560	663.745	663.745
1610	658.745	658.745	1635	653.645	653.645	1640	653.645	651.645
1640	655.245	652.145	1655.5	656.745	647.345	1656	656.745	649.545
1657	656.945	650.645	1658	657.045	651.345	1659	657.145	651.645
1660	657.245	651.745	1661	657.045	651.645	1662	657.045	651.345
1663	656.945	650.545	1664	656.845	649.245	1664.5	656.745	646.645
1670	656.245	648.745	1680	655.245	649.045	1680	653.645	649.045
1750	653.645	651.145	1845	653.645	653.645	1860	654.245	654.245
1870	655.245	655.245	1900	656.745	656.745	1925	658.745	658.745
2100	660.945	660.945	2240	664.345	664.345	2480	666.145	666.145

Downstream Bridge Cross Section Data
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	698.845	1040	694.245	1100	690.945	1170	688.945	1210	683.945
1260	682.045	1340	684.345	1400	681.045	1440	679.045	1490	676.345
1530	674.245	1555	669.045	1580	664.045	1610	658.745	1635	653.645
1640	652.145	1641	652.145	1655.5	647.345	1656	646.945	1657	645.845
1658	645.945	1659	645.945	1660	645.945	1661	645.945	1662	645.945
1663	645.945	1664	646.245	1664.5	646.645	1670	648.745	1680	649.045
1750	651.145	1815	653.645	1830	654.245	1870	655.245	1900	654.145
1925	658.745	2100	660.945	2240	664.345	2450	663.245		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1640	.05	1655.5	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1655.5	1664.5	.3	.7

```
Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   654.4
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   652.5
```

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: -255

INPUT
Description: BHJ
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	684.34	1092	679.54	1128	674.34	1170	669.34	1230	664.54
1310	660.04	1330	657.54	1350	654.84	1372	649.74	1405	647.24
1408	645.74	1412	647.95	1450	649.65	1490	649.24	1525	649.34
1570	649.04	1610	649.84	1670	654.34	1712	659.34	1740	664.84
1750	669.34	1790	674.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1405	.05	1412	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1405	1412	225	260	200	.3	.7

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	5198	PF 1	1640.00	666.74	672.29	670.21	672.45	0.00322	4.57	679.39	213.54	0.38
1	4995	PF 1	1640.00	666.24	671.98		672.10	0.00290	4.49	809.61	268.46	0.36
1	4735	PF 1	1640.00	664.24	671.45		671.53	0.00181	3.93	1014.88	328.46	0.29
1	4495	PF 1	1640.00	663.74	671.21		671.26	0.00085	3.17	1231.26	328.20	0.21
1	4295	PF 1	1640.00	663.24	671.10		671.13	0.00072	2.78	1481.19	417.58	0.19
1	4043	PF 1	1640.00	662.24	670.96	667.76	670.98	0.00059	2.59	1720.34	513.42	0.17
1	3914			Bridge								
1	3785	PF 1	1640.00	660.24	666.72	667.18	668.16	0.02906	10.95	215.96	226.04	0.97
1	3532	PF 1	1640.00	658.24	663.52	662.84	663.92	0.01386	7.58	371.00	171.79	0.63
1	3375	PF 1	1640.00	657.24	662.36		662.54	0.00439	5.23	558.85	195.75	0.44
1	3065	PF 1	1640.00	655.95	660.88		661.12	0.00446	5.55	483.24	190.20	0.45
1	2730	PF 1	1640.00	654.74	659.53	658.23	659.72	0.00404	4.75	516.14	214.41	0.42
1	2480			Bridge								
1	2339	PF 1	1640.00	653.24	657.94		658.02	0.00133	2.59	778.58	344.43	0.24
1	2010	PF 1	1640.00	652.24	657.72		657.73	0.00036	1.50	2013.20	1059.62	0.13
1	1208	PF 1	1860.00	650.74	657.39		657.41	0.00029	1.75	1757.12	502.62	0.12
1	933	PF 1	1860.00	649.74	657.15	654.65	657.26	0.00152	4.17	1010.32	347.88	0.28
1	875			Bridge								
1	428	PF 1	1860.00	647.24	656.63		656.68	0.00048	2.64	1493.39	366.17	0.16
1	147	PF 1	1860.00	646.74	656.36	652.93	656.46					

```
                                                FEMAFldStudy
0.00110        3.95      1003.23       278.18            0.24
  1              -10                        Bridge

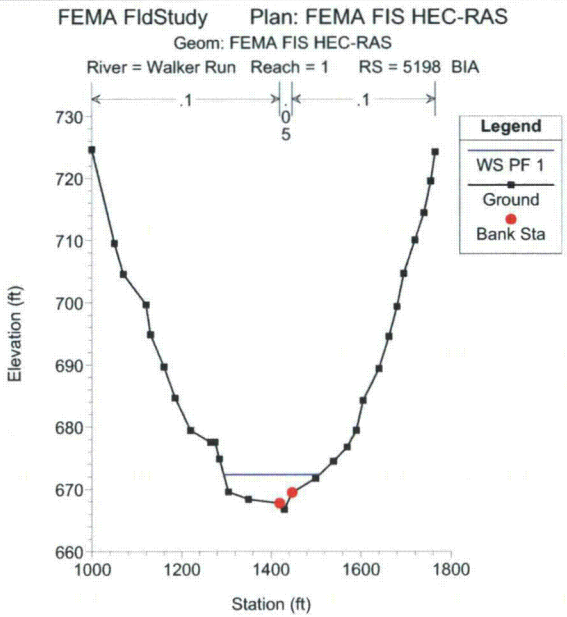
  1              -255          PF 1       1860.00       645.74       653.29       650.73       653.35
0.00149        3.72      1114.02       299.31            0.26
```

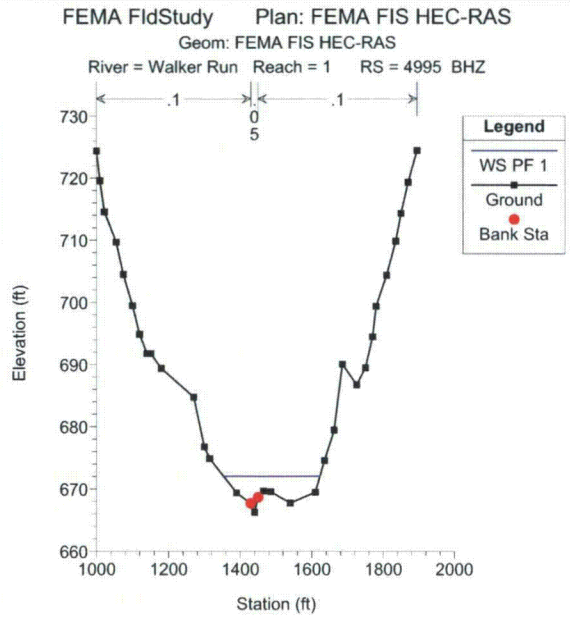
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : FEMA HECRAS

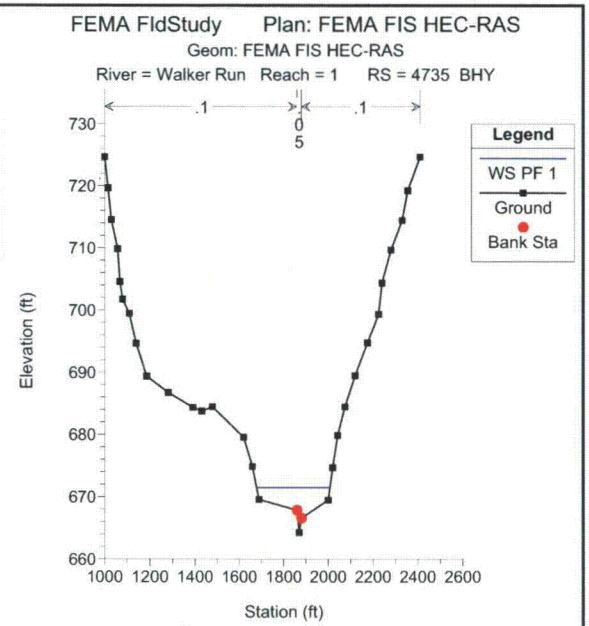
```
River: Walker Run  Reach: 1     RS: 4735     Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
or greater than 1.4.
             This may indicate the need for additional cross sections.
River: Walker Run  Reach: 1     RS: 4043     Profile: PF 1
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
or greater than 1.4.
             This may indicate the need for additional cross sections.
River: Walker Run  Reach: 1     RS: 3914     Profile: PF 1
     Warning:The sluice gate calculations did not converge during the pressure flow only calculation.
     Note:   The downstream water surface is below the minimum elevation for pressure flow.  The sluice
gate equations were used
             for pressure flow.
River: Walker Run  Reach: 1     RS: 3914     Profile: PF 1 Upstream
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, energy was used.
River: Walker Run  Reach: 1     RS: 3914     Profile: PF 1 Downstream
     Warning:The energy equation could not be balanced within the specified number of iterations.  The
program used critical depth
             for the water surface and continued on with the calculations.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, energy was used.
River: Walker Run  Reach: 1     RS: 3785     Profile: PF 1
     Warning:Divided flow computed for this cross-section.
     Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
section.  This may indicate
             the need for additional cross sections.
     Note:   The energy method has computed a class B profile.
River: Walker Run  Reach: 1     RS: 3532     Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
or greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
section.  This may indicate
             the need for additional cross sections.
     Note:   Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run  Reach: 1     RS: 3375     Profile: PF 1
     Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
section.  This may indicate
             the need for additional cross sections.
River: Walker Run  Reach: 1     RS: 3065     Profile: PF 1
     Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross
section.  This may indicate
             the need for additional cross sections.
River: Walker Run  Reach: 1     RS: 2480     Profile: PF 1
     Note:   The downstream water surface is above the minimum elevation required for orifice flow.  The
orifice flow equation was
             used for pressure flow.
River: Walker Run  Reach: 1     RS: 2480     Profile: PF 1 Upstream
     Note:   For the cross section inside the bridge at the upstream end, the water surface and energy
have been projected from
             the upstream cross section.  The selected bridge modeling method does not compute answers
inside the bridge.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, energy was used.
River: Walker Run  Reach: 1     RS: 2480     Profile: PF 1 Downstream
     Note:   For the cross section inside the bridge at the downstream end, the water surface and energy
are based on critical
             depth over the weir.
     Note:   Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, energy was used.
River: Walker Run  Reach: 1     RS: 2339     Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
or greater than 1.4.
```

This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 1208 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 933 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 875 Profile: PF 1
Warning:The pressure flow/weir calculations did not converge within the given number of iterations.
Note: The water surface computed by the sluice gate equation (during pressure/weir calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 875 Profile: PF 1 Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 1 RS: 875 Profile: PF 1 Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 428 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 147 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: -10 Profile: PF 1
Warning:The pressure flow/weir calculations did not converge within the given number of iterations.
Warning:The pure energy/weir flow answer did not converge within the given number of iterations. However, the error was
small enough that the solution was treated as valid.
Note: The water surface computed by the sluice gate equation (during pressure only calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: -10 Profile: PF 1 Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Note: Notes(60): This is an inside cross section of a perched bridge that has energy, low flow inside of the bridge and
weir flow over the embankment. The reported hydraulics are based on the flow and area inside of the bridge.
River: Walker Run Reach: 1 RS: -10 Profile: PF 1 Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Note: Notes(60): This is an inside cross section of a perched bridge that has energy, low flow

inside of the bridge and
weir flow over the embankment. The reported hydraulics are based on the flow and area inside of the bridge.


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 5198 BIA
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4995 BHZ
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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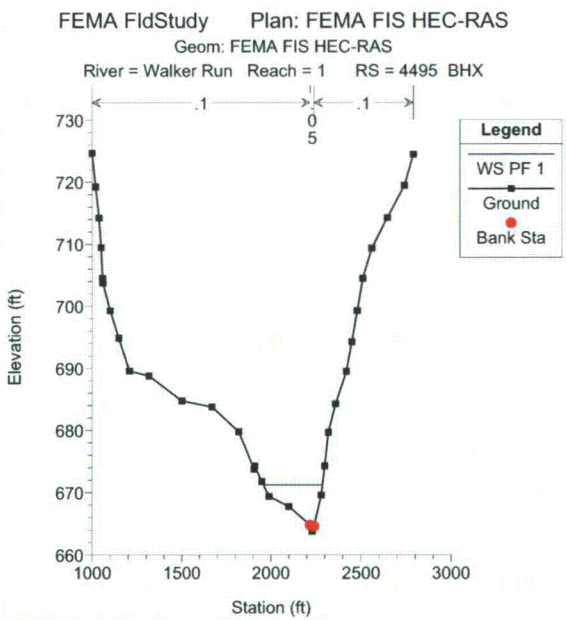
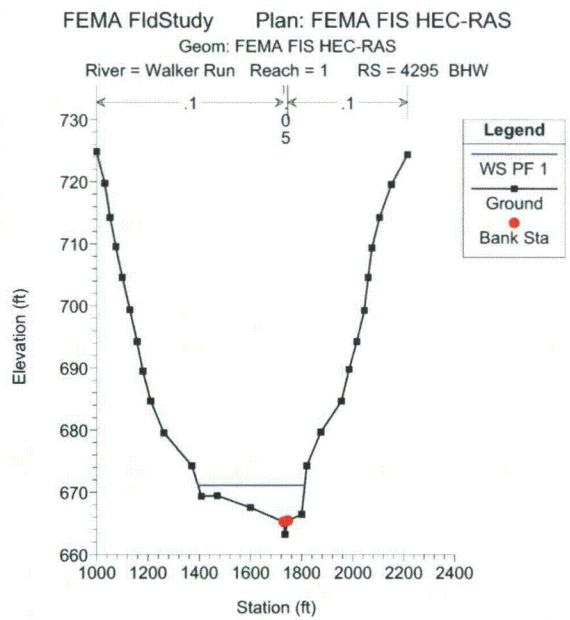
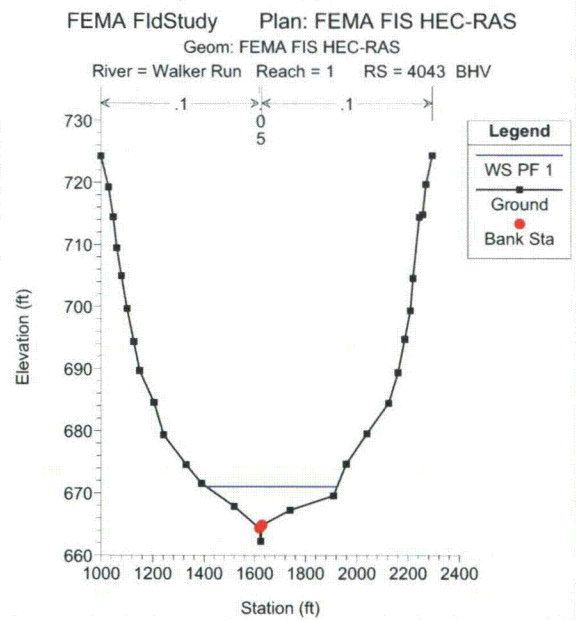
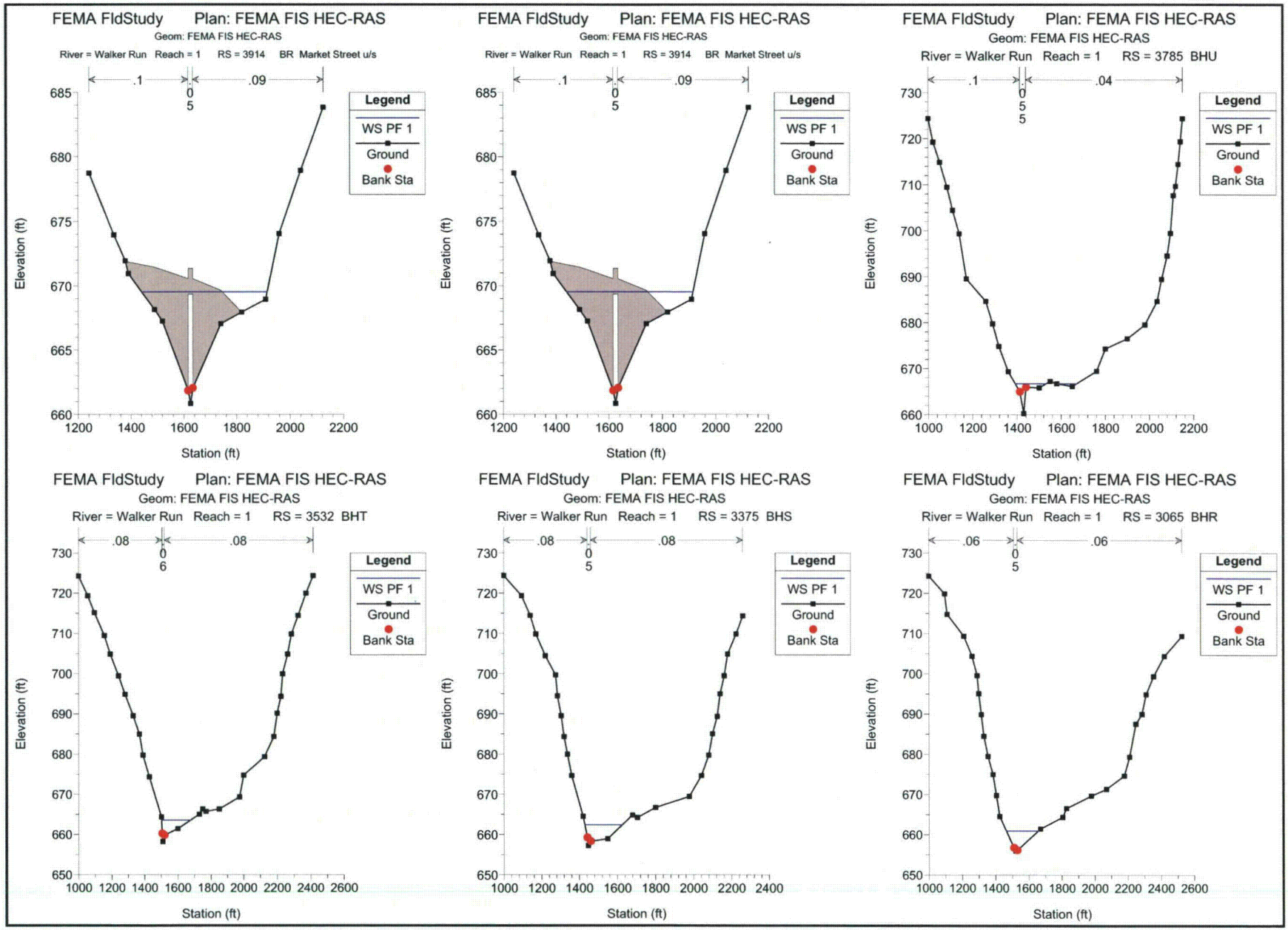
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4735 BHY
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4495 BHX
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4295 BHW
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 4043 BHV
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3914 BR Market Street u/s
.1
.09
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3914 BR Market Street u/s
.1
.09
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3785 BHU
.1
.04
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
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.08
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3375 BHS
.08
.08
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
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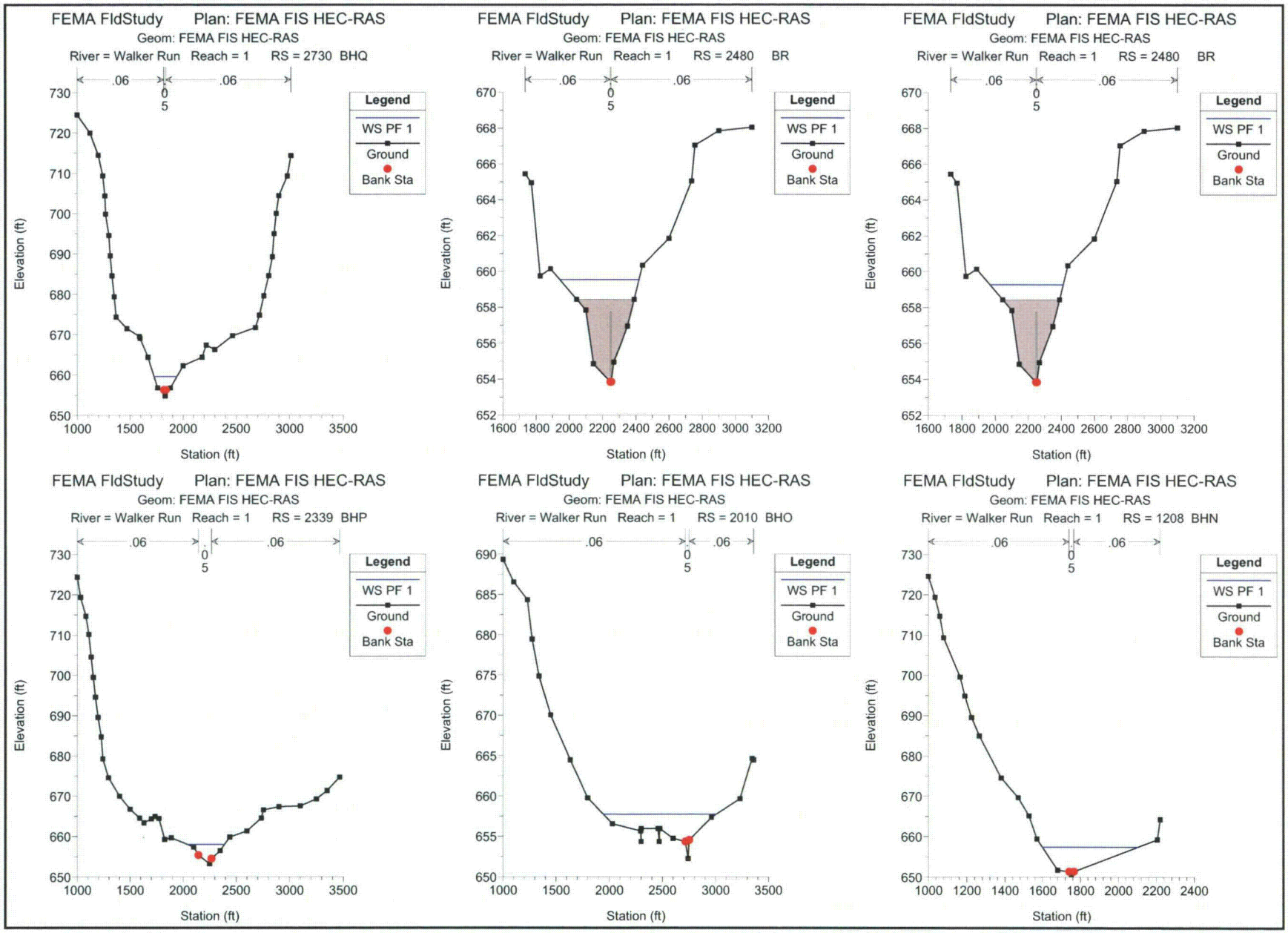
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 3065 BHR
.06
.06
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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Geom: FEMA FIS HEC-RAS
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FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2480 BR
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2480 BR
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2339 BHP
FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 2010 BHO
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Geom: FEMA FIS HEC-RAS
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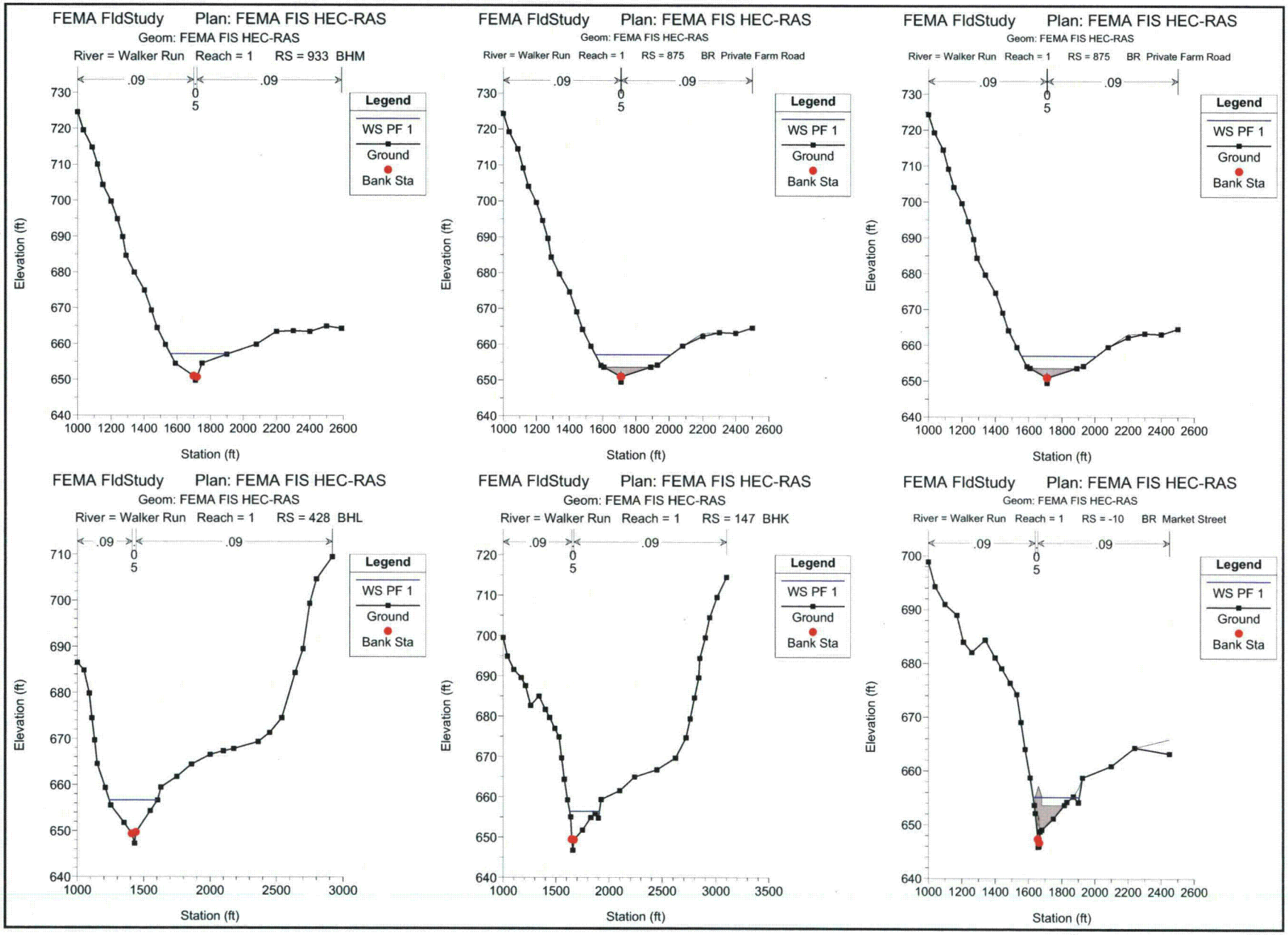
.06
0.5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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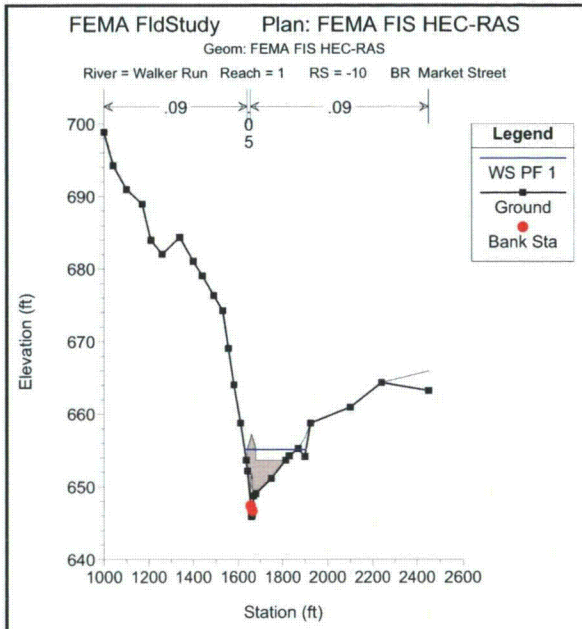
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = 933 BHM
River = Walker Run Reach = 1 RS = 875 BR Private Farm Road
River = Walker Run Reach = 1 RS = 875 BR Private Farm Road
River = Walker Run Reach = 1 RS = 428 BHL
River = Walker Run Reach = 1 RS = 147 BHK
River = Walker Run Reach = 1 RS = -10 BR Market Street
.09
0
5
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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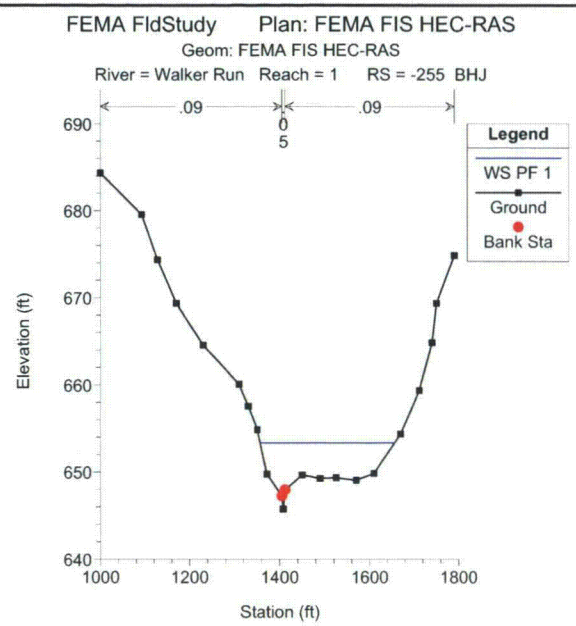
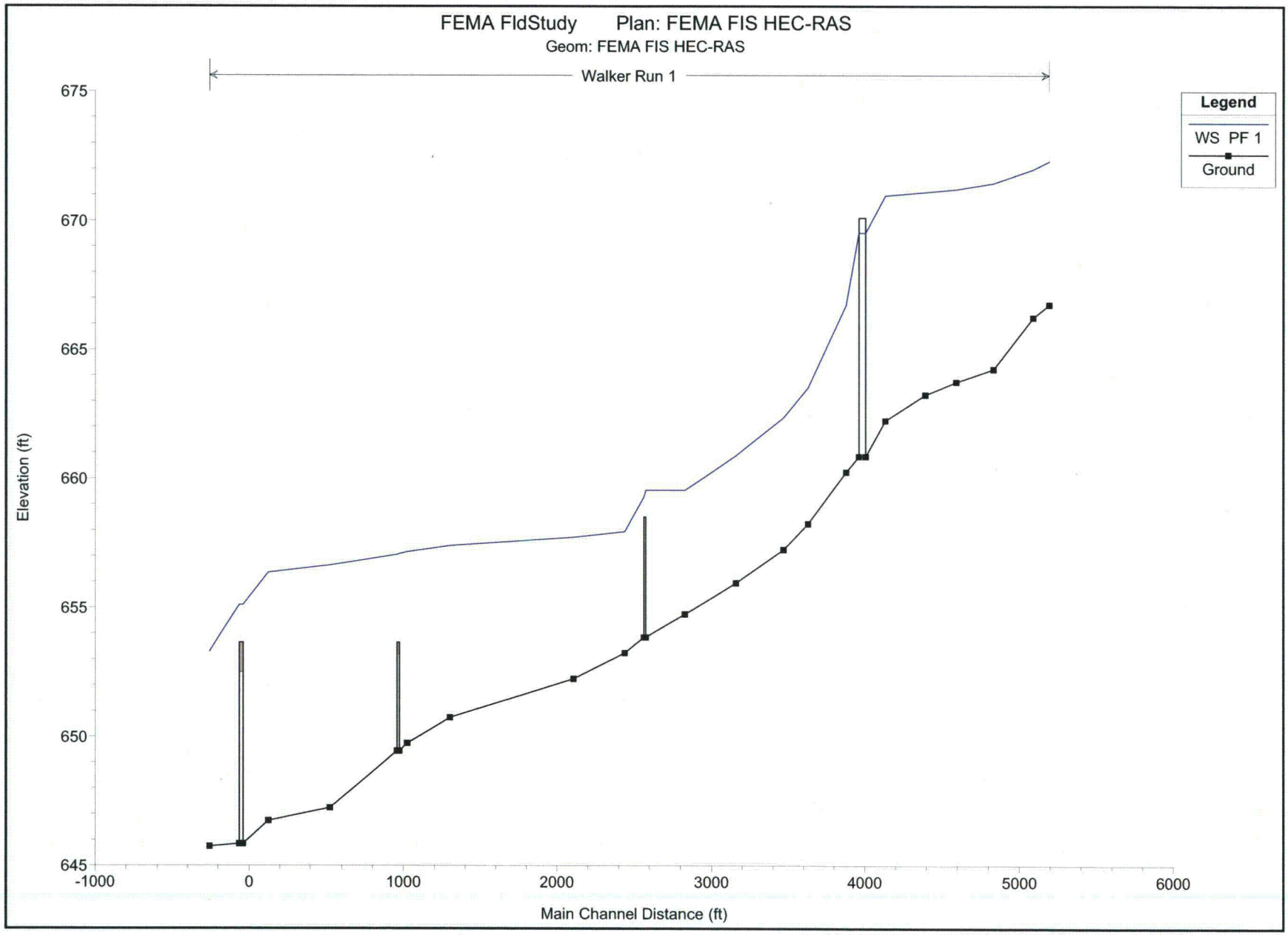
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = -10 BR Market Street
.09
0
5
.09
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
700
690
680
670
660
650
640
1000 1200 1400 1600 1800 2000 2200 2400 2600
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
River = Walker Run Reach = 1 RS = -255 BHJ
.09
0
5
.09
Legend
WS PF 1
Ground
Bank Sta
Elevation (ft)
690
680
670
660
650
640
1000 1200 1400 1600 1800
Station (ft)


FEMA FldStudy Plan: FEMA FIS HEC-RAS
Geom: FEMA FIS HEC-RAS
Walker Run 1
Legend
WS PF 1
Ground
Elevation (ft)
675
670
665
660
655
650
645
-1000
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)

Appendix E:
Existing Hydraulics
(Corrected Effective Model)

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: WalkerRunFld
Project File : WalkerRunFld.prj
Run Date and Time: 11/29/2010 2:04:37 PM

Project in English units

PLAN DATA

Plan Title: Existing Conditions
Plan File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.p05

Geometry Title: Existing Conditions
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.g04

Flow Title : Existing Conditions
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.f03

Plan Summary Information:

Number of:	Cross Sections =	91	Multiple Openings =	0
	Culverts =	3	Inline Structures =	0
	Bridges =	4	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Existing Conditions
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.f03

Flow Data (cfs)

River	Reach	RS	100 year storm	100 year storm encroachment	500 year storm
Tributary	1	6850	303.5	303.5	615.69
Tributary	1	4400	303.5	303.5	615.69
Tributary	1	1252	303.5	303.5	615.69
Walker Run	1	5862	1640	1640	3600
Walker Run	1	5198	1640	1640	3600
Walker Run	2	1602	1860	1860	3100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Tributary	1	100 year storm	Critical	
Tributary	1	100 year storm encroachment		Critical
Tributary	1	500 year storm	Critical	
Walker Run	1	100 year storm	Critical	
Walker Run	1	100 year storm encroachment		Critical
Walker Run	1	500 year storm	Critical	
Walker Run	2	100 year storm		Known WS = 653.29
Walker Run	2	100 year storm encroachment		Known WS = 654.29
Walker Run	2	500 year storm		Known WS = 654.6

GEOMETRY DATA

Geometry Title: Existing Conditions
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.g04

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Tributary	1		Trib Junc
Walker Run	1		Trib Junc
Walker Run	2	Trib Junc	

JUNCTION INFORMATION

Name: Trib Junc
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Walker Run	1	to Walker Run	2	325.9	
Tributary	1	to Walker Run	2	133	

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 6850

INPUT
Description:
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	717.52	.35	717.54	2.18	717.61	3.78	717.66	6.3	717.8
7.85	717.82	12.81	718	20.71	718.1	21.89	718.12	30.23	718.06
30.44	718.06	34.3	718	34.95	717.97	35.49	717.93	40.01	717.62
40.91	717.52	41.61	717.38	43.04	717.13	43.18	717.1	43.68	717.04
43.98	717	47.48	716.55	50.04	716.18	50.95	716	52.04	715.78
54.81	715	56.01	714.66	58.49	714	60.5	713.45	61.8	713
73.57	712.06	74.45	712	75.39	711.91	76.44	711.85	84.53	711.28
90.32	711	91.39	710.93	91.8	710.91	92.02	710.89	92.48	710.85
96.49	710.55	101.47	710	102.88	709.75	104.15	709.32	104.25	709.26
104.43	709.22	104.66	709.19	104.87	709.2	105.86	709.3	106.32	709.38
107.84	709.67	109.84	710	112.63	710.84	113.19	711	113.34	711.06
116.12	712	118.92	712.94	119.09	713	119.23	713.05	122.01	714
123.04	714.38	124.97	715	126.95	715.63	128.05	716	130.39	716.75
131.16	717	132.68	717.25	138.64	718	141.42	718.08	146.9	718.11
148.71	718.06	153.13	718	156.17	717.38	157.97	717	159.64	716.99
159.72	716.99	161.24	717	161.76	717	162.96	717.28	166.09	718
167.49	718.26	174.81	719	177.43	719.22	185.26	719.81	186.71	719.92
187.13	719.95	187.68	720	195.49	720.55	201.16	721	207.47	721.56
209.54	721.73	212.78	722	224.62	722.84	226.57	723	236.08	723.8
238.51	724	242.33	724.16	249.45	724.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	90.32	.08	113.19	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.32	113.19	858.49	916.24	905.57	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 5930

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	707.61	.21	707.52	1.49	707	3.75	706.23	4.35	706.04
4.46	706	4.67	705.91	6.78	705	7.13	704.87	9.64	704
11.48	703.34	12.46	703	12.85	702.86	15.32	702	16.31	701.64
18.18	701	20.11	700.31	21	700	23.24	699.19	23.8	699
24.33	698.81	26.66	698	27.99	697.57	29.87	697	31.89	696.61
35.21	696	40.81	695.52	43.76	695.24	46.22	695	47.88	694.93
73.56	694	78.44	693.3	80.01	693	80.83	692.64	82.4	692
83.33	692	84.28	692	84.3	692	84.31	692	86.28	692
87.21	692.48	88.27	693	101.79	693.51	104.21	693.59	106.79	693.68
108.18	693.72	110.29	693.73	112.58	693.7	112.72	693.69	118.36	693.78
120.92	693.83	122.97	693.9	125.05	694	139.58	694.93	140.72	695
141.28	695.05	153.31	696	158.07	696.55	162.09	697	166	697.45
170.75	698	174.95	698.5	179.08	699	183.24	699.61	185.81	700
188.27	700.35	192.66	701	196.14	701.53	199.34	702	204.09	702.76
205.4	703	207.13	703.33	210.72	704	213.77	704.54	216.32	705
218.9	705.47	221.12	705.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	80.01	.08	88.27	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
80.01	88.27	448.37	429.25	409.23	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 5500

INPUT
Description:
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	705.59	1.65	705.28	3.11	705	3.68	704.9	9.3	704
10.58	703.79	14.78	703	14.79	703	19.67	702.91	20.62	702.9
22.18	702.9	22.97	702.9	23.58	702.92	24.01	702.94	24.36	702.98
24.87	703	25.93	703.05	26.08	703.05	35.07	703.38	37.21	703.44
39.27	703.47	41.12	703.49	42.58	703.48	43.53	703.46	44.12	703.41
44.76	703.31	46.18	703	46.94	702.52	47.85	702	48.86	701.36
49.48	701	50.69	700.22	51.08	700	51.86	699.5	52.59	699
53.94	698.19	54.24	698	54.73	697.69	55.88	697	57.44	696.04
57.51	696	57.79	695.83	59.23	695	60.7	694.11	60.9	694
62.37	693.25	62.91	693	62.98	692.98	65.37	692	65.4	691.99
66.48	691.55	67.85	691	67.95	691	75.95	691	79.78	691
84.86	691	87.6	691	89.79	691	96.84	691	105.06	691
105.18	691	106.9	691	107.22	691	114.51	691	116.13	691
118.28	691.39	121.68	692	123.18	692.64	124.03	693	126.02	693.87
126.33	694	127.25	694.4	128.76	695	129.16	695.13	132.13	696
132.9	696.22	135.68	697	137.76	697.61	139.16	698	139.62	698.13
142.67	699	143.27	699.17	146.17	700	149.04	700.82	149.66	701
150.18	701.16	153.12	702	153.66	702.15	156.6	703	158.09	703.4
160.27	704	162.03	704.45	164.06	705	166.44	705.61	168.26	706
169.59	706.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	66.48	.08	118.28	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
66.48	118.28	758.93	739.98	740.88	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4750

INPUT
Description:
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	719.11	7.68	719	10.17	718.76	18.45	718	20.03	717.49
21.92	717	22.84	716.49	23.71	716	24.48	715.58	25.43	715
26.3	714.49	27.18	714	28.1	713.46	28.92	713	29.88	712.44
30.65	712	31.64	711.37	32.27	711	33.35	710.38	33.99	710
35.06	709.39	35.7	709	36.83	708.35	37.43	708	38.7	707.26
39.13	707	39.54	706.76	40.87	706	42.26	705.19	42.58	705
43.96	704.19	44.31	704	45.75	703.16	46.03	703	47.5	702.13
47.72	702	49.25	701.01	49.26	701	49.27	700.99	50.71	700
51.78	699.09	51.92	699	52.06	698.89	53.27	698	53.57	697.79
54.58	697	55.07	696.68	55.87	696	56.82	695.31	57.23	695
58.25	694.16	58.5	694	60.18	693.01	60.19	693	60.23	692.98
62.33	692	64.4	691	64.41	691	66.77	690	68.03	689.39
68.88	689	70.28	688.56	71.66	688	73.93	687.54	76.53	687
79.74	686.35	81.27	686	83.57	685.49	85.56	685	86.56	684
89.9	684	94.99	684	124.36	684	137.07	684	144.81	684
176.24	685	176.89	685.09	183.88	686	186.34	686.5	188.39	687
191.16	687.7	192.31	688	193.07	688.2	196.16	689	197.57	689.37
200.05	690	206.17	690.93	206.7	691	214.37	691.48	215.87	691.59
217.4	691.74	217.65	691.76	218.07	691.79	218.54	691.81	219.08	691.82
219.68	691.82	220.29	691.82	221.04	691.82	221.15	691.82	221.32	691.79
221.59	691.74	222.48	691.36	223.33	691	225.37	690.05	225.47	690
225.68	689.91	227.73	689	229.96	688.11	230.23	688	230.4	687.93
232.65	687	233.17	686.93	233.41	686.89	233.91	686.96	234.15	687
234.42	687.11	236.86	688	237.5	688.24	239.62	689	242.37	690
245.17	691	245.95	691.05	247.15	691.13	252.96	691.51	261.76	692
269.9	692.26	288.24	692.9	290.57	692.98	291.12	693	296.01	693.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	81.27	.08	183.88	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
81.27	183.88	238.3	226.5	190.7	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4530

INPUT
Description: U/S XS of Beaver Dam Pond Culvert
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	695.63	.38	695.48	1.28	695.09	1.48	695	3.09	694.51
5.01	694	8.08	693.32	9.54	693	12.07	692.33	13.44	692
15.74	691.32	16.91	691	18	690.72	20.83	690	24.22	689.15
24.81	689	28.69	688.02	28.78	688	28.95	687.96	29.27	687.87
32.8	687	37.18	686.21	38.3	686	39.25	685.85	44.98	685
46.66	685	47.66	684	49.21	684	50.78	684	51.95	684
53.56	684	58.64	684	62.64	684	65.43	684	71.47	684
82.7	684	83.09	684	98.62	684	101.48	684	107.38	684
109.3	684	123.54	684	124.7	684	147.47	684	168.98	684
177.3	684	180.32	684	182.51	684	188.98	684	190.4	684
193.03	684	193.27	684	193.44	684	194.9	684	194.96	684
195.01	684	195.13	684	196.34	684	196.91	684	203.33	684
207.17	684	210.36	684	211.96	684	215.52	684	218.11	684
220.77	684	224.16	684	231.87	684	239.24	684	245.5	685
253.07	685	256.85	685.84	257.54	686	258.89	686.31	259.73	686.43
261.48	686.68	262.26	686.84	263.03	687	264	687.21	267.77	688
269.77	688.4	272.58	689	280.78	689.37	283.12	689.52	287.24	689.8
289.93	690	303.56	690.88	305.27	691	307.07	691.07	307.94	691.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.25	.08	256.85	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
39.25	256.85	26.8	29.2	29.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	103	686.02	F
109	307.94	686.02	F

CULVERT

RIVER: Tributary
REACH: 1 RS: 4528

INPUT
Description: Beaver Dam Pond Culvert
Distance from Upstream XS = 10.5
Deck/Roadway Width = 4
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 126

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	699.94		.08	699.93		.17	699.9	
.37	699.82		1.81	699.59		4.29	699.12	
4.86	699		5.91	698.73		7.54	698.44	
9.65	698		12.65	697.57		15.79	697	
17.04	696.74		19.94	696		20.51	695.88	
24.52	695		25.05	694.9		29.34	694	
29.78	693.91		34.3	693		38.09	692.22	
39.2	692		43.19	691.18		43.98	691	
44.34	690.93		44.67	690.88		49.26	690	
51.11	689.68		55.23	689		60.28	688.18	
61.36	688		65.16	687.39		67.46	687	
68.34	686.86		70.96	686.33		80.51	686.24	
80.67	686.24		84.94	686.05		86.72	686.04	
89.52	686.04		93.66	686.03		94.45	686.03	
95.14	686.02		96.47	686.02		97.36	686.02	
101.68	686.02		102.68	686.02		104.7	686.03	
105.44	686.03		109.35	686.02		114.19	686.01	
117.38	686		119.45	685.81		120.95	685.78	
123.15	685.61		123.97	685.38		125.3	685	
127.21	685		132.46	685		134.61	685	
139.57	685		141.83	685		144.59	685	
147.06	685		149.69	685		153.25	685	
155	685		158.41	685		163.68	685	
164.26	685		164.58	685		172.54	685	
173.23	685		174.29	685		182.66	685	
183.32	685		185.42	685		189.93	684.94	
190.82	684.95		198.27	684.93		198.45	684.93	
205.79	684.9		205.98	684.91		206.25	684.92	
207.99	685		214.82	685		215.17	685	
216.22	685		218.29	685		218.85	685	
220.55	685		221.47	685		221.8	685	
222.26	685		222.79	685		223.34	685	
225.66	685		229.27	685		229.91	685	
232.18	685		233.95	685		235.25	685	
238.49	685		239.5	685		240.33	685	
240.63	685		242.95	685		245.9	685	
246.88	685		249.8	685		250.83	685	
252.46	685		260.7	685		262.47	685.37	
265.16	686		268.07	686.63		269.63	687	
272.57	687.71		273.81	688		274.81	688.23	
278.02	689		278.88	689.03		292.31	689.45	
305.41	690		309.17	690.2		310.77	690.28	

Upstream Bridge Cross Section Data
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	695.63	.38	695.48	1.28	695.09	1.48	695	3.09	694.51
5.01	694	8.08	693.32	9.54	693	12.07	692.33	13.44	692
15.74	691.32	16.91	691	18	690.72	20.83	690	24.22	689.15
24.81	689	28.69	688.02	28.78	688	28.95	687.96	29.27	687.87
32.8	687	37.18	686.21	38.3	686	39.25	685.85	44.98	685
46.66	685	47.66	684	49.21	684	50.78	684	51.95	684
53.56	684	58.64	684	62.64	684	65.43	684	71.47	684
82.7	684	83.09	684	98.62	684	101.48	684	107.38	684
109.3	684	123.54	684	124.7	684	147.47	684	168.98	684
177.3	684	180.32	684	182.51	684	188.98	684	190.4	684
193.03	684	193.27	684	193.44	684	194.9	684	194.96	684
195.01	684	195.13	684	196.34	684	196.91	684	203.33	684
207.17	684	210.36	684	211.96	684	215.52	684	218.11	684
220.77	684	224.16	684	231.87	684	239.24	684	245.5	685
253.07	685	256.85	685.84	257.54	686	258.89	686.31	259.73	686.43

261.48	686.68	262.26	686.84	263.03	687	264	687.21	267.77	688
269.77	688.4	272.58	689	280.78	689.37	283.12	689.52	287.24	689.8
289.93	690	303.56	690.88	305.27	691	307.07	691.07	307.94	691.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.25	.08	256.85	.05

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
39.25	256.85	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	103	686.02	F
109	307.94	686.02	F

Downstream Deck/Roadway Coordinates
num= 126

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	699.94		.08	699.93		.17	699.9	
.37	699.82		1.81	699.59		4.29	699.12	
4.86	699		5.91	698.73		7.54	698.44	
9.65	698		12.65	697.57		15.79	697	
17.04	696.74		19.94	696		20.51	695.88	
24.52	695		25.05	694.9		29.34	694	
29.78	693.91		34.3	693		38.09	692.22	
39.2	692		43.19	691.18		43.98	691	
44.34	690.93		44.67	690.88		49.26	690	
51.11	689.68		55.23	689		60.28	688.18	
61.36	688		65.16	687.39		67.46	687	
68.34	686.86		70.96	686.33		80.51	686.24	
80.67	686.24		84.94	686.05		86.72	686.04	
89.52	686.04		93.66	686.03		94.45	686.03	
95.14	686.02		96.47	686.02		97.36	686.02	
101.68	686.02		102.68	686.02		104.7	686.03	
105.44	686.03		109.35	686.02		114.19	686.01	
117.38	686		119.45	685.81		120.95	685.78	
123.15	685.61		123.97	685.38		125.3	685	
127.21	685		132.46	685		134.61	685	
139.57	685		141.83	685		144.59	685	
147.06	685		149.69	685		153.25	685	
155	685		158.41	685		163.68	685	
164.26	685		164.58	685		172.54	685	
173.23	685		174.29	685		182.66	685	
183.32	685		185.42	685		189.93	684.94	
190.82	684.95		198.27	684.93		198.45	684.93	
205.79	684.9		205.98	684.91		206.25	684.92	
207.99	685		214.82	685		215.17	685	
216.22	685		218.29	685		218.85	685	
220.55	685		221.47	685		221.8	685	
222.26	685		222.79	685		223.34	685	
225.66	685		229.27	685		229.91	685	
232.18	685		233.95	685		235.25	685	
238.49	685		239.5	685		240.33	685	
240.63	685		242.95	685		245.9	685	
246.88	685		249.8	685		250.83	685	
252.46	685		260.7	685		262.47	685.37	
265.16	686		268.07	686.63		269.63	687	
272.57	687.71		273.81	688		274.81	688.23	
278.02	689		278.88	689.03		292.31	689.45	
305.41	690		309.17	690.2		310.77	690.28	

Downstream Bridge Cross Section Data
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	698.39	2.25	698	3.51	697.78	8.04	697	10.4	696.58
13.75	696	17.58	695.27	19.01	695	24.3	694.01	24.35	694
24.36	694	24.39	693.99	24.56	693.96	29.6	693	29.96	692.93
34.84	692	35.26	691.92	40.08	691	40.93	690.86	43.54	690.41
45.59	690	46.73	689.76	50.78	689	51.85	688.8	56.28	688
56.66	687.94	56.88	687.91	57.21	687.86	62.06	687	64.06	686.74
67.41	686.48	73.1	686	73.58	685.87	76.63	685.77	78.89	685.6
81.72	685.36	82.81	685.28	83.36	685.25	84.22	685.21	84.7	685.21
87.07	685.08	87.43	685.08	88.66	685	90.82	684.79	91.94	684.65
92.9	684.44	93.35	684.38	94.01	684.33	94.9	684.3	99.29	684.28
104.43	684.19	106.71	684.15	109.3	684.08	111.09	684	111.21	683.99
112.38	683.85	113.67	683.78	114.6	683.71	115.76	683.68	117.21	683.5
118.12	683.44	119.46	683.39	121.24	683.35	122.15	683.37	127.52	683.35
131.92	683.3	134.65	683.33	135.14	683.32	139.51	683.33	140.67	683.32
141.87	683.33	142.84	683.34	143.7	683.37	146.54	683.44	152.28	683.42

157.84	683.49	163.36	683.36	165.79	683.33	166.88	683.33	172.36	683.22
173.32	683.21	176.18	683.19	177.33	683.17	190.83	683.03	191.87	683
198.11	682.59	198.65	682.57	200.68	682.65	201.32	682.65	205.33	682.59
206.51	682.67	207.73	682.75	210.04	682.71	210.84	682.68	212.81	682.65
213.82	682.63	213.87	682.6	216.59	682.57	219.18	682.57	222.09	682.65
229.54	682.91	231.92	683	232.46	683.21	234.58	684	235.86	684.47
237.43	685	237.7	685.1	240.19	686	245.86	686.3	256.09	687
266.97	687.52	275.91	688	283.94	688.34	286.47	688.44	294.52	688.78
302.29	689	315.27	689.42	320.65	689.56	325.31	689.67	329.74	689.81
338.75	689.97	339.92	689.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	117.21	.08	146.54	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
117.21	146.54	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	115	686.02	F
146.54	339.92	685	F

Right Levee Station= 146.54 Elevation= 683.44

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	2	

FHWA Chart # 55- Circular Culvert
FHWA Scale # 1 - Smooth tapered inlet throat
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
4.3	18	.013	.013	0	.9	1

Upstream Elevation = 679.28
Centerline Station = 106
Downstream Elevation = 679.1
Centerline Station = 122

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4500

INPUT
Description: D/S XS of Beaver Dam Pond Culvert
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	698.39	2.25	698	3.51	697.78	8.04	697	10.4	696.58
13.75	696	17.58	695.27	19.01	695	24.3	694.01	24.35	694
24.36	694	24.39	693.99	24.56	693.96	29.6	693	29.96	692.93
34.84	692	35.26	691.92	40.08	691	40.93	690.86	43.54	690.41
45.59	690	46.73	689.76	50.78	689	51.85	688.8	56.28	688
56.66	687.94	56.88	687.91	57.21	687.86	62.06	687	64.06	686.74
67.41	686.48	73.1	686	73.58	685.87	76.63	685.77	78.89	685.6
81.72	685.36	82.81	685.28	83.36	685.25	84.22	685.21	84.7	685.21
87.07	685.08	87.43	685.08	88.66	685	90.82	684.79	91.94	684.65
92.9	684.44	93.35	684.38	94.01	684.33	94.9	684.3	99.29	684.28
104.43	684.19	106.71	684.15	109.3	684.08	111.09	684	111.21	683.99
112.38	683.85	113.67	683.78	114.6	683.71	115.76	683.68	117.21	683.5
118.12	683.44	119.46	683.39	121.24	683.35	122.15	683.37	127.52	683.35
131.92	683.3	134.65	683.33	135.14	683.32	139.51	683.33	140.67	683.32
141.87	683.33	142.84	683.34	143.7	683.37	146.54	683.44	152.28	683.42
157.84	683.49	163.36	683.36	165.79	683.33	166.88	683.33	172.36	683.22
173.32	683.21	176.18	683.19	177.33	683.17	190.83	683.03	191.87	683
198.11	682.59	198.65	682.57	200.68	682.65	201.32	682.65	205.33	682.59
206.51	682.67	207.73	682.75	210.04	682.71	210.84	682.68	212.81	682.65
213.82	682.63	213.87	682.6	216.59	682.57	219.18	682.57	222.09	682.65
229.54	682.91	231.92	683	232.46	683.21	234.58	684	235.86	684.47
237.43	685	237.7	685.1	240.19	686	245.86	686.3	256.09	687
266.97	687.52	275.91	688	283.94	688.34	286.47	688.44	294.52	688.78
302.29	689	315.27	689.42	320.65	689.56	325.31	689.67	329.74	689.81

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  338.75  689.97  339.92  689.99

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05  117.21     .08  146.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.21  146.54             87.5    99.4   102.5              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     115  686.02       F
  146.54  339.92     685       F
Right Levee     Station=  146.54      Elevation=  683.44

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 4400

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      36  683.01     104  679.71  116.53   678.6   128.1  677.84  152.93  677.53
  158.35   677.2   158.8  675.98  159.72  675.78  160.48  676.59   161.3  676.98
  163.98  677.49  176.22  678.17  181.98  677.84     190  680.01

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      36     .05  158.35     .08   161.3     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        158.35   161.3          1043.98  1051.3 1040.76              .3       .5

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 3356

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -438.69  672.01 -380.28  671.01 -365.82  670.01      28  670.01     100  671.01
  194.18  670.23  205.77  669.77   208.9  670.84  210.78  669.09  213.43  668.53
  214.16  667.67  215.07  667.67  215.68  667.68  216.52  667.72     217  667.83
  219.51  670.12  224.24  671.09  229.11  672.65  234.42  670.53  267.47  672.28
  295.86  673.86  312.17  675.66

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -438.69      .1  213.43     .05  219.51      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        213.43  219.51            79.33   49.33      17              .1       .3
Left Levee      Station=     100      Elevation=  671.01
Right Levee     Station=  229.11      Elevation=  672.65

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 3306.66*

INPUT
Description:
Station Elevation Data    num=     150
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -365.58  672.89 -356.29   672.7 -340.98  672.37 -327.21  672.08 -312.14  671.76
 -303.36  671.16 -298.91  670.86 -296.06  670.84 -289.12  670.79  -271.4  670.67
 -257.81   670.6 -245.46  670.51 -223.43  670.37 -220.64  670.35 -219.57  670.34
  -218.2  670.33 -193.72  670.17 -176.88  670.03 -174.43  670.01 -172.82  669.99
  -156.4  669.84 -143.88  669.71 -139.88  669.67 -133.27  669.64 -121.84  669.59
 -109.56  669.53  -105.7  669.51 -103.25   669.5  -93.82  669.49  -76.52  669.46
  -74.99  669.45  -73.04  669.45  -68.83  669.45  -51.07  669.45  -40.16  669.45
  -27.39  669.45  -18.77  669.45   -9.41  669.45      -1  669.45    2.12  669.45
   12.42  669.45   18.14  669.44    21.4  669.44   25.65  669.44   30.44  669.44
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34.89	669.43	38.11	669.42	43.35	669.41	47.64	669.4	52.77	669.4
57.9	669.39	61.35	669.39	64.69	669.43	70	669.49	72.79	669.52
78.37	669.59	84.43	669.66	89.17	669.72	96.02	669.8	97.27	669.81
116.25	670.04	116.42	670.04	120.46	670.09	127.22	670.17	138.39	670.09
145.84	670.03	150.95	669.99	154.6	669.96	157.73	669.94	163.17	669.9
173.92	669.85	179.03	669.83	188.57	669.79	213.37	669.68	216.61	669.57
223.97	669.31	224.62	669.51	226.84	670.2	228.56	668.74	230.98	668.28
231.17	668.13	232.1	667.39	232.43	667.39	232.71	667.39	233.04	667.39
233.28	667.39	234.08	667.42	235.19	667.49	235.82	667.6	238.86	669.45
239.11	669.6	239.2	669.61	243.35	670.3	244.79	670.54	246.31	670.91
250.19	671.87	250.64	671.99	252.74	671.46	256.73	670.45	257.02	670.38
259.17	670.52	263.02	670.8	264.09	670.87	267.67	671.11	269.51	671.23
273.25	671.5	274.5	671.58	274.9	671.61	279.74	671.94	283.98	672.21
285.63	672.33	287.35	672.47	289.44	672.63	290.42	672.72	293.03	672.93
294.86	673.08	296.62	673.23	296.74	673.24	297.95	673.34	300.45	673.54
303.17	673.76	304.27	673.86	309.41	674.17	310.13	674.21	310.29	674.22
310.89	674.25	311.06	674.26	312.77	674.35	314.16	674.42	314.43	674.43
317.24	674.56	317.97	674.59	322.26	674.79	323.5	674.84	326.4	674.97
328.11	675.04	329.23	675.09	330.19	675.13	330.85	675.15	331.11	675.17
332.05	675.24	333.06	675.32	336.37	675.57	339.05	675.76	340.75	675.89
341.41	675.94	345.3	676.22	345.99	676.27	346.65	676.31	350.44	676.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-365.58	.1	230.98	.05	239.11	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
230.98	239.11	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3257.33*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-292.46	673.77	-284.04	673.56	-270.16	673.19	-257.67	672.86	-244	672.51
-236.04	671.97	-232.01	671.7	-229.42	671.67	-223.13	671.57	-207.05	671.34
-194.73	671.19	-183.53	671.01	-163.55	670.72	-161.02	670.69	-160.05	670.67
-158.82	670.66	-136.62	670.34	-121.34	670.05	-119.12	670.01	-117.66	669.98
-102.77	669.67	-91.42	669.42	-87.78	669.34	-81.79	669.28	-71.42	669.16
-60.29	669.05	-56.79	669.01	-54.57	669	-46.01	668.96	-30.33	668.9
-28.94	668.9	-27.17	668.89	-23.36	668.89	-7.25	668.89	2.65	668.89
14.22	668.89	22.05	668.89	30.53	668.89	38.15	668.89	40.99	668.89
50.32	668.88	55.52	668.88	58.47	668.88	62.32	668.87	66.67	668.86
70.71	668.85	73.63	668.84	78.38	668.8	82.27	668.79	86.92	668.78
91.57	668.77	94.7	668.76	97.73	668.79	102.55	668.83	105.08	668.86
110.14	668.9	115.64	668.96	119.93	669	126.14	669.06	127.28	669.07
144.49	669.24	144.64	669.24	148.31	669.27	154.43	669.34	164.57	669.26
171.32	669.21	175.96	669.18	179.27	669.16	182.1	669.15	187.04	669.12
196.78	669.11	201.42	669.11	210.07	669.12	232.56	669.13	235.5	669.06
242.18	668.85	242.76	669.01	244.78	669.56	246.33	668.39	248.53	668.02
248.78	667.88	250.03	667.11	250.44	667.11	250.78	667.11	251.2	667.11
251.5	667.11	252.49	667.17	253.85	667.25	254.63	667.36	258.4	668.95
258.71	669.08	258.81	669.09	263.66	669.75	265.35	669.99	267.12	670.33
271.65	671.22	272.18	671.32	274.63	670.97	279.29	670.28	279.63	670.23
282.13	670.42	286.64	670.8	287.88	670.89	292.06	671.22	294.21	671.39
298.58	671.75	300.04	671.87	300.51	671.91	306.15	672.35	311.11	672.71
313.03	672.86	315.04	673.07	317.48	673.31	318.63	673.43	321.67	673.74
323.81	673.97	325.87	674.18	326	674.2	327.42	674.34	330.34	674.63
333.51	674.94	334.8	675.09	340.8	675.48	341.64	675.53	341.83	675.54
342.53	675.57	342.73	675.58	344.72	675.68	346.35	675.75	346.67	675.76
349.95	675.89	350.79	675.92	355.81	676.11	357.25	676.16	360.64	676.29
362.63	676.34	363.94	676.39	365.07	676.42	365.83	676.44	366.14	676.46
367.24	676.51	368.41	676.57	372.28	676.77	375.41	676.91	377.4	677.01
378.17	677.04	382.71	677.25	383.52	677.29	384.29	677.32	388.72	677.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-292.46	.1	248.53	.05	258.71	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
248.53	258.71	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3208.*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-219.35	674.65	-211.79	674.42	-199.33	674	-188.12	673.65	-175.87	673.26
-168.72	672.78	-165.1	672.55	-162.78	672.51	-157.13	672.36	-142.71	672.01
-131.65	671.78	-121.6	671.51	-103.68	671.08	-101.41	671.03	-100.54	671.01
-99.43	670.98	-79.51	670.51	-65.8	670.07	-63.8	670.01	-62.49	669.96
-49.14	669.51	-38.95	669.12	-35.69	669.01	-30.31	668.91	-21.01	668.74
-11.02	668.57	-7.88	668.51	-5.89	668.49	1.79	668.44	15.86	668.34
17.11	668.34	18.69	668.33	22.12	668.33	36.57	668.33	45.45	668.32
55.84	668.33	62.86	668.33	70.48	668.33	77.31	668.33	79.86	668.33
88.23	668.32	92.89	668.31	95.54	668.31	99	668.3	102.9	668.29
106.52	668.27	109.14	668.25	113.41	668.2	116.9	668.17	121.07	668.17
125.24	668.14	128.05	668.14	130.77	668.16	135.09	668.18	137.36	668.19
141.9	668.22	146.84	668.26	150.69	668.29	156.26	668.33	157.28	668.33
172.73	668.43	172.86	668.43	176.15	668.45	181.65	668.5	190.74	668.44
196.81	668.4	200.96	668.38	203.93	668.36	206.48	668.35	210.91	668.34
219.65	668.37	223.81	668.4	231.57	668.45	251.76	668.58	254.39	668.54
260.38	668.39	260.91	668.51	262.71	668.92	264.11	668.05	266.08	667.77
266.4	667.62	267.97	666.83	268.46	666.83	268.86	666.83	269.36	666.83
269.71	666.83	270.89	666.91	272.52	667.02	273.45	667.13	277.95	668.45
278.31	668.55	278.43	668.57	283.97	669.21	285.9	669.43	287.93	669.75
293.11	670.56	293.71	670.66	296.51	670.48	301.84	670.11	302.23	670.08
305.1	670.31	310.25	670.8	311.67	670.92	316.45	671.34	318.91	671.54
323.9	672	325.57	672.15	326.11	672.21	332.57	672.77	338.23	673.21
340.43	673.4	342.73	673.67	345.52	673.98	346.83	674.14	350.32	674.56
352.77	674.86	355.11	675.14	355.27	675.15	356.88	675.34	360.23	675.73
363.86	676.13	365.32	676.31	372.2	676.78	373.15	676.84	373.36	676.86
374.16	676.89	374.4	676.9	376.68	677.01	378.54	677.08	378.9	677.09
382.65	677.22	383.62	677.25	389.35	677.44	391.01	677.48	394.88	677.61
397.16	677.65	398.66	677.69	399.94	677.72	400.82	677.73	401.17	677.74
402.43	677.78	403.77	677.82	408.19	677.96	411.77	678.06	414.05	678.13
414.93	678.15	420.13	678.28	421.05	678.3	421.93	678.32	426.99	678.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-219.35	.1	266.08	.05	278.31	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
266.08	278.31	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3158.66*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-146.23	675.53	-139.54	675.28	-128.51	674.82	-118.58	674.43	-107.73	674.01
-101.4	673.59	-98.2	673.39	-96.14	673.34	-91.14	673.14	-78.37	672.67
-68.58	672.37	-59.67	672	-43.8	671.44	-41.79	671.37	-41.02	671.34
-40.04	671.3	-22.4	670.67	-10.26	670.09	-8.49	670	-7.33	669.94
4.49	669.34	13.52	668.82	16.4	668.67	21.16	668.55	29.4	668.32
38.25	668.09	41.03	668	42.8	667.98	49.59	667.91	62.05	667.79
63.16	667.78	64.56	667.78	67.6	667.77	80.4	667.76	88.26	667.76
97.46	667.77	103.67	667.77	110.42	667.77	116.47	667.77	118.72	667.77
126.14	667.75	130.27	667.75	132.62	667.74	135.68	667.73	139.13	667.71
142.34	667.69	144.66	667.66	148.44	667.6	151.52	667.56	155.22	667.55
158.91	667.52	161.4	667.51	163.81	667.52	167.64	667.52	169.65	667.53
173.67	667.54	178.04	667.56	181.45	667.57	186.39	667.59	187.29	667.59
200.96	667.63	201.09	667.63	204	667.64	208.87	667.66	216.92	667.62
222.29	667.59	225.97	667.57	228.6	667.56	230.85	667.56	234.78	667.56
242.52	667.64	246.2	667.68	253.08	667.78	270.95	668.03	273.28	668.03
278.59	667.92	279.05	668	280.65	668.28	281.89	667.7	283.64	667.51
284.02	667.37	285.91	666.56	286.47	666.56	286.94	666.56	287.52	666.56
287.92	666.56	289.3	666.65	291.18	666.79	292.26	666.9	297.49	667.95
297.91	668.03	298.04	668.04	304.28	668.66	306.45	668.88	308.73	669.16
314.56	669.91	315.25	670	318.4	669.98	324.4	669.93	324.84	669.93
328.06	670.21	333.86	670.8	335.46	670.95	340.84	671.45	343.61	671.69
349.23	672.25	351.11	672.43	351.71	672.5	358.98	673.18	365.36	673.7
367.84	673.93	370.42	674.27	373.56	674.65	375.04	674.86	378.96	675.37

381.72	675.74	384.36	676.09	384.53	676.11	386.35	676.33	390.12	676.82
394.2	677.31	395.85	677.54	403.59	678.09	404.66	678.16	404.9	678.17
405.8	678.21	406.06	678.22	408.63	678.34	410.72	678.41	411.13	678.42
415.36	678.55	416.45	678.58	422.9	678.77	424.76	678.8	429.12	678.92
431.69	678.95	433.37	678.99	434.82	679.01	435.81	679.02	436.2	679.03
437.61	679.05	439.13	679.07	444.11	679.16	448.14	679.21	450.69	679.25
451.69	679.26	457.54	679.31	458.58	679.32	459.57	679.32	465.26	679.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-146.23	.1	283.64	.05	297.91	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
283.64	297.91	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3109.33*

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-73.11	676.41	-67.29	676.14	-57.68	675.64	-49.04	675.22	-39.59	674.76
-34.08	674.41	-31.29	674.24	-29.5	674.17	-25.14	673.92	-14.02	673.34
-5.5	672.96	2.25	672.5	16.07	671.79	17.82	671.7	18.49	671.67
19.35	671.62	34.71	670.84	45.28	670.11	46.82	670	47.83	669.92
58.13	669.17	65.98	668.53	68.5	668.34	72.64	668.18	79.82	667.9
87.52	667.61	89.94	667.5	91.48	667.48	97.4	667.39	108.25	667.23
109.21	667.22	110.43	667.22	113.07	667.21	124.22	667.2	131.06	667.2
139.07	667.21	144.49	667.21	150.36	667.21	155.63	667.21	157.59	667.21
164.05	667.19	167.64	667.18	169.69	667.17	172.35	667.16	175.36	667.14
178.15	667.11	180.17	667.08	183.46	666.99	186.15	666.95	189.37	666.94
192.59	666.9	194.76	666.89	196.85	666.89	200.18	666.87	201.93	666.87
205.43	666.85	209.24	666.86	212.21	666.85	216.51	666.85	217.29	666.85
229.2	666.82	229.31	666.82	231.84	666.82	236.08	666.83	243.09	666.79
247.77	666.77	250.97	666.76	253.26	666.76	255.23	666.77	258.64	666.78
265.38	666.9	268.59	666.97	274.58	667.11	290.14	667.48	292.17	667.51
296.79	667.46	297.2	667.5	298.59	667.64	299.67	667.35	301.19	667.26
301.63	667.11	303.84	666.28	304.49	666.28	305.02	666.28	305.67	666.28
306.14	666.28	307.7	666.39	309.85	666.56	311.08	666.66	317.03	667.45
317.51	667.51	317.66	667.52	324.59	668.11	327.01	668.33	329.54	668.58
336.02	669.25	336.78	669.33	340.28	669.49	346.95	669.76	347.44	669.79
351.03	670.1	357.47	670.81	359.25	670.97	365.23	671.56	368.31	671.85
374.55	672.5	376.64	672.72	377.32	672.8	385.4	673.59	392.48	674.2
395.24	674.47	398.11	674.87	401.6	675.33	403.24	675.57	407.61	676.19
410.67	676.63	413.6	677.05	413.8	677.07	415.82	677.33	420.01	677.91
424.55	678.49	426.38	678.77	434.98	679.39	436.17	679.47	436.44	679.49
437.44	679.53	437.73	679.54	440.59	679.67	442.91	679.74	443.37	679.75
448.06	679.88	449.27	679.91	456.44	680.09	458.52	680.12	463.36	680.24
466.21	680.26	468.09	680.29	469.69	680.31	470.79	680.32	471.23	680.32
472.8	680.33	474.48	680.33	480.02	680.36	484.5	680.35	487.34	680.36
488.45	680.36	494.95	680.34	496.1	680.34	497.2	680.33	503.54	680.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-73.11	.1	301.19	.05	317.51	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
301.19	317.51	79.33	49.33	17	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3060

INPUT
Description:
Station Elevation Data num= 134

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	677.29	4.96	677	13.14	676.458	20.5	676	33.24	675.219
37.14	675	40.85	674.703	50.32	674	57.58	673.547	64.18	673
75.95	672.148	77.44	672.043	78.01	672	78.74	671.948	91.82	671
100.82	670.131	102.13	670	102.99	669.907	111.76	669	118.45	668.231
120.59	668	124.12	667.815	130.23	667.473	136.79	667.132	138.85	667
140.16	666.969	145.2	666.863	154.44	666.68	155.26	666.666	156.3	666.66

158.55	666.654	168.04	666.64	173.87	666.635	180.69	666.647	185.3	666.653
190.3	666.653	194.79	666.65	196.46	666.646	201.96	666.623	205.02	666.614
206.76	666.606	209.03	666.59	211.59	666.565	213.97	666.531	215.69	666.49
218.49	666.39	220.78	666.337	223.52	666.327	226.26	666.277	229.89	666.254
232.73	666.212	234.22	666.204	237.2	666.171	240.44	666.159	242.97	666.138
246.63	666.115	247.3	666.111	257.44	666.02	257.53	666.019	259.69	666
269.27	665.969	273.25	665.96	275.98	665.958	277.93	665.962	279.6	665.973
282.51	666	288.25	666.162	290.98	666.257	296.08	666.443	311.06	667
315.34	667	318.74	667	319.25	666.857	321.78	666	322.5	666
323.1	666	323.83	666	324.35	666	336.57	666.947	337.11	666.988
337.27	667	344.9	667.568	350.35	668	357.48	668.597	362.17	669
369.51	669.588	373.99	670	381.08	670.809	383.04	671	389.62	671.675
393.01	672	399.88	672.75	402.18	673	402.92	673.096	411.81	674
419.61	674.697	422.64	675	425.8	675.465	429.64	676	431.45	676.282
436.25	677	439.62	677.517	442.85	678	445.29	678.334	449.9	679
454.89	679.674	456.91	680	466.37	680.694	467.68	680.787	467.98	680.804
469.08	680.847	469.4	680.864	472.54	681	475.1	681.07	475.6	681.085
480.77	681.211	482.1	681.238	489.99	681.417	492.27	681.436	497.6	681.559
500.74	681.561	502.8	681.594	504.57	681.607	506.26	681.606	507.99	681.597
509.84	681.581	515.93	681.561	520.86	681.502	523.99	681.484	525.21	681.47
532.36	681.376	533.63	681.355	534.84	681.329	541.81	681.241		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	318.74	.05	337.11	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
318.74	337.11	37.6	45.2	28.2	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3014.8*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.86	675.43	6.58	675.16	14.37	674.65	21.38	674.22	23.85	674.08
33.52	673.54	37.23	673.35	40.76	673.1	49.78	672.5	56.7	672.11
62.98	671.65	74.12	670.92	74.19	670.92	75.61	670.83	76.15	670.8
76.85	670.75	89.31	669.97	97.88	669.25	99.13	669.14	99.95	669.07
108.3	668.32	114.67	667.69	116.71	667.5	120.07	667.34	125.89	667.06
132.14	666.77	134.1	666.66	135.34	666.63	140.14	666.53	148.94	666.37
149.73	666.35	150.72	666.35	152.86	666.34	157.74	666.32	161.9	666.31
167.45	666.31	173.94	666.32	178.34	666.32	183.1	666.32	187.37	666.32
188.96	666.32	194.2	666.3	197.12	666.29	198.77	666.29	200.93	666.27
203.37	666.25	205.64	666.23	207.28	666.19	209.94	666.11	212.13	666.07
214.73	666.06	217.34	666.02	220.8	666.01	223.51	665.97	224.93	665.97
227.76	665.94	230.85	665.93	233.26	665.91	236.74	665.89	237.38	665.89
245.24	665.83	247.04	665.82	247.13	665.82	249.18	665.81	258.31	665.81
262.1	665.82	264.7	665.82	266.55	665.83	268.14	665.85	270.92	665.87
276.38	666.02	278.98	666.1	283.84	666.27	298.11	666.75	298.36	666.75
302.18	666.78	305.42	666.81	305.95	666.63	307.25	666.13	308.58	665.78
309.15	665.78	309.63	665.78	310.22	665.78	310.63	665.78	314.41	666.09
317.41	666.3	321	666.7	321.46	666.75	321.62	666.76	327.21	667.11
328.92	667.2	334.15	667.51	340.98	667.94	343.8	668.13	345.47	668.27
352.5	668.83	356.79	669.22	363.59	669.96	365.46	670.14	371.77	670.76
375.02	671.07	381.6	671.76	382.31	671.83	383.8	672	384.51	672.09
393.03	672.99	400.5	673.7	403.4	674.01	406.43	674.44	410.11	674.94
411.84	675.21	416.44	675.88	418.44	676.17	419.67	676.36	422.76	676.83
425.1	677.16	429.52	677.81	434.3	678.47	436.23	678.78	445.3	679.57
446.55	679.68	446.84	679.7	447.89	679.76	448.2	679.78	451.21	679.97
453.66	680.09	454.14	680.11	457.72	680.28	459.09	680.33	460.36	680.38
467.92	680.66	470.11	680.72	475.21	680.91	478.22	680.97	480.2	681.03
481.34	681.06	481.89	681.07	483.51	681.07	485.17	681.07	486.94	681.06
492.77	681.06	497.5	681.02	500.5	681.01	501.66	681.01	508.51	680.95
509.73	680.93	510.89	680.92	517.57	680.86				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.86	.1	305.42	.05	321.46	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
305.42	321.46	37.6	45.2	28.2	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2969.6*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3.72	673.58	8.21	673.32	15.61	672.85	22.27	672.45	24.61	672.31
33.79	671.86	37.32	671.7	40.68	671.49	49.25	671	55.82	670.67
61.79	670.29	72.37	669.7	72.44	669.69	73.78	669.62	74.3	669.59
74.96	669.56	86.79	668.93	94.94	668.37	96.12	668.28	96.9	668.22
104.83	667.64	110.89	667.15	112.82	667	116.02	666.87	121.55	666.64
127.48	666.41	129.34	666.32	130.53	666.29	135.09	666.21	143.45	666.05
144.19	666.04	145.13	666.03	147.17	666.02	151.81	665.99	155.75	665.99
161.03	665.98	167.2	665.99	171.37	666	175.89	666	179.96	665.99
181.47	665.99	186.44	665.98	189.21	665.97	190.79	665.97	192.84	665.96
195.16	665.94	197.31	665.92	198.87	665.9	201.4	665.84	203.47	665.81
205.95	665.8	208.43	665.77	211.71	665.76	214.28	665.73	215.63	665.73
218.33	665.71	221.26	665.7	223.55	665.69	226.86	665.67	227.46	665.67
234.93	665.63	236.64	665.63	236.72	665.63	238.67	665.63	247.34	665.66
250.94	665.68	253.41	665.69	255.18	665.7	256.69	665.72	259.32	665.75
264.51	665.88	266.98	665.95	271.6	666.09	285.15	666.5	285.39	666.5
289.02	666.56	292.1	666.61	292.65	666.4	294	665.82	295.38	665.56
295.81	665.56	296.17	665.56	296.61	665.56	296.92	665.56	300.02	665.83
302.49	665.98	305.44	666.46	305.81	666.52	305.96	666.53	311.31	666.78
312.95	666.83	317.94	667.02	324.47	667.29	327.17	667.4	328.77	667.54
335.49	668.08	339.6	668.44	346.09	669.11	347.89	669.28	353.91	669.85
357.02	670.14	363.31	670.76	363.99	670.83	365.42	670.99	366.1	671.08
374.24	671.98	381.39	672.71	384.16	673.01	387.06	673.41	390.57	673.89
392.23	674.13	396.63	674.75	398.54	675.03	399.72	675.21	402.68	675.66
404.91	675.98	409.13	676.61	413.7	677.26	415.55	677.56	424.22	678.44
425.42	678.57	425.7	678.59	426.7	678.67	427	678.7	429.87	678.93
432.22	679.1	432.68	679.14	436.1	679.38	437.41	679.45	438.63	679.51
445.86	679.91	447.95	680	452.83	680.27	455.7	680.38	457.59	680.47
458.68	680.52	459.21	680.53	460.76	680.53	462.35	680.54	464.04	680.54
469.62	680.55	474.14	680.54	477	680.55	478.12	680.54	484.67	680.52
485.83	680.51	486.94	680.5	493.33	680.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.72	.1	292.1	.05	305.81	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
292.1	305.81	37.6	45.2	28.2	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2924.4*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5.58	671.72	9.83	671.48	16.84	671.05	23.15	670.67	25.37	670.54
34.07	670.18	37.41	670.05	40.59	669.89	48.71	669.5	54.93	669.23
60.59	668.94	70.62	668.47	70.68	668.46	71.96	668.41	72.44	668.39
73.07	668.37	84.28	667.9	92	667.49	93.12	667.43	93.86	667.38
101.37	666.96	107.11	666.61	108.94	666.5	111.97	666.4	117.2	666.22
122.83	666.04	124.59	665.98	125.71	665.95	130.03	665.88	137.95	665.74
138.66	665.73	139.55	665.72	141.48	665.7	145.87	665.66	149.61	665.66
154.61	665.66	160.45	665.66	164.41	665.67	168.69	665.67	172.54	665.67
173.97	665.66	178.68	665.66	181.31	665.65	182.8	665.65	184.74	665.64
186.94	665.63	188.98	665.62	190.45	665.6	192.85	665.56	194.82	665.54
197.16	665.54	199.51	665.52	202.62	665.51	205.06	665.49	206.34	665.49
208.89	665.47	211.67	665.47	213.84	665.46	216.97	665.45	217.55	665.45
224.62	665.42	226.24	665.43	226.32	665.43	228.17	665.44	236.38	665.5
239.79	665.53	242.13	665.55	243.8	665.57	245.23	665.59	247.73	665.62
252.65	665.73	254.99	665.79	259.36	665.91	272.2	666.25	272.42	666.26
275.87	666.34	278.78	666.42	279.35	666.16	280.74	665.51	282.17	665.33
282.46	665.33	282.7	665.33	282.99	665.33	283.2	665.33	285.63	665.58
287.56	665.67	289.87	666.22	290.17	666.29	290.31	666.29	295.41	666.45
296.97	666.47	301.74	666.53	307.97	666.63	310.54	666.68	312.07	666.81
318.49	667.33	322.4	667.66	328.6	668.26	330.31	668.42	336.06	668.94
339.03	669.2	345.03	669.77	345.68	669.83	347.04	669.99	347.69	670.07
355.46	670.97	362.28	671.71	364.92	672.01	367.69	672.39	371.04	672.83
372.62	673.05	376.82	673.63	378.65	673.88	379.76	674.06	382.59	674.49

384.72	674.81	388.75	675.42	393.11	676.06	394.88	676.34	403.15	677.32
404.29	677.45	404.55	677.48	405.51	677.58	405.79	677.61	408.54	677.9
410.78	678.12	411.21	678.16	414.48	678.48	415.73	678.57	416.89	678.65
423.79	679.15	425.78	679.28	430.44	679.62	433.19	679.79	434.99	679.91
436.03	679.98	436.53	679.99	438.01	680	439.52	680.01	441.14	680.01
446.46	680.05	450.77	680.06	453.51	680.08	454.57	680.08	460.82	680.09
461.93	680.09	462.99	680.09	469.08	680.11				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5.58	.1	278.78	.05	290.17	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
278.78	290.17	37.6	45.2	28.2	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2879.2*

INPUT
Description:
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7.44	669.87	11.46	669.64	18.08	669.24	24.03	668.9	26.13	668.78
34.35	668.5	37.5	668.4	40.51	668.28	48.17	668	54.05	667.79
59.39	667.59	68.86	667.24	68.92	667.24	70.13	667.2	70.59	667.19
71.18	667.17	81.77	666.86	89.05	666.61	90.11	666.57	90.81	666.54
97.91	666.28	103.33	666.07	105.06	666	107.92	665.93	112.86	665.81
118.17	665.68	119.84	665.63	120.9	665.62	124.98	665.55	132.46	665.43
133.12	665.42	133.96	665.41	135.79	665.39	139.94	665.34	143.47	665.34
148.19	665.34	153.71	665.34	157.44	665.34	161.49	665.34	165.12	665.34
166.47	665.34	170.93	665.33	173.4	665.33	174.81	665.33	176.65	665.33
178.72	665.32	180.65	665.31	182.04	665.31	184.31	665.29	186.16	665.28
188.38	665.27	190.6	665.26	193.54	665.26	195.83	665.25	197.04	665.25
199.45	665.24	202.08	665.24	204.12	665.24	207.09	665.23	207.63	665.23
214.31	665.22	215.84	665.23	215.91	665.23	217.66	665.25	225.41	665.35
228.64	665.39	230.85	665.42	232.42	665.44	233.78	665.46	236.13	665.5
240.78	665.59	242.99	665.64	247.12	665.73	259.24	666.01	259.46	666.01
262.71	666.12	265.46	666.22	266.05	665.93	267.49	665.21	268.97	665.11
269.12	665.11	269.24	665.11	269.38	665.11	269.49	665.11	271.24	665.32
272.64	665.35	274.31	665.97	274.52	666.05	274.65	666.06	279.51	666.12
281	666.1	285.53	666.04	291.47	665.98	293.92	665.95	295.37	666.07
301.48	666.57	305.2	666.89	311.1	667.41	312.73	667.55	318.21	668.03
321.03	668.27	326.75	668.78	327.36	668.83	328.66	668.99	329.28	669.07
336.67	669.96	343.16	670.72	345.68	671.02	348.31	671.36	351.51	671.78
353.02	671.98	357.01	672.51	358.75	672.74	359.81	672.9	362.5	673.32
364.53	673.63	368.37	674.22	372.52	674.85	374.2	675.12	382.07	676.19
383.16	676.34	383.41	676.38	384.33	676.49	384.59	676.53	387.2	676.87
389.33	677.14	389.75	677.19	392.86	677.58	394.05	677.69	395.16	677.79
401.72	678.39	403.62	678.56	408.06	678.97	410.67	679.2	412.38	679.35
413.37	679.44	413.86	679.45	415.26	679.46	416.7	679.48	418.24	679.49
423.31	679.55	427.41	679.58	430.01	679.61	431.03	679.62	436.98	679.67
438.04	679.67	439.04	679.68	444.84	679.73				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7.44	.1	265.46	.05	274.52	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
265.46	274.52	37.6	45.2	28.2	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2834

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.3	668.01	26.89	667.01	67.11	666.01	134	665.01	204	665.01
246.49	665.76	252.14	666.03	254.24	664.9	255.77	664.89	256.85	665.07
257.71	665.03	258.87	665.82	263.61	665.79	277.29	665.23	309.05	667.83
338.85	671.59	371.24	676.68	390.72	678.9	420.6	679.35		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.3	.1	252.14	.05	258.87	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
252.14	258.87	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2770.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
22.15	667.64	38.97	666.73	77.41	665.78	102.89	665.38	141.36	664.83
155.31	664.82	208.27	664.66	224.9	664.87	247.67	665.24	248.89	665.24
254.29	665.36	255.75	664.66	256.53	664.32	257.08	664.32	258.16	664.27
259.2	664.44	259.32	664.43	260.03	664.47	261.14	665.27	265.97	665.26
267.08	665.23	279.91	664.78	312.28	667.04	319.57	667.83	342.65	670.33
369.62	673.97	375.67	674.81	388.33	676.09	395.52	676.87	412.93	677.27
425.97	677.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
22.15	.1	254.29	.05	261.14	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
254.29	261.14	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2707.*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35.01	667.26	51.05	666.45	87.72	665.55	112.02	665.16	148.71	664.64
162.02	664.62	212.54	664.3	228.4	664.43	250.12	664.74	251.28	664.71
256.43	664.7	257.98	664.02	258.81	663.73	259.4	663.74	260.55	663.64
261.55	663.81	261.66	663.81	262.34	663.92	263.41	664.73	268.33	664.74
269.46	664.71	282.54	664.32	315.52	666.26	322.94	666.93	346.46	669.08
373.94	672.19	380.09	672.93	392.99	674.08	400.32	674.83	418.06	675.39
431.35	675.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35.01	.1	256.43	.05	263.41	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
256.43	263.41	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2643.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
47.86	666.89	63.12	666.16	98.02	665.32	121.15	664.93	156.07	664.46
168.73	664.42	216.81	663.95	231.9	663.99	252.57	664.25	253.68	664.19
258.58	664.03	260.22	663.38	261.1	663.15	261.72	663.16	262.94	663.02
263.89	663.17	264	663.18	264.66	663.36	265.68	664.18	270.7	664.21
271.85	664.2	285.16	663.87	318.75	665.47	326.31	666.03	350.26	667.82
378.25	670.42	384.52	671.06	397.66	672.07	405.12	672.8	423.18	673.51
436.72	673.81								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
47.86	.1	258.58	.05	265.68	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
        258.58  265.68            69.43   69.15   69.71            .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 2580.*

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   60.72  666.51    75.2  665.88  108.33  665.09  130.28   664.7  163.42  664.28
  175.44  664.23  221.08  663.59   235.4  663.54  255.02  663.75  256.07  663.66
  260.73  663.36  262.46  662.75  263.39  662.57  264.04  662.58  265.33   662.4
  266.24  662.54  266.35  662.55  266.97  662.81  267.96  663.64  273.06  663.69
  274.23  663.68  287.79  663.41  321.98  664.69  329.68  665.13  354.07  666.56
  382.56  668.64  388.94  669.19  402.32  670.06  409.92  670.77  428.31  671.62
  442.09  671.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   60.72      .1  260.73     .05  267.96      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        260.73  267.96            69.43   69.15   69.71            .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 2516.5*

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   73.57  666.14   87.28   665.6  118.63  664.86  139.41  664.47  170.78  664.09
  182.15  664.04  225.34  663.24   238.9   663.1  257.48  663.25  258.47  663.14
  262.87   662.7   264.7  662.11  265.67  661.98  266.37     662  267.71  661.77
  268.59  661.91  268.69  661.92  269.29  662.25  270.23  663.09  275.42  663.16
  276.61  663.17  290.41  662.96  325.22   663.9  333.05  664.23  357.87   665.3
  386.87  666.86  393.37  667.31  406.99  668.05  414.72  668.73  433.44  669.74
  447.46  670.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   73.57      .1  262.87     .05  270.23      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        262.87  270.23            69.43   69.15   69.71            .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 2453.*

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   86.42  665.76   99.36  665.32  128.94  664.63  148.54  664.25  178.13  663.91
  188.87  663.84  229.61  662.88  242.41  662.66  259.93  662.75  260.86  662.61
  265.02  662.03  266.93  661.47  267.96   661.4  268.69  661.42   270.1  661.15
  270.94  661.28  271.03  661.29   271.6  661.69   272.5  662.54  277.78  662.64
  278.99  662.65  293.04  662.51  328.45  663.11  336.42  663.33  361.68  664.05
  391.19  665.08   397.8  665.44  411.65  666.05  419.52   666.7  438.57  667.86
  452.83  668.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   86.42      .1  265.02     .05   272.5      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        265.02   272.5            69.43   69.15   69.71            .1       .3

CROSS SECTION
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RIVER: Tributary
REACH: 1 RS: 2389.5*

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
99.28	665.39	111.44	665.04	139.24	664.4	157.67	664.02	185.49	663.72
195.58	663.65	233.88	662.53	245.91	662.21	262.38	662.26	263.26	662.09
267.16	661.37	269.17	660.84	270.25	660.82	271.01	660.84	272.49	660.52
273.28	660.65	273.38	660.66	273.92	661.14	274.77	662	280.14	662.11
281.38	662.14	295.66	662.05	331.68	662.33	339.79	662.43	365.48	662.79
395.5	663.31	402.22	663.57	416.32	664.04	424.32	664.67	443.69	665.97
458.21	666.43								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
99.28	.1	267.16	.05	274.77	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
267.16	274.77	69.43	69.15	69.71	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2326

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
112.13	665.01	166.8	663.79	202.29	663.45	249.41	661.77	264.83	661.76
269.31	660.7	271.41	660.2	273.33	660.26	274.88	659.9	275.72	660.03
277.04	661.45	283.76	661.62	343.16	661.53	399.81	661.53	420.98	662.03
448.82	664.09	463.58	664.58						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
112.13	.1	269.31	.05	277.04	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
269.31	277.04	673.02	669.78	671.58	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1658

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
173.75	665.01	198.13	661.86	245.91	659.93	256.45	659.51	262.44	659.72
264.16	658.26	265.67	657.96	267.08	657.99	268.29	658.05	269.24	658.2
271.93	658.6	274.07	659.54	279.61	659.65	315.47	660.02	400.34	661.36
434.93	670.15	448.28	670.08						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
173.75	.1	262.44	.05	274.07	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
262.44	274.07	289.98	298.02	301.02	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1360

INPUT
Description: U/S XS of Farm Road Culvert
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	663.365	8.11	663	15.93	662.641	21.14	662.423	26.61	662.185
31.61	662	32.7	661.981	41.37	661.85	48.82	661.755	52.16	661.744

55.89	661.708	58.08	661.707	59.26	661.703	60.41	661.694	61.58	661.68
62.81	661.661	65.38	661.618	66.49	661.595	68.85	661.538	72.65	661.501
75.75	661.436	79.04	661.405	85.46	661.35	98.24	661.027	98.37	661.025
99.34	661	102.23	660.857	104.38	660.771	111.18	660.526	123.04	660.053
126.01	660	127.18	659.98	136.22	659.885	136.56	659.877	142.99	659.783
146.79	659.703	155.28	659.601	159.01	659.499	161.23	659.46	166.49	659.282
173.2	659	174.09	658.999	174.21	658.999	191.49	658.982	191.85	658.982
196.28	658.984	198.06	658.985	201.95	658.992	202.85	658.992	204.56	658.995
206.92	659	210.16	659.002	211.98	659.003	212.84	659.002	214.84	659.001
216.87	659.001	217.64	659	217.94	658.88	219.24	658.295	219.7	658.07
219.84	658	220.21	658	229.38	658	231.64	658.227	231.99	658.242
234.8	658.391	238.12	658.584	244.74	659	247.18	659.09	278.53	660
280.97	660.065	281.4	660.078	290.08	660.31	296.63	660.471	298.54	660.529
302.43	660.616	311.2	660.867	313.3	660.914	315.27	661	326.87	661.587
329.7	661.73	331.06	661.792	335.65	662	346.63	662.658	348.5	662.778
351.83	663	362.64	663.75	364.72	663.894	365.98	664	369.59	664.346
376.67	665	378.66	665.236	386.46	666	386.77	666.037	394.3	667
396.29	667.279	400.99	668	413.48	668.692	418.73	669	419.36	669.003
420.17	669.006	420.4	669.006	426.91	669.016	427.87	669.017	428.87	669.016
429.6	669.015	429.99	669.014	440.45	669.262	440.86	669.198	442.35	669.153
442.92	669.198	442.99	669.211	443.05	669.248	443.3	669.29	444.34	669.314
448.02	669.897	448.28	669.923	448.73	670	452.25	670.375	457.45	670.92
458.12	671	458.89	671.131	460.41	671.347	461.87	671.508	463.6	671.644
465.55	671.859	465.76	671.885	467.9	672	472.53	672.128	478.07	672.263
479.32	672.227	480.67	672.21						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	217.64	.05	244.74	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
217.64	244.74	110	108	100	.4	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	183.25	659.25	F
322.75	480.67	659.25	F

CULVERT

RIVER: Tributary
REACH: 1 RS: 1281

INPUT
Description: Farm Road Culvert
Distance from Upstream XS = 69
Deck/Roadway Width = 19.5
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5	663.33		185	659.19		250	659.25	
360	660.01		410	660.68		530	668.88	

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4.92	663.325	130.71	658.235	195.23	657.765	245.69	657.685	249.14	657.605
250.31	657.055	253.09	656.635	254.08	656.685	256.22	657.225	258.88	657.465
262.11	657.675	272.66	658.275	351.77	658.505	414.17	660.695	522.68	667.715

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4.92	.08	245.69	.08	262.11	.08

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
245.69	262.11	.4	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4.92	183.25	659.25	F
322.75	522.68	659.25	F

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5	663.33		185	659.19		250	659.25	
360	660.01		410	660.68		530	668.88	

Downstream Bridge Cross Section Data

```
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4.92  663.33  130.71  658.23  195.23  657.77  245.69  657.68  249.14   657.6
  250.31  657.05  253.09  656.64  254.08  656.68  256.22  657.22  258.88  657.46
  262.11  657.67  272.66  658.28  351.77  658.51  414.17   660.7  522.68  667.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4.92     .08  245.69     .08  262.11     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
        245.69  262.11            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4.92  223.26  659.25        F
  282.75  522.68  659.25        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular     1.5
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 69    19.5     .017     .017        0                  .5                  1
Upstream   Elevation =  656.68
           Centerline Station =  253
Downstream Elevation =  656.64
           Centerline Station =  253

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 1252

INPUT
Description: D/S XS of Farm Road Culvert
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4.92  663.33  130.71  658.23  195.23  657.77  245.69  657.68  249.14   657.6
  250.31  657.05  253.09  656.64  254.08  656.68  256.22  657.22  258.88  657.46
  262.11  657.67  272.66  658.28  351.77  658.51  414.17   660.7  522.68  667.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4.92     .08  245.69     .08  262.11     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        245.69  262.11             28.8    29.4    29.6            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4.92  223.26  659.25        F
  282.75  522.68  659.25        F

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 1222.6*

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    3.94  662.82   58.79  660.91  131.55  658.28   176.1  657.84  197.01  657.69
   248.2  657.55  250.05  657.47  251.51  657.37   252.3  657.35  253.69   656.9
  253.73   656.9  254.83  656.72  255.76  656.69  256.19  656.63  256.99  656.44
  257.89  656.51  258.32  656.63  259.83  657.04  261.29  657.22  262.25  657.33
  265.18  657.59  271.22  657.91  275.91   658.1  283.35  658.08  356.43  658.44
```

366.14	658.73	408.62	660.73	419.93	661.21	457.75	663.67	530.37	667.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.94	.08	248.2	.08	265.18	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
248.2	265.18	28.8	29.4	29.6	.3	.7

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1193.2*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.95	662.31	58.6	660.69	132.4	658.32	177.59	657.76	198.79	657.61
250.72	657.41	252.85	657.3	254.55	657.13	255.46	657.1	257.07	656.75
257.11	656.75	258.38	656.53	259.46	656.59	259.96	656.53	260.89	656.24
261.7	656.35	262.09	656.46	263.44	656.85	264.75	657.08	265.61	657.2
268.25	657.51	274.39	657.81	279.17	657.92	286.74	657.85	361.08	658.37
370.96	658.62	414.18	661.15	425.7	661.71	464.18	664.24	538.05	667.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.95	.08	250.72	.08	268.25	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
250.72	268.25	28.8	29.4	29.6	.3	.7

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1163.8*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.97	661.81	58.4	660.46	133.24	658.37	179.07	657.68	200.57	657.53
253.23	657.28	255.66	657.13	257.59	656.88	258.62	656.85	260.45	656.6
260.5	656.6	261.94	656.34	263.17	656.49	263.73	656.42	264.79	656.05
265.51	656.18	265.85	656.29	267.05	656.67	268.21	656.94	268.98	657.07
271.31	657.44	277.56	657.71	282.42	657.74	290.12	657.62	365.74	658.3
375.79	658.51	419.75	661.57	431.46	662.22	470.6	664.81	545.74	667.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.97	.08	253.23	.08	271.31	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
253.23	271.31	28.8	29.4	29.6	.3	.7

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1134.4*

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.98	661.3	58.2	660.24	134.08	658.42	180.55	657.6	202.35	657.45
255.75	657.14	258.46	656.96	260.62	656.64	261.78	656.61	263.83	656.45
263.88	656.45	265.5	656.15	266.87	656.39	267.51	656.32	268.69	655.85
269.31	656.02	269.62	656.12	270.67	656.49	271.68	656.79	272.34	656.94
274.38	657.36	280.74	657.61	285.68	657.56	293.51	657.4	370.4	658.23
380.61	658.4	425.31	661.99	437.22	662.72	477.02	665.38	553.42	667.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
.98	.08	255.75	.08	274.38	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
        255.75  274.38              28.8    29.4    29.6              .3       .7

CROSS SECTION


RIVER: Tributary
REACH: 1                    RS: 1105

INPUT
Description:
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  660.79      58  660.01  182.03  657.52  258.26  657.01  261.27  656.79
  263.66  656.39  267.27   656.3  269.06  655.96  270.58  656.29  271.28  656.21
  272.59  655.65  273.38  655.95  275.14  656.65  277.45  657.28  283.91  657.51
  296.89  657.17  385.44  658.29  430.88  662.41  483.44  665.95  561.11  667.03

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08  258.26     .08  277.45     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        258.26  277.45              287     295     303              .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                    RS: 810

INPUT
Description:
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    3.67  658.53    16.9  657.88     160  656.82  271.95  656.84   302.8  656.15
  307.34  656.47  308.53  655.21  309.94  654.96   311.1  654.83  313.17  654.83
  314.06  654.79  314.94  653.84  315.53  654.71  316.36   654.9  317.37  654.24
   318.8  654.78  320.94  655.51  327.28  655.79  351.67   656.4   565.4  656.84
     707  661.28

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    3.67     .08  307.34     .08  320.94     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        307.34  320.94              228     224     222              .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                    RS: 587

INPUT
Description:
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -362  658.01    -200  657.01       0  656.21   18.41  655.67    92.6  655.34
  102.91   654.9  103.88  654.39  105.93  654.47  108.13  654.79  109.33  653.92
  110.17  653.78  110.56  654.16  111.32  654.28  112.69  654.85  114.18  654.96
  132.53  655.09  307.17  656.16  344.29  658.01

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -362     .08  102.91     .08  114.18     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.91  114.18              122     126     127              .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                    RS: 463

INPUT
Description:
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

-416	658.01	-250	657.01	-87	656.01	0	655.59	109.8	654.54
194.42	654.32	208.54	654.65	213.7	654.92	215.61	654.29	217.64	654.15
219.79	653.77	223.31	654.2	224.25	653.23	226.46	653.59	227.82	654.41
233.37	654.53	278.57	654.4	400	655.01	496.5	656.01	525.1	657.01
557	658.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-416	.08	213.7	.08	233.37	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
213.7	233.37	105	105	104	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 357

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-626.5	660.01	-604.5	658.01	-594.5	657.01	-584.5	656.01	-479.5	655.01
0	655.01	153.93	654.15	175.05	653.71	185.31	653.59	188.41	652.4
191.14	653.59	193.32	653.82	195.38	654.05	198.28	654.41	202.04	654.7
206.36	654.46	350	655.01	528.59	656.01	549.3	657.01	596.9	658.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-626.5	.08	185.31	.08	191.14	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
185.31	191.14	179	175	168	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 183

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-631.8	658.01	-603	657.01	-586	656.01	-551	655.01	-252	654.01
-242	654.01	11.07	654.27	105.3	654.68	160.67	655.27	176.42	654.35
191.7	654.33	196.59	653.2	201.52	652.43	202.85	652.14	204.43	652.46
205.71	653.27	208.19	653.86	217.88	653.96	255.38	654.23	305.72	654.38
349	655.01	494	656.01	531.9	657.01	611	658.01		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-631.8	.08	191.7	.08	208.19	.08

Bank Sta: Left	Right	Coeff Contr.	Expan.
191.7	208.19	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 5862

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
6.57	692.9	16.52	686.09	30.12	679.79	46.8	679.9	59.74	679.08
61.77	675.79	63.16	675.53	66.68	676.21	70.59	676.51	72.5	676.66
75.29	677.24	83.9	677.66	93.4	677.98	108.12	680.46	126.96	680.02
134.28	678.08	144.98	678.89	173.49	677.49	203.06	682.96	252.93	692.83
275.94	705.68	283.35	706.71						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
6.57	.1	59.74	.05	75.29	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
 59.74   75.29            200.9   314.2   312.6             .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 5547

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9.27   683.2   30.72  673.65   63.49  674.03   97.47  674.46  108.85  672.92
  130.75  672.73  212.69  671.49  215.49  671.05  218.29   670.1  219.35  669.38
  220.92   669.9   222.1  669.99  224.66   670.6  226.17  670.93  227.99  671.82
  230.09   673.4   245.5  678.64  264.68  690.27  273.75  691.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9.27      .1  215.49     .05  226.17      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        215.49  226.17            266.1     262   254.2             .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 5282

INPUT
Description: U/S XS of Beach Grove Rd Bridge
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  681.12   55.69  675.84   85.36  674.65  174.96  673.59  184.04  670.66
  207.55  670.04  212.26  669.41  214.34  667.03  219.14  667.34  223.57  668.03
  230.88  671.08  241.05  670.68  255.44   674.6  304.55  678.17     320  679.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  212.26     .05  230.88      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        212.26  230.88               82    83.7    86.2             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     174  677.42       F
     253     320  677.42       F

BRIDGE


RIVER: Walker Run
REACH: 1                  RS: 5250

INPUT
Description: Beach Grove Rd Bridge
Distance from Upstream XS =    22.3
Deck/Roadway Width        =    19.3
Weir Coefficient          =     2.5
Upstream  Deck/Roadway Coordinates
    num=      13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  201.96  677.41       0  202.64  677.41       0   214.6  677.42  667.71
  216.27  677.42   671.5  217.27  677.42   672.7  218.96  677.42   673.3
  219.96  677.43   673.4  220.96  677.43   673.3  222.65  677.43   672.7
  224.11  677.43   671.5  226.87  677.43  668.95   226.9  677.43       0
  237.26  677.43       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  681.12   55.69  675.84   85.36  674.65  174.96  673.59  184.04  670.66
  207.55  670.04  212.26  669.41  214.61  667.71  220.04  668.18  223.99  667.71
  230.88  671.08  241.05  670.68  255.44   674.6  304.55  678.17     320  679.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  212.26     .05  230.88      .1
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
        212.26  230.88            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     174  677.42       F
     253     320  677.42       F

Downstream  Deck/Roadway Coordinates
    num=       13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   193.8  677.34       0  194.48   677.4       0  206.44  677.49       0
  207.04  677.48  667.76  208.11  677.42  670.88  209.11  677.42  672.08
   210.8  677.42  672.68   211.8  677.64  672.78   212.8  677.43  672.68
  214.49  677.43  672.08  215.95  677.43  670.88   218.1  677.43  668.66
  229.29  677.19       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -226.11  724.65 -176.11  709.54 -156.11  704.54 -106.11  699.65  -96.11  694.84
  -66.11  689.65  -41.11  684.65   -6.11  679.45   13.04  678.07    71.2  669.33
  203.09  669.53  207.96  667.71  212.14  668.18  215.99  667.71   222.6  670.21
  244.99  670.15  272.89  671.76  306.75  677.78  363.89  679.45  378.89  684.24
  413.89  689.34  435.89  694.54  453.89  699.34  468.89  704.65  493.89  710.04
  513.89  714.45  528.89  719.54  538.89  724.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -226.11      .1  203.09     .05   222.6      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        203.09   222.6            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -226.11  176.89  677.42       F
  249.89  538.89  677.42       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 5198

INPUT
Description: FEMA BIA, D/S XS of Beach Grove Rd Bridge
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -226.11  724.65 -176.11  709.54 -156.11  704.54 -106.11  699.65  -96.11  694.84
  -66.11  689.65  -41.11  684.65   -6.11  679.45   13.04  678.07    71.2  669.33
  203.09  669.53  207.96  665.96  212.14  665.71  215.99  665.85  217.97  666.58
   222.6  670.21  244.99  670.15  272.89  671.76  306.75  677.78  363.89  679.45
  378.89  684.24  413.89  689.34  435.89  694.54  453.89  699.34  468.89  704.65
  493.89  710.04  513.89  714.45  528.89  719.54  538.89  724.24
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -226.11      .1  203.09     .05   222.6      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        203.09   222.6             89.8    90.1    89.3             .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -226.11  176.89  677.42       F
  249.89  538.89  677.42       F

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 5107

INPUT
Description:
Station Elevation Data      num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1.11  677.51   37.49  670.27   96.16   668.4  156.22  668.53  158.69  666.07
  161.58  664.84  163.25  664.65  164.42  664.59  165.79  665.03  166.43  665.04
  169.94   666.9  178.46  667.79  182.69  668.84   193.2   668.9  238.09  668.33
  302.28  669.86     349  678.03

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1.11      .1  156.22     .05  182.69      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        156.22  182.69             112     112     112             .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 4995

INPUT
Description: FEMA BHZ
Station Elevation Data      num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  724.34    1010  719.54    1022  714.54    1055  709.65    1075  704.45
    1100  699.45    1120  694.84    1140  691.74    1150  691.74    1180  689.34
    1270  684.74    1300  676.74    1315  674.84    1390  669.34    1430  667.65
    1440  666.24    1450  668.65    1465  669.65    1485  669.54    1540  667.74
    1610  669.45    1635  674.54    1662  679.45    1685  690.04    1725  686.74
    1750  689.45    1770  694.45    1780  699.34    1810  704.34    1835  709.84
    1850  714.34    1870  719.34    1895  724.45

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000      .1    1430     .05    1450      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1430    1450            180.8   181.3   177.9             .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 4810

INPUT
Description:
Station Elevation Data      num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  673.03   22.15  670.47   30.66  668.65   57.63  668.16  111.49   668.7
  152.11  668.15  195.12  668.51   201.6  666.51  202.75  663.97   210.2  664.04
  214.86  663.49  215.85  664.09   220.3  668.33  253.63  667.96   275.4  667.76
   288.1   666.6  321.23  667.68  361.14  676.54

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   201.6     .05   220.3      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         201.6   220.3              74    73.7      76             .1       .3
```

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4735

INPUT
Description: FEMA BHY
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1015	719.65	1030	714.54	1058	709.84	1068	704.54
1080	701.74	1110	699.45	1140	694.65	1186	689.34	1280	686.74
1390	684.34	1430	683.74	1478	684.45	1620	679.54	1660	674.84
1690	669.54	1860	667.84	1870	664.24	1880	666.54	2000	669.45
2020	674.65	2042	679.84	2075	684.45	2120	689.45	2175	694.74
2225	699.34	2240	704.34	2280	709.65	2330	714.45	2355	719.24
2410	724.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1860	.05	1880	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1860	1880	41.8	43	43	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4692

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.2	676.54	14.2	673.9	29.44	673.96	39.22	671.77	100.41	668.46
182.33	667.17	248.38	667.34	268.47	666.03	281.75	664.29	284.12	662.53
284.81	662.09	290.66	662.02	296.54	662.16	298.07	664.62	299.42	666.98
320.4	666.76	380.91	669.4	431.24	681.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
2.2	.1	248.38	.05	299.42	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
248.38	299.42	188.7	197	188.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4495

INPUT
Description: FEMA BHX
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.65	1020	719.24	1038	714.24	1050	709.45	1058	704.45
1060	703.74	1100	699.24	1148	694.84	1208	689.54	1315	688.74
1500	684.74	1670	683.74	1820	679.74	1905	673.74	1910	674.24
1950	671.74	1990	669.34	2100	667.74	2220	664.74	2230	663.74
2240	664.54	2280	669.54	2300	674.24	2320	679.65	2360	684.24
2420	689.45	2450	694.24	2480	699.24	2510	704.45	2560	709.34
2645	714.24	2740	719.45	2790	724.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	2220	.05	2240	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2220	2240	77.5	81	77.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4414

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-5.7	673.7	1.31	671.76	19.96	669.88	70.87	667.77	193.46	667.01
240.89	666.16	297.49	667.18	302.08	662.9	308.32	662.46	313.21	662.89
316.82	666.65	331.76	668.59	406.27	680.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-5.7	.1	297.49	.05	316.82	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
297.49	316.82	114.9	119	117.5	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4295

INPUT
Description: FEMA BHW
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.84	1032	719.74	1052	714.24	1075	709.54	1100	704.54
1130	699.34	1158	694.24	1180	689.45	1210	684.65	1262	679.54
1370	674.24	1408	669.34	1470	669.45	1600	667.54	1730	665.24
1735	663.24	1745	665.45	1800	666.45	1820	674.24	1875	679.65
1955	684.65	1985	689.74	2015	694.24	2045	699.24	2060	704.54
2075	709.34	2105	714.24	2152	719.54	2215	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1730	.05	1745	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1730	1745	160.8	170.5	164.4	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4130

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.79	672.78	38.19	668.15	65.97	666.24	127.28	666.03	170.88	665.59
200.6	666.07	205.29	663.4	210.07	661.54	214.21	661.99	216.84	662.54
219.86	666.1	253.95	665.83	269.33	665.98	370.38	665.85	415.17	670.09
549.86	674.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.79	.1	200.6	.05	219.86	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
200.6	219.86	87.5	89.5	81.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4043

INPUT
Description: FEMA BHV
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1030	719.24	1048	714.45	1062	709.45	1080	704.95
1102	699.65	1128	694.34	1150	689.65	1205	684.54	1242	679.34
1330	674.54	1390	671.54	1520	667.84	1620	664.34	1625	662.24
1630	664.84	1740	667.24	1910	669.54	1960	674.65	2040	679.54
2125	684.45	2162	689.34	2188	694.74	2210	699.34	2220	704.54
2245	714.45	2258	714.84	2270	719.74	2295	724.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1620	.05	1630	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1620	1630	67.9	88.3	73.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3972

INPUT
Description: U/S XS of Market Street Bridge
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
123.85	674.24	171.83	670.24	197.75	670.47	204.44	667.88	215.91	667.02
223.06	665.53	249.69	664.89	259.88	664.22	268.46	664.16	270.18	661.21
277.41	661.6	281.39	661.43	285.52	661.64	287.08	664.59	315.58	665.35
372.3	666.78	391.2	666.21	536	666.78	559	667.64	748.66	669.45
788.66	674.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
123.85	.1	268.46	.05	287.08	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
268.46	287.08	101.2	98.1	100.6	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
123.85	202.37	670.8	F
341.4	788.66	670.3	F

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 3914

INPUT
Description: Market Street Bridge
Distance from Upstream XS = 40.1
Deck/Roadway Width = 43.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.611	673.611	71.3	672.778	672.278	151.64	671.546	671.546
216.18	671.069	671.069	254.71	670.8	664.72	260.35	670.8	663.3
260.36	673.78	663.04	260.37	673.78	669.04	272.2	673.78	669.04
283.42	673.78	669.04	283.43	673.78	663.08	285	673.78	664.36
285.1	670.45	664.36	287.02	670.3	665.83	339.19	669.234	669.234
435.84	667.629	667.629						

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-113.65	679.5	-20.65	674.7	0	673.611	71.3	672.778	151.64	671.546
216.18	671.069	254.71	664.72	261	663.04	272.49	661.04	283.42	663.08
287.02	665.83	339.19	669.234	435.84	667.629	464.35	668.7	554.35	669.7
604.35	674.8	684.35	679.7	769.35	684.6	1000	684.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-113.65	.1	254.71	.05	287.02	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
254.71	287.02	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-113.65	202.37	670.8	F
341.4	1000	670.3	F

Downstream Deck/Roadway Coordinates
num= 15

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.611	673.611	71.3	672.778	672.278	151.64	671.546	671.546
216.18	671.069	671.069	254.71	670.8	664.72	260.35	670.8	661.95
260.36	673.42	668.72	272.2	673.42	668.72	283.42	673.42	668.72

```
  283.43  673.42  661.35     285  673.42  664.36   285.1  670.45  664.36
  289.14   670.3  664.78  339.19 669.234 669.234  435.84 667.629 667.629

Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -350   679.5 -113.65   679.5  -20.65   674.7       0 673.611    71.3 672.778
  151.64 671.546  216.18 671.069  254.71  664.72     261  663.04  272.49  661.04
  283.42  663.08  287.02  665.83  339.19 669.234  435.84 667.629  464.35   668.7
  554.35   669.7  604.35   674.8  684.35   679.7  769.35   684.6

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    -350      .1 -113.65      .1  254.71    .055  287.02      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        254.71  287.02             .4       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -350     200   670.9       F
     310  769.35   670.3       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   668.7
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   670.1

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 3860

INPUT
Description: D/S XS of Market Street Bridge
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  117.66  675.84  137.05  672.03  181.62  671.65  219.23  671.09  253.06  668.65
  262.64  664.21  265.16  663.32  266.08  661.15  272.52  660.73  283.67  661.59
  288.12  663.96  295.78  666.15  334.66  665.91  349.26  667.65  357.79  668.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  117.66      .1  265.16    .055  288.12     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        265.16  288.12             75.5    68.6    74.8             .4       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  117.66     200   670.9       F
     310  357.79   670.3       F

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 3785
```

INPUT
Description: FEMA BHU
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1022	719.24	1052	714.84	1085	709.45	1110	704.45
1140	699.34	1172	689.54	1260	684.65	1290	679.74	1318	674.84
1360	669.34	1412	664.95	1430	660.24	1440	665.95	1500	665.84
1550	667.24	1580	666.74	1650	666.15	1760	669.45	1800	674.34
1900	676.54	1980	679.54	2035	684.65	2055	689.45	2080	694.54
2095	699.45	2108	707.65	2118	709.65	2130	714.45	2140	719.34
2150	724.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1412	.055	1440	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1412	1440	63.5	56.1	58.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3735

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46.72	679.91	74.63	675.8	101.02	670.65	135.38	669.18	157.56	666.89
181.15	666.12	181.25	664.03	182.71	662.51	184.32	662.24	185.67	660.86
187.89	660.4	192.29	660.36	196.75	660.67	199.82	660.74	207.26	665.22
222.51	665.76	281.32	665.28	293.21	664.71	340	664	396	664
402	665	420	666	422	666	440	666	642.15	669.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
46.72	.1	181.15	.055	207.26	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
181.15	207.26	208.1	193.9	194.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3532

INPUT
Description: FEMA BHT
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1055	719.34	1095	715.15	1155	709.45	1190	704.84
1240	699.45	1280	694.84	1330	689.54	1368	684.95	1390	679.74
1428	674.34	1455	671.09	1479.93	668.1	1496.1	666.46	1510.17	662.05
1513.34	660.29	1514.53	659.03	1518.38	658.71	1519.83	658.78	1524.51	659.04
1527.37	664.82	1537.93	664.34	1612.95	662.99	1728.54	663.46	1730	665.04
1750	666.34	1770	665.74	1850	666.34	1975	669.34	2000	674.74
2125	679.34	2180	684.34	2200	690.15	2222	694.34	2232	699.95
2262	704.84	2285	709.84	2325	714.45	2372	719.95	2415	724.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1496.1	.06	1527.37	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1496.1	1527.37	123.6	125	123.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3410

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

33.79	674.7	76.45	668.35	118.62	664.23	127.12	658.22	129.14	657.83
131.86	658.02	136.11	657.9	138.1	658.16	141.34	659.72	154.15	659.99
159.04	661.67	173.29	662.2	193.85	659.88	228.32	660.18	314.35	662.42
376	661.82	381.4	662.93	385.18	663.96	402.12	664.21		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
33.79	.08	118.62	.05	141.34	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
118.62	141.34	36.2	35	34.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3375

INPUT
Description: FEMA BHS
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1095	719.34	1140	714.45	1170	709.84	1220	704.45
1275	699.65	1285	694.45	1305	689.54	1320	684.34	1338	679.95
1360	674.65	1420	664.54	1443	659.24	1448	657.24	1460	658.34
1550	658.95	1680	664.84	1705	664.24	1800	666.74	1978	669.45
2042	674.65	2080	679.74	2100	685.04	2125	689.34	2140	694.95
2162	699.45	2180	704.84	2225	709.84	2260	714.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1443	.05	1460	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1443	1460	92.9	96	103.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3278

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
40.42	666.96	56.89	663.45	68.65	662.53	75.07	662.03	79.29	658.4
81.65	657.27	82.94	657.07	85.53	657.01	86.77	657.6	90.32	660.28
96.28	660.96	102.77	661.42	111.91	662.29	155.88	661.02	343	662.66
653	665.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
40.42	.06	75.07	.05	90.32	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
75.07	90.32	195.6	214	204.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3065

INPUT
Description: FEMA BHR
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.24	1095	719.84	1110	714.74	1210	709.34	1260	704.34
1290	699.54	1300	695.04	1315	689.84	1330	684.45	1355	679.45
1385	674.95	1405	669.74	1425	664.54	1510	656.74	1520	655.95
1530	656.15	1670	661.45	1805	664.34	1828	666.54	1978	669.65
2070	671.34	2178	674.65	2210	679.34	2248	687.54	2285	689.95
2310	694.84	2355	699.34	2420	704.34	2525	709.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1510	.05	1530	.06

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1510    1530            129.8   116.6   121.4              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 2949

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   34.18  664.58   74.16  659.96   96.72  659.48  132.97  659.67  148.16  660.33
  152.24   655.9  153.74   655.8  155.46  655.77  156.94  655.96  158.15  656.45
  164.41  660.28  192.14  659.68  255.96  659.64  464.54  662.65  474.11  665.45
  491.53  665.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   34.18     .06  148.16     .05  164.41     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        148.16  164.41              211   213.4   221.1              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 2730

INPUT
Description: FEMA BHQ
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -421.78  724.45 -301.78  719.95 -223.78  714.45 -179.78  709.34 -159.78  704.34
 -153.78  699.84 -121.78  694.54 -109.78  689.54  -93.78  684.54  -71.78  679.34
  -53.78  674.34   48.22  671.45  166.22  669.54  173.22  669.04  247.22  664.34
  302.74     659  389.32     658  396.22  656.24  408.22  654.74  415.22  656.24
  458.22  656.74  578.22  662.24  717.97     663  739.24     664  745.24     665
  754.54     668   774.2     668  792.47     668  798.22  667.34  878.22  666.24
 1043.22  669.65 1258.22  671.65 1296.22  674.74 1338.22  679.54 1383.22  684.54
 1418.22  689.24 1433.22  694.95 1453.22  699.95 1478.22  704.34 1558.22  709.24
 1593.22  714.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -421.78     .06  396.22     .05  415.22     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        396.22  415.22             99.6    93.9    94.4              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 2634

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5.46  666.85  121.54  661.36   218.2  657.67  260.41  658.53  265.68  658.26
  269.53  654.41  272.46  653.74   274.6  653.83  275.22  654.29  275.87   655.2
  282.17  658.65  550.04  660.42  638.28  663.53     654  664.03     663  667.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5.46     .06  265.68     .05  282.17     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        265.68  282.17            137.8     138   136.4              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 2497
```

INPUT
Description: U/S XS of Walker Run Crossing
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.53	665.89	39.47	664.2	44.97	663.57	107.45	659.28	166.22	657.83
205.6	657.61	262.97	657.78	280.78	656.99	283.96	654.28	286.94	653.51
288.71	653.76	291.25	653.78	294.33	654.23	295.69	655.07	296.61	655.54
297.97	657.53	303.08	657.83	439.74	659.15	528.78	658.58	585.34	660.05
658.58	665.36	678.36	665.96	682.31	667.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.53	.06	280.78	.05	297.97	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
280.78	297.97	33.8	35.1	35.9	.3	.7

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 2480

INPUT
Description: Walker Run Crossing
Distance from Upstream XS = 9.5
Deck/Roadway Width = 13.8
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 29

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
11.87	665.82	665.82	47.14	662.724	662.724	74.04	660.848	660.848
113.05	659.88	659.28	162.23	658.903	658.06	172.76	658.91	657.83
211.42	658.93	657.61	287.93	658.98	657	289.31	658.99	655
290	659.02	654.27	292.65	659.05	653.74	292.65	659.05	657.67
294.77	659.103	657.67	297.73	659	657.67	297.74	659	654.24
297.95	659	654.24	301.58	658.9	655	301.83	658.9	655.06
303.52	658.95	655.54	304.43	658.97	657.53	310.59	659.05	657.82
422.97	660.036	657.82	447.67	660.3	659.14	533.91	660.9	658.57
591.63	661.4	660.06	605.41	662.027	661	653	665	664.61
665.09	666	665.37	694.26	667.627	667.627			

Upstream Bridge Cross Section Data
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11.87	665.882	39.22	664.19	46.11	663.57	113.05	659.28	172.76	657.83
211.42	657.61	270.23	657.78	287.93	657	290	654.27	293.2	653.74
295.57	653.36	295.74	653.75	297.74	653.79	297.95	654.24	301.83	655.06
303.52	655.54	304.43	657.53	310.59	657.82	447.67	659.14	533.91	658.57
591.63	660.06	653	664.61	665.09	665.37	694.25	667.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
11.87	.06	287.93	.05	304.43	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
287.93	304.43	.3	.7

Downstream Deck/Roadway Coordinates
num= 31

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
11.87	665.82	665.82	47.14	662.724	662.724	62.28	661.7	659.98
74.04	660.848	658.43	114.78	659.4	658.43	162.23	658.903	657
222.04	658.91	657.5	268.28	658.96	657.91	282.83	658.98	657.41
289.31	658.99	654	290.86	659.01	654.02	292.33	659.02	653.93
292.65	659.05	653.74	292.66	659.05	657.67	294.77	659.103	657.67
297.73	659	657.67	297.74	659	654.24	298.39	659	654.38
301.58	658.9	655	302.27	658.9	657.21	365.85	659.8	658.01
380.66	659.9	659.03	418.1	659.99	659.03	422.97	660.036	658.78
520.51	661	658.78	538.81	661.1	659.14	544.9	661.2	659.31
605.41	662.027	660	615.07	662.1	661.25	669.45	665	664.61
694.26	667.627	667.627						

Downstream Bridge Cross Section Data
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-10	665.882	11.87	665.882	50.11	662.78	62.28	659.98	114.78	658.43
222.04	657.5	268.28	657.91	282.83	657.41	290.86	654.02	292.33	653.93
293.18	653.85	295.81	653.81	296.52	654.02	298.39	654.38	302.27	657.21

365.85	658.01	380.66	659.03	418.1	659.03	520.51	658.78	538.81	659.14
544.9	659.31	615.07	661.25	669.45	664.61	694.25	667.63		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-10	.06	11.87	.06	282.83	.05	302.27	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
282.83	302.27	.3	.7

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 659.2
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd = 1.5
Submerged Inlet + Outlet Cd = .8
Max Low Cord = 658.5

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2462

INPUT
Description: D/S XS of Walker Run Crossing
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.2	666.86	49.93	662.78	70.39	659.98	130.3	658.42	237.98	657.49
283.65	657.9	298.45	657.41	305.06	654.03	307.41	653.92	309.95	653.86
311.78	654.02	315.94	654.96	317.95	657.21	381.94	658.01	396.57	659.03
433.04	659.03	535.44	658.78	555.06	659.14	560.39	659.8	629.95	661.26
684.19	664.6	700.62	665.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9.2	.06	298.45	.05	317.95	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
298.45	317.95	117	123	126.5	.3	.7

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2339

INPUT
Description: FEMA BHP
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.34	1030	719.34	1080	714.65	1108	710.15	1130	704.54
1150	699.45	1170	694.54	1195	689.54	1225	684.65	1240	679.24
1295	674.54	1400	669.95	1500	666.74	1590	664.54	1630	663.34
1700	664.34	1735	664.95	1772	664.45	1825	659.24	1888	659.65
2100	657.34	2145	655.34	2250	653.24	2268	654.45	2350	656.45
2440	659.84	2600	661.34	2735	664.54	2755	666.54	2900	667.34
3100	667.54	3250	669.24	3350	671.34	3465	674.65		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2145	.05	2268	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2145	2268	62.3	64.8	61.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2274

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-85.7	666.85	-46.1	663.17	-23	659.97	16.47	657.72	45.83	658.28
67.54	658.17	89.33	656.46	91.41	654.78	92.23	652.48	95.09	651.42
99.01	652.22	102.9	653.21	104.42	653.39	105.71	655.36	121.29	656.82
507.83	659.46	557.25	660.35	636	663.34	650.4	665.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-85.7	.06	89.33	.05	105.71	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
89.33	105.71	136.2	136.2	129.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2139

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-101	660.01	41.82	658.6	77.75	655.4	217.23	654.68	305.8	654.64
307.09	656.3	314.38	656.84	327.19	656.9	354.66	655.54	357.53	654.39
358.78	652.08	360.05	651.18	362.06	650.72	364.09	651.21	366.47	651.49
369.75	654.6	370.25	655.38	374.79	656.34	396.01	655.99	767.34	658.35
818.4	659.6	905	662.46	916.1	663.58				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-101	.06	354.66	.05	370.25	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
354.66	370.25	126.7	129	129.7	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2010

INPUT
Description: FEMA BHO
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	689.34	1100	686.54	1230	684.34	1275	679.45	1340	674.84
1450	670.04	1635	664.45	1798	659.74	2030	656.54	2295	655.65
2298	654.34	2300	655.95	2460	655.95	2470	654.34	2475	655.95
2600	654.74	2715	654.34	2740	652.24	2750	654.54	2960	657.34
3230	659.65	3345	664.65	3360	664.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	2715	.05	2750	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2715	2750	84.1	85.6	88.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 1925

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-232.06	658.01	-166.67	655.4	34.55	654.38	78.78	654.68	85.55	655
101.09	655.65	109.35	655.67	111.58	653.77	113.72	652.28	115.93	651.72
120.12	651.09	123.07	651.4	125.43	652.9	126.09	654.67	128.49	655.57
142.56	655.17	278.44	654.58	368.74	655.3	496.43	655.55	623.92	656.57
700.01	659.91								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-232.06	.06	109.35	.05	128.49	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
109.35	128.49	282.6	325.9	321	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1602

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-627.1	658.01	-562.09	656.01	-429.8	655.01	-285.4	654.01	20.81	654.67
48.57	654.71	66.44	654.61	72.14	654.79	85.07	654.21	87.82	651.4
91.51	650.67	93.9	650.84	96.86	651.6	98.18	651.9	100.7	654.03
108.02	654.27	243	654.08	428.23	655.01	456.83	656.01	487.78	657.01
560.78	658.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-627.1	.08	85.07	.06	100.7	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
85.07	100.7	202.2	203.5	203	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1402

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-214.73	660.01	-151.73	657.01	-116.53	656.01	-65.33	655.01	-57.33	654.01
-47.9	653.01	-26.6	653.01	61.72	652.96	129.69	653.53	136.69	653.6
143.69	653.86	148.69	654.03	153.69	654.21	156.09	654.04	156.39	652.1
156.89	651.34	158.69	650.52	160.49	650.2	161.99	649.8	163.69	649.82
165.69	649.95	166.99	650.67	168.49	651.36	169.29	651.84	169.89	653.64
172.09	654.15	177.99	653.93	183.69	653.92	187.1	653.79	232.35	653.34
246.57	653.84	359.8	654.16	416.89	654.15	519.9	654.01	527.8	655.01
536.5	656.01	540.2	657.01	548.5	658.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-214.73	.08	156.09	.06	169.89	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
156.09	169.89	183	194	196.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1208

INPUT
Description: FEMA BHN
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.34	1060	714.65	1080	709.34	1165	699.54
1190	694.84	1225	689.54	1265	684.95	1380	674.54	1470	669.65

```
    1528  665.15    1570  659.45    1680  651.74    1740  651.34    1752  650.74
    1765  651.34    2205  659.24    2220  664.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .08    1740     .06    1765     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1740    1765             228.9   218.5   209.9              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 990

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -41.4  660.01    -4.3  656.01   32.63   652.9   63.74  651.93  118.97  653.07
  125.76  650.82  126.92  650.45  132.87  649.47  135.28  649.66  136.76  650.43
  138.23  653.22  149.36  652.61  186.43  652.59  234.63  654.38  362.19  653.45
  497.17  656.01   516.5  658.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -41.4     .08  118.97     .06  138.23     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        118.97  138.23             56.8    56.5    58.9              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 933

INPUT
Description: FEMA BHM
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  724.54    1035  719.54    1088  714.74    1120  710.04    1152  704.34
    1200  699.74    1238  694.84    1270  689.84    1290  684.65    1340  679.95
    1402  674.95    1445  669.34    1480  664.45    1530  659.74    1590  654.45
    1700  650.95    1710  649.74    1720  650.65    1750  654.54    1900  657.04
    2080  659.84    2200  663.45    2300  663.65    2400  663.45    2500  664.95
    2590  664.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1700     .05    1720     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1700    1720             48.7    48.4    45.9              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 884

INPUT
Description: U/S XS of Private Farm Road
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -288  691.97 -147.11  671.47     -33  660.01   12.49  656.08   52.79  653.68
   71.68  653.18  101.89   653.2  117.08  652.72   120.1  649.74   121.4  649.01
  123.02  648.62  125.03  649.16  129.44  653.21  174.49  652.41  194.38   652.9
     524  662.27     538  663.17   560.8  664.45  607.89  664.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -288     .09  117.08     .05  129.44     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.08  129.44             20.6    19.1    19.6              .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
```

-288	112.93	652.53	F
133.68	607.89	652.53	F

CULVERT

RIVER: Walker Run
REACH: 2 RS: 875

INPUT
Description: Private Farm Road
Distance from Upstream XS = 1.6
Deck/Roadway Width = 15.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.14	656.071	656.071	52.52	653.686	653.686	71.38	653.5	653.18
115.86	653.386	649.74	122.61	652.528	648.62	122.83	652.53	648.66
124.23	652.54	648.9	130.22	653.444	653.21	173.58	653.2	652.41
194.42	653.1	652.9	217.91	652.805	652.805	378.6	653.084	653.084
465.08	656.47	656.47	522.51	662.265	662.265	535.78	663.101	663.101
535.81	663.177	663.177	535.99	663.037	663.037			

Upstream Bridge Cross Section Data
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-322.11	691.97	-147.11	671.47	-2.11	656.57	12.14	656.071	52.52	653.686
71.38	653.18	101.3	653.2	116.89	652.72	120.15	649.74	120.82	648.93
121.18	649.01	122.65	648.62	124.23	648.9	124.43	649.16	129.48	653.21
173.58	652.41	194.42	652.9	297.89	656.07	337.89	656.67	607.89	664.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-322.11	.09	116.89	.05	129.48	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
116.89	129.48	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-322.11	112.93	652.53	F
133.68	607.89	652.53	F

Downstream Deck/Roadway Coordinates
num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.14	656.071	656.071	52.52	653.686	653.686	77.11	653.4	652.55
115.86	653.386	651.91	122.61	652.528	649.92	122.73	652.53	650.54
122.85	652.53	651.24	123.07	652.53	651.64	123.32	652.53	651.8
123.57	652.53	651.64	123.79	652.53	651.24	123.91	652.53	650.54
124.03	652.53	650.11	126.1	652.53	648.93	130.22	653.444	649.62
136.9	653.4	652.21	185.27	653.2	652.86	217.91	652.805	652.8
378.6	653.084	653.084	465.08	656.47	656.47	522.51	662.265	662.265
535.78	663.101	663.101	535.81	663.177	663.177	535.99	663.037	663.037

Downstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-322.11	691.97	-147.11	671.47	-2.11	656.57	12.14	656.071	52.52	653.686
77.11	652.55	116.71	651.91	123.34	649.92	124.03	650.11	125.51	649.41
126.1	648.93	130.12	649.62	136.9	652.21	185.27	652.86	218.62	652.8
297.89	656.07	337.89	656.67	607.89	664.667				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-322.11	.09	116.71	.05	136.9	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
116.71	136.9	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-322.11	109	652.53	F
136	607.89	652.53	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 654.4
Energy head used in spillway design =

Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	2.75	

FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	2.2	14.9	.023	.023	.1	.9	1

Upstream Elevation = 648.96
Centerline Station = 123.3
Downstream Elevation = 649.411
Centerline Station = 123.2

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 863

INPUT
Description: D/S XS of Private Farm Road
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-294	691.97	-147.11	671.47	-22.2	660.01	24.99	655.04	34.67	653.86
72.57	652.55	113.12	651.91	120.43	649.92	123.41	648.96	126.4	649.62
133.22	652.21	182	652.85	214.18	652.8	518.46	662.27	588	664.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-294	.09	113.12	.05	133.22	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
113.12	133.22	157.2	147.1	138.4	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-294	109	652.53	F
136	588	652.53	F

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 715

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-92.4	658.01	2.21	655.41	40.88	653.76	46.14	653.57	77.95	651.4
100.08	650.67	101.47	648.52	104.64	647.91	107.47	647.9	108.96	648.04
110.34	648.14	111.67	648.52	114.47	650.93	126.37	650.97	191.93	651.64
278.3	653.09	365.34	656.46						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-92.4	.09	100.08	.05	114.47	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
100.08	114.47	172	178.4	188.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 536

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-86.6	657.01	-45.02	655.01	5.76	652.05	48.16	650.97	149.99	651.14
170.47	649.65	172.89	647.93	174.84	647.22	176.44	647.18	179.25	646.97
182.05	647.71	182.91	648.29	184.3	650.54	191.59	650.96	206.95	652.58
269.71	656.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-86.6	.09	170.47	.05	184.3	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
170.47	184.3	89.9	107	110.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 428

INPUT
Description: FEMA BHL
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	686.54	1050	684.84	1090	679.84	1110	674.45	1130	669.65
1150	664.54	1210	659.34	1250	655.54	1350	651.74	1410	649.34
1430	647.24	1440	649.65	1550	654.34	1605	656.65	1630	659.45
1750	661.74	1860	664.45	2000	666.54	2100	667.34	2180	667.84
2365	669.34	2450	671.34	2540	674.54	2640	684.34	2700	689.54
2750	699.34	2800	704.65	2920	709.45				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1410	.05	1440	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1410	1440	84.2	119.6	73.2	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 350

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7.67	656.47	30.04	652.51	50.26	651.27	122.31	650.39	128.41	647.64
131.05	647.09	132.71	647.08	135.14	647.17	138.64	647.65	139.08	648.11
140.48	648.18	141.29	649.59	150.13	650.23	156.97	649.72	249.39	650.76
267.01	652.4	309.86	655.02	325.84	655.85				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7.67	.09	122.31	.05	141.29	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
122.31	141.29	169.4	222.4	165.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 185

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8.8	659.55	15.53	658.78	23.2	653.48	25.13	652.64	29.31	649.46
32.38	649.12	33.4	647.67	34.97	646.89	37.17	646.4	40.26	646.66
42.19	646.41	44.77	646.96	46.4	647.15	49.26	649.32	59.74	649.89
197.88	650.38	234.08	652.49	273.02	654.62	299.87	655.74	305.41	656.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8.8	.09	32.38	.05	49.26	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
32.38	49.26	39.3	58	36.4	.1	.3

CROSS SECTION

RIVER: Walker Run

REACH: 2 RS: 147

INPUT
Description: FEMA BHK
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	699.45	1040	694.84	1100	691.54	1170	689.54	1210	687.54
1260	682.65	1340	684.95	1400	681.65	1440	679.65	1490	676.95
1530	674.84	1555	669.65	1580	664.34	1610	659.24	1640	655.04
1650	649.45	1660	646.74	1670	649.34	1750	651.74	1830	654.84
1870	655.84	1900	654.74	1925	659.34	2100	661.54	2240	664.95
2450	666.74	2623	669.65	2720	674.65	2760	679.34	2800	684.54
2838	689.54	2848	694.34	2900	699.45	2940	704.45	3010	709.45
3100	714.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1650	.05	1670	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1650	1670	138.5	154.5	134.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 011

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-177.52	656.04	33.24	653.12	38.49	652.67	45.07	649.46	51.29	648.2
53.81	646.7	54.7	645.84	57.12	645.71	59.41	645.74	61.18	646.53
64.38	648.11	69.53	648.34	79.21	649.32	111.92	649.09	167.8	651.4
249.3	651.46	251.06	651.01	293.8	653.77	352.41	660.72		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-177.52	.09	51.29	.05	64.38	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
51.29	64.38	39.9	38	43.7	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
-177.52	42	652.95	F
90	352.41	652.95	F

BRIDGE

RIVER: Walker Run
REACH: 2 RS: -10

INPUT
Description: Market Street
Distance from Upstream XS = 8.5
Deck/Roadway Width = 24.9
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-172.52	655.288		32.59	653.113		44.69	652.945	
44.69	654.155		62.11	656.025	644.195	62.5	656.045	646.915
62.61	656.065	647.975	63.5	656.085	649.645	65.5	656.125	650.645
65.9	656.125	650.675	66.3	656.125	650.645	68.3	656.085	649.645
69.6	656.065	647.975	70	656.045	646.915	70.35	656.025	644.915
98.44	654.145		98.45	652.945		172.12	652.5	
253.49	653.245							

Upstream Bridge Cross Section Data
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-172.52	655.288	32.43	652.375	38.83	651.925	48.62	648.705	55.15	647.445
59.2	645.945	61.39	645.095	65.45	644.995	67.71	645.785	70.85	647.355
86.15	648.555	116.5	649.245	172.12	652.5	253.49	653.245	332.2	654.325
350.6	655.245	358.85	656.245						

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
 -172.52     .09   55.15     .05   70.85     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
          55.15   70.85            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -172.52      42  652.95       F
      90  358.85  652.95       F

Downstream  Deck/Roadway Coordinates
    num=      19
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 -199.02 655.288            6.09 653.113           18.19 652.945
   18.19 653.665           35.61 656.025 645.195      36 656.075 647.915
   36.11 656.095 648.765      37 656.165 649.835      39 656.225 650.835
    39.4 656.225 650.865    39.8 656.225 650.835    41.8 656.165 649.835
    43.1 656.095 648.765    43.5 656.075 647.995   43.85 656.025 646.665
   71.94 654.415           71.95 652.945          145.62   652.5
  226.99 653.245

Downstream Bridge Cross Section Data
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -199.02 655.288   -6.99 653.185    1.13 653.145   13.19 650.795   26.39 648.445
    31.8 647.955   33.72 646.465   36.22 645.845   39.63 644.505    42.3 643.715
   44.81 644.305    48.1 645.855      51 647.395   61.17 647.815   72.07 651.545
  145.62   652.5  226.99 653.245   332.2 654.325   350.6 655.245  358.85 656.245

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -199.02     .09    31.8     .05      51     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
          31.8      51            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -199.02   15.72  652.95       F
   63.89  358.85  652.95       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   654.4
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   652.5

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: -30

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -199.02  656.04  -46.68  654.28    -4.4  653.95    4.43   653.9   17.96  651.54
   30.08   649.2    35.6  648.71   37.35  647.22   38.98   646.6   41.82  645.27
```

```
   45.52  644.46   48.05  645.07   52.27  646.61   53.56  648.15   63.11  648.57
   79.88  650.16   85.95  652.29   181.4   651.9  273.84  653.77  319.73  659.02

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -199.02     .09    35.6     .05   53.56     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          35.6   53.56             39.8    41.7    52.9              .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -199.02   15.72  652.95        F
   63.89  319.73  652.95        F

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: -78

INPUT
Description:
Station Elevation Data      num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -15  653.95    8.17  649.27   36.56  649.66   42.24   648.9   46.48  646.51
   49.12  645.82   52.33  645.43   54.96  645.72   58.47  646.11   62.68  648.65
   65.38  648.62   71.37  648.11   81.36  648.01   96.66  649.71     189  651.01
   294.7  652.01   299.5  653.01

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -15     .09   36.56     .05   62.68     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          36.56  62.68             70.8    70.8    80.2              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: -154

INPUT
Description:
Station Elevation Data      num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  -151.5  656.03       0  654.28   13.15  649.96   23.45  649.01   28.15  648.96
   30.73  645.21   33.05   644.9   35.85  645.52   40.46  645.66   41.74  646.07
   43.72  648.39   63.07   648.9      97  649.15  199.07  650.01  206.89  651.01
   218.8  653.01

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -151.5     .09   28.15     .05   43.72     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          28.15  43.72               75      75      75              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: -255

INPUT
Description: FEMA BHJ
Station Elevation Data      num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  684.34    1092  679.54    1128  674.34    1170  669.34    1230  664.54
    1310  660.04    1330  657.54    1350  654.84    1372  649.74    1405  647.24
    1408  645.74    1412  647.95    1450  649.65    1490  649.24    1525  649.34
    1570  649.04    1610  649.84    1670  654.34    1712  659.34    1740  664.84
    1750  669.34    1790  674.84

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1405     .05    1412     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
```

1405 1412 .1 .3

Profile Output Table - Standard Table 1

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.
E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl		
(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(cfs)	(ft)	(ft)	(ft)
Walker Run	1	5862	100 year storm		1640.00	675.53	680.72	680.72
681.63	0.02251	10.81	321.10	162.84	0.92			
Walker Run	1	5862	500 year storm		3600.00	675.53	682.00	682.00
683.38	0.02781	14.32	536.34	172.55	1.07			
Walker Run	1	5547	100 year storm		1640.00	669.38	677.11	674.58
677.20	0.00176	4.35	890.41	218.06	0.29			
Walker Run	1	5547	500 year storm		3600.00	669.38	678.79	675.66
678.98	0.00294	6.50	1263.59	226.57	0.39			
Walker Run	1	5282	100 year storm		1640.00	667.03	676.24	673.33
676.58	0.00295	6.02	457.36	226.49	0.38			
Walker Run	1	5282	500 year storm		3600.00	667.03	677.59	675.45
678.04	0.00420	7.99	1027.61	259.44	0.46			
Walker Run	1	5250			Bridge			
Walker Run	1	5198	100 year storm		1640.00	665.71	672.25	672.25
673.74	0.01851	11.33	231.39	223.91	0.87			
Walker Run	1	5198	500 year storm		3600.00	665.71	674.34	674.34
676.72	0.02127	15.15	383.75	249.54	0.98			
Walker Run	1	5107	100 year storm		1640.00	664.59	672.30	670.22
672.39	0.00157	3.56	989.81	288.98	0.26			
Walker Run	1	5107	500 year storm		3600.00	664.59	673.89	671.16
674.06	0.00236	5.16	1463.18	306.07	0.34			
Walker Run	1	4995	100 year storm		1640.00	666.24	672.05	
672.16	0.00273	4.39	826.98	269.66	0.35			
Walker Run	1	4995	500 year storm		3600.00	666.24	673.49	
673.71	0.00405	6.37	1236.24	296.47	0.45			
Walker Run	1	4810	100 year storm		1640.00	663.49	671.80	
671.86	0.00103	3.19	1208.61	329.14	0.21			
Walker Run	1	4810	500 year storm		3600.00	663.49	673.05	
673.18	0.00206	5.01	1630.02	345.41	0.30			
Walker Run	1	4735	100 year storm		1640.00	664.24	671.69	
671.76	0.00143	3.60	1096.91	330.82	0.26			
Walker Run	1	4735	500 year storm		3600.00	664.24	672.83	
673.00	0.00281	5.66	1480.08	341.66	0.37			
Walker Run	1	4692	100 year storm		1640.00	662.02	671.68	
671.72	0.00051	2.30	1379.63	349.44	0.16			
Walker Run	1	4692	500 year storm		3600.00	662.02	672.79	
672.91	0.00122	3.93	1773.58	360.30	0.25			
Walker Run	1	4495	100 year storm		1640.00	663.74	671.57	
671.61	0.00066	2.88	1350.83	335.74	0.19			
Walker Run	1	4495	500 year storm		3600.00	663.74	672.50	
672.63	0.00173	5.06	1673.15	354.76	0.31			
Walker Run	1	4414	100 year storm		1640.00	662.46	671.52	
671.56	0.00066	2.71	1401.92	345.90	0.17			
Walker Run	1	4414	500 year storm		3600.00	662.46	672.37	
672.49	0.00180	4.82	1700.93	355.68	0.29			

Walker Run	1	4295		100 year storm	1640.00		663.24	671.46	
671.49	0.00054	2.50	1632.18	421.29		0.16			
Walker Run	1	4295		500 year storm	3600.00		663.24	672.20	
672.29	0.00156	4.52	1947.75	428.96		0.28			
Walker Run	1	4130		100 year storm	1640.00		661.54	671.41	
671.42	0.00027	1.82	2046.31	435.84		0.11			
Walker Run	1	4130		500 year storm	3600.00		661.54	672.03	
672.09	0.00089	3.49	2326.10	458.16		0.21			
Walker Run	1	4043		100 year storm	1640.00		662.24	671.38	
671.39	0.00042	2.27	1939.12	532.22		0.14			
Walker Run	1	4043		500 year storm	3600.00		662.24	671.94	
672.00	0.00134	4.25	2243.45	551.40		0.26			
Walker Run	1	3972		100 year storm	1640.00		661.21	671.36	667.07
671.37	0.00020	1.68	2526.31	605.88		0.10			
Walker Run	1	3972		500 year storm	3600.00		661.21	671.88	668.65
671.92	0.00067	3.23	2844.33	616.38		0.18			
Walker Run	1	3914			Bridge				
Walker Run	1	3860		100 year storm	1640.00		660.73	667.84	667.09
668.89	0.01004	8.79	216.92	96.28		0.61			
Walker Run	1	3860		500 year storm	3600.00		660.73	669.38	669.38
671.91	0.01787	13.55	307.84	114.87		0.85			
Walker Run	1	3785		100 year storm	1640.00		660.24	667.18	667.18
667.74	0.01141	7.39	336.84	292.96		0.62			
Walker Run	1	3785		500 year storm	3600.00		660.24	667.19	667.94
669.82	0.05357	16.04	340.75	294.84		1.34			
Walker Run	1	3735		100 year storm	1640.00		660.36	666.48	665.54
666.65	0.00307	3.88	503.03	298.67		0.31			
Walker Run	1	3735		500 year storm	3600.00		660.36	667.62	666.45
667.89	0.00323	4.58	899.98	387.86		0.33			
Walker Run	1	3532		100 year storm	1640.00		658.71	664.66	664.66
665.29	0.02558	8.39	336.81	224.33		0.77			
Walker Run	1	3532		500 year storm	3600.00		658.71	665.80	
666.49	0.02464	9.18	601.73	253.04		0.78			
Walker Run	1	3410		100 year storm	1640.00		657.83	663.82	662.43
663.94	0.00300	4.24	712.23	265.45		0.35			
Walker Run	1	3410		500 year storm	3600.00		657.83	664.94	
665.19	0.00496	6.19	1027.34	290.72		0.46			
Walker Run	1	3375		100 year storm	1640.00		657.24	663.78	
663.86	0.00133	3.46	863.92	233.31		0.25			
Walker Run	1	3375		500 year storm	3600.00		657.24	664.83	
665.04	0.00312	5.92	1137.03	308.39		0.40			
Walker Run	1	3278		100 year storm	1640.00		657.01	662.97	662.97
663.49	0.01432	8.65	383.49	317.40		0.72			
Walker Run	1	3278		500 year storm	3600.00		657.01	664.08	
664.49	0.01009	8.42	819.43	462.58		0.63			
Walker Run	1	3065		100 year storm	1640.00		655.95	662.04	659.47
662.14	0.00145	3.66	730.89	245.14		0.27			
Walker Run	1	3065		500 year storm	3600.00		655.95	663.34	
663.55	0.00237	5.36	1100.27	320.40		0.35			
Walker Run	1	2949		100 year storm	1640.00		655.77	661.56	

661.79	0.00729	5.83	509.78	329.00		0.50			
Walker Run	1	2949		500 year storm	3600.00		655.77	662.90	
663.13	0.00524	5.95	1017.06	416.68		0.45			
Walker Run	1	2730		100 year storm	1640.00		654.74	661.09	
661.18	0.00134	3.40	785.64	272.20		0.25			
Walker Run	1	2730		500 year storm	3600.00		654.74	662.14	
662.34	0.00264	5.35	1087.36	305.83		0.37			
Walker Run	1	2634		100 year storm	1640.00		653.74	660.84	
660.97	0.00351	4.68	696.87	426.74		0.36			
Walker Run	1	2634		500 year storm	3600.00		653.74	661.83	
662.02	0.00411	5.69	1145.75	478.41		0.40			
Walker Run	1	2497		100 year storm	1640.00		653.51	660.69	659.26
660.73	0.00090	2.72	1150.81	507.16		0.19			
Walker Run	1	2497		500 year storm	3600.00		653.51	661.57	659.86
661.66	0.00159	3.96	1608.61	532.14		0.26			
Walker Run	1	2480			Bridge				
Walker Run	1	2462		100 year storm	1640.00		653.86	659.30	
659.58	0.00735	6.44	519.60	459.79		0.54			
Walker Run	1	2462		500 year storm	3600.00		653.86	660.31	
660.58	0.00623	6.80	1013.13	516.85		0.51			
Walker Run	1	2339		100 year storm	1640.00		653.24	659.26	
659.29	0.00036	1.65	1335.67	503.26		0.13			
Walker Run	1	2339		500 year storm	3600.00		653.24	660.16	
660.24	0.00078	2.72	1878.74	658.75		0.20			
Walker Run	1	2274		100 year storm	1640.00		651.42	658.64	658.64
659.17	0.00981	8.18	438.59	387.16		0.61			
Walker Run	1	2274		500 year storm	3600.00		651.42	659.48	659.48
660.06	0.01204	9.93	820.04	523.00		0.69			
Walker Run	1	2139		100 year storm	1640.00		650.72	657.33	656.10
657.40	0.00214	3.38	865.59	549.99		0.27			
Walker Run	1	2139		500 year storm	3600.00		650.72	658.46	656.87
658.56	0.00217	3.93	1597.04	728.42		0.28			
Walker Run	1	2010		100 year storm	1640.00		652.24	657.20	
657.22	0.00085	2.13	1485.30	966.77		0.19			
Walker Run	1	2010		500 year storm	3600.00		652.24	658.36	
658.39	0.00072	2.33	2731.39	1181.03		0.18			
Walker Run	1	1925		100 year storm	1640.00		651.09	657.14	
657.16	0.00059	1.77	1640.90	847.24		0.15			
Walker Run	1	1925		500 year storm	3600.00		651.09	658.30	
658.33	0.00064	2.15	2655.22	895.44		0.16			
Walker Run	2	1602		100 year storm	1860.00		650.67	656.98	
656.99	0.00045	1.46	2515.34	1080.54		0.11			
Walker Run	2	1602		500 year storm	3100.00		650.67	658.16	
658.18	0.00034	1.45	3865.33	1187.88		0.10			
Walker Run	2	1402		100 year storm	1860.00		649.80	656.88	
656.89	0.00050	1.59	2023.17	686.83		0.11			
Walker Run	2	1402		500 year storm	3100.00		649.80	658.07	
658.09	0.00048	1.74	2866.66	722.58		0.11			
Walker Run	2	1208		100 year storm	1860.00		650.74	656.74	
656.77	0.00085	2.30	1443.04	456.81		0.17			
Walker Run	2	1208		500 year storm	3100.00		650.74	657.92	
657.97	0.00096	2.77	2032.89	539.64		0.19			

Walker Run	2	990		100 year storm	1860.00		649.47	656.54	
656.57	0.00096	2.28	1455.12	511.53		0.17			
Walker Run	2	990		500 year storm	3100.00		649.47	657.72	
657.76	0.00091	2.51	2071.98	533.88		0.17			
Walker Run	2	933		100 year storm	1860.00		649.74	656.25	
656.46	0.00328	5.59	724.81	282.76		0.40			
Walker Run	2	933		500 year storm	3100.00		649.74	657.40	
657.65	0.00345	6.44	1097.15	366.27		0.43			
Walker Run	2	884		100 year storm	1860.00		648.62	656.05	654.99
656.25	0.00581	6.24	688.16	292.08		0.46			
Walker Run	2	884		500 year storm	3100.00		648.62	657.23	655.62
657.44	0.00503	6.59	1066.49	347.54		0.44			
Walker Run	2	875			Culvert				
Walker Run	2	863		100 year storm	1860.00		648.96	656.03	654.48
656.18	0.00295	4.92	834.23	302.32		0.37			
Walker Run	2	863		500 year storm	3100.00		648.96	657.20	655.13
657.38	0.00300	5.63	1217.61	351.16		0.38			
Walker Run	2	715		100 year storm	1860.00		647.90	655.76	
655.83	0.00146	3.85	1105.10	357.68		0.25			
Walker Run	2	715		500 year storm	3100.00		647.90	656.91	
657.01	0.00165	4.53	1555.58	417.70		0.28			
Walker Run	2	536		100 year storm	1860.00		646.97	655.51	
655.59	0.00130	3.79	1093.64	305.51		0.24			
Walker Run	2	536		500 year storm	3100.00		646.97	656.59	
656.71	0.00169	4.72	1445.07	343.92		0.28			
Walker Run	2	428		100 year storm	1860.00		647.24	655.36	
655.46	0.00117	3.69	1054.59	319.53		0.25			
Walker Run	2	428		500 year storm	3100.00		647.24	656.39	
656.54	0.00156	4.67	1404.69	357.75		0.29			
Walker Run	2	350		100 year storm	1860.00		647.08	655.30	
655.36	0.00086	3.11	1238.61	301.02		0.20			
Walker Run	2	350		500 year storm	3100.00		647.08	656.31	
656.40	0.00126	4.09	1551.32	317.24		0.25			
Walker Run	2	185		100 year storm	1860.00		646.40	655.12	
655.19	0.00098	3.48	1120.00	264.17		0.22			
Walker Run	2	185		500 year storm	3100.00		646.40	656.02	
656.15	0.00155	4.71	1367.68	282.18		0.28			
Walker Run	2	147		100 year storm	1860.00		646.74	654.82	
655.10	0.00331	5.97	625.03	191.48		0.41			
Walker Run	2	147		500 year storm	3100.00		646.74	655.49	
655.99	0.00558	8.25	771.06	243.67		0.53			
Walker Run	2	011		100 year storm	1860.00		645.71	654.70	652.67
654.78	0.00116	3.86	1161.07	382.56		0.24			
Walker Run	2	011		500 year storm	3100.00		645.71	655.30	652.96
655.44	0.00207	5.39	1402.37	430.41		0.32			
Walker Run	2	-10			Bridge				
Walker Run	2	-30		100 year storm	1860.00		644.46	653.53	652.28
654.02	0.00480	7.39	546.58	255.23		0.47			
Walker Run	2	-30		500 year storm	3100.00		644.46	654.90	653.73

655.32	0.00413	7.66	980.02	384.37		0.45			
Walker Run	2	-78		100 year storm	1860.00		645.43	653.52	
653.63	0.00158	3.92	1007.20	312.39		0.27			
Walker Run	2	-78		500 year storm	3100.00		645.43	654.87	
655.00	0.00160	4.48	1431.20	314.50		0.28			
Walker Run	2	-154		100 year storm	1860.00		644.90	653.37	
653.49	0.00197	4.45	858.83	216.03		0.29			
Walker Run	2	-154		500 year storm	3100.00		644.90	654.68	
654.85	0.00231	5.36	1150.66	253.36		0.32			
Walker Run	2	-255		100 year storm	1860.00		645.74	653.29	650.73
653.35	0.00149	3.72	1114.02	299.31		0.26			
Walker Run	2	-255		500 year storm	3100.00		645.74	654.60	651.23
654.68	0.00162	4.37	1521.10	321.15		0.27			
Tributary	1	6850		100 year storm	303.50		709.19	711.95	711.95
712.55	0.05765	6.42	49.26	40.97		0.85			
Tributary	1	6850		500 year storm	615.69		709.19	712.72	712.72
713.53	0.04633	7.33	85.46	52.94		0.81			
Tributary	1	5930		100 year storm	303.50		692.00	695.49	694.41
695.55	0.00238	1.91	155.41	105.67		0.19			
Tributary	1	5930		500 year storm	615.69		692.00	696.21	694.97
696.32	0.00284	2.39	237.78	121.05		0.21			
Tributary	1	5500		100 year storm	303.50		691.00	692.04	692.04
692.52	0.08834	5.60	54.57	56.50		0.98			
Tributary	1	5500		500 year storm	615.69		691.00	693.23	
693.61	0.02428	4.90	125.00	62.13		0.58			
Tributary	1	4750		100 year storm	303.50		684.00	686.28	684.86
686.32	0.00277	1.52	200.10	105.21		0.19			
Tributary	1	4750		500 year storm	615.69		684.00	686.89	
686.97	0.00454	2.33	265.88	110.85		0.26			
Tributary	1	4530		100 year storm	303.50		684.00	686.03	686.03
686.04	0.00066	0.73	415.50	219.53		0.09			
Tributary	1	4530		500 year storm	615.69		684.00	686.37	686.02
686.39	0.00157	1.26	489.93	222.97		0.15			
Tributary	1	4528			Culvert				
Tributary	1	4500		100 year storm	303.50		683.30	684.80	684.80
685.52	0.07709	6.59	45.01	146.10		0.97			
Tributary	1	4500		500 year storm	615.69		683.30	685.00	685.00
685.13	0.00406	1.65	226.99	148.77		0.23			
Tributary	1	4400		100 year storm	303.50		675.78	678.48	678.60
679.05	0.05829	5.88	50.39	66.08		0.70			
Tributary	1	4400		500 year storm	615.69		675.78	678.28	679.12
682.54	0.58711	17.46	37.31	62.22		2.20			
Tributary	1	3356		100 year storm	303.50		667.67	671.01	671.01
671.02	0.00152	1.99	514.13	604.14		0.21			
Tributary	1	3356		500 year storm	615.69		667.67	671.09	671.02
671.12	0.00484	3.62	560.74	609.00		0.38			
Tributary	1	3306.66*		100 year storm	303.50		667.39	670.21	670.03
670.28	0.00775	4.18	251.04	441.91		0.49			
Tributary	1	3306.66*		500 year storm	615.69		667.39	670.62	
670.69	0.00689	4.42	449.13	511.66		0.48			

Tributary	1	3257.33*		100 year storm		303.50	667.11	669.64
669.72	0.00806	4.06	237.96	364.42		0.51		
Tributary	1	3257.33*		500 year storm		615.69	667.11	670.09
670.16	0.00730	4.42	405.46	389.19		0.50		
Tributary	1	3208.*		100 year storm		303.50	666.83	669.08
669.15	0.00799	3.75	231.10	320.68		0.50		
Tributary	1	3208.*		500 year storm		615.69	666.83	669.56
669.63	0.00714	4.17	388.38	337.34		0.49		
Tributary	1	3158.66*		100 year storm		303.50	666.56	668.54
668.59	0.00764	3.34	225.97	281.34		0.48		
Tributary	1	3158.66*		500 year storm		615.69	666.56	669.06
669.12	0.00672	3.83	377.58	298.47		0.48		
Tributary	1	3109.33*		100 year storm		303.50	666.28	668.02
668.06	0.00694	2.89	223.02	246.69		0.45		
Tributary	1	3109.33*		500 year storm		615.69	666.28	668.59
668.65	0.00610	3.47	370.05	264.40		0.45		
Tributary	1	3060		100 year storm		303.50	666.00	667.57
667.60	0.00552	2.40	227.77	216.44		0.39		
Tributary	1	3060		500 year storm		615.69	666.00	668.17
668.23	0.00545	3.15	362.62	233.34		0.42		
Tributary	1	3014.8*		100 year storm		303.50	665.78	667.36
667.39	0.00563	2.47	225.54	211.79		0.40		
Tributary	1	3014.8*		500 year storm		615.69	665.78	667.95
668.01	0.00564	3.24	357.75	229.16		0.43		
Tributary	1	2969.6*		100 year storm		303.50	665.56	667.13
667.17	0.00583	2.55	222.80	209.62		0.41		
Tributary	1	2969.6*		500 year storm		615.69	665.56	667.73
667.79	0.00588	3.34	353.55	227.55		0.44		
Tributary	1	2924.4*		100 year storm		303.50	665.33	666.91
666.95	0.00596	2.59	222.79	211.11		0.41		
Tributary	1	2924.4*		500 year storm		615.69	665.33	667.51
667.56	0.00600	3.38	353.99	228.88		0.44		
Tributary	1	2879.2*		100 year storm		303.50	665.11	666.69
666.72	0.00582	2.57	228.20	216.04		0.40		
Tributary	1	2879.2*		500 year storm		615.69	665.11	667.29
667.34	0.00580	3.32	365.59	242.12		0.43		
Tributary	1	2834		100 year storm		303.50	664.89	666.50
666.52	0.00463	2.29	261.55	245.39		0.35		
Tributary	1	2834		500 year storm		615.69	664.89	667.11
667.14	0.00460	2.94	419.87	275.01		0.38		
Tributary	1	2770.5*		100 year storm		303.50	664.27	666.17
666.19	0.00484	2.67	251.98	237.92		0.37		
Tributary	1	2770.5*		500 year storm		615.69	664.27	666.77
666.82	0.00485	3.32	406.26	270.23		0.40		
Tributary	1	2707.*		100 year storm		303.50	663.64	665.81
665.85	0.00513	3.04	241.39	230.78		0.40		
Tributary	1	2707.*		500 year storm		615.69	663.64	666.41
666.47	0.00517	3.69	391.13	264.71		0.42		
Tributary	1	2643.5*		100 year storm		303.50	663.02	665.42
665.47	0.00562	3.44	227.36	224.12		0.42		
Tributary	1	2643.5*		500 year storm		615.69	663.02	666.03
666.09	0.00557	4.07	373.06	257.73		0.44		
Tributary	1	2580.*		100 year storm		303.50	662.40	665.00

665.07	0.00609	3.79	211.80	214.25		0.45			
Tributary	1	2580.*		500 year storm	615.69		662.40	665.61	
665.69	0.00610	4.45	352.78	251.20		0.47			
Tributary	1	2516.5*		100 year storm	303.50		661.77	664.53	
664.62	0.00686	4.18	193.44	203.87		0.48			
Tributary	1	2516.5*		500 year storm	615.69		661.77	665.13	
665.23	0.00696	4.89	329.44	246.88		0.50			
Tributary	1	2453.*		100 year storm	303.50		661.15	663.97	
664.09	0.00833	4.66	172.56	186.06		0.53			
Tributary	1	2453.*		500 year storm	615.69		661.15	664.59	
664.72	0.00791	5.29	309.32	246.51		0.53			
Tributary	1	2389.5*		100 year storm	303.50		660.52	663.34	
663.47	0.00942	4.90	168.95	189.90		0.56			
Tributary	1	2389.5*		500 year storm	615.69		660.52	664.14	
664.24	0.00585	4.68	351.08	266.04		0.46			
Tributary	1	2326		100 year storm	303.50		659.90	663.14	
663.17	0.00207	2.54	310.65	225.12		0.27			
Tributary	1	2326		500 year storm	615.69		659.90	663.96	
664.00	0.00200	2.97	518.66	288.12		0.27			
Tributary	1	1658		100 year storm	303.50		657.96	661.60	
661.66	0.00247	3.03	253.83	196.62		0.30			
Tributary	1	1658		500 year storm	615.69		657.96	662.42	
662.49	0.00252	3.57	422.68	210.71		0.32			
Tributary	1	1360		100 year storm	303.50		658.00	659.91	659.74
660.16	0.01443	4.79	110.93	141.83		0.67			
Tributary	1	1360		500 year storm	615.69		658.00	660.25	660.25
660.73	0.02381	7.02	164.38	169.74		0.89			
Tributary	1	1281			Culvert				
Tributary	1	1252		100 year storm	303.50		656.64	659.13	658.71
659.35	0.02336	4.25	83.02	260.75		0.55			
Tributary	1	1252		500 year storm	615.69		656.64	659.57	659.25
659.61	0.00445	2.14	380.55	284.40		0.25			
Tributary	1	1222.6*		100 year storm	303.50		656.44	658.95	
658.97	0.00413	1.77	241.50	257.61		0.23			
Tributary	1	1222.6*		500 year storm	615.69		656.44	659.44	
659.48	0.00464	2.20	373.97	281.64		0.25			
Tributary	1	1193.2*		100 year storm	303.50		656.24	658.82	
658.85	0.00418	1.81	240.32	257.77		0.23			
Tributary	1	1193.2*		500 year storm	615.69		656.24	659.30	
659.34	0.00488	2.27	367.35	280.53		0.26			
Tributary	1	1163.8*		100 year storm	303.50		656.05	658.70	
658.73	0.00423	1.84	238.38	257.16		0.23			
Tributary	1	1163.8*		500 year storm	615.69		656.05	659.15	
659.19	0.00526	2.36	357.55	279.44		0.27			
Tributary	1	1134.4*		100 year storm	303.50		655.85	658.58	
658.61	0.00426	1.87	236.59	255.25		0.24			
Tributary	1	1134.4*		500 year storm	615.69		655.85	658.98	
659.03	0.00586	2.49	343.55	277.02		0.29			
Tributary	1	1105		100 year storm	303.50		655.65	658.45	
658.48	0.00434	1.91	235.54	251.50		0.24			
Tributary	1	1105		500 year storm	615.69		655.65	658.78	
658.84	0.00727	2.74	320.88	271.36		0.32			

Tributary	1	810		100 year storm	303.50		653.84	657.29
657.31	0.00358	1.83	313.52	483.02		0.21		
Tributary	1	810		500 year storm	615.69		653.84	658.29
658.30	0.00078	1.08	871.58	603.13		0.10		
Tributary	1	587		100 year storm	303.50		653.78	657.03
657.04	0.00059	0.81	556.34	528.20		0.09		
Tributary	1	587		500 year storm	615.69		653.78	658.21
658.21	0.00023	0.65	1298.48	706.29		0.06		
Tributary	1	463		100 year storm	303.50		653.23	657.02
657.02	0.00007	0.30	1281.40	776.36		0.03		
Tributary	1	463		500 year storm	615.69		653.23	658.20
658.20	0.00005	0.33	2331.59	973.00		0.03		
Tributary	1	357		100 year storm	303.50		652.40	657.01
657.01	0.00002	0.20	2268.67	1143.99		0.02		
Tributary	1	357		500 year storm	615.69		652.40	658.19
658.19	0.00002	0.22	3658.26	1203.42		0.02		
Tributary	1	183		100 year storm	303.50		652.14	657.01
657.01	0.00001	0.15	2669.07	1134.99		0.01		
Tributary	1	183		500 year storm	615.69		652.14	658.19
658.19	0.00001	0.19	4082.09	1242.80		0.01		

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : LSI Existing

River: Tributary Reach: 1 RS: 6850 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 5930 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 5930 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 5500 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 5500 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4530 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm
Warning:During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of
energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm Culv: Culvert #1
Warning:During the culvert inlet control computations, the program could not balance the culvert/weir flow. The reported
inlet energy grade answer may not be valid.
Warning:During the culvert outlet control computations, the program could not balance the culvert/weir flow. The reported
outlet energy grade answer may not be valid.
River: Tributary Reach: 1 RS: 4500 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4500 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4400 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4400 Profile: 500 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 3356 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: Tributary Reach: 1 RS: 3356 Profile: 500 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3306.66* Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3306.66* Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
River: Tributary Reach: 1 RS: 2389.5* Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 2389.5* Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 2326 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 2326 Profile: 500 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1658 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1658 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1360 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 1360 Profile: 500 year storm
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 1281 Profile: 500 year storm
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 1252 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 1105 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1105 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 810 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 810 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 357 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Tributary Reach: 1 RS: 183 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 5862 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 5862 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 5547 Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5547 Profile: 500 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5282 Profile: 100 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5282 Profile: 500 year storm
Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
whose main channel velocity head was the closest to the previously computed cross section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm Upstream
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 500 year storm Upstream
Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
whose main channel velocity head was the closest to the previously computed cross section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 500 year storm Downstream
Warning:Multiple water surfaces were found that could balance the energy equation. The program selected the water surface
whose main channel velocity head was the closest to the previously computed cross section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest,

valid, energy was used.
River: Walker Run Reach: 1 RS: 5107 Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5107 Profile: 500 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 4995 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4810 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 4735 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4735 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4043 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3972 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3972 Profile: 500 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm
Warning:The sluice gate calculations did not converge during the pressure flow only calculation.
Note: The weir over a bridge is submerged, the energy answer was used.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm Downstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm
Warning:The pressure flow/weir flow answer did not converge within the given number of iterations. However, the error was
small enough that the solution was treated as valid.
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface is based on critical depth over the
weir. The energy has been projected.
Note: Multiple critical depths were found at this location. The critical depth with the lowest,

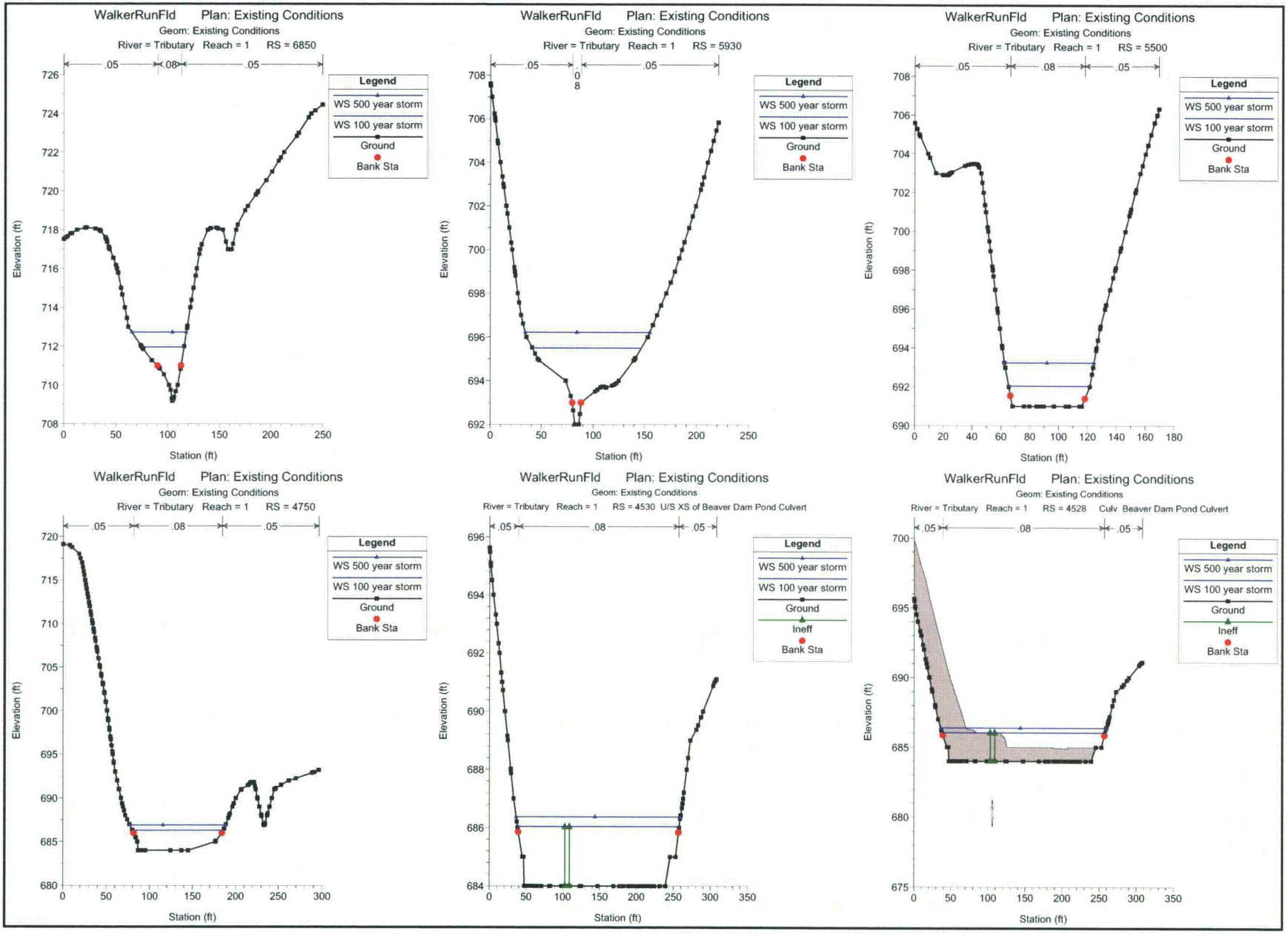
valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3785 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 3785 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3735 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3735 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3532 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.

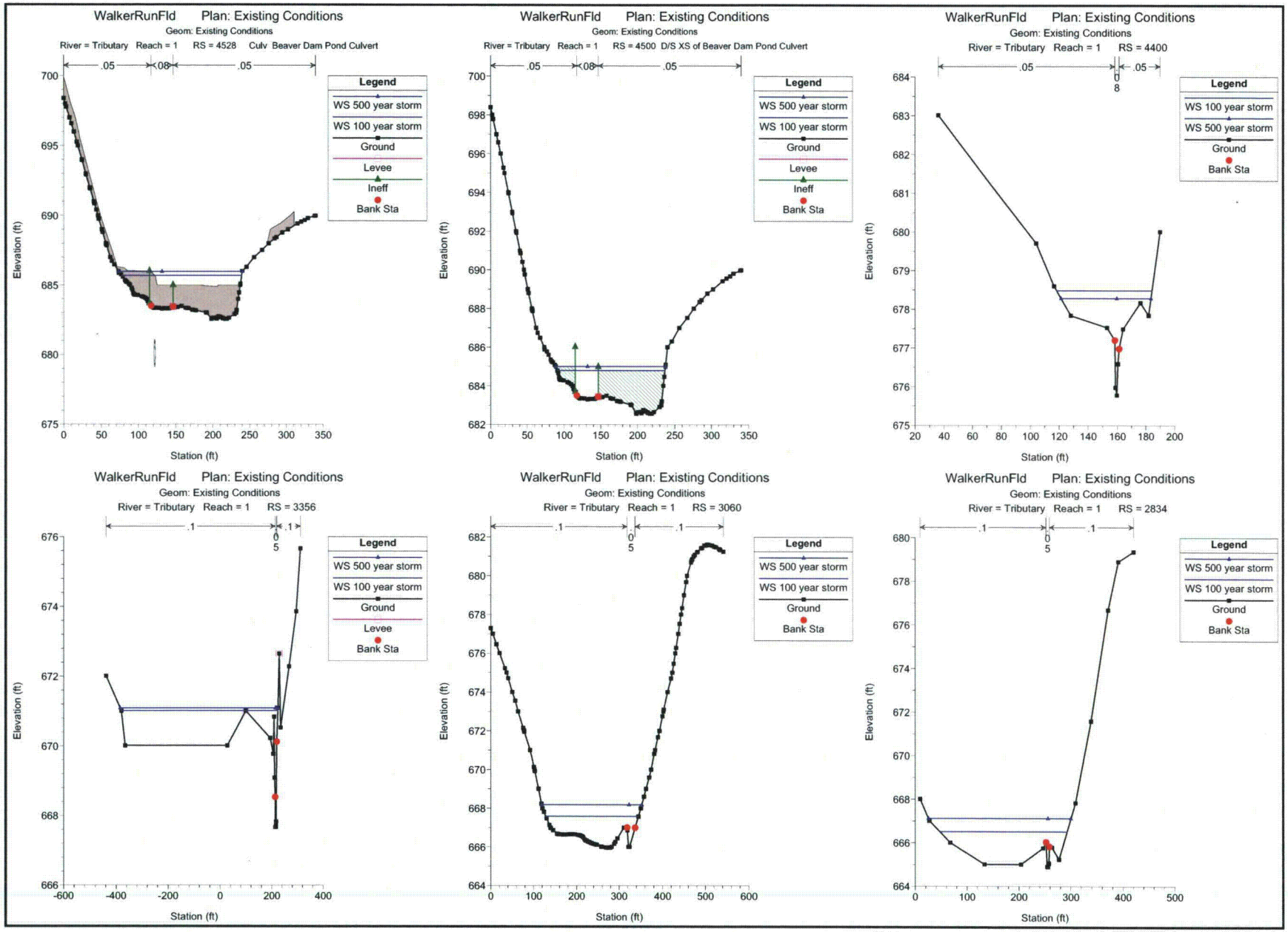
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 3532 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3410 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3410 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 3375 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3375 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3278 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 3278 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3065 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3065 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2949 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2730 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2634 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2634 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2480 Profile: 100 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 2480 Profile: 100 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy

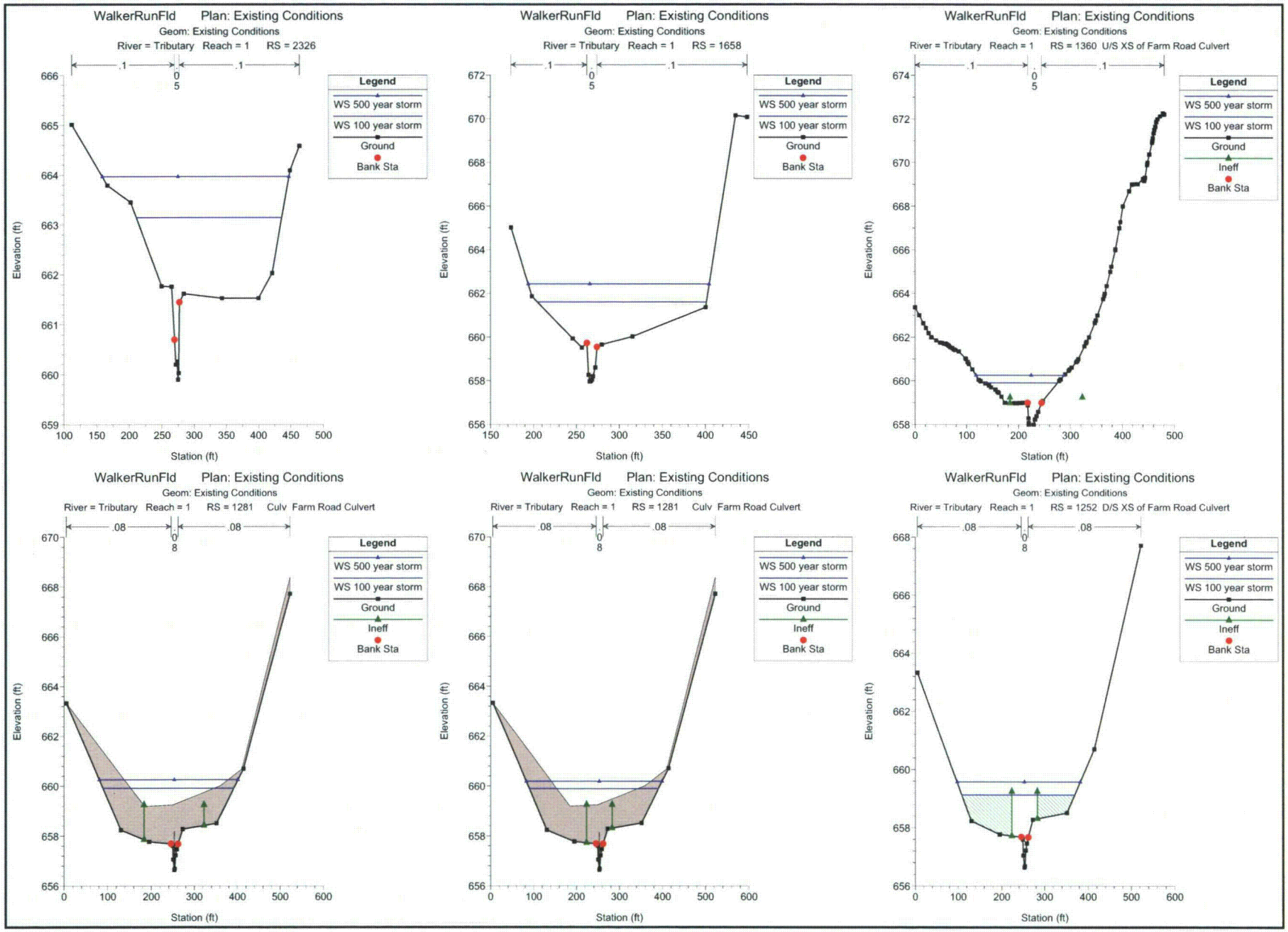
have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: 100 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical
depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: 500 year storm
Warning:The pressure flow/weir flow answer did not converge within the given number of iterations. However, the error was
small enough that the solution was treated as valid.
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 2480 Profile: 500 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2480 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical
depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 2462 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2462 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2339 Profile: 100 year storm
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2339 Profile: 500 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2274 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 2274 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

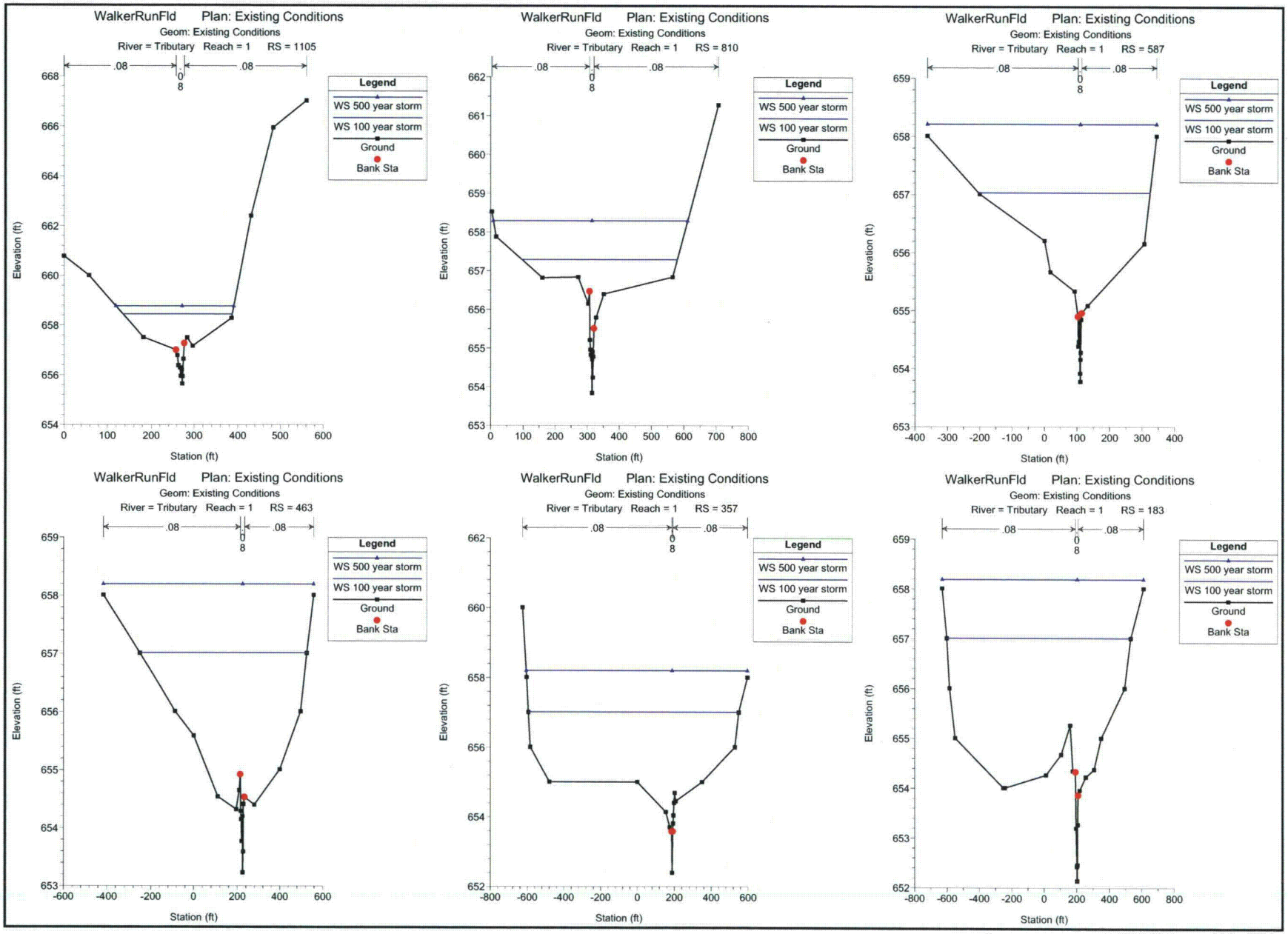
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 2139 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 2139 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 1925 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 1602 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 1402 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 990 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 990 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 884 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: 884 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: 715 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 350 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 185 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 185 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 147 Profile: 100 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 147 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 011 Profile: 100 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: 011 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy

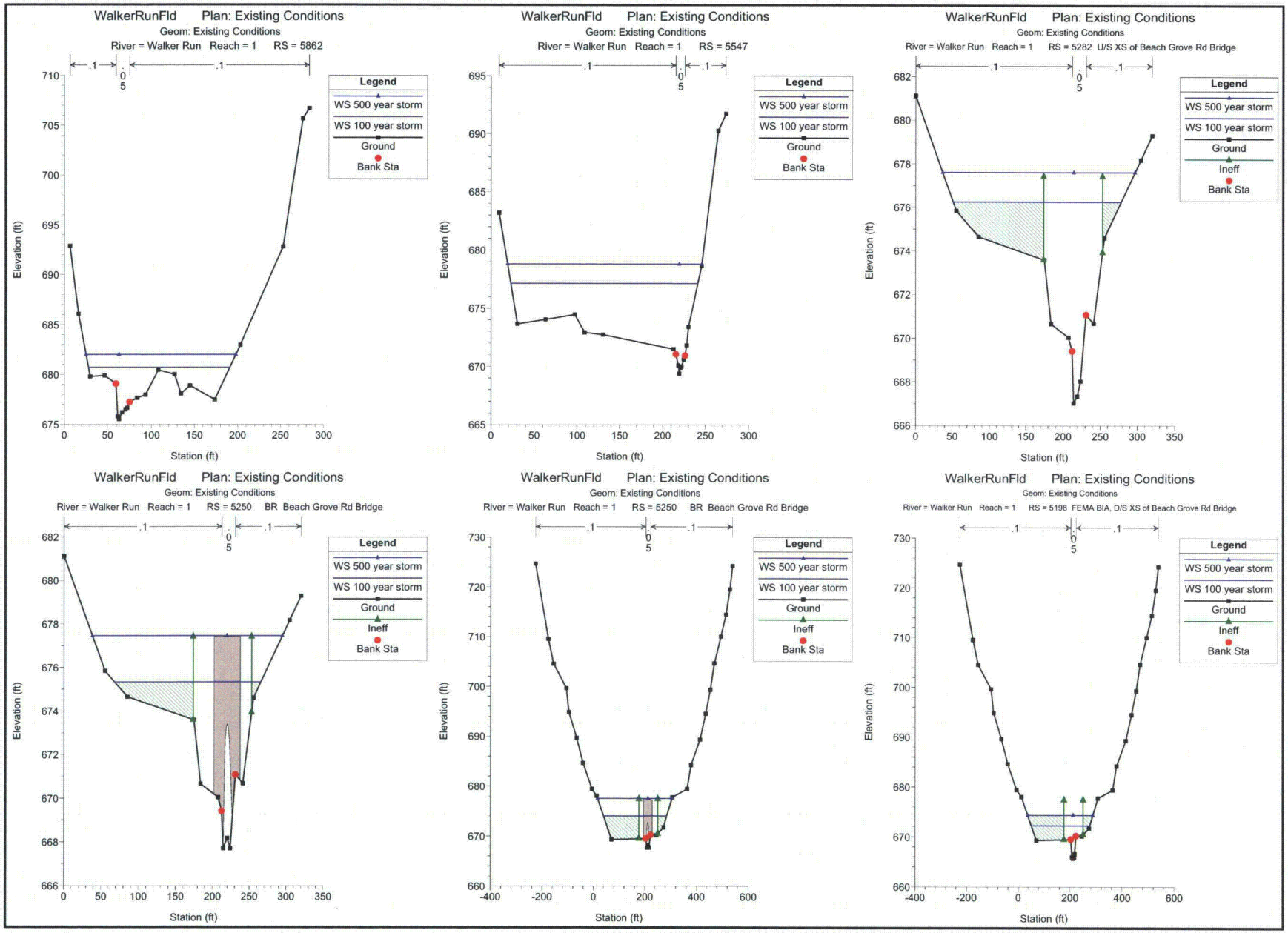
have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface is based on critical depth over the
weir. The energy has been projected.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from
the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: -78 Profile: 100 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: -78 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: -154 Profile: 100 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: -154 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.

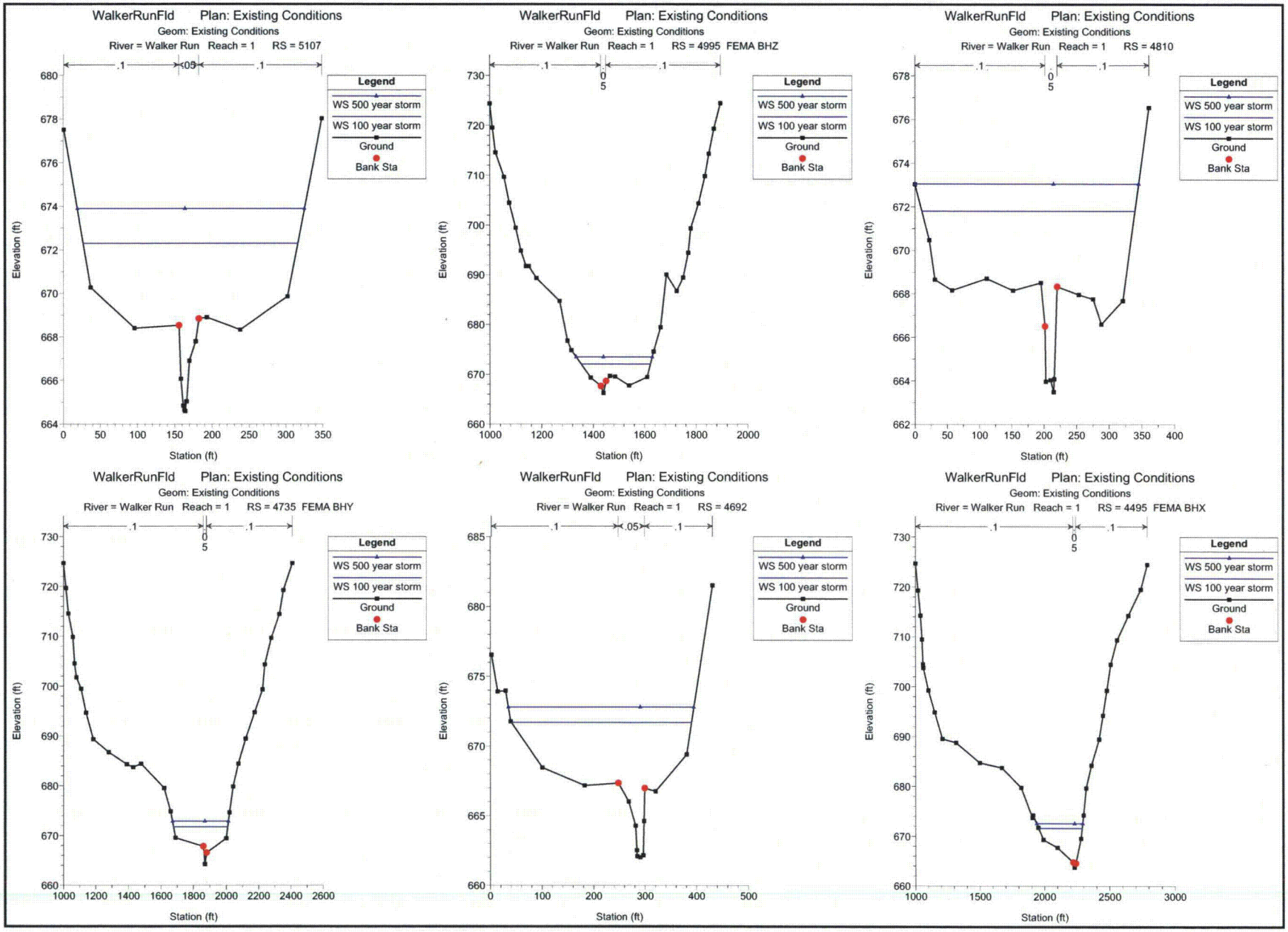

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 6850
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 5930
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 5500
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4750
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4530 U/S XS of Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4528 Culv Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

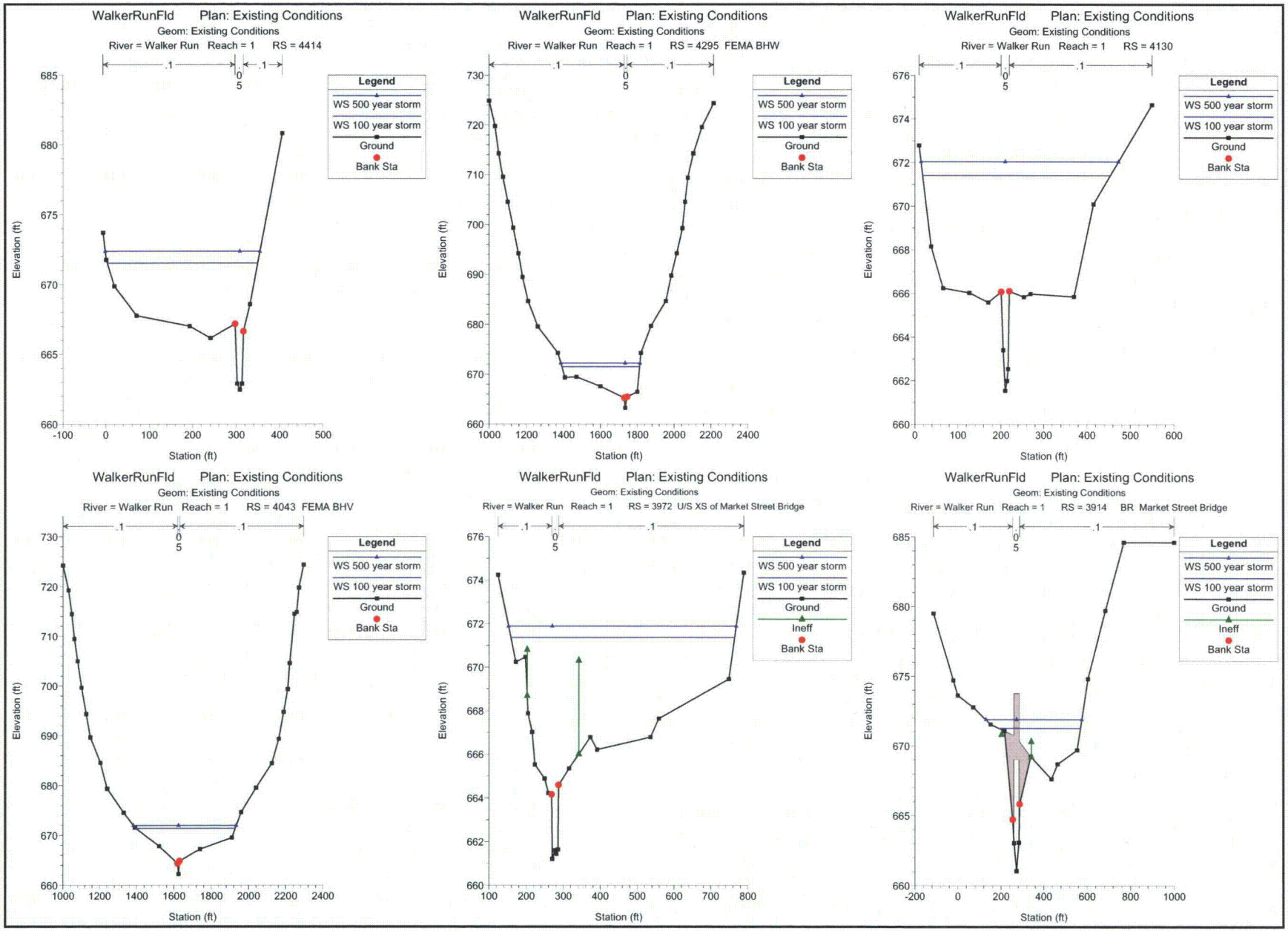

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4528 Culv Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4500 D/S XS of Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 4400
.05 .05
0
8
Legend
WS 100 year storm
WS 500 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 3356
.1 .1
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 3060
.1 .1
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 2834
.1 .1
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

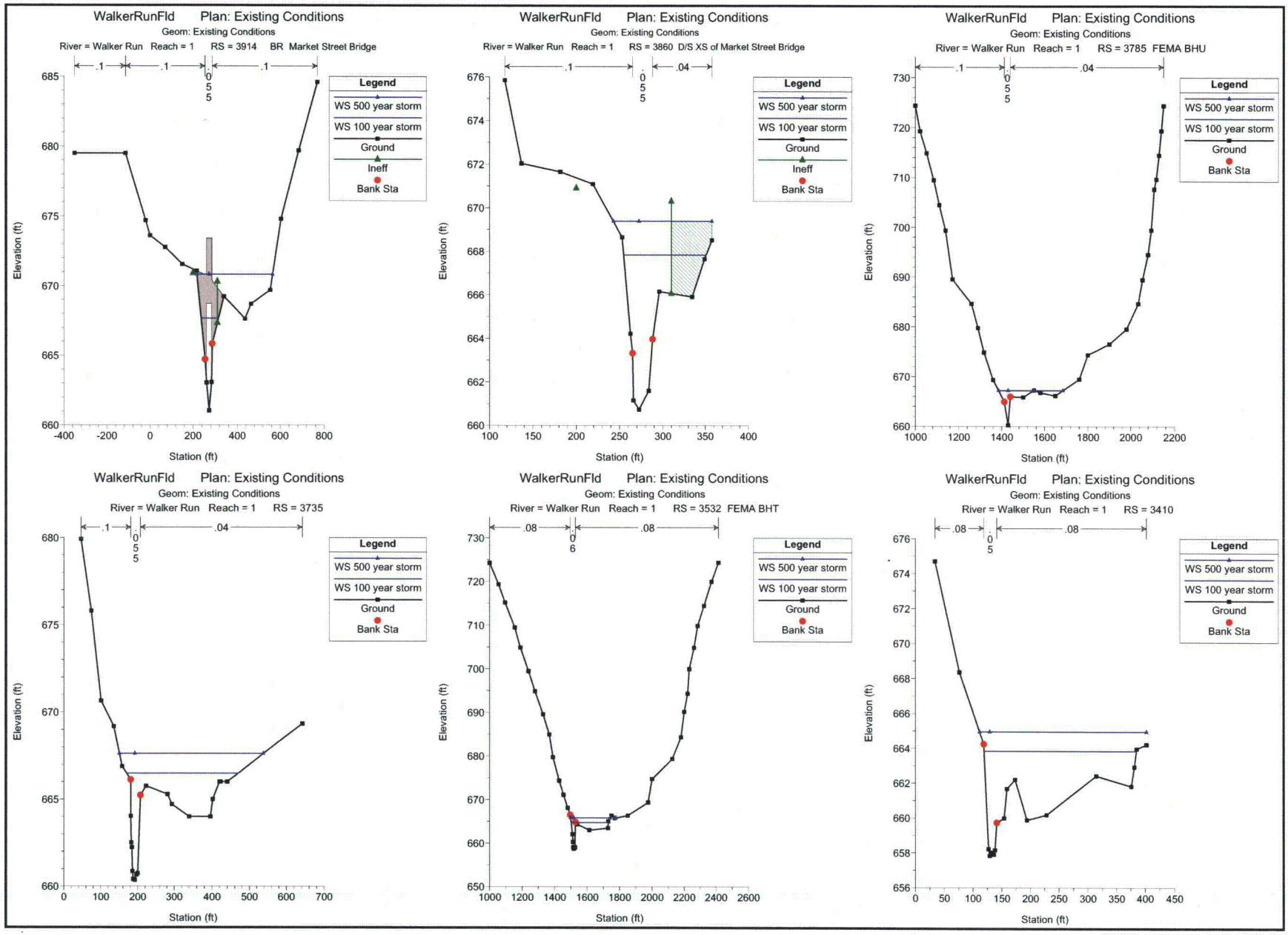

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 2326
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1658
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1360 U/S XS of Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1281 Culv Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1281 Culv Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1252 D/S XS of Farm Road Culvert
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

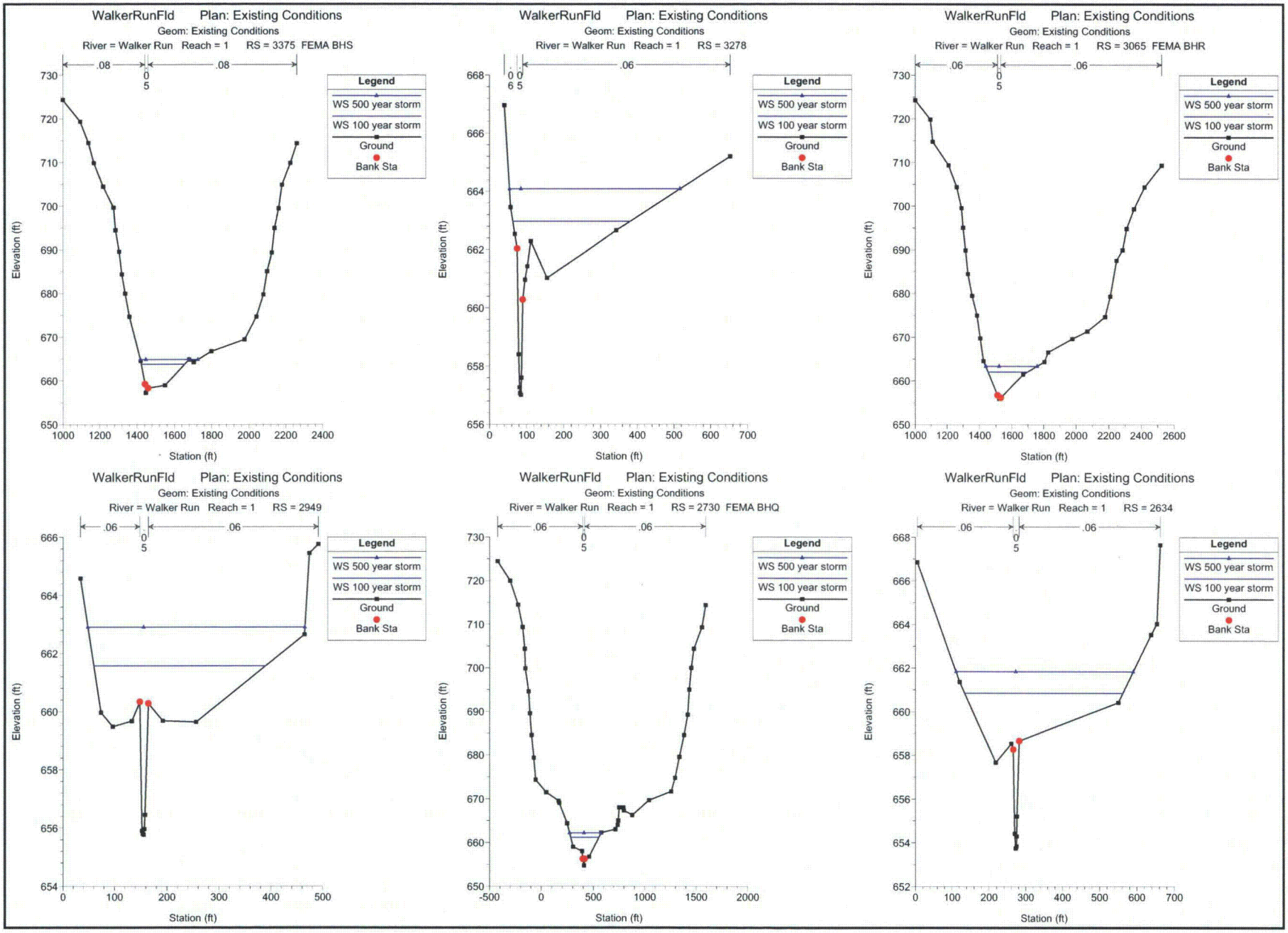

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 1105
.08
0
8
.08
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 810
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 587
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 463
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 357
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Tributary Reach = 1 RS = 183

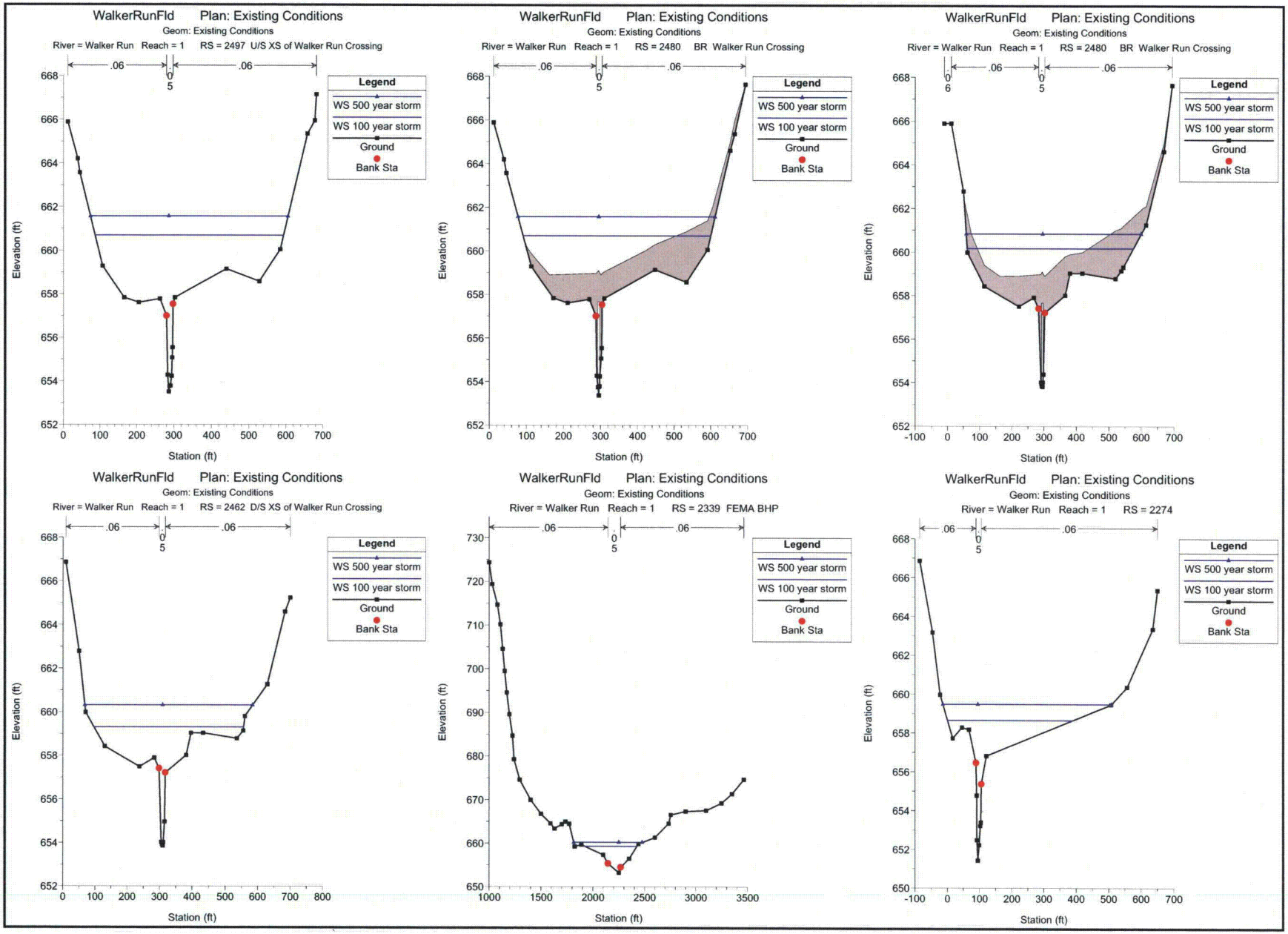

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5862
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5547
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5282 U/S XS of Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5250 BR Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5250 BR Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5198 FEMA BIA, D/S XS of Beach Grove Rd Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

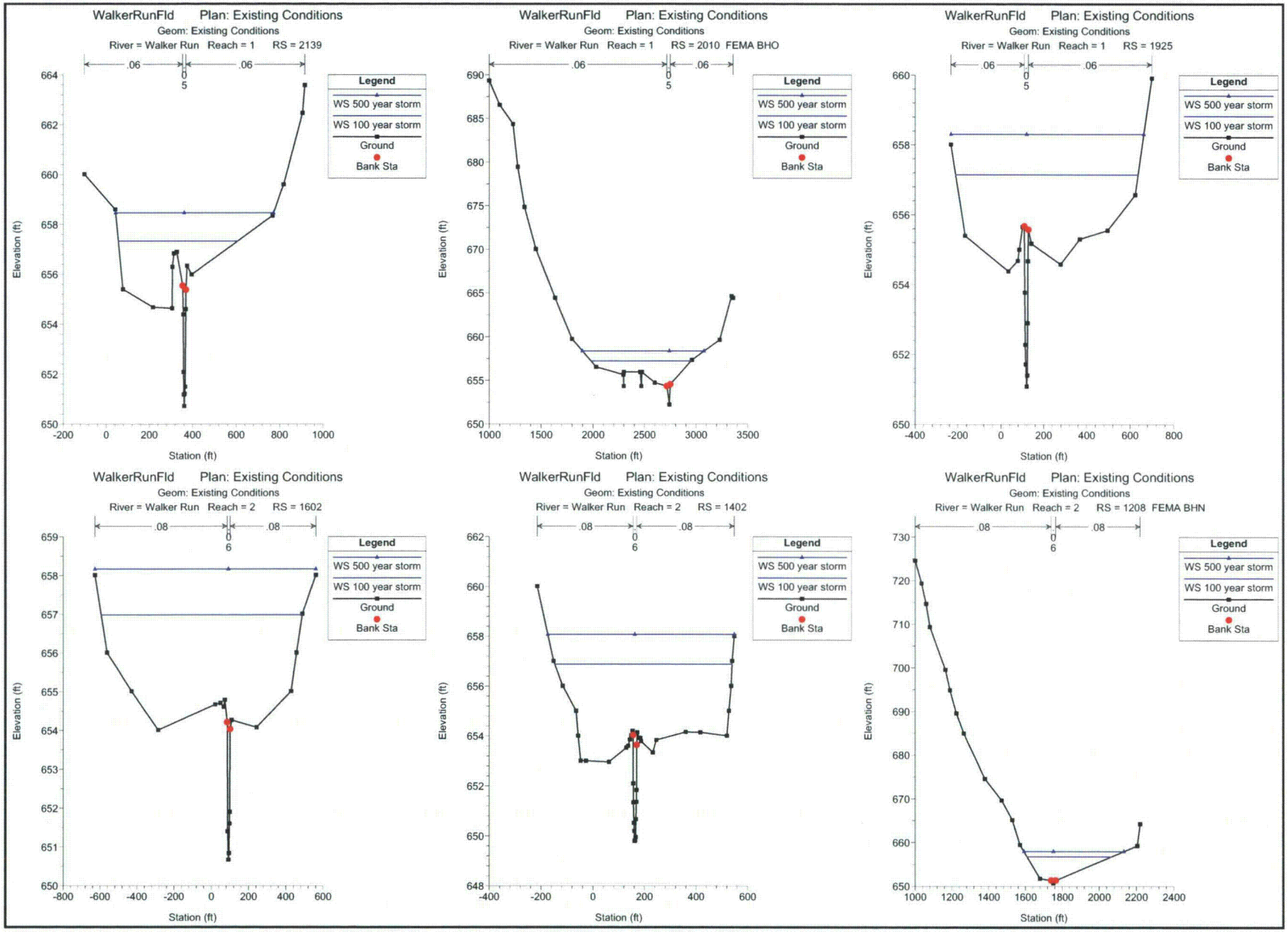

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 5107
.1
.05
.1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4995 FEMA BHZ
.1
0
5
.1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4810
.1
0
5
.1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4735 FEMA BHY
.1
0
5
.1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4692
.1
.05
.1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4495 FEMA BHX
.1
0
5
.1
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

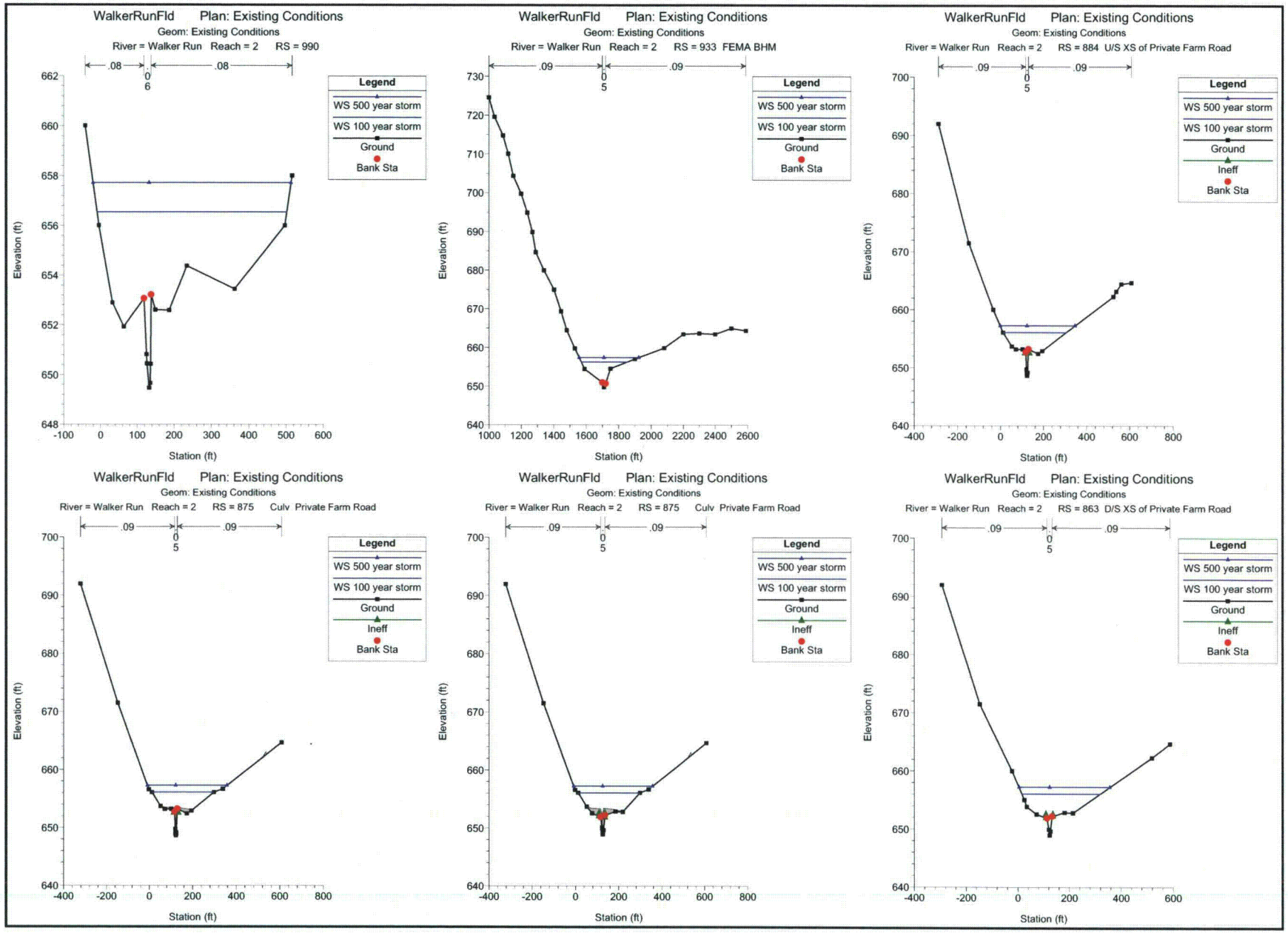

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4414
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4295 FEMA BHW
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4130
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 4043 FEMA BHV
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3972 U/S XS of Market Street Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3914 BR Market Street Bridge
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

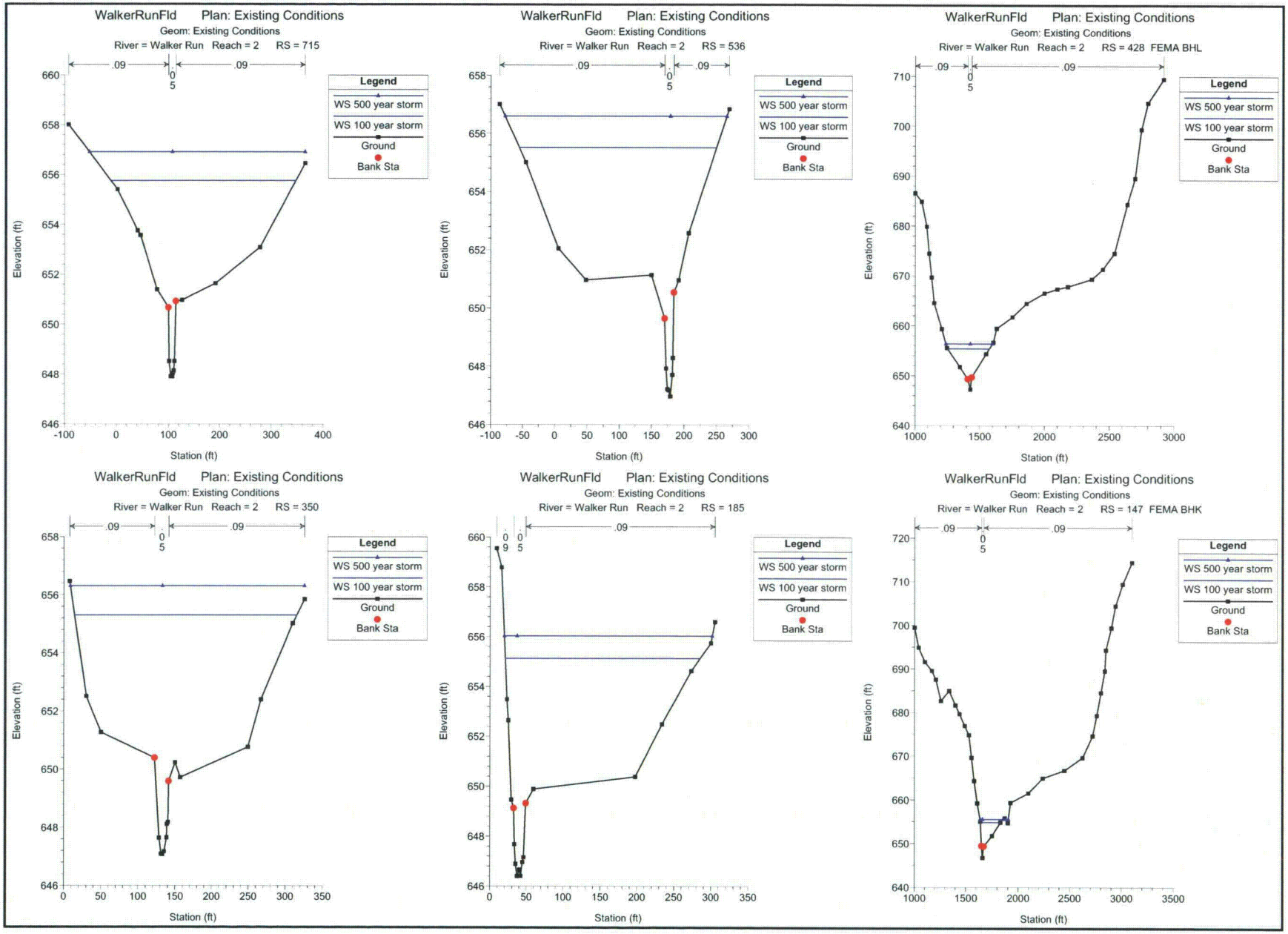

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3914 BR Market Street Bridge
.1 .1 .055 .1
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3860 D/S XS of Market Street Bridge
.1 .055 .04
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3785 FEMA BHU
.1 .055 .04
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3735
.1 .055 .04
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3532 FEMA BHT
.08 .06 .08
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3410
.08 .05 .08
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

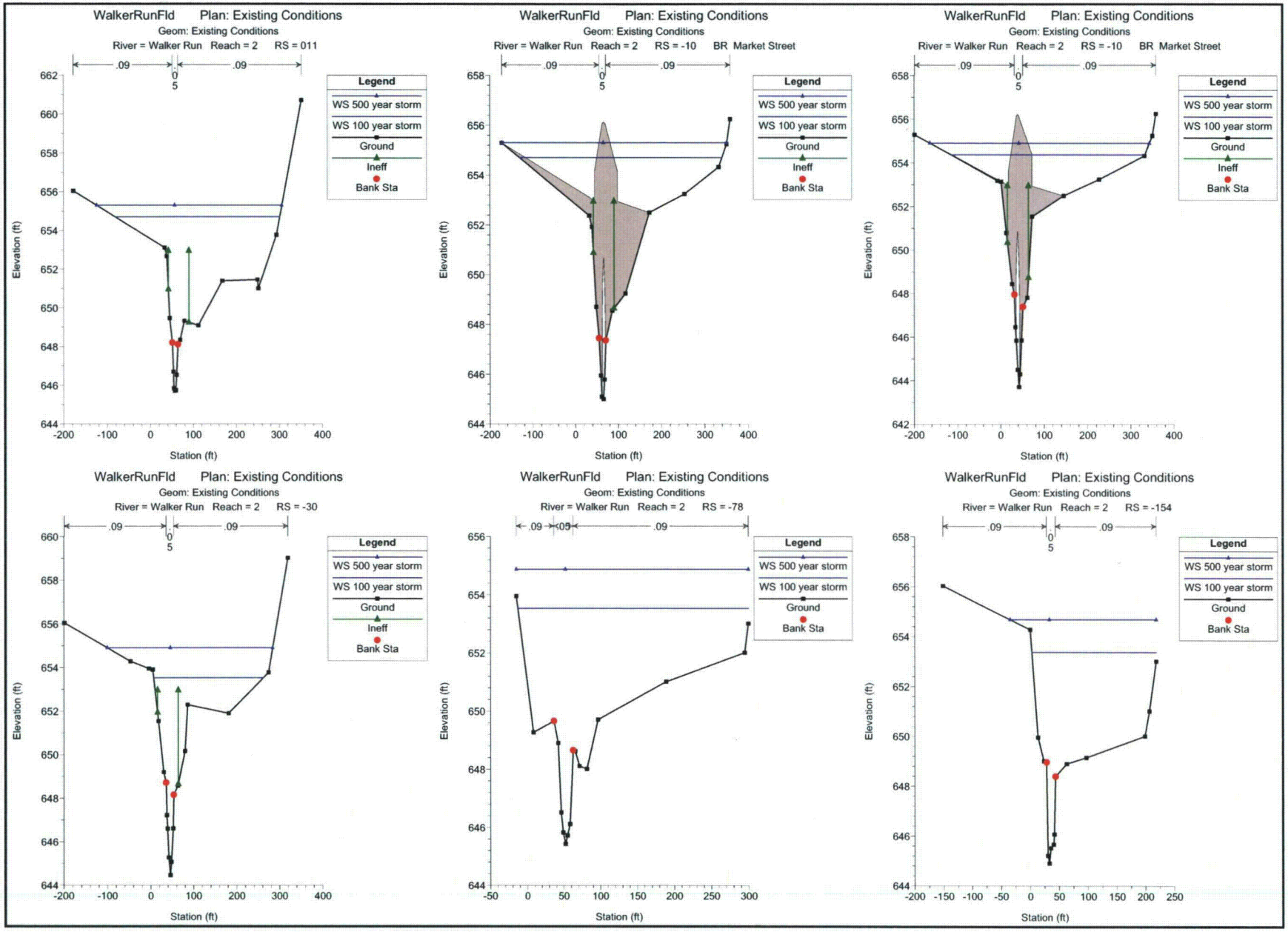

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3375 FEMA BHS
.08
.08
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3278
.06
0
6
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 3065 FEMA BHR
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2949
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2730 FEMA BHQ
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2634
.06
.06
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

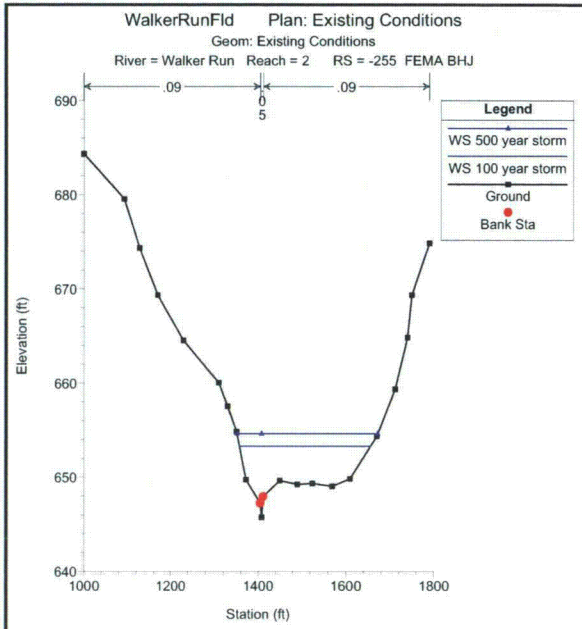

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2497 U/S XS of Walker Run Crossing
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2480 BR Walker Run Crossing
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2462 D/S XS of Walker Run Crossing
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2339 FEMA BHP
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2274
.06
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

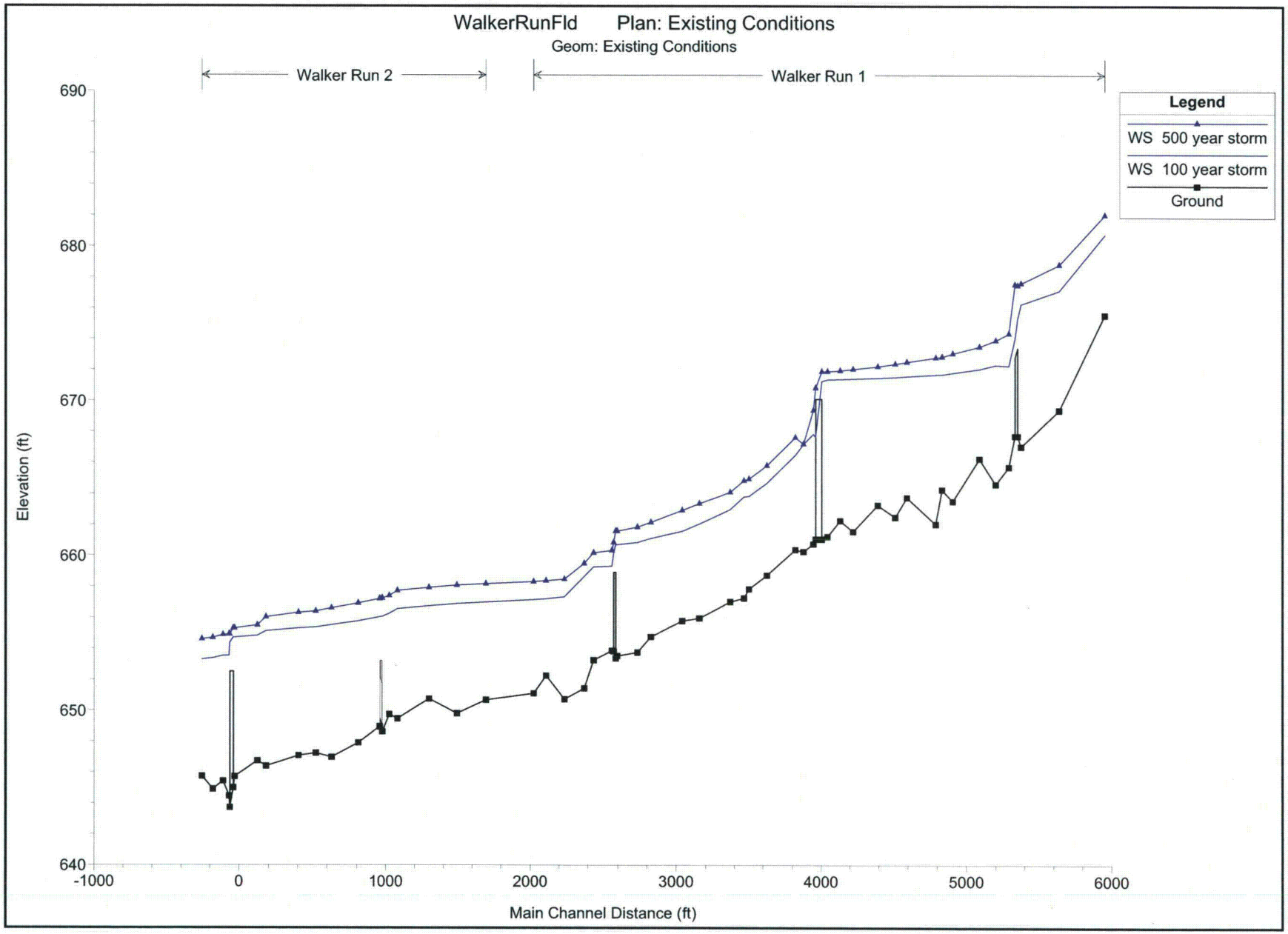

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2139
.06 .06
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 2010 FEMA BHO
.06 .06
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 1 RS = 1925
.06 .06
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 1602
.08 .08
0 6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 1402
.08 .08
0 6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 1208 FEMA BHN
.08 .08
0 6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

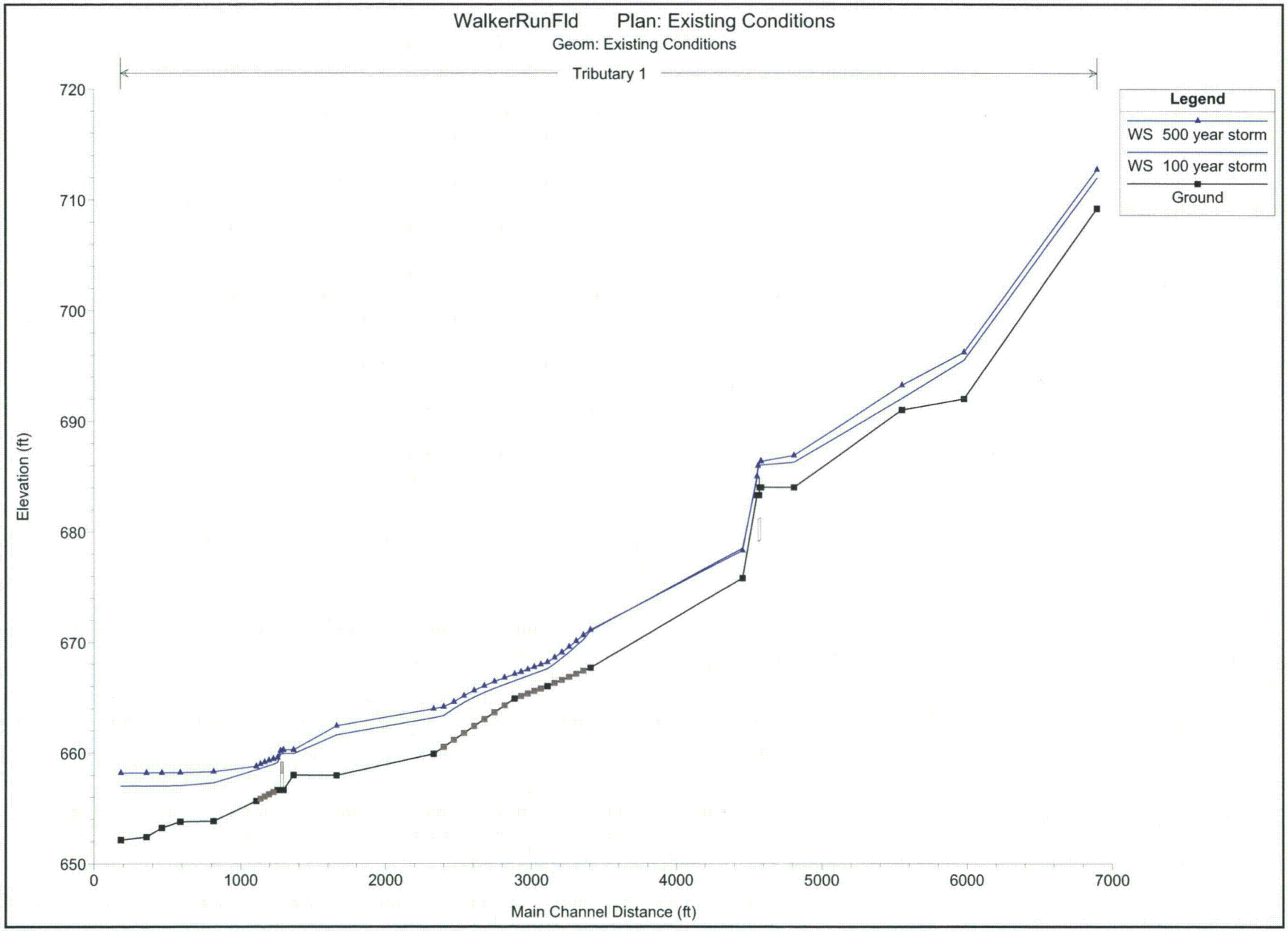

WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 990
.08 .08
0 6
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 933 FEMA BHM
.09 .09
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 884 U/S XS of Private Farm Road
.09 .09
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 875 Culv Private Farm Road
.09 .09
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 875 Culv Private Farm Road
.09 .09
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 863 D/S XS of Private Farm Road
.09 .09
0 5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 715
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 536
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 428 FEMA BHL
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 350
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 185
0
9
0
5
.09
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 147 FEMA BHK
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = 011
River = Walker Run Reach = 2 RS = -10 BR Market Street
River = Walker Run Reach = 2 RS = -30
River = Walker Run Reach = 2 RS = -78
River = Walker Run Reach = 2 RS = -154
.09
0
5
Legend
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
River = Walker Run Reach = 2 RS = -255 FEMA BHJ
.09
0
5
.09
Legend
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
690
680
670
660
650
640
1000
1200
1400
1600
1800
Station (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
Walker Run 2
Walker Run 1
Legend
WS 500 year storm
WS 100 year storm
Ground
Elevation (ft)
690
680
670
660
650
640
-1000
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)


WalkerRunFld Plan: Existing Conditions
Geom: Existing Conditions
Tributary 1
Legend
WS 500 year storm
WS 100 year storm
Ground
Elevation (ft)
720
710
700
690
680
670
660
650
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)

Appendix F:
Proposed Hydraulics
(Revised Conditions Model)

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
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PROJECT DATA
Project Title: WalkerRunFld
Project File : WalkerRunFld.prj
Run Date and Time: 12/8/2010 3:16:02 PM

Project in English units

PLAN DATA

Plan Title: Proposed Conditions
Plan File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.p09

Geometry Title: Proposed Conditions
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.g07

Flow Title : Existing Conditions
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.f03

Plan Summary Information:
Number of: Cross Sections = 88 Multiple Openings = 0
Culverts = 2 Inline Structures = 0
Bridges = 8 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Walker Run Reach = 1

RS	Profile	Method	Value1	Value2
5862	100 year storm	encroachment	1	50 108.12
5547	100 year storm	encroachment	1	130.75 226.17
5282	100 year storm	encroachment	1	182.76 244
5198	100 year storm	encroachment	1	176.89 249.89
5107	100 year storm	encroachment	1	120 221
4995	100 year storm	encroachment	1	1383 1505
4810	100 year storm	encroachment	1	70.73 245.06
4735	100 year storm	encroachment	1	1700.14 1990.13
4692	100 year storm	encroachment	1	100.41 364.89
4495	100 year storm	encroachment	1	2041.17 2191.82
4414	100 year storm	encroachment	1	105.71 274.29
4295	100 year storm	encroachment	1	1531.78 1800

					WalkerRunFld
4130	100 year storm encroachment	1	65.97	269.33
4043	100 year storm encroachment	1	1565	1720
3972	100 year storm encroachment	1	197.75	375
3860	100 year storm encroachment	1	261	285
3785	100 year storm encroachment	1	1413.78	1470
3735	100 year storm encroachment	1	167.57	270
3532	100 year storm encroachment	1	1577.02	1689.17
3410	100 year storm encroachment	1	235.04	355
3375	100 year storm encroachment	1	1528.63	1649.15
3278	100 year storm encroachment	1	117.52	231.3
3065	100 year storm encroachment	1	1567.38	1735.89
2949	100 year storm encroachment	1	174.36	299.61
2730	100 year storm encroachment	1	374.49	528.2
2497	100 year storm encroachment	1	272.27	501.55
2462	100 year storm encroachment	1	275	425
2339	100 year storm encroachment	1	2325	2475.07
2274	100 year storm encroachment	1	96.48	348.92
2139	100 year storm encroachment	1	340.14	604.68
2010	100 year storm encroachment	1	2690	2953.62
1925	100 year storm encroachment	1	121.59	320.86

River = Walker Run Reach = 2

RS	Profile	Method	Value1	Value2
1602	100 year storm encroachment	1	-100	366.99
1402	100 year storm encroachment	1	-26.6	416.89
1208	100 year storm encroachment	1	1627.49	1972.61
990	100 year storm encroachment	1	63.74	186.43
933	100 year storm encroachment	1	1630	1750
884	100 year storm encroachment	1	61.19	194.38
863	100 year storm encroachment	1	52.92	182
715	100 year storm encroachment	1	59.56	191.93
536	100 year storm encroachment	1	5.76	206.95
428	100 year storm encroachment	1	1276.75	1550
350	100 year storm encroachment	1	30.04	267.01
185	100 year storm encroachment	1	25.13	110
147	100 year storm encroachment	1	1642.37	1770
011	100 year storm encroachment	1	-10.18	174.39
-30	100 year storm encroachment	1	9.65	215.96
-78	100 year storm encroachment	4	.5	
-154	100 year storm encroachment	4	.1	

FLOW DATA

Flow Title: Existing Conditions
Flow File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.f03

Flow Data (cfs)

River	Reach	RS	100 year storm	100 year storm encroachment	500 year storm
Tributary	1	6850	303.5	303.5	615.69
Tributary	1	4400	303.5	303.5	615.69
Tributary	1	1252	303.5	303.5	615.69
Walker Run	1	5862	1640	1640	3600
Walker Run	1	5198	1640	1640	3600
Walker Run	2	1602	1860	1860	3100

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Tributary	1	100 year storm	Critical	
Tributary	1	100 year storm encroachment		Critical
Tributary	1	500 year storm	Critical	
Walker Run	1	100 year storm	Critical	
Walker Run	1	100 year storm encroachment		Critical
Walker Run	1	500 year storm	Critical	
Walker Run	2	100 year storm		Known WS = 653.29
Walker Run	2	100 year storm encroachment		Known WS = 654.29
Walker Run	2	500 year storm		Known WS = 654.6

GEOMETRY DATA

Geometry Title: Proposed Conditions
Geometry File : p:\PROJECTS\Environmental\PPL - Wetland Permitting Oversite E-726-L8\TASKS\Task 10 - Floodplain\Walker Run HEC-RAS\WalkerRunFld.g07

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Tributary	1		Trib Junc
Walker Run	1		Trib Junc
Walker Run	2	Trib Junc	

JUNCTION INFORMATION

Name: Trib Junc
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Walker Run	1	to Walker Run	2	325.9	
Tributary	1	to Walker Run	2	133	

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 6850

INPUT
Description:
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	717.52	.35	717.54	2.18	717.61	3.78	717.66	6.3	717.8
7.85	717.82	12.81	718	20.71	718.1	21.89	718.12	30.23	718.06
30.44	718.06	34.3	718	34.95	717.97	35.49	717.93	40.01	717.62
40.91	717.52	41.61	717.38	43.04	717.13	43.18	717.1	43.68	717.04
43.98	717	47.48	716.55	50.04	716.18	50.95	716	52.04	715.78
54.81	715	56.01	714.66	58.49	714	60.5	713.45	61.8	713
73.57	712.06	74.45	712	75.39	711.91	76.44	711.85	84.53	711.28
90.32	711	91.39	710.93	91.8	710.91	92.02	710.89	92.48	710.85
96.49	710.55	101.47	710	102.88	709.75	104.15	709.32	104.25	709.26
104.43	709.22	104.66	709.19	104.87	709.2	105.86	709.3	106.32	709.38
107.84	709.67	109.84	710	112.63	710.84	113.19	711	113.34	711.06
116.12	712	118.92	712.94	119.09	713	119.23	713.05	122.01	714
123.04	714.38	124.97	715	126.95	715.63	128.05	716	130.39	716.75
131.16	717	132.68	717.25	138.64	718	141.42	718.08	146.9	718.11
148.71	718.06	153.13	718	156.17	717.38	157.97	717	159.64	716.99
159.72	716.99	161.24	717	161.76	717	162.96	717.28	166.09	718
167.49	718.26	174.81	719	177.43	719.22	185.26	719.81	186.71	719.92
187.13	719.95	187.68	720	195.49	720.55	201.16	721	207.47	721.56
209.54	721.73	212.78	722	224.62	722.84	226.57	723	236.08	723.8
238.51	724	242.33	724.16	249.45	724.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	90.32	.08	113.19	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.32	113.19	858.49	916.24	905.57	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 5930

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	707.61	.21	707.52	1.49	707	3.75	706.23	4.35	706.04
4.46	706	4.67	705.91	6.78	705	7.13	704.87	9.64	704
11.48	703.34	12.46	703	12.85	702.86	15.32	702	16.31	701.64

18.18	701	20.11	700.31	21	700	23.24	699.19	23.8	699
24.33	698.81	26.66	698	27.99	697.57	29.87	697	31.89	696.61
35.21	696	40.81	695.52	43.76	695.24	46.22	695	47.88	694.93
73.56	694	78.44	693.3	80.01	693	80.83	692.64	82.4	692
83.33	692	84.28	692	84.3	692	84.31	692	86.28	692
87.21	692.48	88.27	693	101.79	693.51	104.21	693.59	106.79	693.68
108.18	693.72	110.29	693.73	112.58	693.7	112.72	693.69	118.36	693.78
120.92	693.83	122.97	693.9	125.05	694	139.58	694.93	140.72	695
141.28	695.05	153.31	696	158.07	696.55	162.09	697	166	697.45
170.75	698	174.95	698.5	179.08	699	183.24	699.61	185.81	700
188.27	700.35	192.66	701	196.14	701.53	199.34	702	204.09	702.76
205.4	703	207.13	703.33	210.72	704	213.77	704.54	216.32	705
218.9	705.47	221.12	705.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	80.01	.08	88.27	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
80.01	88.27	448.37	429.25	409.23	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 5500

INPUT
Description:
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	705.59	1.65	705.28	3.11	705	3.68	704.9	9.3	704
10.58	703.79	14.78	703	14.79	703	19.67	702.91	20.62	702.9
22.18	702.9	22.97	702.9	23.58	702.92	24.01	702.94	24.36	702.98
24.87	703	25.93	703.05	26.08	703.05	35.07	703.38	37.21	703.44
39.27	703.47	41.12	703.49	42.58	703.48	43.53	703.46	44.12	703.41
44.76	703.31	46.18	703	46.94	702.52	47.85	702	48.86	701.36
49.48	701	50.69	700.22	51.08	700	51.86	699.5	52.59	699
53.94	698.19	54.24	698	54.73	697.69	55.88	697	57.44	696.04
57.51	696	57.79	695.83	59.23	695	60.7	694.11	60.9	694
62.37	693.25	62.91	693	62.98	692.98	65.37	692	65.4	691.99
66.48	691.55	67.85	691	67.95	691	75.95	691	79.78	691
84.86	691	87.6	691	89.79	691	96.84	691	105.06	691
105.18	691	106.9	691	107.22	691	114.51	691	116.13	691
118.28	691.39	121.68	692	123.18	692.64	124.03	693	126.02	693.87
126.33	694	127.25	694.4	128.76	695	129.16	695.13	132.13	696
132.9	696.22	135.68	697	137.76	697.61	139.16	698	139.62	698.13
142.67	699	143.27	699.17	146.17	700	149.04	700.82	149.66	701
150.18	701.16	153.12	702	153.66	702.15	156.6	703	158.09	703.4
160.27	704	162.03	704.45	164.06	705	166.44	705.61	168.26	706
169.59	706.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	66.48	.08	118.28	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
66.48	118.28	758.93	739.98	740.88	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4750

INPUT
Description:
Station Elevation Data num= 130

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	719.11	7.68	719	10.17	718.76	18.45	718	20.03	717.49
21.92	717	22.84	716.49	23.71	716	24.48	715.58	25.43	715
26.3	714.49	27.18	714	28.1	713.46	28.92	713	29.88	712.44
30.65	712	31.64	711.37	32.27	711	33.35	710.38	33.99	710
35.06	709.39	35.7	709	36.83	708.35	37.43	708	38.7	707.26
39.13	707	39.54	706.76	40.87	706	42.26	705.19	42.58	705
43.96	704.19	44.31	704	45.75	703.16	46.03	703	47.5	702.13
47.72	702	49.25	701.01	49.26	701	49.27	700.99	50.71	700
51.78	699.09	51.92	699	52.06	698.89	53.27	698	53.57	697.79
54.58	697	55.07	696.68	55.87	696	56.82	695.31	57.23	695

58.25	694.16	58.5	694	60.18	693.01	60.19	693	60.23	692.98
62.33	692	64.4	691	64.41	691	66.77	690	68.03	689.39
68.88	689	70.28	688.56	71.66	688	73.93	687.54	76.53	687
79.74	686.35	81.27	686	83.57	685.49	85.56	685	86.56	684
89.9	684	94.99	684	124.36	684	137.07	684	144.81	684
176.24	685	176.89	685.09	183.88	686	186.34	686.5	188.39	687
191.16	687.7	192.31	688	193.07	688.2	196.16	689	197.57	689.37
200.05	690	206.17	690.93	206.7	691	214.37	691.48	215.87	691.59
217.4	691.74	217.65	691.76	218.07	691.79	218.54	691.81	219.08	691.82
219.68	691.82	220.29	691.82	221.04	691.82	221.15	691.82	221.32	691.79
221.59	691.74	222.48	691.36	223.33	691	225.37	690.05	225.47	690
225.68	689.91	227.73	689	229.96	688.11	230.23	688	230.4	687.93
232.65	687	233.17	686.93	233.41	686.89	233.91	686.96	234.15	687
234.42	687.11	236.86	688	237.5	688.24	239.62	689	242.37	690
245.17	691	245.95	691.05	247.15	691.13	252.96	691.51	261.76	692
269.9	692.26	288.24	692.9	290.57	692.98	291.12	693	296.01	693.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	81.27	.08	183.88	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
81.27	183.88	238.3	226.5	190.7	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 4530

INPUT
Description: U/S XS of Beaver Dam Pond Culvert
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	695.63	.38	695.48	1.28	695.09	1.48	695	3.09	694.51
5.01	694	8.08	693.32	9.54	693	12.07	692.33	13.44	692
15.74	691.32	16.91	691	18	690.72	20.83	690	24.22	689.15
24.81	689	28.69	688.02	28.78	688	28.95	687.96	29.27	687.87
32.8	687	37.18	686.21	38.3	686	39.25	685.85	44.98	685
46.66	685	47.66	684	49.21	684	50.78	684	51.95	684
53.56	684	58.64	684	62.64	684	65.43	684	71.47	684
82.7	684	83.09	684	98.62	684	101.48	684	107.38	684
109.3	684	123.54	684	124.7	684	147.47	684	168.98	684
177.3	684	180.32	684	182.51	684	188.98	684	190.4	684
193.03	684	193.27	684	193.44	684	194.9	684	194.96	684
195.01	684	195.13	684	196.34	684	196.91	684	203.33	684
207.17	684	210.36	684	211.96	684	215.52	684	218.11	684
220.77	684	224.16	684	231.87	684	239.24	684	245.5	685
253.07	685	256.85	685.84	257.54	686	258.89	686.31	259.73	686.43
261.48	686.68	262.26	686.84	263.03	687	264	687.21	267.77	688
269.77	688.4	272.58	689	280.78	689.37	283.12	689.52	287.24	689.8
289.93	690	303.56	690.88	305.27	691	307.07	691.07	307.94	691.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.25	.08	256.85	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
39.25	256.85	26.8	29.2	29.5	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	103	686.02	F
109	307.94	686.02	F

CULVERT

RIVER: Tributary
REACH: 1 RS: 4528

INPUT
Description: Beaver Dam Pond Culvert
Distance from Upstream XS = 10.5
Deck/Roadway Width = 4
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 126

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	699.94		.08	699.93		.17	699.9	

.37	699.82	1.81	699.59	4.29	699.12
4.86	699	5.91	698.73	7.54	698.44
9.65	698	12.65	697.57	15.79	697
17.04	696.74	19.94	696	20.51	695.88
24.52	695	25.05	694.9	29.34	694
29.78	693.91	34.3	693	38.09	692.22
39.2	692	43.19	691.18	43.98	691
44.34	690.93	44.67	690.88	49.26	690
51.11	689.68	55.23	689	60.28	688.18
61.36	688	65.16	687.39	67.46	687
68.34	686.86	70.96	686.33	80.51	686.24
80.67	686.24	84.94	686.05	86.72	686.04
89.52	686.04	93.66	686.03	94.45	686.03
95.14	686.02	96.47	686.02	97.36	686.02
101.68	686.02	102.68	686.02	104.7	686.03
105.44	686.03	109.35	686.02	114.19	686.01
117.38	686	119.45	685.81	120.95	685.78
123.15	685.61	123.97	685.38	125.3	685
127.21	685	132.46	685	134.61	685
139.57	685	141.83	685	144.59	685
147.06	685	149.69	685	153.25	685
155	685	158.41	685	163.68	685
164.26	685	164.58	685	172.54	685
173.23	685	174.29	685	182.66	685
183.32	685	185.42	685	189.93	684.94
190.82	684.95	198.27	684.93	198.45	684.93
205.79	684.9	205.98	684.91	206.25	684.92
207.99	685	214.82	685	215.17	685
216.22	685	218.29	685	218.85	685
220.55	685	221.47	685	221.8	685
222.26	685	222.79	685	223.34	685
225.66	685	229.27	685	229.91	685
232.18	685	233.95	685	235.25	685
238.49	685	239.5	685	240.33	685
240.63	685	242.95	685	245.9	685
246.88	685	249.8	685	250.83	685
252.46	685	260.7	685	262.47	685.37
265.16	686	268.07	686.63	269.63	687
272.57	687.71	273.81	688	274.81	688.23
278.02	689	278.88	689.03	292.31	689.45
305.41	690	309.17	690.2	310.77	690.28

Upstream Bridge Cross Section Data
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	695.63	.38	695.48	1.28	695.09	1.48	695	3.09	694.51
5.01	694	8.08	693.32	9.54	693	12.07	692.33	13.44	692
15.74	691.32	16.91	691	18	690.72	20.83	690	24.22	689.15
24.81	689	28.69	688.02	28.78	688	28.95	687.96	29.27	687.87
32.8	687	37.18	686.21	38.3	686	39.25	685.85	44.98	685
46.66	685	47.66	684	49.21	684	50.78	684	51.95	684
53.56	684	58.64	684	62.64	684	65.43	684	71.47	684
82.7	684	83.09	684	98.62	684	101.48	684	107.38	684
109.3	684	123.54	684	124.7	684	147.47	684	168.98	684
177.3	684	180.32	684	182.51	684	188.98	684	190.4	684
193.03	684	193.27	684	193.44	684	194.9	684	194.96	684
195.01	684	195.13	684	196.34	684	196.91	684	203.33	684
207.17	684	210.36	684	211.96	684	215.52	684	218.11	684
220.77	684	224.16	684	231.87	684	239.24	684	245.5	685
253.07	685	256.85	685.84	257.54	686	258.89	686.31	259.73	686.43
261.48	686.68	262.26	686.84	263.03	687	264	687.21	267.77	688
269.77	688.4	272.58	689	280.78	689.37	283.12	689.52	287.24	689.8
289.93	690	303.56	690.88	305.27	691	307.07	691.07	307.94	691.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	39.25	.08	256.85	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
39.25	256.85	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	103	686.02	F
109	307.94	686.02	F

Downstream Deck/Roadway Coordinates
num= 126

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	699.94		.08	699.93		.17	699.9	

.37	699.82	1.81	699.59	4.29	699.12
4.86	699	5.91	698.73	7.54	698.44
9.65	698	12.65	697.57	15.79	697
17.04	696.74	19.94	696	20.51	695.88
24.52	695	25.05	694.9	29.34	694
29.78	693.91	34.3	693	38.09	692.22
39.2	692	43.19	691.18	43.98	691
44.34	690.93	44.67	690.88	49.26	690
51.11	689.68	55.23	689	60.28	688.18
61.36	688	65.16	687.39	67.46	687
68.34	686.86	70.96	686.33	80.51	686.24
80.67	686.24	84.94	686.05	86.72	686.04
89.52	686.04	93.66	686.03	94.45	686.03
95.14	686.02	96.47	686.02	97.36	686.02
101.68	686.02	102.68	686.02	104.7	686.03
105.44	686.03	109.35	686.02	114.19	686.01
117.38	686	119.45	685.81	120.95	685.78
123.15	685.61	123.97	685.38	125.3	685
127.21	685	132.46	685	134.61	685
139.57	685	141.83	685	144.59	685
147.06	685	149.69	685	153.25	685
155	685	158.41	685	163.68	685
164.26	685	164.58	685	172.54	685
173.23	685	174.29	685	182.66	685
183.32	685	185.42	685	189.93	684.94
190.82	684.95	198.27	684.93	198.45	684.93
205.79	684.9	205.98	684.91	206.25	684.92
207.99	685	214.82	685	215.17	685
216.22	685	218.29	685	218.85	685
220.55	685	221.47	685	221.8	685
222.26	685	222.79	685	223.34	685
225.66	685	229.27	685	229.91	685
232.18	685	233.95	685	235.25	685
238.49	685	239.5	685	240.33	685
240.63	685	242.95	685	245.9	685
246.88	685	249.8	685	250.83	685
252.46	685	260.7	685	262.47	685.37
265.16	686	268.07	686.63	269.63	687
272.57	687.71	273.81	688	274.81	688.23
278.02	689	278.88	689.03	292.31	689.45
305.41	690	309.17	690.2	310.77	690.28

Downstream Bridge Cross Section Data
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	698.39	2.25	698	3.51	697.78	8.04	697	10.4	696.58
13.75	696	17.58	695.27	19.01	695	24.3	694.01	24.35	694
24.36	694	24.39	693.99	24.56	693.96	29.6	693	29.96	692.93
34.84	692	35.26	691.92	40.08	691	40.93	690.86	43.54	690.41
45.59	690	46.73	689.76	50.78	689	51.85	688.8	56.28	688
56.66	687.94	56.88	687.91	57.21	687.86	62.06	687	64.06	686.74
67.41	686.48	73.1	686	73.58	685.87	76.63	685.77	78.89	685.6
81.72	685.36	82.81	685.28	83.36	685.25	84.22	685.21	84.7	685.21
87.07	685.08	87.43	685.08	88.66	685	90.82	684.79	91.94	684.65
92.9	684.44	93.35	684.38	94.01	684.33	94.9	684.3	99.29	684.28
104.43	684.19	106.71	684.15	109.3	684.08	111.09	684	111.21	683.99
112.38	683.85	113.67	683.78	114.6	683.71	115.76	683.68	117.21	683.5
118.12	683.44	119.46	683.39	121.24	683.35	122.15	683.37	127.52	683.35
131.92	683.3	134.65	683.33	135.14	683.32	139.51	683.33	140.67	683.32
141.87	683.33	142.84	683.34	143.7	683.37	146.54	683.44	152.28	683.42
157.84	683.49	163.36	683.36	165.79	683.33	166.88	683.33	172.36	683.22
173.32	683.21	176.18	683.19	177.33	683.17	190.83	683.03	191.87	683
198.11	682.59	198.65	682.57	200.68	682.65	201.32	682.65	205.33	682.59
206.51	682.67	207.73	682.75	210.04	682.71	210.84	682.68	212.81	682.65
213.82	682.63	213.87	682.6	216.59	682.57	219.18	682.57	222.09	682.65
229.54	682.91	231.92	683	232.46	683.21	234.58	684	235.86	684.47
237.43	685	237.7	685.1	240.19	686	245.86	686.3	256.09	687
266.97	687.52	275.91	688	283.94	688.34	286.47	688.44	294.52	688.78
302.29	689	315.27	689.42	320.65	689.56	325.31	689.67	329.74	689.81
338.75	689.97	339.92	689.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	117.21	.08	146.54	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
117.21	146.54	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent

```
       0     115  686.02       F
  146.54  339.92     685       F
Right Levee     Station=  146.54      Elevation=  683.44

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular       2
FHWA Chart # 55-  Circular Culvert
FHWA Scale # 1 - Smooth tapered inlet throat
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                4.3      18     .013     .013        0                  .9                 1
Upstream   Elevation =  679.28
           Centerline Station =  106
Downstream Elevation =  679.1
           Centerline Station =  122

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 4500

INPUT
Description: D/S XS of Beaver Dam Pond Culvert
Station Elevation Data    num=     122
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  698.39    2.25     698    3.51  697.78    8.04     697    10.4  696.58
   13.75     696   17.58  695.27   19.01     695    24.3  694.01   24.35     694
   24.36     694   24.39  693.99   24.56  693.96    29.6     693   29.96  692.93
   34.84     692   35.26  691.92   40.08     691   40.93  690.86   43.54  690.41
   45.59     690   46.73  689.76   50.78     689   51.85   688.8   56.28     688
   56.66  687.94   56.88  687.91   57.21  687.86   62.06     687   64.06  686.74
   67.41  686.48    73.1     686   73.58  685.87   76.63  685.77   78.89   685.6
   81.72  685.36   82.81  685.28   83.36  685.25   84.22  685.21    84.7  685.21
   87.07  685.08   87.43  685.08   88.66     685   90.82  684.79   91.94  684.65
    92.9  684.44   93.35  684.38   94.01  684.33    94.9   684.3   99.29  684.28
  104.43  684.19  106.71  684.15   109.3  684.08  111.09     684  111.21  683.99
  112.38  683.85  113.67  683.78   114.6  683.71  115.76  683.68  117.21   683.5
  118.12  683.44  119.46  683.39  121.24  683.35  122.15  683.37  127.52  683.35
  131.92   683.3  134.65  683.33  135.14  683.32  139.51  683.33  140.67  683.32
  141.87  683.33  142.84  683.34   143.7  683.37  146.54  683.44  152.28  683.42
  157.84  683.49  163.36  683.36  165.79  683.33  166.88  683.33  172.36  683.22
  173.32  683.21  176.18  683.19  177.33  683.17  190.83  683.03  191.87     683
  198.11  682.59  198.65  682.57  200.68  682.65  201.32  682.65  205.33  682.59
  206.51  682.67  207.73  682.75  210.04  682.71  210.84  682.68  212.81  682.65
  213.82  682.63  213.87   682.6  216.59  682.57  219.18  682.57  222.09  682.65
  229.54  682.91  231.92     683  232.46  683.21  234.58     684  235.86  684.47
  237.43     685   237.7   685.1  240.19     686  245.86   686.3  256.09     687
  266.97  687.52  275.91     688  283.94  688.34  286.47  688.44  294.52  688.78
  302.29     689  315.27  689.42  320.65  689.56  325.31  689.67  329.74  689.81
  338.75  689.97  339.92  689.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .05  117.21     .08  146.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.21  146.54             87.5    99.4   102.5              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     115  686.02       F
  146.54  339.92     685       F
Right Levee     Station=  146.54      Elevation=  683.44

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 4400
```

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
36	683.01	104	679.71	116.53	678.6	128.1	677.84	152.93	677.53
158.35	677.2	158.8	675.98	159.72	675.78	160.48	676.59	161.3	676.98
163.98	677.49	176.22	678.17	181.98	677.84	190	680.01		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
36	.05	158.35	.08	161.3	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
158.35	161.3	1043.98	1051.3	1040.76	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3356

INPUT
Description: U/S XS of RR Bridge No 5
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-438.69	672.01	-380.28	671.01	-365.82	670.01	28	670.01	100	671.01
194.18	670.23	205.77	669.77	208.9	670.84	210.78	669.09	213.43	668.53
214.16	667.67	215.07	667.67	215.68	667.68	216.52	667.72	217	667.83
219.51	670.12	224.24	671.09	229.11	672.65	234.42	670.53	267.47	672.28
295.86	673.86	312.17	675.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-438.69	.1	213.43	.05	219.51	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
213.43	219.51	476	296	102	.3	.5

Left Levee Station= 100 Elevation= 671.01

BRIDGE

RIVER: Tributary
REACH: 1 RS: 3108

INPUT
Description: RR bridge No 5
Distance from Upstream XS = 223
Deck/Roadway Width = 60
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 5

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-200	685.6	0	-94.46	685.6	0	-94.46	685.6	680.6
440	691.8	686.8	600	691.8	0			

Upstream Bridge Cross Section Data
Station Elevation Data num= 110

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-200	673	0	673	65.98	668.53	68.5	668.34	72.64	668.18
79.82	667.9	87.52	667.61	89.94	667.5	91.48	667.48	97.4	667.39
108.25	667.23	109.21	667.22	110.43	667.22	113.07	667.21	124.22	667.2
131.06	667.2	139.07	667.21	144.49	667.21	150.36	667.21	155.63	667.21
157.59	667.21	164.05	667.19	167.64	667.18	169.69	667.17	172.35	667.16
175.36	667.14	178.15	667.11	180.17	667.08	183.46	666.99	186.15	666.95
189.37	666.94	192.59	666.9	194.76	666.89	196.85	666.89	200.18	666.87
201.93	666.87	205.43	666.85	209.24	666.86	212.21	666.85	216.51	666.85
217.29	666.85	229.2	666.82	229.31	666.82	231.84	666.82	236.08	666.83
243.09	666.79	247.77	666.77	250.97	666.76	253.26	666.76	255.23	666.77
258.64	666.78	265.38	666.9	268.59	666.97	274.58	667.11	290.14	667.48
292.17	667.51	296.79	667.46	297.2	667.5	298.59	667.64	299.67	667.35
301.19	667.26	301.63	667.11	303.84	666.43	304.49	666.43	305.02	666.43
305.67	666.43	306.14	666.43	307.7	666.43	309.85	666.56	311.08	666.66
317.03	667.45	317.51	667.51	317.66	667.52	324.59	668.11	327.01	668.33
329.54	668.58	336.02	669.25	336.78	669.33	340.28	669.49	346.95	669.76
347.44	669.79	351.03	670.1	357.47	670.81	359.25	670.97	365.23	671.56
368.31	671.85	374.55	672.5	376.64	672.72	377.32	672.8	385.4	673.59
392.48	674.2	395.24	674.47	398.11	674.87	401.6	675.33	403.24	675.57

407.61	676.19	410.67	676.63	413.6	677.05	413.8	677.07	415.82	677.33
420.01	677.91	424.55	678.49	426.38	678.77	434.98	679.39	436.17	679.47
436.44	679.49	437.44	679.53	437.73	679.54	440	691.8	540	691.8

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-200	.1	0	.1	304.49	.05	317.51	.1

Bank Sta: Left Right Coeff Contr. Expan.
301.19 317.51 .3 .5
Left Levee Station= 100 Elevation= 671.01

Downstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-94.46	685.6	0	-94.46	685.6	680.6	440	691.8	686.8

Downstream Bridge Cross Section Data
Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	682	0	682	10	682	60	682.5	60	668.53
65.98	668.53	68.5	668.34	72.64	668.18	79.82	667.9	87.52	667.61
89.94	667.5	91.48	667.48	97.4	667.39	108.25	667.23	109.21	667.22
110.43	667.22	113.07	667.21	124.22	667.2	131.06	667.2	139.07	667.21
144.49	667.21	150.36	667.21	155.63	667.21	157.59	667.21	164.05	667.19
167.64	667.18	169.69	667.17	172.35	667.16	175.36	667.14	178.15	667.11
180.17	667.08	183.46	666.99	186.15	666.95	189.37	666.94	192.59	666.9
194.76	666.89	196.85	666.89	200.18	666.87	201.93	666.87	205.43	666.85
209.24	666.86	212.21	666.85	216.51	666.85	217.29	666.85	229.2	666.82
229.31	666.82	231.84	666.82	236.08	666.83	243.09	666.79	247.77	666.77
250.97	666.76	253.26	666.76	255.23	666.77	258.64	666.78	265.38	666.9
268.59	666.97	274.58	667.11	290.14	667.48	292.17	667.51	296.79	667.46
297.2	667.5	298.59	667.64	299.67	667.35	301.19	667.26	301.63	667.11
303.84	666.28	304.49	666.05	305.02	666.05	305.67	666.05	306.14	666.28
307.7	666.39	309.85	666.56	311.08	666.66	317.03	667.45	317.51	667.51
317.66	667.52	324.59	668.11	327.01	668.33	329.54	668.58	336.02	669.25
336.78	669.33	340.28	669.49	346.95	669.76	347.44	669.79	351.03	670.1
357.47	670.81	359.25	670.97	365.23	671.56	368.31	671.85	374.55	672.5
376.64	672.72	377.32	672.8	385.4	673.59	392.48	674.2	395.24	674.47
398.11	674.87	401.6	675.33	403.24	675.57	407.61	676.19	410.67	676.63
413.6	677.05	413.8	677.07	415.82	677.33	420.01	677.91	424.55	678.49
426.38	678.77	434.98	679.39	436.17	679.47	436.44	679.49	437.44	679.53
437.73	679.54	440	691.8	540	691.8				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-75	.1	0	.1	304.49	.05	317.51	.1

Bank Sta: Left Right Coeff Contr. Expan.
301.19 317.51 .3 .5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 5

Pier Data
Pier Station Upstream= -5.9 Downstream= -5.9
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Pier Data
Pier Station Upstream= 83.28 Downstream= 83.28
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Pier Data
Pier Station Upstream= 168.46 Downstream= 168.46
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Pier Data
Pier Station Upstream= 257.64 Downstream= 257.64
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Pier Data
Pier Station Upstream= 346.82 Downstream= 346.82
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	696.5

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 3060

INPUT
Description: D/S XS of RR Bridge No 5, U/S XS of Bridge No 2, 6
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	682	10	682	60	676	64.18	673	75.95	672.148
77.44	672.043	78.01	672	78.74	671.948	91.82	671	100.82	670.131
102.13	670	102.99	669.907	111.76	669	118.45	668.231	120.59	668
124.12	667.815	130.23	667.473	136.79	667.132	138.85	667	140.16	666.969
145.2	666.863	154.44	666.68	155.26	666.666	156.3	666.66	158.55	666.654
168.04	666.64	173.87	666.635	180.69	666.647	185.3	666.653	190.3	666.653
194.79	666.65	196.46	666.646	201.96	666.623	205.02	666.614	206.76	666.606
209.03	666.59	211.59	666.565	213.97	666.531	215.69	666.49	218.49	666.39
220.78	666.337	223.52	666.327	226.26	666.277	229.89	666.254	232.73	666.212
234.22	666.204	237.2	666.171	240.44	666.159	242.97	666.138	246.63	666.115
247.3	666.111	257.44	666.02	257.53	666.019	259.69	666	269.27	665.969
273.25	665.96	275.98	665.958	277.93	665.962	279.6	665.973	282.51	666
288.25	666.162	290.98	666.257	296.08	666.443	311.06	667	315.34	667
318.74	667	319.25	666.857	321.78	666	322.5	666	323.1	666
323.83	666	324.35	666	336.57	666.947	337.11	666.988	337.27	667
344.9	667.568	350.35	668	357.48	668.597	362.17	669	369.51	669.588
373.99	670	381.08	670.809	383.04	671	389.62	671.675	393.01	672
399.88	672.75	402.18	673	402.92	673.096	411.81	674	419.61	674.697
422.64	675	425.8	675.465	429.64	676	431.45	676.282	436.25	677
439.62	677.517	440	692	540	692				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	318.74	.05	337.11	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

318.74 337.11 188 226 141 .3 .5

BRIDGE

RIVER: Tributary
REACH: 1 RS: 3010

INPUT
Description: Bridge No 2 and Pipe Bridge 6
Distance from Upstream XS = 20
Deck/Roadway Width = 90
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	690.9	0	31.84	690.9	685.6	440	695	690

Upstream Bridge Cross Section Data
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	682	10	682	60	676	64.18	673	75.95	672.148
77.44	672.043	78.01	672	78.74	671.948	91.82	671	100.82	670.131
102.13	670	102.99	669.907	111.76	669	118.45	668.231	120.59	668
124.12	667.815	130.23	667.473	136.79	667.132	138.85	667	140.16	666.969
145.2	666.863	154.44	666.68	155.26	666.666	156.3	666.66	158.55	666.654
168.04	666.64	173.87	666.635	180.69	666.647	185.3	666.653	190.3	666.653
194.79	666.65	196.46	666.646	201.96	666.623	205.02	666.614	206.76	666.606
209.03	666.59	211.59	666.565	213.97	666.531	215.69	666.49	218.49	666.39
220.78	666.337	223.52	666.327	226.26	666.277	229.89	666.254	232.73	666.212
234.22	666.204	237.2	666.171	240.44	666.159	242.97	666.138	246.63	666.115
247.3	666.111	257.44	666.02	257.53	666.019	259.69	666	269.27	665.969
273.25	665.96	275.98	665.87	277.93	665.962	279.6	665.973	282.51	666
288.25	666.162	290.98	666.257	296.08	666.443	311.06	667	315.34	667
318.74	667	319.25	666.857	321.78	666	322.5	665.89	323.1	665.89
323.83	665.89	324.35	666	336.57	666.947	337.11	666.988	337.27	667
344.9	667.568	350.35	668	357.48	668.597	362.17	669	369.51	669.588
373.99	670	381.08	670.809	383.04	671	389.62	671.675	393.01	672
399.88	672.75	402.18	673	402.92	673.096	411.81	674	419.61	674.697
422.64	675	425.8	675.465	429.64	676	431.45	676.282	436.25	677
439.62	677.517	440	695	540	695				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.1	124.12	.1	318.74	.05	337.11	.1

Bank Sta: Left Right Coeff Contr. Expan.
318.74 337.11 .3 .5

Downstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-8.16	690.9	685.9	400	695	690	435	695	0

Downstream Bridge Cross Section Data
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-50	690.9	-8.16	690.9	-8.16	668.62	9.3	668.62	26.89	667.62
67.11	666.62	134	665.44	204	665.44	246.49	666.37	252.14	666.64
254.24	665.51	255.77	665.44	256.85	665.68	257.71	665.64	258.87	666.43
263.61	666.4	277.29	665.84	309.05	668.44	338.85	672.2	371.24	677.29
390.72	679.51	420.6	679.96	435	679.96	435	694.61	450	694.61

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-50	.1	-8.16	.1	26.89	.1	252.14	.05	258.87	.1

Bank Sta: Left Right Coeff Contr. Expan.
252.14 258.87 .3 .5
Left Levee Station= 252.14 Elevation= 666.03

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

```
Number of Piers =  4

Pier Data
Pier Station     Upstream=  112.92    Downstream=   72.92
Upstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695
Downstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695

Pier Data
Pier Station     Upstream=  194.92    Downstream=  154.92
Upstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695
Downstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695

Pier Data
Pier Station     Upstream=  276.92    Downstream=  236.92
Upstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695
Downstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695

Pier Data
Pier Station     Upstream=  358.92    Downstream=  318.92
Upstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695
Downstream     num=       2
    Width   Elev    Width   Elev
       4       0       4     695

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Tributary
REACH: 1                  RS: 2834

INPUT
Description: D/S XS of Bridge No 2, 6
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     9.3  668.01   26.89  667.01   67.11  666.01     134  665.01     204  665.01
  246.49  665.76  252.14  666.03  254.24   664.9  255.77  664.89  256.85  665.07
  257.71  665.03  258.87  665.82  263.61  665.79  277.29  665.23  309.05  667.83
  338.85  671.59  371.24  676.68  390.72   678.9   420.6  679.35     435  679.35
     435     694

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     9.3      .1  252.14     .05  258.87      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan..
        252.14  258.87             46.29    46.1   46.48             .3       .5
Left Levee      Station=  252.14      Elevation=  666.03

CROSS SECTION
```

RIVER: Tributary
REACH: 1 RS: 2791.66*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10.94	669.01	28.52	667.4	32.14	667.18	36.18	666.92	68.7	666.04
94.87	665.57	135.53	664.94	150.07	664.91	185.9	664.88	205.47	664.82
233.48	665.19	247.93	665.43	249.05	665.48	253.57	665.59	255	664.87
255.76	664.51	256.31	664.51	257.36	664.47	258.42	664.65	258.54	664.64
259.25	664.66	260.38	665.46	263.4	665.45	265.72	665.44	281.11	664.92
290.1	665.52	315.57	667.22	316.85	667.31	325.08	668.19	337.59	669.65
344.23	670.37	350.39	671.99	360.6	674.93	386.83	678.29	387.57	678.36
402.4	679.73	408.76	680.42	413.19	680.55	416.33	680.75	420.83	680.81
433.86	680.13	442.38	679.72	458.58	678.74	458.58	692.17		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10.94	.1	253.57	.05	260.38	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
253.57	260.38	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2749.33*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
12.58	670.01	30.14	667.79	33.77	667.43	37.8	667.02	70.29	666.07
96.44	665.52	137.07	664.86	151.59	664.81	187.39	664.75	206.95	664.63
234.93	664.88	249.36	665.09	250.48	665.14	255	665.14	256.49	664.44
257.29	664.12	257.85	664.12	258.96	664.06	259.98	664.23	260.1	664.23
260.8	664.29	261.9	665.09	265.26	665.11	267.83	665.09	284.93	664.62
294.93	665.16	323.22	666.7	324.65	666.79	333.8	667.63	347.71	669.14
355.08	669.85	361.92	672.39	373.27	676.85	402.43	679.9	403.24	679.96
419.73	681.21	426.79	681.95	431.72	682.13	435.21	682.5	440.21	682.55
454.69	681.03	464.16	680.09	482.17	678.12	482.17	690.33		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
12.58	.1	255	.05	261.9	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
255	261.9	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2707.*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
14.23	671.01	31.77	668.19	35.39	667.69	39.42	667.11	71.88	666.09
98.01	665.47	138.6	664.79	153.11	664.71	188.88	664.62	208.42	664.45
236.38	664.57	250.8	664.76	251.92	664.8	256.43	664.7	257.98	664.02
258.81	663.73	259.4	663.74	260.55	663.64	261.55	663.81	261.66	663.81
262.34	663.92	263.41	664.73	267.11	664.76	269.93	664.75	288.76	664.31
299.75	664.8	330.88	666.18	332.46	666.27	342.52	667.07	357.82	668.64
365.93	669.32	373.46	672.79	385.94	678.76	418.02	681.51	418.92	681.57
437.05	682.69	444.83	683.47	450.24	683.72	454.09	684.25	459.59	684.3
475.52	681.93	485.94	680.46	505.75	677.51	505.75	688.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
14.23	.1	256.43	.05	263.41	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
256.43	263.41	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2664.66*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
15.87	672.01	33.4	668.58	37.01	667.95	41.04	667.21	73.48	666.12
99.58	665.42	140.13	664.71	154.63	664.6	190.37	664.49	209.89	664.26
237.82	664.26	252.23	664.43	253.35	664.46	257.86	664.25	259.48	663.6
260.34	663.35	260.95	663.35	262.14	663.23	263.11	663.39	263.22	663.39
263.88	663.55	264.93	664.36	268.96	664.41	272.04	664.4	292.58	664.01
304.57	664.43	338.54	665.67	340.26	665.75	351.24	666.51	367.93	668.13
376.78	668.79	384.99	673.19	398.62	680.68	433.62	683.12	434.59	683.17
454.38	684.17	462.86	684.99	468.77	685.31	472.97	686	478.97	686.04
496.35	682.82	507.72	680.83	529.33	676.9	529.33	686.67		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
15.87	.1	257.86	.05	264.93	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
257.86	264.93	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2622.33*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17.51	673.01	35.02	668.97	38.64	668.2	42.66	667.31	75.07	666.15
101.15	665.36	141.67	664.64	156.15	664.5	191.86	664.36	211.36	664.07
239.27	663.95	253.67	664.09	254.79	664.12	259.29	663.81	260.97	663.17
261.86	662.96	262.5	662.96	263.73	662.81	264.68	662.96	264.79	662.97
265.43	663.18	266.44	664	270.81	664.06	274.15	664.05	296.4	663.7
309.4	664.07	346.2	665.15	348.06	665.23	359.95	665.95	378.04	667.63
387.63	668.27	396.53	673.59	411.29	682.59	449.21	684.73	450.27	684.77
471.71	685.65	480.9	686.52	487.3	686.89	491.85	687.75	498.34	687.79
517.19	683.72	529.5	681.2	552.92	676.29	552.92	684.83		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17.51	.1	259.29	.05	266.44	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
259.29	266.44	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2580.*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
19.15	674.01	36.65	669.36	40.26	668.46	44.28	667.41	76.66	666.18
102.72	665.31	143.2	664.56	157.68	664.4	193.35	664.23	212.84	663.88
240.72	663.64	255.1	663.76	256.22	663.79	260.73	663.36	262.46	662.75
263.39	662.57	264.04	662.58	265.33	662.4	266.24	662.54	266.35	662.55
266.97	662.81	267.96	663.64	272.66	663.71	276.26	663.7	300.22	663.4
314.22	663.71	353.86	664.63	355.86	664.71	368.67	665.39	388.15	667.12
398.48	667.74	408.06	673.99	423.96	684.51	464.81	686.34	465.95	686.38
489.04	687.13	498.93	688.04	505.83	688.48	510.73	689.5	517.72	689.53
538.02	684.62	551.27	681.57	576.5	675.67	576.5	683		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
19.15	.1	260.73	.05	267.96	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
260.73	267.96	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2537.66*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20.79	675	38.27	669.75	41.88	668.72	45.9	667.51	78.25	666.2
104.29	665.26	144.73	664.49	159.2	664.3	194.84	664.1	214.31	663.7
242.17	663.33	256.54	663.43	257.66	663.45	262.16	662.92	263.95	662.32
264.91	662.18	265.59	662.19	266.92	661.98	267.81	662.12	267.91	662.13
268.51	662.43	269.47	663.27	274.51	663.36	278.37	663.35	304.05	663.09
319.04	663.34	361.52	664.12	363.66	664.19	377.39	664.83	398.26	666.62
409.33	667.21	419.6	674.39	436.64	686.42	480.4	687.95	481.62	687.98
506.36	688.61	516.97	689.56	524.36	690.07	529.61	691.25	537.1	691.28
558.85	685.52	573.05	681.95	600.08	675.06	600.08	681.17		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
20.79	.1	262.16	.05	269.47	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
262.16	269.47	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2495.33*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
22.43	676	39.9	670.14	43.51	668.97	47.52	667.61	79.84	666.23
105.86	665.21	146.27	664.41	160.72	664.2	196.33	663.97	215.78	663.51
243.62	663.01	257.98	663.09	259.09	663.11	263.59	662.48	265.44	661.9
266.43	661.79	267.14	661.81	268.51	661.56	269.37	661.7	269.47	661.71
270.06	662.06	270.98	662.91	276.36	663.01	280.47	663	307.87	662.78
323.87	662.98	369.18	663.6	371.46	663.68	386.11	664.27	408.37	666.11
420.18	666.69	431.14	674.8	449.31	688.34	495.99	689.56	497.3	689.58
523.69	690.09	535	691.09	542.89	691.65	548.48	693	556.48	693.02
579.68	686.41	594.83	682.32	623.67	674.45	623.67	679.33		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
22.43	.1	263.59	.05	270.98	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
263.59	270.98	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2453.*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
24.07	677	41.53	670.54	45.13	669.23	49.14	667.7	81.43	666.26
107.42	665.16	147.8	664.34	162.24	664.09	197.82	663.84	217.25	663.32
245.07	662.7	259.41	662.76	260.53	662.77	265.02	662.03	266.93	661.47
267.96	661.4	268.69	661.42	270.1	661.15	270.94	661.28	271.03	661.29
271.6	661.69	272.5	662.54	278.21	662.67	282.58	662.66	311.69	662.48
328.69	662.62	376.83	663.08	379.27	663.16	394.83	663.71	418.49	665.61
431.03	666.16	442.67	675.2	461.98	690.25	511.59	691.17	512.97	691.19
541.02	691.56	553.04	692.61	561.41	693.24	567.36	694.75	575.86	694.77
600.51	687.31	616.61	682.69	647.25	673.84	647.25	677.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

24.07	.1	265.02	.05	272.5	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
265.02	272.5	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2410.66*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
25.72	678	43.15	670.93	46.75	669.49	50.76	667.8	83.02	666.29
108.99	665.11	149.33	664.26	163.76	663.99	199.31	663.71	218.73	663.13
246.51	662.39	260.85	662.43	261.96	662.44	266.45	661.59	268.43	661.05
269.48	661.01	270.23	661.03	271.7	660.73	272.5	660.86	272.6	660.87
273.14	661.32	274.01	662.18	280.06	662.32	284.69	662.31	315.51	662.17
333.51	662.26	384.49	662.56	387.07	662.64	403.54	663.15	428.6	665.1
441.88	665.63	454.21	675.6	474.65	692.17	527.18	692.78	528.65	692.79
558.35	693.04	571.07	694.13	579.94	694.83	586.24	696.5	595.24	696.51
621.34	688.21	638.39	683.06	670.83	673.22	670.83	675.67		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
25.72	.1	266.45	.05	274.01	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
266.45	274.01	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2368.33*

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
27.36	679	44.78	671.32	48.38	669.74	52.38	667.9	84.62	666.32
110.56	665.06	150.87	664.19	165.28	663.89	200.8	663.58	220.2	662.95
247.96	662.08	262.28	662.09	263.4	662.1	267.88	661.14	269.92	660.62
271.01	660.62	271.78	660.65	273.29	660.32	274.07	660.44	274.16	660.45
274.69	660.95	275.53	661.81	281.91	661.97	286.8	661.96	319.33	661.87
338.34	661.89	392.15	662.05	394.87	662.12	412.26	662.59	438.71	664.6
452.73	665.11	465.74	676	487.33	694.08	542.78	694.39	544.32	694.4
575.67	694.52	589.11	695.66	598.47	696.41	605.12	698.25	614.62	698.26
642.17	689.1	660.17	683.43	694.42	672.61	694.42	673.83		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
27.36	.1	267.88	.05	275.53	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
267.88	275.53	46.29	46.1	46.48	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 2326

INPUT
Description: U/S XS of Pipe Bridge 7
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
29	680	50	670	54	668	112.13	665.01	166.8	663.79
202.29	663.45	249.41	661.77	264.83	661.76	269.31	660.7	271.41	660.2
273.33	660.26	274.88	659.9	275.72	660.03	277.04	661.45	283.76	661.62
343.16	661.53	399.81	661.53	420.98	662.03	448.82	664.09	463.58	664.58
500	696	560	696	593	696	617	698	624	700
634	700	663	690	718	672				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
29	.1	269.31	.05	277.04	.1

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        269.31  277.04           673.04  669.86  671.65              .3       .5

BRIDGE


RIVER: Tributary
REACH: 1                  RS: 1790

INPUT
Description: Pipe bridge - No 7
Distance from Upstream XS =     526
Deck/Roadway Width        =      20
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  677.93       0   123.5  677.93       0   123.5  677.93  672.93
   463.6  677.93  672.93   463.6  677.93       0     500  677.93       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -200   678.6      29   678.6      50   668.6      54   666.6  112.13  663.61
   166.8  662.39  202.29  662.05  249.41  660.37  264.83  660.36  269.31   659.3
  271.41   658.8  273.33  658.86  274.88  658.38  275.72  658.63  277.04  660.05
  283.76  660.22  343.16  660.13  399.81  660.13  420.98  660.63  448.82  662.69
  463.58  663.18  463.58   694.6     560   694.6     593   694.6     617   696.6
     624   698.6     634   698.6     663   688.6     718   670.6

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    -200      .1      29      .1  269.31     .05  277.04      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        269.31  277.04              .3       .5

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  677.93       0   123.5  677.93       0   123.5  677.93  672.93
   463.6  677.93  672.93   463.6  677.93       0     500  677.93       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     690   12.63     688    31.4     684      43     680      48     678
  173.75  665.01  198.13  661.86  245.91  659.93  256.45  659.51  262.44  659.72
  264.16  658.38  265.67  658.38  267.08  658.32  268.29  658.32  269.24  658.38
  271.93   658.6  274.07  659.54  279.61  659.65  315.47  660.02  400.34  661.36
  434.93  670.15  448.28  670.08     500  670.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  262.44     .05  274.07      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        262.44  274.07              .3       .5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=   208.5    Downstream=   208.5
Upstream     num=       2
    Width   Elev    Width   Elev
        4      0        4    700
Downstream     num=       2
    Width   Elev    Width   Elev
        4      0        4    700
```

Pier Data
Pier Station Upstream= 293.5 Downstream= 293.5
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	700

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	700

Pier Data
Pier Station Upstream= 378.5 Downstream= 378.5
Upstream num= 2

Width	Elev	Width	Elev
4	0	4	700

Downstream num= 2

Width	Elev	Width	Elev
4	0	4	700

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1658

INPUT
Description: D/S XS of Pipe Bridge No 7
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	690	12.63	688	31.4	684	43	680	48	678
173.75	665.01	198.13	661.86	245.91	659.93	256.45	659.51	262.44	659.72
264.16	658.26	265.67	657.96	267.08	657.99	268.29	658.05	269.24	658.2
271.93	658.6	274.07	659.54	279.61	659.65	315.47	660.02	400.34	661.36
434.93	670.15	448.28	670.08						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	262.44	.05	274.07	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
262.44	274.07	48.34	49.66	50.16	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1608.33*

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	690.33	12.27	688.67	30.51	685.33	41.78	682	46.63	680.33
46.86	680.31	48.47	675.15	57.19	674.36	61.11	674.01	65.48	673.62
68.04	673.39	69.43	673.26	70.77	673.14	72.14	673.02	73.58	672.89
76.6	672.61	77.9	672.5	80.66	672.24	85.11	671.84	88.74	671.51
92.6	671.16	100.12	670.49	115.09	669.11	115.24	669.09	116.38	668.99
119.77	668.66	122.29	668.43	130.25	667.68	144.15	666.37	147.63	666.05
149	665.93	159.59	664.97	159.99	664.94	167.52	664.25	168.81	664.14
171.97	663.77	181.92	662.66	186.29	662.15	188.89	661.86	192.49	661.44
195.05	661.34	202.91	661.02	203.95	660.99	204.09	660.98	224.34	660.28
224.76	660.26	229.95	660.08	232.03	660.01	236.59	659.85	237.65	659.82
238.91	659.77	239.65	659.75	242.41	659.66	246.21	659.53	248.34	659.45
249.15	659.43	249.35	659.43	251.69	659.5	254.07	659.57	254.97	659.6

255.39	659.27	256.6	658.3	257.2	658.16	257.84	658.01	258.03	657.97
258.09	657.97	259.62	657.97	261.03	658.03	261.23	658.03	261.25	658.03
262.6	658.1	263	658.15	263.68	658.24	265.06	658.41	266.75	658.63
269.18	659.45	271.09	659.49	275.05	659.58	295.58	659.87	297.48	659.9
297.82	659.91	304.6	660	309.71	660.07	311.21	660.09	313.04	660.11
314.25	660.13	321.1	660.26	322.74	660.29	324.28	660.32	333.34	660.53
335.55	660.58	336.61	660.61	340.19	660.69	348.77	660.9	350.23	660.94
352.83	661.01	361.28	661.24	362.9	661.28	363.89	661.31	366.71	661.41
372.24	661.59	373.79	661.64	379.88	661.85	380.13	661.86	386.01	662.09
387.56	662.16	391.23	662.32	400.99	662.56	402.95	662.61	405.09	663.06
405.58	663.16	406.22	663.29	406.4	663.32	411.48	664.34	412.23	664.49
413.01	664.65	413.58	664.76	413.89	664.82	414.68	668.81	439.59	673.79
453.73	673.73								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.095	254.97	.05	269.18	.095

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
254.97	269.18	48.34	49.66	50.16	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1558.66*

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	690.67	11.91	689.33	29.61	686.67	40.55	684	45.27	682.67
45.49	682.65	47.05	672.49	55.52	671.84	59.32	671.56	63.56	671.23
66.05	671.05	67.39	670.95	68.7	670.85	70.03	670.75	71.43	670.64
74.35	670.42	75.61	670.32	78.3	670.1	82.62	669.77	86.15	669.49
89.89	669.21	97.19	668.66	111.72	667.49	111.87	667.48	112.97	667.39
116.26	667.1	118.7	666.89	126.44	666.25	139.92	665.11	143.3	664.84
144.63	664.74	154.91	663.96	155.3	663.92	162.61	663.36	163.86	663.26
166.93	662.96	176.59	662.04	180.83	661.62	183.36	661.38	186.86	661.03
189.34	660.93	196.97	660.62	197.98	660.59	198.12	660.58	217.77	660.02
218.18	660.01	223.22	659.86	225.24	659.81	229.66	659.68	230.69	659.65
231.92	659.62	232.63	659.6	235.32	659.52	239	659.42	241.07	659.36
241.86	659.34	242.05	659.35	244.32	659.4	246.63	659.46	247.51	659.48
247.9	659.19	249.04	658.34	249.61	658.19	250.21	658.02	250.39	657.97
250.52	657.97	253.57	657.97	255.15	658.07	255.37	658.07	255.39	658.07
256.92	658.15	257.36	658.2	258.13	658.29	259.67	658.45	261.56	658.65
264.29	659.36	266.31	659.41	270.49	659.51	292.17	659.9	294.18	659.93
294.53	659.94	301.69	660.06	307.1	660.15	308.67	660.18	310.61	660.21
311.88	660.23	319.12	660.38	320.85	660.41	322.47	660.46	332.04	660.74
334.38	660.81	335.5	660.84	339.29	660.95	348.34	661.25	349.89	661.31
352.63	661.41	361.55	661.74	363.27	661.81	364.31	661.85	367.28	662
373.12	662.27	374.77	662.36	381.2	662.68	381.46	662.69	387.67	663.07
389.31	663.18	393.19	663.46	403.49	663.78	405.55	663.85	407.82	664.25
408.34	664.33	409.01	664.43	409.2	664.46	414.57	665.28	415.36	665.4
416.18	665.52	416.79	665.61	417.11	665.66	417.94	673.45	444.25	677.43
459.19	677.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	247.51	.05	264.29	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
247.51	264.29	48.34	49.66	50.16	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1509.*

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	691	11.55	690	28.72	688	39.33	686	43.9	685
44.12	684.99	45.63	669.83	53.84	669.32	57.53	669.1	61.64	668.85
64.06	668.72	65.36	668.64	66.63	668.56	67.92	668.48	69.27	668.4
72.11	668.22	73.33	668.14	75.94	667.96	80.13	667.7	83.55	667.48
87.17	667.26	94.26	666.83	108.35	665.87	108.49	665.87	109.56	665.79

112.75	665.54	115.12	665.36	122.62	664.82	135.7	663.84	138.98	663.63
140.27	663.55	150.24	662.94	150.62	662.91	157.71	662.47	158.92	662.38
161.9	662.15	171.26	661.43	175.38	661.09	177.82	660.9	181.22	660.61
183.63	660.52	191.03	660.21	192.01	660.19	192.14	660.19	211.2	659.76
211.6	659.75	216.48	659.64	218.44	659.6	222.74	659.51	223.73	659.49
224.92	659.46	225.61	659.45	228.22	659.39	231.79	659.32	233.8	659.27
234.56	659.26	234.75	659.26	236.95	659.3	239.19	659.34	240.04	659.36
240.41	659.11	241.49	658.37	242.01	658.21	242.58	658.04	242.76	657.98
242.94	657.98	247.53	657.98	249.27	658.11	249.52	658.12	249.54	658.12
251.23	658.2	251.72	658.25	252.57	658.33	254.28	658.48	256.38	658.68
259.4	659.27	261.52	659.33	265.93	659.44	288.76	659.92	290.88	659.97
291.25	659.97	298.79	660.12	304.48	660.23	306.14	660.27	308.18	660.3
309.52	660.33	317.14	660.5	318.96	660.54	320.67	660.59	330.75	660.95
333.21	661.04	334.39	661.08	338.38	661.21	347.92	661.61	349.54	661.68
352.43	661.81	361.82	662.24	363.63	662.33	364.72	662.39	367.86	662.58
374.01	662.95	375.74	663.08	382.51	663.51	382.78	663.53	389.33	664.05
391.05	664.2	395.14	664.59	405.99	665.01	408.16	665.1	410.55	665.44
411.09	665.5	411.8	665.58	412	665.6	417.65	666.21	418.49	666.3
419.36	666.4	419.99	666.46	420.33	666.5	421.21	678.09	448.91	681.08
464.64	681.04								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.085	240.04	.05	259.4	.085

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
240.04	259.4	48.34	49.66	50.16	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1459.33*

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	691.33	11.19	690.67	27.83	689.33	38.11	688	42.54	687.33
42.74	687.33	44.21	667.17	52.17	666.8	55.74	666.65	59.72	666.47
62.07	666.38	63.33	666.33	64.56	666.27	65.81	666.22	67.12	666.15
69.87	666.02	71.05	665.96	73.57	665.82	77.63	665.64	80.95	665.46
84.46	665.31	91.32	665	104.98	664.26	105.12	664.25	106.16	664.19
109.24	663.98	111.54	663.83	118.81	663.39	131.48	662.58	134.66	662.42
135.91	662.36	145.57	661.92	145.93	661.9	152.8	661.57	153.98	661.51
156.86	661.33	165.93	660.82	169.92	660.56	172.29	660.42	175.58	660.19
177.91	660.11	185.08	659.81	186.04	659.79	186.16	659.79	204.63	659.5
205.01	659.49	209.75	659.42	211.65	659.4	215.81	659.34	216.77	659.32
217.92	659.31	218.6	659.3	221.12	659.26	224.58	659.21	226.52	659.18
227.27	659.17	227.44	659.17	229.58	659.2	231.75	659.23	232.57	659.24
232.92	659.04	233.93	658.41	234.42	658.24	234.95	658.05	235.12	657.99
235.36	657.99	241.48	657.99	243.4	658.15	243.67	658.16	243.69	658.16
245.54	658.26	246.08	658.3	247.02	658.37	248.9	658.52	251.19	658.7
254.52	659.18	256.74	659.25	261.37	659.37	285.35	659.95	287.57	660
287.97	660.01	295.89	660.19	301.86	660.31	303.61	660.35	305.75	660.39
307.16	660.42	315.16	660.62	317.07	660.66	318.87	660.73	329.46	661.17
332.04	661.27	333.28	661.32	337.47	661.47	347.49	661.96	349.19	662.04
352.23	662.2	362.1	662.75	363.99	662.85	365.14	662.93	368.44	663.17
374.9	663.63	376.71	663.8	383.83	664.34	384.11	664.36	390.98	665.04
392.8	665.23	397.09	665.73	408.48	666.24	410.77	666.35	413.27	666.62
413.85	666.67	414.59	666.72	414.8	666.73	420.74	667.15	421.61	667.21
422.53	667.27	423.19	667.31	423.55	667.34	424.47	682.72	453.57	684.72
470.09	684.69								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	232.57	.05	254.52	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
232.57	254.52	48.34	49.66	50.16	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1409.66*

INPUT
Description:

Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	691.67	10.83	691.33	26.93	690.67	36.88	690	41.17	689.67
41.37	689.66	42.79	664.51	50.49	664.28	53.95	664.2	57.81	664.09
60.07	664.04	61.29	664.02	62.48	663.98	63.69	663.95	64.96	663.91
67.62	663.82	68.77	663.78	71.21	663.68	75.14	663.57	78.35	663.45
81.75	663.36	88.39	663.18	101.61	662.64	101.74	662.64	102.75	662.6
105.74	662.42	107.96	662.3	114.99	661.96	127.26	661.32	130.33	661.21
131.54	661.17	140.89	660.9	141.25	660.89	147.9	660.68	149.03	660.63
151.83	660.52	160.61	660.21	164.47	660.03	166.76	659.94	169.95	659.77
172.2	659.69	179.14	659.4	180.06	659.4	180.19	659.4	198.06	659.24
198.43	659.24	203.01	659.2	204.85	659.19	208.88	659.16	209.81	659.16
210.93	659.15	211.58	659.15	214.02	659.13	217.37	659.11	219.25	659.09
219.97	659.09	220.14	659.09	222.21	659.1	224.31	659.12	225.11	659.12
225.43	658.96	226.37	658.45	226.83	658.27	227.33	658.06	227.48	657.99
227.79	657.99	235.43	657.99	237.52	658.19	237.81	658.2	237.84	658.2
239.86	658.31	240.44	658.34	241.46	658.41	243.51	658.55	246.01	658.73
249.63	659.09	251.96	659.17	256.81	659.31	281.94	659.97	284.27	660.03
284.68	660.04	292.98	660.25	299.25	660.39	301.07	660.44	303.32	660.49
304.79	660.52	313.18	660.75	315.19	660.79	317.07	660.86	328.16	661.38
330.87	661.5	332.17	661.56	336.56	661.74	347.06	662.31	348.85	662.41
352.03	662.6	362.37	663.25	364.36	663.37	365.56	663.46	369.01	663.76
375.78	664.32	377.69	664.52	385.14	665.17	385.44	665.2	392.64	666.02
394.54	666.25	399.04	666.86	410.98	667.47	413.38	667.59	416	667.81
416.6	667.83	417.38	667.86	417.6	667.87	423.82	668.08	424.74	668.11
425.7	668.14	426.4	668.16	426.77	668.18	427.74	687.36	458.23	688.36
475.55	688.35								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.075	225.11	.05	249.63	.075

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
225.11	249.63	48.34	49.66	50.16	.3	.5

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1360

INPUT
Description: U/S XS of Bridge No 3
Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	692	40	692	41.37	661.85	48.82	661.755	52.16	661.744
55.89	661.708	58.08	661.707	59.26	661.703	60.41	661.694	61.58	661.68
62.81	661.661	65.38	661.618	66.49	661.595	68.85	661.538	72.65	661.501
75.75	661.436	79.04	661.405	85.46	661.35	98.24	661.027	98.37	661.025
99.34	661	102.23	660.857	104.38	660.771	111.18	660.526	123.04	660.053
126.01	660	127.18	659.98	136.22	659.885	136.56	659.877	142.99	659.783
146.79	659.703	155.28	659.601	159.01	659.499	161.23	659.46	166.49	659.282
173.2	659	174.09	658.999	174.21	658.999	191.49	658.982	191.85	658.982
196.28	658.984	198.06	658.985	201.95	658.992	202.85	658.992	204.56	658.995
206.92	659	210.16	659.002	211.98	659.003	212.84	659.002	214.84	659.001
216.87	659.001	217.64	659	217.94	658.88	219.24	658.295	219.7	658.07
219.84	658	220.21	658	229.38	658	231.64	658.227	231.99	658.242
234.8	658.391	238.12	658.584	244.74	659	247.18	659.09	278.53	660
280.97	660.065	281.4	660.078	290.08	660.31	296.63	660.471	298.54	660.529
302.43	660.616	311.2	660.867	313.3	660.914	315.27	661	326.87	661.587
329.7	661.73	331.06	661.792	335.65	662	346.63	662.658	348.5	662.778
351.83	663	362.64	663.75	364.72	663.894	365.98	664	369.59	664.346
376.67	665	378.66	665.236	386.46	666	386.77	666.037	394.3	667
396.29	667.279	400.99	668	413.48	668.692	418.73	669	419.36	669.003
420.17	669.006	420.4	669.006	426.91	669.016	427.87	669.017	428.87	669.016
429.6	669.015	429.99	669.014	431	692	481	692		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.07	217.64	.05	244.74	.07

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
217.64	244.74	110	108	100	.1	.3

BRIDGE

RIVER: Tributary
REACH: 1 RS: 1281

```
INPUT
Description: Bridge No 3
Distance from Upstream XS =       51
Deck/Roadway Width        =       56
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  703.91       0    5.92  703.91       0    5.92  703.91  698.91
  414.08     712     707  414.08     712       0     500     712

Upstream Bridge Cross Section Data
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     692    5.92     692    5.92  661.85   48.82 661.755   52.16 661.744
   55.89 661.708   58.08 661.707   59.26 661.703   60.41 661.694   61.58  661.68
   62.81 661.661   65.38 661.618   66.49 661.595   68.85 661.538   72.65 661.501
   75.75 661.436   79.04 661.405   85.46  661.35   98.24 661.027   98.37 661.025
   99.34     661  102.23 660.857  104.38 660.771  111.18 660.526  123.04 660.053
  126.01     660  127.18  659.98  136.22 659.885  136.56 659.877  142.99 659.783
  146.79 659.703  155.28 659.601  159.01 659.499  161.23  659.46  166.49 659.282
   173.2     659  174.09 658.999  174.21 658.999  191.49 658.982  191.85 658.982
  196.28 658.984  198.06 658.985  201.95 658.992  202.85 658.992  204.56 658.995
  206.92     659  210.16 659.002  211.98 659.003  212.84 659.002  214.84 659.001
  216.87 659.001  217.64     659  217.94  658.88  219.24 658.295   219.7  658.07
  219.84     658     225     657  229.38     658  231.64 658.227  231.99 658.242
   234.8 658.391  238.12 658.584  244.74     659  247.18  659.09  278.53     660
  280.97 660.065   281.4 660.078  290.08  660.31  296.63 660.471  298.54 660.529
  302.43 660.616   311.2 660.867   313.3 660.914  315.27     661  326.87 661.587
   329.7  661.73  331.06 661.792  335.65     662  346.63 662.658   348.5 662.778
  351.83     663  362.64  663.75  364.72 663.894  365.98     664  369.59 664.346
  376.67     665  378.66 665.236  386.46     666  386.77 666.037   394.3     667
  396.29 667.279  400.99     668  413.48 668.692  414.08 669.014  414.08     692
     481     692

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .07  217.64     .05  244.74     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
        217.64  244.74              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     692       0   41.84  703.91       0   41.84  703.91  698.91
     450     712     707     450     712       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4.92     692   41.84     692   41.84  660.58  130.71  658.23  195.23  657.77
  245.69  657.68  249.14   657.6  250.31  657.05  253.09  656.64  254.08  656.68
  256.22  657.22  258.88  657.46  262.11  657.67  272.66  658.28  351.77  658.51
  414.17   660.7     450     663     450     712  522.68     712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4.92     .07  245.69     .08  262.11     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
        245.69  262.11              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=   107.5    Downstream=  143.42
Upstream     num=       2
    Width   Elev    Width   Elev
        4      0        4    710
```

```
Downstream      num=        2
    Width   Elev    Width   Elev
       4       0       4     710

Pier Data
Pier Station     Upstream=     210    Downstream=  245.92
Upstream     num=        2
    Width   Elev    Width   Elev
       4       0       4     710
Downstream      num=        2
    Width   Elev    Width   Elev
       4       0       4     710

Pier Data
Pier Station     Upstream=   312.5    Downstream=  348.42
Upstream     num=        2
    Width   Elev    Width   Elev
       4       0       4     709
Downstream      num=        2
    Width   Elev    Width   Elev
       4       0       4     710

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Tributary
REACH: 1                   RS: 1252

INPUT
Description: D/S XS of Bridge No 3
Station Elevation Data     num=      19
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    4.92      692       73      692       73   660.58   130.71   658.23   195.23   657.77
  245.69   657.68   249.14    657.6   250.31   657.05   253.09   656.64   254.08   656.68
  256.22   657.22   258.88   657.46   262.11   657.67   272.66   658.28   351.77   658.51
  414.17    660.7      449      663      449      710   522.68      710

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    4.92     .07   245.69     .08   262.11     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        245.69  262.11                48      49   49.34              .1       .3

CROSS SECTION


RIVER: Tributary
REACH: 1                   RS: 1203.*

INPUT
Description:
Station Elevation Data     num=      35
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    3.28    681.6    58.66   681.34    73.01   681.24    73.01   660.29   132.12   658.31
  177.09   657.78    198.2   657.64   249.88   657.46   251.92   657.36   253.54   657.21
  254.41   657.19   255.94    656.8   255.99    656.8    257.2   656.59   258.23   656.63
   258.7   656.56   259.59   656.31   260.43    656.4   260.83   656.52   262.24   656.92
   263.6   657.13   264.49   657.24   267.22   657.54   273.48   657.85   277.95   657.98
  286.05   657.93   358.37   658.38    371.8   658.75    415.8   661.13   421.81   661.41
  457.22   663.76   457.22    695.1    466.7   695.32    480.8      696   532.12      702

Manning's n Values         num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
3.28	.073	249.88	.08	267.22	.073

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
249.88	267.22	48	49	49.34	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1154.*

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1.64	671.19	58.33	670.67	73.02	670.47	73.02	660	133.52	658.39
179.56	657.65	201.17	657.5	254.07	657.23	256.59	657.07	258.6	656.8
259.67	656.77	261.57	656.55	261.63	656.55	263.13	656.28	264.4	656.46
264.99	656.39	266.09	655.98	266.78	656.13	267.11	656.23	268.26	656.61
269.37	656.89	270.1	657.02	272.34	657.41	278.69	657.68	283.24	657.69
291.47	657.55	364.97	658.25	378.62	658.52	423.34	661.77	429.45	662.12
465.43	664.53	465.43	680.19	475.07	680.63	489.4	682	541.56	694

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1.64	.077	254.07	.08	272.34	.077

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
254.07	272.34	48	49	49.34	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 1105

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	660.79	58	660.01	182.03	657.52	258.26	657.01	261.27	656.79
263.66	656.39	267.27	656.3	269.06	655.96	270.58	656.29	271.28	656.21
272.59	655.65	273.38	655.95	275.14	656.65	277.45	657.28	283.91	657.51
296.89	657.17	385.44	658.29	430.88	662.41	483.44	665.95	498	668
551	686								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.08	258.26	.08	277.45	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
258.26	277.45	287	295	303	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 810

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
3.67	658.53	16.9	657.88	160	656.82	271.95	656.84	302.8	656.15
307.34	656.47	308.53	655.21	309.94	654.96	311.1	654.83	313.17	654.83
314.06	654.79	314.94	653.84	315.53	654.71	316.36	654.9	317.37	654.24
318.8	654.78	320.94	655.51	327.28	655.79	351.67	656.4	565.4	656.84
602.78	658.01	619	660	626	662	688	664	707	666

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
3.67	.08	307.34	.08	320.94	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
307.34	320.94	228	224	222	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 587

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-362	658.01	-200	657.01	0	656.21	18.41	655.67	92.6	655.34
102.91	654.9	103.88	654.39	105.93	654.47	108.13	654.79	109.33	653.92
110.17	653.78	110.56	654.16	111.32	654.28	112.69	654.85	114.18	654.96
132.53	655.09	307.17	656.16	344.29	658.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-362	.08	102.91	.08	114.18	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
102.91	114.18	122	126	127	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 463

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-416	658.01	-250	657.01	-87	656.01	0	655.59	109.8	654.54
194.42	654.32	208.54	654.65	213.7	654.92	215.61	654.29	217.64	654.15
219.79	653.77	223.31	654.2	224.25	653.23	226.46	653.59	227.82	654.41
233.37	654.53	278.57	654.4	400	655.01	496.5	656.01	525.1	657.01
557	658.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-416	.08	213.7	.08	233.37	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
213.7	233.37	105	105	104	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 357

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-626.5	660.01	-604.5	658.01	-594.5	657.01	-584.5	656.01	-479.5	655.01
0	655.01	153.93	654.15	175.05	653.71	185.31	653.59	188.41	652.4
191.14	653.59	193.32	653.82	195.38	654.05	198.28	654.41	202.04	654.7
206.36	654.46	350	655.01	528.59	656.01	549.3	657.01	596.9	658.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-626.5	.08	185.31	.08	191.14	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
185.31	191.14	179	175	168	.1	.3

CROSS SECTION

RIVER: Tributary
REACH: 1 RS: 183

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-631.8	658.01	-603	657.01	-586	656.01	-551	655.01	-252	654.01
-242	654.01	11.07	654.27	105.3	654.68	160.67	655.27	176.42	654.35
191.7	654.33	196.59	653.2	201.52	652.43	202.85	652.14	208.19	653.86
305.72	654.38	349	655.01	494	656.01	531.9	657.01	611	658.01

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  -631.8     .08   191.7     .08  208.19     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
         191.7  208.19      .       .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 5862

INPUT
Description:
Station Elevation Data      num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    6.57   692.9   16.52  686.09   30.12  679.79    46.8   679.9   59.74  679.08
   61.77  675.79   63.16  675.53   66.68  676.21   70.59  676.51    72.5  676.66
   75.29  677.24    83.9  677.66    93.4  677.98  108.12  680.46  126.96  680.02
  134.28  678.08  144.98  678.89  173.49  677.49  203.06  682.96  252.93  692.83
  275.94  705.68  283.35  706.71

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    6.57      .1   59.74     .05   75.29      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          59.74   75.29            200.9   314.2   312.6              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 5547

INPUT
Description:
Station Elevation Data      num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9.27   683.2   30.72  673.65   63.49  674.03   97.47  674.46  108.85  672.92
  130.75  672.73  212.69  671.49  215.49  671.05  218.29   670.1  219.35  669.38
  220.92   669.9   222.1  669.99  224.66   670.6  226.17  670.93  227.99  671.82
  230.09   673.4   245.5  678.64  264.68  690.27  273.75  691.73

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9.27      .1  215.49     .05  226.17      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         215.49  226.17            266.1     262   254.2              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 5282

INPUT
Description: u/s XS of Beach Grove Road Bridge
Station Elevation Data      num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  681.12   55.69  675.84   85.36  674.65  174.96  673.59  184.04  670.66
  207.55  670.04  212.26  669.41  214.34  667.03  219.14  667.34  223.57  668.03
  230.88  671.08  241.05  670.68  255.44   674.6  304.55  678.17     320  679.29

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  212.26     .05  230.88      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         212.26  230.88                 82    83.7    86.2              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     174  677.42        F
     253     320  677.42        F

BRIDGE
```

```
RIVER: Walker Run
REACH: 1                    RS: 5250

INPUT
Description: Beach Grove Road
Distance from Upstream XS =     22.3
Deck/Roadway Width        =     19.3
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=       13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  201.96  677.41       0  202.64  677.41       0   214.6  677.42  667.71
  216.27  677.42   671.5  217.27  677.42   672.7  218.96  677.42   673.3
  219.96  677.43   673.4  220.96  677.43   673.3  222.65  677.43   672.7
  224.11  677.43   671.5  226.87  677.43  668.95   226.9  677.43       0
  237.26  677.43       0

Upstream Bridge Cross Section Data
Station Elevation Data    num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  681.12   55.69  675.84   85.36  674.65  174.96  673.59  184.04  670.66
  207.55  670.04  212.26  669.41  214.61  667.71  220.04  668.18  223.99  667.71
  230.88  671.08  241.05  670.68  255.44   674.6  304.55  678.17     320  679.29
     350  679.29

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1  212.26     .05  230.88      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        212.26  230.88             .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
       0     174  677.42        F
     253     350  677.42        F

Downstream  Deck/Roadway Coordinates
    num=       13
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   193.8  677.34       0  194.48   677.4       0  206.44  677.49       0
  207.04  677.48  667.76  208.11  677.42  670.88  209.11  677.42  672.08
   210.8  677.42  672.68   211.8  677.64  672.78   212.8  677.43  672.68
  214.49  677.43  672.08  215.95  677.43  670.88   218.1  677.43  668.66
  229.29  677.19       0

Downstream Bridge Cross Section Data
Station Elevation Data    num=       30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -226.11  724.65 -176.11  709.54 -156.11  704.54 -106.11  699.65  -96.11  694.84
  -66.11  689.65  -41.11  684.65   -6.11  679.45   13.04  678.07    71.2  669.33
  123.89  668.34  186.89     668  204.89  667.74  207.05  667.71  212.14  668.18
  216.09  667.71  221.89  669.45  244.99  670.15  272.89  671.76  306.75  677.78
  363.89  679.45  378.89  684.24  413.89  689.34  435.89  694.54  453.89  699.34
  468.89  704.65  493.89  710.04  513.89  714.45  528.89  719.54  538.89  724.24

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 -226.11      .1  204.89     .05  221.89      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        204.89  221.89             .3       .7
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
 -226.11  176.89  677.42        F
  249.89  538.89  677.42        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
```

```
        Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
        Energy Only

Additional Bridge Parameters
        Add Friction component to Momentum
        Do not add Weight component to Momentum
        Class B flow critical depth computations use critical depth
            inside the bridge at the upstream end
        Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 5198

INPUT
Description: FEMA BIA d/s XS of Beach Grove Road Bridge
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -226.11  724.65 -176.11  709.54 -156.11  704.54 -106.11  699.65  -96.11  694.84
  -66.11  689.65  -41.11  684.65   -6.11  679.45   13.04  678.07    71.2  669.33
  123.89  668.34  186.89     668  204.89  667.74  207.96  665.96  212.14  665.71
  215.99  665.85  217.97  666.58  221.89  669.45  244.99  670.15  272.89  671.76
  306.75  677.78  363.89  679.45  378.89  684.24  413.89  689.34  435.89  694.54
  453.89  699.34  468.89  704.65  493.89  710.04  513.89  714.45  528.89  719.54
  538.89  724.24

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -226.11      .1  204.89     .05  221.89      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        204.89  221.89             89.8    90.1    89.3              .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -226.11  176.89  677.42       F
  249.89  538.89  677.42       F

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 5107

INPUT
Description:
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1.11  677.51   37.49  670.27   96.16   668.4  133.14  668.48     139     668
     144     667  158.69  666.07  161.58  664.84  163.25  664.65  164.42  664.59
  165.79  665.03  166.43  665.04  169.94   666.9     221     667     225     668
  238.09  668.33  302.28  669.86     349  678.03

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    1.11      .1   37.49     .11     144     .05  169.94     .11  238.09      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           144  169.94             112     112     112              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 1                    RS: 4995

INPUT
Description: FEMA BHZ
Station Elevation Data     num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  724.34    1010  719.54    1022  714.54    1055  709.65    1075  704.45
    1100  699.45    1120  694.84    1140  691.74    1150  691.74    1180  689.34
    1270  684.74    1300  676.74    1315  674.84    1383     669    1387     668
    1392     667    1440  666.24    1497     667    1501     668    1505   668.9
    1540  667.74    1610  669.45    1635  674.54    1662  679.45    1685  690.04
```

1725	686.74	1750	689.45	1770	694.45	1780	699.34	1810	704.34
1835	709.84	1850	714.34	1870	719.34	1895	724.45		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.1	1383	.11	1392	.05	1497	.11	1610	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1392	1497	180.8	181.3	177.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4810

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	673.03	22.15	670.47	30.66	668.65	57.63	668.16	64.81	668.208
65.68	668.122	66.08	668	70.73	667.243	71.83	667.059	72.15	667
75.4	666.647	81.53	666	105.92	665.242	113.64	665	113.91	664.818
115.25	664	116.22	663.356	116.96	663	118.18	662.871	119.73	662.932
120.24	663	120.56	663.14	122.83	664	125.34	664.475	128.1	665
133.43	665.032	135.86	665.045	154.3	665.142	162.99	665.18	165.61	665.201
178.31	665.3	180.17	665.3	180.7	665.3	181.83	665.3	185.8	665.25
190.21	665.165	200.97	665	211.96	665.141	223.37	665.3	234.5	665.753
241.06	666	241.82	666.19	245.06	667	247.93	667.645	249.2	668
249.5	668	250	668.001	252.44	668.004	252.46	668.004	252.53	668.004
255.19	668.001	255.55	668.001	256.08	668	257.45	667.938	257.73	667.957
257.9	667.966	258.59	667.961	288.1	666.6	321.23	667.68	361.14	676.54

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.1	57.63	.11	113.64	.05	128.1	.11	258.59	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
113.64	128.1	74	73.7	76	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4735

INPUT
Description: FEMA BHY
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
783	694	895	694	902	696	933	696	1003	696
1203	694	1369	692	1375	690	1388	686	1390	684.34
1430	683.74	1478	684.45	1620	679.54	1660	674.84	1690	669.54
1700.14	668	1706.48	668	1706.71	668	1707.21	668	1708.07	668
1708.72	668	1709.45	668	1710.13	668	1716.64	667.49	1719.92	667
1721.48	666.749	1726.83	666	1728.55	665.722	1734.13	665	1739.14	664.952
1752.79	664.8	1756.71	664.732	1767.42	664.59	1769.17	664.59	1771.11	664.599
1772.15	664.613	1775.69	664.672	1781.28	664.8	1793.07	664.416	1805.05	664
1807.11	663.406	1808.61	663	1809.81	662.542	1811.01	662.258	1812.45	662.633
1813.53	663	1813.83	663.21	1814.96	664	1821.41	664.218	1825.33	664.237
1830.8	664.295	1844.45	664.489	1871.09	664.907	1876.95	665	1882.27	665.608
1885.67	666	1886.97	666.323	1889.7	667	1890.9	667.064	1909.49	666.951
1909.55	666.956	1917.09	666.674	2000	669.45	2020	674.65	2042	679.84
2046	690	2054	694	2163	696	2171	700	2191	710

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
783	.1	1734.13	.11	1805.05	.05	1814.96	.11	1882.27	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1805.05	1814.96	41.8	43	43	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4692

INPUT

Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.2	676.54	14.2	673.9	29.44	673.96	39.22	671.77	100.41	668.46
115.19	668	117.8	668	120.39	668	122.3	668	124.73	667.454
126.96	667	129.52	666.456	131.99	666	134.43	665.482	136.94	665
150.39	664.915	174.31	664.51	176.11	664.456	178.71	664.392	181.33	664.388
187.44	664.226	195.53	664	197.09	663.916	198.85	663.834	200.84	663.787
201.06	663.773	203.64	663.897	206.14	664	216.1	664.145	218.05	664.16
224.56	664.251	229.54	664.259	234.53	664.327	280.45	664.929	282.17	664.936
287.78	665	294.26	665.639	297.98	666	300.25	666.484	302.51	667
307.96	666.83	316.64	666.554	320.98	666.408	322.95	666.329	329.57	666.282
329.66	666.29	331.96	666.203	380.91	669.4	419.8	678	423	676
424	676	433	680						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
2.2	.1	136.94	.11	195.53	.05	206.14	.11	302.51	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
195.53	206.14	188.7	197	188.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4495

INPUT
Description: FEMA BHX
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1198	694	1232	700	1261	710	1279	716	1307	716
1411	718	1688	718	1713	710	1774	690	1805	680
1820	679.74	2003	667.576	2006.92	667.612	2011.35	667.652	2018.97	667.902
2020.87	667.974	2021.45	667.975	2022.29	667.977	2025.06	667.984	2026.78	667.987
2027.89	667.99	2029.03	667.99	2032.09	667.994	2033	667.996	2035.46	667.999
2036.6	668	2039.69	667.326	2041.17	667	2042.52	666.736	2046.49	666
2047.63	665.765	2051.55	665	2061.5	664.353	2067.59	664.252	2073.17	664.091
2073.93	664.089	2078.82	664.087	2080.05	664.084	2083.21	664.075	2091.76	664.056
2097.57	664.038	2101.06	664.028	2109.99	664	2114.37	663.524	2116.41	663.305
2117.18	663.233	2121.29	663.713	2123.77	664	2124.99	664	2125.39	664
2138.05	664	2142.26	664	2146.61	664	2149.65	664	2152.42	664
2164.57	664.267	2171.35	664.553	2173.93	664.594	2181.16	665	2184.58	665.607
2186.64	666	2189.87	666.635	2191.82	667	2199.16	667.003	2219.84	666.825
2222.42	665.866	2230	664.079	2231.69	664.473	2232.04	664.556	2235.56	665.015
2242.2	665.926	2242.71	666	2244.28	666	2244.52	666	2244.73	666
2280	669.54	2300	674.24	2306	676	2313	676	2321	680
2338	690	2345	692	2370	694	2486	696	2495	700
2515	710								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1198	.1	2036.6	.11	2109.99	.05	2123.77	.11	2244.73	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2109.99	2123.77	77.5	81	77.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4414

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-5.7	673.7	1.31	671.76	19.96	669.88	70.87	667.77	105.71	667
105.98	666.94	109.83	666	110.36	665.876	114.28	665	128.45	664.158
137.09	664.014	137.29	664.006	138.95	664	151.88	663.973	152.23	663.974
164.32	663.974	164.86	663.977	169.07	663.978	172.77	663.817	173.49	663.764
174.35	663.649	175.33	663.466	177.51	663.013	177.55	663.014	178.12	663
178.49	662.971	178.66	663	179.14	663.063	181.06	663.262	181.27	663.281
183.82	663.485	186.11	663.666	187.66	663.778	188.15	663.78	188.44	663.796
189.28	663.798	189.93	663.833	190.54	663.877	202.44	664	207.78	664
207.97	664	208.27	664	223.32	664	224.04	664	226.1	664
236.4	664	239.7	664	246.89	664	252.71	664	263.16	664.644
269.13	665	271.32	665.454	274.29	666	289.21	666.75	296.88	667.165

298.28	666.355	316.64	665.969	317.16	665.968	317.2	666	317.52	666
318.14	666	318.59	666	331.76	668.59	383	676	385	674
387	674	400	680	425	690				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-5.7	.1	128.45	.11	169.07	.05	190.54	.11	331.76	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
169.07	190.54	114.9	119	117.5	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4295

INPUT
Description: FEMA BHW
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1067	710	1145	710	1151	708	1167	708	1173	710
1201	710	1208	708	1218	708	1223	710	1253	700
1312	680	1370	674.24	1408	669.34	1470	669.45	1507.95	667.187
1509.22	667.198	1510.67	667.211	1513.14	667.293	1519.31	667.527	1520.9	667.476
1522.86	667.413	1524.07	667.283	1525.97	667.08	1526.72	667	1528.93	666.464
1530.85	666	1531.78	665.82	1535.97	665	1537.1	664.796	1541.24	664
1546.87	663.846	1555.86	663.6	1558.07	663.572	1565.76	663.496	1569.64	663.469
1573.24	663.451	1577.76	663.46	1582.84	663.507	1589.02	663.6	1590.11	663.585
1590.4	663.581	1606.93	663.395	1611.2	663.343	1614.72	663.297	1626.09	663.162
1639.19	663	1641.48	662.948	1646.47	662.823	1650.69	662.977	1651.36	663
1651.82	663.016	1652.1	663.018	1652.17	663.02	1654.85	663.027	1658.85	663.056
1659.58	663.044	1660.07	663.041	1660.66	663.046	1669.22	663.127	1672.44	663.169
1680.77	663.278	1689.02	663.437	1695.4	663.554	1714.18	664	1714.51	664.043
1715.85	664.216	1721.6	665	1726.29	665.903	1726.69	666	1744.06	665.521
1753	665.29	1762.02	665.598	1769.22	665.843	1773.58	666	1800	666.45
1820	674.24	1875	679.65	1896	674	1903	672	1908	672
1915	674	1930	680	1949	690	1953	692	2038	694
2241	696	2250	700	2285	710				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1067	.1	1519.31	.11	1639.19	.05	1652.17	.11	1800	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1639.19	1652.17	160.8	170.5	164.4	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4130

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9.79	672.78	38.19	668.15	65.97	666.24	90.55	666.158	91.61	666.009
91.72	666	92.08	665.946	98.82	665	100.19	664.775	105.05	664
106.39	663.159	106.76	663	107.96	662.985	116.25	662.936	120.19	662.935
124.72	662.947	127.3	662.968	130.71	663	136.98	663	145.11	663
151.76	663	154.8	663	156.55	663	160.84	662.674	166.49	662.262
171.27	662.654	174.9	663	179.99	663.043	180.66	663.04	190	663.361
198.82	663.597	210.12	664	213.33	664.489	215.93	665	218.2	664.985
218.74	664.983	220.89	664.961	221.71	664.955	226.08	664.933	227.28	664.933
229.38	664.933	237.05	664.971	238.12	664.969	239.02	665	253.95	665.83
269.33	665.98	370.38	665.85	415.17	670.09	473	672	491	680
517	692								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
9.79	.1	90.55	.11	156.55	.05	174.9	.11	239.02	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
156.55	174.9	87.5	89.5	81.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 4043

INPUT
Description: FEMA BHV
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1127	714	1175	712	1211	710	1217	708	1228	708
1235	710	1269	704	1282	704	1294	700	1324	690
1330	674.54	1390	671.54	1520	667.84	1580.33	666	1582.28	665.776
1590.68	665	1594.63	664.551	1600.28	664	1606.73	663.761	1610.6	663.475
1618.4	663	1621.16	662.919	1623.52	662.858	1625.01	662.825	1629.53	662.932
1631.2	662.974	1631.53	662.982	1632.7	663	1648.17	663.419	1662.23	664
1664.92	664.369	1670	665	1670.44	665	1673.62	664.991	1673.97	664.99
1676.78	664.988	1680.44	664.98	1680.85	664.98	1681.37	664.978	1682.77	664.977
1689.01	664.975	1692.57	664.975	1693.29	665	1740	667.24	1910	669.54
1960	674.65	1965	672	1971	672	1987	680	2011	692
2107	694	2310	696	2355	710	2425	736		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1127	.1	1580.33	.11	1618.4	.05	1632.7	.11	1670	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1618.4	1632.7	67.9	88.3	73.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3972

INPUT
Description: U/S XS of Market Street Bridge
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
123.85	674.24	171.83	670.24	197.75	670.47	204.44	667.88	215.91	667.02
223.06	665.53	225.4	663	270.18	661.21	277.41	661.6	281.39	661.43
285.52	661.64	287.4	663	295.4	664	298.04	664.769	299.32	664.863
315.58	665.35	372.3	666.78	391.2	666.21	536	666.78	559	667.64
748.66	669.45	788.66	674.34						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
123.85	.1	225.4	.05	299.32	.1	372.3	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
225.4	299.32	101.2	98.1	100.6	.3	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
123.85	202.37	670.8	F
341.4	788.66	670.3	F

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 3914

INPUT
Description: Market Street u/s
Distance from Upstream XS = 40.1
Deck/Roadway Width = 43.1
Weir Coefficient = 2.5
Upstream Deck/Roadway Coordinates
num= 16

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.611	673.611	71.3	672.778	672.278	151.64	671.546	671.546
216.18	671.069	671.069	254.71	670.8	664.72	260.35	670.8	663.3
260.36	673.78	663.04	260.37	673.78	669.04	272.2	673.78	669.04
283.42	673.78	669.04	283.43	673.78	663.08	285	673.78	664.36
285.1	670.45	664.36	287.02	670.3	665.83	339.19	669.234	669.234
435.84	667.629	667.629						

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-113.65	679.5	-20.65	674.7	0	673.611	71.3	672.778	151.64	671.546
216.18	671.069	254.71	664.72	261	663.04	272.49	661.04	283.42	663.08

```
  287.02  665.83  339.19 669.234  435.84 667.629  464.35   668.7  554.35   669.7
  604.35   674.8  684.35   679.7  769.35   684.6    1200   684.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -113.65      .1  254.71     .05  287.02      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
        254.71  287.02            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -113.65  202.37   670.8       F
   341.4    1200   670.3       F

Downstream  Deck/Roadway Coordinates
    num=      15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0 673.611 673.611    71.3 672.778 672.278  151.64 671.546 671.546
  216.18 671.069 671.069  254.71   670.8  664.72  260.35   670.8  661.95
  260.36  673.42  668.72   272.2  673.42  668.72  283.42  673.42  668.72
  283.43  673.42  661.35     285  673.42  664.36   285.1  670.45  664.36
  289.14   670.3  664.78  339.19 669.234 669.234  435.84 667.629 667.629

Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -230   679.5 -113.65   679.5  -20.65   674.7       0 673.611    71.3 672.778
  151.64 671.546  216.18 671.069  254.71  664.72     261  663.04  272.49  661.04
  283.42  663.08  287.02  665.83  339.19 669.234  435.84 667.629  464.35   668.7
  554.35   669.7  604.35   674.8  684.35   679.7  769.35   684.6

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    -230      .1 -113.65      .1  254.71    .055  287.02     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        254.71  287.02            .4       .8
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -230     200   670.9       F
     310  769.35   670.3       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   668.7
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   670.1

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 3860

INPUT
Description: D/S XS of Market Street Bridge
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

117.66	675.84	137.05	672.03	181.62	671.65	219.23	671.09	253.06	668.65
262.64	664.21	265.16	663.32	266.08	661.15	272.52	660.73	283.67	661.59
288.12	663.96	295.78	666.15	334.66	665.91	349.26	667.65	357.79	668.52

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
117.66	.1	219.23	.12	265.16	.055	288.12	.06	334.66	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

265.16	288.12	75.5	68.6	74.8	.4	.8

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
117.66	200	670.9	F
310	357.79	670.3	F

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3785

INPUT
Description: FEMA BHU
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1012	714	1143	710	1160	710	1203	692	1225	692
1260	684.65	1290	679.74	1318	674.84	1360	669.34	1412	664.95
1426.79	661	1430.1	660.85	1431.45	660.96	1431.99	661	1435.13	661
1436.82	661	1439.14	661.16	1457.87	662	1458.82	662.19	1462.77	663
1463.66	663.18	1467.67	664	1469.67	664.41	1472.57	665	1474.69	665
1477.84	665	1477.88	665	1477.94	665	1479.92	665	1480.99	665
1500	665.84	1550	667.24	1580	666.74	1650	666.15	1760	669.45
1800	674.34	1812	674	1823	670	1827	670	1845	680
1869	692	1985	694						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1012	.1	1412	.055	1472.57	.12	1480.99	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

1412	1472.57	63.5	56.1	58.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3735

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46.72	679.91	74.63	675.8	101.02	670.65	135.38	669.18	157.56	666.89
174.59	661	186.31	660.48	186.63	660.49	186.72	660.46	187.27	660.56
190.57	661	193.83	661	195.08	661	203.49	661.11	234.44	661.6
236.03	661.59	238.97	661.63	240.01	661.61	241.57	661.64	242.67	661.63
244.2	661.62	247.27	661.68	250.62	661.71	252.67	661.76	261.64	661.92
262.33	661.94	265.73	662	269.46	662.52	272.84	663	275.62	663.39
281.52	664	284.12	664.07	287.2	664.13	298.4	664.17	306.64	664.14
340	664	396	664	402	665	420	666	422	666
440	666	642.15	669.34						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
46.72	.1	174.59	.055	190.57	.12	340	.04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

174.59	190.57	208.1	193.9	194.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3532

INPUT
Description: FEMA BHT
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

1000	714	1260	714	1310	712	1352	710	1360	710
1368	684.95	1390	679.74	1428	674.34	1489.73	661	1490.27	661
1492.15	661	1494.56	661	1497.2	661	1497.87	661	1499.76	661
1502.81	661	1503.38	661	1505.44	661	1508.4	661	1509.25	661
1509.96	660.87	1510.56	660.88	1513.01	661	1523.66	661	1526.48	661.71
1527.55	662	1531.58	662.51	1535.35	663	1540.62	663	1557.67	663
1560.38	662.32	1561.67	662	1566.52	661.07	1567.04	661	1570.41	660.94
1573.77	660.89	1577.02	660.87	1590.62	660.85	1591.26	660.84	1604.01	660.81
1606.68	660.8	1616.06	660.79	1618.17	660.79	1627.35	660.78	1629.71	660.77
1630.88	660.76	1632.64	660.73	1635.02	660.68	1637.73	660.62	1648.78	660.62
1650.3	660.51	1653.61	660.19	1655.15	660	1658.81	659.3	1660.1	659
1661.18	658.94	1662	658.87	1662.85	658.95	1663.54	659	1665.67	659.9
1665.93	660	1665.97	660.02	1666.12	660.03	1668.34	660.42	1674.49	660.46
1677.45	660.63	1678.76	660.71	1689.17	660.75	1696.73	660.82	1710.74	661
1711.27	661.02	1719.48	662	1722.58	662.37	1726.32	663	1750	666.34
1770	665.74	1850	666.34	1970	670	1973	668	1976	668
2000	680	2024	692	2161	694	2360	696	2369	700
2425	720								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1489.73	.1	1648.78	.06	1668.34	.1	1726.32	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1648.78	1668.34	123.6	125	123.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3410

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
33.79	674.7	76.45	668.35	118.62	664.23	124.75	661.35	124.85	661.36
127.56	661.14	129.03	661	130.2	660.26	130.68	660	138.5	660
142.94	660	147.75	660.61	151	661	157.96	661.36	165.48	661.49
172.81	661.72	182.05	661.83	185.53	661.89	186.48	661.9	195.32	661.95
195.65	661.95	195.89	661.95	196.08	661.94	196.17	661.94	196.63	661.89
202.22	661.25	203.08	661.21	203.57	661.16	203.9	661.1	204.29	661
215	660	286.94	660	292.1	659.48	292.19	659.47	295.01	659.02
296.11	658.92	296.16	658.92	297.06	658.95	297.65	659	299.62	659.46
301.23	660	305.18	660.06	360	660.06	368.41	661	368.55	661.04
372.42	662	372.5	662.02	376.43	663	381.4	662.93	385.18	663.96
402.12	664.21								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
33.79	.08	124.75	.1	286.94	.05	301.23	.1	372.42	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
286.94	301.23	36.2	35	34.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3375

INPUT
Description: FEMA BHS
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
988	714	1208	714	1255	712	1291	710	1305	710
1320	684.34	1338	679.95	1360	674.65	1420	664.54	1421.52	661.96
1421.81	661.99	1423.45	661.86	1424.56	661.76	1424.89	661.79	1426.25	661.7
1430.45	661.52	1435.64	661	1437.79	661	1438.89	661	1439.66	661
1440	660.83	1441.57	660	1447.71	660	1451.29	660	1458.24	660
1464.7	660.48	1468.14	660.71	1468.6	660.73	1469.2	660.75	1470.03	660.75
1472.79	660.82	1479.61	660.94	1480.67	660.94	1483.28	661	1489.17	661.04
1489.6	661.05	1495.46	661.07	1499.84	661.05	1502.67	661	1503.12	660.98
1503.38	660.98	1506.72	660.81	1522.07	659.77	1528.63	659.69	1531.51	659.69
1537.4	659.65	1538.88	659.65	1545.07	659.65	1546.45	659.64	1554.57	659.67
1555.42	659.67	1558.24	659.69	1560.46	659.7	1563.93	659.75	1569.61	659.77
1572.96	659.78	1575.61	659.82	1580.07	659.85	1586.63	659.9	1598.22	660
1599.68	659.66	1601.63	659	1604.09	658.53	1605.43	658.03	1606.47	657.99
1606.53	657.97	1607.99	658	1608.43	658.08	1610.14	659	1610.55	659.3

1611.37	660	1631.33	660.32	1671.63	661	1673.22	661.4	1675.64	662
1677.17	662.38	1679.64	663	1679.72	663	1680.1	663	1680.34	663
1705	664.24	1800	666.74	1888	668	1893	670	1897	670
1901	668	1908	668	1932	680	1957	692	2116	694

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
988	.08	1421.52	.1	1598.22	.05	1611.37	.1	1705	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1598.22	1611.37	92.9	96	103.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3278

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
40.42	666.96	56.89	663.45	68.42	662.57	75.07	662.03	76.37	661
81.04	660.09	81.46	660	94.29	659.62	111.19	659.22	111.85	659.22
111.94	659.22	112.62	659.22	117.52	659.24	139.22	659.04	153.04	659.01
156.74	659.01	160.34	659	161.5	658.49	163.91	658.08	164.9	658
166.03	657.99	166.14	658.05	168.81	658.44	172.27	658.76	173.42	658.88
173.99	658.91	175.26	659	190.83	659.05	204.68	659.1	212.3	659.12
225	659.2	231.3	659.22	242	659.3	255.25	659.3	277.78	659.08
286.69	659.25	289.27	659.3	300.2	659.49	332.26	660	335.19	660.73
336.28	661	339.14	661.71	340.3	662	341.7	662.33	342.25	662.47
343.67	662.84	343.81	662.88	344.38	662.72	345.42	662.71	450	666
453	668	653	668						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
40.42	.06	76.37	.08	160.34	.05	175.26	.08	340.3	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
160.34	175.26	195.6	214	204.6	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 3065

INPUT
Description: FEMA BHR
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
888	714	1301	714	1348	712	1368	708	1382	708
1388	710	1405	669.74	1425	664.54	1465.04	660.87	1473.01	660.71
1474.43	660.71	1475.09	660.7	1475.71	660.68	1476.78	660.64	1478.13	660.59
1479.96	660.54	1481.67	660.42	1483.06	660.33	1484.98	660.2	1486.52	660
1493.71	659.08	1494.24	659	1495.27	658.97	1495.79	658.96	1516.92	658.58
1519.95	658.53	1527.95	658.62	1531.7	658.6	1534.1	658.59	1542.56	658.61
1544.34	658.63	1554.25	658.69	1567.38	658.77	1567.62	658.77	1567.88	658.78
1568.87	658.79	1569.18	658.78	1570.26	658.78	1570.92	658.78	1581.03	658.72
1590.33	658.6	1593.99	658.56	1601.9	658.5	1605.27	658.47	1613.35	658.5
1619.49	658.49	1620.03	658.48	1626.57	658.43	1627.51	658.41	1628.55	658.39
1637.92	658.31	1639.65	658.28	1641.75	658.26	1649.82	658.24	1652.44	658.22
1655.88	658.19	1663.41	658.17	1665.27	658.12	1676.69	658.1	1680.99	658.07
1684.91	658.03	1687.34	658	1689.5	657.5	1690.38	657	1690.5	657
1692.56	656.75	1692.59	656.75	1692.65	656.75	1694.85	657	1695.87	657.33
1697.34	658	1701.15	658.05	1735.89	658.61	1746.13	658.59	1749	658.59
1750.69	658.6	1752.38	658.61	1754.21	658.63	1756.59	658.68	1765.02	658.86
1766.8	658.85	1771.75	659	1773.09	659.33	1775.76	660	1777.05	660.32
1779.76	661	1780.08	661.09	1782.79	662	1805	664.34	1828	666.54
1831	666	1833	666	1844	668	1849	670	2056	670
2066	668	2068	668	2081	670	2138	670	2211	668
2384	668	2400	676						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
888	.06	1486.52	.08	1687.34	.05	1697.34	.08	1782.79	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1687.34	1697.34	129.8	116.6	121.4	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2949

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	710	17.6	706	26.4	706	38	710	83	688
96.72	659.48	106.73	659.92	109.72	659.69	111.72	659.53	118.37	659.09
118.87	659.08	119.65	659	131.83	658.19	134.85	658	141.52	657.88
145.97	657.82	150.6	657.78	154.47	657.77	168.39	657.77	172.22	657.76
174.36	657.76	181.6	657.76	196.62	657.02	201.25	657.01	202.88	657.01
208.06	657	214.52	657	216.28	656.97	220.44	656.88	224.77	656.81
225.97	656.79	227.96	656.74	235.14	656.86	239.37	656.95	239.92	656.87
240.15	656.85	241.06	657	244.18	657.21	246.32	657.43	252.53	657.63
254.33	657.76	263.53	658	266.22	658	266.62	658	279.29	658
282.15	658	290.8	658	299.61	658	305.47	658	318.22	658
321.61	658	335.13	658	335.56	658	337.59	658	349.25	658
353.11	657.96	366.29	657.93	376.49	657.92	388.48	657.92	398.28	658
403.1	657.96	412.2	658	418.32	658	431	658.44	441.57	659
444	659.6	445.6	660	448.16	660.63	449.64	661	452.33	661.67
453.68	662	464.54	662.65	474.11	665.45	491.53	665.76		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	111.72	.08	214.52	.05	241.06	.08	453.68	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
214.52	241.06	211	213.4	221.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2730

INPUT
Description: FEMA BHQ U/S XS of Walker Run Prop Bridge
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-421.78	714	-377.17	714	-201.17	712	-122.17	710	-107.17	708
-75.17	708	-57.17	710	89.83	694	135.83	692	162.83	688
202.83	686	262.83	686	304.83	680	306	658.64	319.28	658.36
322.31	658.33	325.72	658.28	329.58	658.24	334	658.18	339.2	658.11
345.48	658.01	346.25	658	350.92	657.34	352.81	656.8	355.33	656.83
360.52	656.83	362.38	656.82	367.4	656.8	370.87	656.82	373.25	656.81
373.85	656.81	374.49	656.86	382.57	656.59	395.38	656.32	409.31	656.27
412.81	656.25	416.6	656.02	430	656.02	430.27	656	431.42	655.78
434.92	655.66	436.88	655.83	439.81	656	442.6	656.32	456.04	656.53
464.73	656.57	466.97	656.61	469.29	656.64	472.01	656.67	474.24	656.69
476.14	656.72	478.25	656.73	479.98	656.75	481.47	656.75	482.95	656.76
484.7	656.77	486.72	656.78	490.65	656.79	491.55	656.79	492.37	656.8
505.42	656.98	515.12	656.98	516.8	656.99	528.2	657	538.29	657
538.41	657	658.42	657	668.42	658	687.12	662	717.97	663
739.24	664	745.24	665	754.54	668	774.2	668	792.47	668
805.47	666	810.47	666	818.47	668	829.47	670	832.47	670
1040.47	668	1043.47	666	1593.22	666				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-421.78	.06	334	.08	416.6	.05	439.81	.08	687.12	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
430	439.81	237.4	231.9	230.8	.3	.5

BRIDGE

RIVER: Walker Run
REACH: 1 RS: 2620

INPUT
Description: Bridge on Site B Walker Run
Distance from Upstream XS = 71
Deck/Roadway Width = 13.8

Weir Coefficient = 2.5

Upstream Deck/Roadway Coordinates

num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.19	0	160	673.19	0	305	672.26	671.26
705	668.26	667.26	716	667.65	0	736	667.65	0

Upstream Bridge Cross Section Data

Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-421.78	714	-377.17	714	-201.17	712	-122.17	710	-107.17	708
-75.17	708	-57.17	710	89.83	694	135.83	692	162.83	688
202.83	686	262.83	686	304.83	680	306	658.64	319.28	658.36
322.31	658.33	325.72	658.28	329.58	658.24	334	658.18	339.2	658.11
345.48	658.01	346.25	658	350.92	657.34	352.81	656.8	355.33	656.83
360.52	656.83	362.38	656.82	367.4	656.8	370.87	656.82	373.25	656.81
373.85	656.81	374.49	656.86	382.57	656.59	395.38	656.32	409.31	656.27
412.81	656.25	416.6	656.02	430	656.02	430.27	656	431.42	655.78
434.92	655.66	436.88	655.83	439.81	656	442.6	656.32	456.04	656.53
464.73	656.57	466.97	656.61	469.29	656.64	472.01	656.67	474.24	656.69
476.14	656.72	478.25	656.73	479.98	656.75	481.47	656.75	482.95	656.76
484.7	656.77	486.72	656.78	490.65	656.79	491.55	656.79	492.37	656.8
505.42	656.98	515.12	656.98	516.8	656.99	528.2	657	538.29	657
538.41	657	658.42	657	668.42	658	687.12	662	717.97	663
739.24	664	745.24	665	754.54	668	774.2	668	792.47	668
805.47	666	810.47	666	818.47	668	829.47	670	832.47	670
1040.47	668	1043.47	666	1593.22	666				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-421.78	.06	334	.08	416.6	.05	439.81	.08	687.12	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
430	439.81	.3	.5

Downstream Deck/Roadway Coordinates

num= 5

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	673.19	0	130	673.19	0	175	672.26	671.26
575	668.26	667.26	682.2	667.65	0			

Downstream Bridge Cross Section Data

Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	675	105	666	169.7	662	176	660	182	658
194.31	657.58	211.95	657	216.39	656.69	219.45	656.65	222.52	656.63
231.11	656.33	241.63	656.33	250.53	656.2	262.61	656.04	264.91	656.05
272.27	656.06	275.1	656.07	279.86	656.07	285.09	656.08	293.79	656.09
295.78	656.09	306.04	656.09	308.92	656.08	310.65	656.09	312.14	656.09
319.96	656.08	322.32	656.08	328.92	656.06	333.01	656.06	337.43	656.07
341.59	656.05	347.14	656.05	350.97	656.06	354.99	656.06	355.25	656.06
355.57	656.06	356.3	656.06	365.12	656.06	371.78	656.05	378.51	656.05
383.44	656.04	386.2	656.04	390.9	656.04	397.79	656.03	406.48	656.03
418.61	656.01	431.55	656	433.09	655.17	433.4	655	433.64	654.95
433.9	654.9	435.69	654.75	436.92	654.97	437.79	655	438.31	655.29
439.78	656	442.48	656	474.44	656	480.93	655.89	496.46	655.94
501.55	656	505.3	656.18	532.81	657	533.28	657.05	540.1	657.71
542.97	658	554.45	658.87	555.99	659	560.72	659.3	572.87	660
577.28	660.22	584.19	660.56	590.14	660.86	591.26	660.92	597.54	661.5
599.58	661.63	603.22	661.88	605.32	662	658.58	665.36	678.36	665.96
682.31	667.16	1000	667.16						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	211.95	.08	431.55	.05	439.78	.08	590.14	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
431.55	439.78	.3	.5

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 659.2
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 4

```
Pier Data
Pier Station     Upstream=   330.2    Downstream=   300.2
Upstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26
Downstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26

Pier Data
Pier Station     Upstream=   410.2    Downstream=   380.2
Upstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26
Downstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26

Pier Data
Pier Station     Upstream=   490.2    Downstream=   460.2
Upstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26
Downstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26

Pier Data
Pier Station     Upstream=   570.2    Downstream=   540.2
Upstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26
Downstream     num=       2
    Width   Elev    Width   Elev
       2       0       2  671.26

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =     1.5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =   658.5

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 1                  RS: 2497

INPUT
Description: D/S XS of Walker Run Prop Bridge
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     663   169.7     662     176     660     182     658  194.31  657.58
  211.95     657  216.39  656.69  219.45  656.65  222.52  656.63  231.11  656.33
  241.63  656.33  250.53   656.2  262.61  656.04  264.91  656.05  272.27  656.06
   275.1  656.07  279.86  656.07  285.09  656.08  293.79  656.09  295.78  656.09
  306.04  656.09  308.92  656.08  310.65  656.09  312.14  656.09  319.96  656.08
  322.32  656.08  328.92  656.06  333.01  656.06  337.43  656.07  341.59  656.05
  347.14  656.05  350.97  656.06  354.99  656.06  355.25  656.06  355.57  656.06
   356.3  656.06  365.12  656.06  371.78  656.05  378.51  656.05  383.44  656.04
   386.2  656.04   390.9  656.04  397.79  656.03  406.48  656.03  418.61  656.01
  431.55     656  433.09  655.17   433.4     655  433.64  654.95   433.9   654.9
  435.69  654.75  436.92  654.97  437.79     655  438.31  655.29  439.78     656
  442.48     656  474.44     656  480.93  655.89  496.46  655.94  501.55     656
   505.3  656.18  532.81     657  533.28  657.05   540.1  657.71  542.97     658
  554.45  658.87  555.99     659  560.72   659.3  585.34  660.05  658.58  665.36
```

678.36 665.96 682.31 667.16

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	211.95	.08	431.55	.05	439.78	.08	585.34	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
431.55	439.78	33.8	35.1	35.9	.3	.5

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2462

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	662	26	662	70.39	659.98	130.3	658.42	191.55	657.89
194.47	657.86	200.62	657.68	214.06	657.25	223.61	657	230.7	656.3
233.59	656	244.38	655.94	249.84	655.91	254.12	655.9	258.8	655.9
262.67	655.9	264.18	655.9	270.27	655.9	276.39	655.9	283.92	655.9
289.65	655.91	298.05	655.91	321.59	655.41	325.07	655.33	330.35	655.31
333.33	655.24	335.99	655.23	339.76	655.14	344.9	655.03	345.18	655.02
345.99	655	347.04	654.92	350.97	654.61	354.06	654.81	357.06	655
358	655	465	655	475	656	510.01	656.95	510.72	656.94
512.02	657	515.93	657.74	517.81	658	537.09	658.53	543.64	658.86
546.52	659	555.06	659.14	560.39	659.8	629.95	661.26	684.19	664.6
700.62	665.24								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	223.61	.08	345.99	.05	357.06	.08	510.01	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
345.99	357.06	117	123	126.5	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2339

INPUT
Description: FEMA BHP
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1002.3	712	1055.3	710	1070.3	710	1208.3	700	1293.3	680
1360.3	680	1410.3	688	1538.7	680	1583.6	670	1592.4	669
1601.8	668	1634.5	667	1747.5	666	1757	665	1776	664
1787.68	662.91	1824.83	659.26	1888	659.65	2100	657.34	2209.01	656.91
2212.33	656.29	2214.36	656.48	2216.73	656.27	2220.07	656	2226.21	655.77
2228.06	655.7	2234.48	655.47	2237.75	655.41	2241.37	655.39	2244.6	655.27
2250.48	655.26	2254.59	655.31	2257.14	655.25	2262.59	655.21	2264.25	655.23
2264.33	655.23	2266.6	655.24	2299.05	655.35	2300.54	655.33	2303.12	655.31
2308.41	655.33	2315.43	655.3	2321.54	655.27	2325.04	655.26	2333.98	655.23
2337.74	655.21	2341.08	655.21	2343.81	655.21	2345.91	655.23	2347.67	655.25
2348.65	655.28	2349.76	655.35	2350.65	655.43	2351.77	655.48	2352.92	655.48
2354.43	655.49	2356.55	655.48	2358.37	655.47	2361.11	655.46	2364	655.44
2367.03	655.42	2369.84	655.4	2376.71	655.34	2387.47	655.24	2413.3	655.01
2414.16	655	2414.9	654.86	2415.59	654.76	2417.73	654.4	2417.86	654.38
2418.2	654.44	2421.13	655	2428.82	655.89	2433.17	656.4	2444.82	656.9
2450.38	656.73	2463.09	656.67	2475.07	656.57	2488.7	656	2495.47	656.87
2496.25	657	2496.41	656.97	2498.07	657.31	2501.16	657.84	2502.1	658
2503.07	658.03	2506.82	658.16	2512.61	658.29	2516.9	658.38	2523.42	658.48
2528.18	658.55	2530.86	658.57	2534.06	658.59	2563.54	659.61	2599.59	659.96
2603.04	660.02	2606.09	660.08	2735	664.54	2755	666.54	2778	666
3465	666								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1002.3	.06	2209.01	.08	2413.3	.05	2421.13	.08	2501.16	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2413.3	2421.13	62.3	64.8	61.8	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2274

INPUT
Description:
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-75	664	-46.1	663.17	-23	659.97	16.47	657.72	45.83	658.28
67.54	658.17	89.33	656.46	93.94	656.49	96.48	656	115.41	655.33
123.78	655.21	127.83	655.09	128.92	655.09	136.61	655.09	138.38	655.08
145.96	655.07	151.42	655.06	157.67	655.04	158.35	655.04	167.72	655.05
171.56	655.05	174.69	655.06	177.39	655.06	177.46	655.06	177.55	655.06
178.01	655.06	178.84	655.06	180.13	655.06	181.79	655.06	183.41	655.05
185.32	655.05	187.03	655.05	188.39	655.04	190.37	655.03	197.78	655
198	654.86	199.56	654	201.75	653.95	203.12	653.9	205.3	653.98
206.05	654	206.47	654.2	208.38	655	216.7	655	220.33	655
222.84	655	226.47	655	228.67	655	231.37	655	234.06	655
236.43	655	238.01	655	239.75	655	241.29	655	243.55	655
249.93	655	253.81	655	256.01	655	257.29	655	258.3	655
259.56	655	260.69	655	262.07	655	263.95	655	267.98	655
274.42	655	279.63	655	285.91	655	289.82	655	292.73	655
297.33	655	299.5	655	301.91	655	303.86	655	306.15	655
308.81	655	310.99	655	314	655	326.12	655.4	329.29	655.44
348.92	655.98	349.06	655.98	349.18	655.99	349.26	655.99	349.69	656
349.83	656.02	356.2	657	360.13	657.7	362.04	658	364.41	658.04
369.84	658.08	376.37	658.13	382.25	658.34	448.6	658.96	455.12	659.08
460.9	659.19	507.83	659.46	557.25	660.35	636	663.34	650.4	665.34

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-75	.06	-46.1	.06	89.33	.08	197.78	.05	208.38	.08
349.83	.06								

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
197.78	208.38	136.2	136.2	129.1	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2139

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-101	660.01	41.82	658.6	77.75	655.4	217.23	654.68	305.8	654.64
306.47	655.5074	313.91	655.54	324.93	656	334.22	656	336.38	656
340.14	656	343.15	655.59	347.59	655	350.81	654.89	353.02	654.87
368.38	654.49	386.15	654.15	388.45	654.14	394.41	654.14	394.86	654.14
396.46	654.13	397.8	654.13	405.14	654.11	406.63	654.1	413.09	654.09
414.8	654.09	416.99	654.08	422.83	654.08	425.39	654.08	428.92	654.08
432.95	654.07	441.66	654.07	446.94	654.07	449.97	654.06	460.16	654.06
463.62	654.06	467.64	654.05	471.35	654.05	476.36	654.03	488.21	654
489.58	653.78	492.25	653.31	495.12	653.81	495.94	654	503.87	654.2
518.06	654.42	524.76	654.54	534.26	654.7	548.38	654.64	555.21	654.62
556.53	654.62	558.69	654.62	569.44	654.65	579.37	654.7	583.54	654.76
595.53	654.97	596.52	654.99	597.08	655	600.77	655.89	601.22	656
604.68	656.84	605.35	657	608.39	657.09	614.45	657.14	626.18	657.36
636.66	657.56	767.34	658.35	818.4	659.6	905	662.46	916.1	663.58

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-101	.06	340.14	.08	488.21	.05	495.94	.08	600.77	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
488.21	495.94	126.7	129	129.7	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 2010

INPUT
Description: FEMA BHO
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

1190	690	1390	690	1512	690	1531	700	1598	700
1682	662	1798	659.74	2030	656.54	2295	655.65	2298	654.34
2300	655.95	2460	655.95	2470	654.34	2475	655.95	2600	654.74
2636.82	654.74	2662.58	654.93	2666	655	2667.83	655	2668.6	655
2682.97	655	2685.25	655	2690.83	655	2698.43	655	2698.91	655
2707.11	654.81	2722.01	654.57	2737.58	654.07	2738.89	654.03	2739.78	654
2753.12	653.59	2760.72	653.46	2761.93	653.44	2767.05	653.33	2777.08	653.22
2779.62	653.17	2783.13	653.15	2790.43	653.22	2794.01	653.22	2796.97	653.23
2800.7	653.35	2803.83	653.39	2806.44	653.46	2821.7	653.76	2824.31	653.82
2825.18	653.85	2832.33	653.8	2832.84	653.8	2833.41	653.81	2833.78	653.81
2834.88	653.81	2835.73	653.81	2836.34	653.81	2836.82	653.81	2837.31	653.81
2837.86	653.8	2838.52	653.8	2839.4	653.78	2840.29	653.77	2841.12	653.75
2842.43	653.72	2849.7	653.54	2860.7	653.33	2870.92	653	2872.72	652.83
2874.36	652.7	2876.58	652.91	2877.55	653	2879.56	653.08	2880.69	653.09
2882.28	653.13	2896.3	653.49	2916.66	654	2922.94	654.29	2925.09	654.39
2926.94	654.39	2929.89	654.32	2931.58	654.29	2933.44	654.27	2935.57	654.26
2938.69	654.26	2941.81	654.27	2947.37	654.35	2953.62	654.41	2962.72	654.58
2969.66	654.66	2984.34	655	2984.5	655.03	2985.31	655.19	2988.79	655.86
2989.51	656	2993.12	656.7	2994.67	657	3230	659.65	3345	664.65
3360	664.45								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
1190	.06	2707.11	.08	2870.92	.05	2879.56	.08	2994.67	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2870.92	2879.56	84.1	85.6	88.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 1 RS: 1925

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-232.06	658.01	-166.67	655.4	34.55	654.38	78.78	654.68	83.55	655
83.73	655	84.22	655	84.97	655	85.45	655	87.04	655
88.89	655	93.3	655	100.05	655	121.59	654.03	137.98	653.3
152.32	653.06	154.68	653.02	155.34	653.01	155.95	653.02	157.12	653.03
172.47	653.3	191.08	653.12	204.42	653	209.26	653	211.05	652.67
214.31	652.07	215.72	652.3	218.15	652.69	218.56	652.74	219.85	653
232.09	653.08	233.06	653.09	233.24	653.09	236.42	653.1	238.98	653.11
241.45	653.12	250.54	653.19	250.85	653.19	251.07	653.19	252.26	653.2
258.5	653.2	261.07	653.2	268.26	653.2	272.82	653.2	283.33	653.06
291.28	653.15	296.08	653.2	308.29	653.59	320.86	654	334	655
368.74	655.3	496.43	655.55	623.92	656.57	700.01	659.91		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-232.06	.06	121.59	.08	209.26	.05	219.85	.08	334	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
209.26	219.85	282.6	325.9	321	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1602

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-627.1	658.01	-562.09	656.01	-429.8	655.01	-285.4	654.01	20.81	654.67
48.57	654.71	66.44	654.61	72.14	654.79	85.07	654.21	87.82	651.4
91.51	650.67	93.9	650.84	96.86	651.6	98.18	651.9	100.7	654.03
108.02	654.27	243	654.08	428.23	655.01	456.83	656.01	487.78	657.01
560.78	658.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-627.1	.08	85.07	.06	100.7	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
85.07	100.7	202.2	203.5	203	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1402

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-214.73	660.01	-151.73	657.01	-116.53	656.01	-65.33	655.01	-57.33	654.01
-47.9	653.01	-26.6	653.01	61.72	652.96	129.69	653.53	136.69	653.6
143.69	653.86	148.69	654.03	153.69	654.21	156.09	654.04	156.39	652.1
156.89	651.34	158.69	650.52	160.49	650.2	161.99	649.8	163.69	649.82
165.69	649.95	166.99	650.67	168.49	651.36	169.29	651.84	169.89	653.64
172.09	654.15	177.99	653.93	183.69	653.92	187.1	653.79	232.35	653.34
246.57	653.84	359.8	654.16	416.89	654.15	519.9	654.01	527.8	655.01
536.5	656.01	540.2	657.01	548.5	658.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-214.73	.08	156.09	.06	169.89	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
156.09	169.89	183	194	196.3	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 1208

INPUT
Description: FEMA BHN
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	724.54	1035	719.34	1060	714.65	1080	709.34	1165	699.54
1190	694.84	1225	689.54	1265	684.95	1380	674.54	1470	669.65
1528	665.15	1570	659.45	1680	651.74	1740	651.34	1752	650.74
1765	651.34	2205	659.24	2220	664.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.08	1740	.06	1765	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1740	1765	228.9	218.5	209.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 990

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-41.4	660.01	-4.3	656.01	32.63	652.9	63.74	651.93	118.97	653.07
125.76	650.82	126.92	650.45	132.87	649.47	135.28	649.66	136.76	650.43
138.23	653.22	149.36	652.61	186.43	652.59	234.63	654.38	362.19	653.45
497.17	656.01	516.5	658.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-41.4	.08	118.97	.06	138.23	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
118.97	138.23	56.8	56.5	58.9	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: 933

INPUT
Description: FEMA BHM

```
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  724.54    1035  719.54    1088  714.74    1120  710.04    1152  704.34
    1200  699.74    1238  694.84    1270  689.84    1290  684.65    1340  679.95
    1402  674.95    1445  669.34    1480  664.45    1530  659.74    1590  654.45
    1700  650.95    1710  649.74    1720  650.65    1750  654.54    1900  657.04
    2080  659.84    2200  663.45    2300  663.65    2400  663.45    2500  664.95
    2590  664.34

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1700     .05    1720     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1700    1720             48.7    48.4    45.9              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                   RS: 884

INPUT
Description: U/S XS of Farm Road Culvert
Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -288  691.97 -147.11  671.47     -33  660.01   12.49  656.08   52.79  653.68
   71.68  653.18  101.89   653.2  117.08  652.72   120.1  649.74   121.4  649.01
  123.02  648.62  125.03  649.16  129.44  653.21  174.49  652.41  194.38   652.9
     524  662.27     538  663.17   560.8  664.45  607.89  664.67

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -288     .09  117.08     .05  129.44     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.08  129.44             20.6    19.1    19.6              .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -288  112.93  652.53        F
  133.68  607.89  652.53        F

CULVERT


RIVER: Walker Run
REACH: 2                   RS: 875

INPUT
Description: Private Farm Road
Distance from Upstream XS =     1.6
Deck/Roadway Width        =    15.1
Weir Coefficient          =     2.5
Upstream  Deck/Roadway Coordinates
    num=      17
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   12.14 656.071 656.071   52.52 653.686 653.686   71.38   653.5  653.18
  115.86 653.386  649.74  122.61 652.528  648.62  122.83  652.53  648.66
  124.23  652.54   648.9  130.22 653.444  653.21  173.58   653.2  652.41
  194.42   653.1   652.9  217.91 652.805 652.805   378.6 653.084 653.084
  465.08  656.47  656.47  522.51 662.265 662.265  535.78 663.101 663.101
  535.81 663.177 663.177  535.99 663.037 663.037

Upstream Bridge Cross Section Data
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -322.11  691.97 -147.11  671.47   -2.11  656.57   12.14 656.071   52.52 653.686
   71.38  653.18   101.3   653.2  116.89  652.72  120.15  649.74  120.82  648.93
  121.18  649.01  122.65  648.62  124.23   648.9  124.43  649.16  129.48  653.21
  173.58  652.41  194.42   652.9  297.89  656.07  337.89  656.67  607.89  664.67

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -322.11     .09  116.89     .05  129.48     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
        116.89  129.48              .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
```

```
 -322.11  112.93  652.53       F
  133.68  607.89  652.53       F

Downstream  Deck/Roadway Coordinates
    num=      24
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   12.14 656.071 656.071   52.52 653.686 653.686   77.11   653.4  652.55
  115.86 653.386  651.91  122.61 652.528  649.92  122.73  652.53  650.54
  122.85  652.53  651.24  123.07  652.53  651.64  123.32  652.53   651.8
  123.57  652.53  651.64  123.79  652.53  651.24  123.91  652.53  650.54
  124.03  652.53  650.11   126.1  652.53  648.93  130.22 653.444  649.62
   136.9   653.4  652.21  185.27   653.2  652.86  217.91 652.805   652.8
   378.6 653.084 653.084  465.08  656.47  656.47  522.51 662.265 662.265
  535.78 663.101 663.101  535.81 663.177 663.177  535.99 663.037 663.037

Downstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -322.11  691.97 -147.11  671.47   -2.11  656.57   12.14 656.071   52.52 653.686
   77.11  652.55  116.71  651.91  123.34  649.92  124.03  650.11  125.51  649.41
   126.1  648.93  130.12  649.62   136.9  652.21  185.27  652.86  218.62   652.8
  297.89  656.07  337.89  656.67  607.89 664.667

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -322.11     .09  116.71     .05   136.9     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
        116.71   136.9            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -322.11     109  652.53       F
     136  607.89  652.53       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   654.4
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular    2.75
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 3 - Pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                2.2    14.9     .023     .023       .1                  .9                 1
Upstream   Elevation =  648.96
           Centerline Station =  123.3
Downstream Elevation =  649.411
           Centerline Station =  123.2

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 863

INPUT
Description: D/S XS Farm Road Culvert
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    -294  691.97 -147.11  671.47   -22.2  660.01   24.99  655.04   34.67  653.86
   72.57  652.55  113.12  651.91  120.43  649.92  123.41  648.96   126.4  649.62
  133.22  652.21     182  652.85  214.18   652.8  518.46  662.27     588  664.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    -294     .09  113.12     .05  133.22     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        113.12  133.22            157.2   147.1   138.4             .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    -294     109  652.53       F
```

```
     136     588  652.53       F

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: 715

INPUT
Description:
Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -92.4  658.01    2.21  655.41   40.88  653.76   46.14  653.57   77.95   651.4
  100.08  650.67  101.47  648.52  104.64  647.91  107.47   647.9  108.96  648.04
  110.34  648.14  111.67  648.52  114.47  650.93  126.37  650.97  191.93  651.64
   278.3  653.09  365.34  656.46

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -92.4     .09  100.08     .05  114.47     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        100.08  114.47              172   178.4   188.1              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: 536

INPUT
Description:
Station Elevation Data     num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -86.6  657.01  -45.02  655.01    5.76  652.05   48.16  650.97  149.99  651.14
  170.47  649.65  172.89  647.93  174.84  647.22  176.44  647.18  179.25  646.97
  182.05  647.71  182.91  648.29   184.3  650.54  191.59  650.96  206.95  652.58
  269.71  656.85

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -86.6     .09  170.47     .05   184.3     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        170.47   184.3              89.9     107   110.1              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: 428

INPUT
Description: FEMA BHL
Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  686.54    1050  684.84    1090  679.84    1110  674.45    1130  669.65
    1150  664.54    1210  659.34    1250  655.54    1350  651.74    1410  649.34
    1430  647.24    1440  649.65    1550  654.34    1605  656.65    1630  659.45
    1750  661.74    1860  664.45    1880     666    2920     666

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1410     .05    1440     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1410    1440              84.2   119.6    73.2              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: 350

INPUT
Description:
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    7.67  656.47   30.04  652.51   50.26  651.27  122.31  650.39  128.41  647.64
```

```
  131.05  647.09  132.71  647.08  135.14  647.17  138.64  647.65  139.08  648.11
  140.48  648.18  141.29  649.59  150.13  650.23  156.97  649.72  249.39  650.76
  267.01   652.4  309.86  655.02  325.84  655.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    7.67     .09  122.31     .05  141.29     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        122.31  141.29            169.4   222.4   165.9              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 185

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     8.8  659.55   15.53  658.78    23.2  653.48   25.13  652.64   29.31  649.46
   32.38  649.12    33.4  647.67   34.97  646.89   37.17   646.4   40.26  646.66
   42.19  646.41   44.77  646.96    46.4  647.15   49.26  649.32   59.74  649.89
  197.88  650.38  234.08  652.49  273.02  654.62  299.87  655.74  305.41  656.59

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     8.8     .09   32.38     .05   49.26     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         32.38   49.26             39.3      58    36.4              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 147

INPUT
Description: FEMA BHK
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  699.45    1040  694.84    1100  691.54    1170  689.54    1210  687.54
    1260  682.65    1340  684.95    1400  681.65    1440  679.65    1490  676.95
    1530  674.84    1555  669.65    1580  664.34    1610  659.24    1640  655.04
    1650  649.45    1660  646.74    1670  649.34    1750  651.74    1830  654.84
    1870  655.84    1900  654.74    1925  659.34    2100  661.54    2240  664.95
    2260     666    3100     666

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .09    1650     .05    1670     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1650    1670            138.5   154.5   134.1              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                  RS: 011

INPUT
Description: U/S XS of Market Street Bridge
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -177.52  656.04   33.24  653.12   38.49  652.67   45.07  649.46   51.29   648.2
   53.81   646.7    54.7  645.84   57.12  645.71   59.41  645.74   61.18  646.53
   64.38  648.11   69.53  648.34   79.21  649.32  111.92  649.09   167.8   651.4
   249.3  651.46  251.06  651.01   293.8  653.77  352.41  660.72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -177.52     .09   51.29     .05   64.38     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         51.29   64.38             39.9      38    43.7              .3       .7
Ineffective Flow     num=       2
```

```
   Sta L   Sta R    Elev  Permanent
 -177.52      42  652.95       F
      90  352.41  652.95       F

BRIDGE


RIVER: Walker Run
REACH: 2                    RS: -10

INPUT
Description: Market Street
Distance from Upstream XS =      8.5
Deck/Roadway Width        =     24.9
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=       19
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 -172.52 655.288           32.59 653.113           44.69 652.945
   44.69 654.155           62.11 656.025 644.195    62.5 656.045 646.915
   62.61 656.065 647.975    63.5 656.085 649.645    65.5 656.125 650.645
    65.9 656.125 650.675    66.3 656.125 650.645    68.3 656.085 649.645
    69.6 656.065 647.975      70 656.045 646.915   70.35 656.025 644.915
   98.44 654.145           98.45 652.945          172.12   652.5
  253.49 653.245

Upstream Bridge Cross Section Data
Station Elevation Data    num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -172.52 655.288   32.43 652.375   38.83 651.925   48.62 648.705   55.15 647.445
    59.2 645.945   61.39 645.095   65.45 644.995   67.71 645.785   70.85 647.355
   86.15 648.555   116.5 649.245  172.12   652.5  253.49 653.245   332.2 654.325
   350.6 655.245  358.85 656.245

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -172.52     .09   55.15     .05   70.85     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
          55.15   70.85            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -172.52      42  652.95       F
      90  358.85  652.95       F

Downstream  Deck/Roadway Coordinates
    num=       19
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 -199.02 655.288            6.09 653.113           18.19 652.945
   18.19 653.665           35.61 656.025 645.195      36 656.075 647.915
   36.11 656.095 648.765      37 656.165 649.835      39 656.225 650.835
    39.4 656.225 650.865    39.8 656.225 650.835    41.8 656.165 649.835
    43.1 656.095 648.765    43.5 656.075 647.995   43.85 656.025 646.665
   71.94 654.415           71.95 652.945          145.62   652.5
  226.99 653.245

Downstream Bridge Cross Section Data
Station Elevation Data    num=       20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -199.02 655.288   -6.99 653.185    1.13 653.145   13.19 650.795   26.39 648.445
    31.8 647.955   33.72 646.465   36.22 645.845   39.63 644.505    42.3 643.715
   44.81 644.305    48.1 645.855      51 647.395   61.17 647.815   72.07 651.545
  145.62   652.5  226.99 653.245   332.2 654.325   350.6 655.245  358.85 656.245

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 -199.02     .09    31.8     .05      51     .09

Bank Sta: Left   Right    Coeff Contr.   Expan.
          31.8      51            .3       .7
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 -199.02   15.72  652.95       F
   63.89  358.85  652.95       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   654.4
```

```
Energy head used in spillway design          =
Spillway height used in design               =
Weir crest shape                             = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =      1.5
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =    652.5

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: -30

INPUT
Description: D/S XS of Market Street Bridge
Station Elevation Data     num=       20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 -199.02  656.04  -46.68  654.28    -4.4  653.95    4.43   653.9   17.96  651.54
   30.08   649.2    35.6  648.71   37.35  647.22   38.98   646.6   41.82  645.27
   45.52  644.46   48.05  645.07   52.27  646.61   53.56  648.15   63.11  648.57
   79.88  650.16   85.95  652.29   181.4   651.9  273.84  653.77  319.73  659.02

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 -199.02     .09    35.6     .05   53.56     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          35.6   53.56             39.8    41.7    52.9              .3       .7
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
 -199.02   15.72  652.95       F
   63.89  319.73  652.95       F

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: -78

INPUT
Description:
Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -15  653.95    8.17  649.27   36.56  649.66   42.24   648.9   46.48  646.51
   49.12  645.82   52.33  645.43   54.96  645.72   58.47  646.11   62.68  648.65
   65.38  648.62   71.37  648.11   81.36  648.01   96.66  649.71     189  651.01
   294.7  652.01   299.5  653.01

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
     -15     .09   36.56     .05   62.68     .09

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          36.56  62.68             70.8    70.8    80.2              .1       .3

CROSS SECTION


RIVER: Walker Run
REACH: 2                    RS: -154

INPUT
Description:
```

Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-151.5	656.03	0	654.28	13.15	649.96	23.45	649.01	28.15	648.96
30.73	645.21	33.05	644.9	35.85	645.52	40.46	645.66	41.74	646.07
43.72	648.39	63.07	648.9	97	649.15	199.07	650.01	206.89	651.01
218.8	653.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-151.5	.09	28.15	.05	43.72	.09

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
28.15	43.72	75	75	75	.1	.3

CROSS SECTION

RIVER: Walker Run
REACH: 2 RS: -255

INPUT
Description: FEMA BHJ
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	684.34	1092	679.54	1128	674.34	1170	669.34	1230	664.54
1310	660.04	1330	657.54	1350	654.84	1372	649.74	1405	647.24
1408	645.74	1412	647.95	1450	649.65	1490	649.24	1525	649.34
1570	649.04	1610	649.84	1670	654.34	1712	659.34	1740	664.84
1750	669.34	1790	674.84						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.09	1405	.05	1412	.09

Bank Sta: Left	Right	Coeff Contr.	Expan.
1405	1412	.1	.3

Profile Output Table - Encroachment 1

River	Reach	River Sta	Profile	W.S. Elev	Prof Delta WS	E.G. Elev
Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Walker Run	1	5862		100 year storm		680.72			681.63
162.84	71.66	716.24	852.11		59.74	75.29			
Walker Run	1	5862		100 year storm e		681.58		0.86	683.30
58.12	74.40	1016.25	549.36	50.00	59.74	75.29	108.12		
Walker Run	1	5862		500 year storm		682.00		1.28	683.38
172.55	311.09	1234.40	2054.52		59.74	75.29			
Walker Run	1	5547		100 year storm		676.98			677.08
217.39	1264.99	324.04	50.96		215.49	226.17			
Walker Run	1	5547		100 year storm e		677.97		0.99	678.12
95.42	1273.20	366.80		130.75	215.49	226.17	226.17		
Walker Run	1	5547		500 year storm		679.67		2.68	679.80
229.98	2893.85	556.42	149.73		215.49	226.17			
Walker Run	1	5282		100 year storm		676.02			676.40
79.00	524.10	894.12	221.78		212.26	230.88			
Walker Run	1	5282		100 year storm e		677.03		1.00	677.38
61.24	513.13	950.86	176.01	182.76	212.26	230.88	244.00		
Walker Run	1	5282		500 year storm		679.11		3.09	679.31
296.26	1862.89	1157.68	579.43		212.26	230.88			
Walker Run	1	5250	BR U	100 year storm		674.43			675.87
43.70	835.78	535.54	268.68		212.26	230.88			
Walker Run	1	5250	BR U	100 year storm e		674.49		0.06	676.66
25.94	845.44	632.74	161.82	182.76	212.26	230.88	244.00		
Walker Run	1	5250	BR U	500 year storm		679.08		4.65	679.22
295.47	2652.76	230.15	717.09		212.26	230.88			
Walker Run	1	5250	BR D	100 year storm		673.22			674.39

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  37.51    826.40      348.56    465.04                204.89     221.89
Walker Run    1            5250     BR D  100 year storm e      673.32          0.10      674.44
  37.51    767.55      377.01    495.44     176.89     204.89     221.89     249.89
Walker Run    1            5250     BR D  500 year storm        675.12          1.90      678.09
  37.51   1823.62      472.70   1303.68                204.89     221.89


Walker Run    1            5198           100 year storm        671.55                    672.97
  73.00    507.50      992.97    139.52                204.89     221.89
Walker Run    1            5198           100 year storm e      672.64          1.09      673.44
  73.00    492.58      935.68    211.74     176.89     204.89     221.89     249.89
Walker Run    1            5198           500 year storm        673.56          2.01      675.95
  73.00   1147.10     1889.95    562.94                204.89     221.89


Walker Run    1            5107           100 year storm        671.48                    671.61
 280.17    344.74      606.83    688.42                144.00     169.94
Walker Run    1            5107           100 year storm e      672.37          0.88      672.64
 101.00    172.93      886.79    580.29     120.00     144.00     169.94     221.00
Walker Run    1            5107           500 year storm        673.22          1.74      673.43
 298.84    928.16     1098.69   1573.15                144.00     169.94


Walker Run    1            4995           100 year storm        671.35                    671.44
 263.68     46.08     1308.91    285.01                1392.00    1497.00
Walker Run    1            4995           100 year storm e      672.34          0.99      672.44
 122.00     34.74     1575.62     29.64    1383.00    1392.00    1497.00    1505.00
Walker Run    1            4995           500 year storm        673.01          1.66      673.20
 291.10    155.94     2676.77    767.28                1392.00    1497.00


Walker Run    1            4810           100 year storm        671.26                    671.29
 321.99    331.96      280.07   1027.96                113.64     128.10
Walker Run    1            4810           100 year storm e      672.26          1.00      672.30
 174.33    315.47      350.74    973.79      70.73     113.64     128.10     245.06
Walker Run    1            4810           500 year storm        672.85          1.60      672.93
 343.00    798.73      542.33   2258.94                113.64     128.10


Walker Run    1            4735           100 year storm        671.22                    671.25
 326.32    633.79      207.56    798.65                1805.05    1814.96
Walker Run    1            4735           100 year storm e      672.24          1.02      672.26
 289.99    617.64      195.78    826.58    1700.14    1805.05    1814.96    1990.13
Walker Run    1            4735           500 year storm        672.78          1.56      672.84
 341.14   1374.08      398.75   1827.17                1805.05    1814.96


Walker Run    1            4692           100 year storm        671.20                    671.22
 339.30    544.02      192.11    903.87                195.53     206.14
Walker Run    1            4692           100 year storm e      672.23          1.03      672.25
 264.48    534.62      189.99    915.39     100.41     195.53     206.14     364.89
Walker Run    1            4692           500 year storm        672.74          1.54      672.80
 361.11   1248.59      379.46   1971.95                195.53     206.14


Walker Run    1            4495           100 year storm        671.11                    671.13
 336.79    607.54      253.51    778.95                2109.99    2123.77
Walker Run    1            4495           100 year storm e      672.12          1.02      672.17
 150.65    653.55      343.20    643.25    2041.17    2109.99    2123.77    2191.82
Walker Run    1            4495           500 year storm        672.54          1.43      672.60
 364.35   1381.30      505.83   1712.88                2109.99    2123.77


Walker Run    1            4414           100 year storm        671.08                    671.10
 340.84    549.94      354.83    735.23                169.07     190.54
Walker Run    1            4414           100 year storm e      672.09          1.02      672.13
 168.58    514.96      442.09    682.95     105.71     169.07     190.54     274.29
Walker Run    1            4414           500 year storm        672.46          1.39      672.53
 359.74   1282.42      717.71   1599.88                169.07     190.54


Walker Run    1            4295           100 year storm        671.05                    671.06
 417.07    765.21      193.71    681.08                1639.19    1652.17
Walker Run    1            4295           100 year storm e      672.08          1.03      672.09
 268.22    685.39      208.43    746.17    1531.78    1639.19    1652.17    1800.00
Walker Run    1            4295           500 year storm        672.40          1.35      672.44
 438.83   1733.52      391.97   1474.51                1639.19    1652.17
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Walker Run	1		4130		100 year storm		671.01		671.03
422.39	524.48	279.58	835.94			156.55	174.90		
Walker Run	1		4130		100 year storm e		672.03	1.02	672.06
203.36	641.29	384.21	614.50		65.97	156.55	174.90	269.33	
Walker Run	1		4130		500 year storm		672.31	1.29	672.35
460.98	1137.28	558.08	1904.64			156.55	174.90		
Walker Run	1		4043		100 year storm		670.98		671.00
514.26	501.68	277.13	861.18			1618.40	1632.70		
Walker Run	1		4043		100 year storm e		671.97	0.99	672.02
155.00	446.28	397.11	796.62		1565.00	1618.40	1632.70	1720.00	
Walker Run	1		4043		500 year storm		672.24	1.26	672.29
567.20	1163.68	510.72	1925.60			1618.40	1632.70		
Walker Run	1		3972		100 year storm		670.96		670.98
597.89	43.19	905.10	691.72			225.40	299.32		
Walker Run	1		3972		100 year storm e		671.95	0.99	671.99
177.25	69.41	1273.58	297.01		197.75	225.40	299.32	375.00	
Walker Run	1		3972		500 year storm		672.20	1.24	672.25
622.89	125.68	1758.15	1716.17			225.40	299.32		
Walker Run	1		3914	BR U	100 year storm		667.46		670.16
23.06		1640.00				254.71	287.02		
Walker Run	1		3914	BR U	100 year storm e		671.27	3.81	671.82
152.53	15.13	1128.29	496.58		197.75	254.71	287.02	375.00	
Walker Run	1		3914	BR U	500 year storm		672.20	4.74	672.25
445.39	311.86	1613.59	1614.81			254.71	287.02		
Walker Run	1		3914	BR D	100 year storm		667.48		670.17
23.06		1640.00				254.71	287.02		
Walker Run	1		3914	BR D	100 year storm e		668.46	0.98	670.48
22.42		1640.00			261.00	254.71	287.02	285.00	
Walker Run	1		3914	BR D	500 year storm		670.41	2.93	672.24
275.12	311.86	1613.59	1614.81			254.71	287.02		
Walker Run	1		3860		100 year storm		666.07		669.32
37.70	33.80	1565.62	40.59			265.16	288.12		
Walker Run	1		3860		100 year storm e		667.11	1.04	669.87
24.00	51.19	1588.81			261.00	265.16	288.12	285.00	
Walker Run	1		3860		500 year storm		669.66	3.59	672.24
70.94	194.50	2682.30	723.21			265.16	288.12		
Walker Run	1		3785		100 year storm		665.19		666.52
76.26	0.22	1638.08	1.70			1412.00	1472.57		
Walker Run	1		3785		100 year storm e		666.20	1.01	666.98
56.22		1640.00			1413.78	1412.00	1472.57	1470.00	
Walker Run	1		3785		500 year storm		665.96	0.77	669.65
104.48	14.03	3499.08	86.89			1412.00	1472.57		
Walker Run	1		3735		100 year storm		665.10		665.37
241.03	52.47	469.99	1117.54			174.59	190.57		
Walker Run	1		3735		100 year storm e		666.02	0.92	666.35
102.43	63.28	572.72	1004.01		167.57	174.59	190.57	270.00	
Walker Run	1		3735		500 year storm		666.63	1.53	666.96
319.95	113.10	716.81	2770.09			174.59	190.57		
Walker Run	1		3532		100 year storm		663.74		663.88
254.48	901.75	375.28	362.98			1648.78	1668.34		
Walker Run	1		3532		100 year storm e		664.72	0.98	664.99
112.15	835.34	562.70	241.96		1577.02	1648.78	1668.34	1689.17	
Walker Run	1		3532		500 year storm		665.26	1.52	665.50
272.34	2094.27	681.11	824.62			1648.78	1668.34		
Walker Run	1		3410		100 year storm		662.82		663.00
254.07	863.72	292.08	484.21			286.94	301.23		
Walker Run	1		3410		100 year storm e		663.77	0.96	664.08
119.96	599.38	433.89	606.72		235.04	286.94	301.23	355.00	
Walker Run	1		3410		500 year storm		664.22	1.40	664.52
283.48	1993.16	544.78	1062.06			286.94	301.23		

Walker Run	1	3375		100 year storm		662.38			662.64
255.90	1009.53	343.11	287.36		1598.22	1611.37			
Walker Run	1	3375		100 year storm e		663.41		1.03	663.77
120.52	838.95	460.21	340.84	1528.63	1598.22	1611.37	1649.15		
Walker Run	1	3375		500 year storm		663.78		1.40	664.15
275.45	2277.58	584.72	737.70		1598.22	1611.37			
Walker Run	1	3278		100 year storm		661.78			661.90
264.03	480.85	224.60	934.55		160.34	175.26			
Walker Run	1	3278		100 year storm e		662.69		0.91	662.99
113.78	533.47	400.94	705.59	117.52	160.34	175.26	231.30		
Walker Run	1	3278		500 year storm		663.14		1.36	663.36
298.10	1084.52	425.74	2089.74		160.34	175.26			
Walker Run	1	3065		100 year storm		660.64			660.77
301.63	1051.76	179.07	409.18		1687.34	1697.34			
Walker Run	1	3065		100 year storm e		661.74		1.10	661.89
168.51	1071.74	226.70	341.57	1567.38	1687.34	1697.34	1735.89		
Walker Run	1	3065		500 year storm		661.97		1.33	662.18
329.67	2386.06	303.67	910.27		1687.34	1697.34			
Walker Run	1	2949		100 year storm		659.99			660.10
349.10	489.41	352.79	797.80		214.52	241.06			
Walker Run	1	2949		100 year storm e		661.02		1.03	661.30
125.25	479.51	624.38	536.11	174.36	214.52	241.06	299.61		
Walker Run	1	2949		500 year storm		661.35		1.36	661.53
355.24	1101.29	632.83	1865.88		214.52	241.06			
Walker Run	1	2730		100 year storm		659.23			659.30
368.22	557.43	124.90	957.67		430.00	439.81			
Walker Run	1	2730		100 year storm e		660.15		0.92	660.30
153.71	672.86	204.31	762.83	374.49	430.00	439.81	528.20		
Walker Run	1	2730		500 year storm		660.57		1.34	660.70
374.55	1234.22	225.45	2140.32		430.00	439.81			
Walker Run	1	2620	BR U	100 year storm		658.91			659.01
358.70	548.40	139.69	951.91		430.00	439.81			
Walker Run	1	2620	BR U	100 year storm e		659.76		0.85	659.97
149.71	662.47	217.16	760.37	374.49	430.00	439.81	528.20		
Walker Run	1	2620	BR U	500 year storm		660.24		1.33	660.40
364.97	1205.31	245.61	2149.08		430.00	439.81			
Walker Run	1	2620	BR D	100 year storm		658.89			658.94
367.34	1101.86	101.50	436.63		431.55	439.78			
Walker Run	1	2620	BR D	100 year storm e		659.79		0.90	659.85
223.28	1091.79	130.13	418.08	272.27	431.55	439.78	501.55		
Walker Run	1	2620	BR D	500 year storm		660.21		1.33	660.32
392.81	2439.36	188.34	972.30		431.55	439.78			
Walker Run	1	2497		100 year storm		658.40			658.48
367.52	1086.33	107.38	446.29		431.55	439.78			
Walker Run	1	2497		100 year storm e		659.48		1.07	659.55
229.28	1083.13	126.82	430.05	272.27	431.55	439.78	501.55		
Walker Run	1	2497		500 year storm		659.64		1.24	659.78
394.80	2409.14	190.95	999.91		431.55	439.78			
Walker Run	1	2462		100 year storm		658.29			658.36
383.73	590.93	136.63	912.45		345.99	357.06			
Walker Run	1	2462		100 year storm e		659.31		1.01	659.44
150.00	648.95	223.86	767.19	275.00	345.99	357.06	425.00		
Walker Run	1	2462		500 year storm		659.52		1.22	659.64
469.98	1498.04	248.93	1853.03		345.99	357.06			
Walker Run	1	2339		100 year storm		657.83			657.92
445.75	1346.00	109.94	184.06		2413.30	2421.13			
Walker Run	1	2339		100 year storm e		658.58		0.76	658.84
150.07	1113.61	201.89	324.50	2325.00	2413.30	2421.13	2475.07		
Walker Run	1	2339		500 year storm		659.07		1.25	659.19
607.15	2917.57	173.41	509.02		2413.30	2421.13			

Walker Run	1		2274		100 year storm		657.41			657.55
281.37	600.83	177.06	862.11			197.78	208.38			
Walker Run	1		2274		100 year storm e		658.50		1.08	658.56
252.44	608.23	156.52	875.25		96.48	197.78	208.38		348.92	
Walker Run	1		2274		500 year storm		658.61		1.20	658.84
410.38	1410.21	314.19	1875.60			197.78	208.38			
Walker Run	1		2139		100 year storm		657.23			657.26
562.23	1283.56	57.83	298.61			488.21	495.94			
Walker Run	1		2139		100 year storm e		658.32		1.08	658.36
264.54	950.85	99.48	589.67		340.14	488.21	495.94		604.68	
Walker Run	1		2139		500 year storm		658.42		1.19	658.47
726.28	2797.75	105.22	697.03			488.21	495.94			
Walker Run	1		2010		100 year storm		657.16			657.17
1023.33	1291.15	64.21	284.64			2870.92	2879.56			
Walker Run	1		2010		100 year storm e		658.21		1.05	658.24
263.62	1108.56	112.76	418.68		2690.00	2870.92	2879.56		2953.62	
Walker Run	1		2010		500 year storm		658.34		1.19	658.36
1214.50	2953.63	99.37	547.00			2870.92	2879.56			
Walker Run	1		1925		100 year storm		657.12			657.13
846.16	903.88	78.89	657.23			209.26	219.85			
Walker Run	1		1925		100 year storm e		658.12		1.00	658.17
199.27	683.74	167.63	788.63		121.59	209.26	219.85		320.86	
Walker Run	1		1925		500 year storm		658.29		1.17	658.32
895.22	1938.02	131.88	1530.11			209.26	219.85			
Walker Run	2		1602		100 year storm		656.98			656.99
1080.54	1076.84	120.65	662.51			85.07	100.70			
Walker Run	2		1602		100 year storm e		657.90		0.91	657.92
466.99	626.90	184.94	1048.16		-100.00	85.07	100.70		366.99	
Walker Run	2		1602		500 year storm		658.16		1.18	658.18
1187.88	1840.94	145.90	1113.16			85.07	100.70			
Walker Run	2		1402		100 year storm		656.88			656.89
686.83	836.58	137.56	885.86			156.09	169.89			
Walker Run	2		1402		100 year storm e		657.80		0.92	657.82
443.49	842.96	152.98	864.06		-26.60	156.09	169.89		416.89	
Walker Run	2		1402		500 year storm		658.07		1.20	658.09
722.58	1377.53	179.19	1543.28			156.09	169.89			
Walker Run	2		1208		100 year storm		656.74			656.77
456.81	682.86	327.28	849.85			1740.00	1765.00			
Walker Run	2		1208		100 year storm e		657.72		0.98	657.74
345.12	650.98	286.60	922.42		1627.49	1740.00	1765.00		1972.61	
Walker Run	2		1208		500 year storm		657.92		1.18	657.97
539.64	1089.30	476.80	1533.90			1740.00	1765.00			
Walker Run	2		990		100 year storm		656.54			656.57
511.53	588.54	251.80	1019.66			118.97	138.23			
Walker Run	2		990		100 year storm e		657.39		0.85	657.55
122.69	722.27	544.24	593.49		63.74	118.97	138.23		186.43	
Walker Run	2		990		500 year storm		657.72		1.18	657.76
533.88	923.36	334.86	1841.78			118.97	138.23			
Walker Run	2		933		100 year storm		656.25			656.46
282.76	873.79	667.60	318.61			1700.00	1720.00			
Walker Run	2		933		100 year storm e		657.17		0.92	657.39
120.00	835.26	733.70	291.04		1630.00	1700.00	1720.00		1750.00	
Walker Run	2		933		500 year storm		657.40		1.15	657.65
366.27	1465.66	917.65	716.69			1700.00	1720.00			
Walker Run	2		884		100 year storm		656.05			656.25
292.08	528.24	441.78	889.98			117.08	129.44			
Walker Run	2		884		100 year storm e		656.98		0.93	657.23
133.19	573.37	509.62	777.01		61.19	117.08	129.44		194.38	
Walker Run	2		884		500 year storm		657.23		1.18	657.44

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  347.54    969.41      562.31   1568.29                117.08     129.44

Walker Run    2             875                                  Culvert


Walker Run    2             863            100 year storm        656.03                          656.18
  302.32    548.91      550.99    760.10                113.12     133.22
Walker Run    2             863            100 year storm e      656.90            0.87          657.14
  129.08    647.52      717.28    495.20     52.92      113.12     133.22        182.00
Walker Run    2             863            500 year storm        657.20            1.17          657.38
  351.16    943.77      763.77   1392.46                113.12     133.22

Walker Run    2             715            100 year storm        655.76                          655.83
  357.68    373.28      399.05   1087.67                100.08     114.47
Walker Run    2             715            100 year storm e      656.57            0.81          656.73
  132.37    426.64      552.33    881.02     59.56      100.08     114.47        191.93
Walker Run    2             715            500 year storm        656.91            1.15          657.01
  417.70    691.93      544.39   1863.68                100.08     114.47

Walker Run    2             536            100 year storm        655.51                          655.59
  305.51   1267.04      403.78    189.18                170.47     184.30
Walker Run    2             536            100 year storm e      656.41            0.90          656.47
  201.19   1306.87      403.81    149.32      5.76      170.47     184.30        206.95
Walker Run    2             536            500 year storm        656.59            1.08          656.71
  343.92   2161.64      573.44    364.93                170.47     184.30

Walker Run    2             428            100 year storm        655.36                          655.46
  319.53    609.78      777.09    473.13               1410.00    1440.00
Walker Run    2             428            100 year storm e      656.34            0.98          656.40
  273.25    658.02      693.25    508.73   1276.75     1410.00    1440.00       1550.00
Walker Run    2             428            500 year storm        656.39            1.03          656.54
  357.75   1094.98     1127.31    877.72               1410.00    1440.00

Walker Run    2             350            100 year storm        655.30                          655.36
  301.02    513.12      431.84    915.04                122.31     141.29
Walker Run    2             350            100 year storm e      656.30            1.00          656.34
  236.97    540.43      414.20    905.37     30.04      122.31     141.29        267.01
Walker Run    2             350            500 year storm        656.31            1.00          656.40
  317.24    894.49      645.97   1559.53                122.31     141.29

Walker Run    2             185            100 year storm        655.12                          655.19
  264.17     52.88      471.17   1335.95                 32.38      49.26
Walker Run    2             185            100 year storm e      655.84            0.72          656.14
   84.87     86.53      863.30    910.17     25.13       32.38      49.26        110.00
Walker Run    2             185            500 year storm        656.02            0.90          656.15
  282.18     91.86      709.34   2298.81                 32.38      49.26

Walker Run    2             147            100 year storm        654.82                          655.10
  191.48     43.17      806.03   1010.81               1650.00    1670.00
Walker Run    2             147            100 year storm e      655.81            0.99          656.01
  127.63     48.34      772.49   1039.18   1642.37     1650.00    1670.00       1770.00
Walker Run    2             147            500 year storm        655.49            0.67          655.99
  243.67     80.38     1225.11   1794.51               1650.00    1670.00

Walker Run    2             011            100 year storm        654.70                          654.78
  382.56    147.14      411.53   1301.34                 51.29      64.38
Walker Run    2             011            100 year storm e      655.68            0.98          655.78
  184.57    230.08      480.36   1149.56    -10.18       51.29      64.38        174.39
Walker Run    2             011            500 year storm        655.30            0.59          655.44
  430.41    306.75      616.60   2176.65                 51.29      64.38

Walker Run    2             -10     BR U   100 year storm        654.70                          654.78
  416.58    369.91      221.51   1277.58                 55.15      70.85
Walker Run    2             -10     BR U   100 year storm e      655.68            0.98          655.78
  167.91    571.87      230.32   1052.77    -10.18       55.15      70.85        174.39
Walker Run    2             -10     BR U   500 year storm        655.30            0.59          655.44
  497.59    831.07      145.41   2107.22                 55.15      70.85
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Walker Run	2	-10	BR D	100 year storm		654.36			654.78
396.11	369.91	221.51	1277.58		31.80	51.00			
Walker Run	2	-10	BR D	100 year storm	e	654.48		0.12	655.21
159.80	571.87	230.32	1052.77	9.65	31.80	51.00		215.96	
Walker Run	2	-10	BR D	500 year storm		654.90		0.54	655.32
470.41	831.07	145.41	2107.22		31.80	51.00			
Walker Run	2	-30		100 year storm		653.53			654.02
255.23	184.99	1010.37	664.64		35.60	53.56			
Walker Run	2	-30		100 year storm	e	654.43		0.90	654.68
206.31	196.84	858.73	804.44	9.65	35.60	53.56		215.96	
Walker Run	2	-30		500 year storm		654.90		1.38	655.32
384.37	371.25	1236.46	1492.29		35.60	53.56			
Walker Run	2	-78		100 year storm		653.52			653.63
312.39	240.34	654.22	965.44		36.56	62.68			
Walker Run	2	-78		100 year storm	e	654.40		0.87	654.50
199.28	89.24	716.65	1054.11	22.89	36.56	62.68		222.17	
Walker Run	2	-78		500 year storm		654.87		1.35	655.00
314.50	417.78	905.37	1776.85		36.56	62.68			
Walker Run	2	-154		100 year storm		653.37			653.49
216.03	130.75	515.64	1213.61		28.15	43.72			
Walker Run	2	-154		100 year storm	e	654.32		0.95	654.40
190.19	103.03	478.86	1278.11	13.50	28.15	43.72		203.69	
Walker Run	2	-154		500 year storm		654.68		1.31	654.85
253.36	244.84	730.73	2124.44		28.15	43.72			
Walker Run	2	-255		100 year storm		653.29			653.35
299.31	311.80	171.63	1376.57		1405.00	1412.00			
Walker Run	2	-255		100 year storm	e	654.29		1.00	654.32
316.96	306.07	150.51	1403.42		1405.00	1412.00			
Walker Run	2	-255		500 year storm		654.60		1.31	654.68
321.15	507.27	242.01	2350.71		1405.00	1412.00			
Tributary	1	6850		100 year storm		711.95			712.55
40.97	40.67	257.28	5.55		90.32	113.19			
Tributary	1	6850		100 year storm	e	711.95		0.00	712.55
40.97	40.67	257.28	5.55		90.32	113.19			
Tributary	1	6850		500 year storm		712.72		0.77	713.53
52.94	164.92	423.30	27.47		90.32	113.19			
Tributary	1	5930		100 year storm		695.49			695.55
105.67	68.85	50.86	183.79		80.01	88.27			
Tributary	1	5930		100 year storm	e	695.49		0.00	695.55
105.67	68.85	50.86	183.79		80.01	88.27			
Tributary	1	5930		500 year storm		696.21		0.72	696.32
121.05	169.33	77.77	368.59		80.01	88.27			
Tributary	1	5500		100 year storm		692.04			692.52
56.50	1.03	297.42	5.05		66.48	118.28			
Tributary	1	5500		100 year storm	e	692.04		0.00	692.52
56.50	1.03	297.42	5.05		66.48	118.28			
Tributary	1	5500		500 year storm		693.23		1.19	693.61
62.13	15.50	561.98	38.21		66.48	118.28			
Tributary	1	4750		100 year storm		686.28			686.32
105.21	0.07	303.35	0.08		81.27	183.88			
Tributary	1	4750		100 year storm	e	686.28		0.00	686.32
105.21	0.07	303.35	0.08		81.27	183.88			
Tributary	1	4750		500 year storm		686.89		0.61	686.97
110.85	2.31	610.88	2.50		81.27	183.88			
Tributary	1	4530		100 year storm		686.03			686.04
219.53	0.02	303.47	0.01		39.25	256.85			
Tributary	1	4530		100 year storm	e	686.03		0.00	686.04
219.53	0.02	303.47	0.01		39.25	256.85			
Tributary	1	4530		500 year storm		686.37		0.34	686.39
222.97	0.44	614.93	0.33		39.25	256.85			

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Tributary     1            4528                                  Culvert


Tributary     1            4500          100 year storm        684.80                          685.52
   31.54    23.76       279.74                     117.21        146.54
Tributary     1            4500          100 year storm e      684.80          0.00            685.52
   31.54    23.76       279.74                     117.21        146.54
Tributary     1            4500          500 year storm        685.00          0.20            685.13
  122.43     7.10        79.82    528.77            117.21        146.54

Tributary     1            4400          100 year storm        678.48                          679.05
   66.08   180.37        37.56     85.57            158.35        161.30
Tributary     1            4400          100 year storm e      678.48          0.00            679.05
   66.08   180.37        37.56     85.57            158.35        161.30
Tributary     1            4400          500 year storm        678.28         -0.20            682.54
   62.22   357.47       101.09    157.13            158.35        161.30

Tributary     1            3356          100 year storm        671.01                          671.02
  614.41   269.22        33.09      1.19            213.43        219.51
Tributary     1            3356          100 year storm e      671.01          0.00            671.02
  614.41   269.22        33.09      1.19            213.43        219.51
Tributary     1            3356          500 year storm        671.02          0.01            671.06
  615.24   546.82        66.40      2.47            213.43        219.51

Tributary     1            3108     BR U 100 year storm        668.29                          668.32
  218.53   243.37        58.22      1.90            301.19        317.51
Tributary     1            3108     BR U 100 year storm e      668.29          0.00            668.32
  218.53   243.37        58.22      1.90            301.19        317.51
Tributary     1            3108     BR U 500 year storm        668.83          0.54            668.88
  223.93   497.95       108.71      9.03            301.19        317.51

Tributary     1            3108     BR D 100 year storm        667.73                          667.84
  226.80   228.93        74.42      0.15            301.19        317.51
Tributary     1            3108     BR D 100 year storm e      667.73          0.00            667.84
  226.80   228.93        74.42      0.15            301.19        317.51
Tributary     1            3108     BR D 500 year storm        668.33          0.61            668.44
  246.40   492.44       119.14      4.11            301.19        317.51

Tributary     1            3060          100 year storm        667.66                          667.69
  219.14   251.71        50.26      1.53            318.74        337.11
Tributary     1            3060          100 year storm e      667.66          0.00            667.69
  219.14   251.71        50.26      1.53            318.74        337.11
Tributary     1            3060          500 year storm        668.27          0.61            668.32
  235.49   505.92       100.38      9.39            318.74        337.11

Tributary     1            3010     BR U 100 year storm        667.54                          667.58
  207.38   248.48        53.97      1.05            318.74        337.11
Tributary     1            3010     BR U 100 year storm e      667.54          0.00            667.58
  207.38   248.48        53.97      1.05            318.74        337.11
Tributary     1            3010     BR U 500 year storm        668.15          0.61            668.21
  224.84   499.70       107.51      8.48            318.74        337.11

Tributary     1            3010     BR D 100 year storm        667.04                          667.07
  229.94   264.13        18.67     20.70            252.14        258.87
Tributary     1            3010     BR D 100 year storm e      667.04          0.00            667.07
  229.94   264.13        18.67     20.70            252.14        258.87
Tributary     1            3010     BR D 500 year storm        667.66          0.61            667.70
  261.23   522.28        37.47     55.93            252.14        258.87

Tributary     1            2834          100 year storm        666.51                          666.54
  246.16   259.77        20.02     23.70            252.14        258.87
Tributary     1            2834          100 year storm e      666.51          0.00            666.54
  246.16   259.77        20.02     23.70            252.14        258.87
Tributary     1            2834          500 year storm        667.11          0.59            667.14
  275.00   519.75        37.81     58.14            252.14        258.87

Tributary     1            2791.66*      100 year storm        666.30                          666.32
  242.56   241.53        26.11     35.87            253.57        260.38
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Tributary      1              2791.66*        100 year storm e      666.30                0.00      666.32
  242.56    241.53        26.11     35.87                253.57     260.38
Tributary      1              2791.66*        500 year storm        666.88                0.58      666.92
  272.79    487.94        45.98     81.77                253.57     260.38

Tributary      1              2749.33*        100 year storm        666.06                          666.10
  240.94    221.18        33.01     49.31                255.00     261.90
Tributary      1              2749.33*        100 year storm e      666.06                0.00      666.10
  240.94    221.18        33.01     49.31                255.00     261.90
Tributary      1              2749.33*        500 year storm        666.64                0.57      666.68
  271.08    454.26        54.93    106.50                255.00     261.90

Tributary      1              2707.*          100 year storm        665.81                          665.85
  238.80    198.34        40.12     65.04                256.43     263.41
Tributary      1              2707.*          100 year storm e      665.81                0.00      665.85
  238.80    198.34        40.12     65.04                256.43     263.41
Tributary      1              2707.*          500 year storm        666.37                0.56      666.43
  270.83    415.08        63.86    136.76                256.43     263.41

Tributary      1              2664.66*        100 year storm        665.53                          665.58
  239.34    173.65        47.35     82.51                257.86     264.93
Tributary      1              2664.66*        100 year storm e      665.53                0.00      665.58
  239.34    173.65        47.35     82.51                257.86     264.93
Tributary      1              2664.66*        500 year storm        666.09                0.56      666.15
  270.47    372.47        72.68    170.54                257.86     264.93

Tributary      1              2622.33*        100 year storm        665.23                          665.29
  239.57    147.12        54.48    101.90                259.29     266.44
Tributary      1              2622.33*        100 year storm e      665.23                0.00      665.29
  239.57    147.12        54.48    101.90                259.29     266.44
Tributary      1              2622.33*        500 year storm        665.79                0.56      665.86
  270.11    327.52        81.16    207.01                259.29     266.44

Tributary      1              2580.*          100 year storm        664.90                          664.97
  234.73    120.61        60.89    122.00                260.73     267.96
Tributary      1              2580.*          100 year storm e      664.90                0.00      664.97
  234.73    120.61        60.89    122.00                260.73     267.96
Tributary      1              2580.*          500 year storm        665.46                0.56      665.54
  271.32    281.43        89.10    245.16                260.73     267.96

Tributary      1              2537.66*        100 year storm        664.55                          664.63
  229.77     95.03        66.84    141.63                262.16     269.47
Tributary      1              2537.66*        100 year storm e      664.55                0.00      664.63
  229.77     95.03        66.84    141.63                262.16     269.47
Tributary      1              2537.66*        500 year storm        665.12                0.57      665.21
  269.14    235.01        96.32    284.36                262.16     269.47

Tributary      1              2495.33*        100 year storm        664.17                          664.27
  219.10     74.73        71.17    157.60                263.59     270.98
Tributary      1              2495.33*        100 year storm e      664.17                0.00      664.27
  219.10     74.73        71.17    157.60                263.59     270.98
Tributary      1              2495.33*        500 year storm        664.77                0.60      664.87
  264.27    194.41       101.08    320.20                263.59     270.98

Tributary      1              2453.*          100 year storm        663.79                          663.89
  196.17     60.31        74.01    169.19                265.02     272.50
Tributary      1              2453.*          100 year storm e      663.79                0.00      663.89
  196.17     60.31        74.01    169.19                265.02     272.50
Tributary      1              2453.*          500 year storm        664.44                0.65      664.54
  261.26    160.39       103.43    351.86                265.02     272.50

Tributary      1              2410.66*        100 year storm        663.44                          663.52
  198.83     49.76        73.18    180.56                266.45     274.01
Tributary      1              2410.66*        100 year storm e      663.44                0.00      663.52
  198.83     49.76        73.18    180.56                266.45     274.01
Tributary      1              2410.66*        500 year storm        664.16                0.72      664.24
  261.97    134.82       101.12    379.75                266.45     274.01

Tributary      1              2368.33*        100 year storm        663.17                          663.23
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  206.48     43.05       67.77    192.67                267.88     275.53
Tributary     1            2368.33*       100 year storm e      663.17            0.00      663.23
  206.48     43.05       67.77    192.67                267.88     275.53
Tributary     1            2368.33*       500 year storm        663.96            0.78      664.02
  268.08    117.76       95.17    402.75                267.88     275.53

Tributary     1            2326           100 year storm        663.02                      663.05
  219.83     38.59       58.96    205.96                269.31     277.04
Tributary     1            2326           100 year storm e      663.02            0.00      663.05
  219.83     38.59       58.96    205.96                269.31     277.04
Tributary     1            2326           500 year storm        663.82            0.81      663.86
  279.76    104.07       87.45    424.17                269.31     277.04

Tributary     1            1790     BR U  100 year storm        661.86                      661.89
  219.09     45.10       56.21    202.19                269.31     277.04
Tributary     1            1790     BR U  100 year storm e      661.86            0.00      661.89
  219.09     45.10       56.21    202.19                269.31     277.04
Tributary     1            1790     BR U  500 year storm        662.67            0.81      662.71
  282.43    120.73       87.04    407.93                269.31     277.04

Tributary     1            1790     BR D  100 year storm        661.80                      661.84
  190.40     66.29       99.72    137.49                262.44     274.07
Tributary     1            1790     BR D  100 year storm e      661.80            0.00      661.84
  190.40     66.29       99.72    137.49                262.44     274.07
Tributary     1            1790     BR D  500 year storm        662.59            0.79      662.66
  200.73    150.31      159.36    306.02                262.44     274.07

Tributary     1            1658           100 year storm        661.44                      661.52
  192.24     57.05      118.90    127.55                262.44     274.07
Tributary     1            1658           100 year storm e      661.44            0.00      661.52
  192.24     57.05      118.90    127.55                262.44     274.07
Tributary     1            1658           500 year storm        662.21            0.77      662.30
  208.28    133.72      175.84    306.12                262.44     274.07

Tributary     1            1608.33*       100 year storm        661.25                      661.35
  164.59     63.97      139.58     99.95                254.97     269.18
Tributary     1            1608.33*       100 year storm e      661.25            0.00      661.35
  164.59     63.97      139.58     99.95                254.97     269.18
Tributary     1            1608.33*       500 year storm        661.99            0.74      662.11
  195.87    154.70      215.24    245.75                254.97     269.18

Tributary     1            1558.66*       100 year storm        661.06                      661.17
  156.16     69.27      154.43     79.80                247.51     264.29
Tributary     1            1558.66*       100 year storm e      661.06            0.00      661.17
  156.16     69.27      154.43     79.80                247.51     264.29
Tributary     1            1558.66*       500 year storm        661.77            0.71      661.91
  183.08    167.89      243.01    204.80                247.51     264.29

Tributary     1            1509.*         100 year storm        660.88                      660.98
  150.59     76.33      162.62     64.55                240.04     259.40
Tributary     1            1509.*         100 year storm e      660.88            0.00      660.98
  150.59     76.33      162.62     64.55                240.04     259.40
Tributary     1            1509.*         500 year storm        661.55            0.67      661.69
  176.83    182.13      260.50    173.06                240.04     259.40

Tributary     1            1459.33*       100 year storm        660.69                      660.79
  149.88     86.20      165.48     51.83                232.57     254.52
Tributary     1            1459.33*       100 year storm e      660.69            0.00      660.79
  149.88     86.20      165.48     51.83                232.57     254.52
Tributary     1            1459.33*       500 year storm        661.33            0.64      661.47
  176.57    200.67      269.41    145.61                232.57     254.52

Tributary     1            1409.66*       100 year storm        660.50                      660.59
  151.44     99.66      162.61     41.23                225.11     249.63
Tributary     1            1409.66*       100 year storm e      660.50            0.00      660.59
  151.44     99.66      162.61     41.23                225.11     249.63
Tributary     1            1409.66*       500 year storm        661.10            0.60      661.24
  188.41    228.01      267.45    120.24                225.11     249.63
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Tributary	1	1360		100 year storm	660.33			660.40
174.95	125.25	146.83	31.42	217.64	244.74			
Tributary	1	1360		100 year storm e	660.33		0.00	660.40
174.95	125.25	146.83	31.42	217.64	244.74			
Tributary	1	1360		500 year storm	660.91		0.58	661.01
212.10	282.06	240.27	93.36	217.64	244.74			
Tributary	1	1281	BR U	100 year storm	659.65			660.02
110.93	70.04	223.20	10.26	217.64	244.74			
Tributary	1	1281	BR U	100 year storm e	659.65		0.00	660.02
110.93	70.04	223.20	10.26	217.64	244.74			
Tributary	1	1281	BR U	500 year storm	660.15		0.51	660.60
159.64	209.43	356.04	50.22	217.64	244.74			
Tributary	1	1281	BR D	100 year storm	659.03			659.06
254.17	195.49	42.29	65.71	245.69	262.11			
Tributary	1	1281	BR D	100 year storm e	659.01		-0.02	659.04
253.06	195.87	42.82	64.80	245.69	262.11			
Tributary	1	1281	BR D	500 year storm	659.52		0.49	659.57
286.90	379.33	64.24	172.11	245.69	262.11			
Tributary	1	1252		100 year storm	659.03			659.06
255.39	192.72	46.73	64.05	245.69	262.11			
Tributary	1	1252		100 year storm e	659.01		-0.02	659.04
254.49	193.12	47.27	63.11	245.69	262.11			
Tributary	1	1252		500 year storm	659.52		0.49	659.57
281.54	372.28	73.40	170.01	245.69	262.11			
Tributary	1	1203.*		100 year storm	658.85			658.87
257.48	174.39	54.52	74.59	249.88	267.22			
Tributary	1	1203.*		100 year storm e	658.81		-0.03	658.84
255.86	174.78	55.85	72.87	249.88	267.22			
Tributary	1	1203.*		500 year storm	659.32		0.47	659.36
280.29	345.10	85.11	185.48	249.88	267.22			
Tributary	1	1154.*		100 year storm	658.66			658.68
256.92	156.23	63.66	83.61	254.07	272.34			
Tributary	1	1154.*		100 year storm e	658.58		-0.07	658.62
253.21	156.13	67.20	80.17	254.07	272.34			
Tributary	1	1154.*		500 year storm	659.08		0.43	659.13
278.97	317.55	100.62	197.51	254.07	272.34			
Tributary	1	1105		100 year storm	658.45			658.48
251.49	139.53	73.78	90.19	258.26	277.45			
Tributary	1	1105		100 year storm e	658.26		-0.19	658.31
237.30	138.11	85.80	79.59	258.26	277.45			
Tributary	1	1105		500 year storm	658.78		0.33	658.84
271.28	285.86	122.81	207.02	258.26	277.45			
Tributary	1	810		100 year storm	657.29			657.31
483.04	68.44	59.73	175.32	307.34	320.94			
Tributary	1	810		100 year storm e	657.97		0.68	657.97
586.48	101.63	30.26	171.61	307.34	320.94			
Tributary	1	810		500 year storm	658.29		1.00	658.30
596.53	226.32	49.82	339.54	307.34	320.94			
Tributary	1	587		100 year storm	657.03			657.04
528.17	112.58	23.18	167.74	102.91	114.18			
Tributary	1	587		100 year storm e	657.94		0.90	657.94
692.76	140.80	14.92	147.78	102.91	114.18			
Tributary	1	587		500 year storm	658.21		1.17	658.21
706.29	298.86	27.43	289.40	102.91	114.18			
Tributary	1	463		100 year storm	657.02			657.02
776.32	150.82	16.81	135.86	213.70	233.37			
Tributary	1	463		100 year storm e	657.93		0.92	657.93
957.60	160.67	13.53	129.30	213.70	233.37			
Tributary	1	463		500 year storm	658.20		1.18	658.20
973.00	331.35	26.05	258.29	213.70	233.37			

Tributary	1	357		100 year storm	657.01			657.01
1143.98	216.15	4.62	82.73	185.31	191.14			
Tributary	1	357		100 year storm e	657.93		0.92	657.93
1196.87	213.46	3.51	86.54	185.31	191.14			
Tributary	1	357		500 year storm	658.19		1.18	658.19
1203.42	431.49	6.71	177.48	185.31	191.14			
Tributary	1	183		100 year storm	657.01			657.01
1134.98	229.80	9.58	64.12	191.70	208.19			
Tributary	1	183		100 year storm e	657.93		0.92	657.93
1234.23	225.72	8.01	69.76	191.70	208.19			
Tributary	1	183		500 year storm	658.19		1.18	658.19
1242.80	455.50	15.63	144.56	191.70	208.19			

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Prop

River: Tributary Reach: 1 RS: 6850 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 5930 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 5930 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 5930 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 5500 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

River: Tributary Reach: 1 RS: 5500 Profile: 100 year storm e
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 5500 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4750 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 4530 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4530 Profile: 100 year storm e
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm
Warning:During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of
energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm Culv: Culvert #1
Warning:During the culvert inlet control computations, the program could not balance the culvert/weir flow. The reported
inlet energy grade answer may not be valid.
Warning:During the culvert outlet control computations, the program could not balance the culvert/weir flow. The reported
outlet energy grade answer may not be valid.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm e
Warning:During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of
energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
Warning:During subcritical analysis, the water surface upstream of culvert went to critical depth.
River: Tributary Reach: 1 RS: 4528 Profile: 100 year storm e Culv: Culvert #1
Warning:During the culvert inlet control computations, the program could not balance the culvert/weir flow. The reported
inlet energy grade answer may not be valid.
Warning:During the culvert outlet control computations, the program could not balance the culvert/weir flow. The reported
outlet energy grade answer may not be valid.
River: Tributary Reach: 1 RS: 4500 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4500 Profile: 100 year storm e
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4500 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4400 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4400 Profile: 100 year storm e
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 4400 Profile: 500 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 3356 Profile: 100 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3356 Profile: 100 year storm e
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3356 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Tributary Reach: 1 RS: 3108 Profile: 100 year storm
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: Tributary Reach: 1 RS: 3108 Profile: 100 year storm Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 3108 Profile: 100 year storm Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Manning's n values were composited to a single value in the main channel.
River: Tributary Reach: 1 RS: 3108 Profile: 100 year storm e
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: Tributary Reach: 1 RS: 3108 Profile: 100 year storm e Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 3108 Profile: 100 year storm e Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Manning's n values were composited to a single value in the main channel.
River: Tributary Reach: 1 RS: 3108 Profile: 500 year storm Upstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Tributary Reach: 1 RS: 3108 Profile: 500 year storm Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: Manning's n values were composited to a single value in the main channel.
River: Tributary Reach: 1 RS: 3010 Profile: 500 year storm Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 2834 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 2326 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 2326 Profile: 100 year storm e
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 2326 Profile: 500 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1790 Profile: 100 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 1790 Profile: 100 year storm Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 1790 Profile: 100 year storm e Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 1790 Profile: 100 year storm e Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Tributary Reach: 1 RS: 1360 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 1360 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 1360 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 1281 Profile: 100 year storm Upstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 1281 Profile: 100 year storm Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The

program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1281 Profile: 100 year storm e Upstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 1281 Profile: 100 year storm e Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1281 Profile: 500 year storm Upstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: Tributary Reach: 1 RS: 1281 Profile: 500 year storm Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1105 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Tributary Reach: 1 RS: 1105 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 1105 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

River: Tributary Reach: 1 RS: 810 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 810 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 810 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 587 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 463 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Tributary Reach: 1 RS: 357 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Tributary Reach: 1 RS: 183 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 5862 Profile: 100 year storm e
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The cross section had to be extended vertically during the critical depth calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section
slice/secant method to find critical depth.
River: Walker Run Reach: 1 RS: 5862 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program defaulted to critical depth.
River: Walker Run Reach: 1 RS: 5547 Profile: 100 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5547 Profile: 100 year storm e
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5547 Profile: 500 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 5282 Profile: 100 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5282 Profile: 100 year storm e
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5282 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm Upstream
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm e Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 100 year storm e Downstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 500 year storm Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5250 Profile: 500 year storm Downstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross

section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 100 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 100 year storm e
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5198 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 5107 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 5107 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 5107 Profile: 500 year storm
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 4414 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4295 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
River: Walker Run Reach: 1 RS: 4130 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4043 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4043 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 4043 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3972 Profile: 100 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7

or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3972 Profile: 100 year storm e
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3972 Profile: 500 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm
Warning:The sluice gate calculations did not converge during the pressure flow only calculation.
Note: The weir over a bridge is submerged, the energy answer was used.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm Upstream
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm Downstream
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm e
Warning:The sluice gate calculations did not converge during the pressure flow only calculation.
Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum
answer has been disregarded.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm e Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 100 year storm e Downstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3914 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface is based on critical depth over the
weir. The energy has been projected.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 100 year storm
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: The energy method has computed a class B profile.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 100 year storm e
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3860 Profile: 500 year storm
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3785 Profile: 100 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3785 Profile: 100 year storm e
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3785 Profile: 500 year storm
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 1 RS: 3735 Profile: 100 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3735 Profile: 100 year storm e
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3735 Profile: 500 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: Walker Run Reach: 1 RS: 3410 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 1 RS: 3375 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3375 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3278 Profile: 100 year storm

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3278 Profile: 100 year storm e
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 3278 Profile: 500 year storm
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2730 Profile: 100 year storm e
Warning:The parabolic search method failed to converge on critical depth. The program will try the cross section
slice/secant method to find critical depth.
River: Walker Run Reach: 1 RS: 2620 Profile: 100 year storm
Note: The water surface computed by the sluice gate equation (during pressure only calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
Note: Pressure flow was attempted because the energy, from the low flow method, was high enough. However, the pressure
flow answer was below the low chord. Therefore, the pressure answer is not valid.
River: Walker Run Reach: 1 RS: 2620 Profile: 100 year storm Upstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2620 Profile: 100 year storm e
Note: The water surface computed by the sluice gate equation (during pressure only calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
Note: Pressure flow was attempted because the energy, from the low flow method, was high enough. However, the pressure
flow answer was below the low chord. Therefore, the pressure answer is not valid.
River: Walker Run Reach: 1 RS: 2620 Profile: 100 year storm e Upstream
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2620 Profile: 100 year storm e Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 1 RS: 2620 Profile: 500 year storm
Note: The water surface computed by the sluice gate equation (during pressure only calculations) is below the physical low
chord of the bridge.
Note: The downstream water surface is below the minimum elevation for pressure flow. The sluice gate equations were used
for pressure flow.
Note: Pressure flow was attempted because the energy, from the low flow method, was high enough. However, the pressure
flow answer was below the low chord. Therefore, the pressure answer is not valid.
River: Walker Run Reach: 1 RS: 2620 Profile: 500 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 1 RS: 2620 Profile: 500 year storm Downstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 1 RS: 2462 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2339 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2274 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2274 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7

or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 2139 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 1 RS: 1925 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 1602 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 1402 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 1208 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 990 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 990 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 884 Profile: 100 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: 884 Profile: 100 year storm e
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Walker Run Reach: 2 RS: 884 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: 875 Profile: 100 year storm e
Warning:During subcritical analysis, while trying to calculate culvert and weir flow, the program could not get a balance of
energy within the specified tolerance and number of trials. The program used the solution with the minimum error.
River: Walker Run Reach: 2 RS: 875 Profile: 100 year storm e Culv: Culvert #1
Warning:During the culvert inlet control computations, the program could not balance the culvert/weir flow. The reported
inlet energy grade answer may not be valid.
Warning:During the culvert outlet control computations, the program could not balance the culvert/weir flow. The reported
outlet energy grade answer may not be valid.
River: Walker Run Reach: 2 RS: 863 Profile: 100 year storm e
Warning:The cross section had to be extended vertically during the critical depth calculations.
River: Walker Run Reach: 2 RS: 715 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 715 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 350 Profile: 100 year storm e
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 350 Profile: 500 year storm
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run Reach: 2 RS: 185 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 185 Profile: 500 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 147 Profile: 100 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 147 Profile: 500 year storm
Warning:Divided flow computed for this cross-section.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7

or greater than 1.4.
This may indicate the need for additional cross sections.
River: Walker Run Reach: 2 RS: 011 Profile: 100 year storm
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: 011 Profile: 100 year storm e
Warning:The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: 011 Profile: 500 year storm
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm Upstream
Warning:Critical depth could not be determined within the specified number of iterations. The program used the iteration
with the lowest energy.
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface is based on critical depth over the
weir. The energy has been projected.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm e
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm e Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 100 year storm e Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy are based on critical
depth over the weir.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm
Note: The downstream water surface is above the minimum elevation required for orifice flow. The orifice flow equation was
used for pressure flow.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm Upstream
Note: For the cross section inside the bridge at the upstream end, the water surface and energy have been projected from
the upstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -10 Profile: 500 year storm Downstream
Note: For the cross section inside the bridge at the downstream end, the water surface and energy have been projected from
the downstream cross section. The selected bridge modeling method does not compute answers inside the bridge.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 100 year storm
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 100 year storm e
Warning:The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: Walker Run Reach: 2 RS: -30 Profile: 500 year storm

```
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
or greater than 1.4.
             This may indicate the need for additional cross sections.
     Warning:Critical depth could not be determined within the specified number of iterations.  The
program used the iteration
             with the lowest energy.
River: Walker Run  Reach: 2     RS: -78     Profile: 100 year storm
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run  Reach: 2     RS: -78     Profile: 500 year storm
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run  Reach: 2     RS: -154     Profile: 100 year storm
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Walker Run  Reach: 2     RS: -154     Profile: 500 year storm
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
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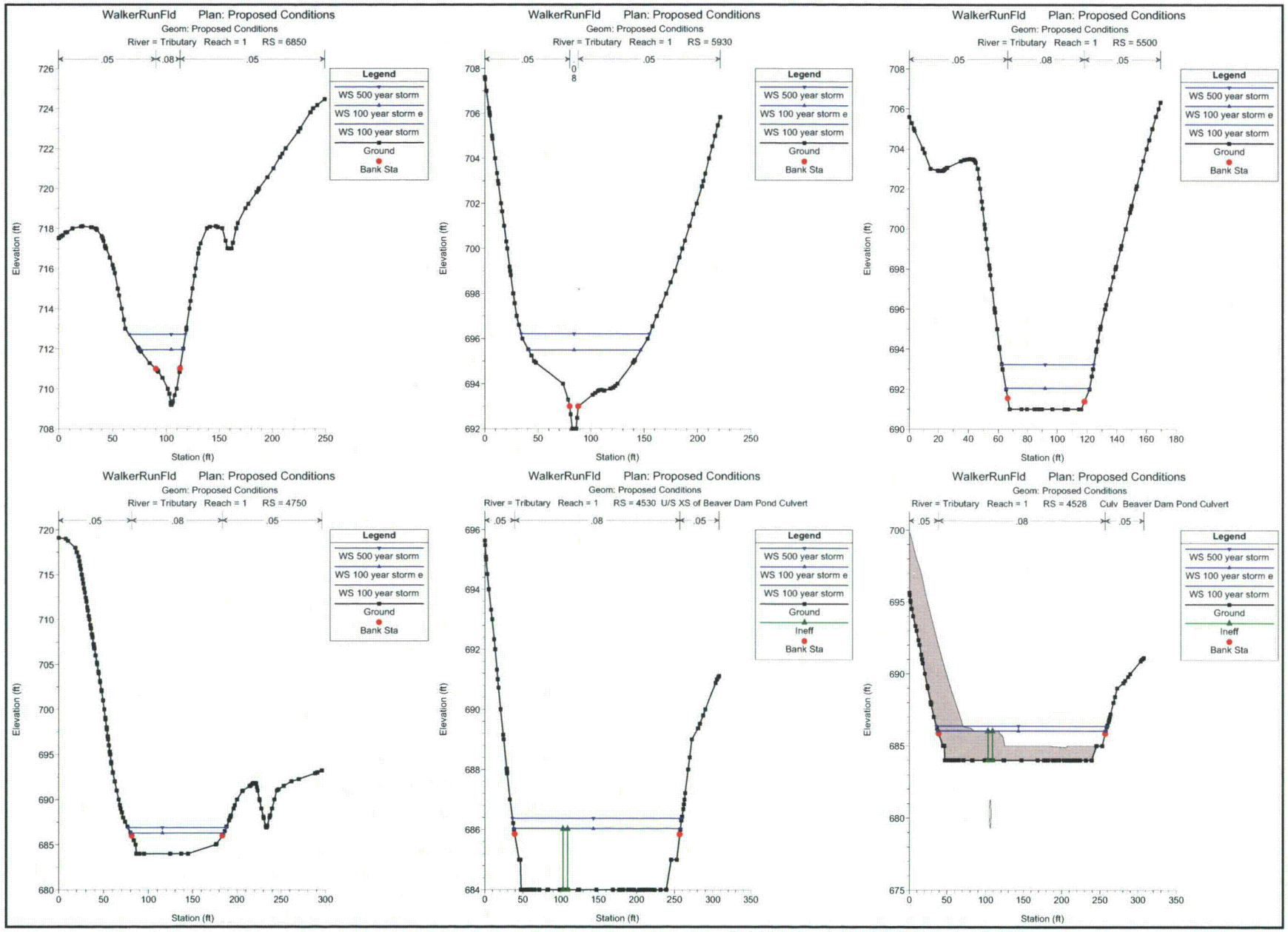
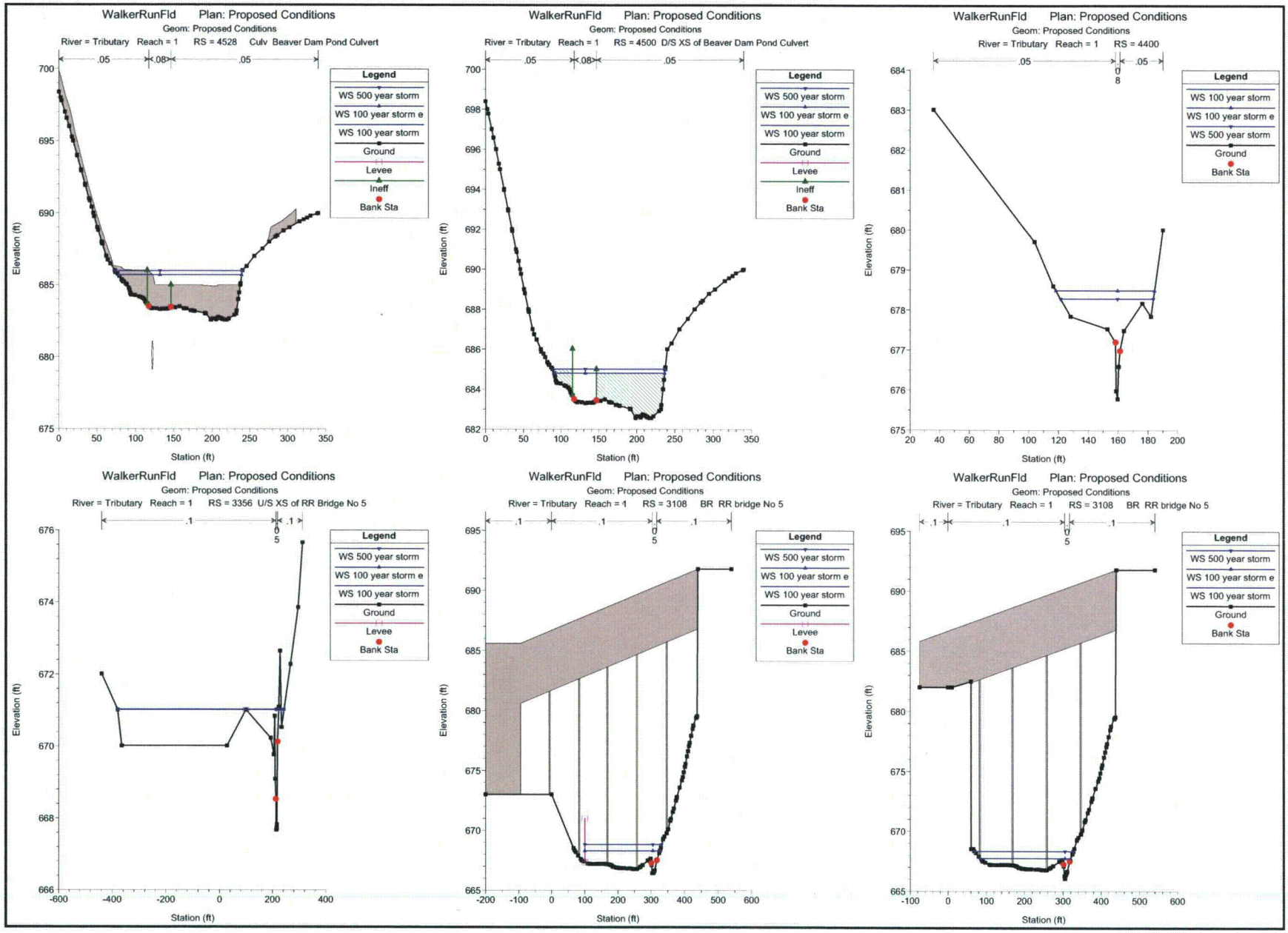
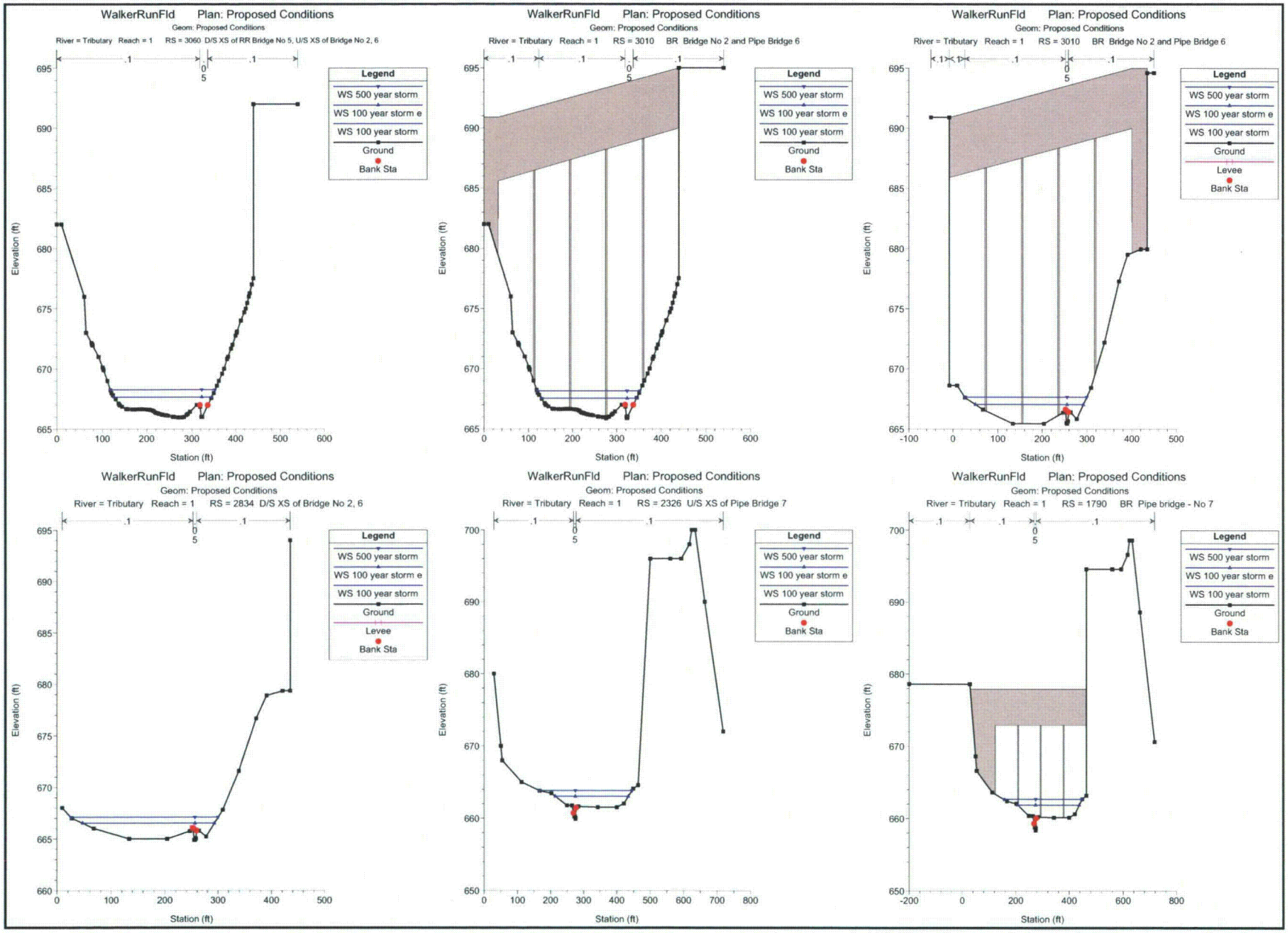
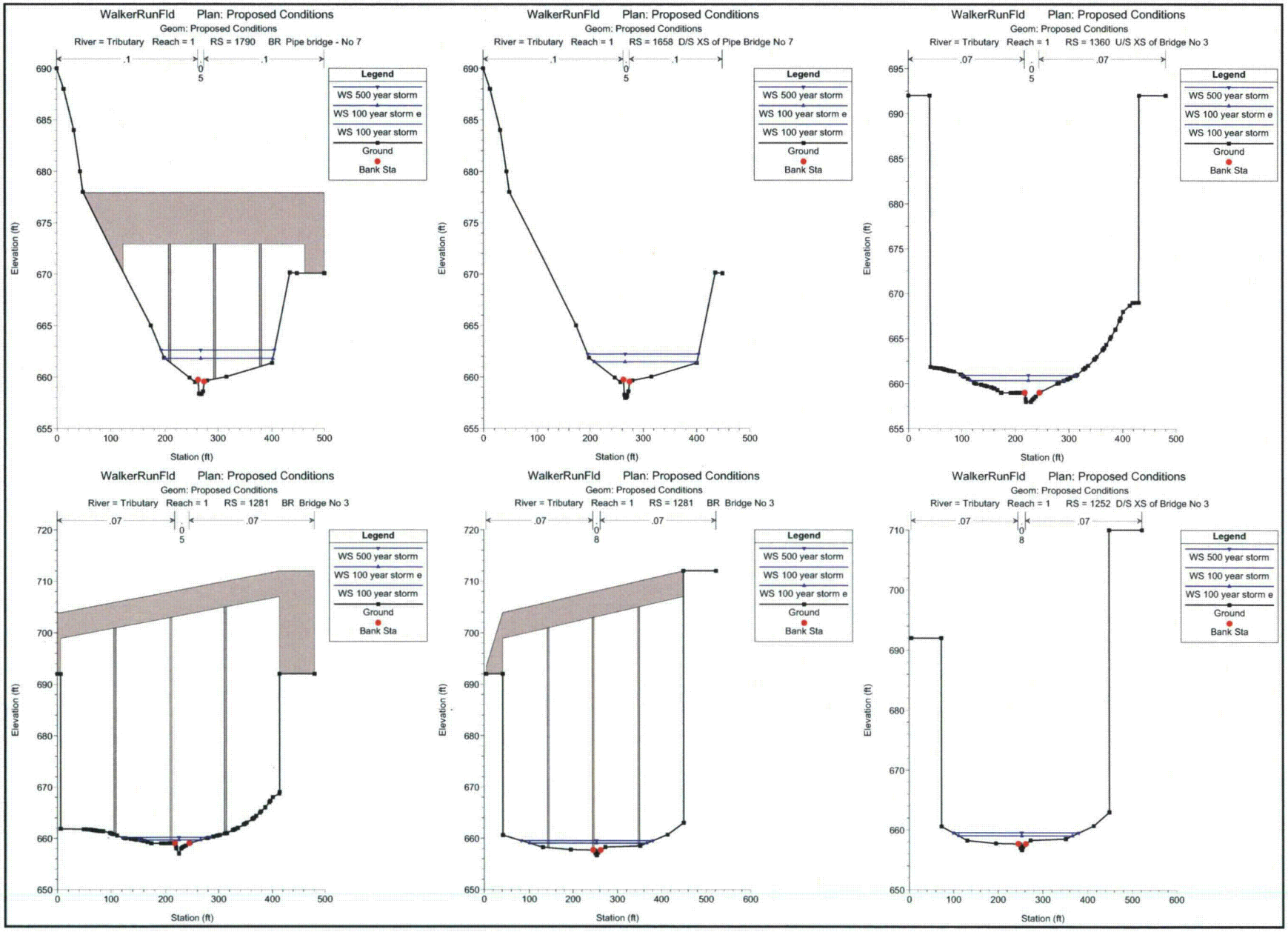
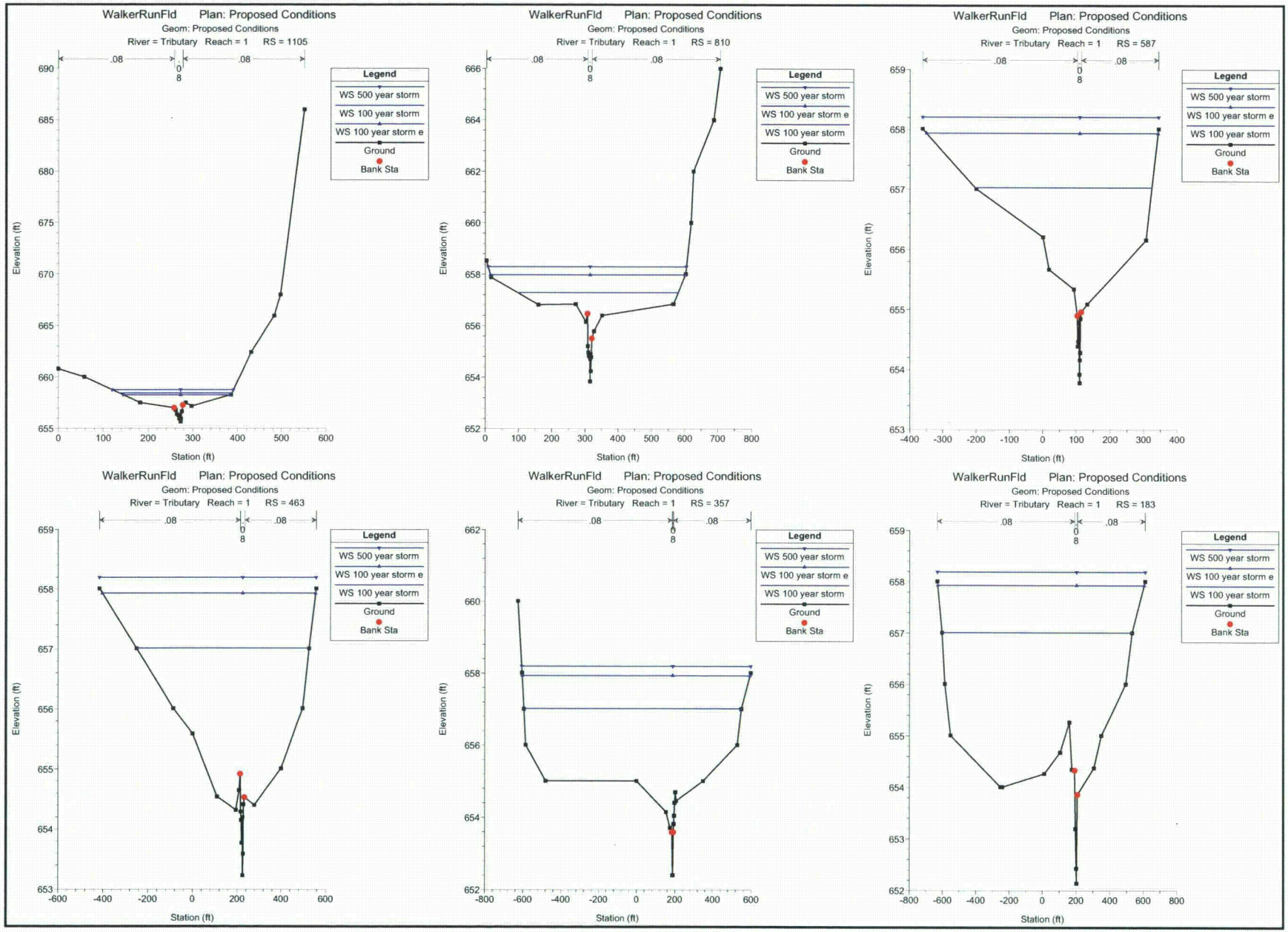
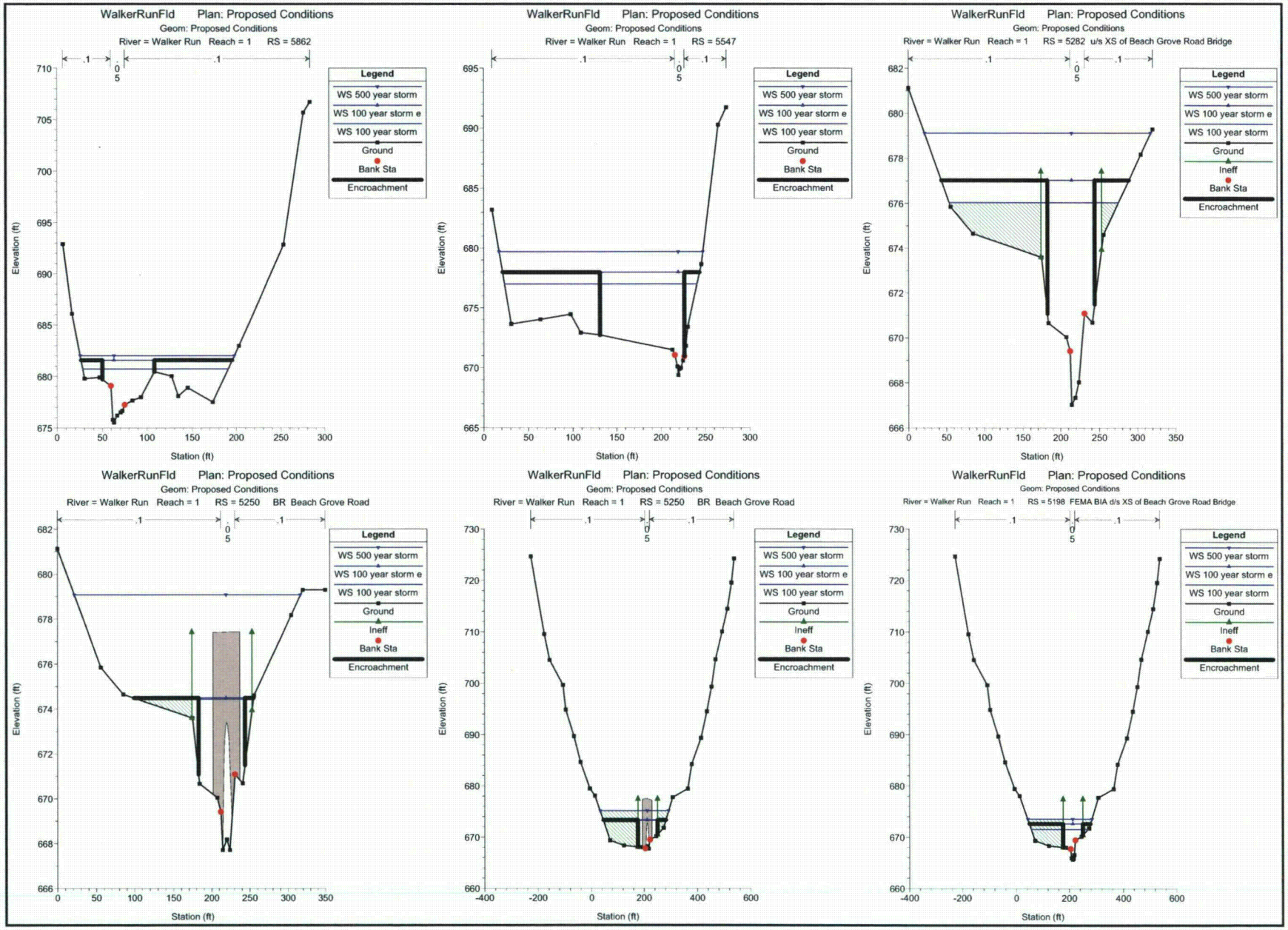

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 6850
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 5930
.05 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 5500
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 4750
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 4530 U/S XS of Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 4528 Culv Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

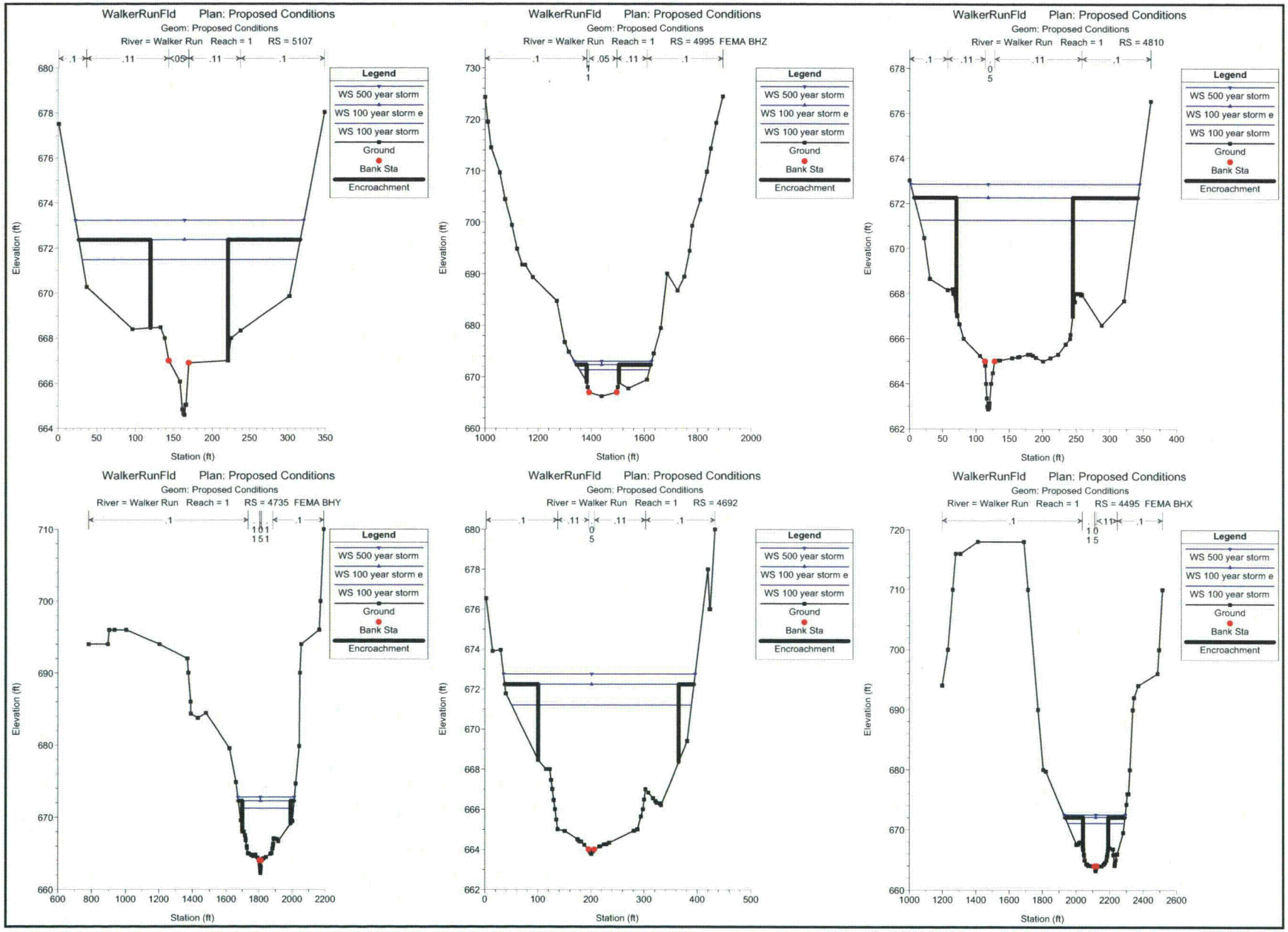

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 4528 Culv Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 4500 D/S XS of Beaver Dam Pond Culvert
.05 .08 .05
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 4400
.05 .05
Legend
WS 100 year storm
WS 100 year storm e
WS 500 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 3356 U/S XS of RR Bridge No 5
.1 .1
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 3108 BR RR bridge No 5
.1 .1 .1
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 3108 BR RR bridge No 5
.1 .1 .1
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

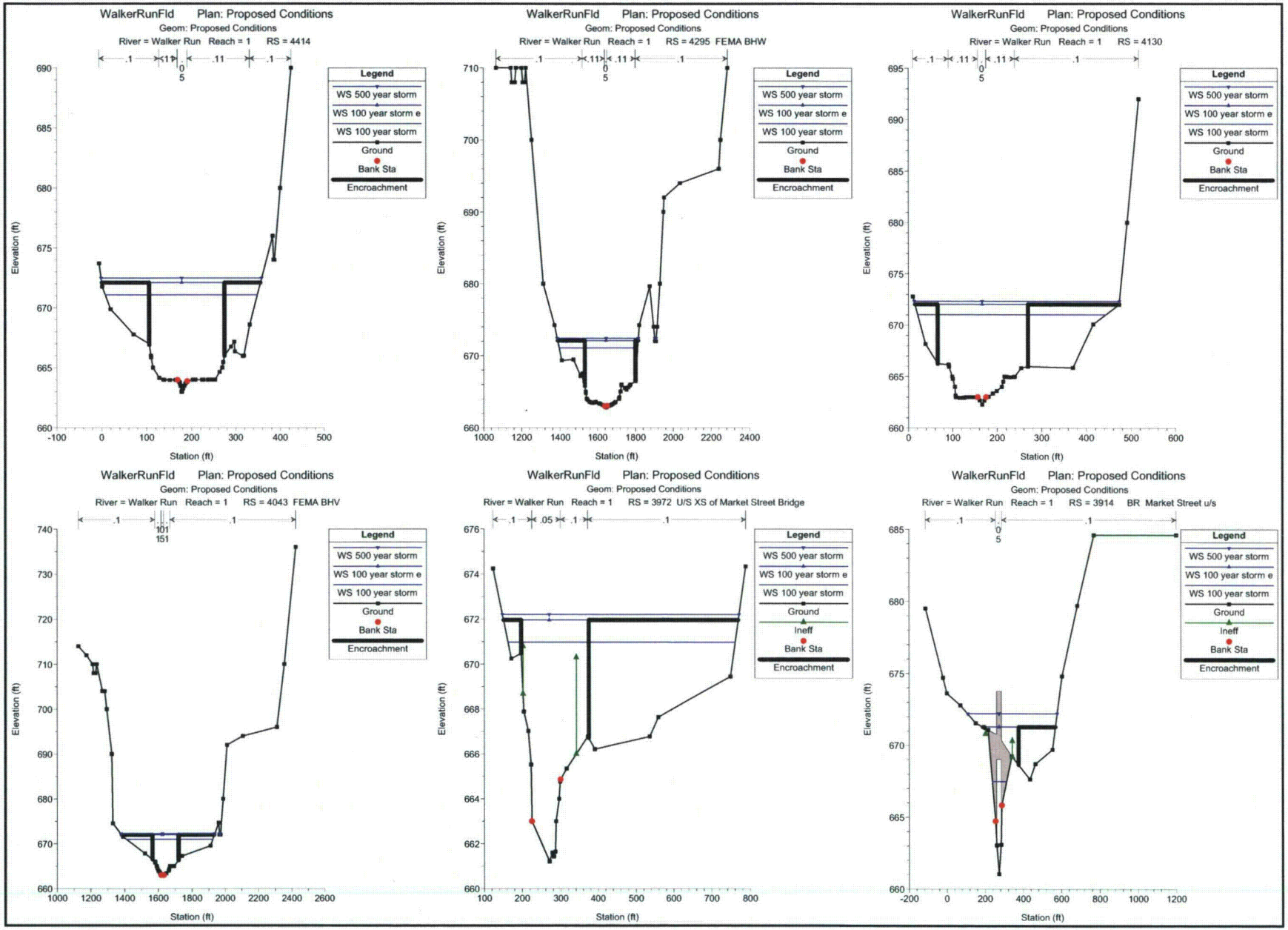

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 3060 D/S XS of RR Bridge No 5, U/S XS of Bridge No 2, 6
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 3010 BR Bridge No 2 and Pipe Bridge 6
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 3010 BR Bridge No 2 and Pipe Bridge 6
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 2834 D/S XS of Bridge No 2, 6
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 2326 U/S XS of Pipe Bridge 7
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1790 BR Pipe bridge - No 7
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

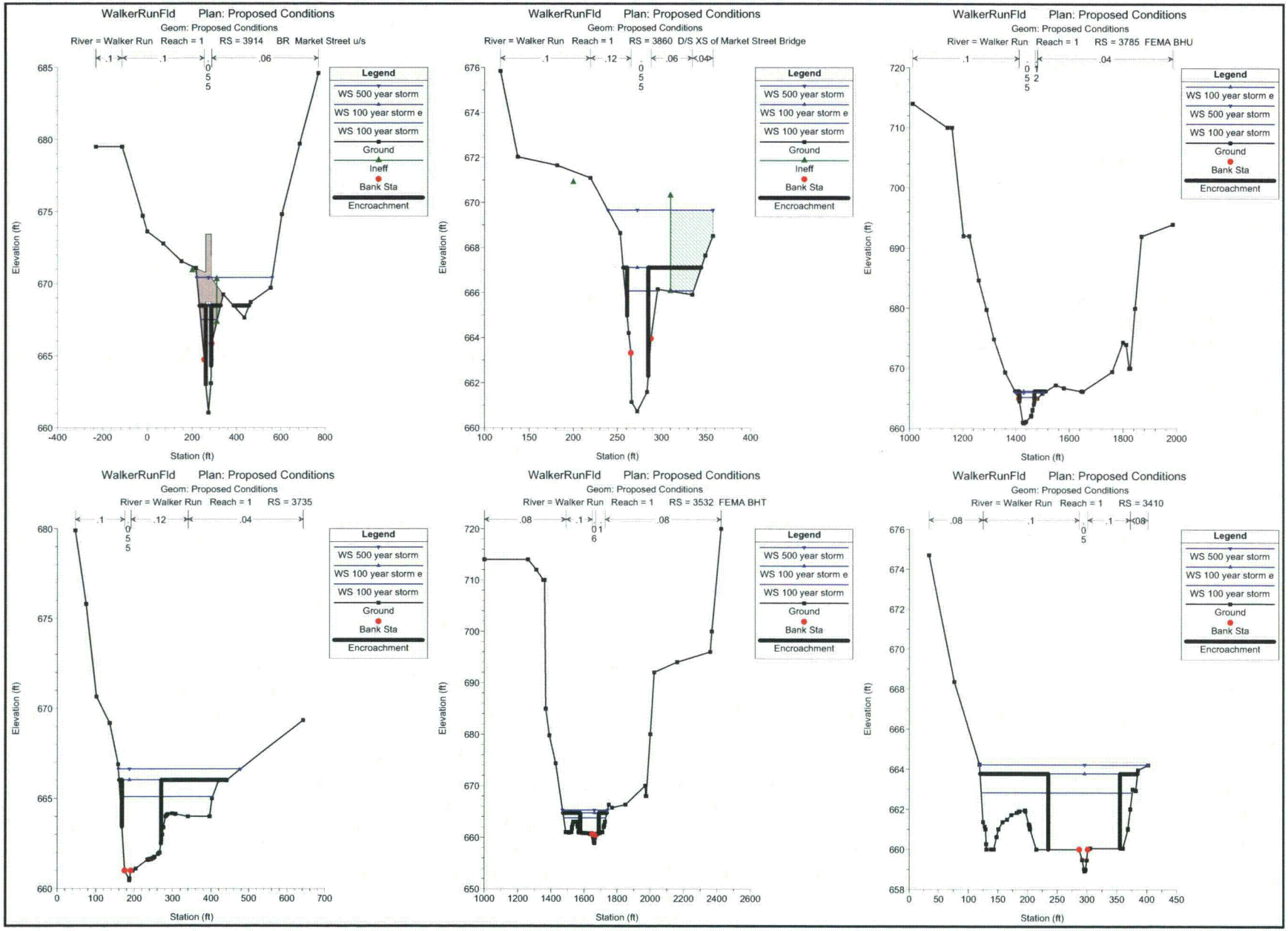

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1790 BR Pipe bridge - No 7
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1658 D/S XS of Pipe Bridge No 7
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1360 U/S XS of Bridge No 3
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1281 BR Bridge No 3
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1281 BR Bridge No 3
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1252 D/S XS of Bridge No 3
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

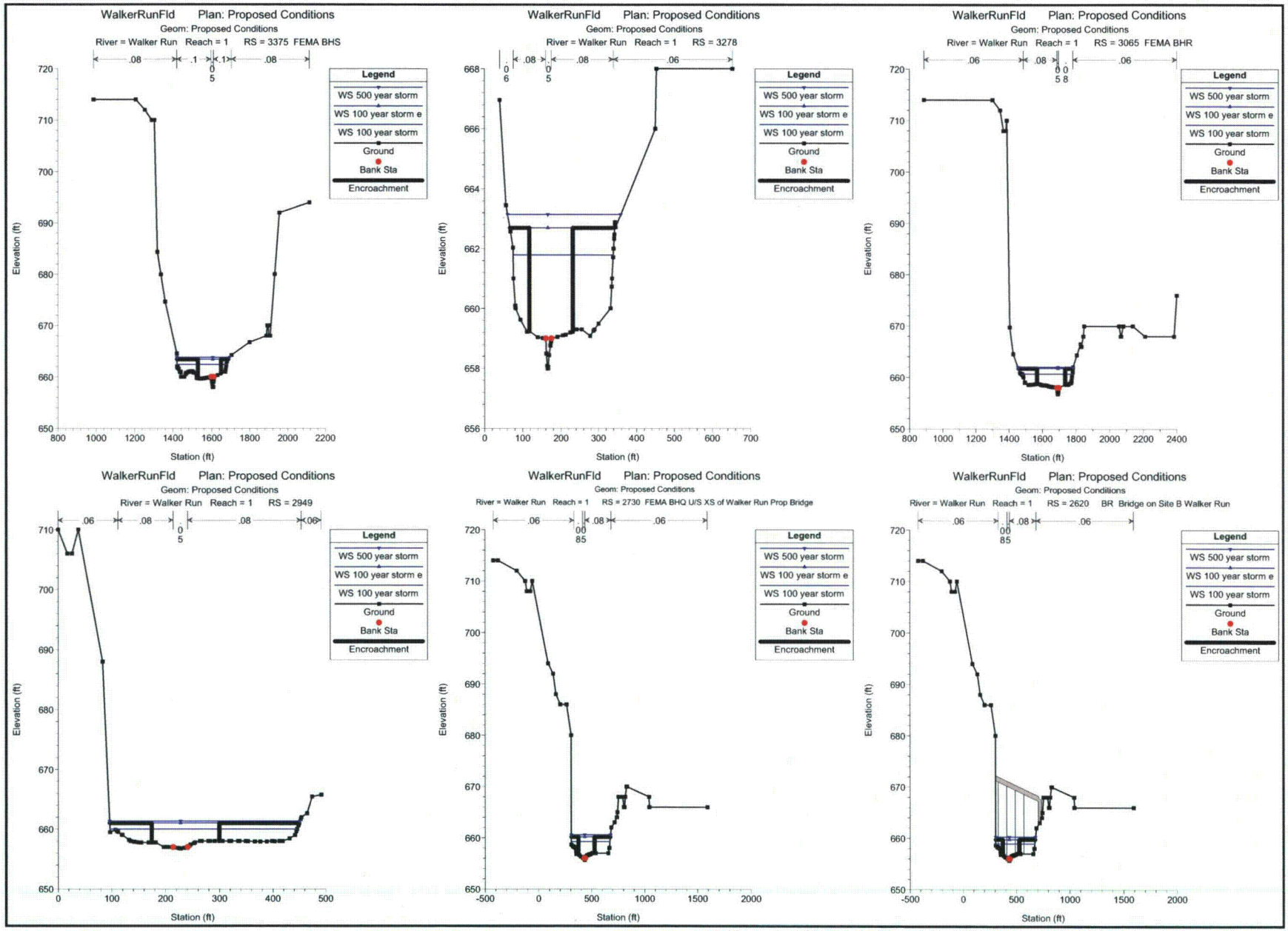

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 1105
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 810
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 587
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 463
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 357
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Tributary Reach = 1 RS = 183
.08
0
8
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)

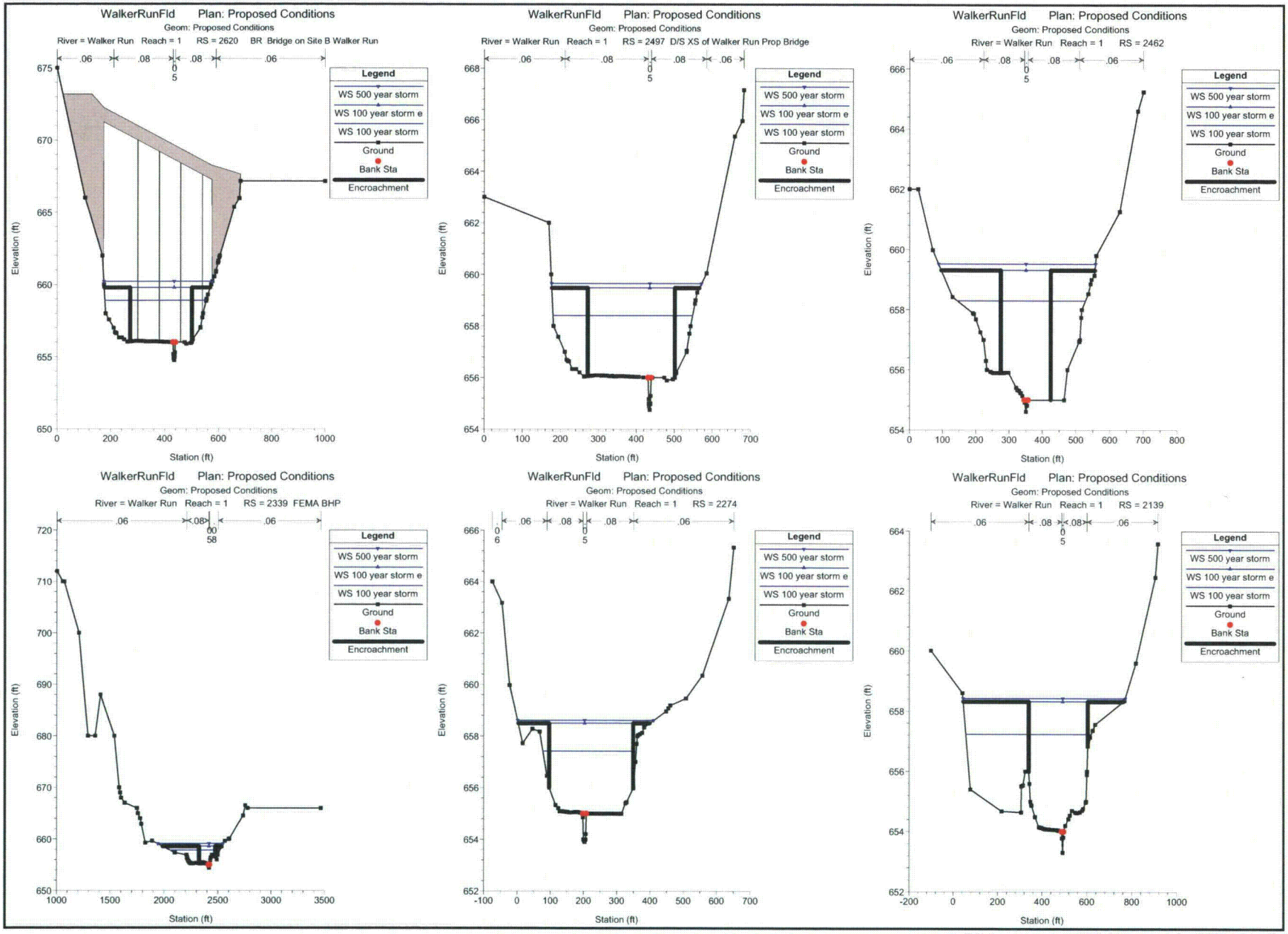

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 5862
River = Walker Run Reach = 1 RS = 5547
River = Walker Run Reach = 1 RS = 5282 u/s XS of Beach Grove Road Bridge
River = Walker Run Reach = 1 RS = 5250 BR Beach Grove Road
River = Walker Run Reach = 1 RS = 5198 FEMA BIA d/s XS of Beach Grove Road Bridge
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

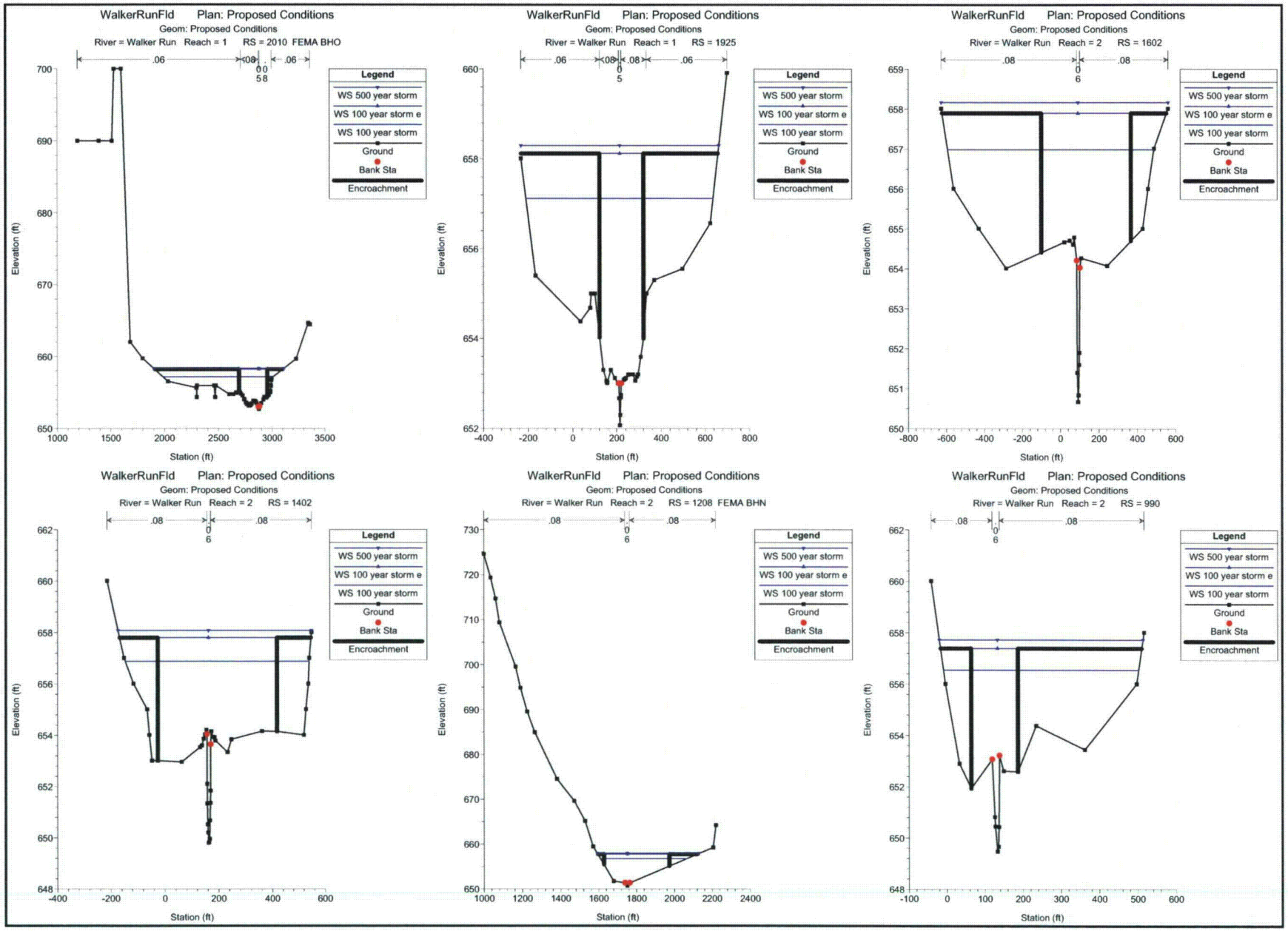

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 5107
River = Walker Run Reach = 1 RS = 4995 FEMA BHZ
River = Walker Run Reach = 1 RS = 4810
River = Walker Run Reach = 1 RS = 4735 FEMA BHY
River = Walker Run Reach = 1 RS = 4692
River = Walker Run Reach = 1 RS = 4495 FEMA BHX
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

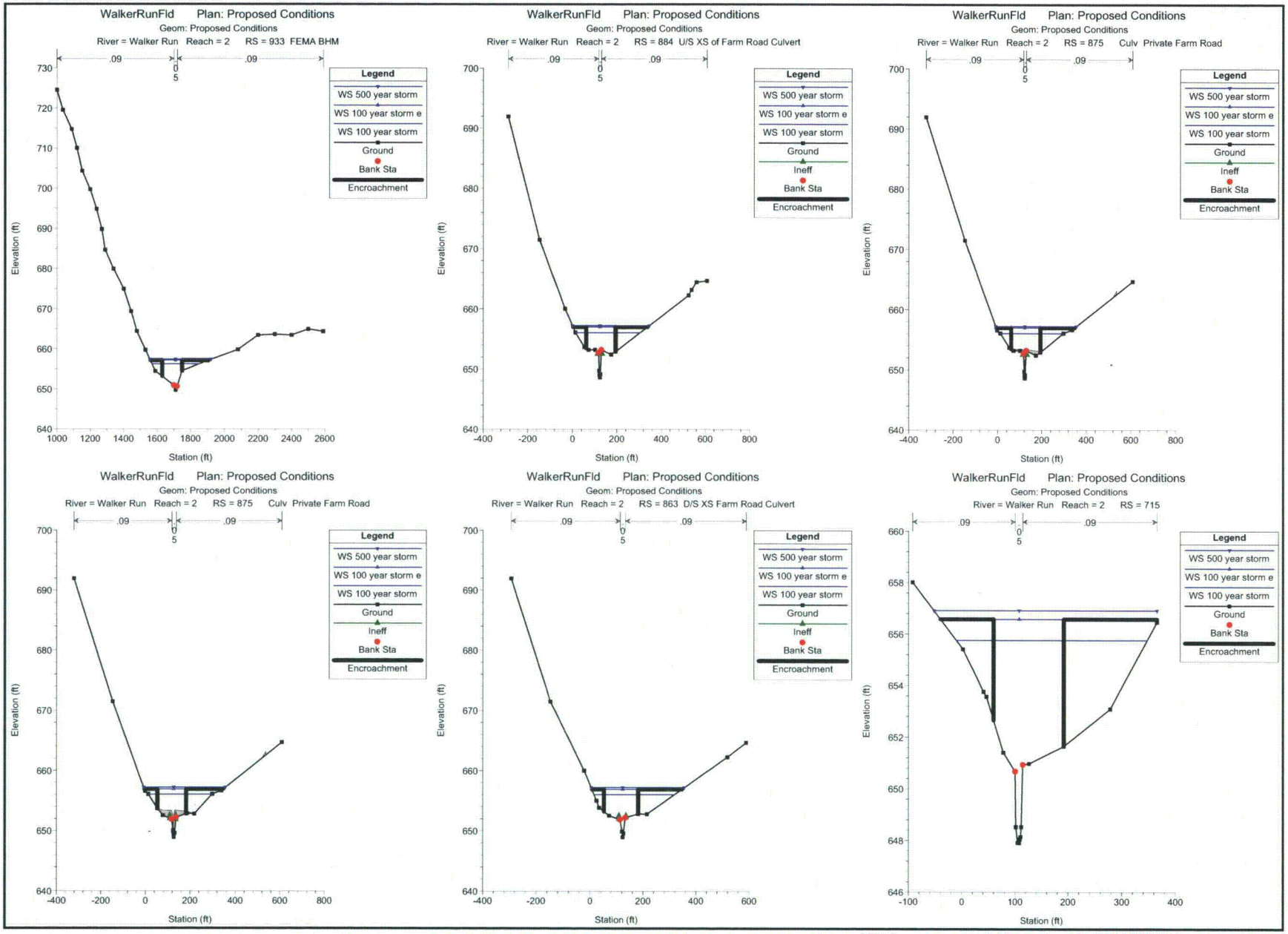

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 4414
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 4295 FEMA BHW
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 4130
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 4043 FEMA BHV
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3972 U/S XS of Market Street Bridge
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3914 BR Market Street u/s
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

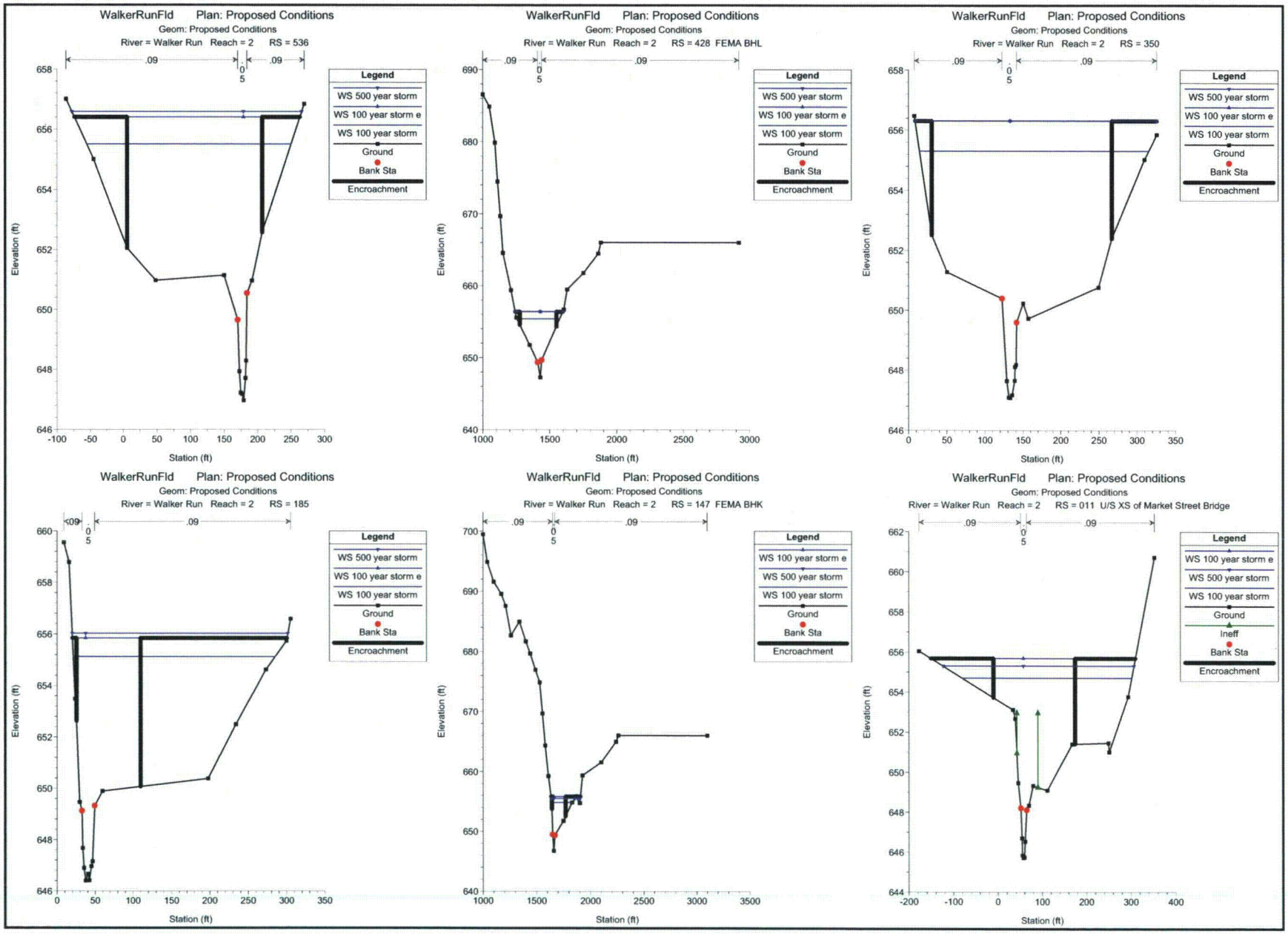

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3914 BR Market Street u/s
.1 .1 .06
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3860 D/S XS of Market Street Bridge
.1 .12 .06 .04
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3785 FEMA BHU
.1 .04
Legend
WS 100 year storm e
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3735
.1 .12 .04
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3532 FEMA BHT
.08 .1 .08
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3410
.08 .1 .1 .08
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

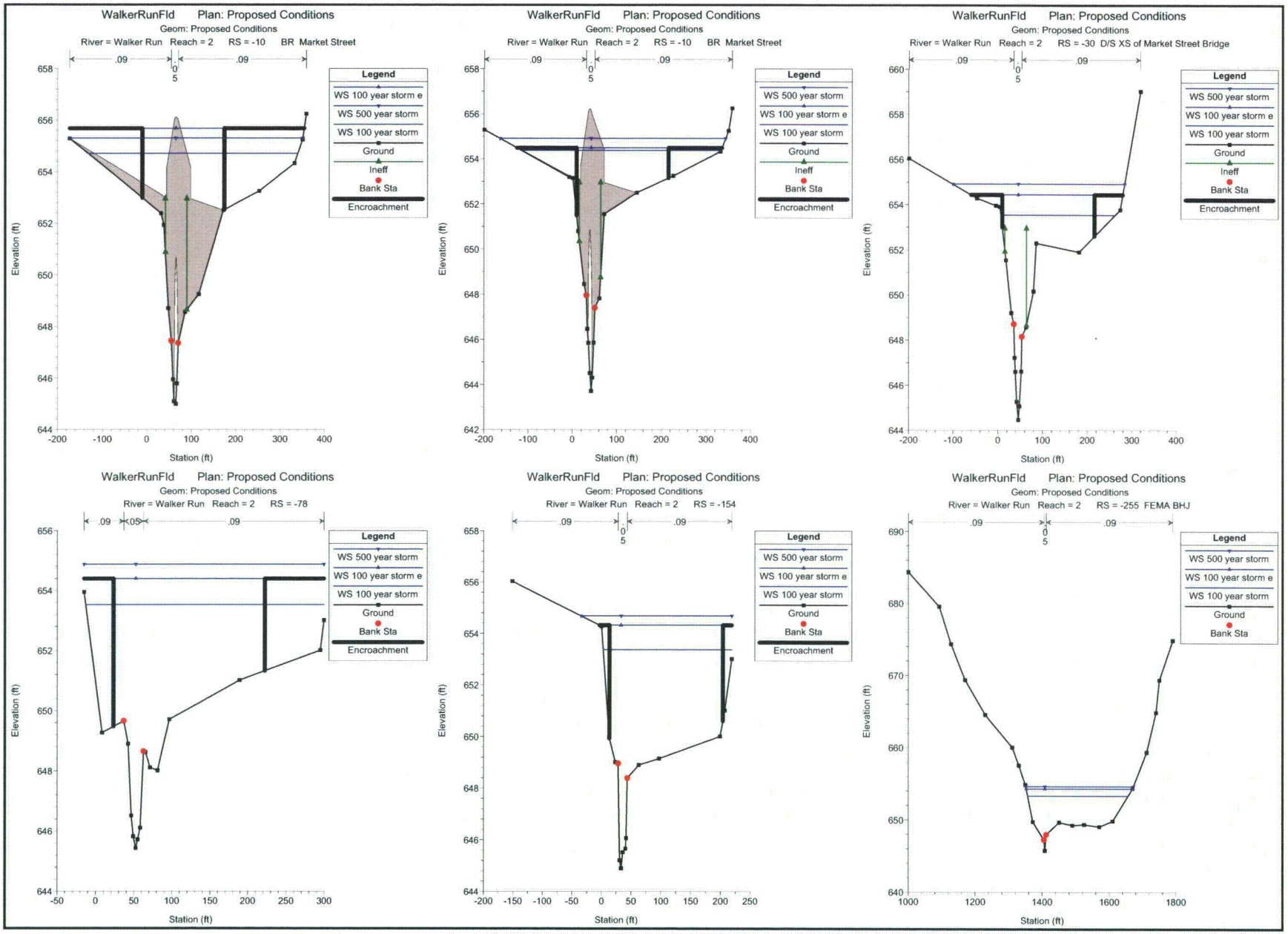

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3375 FEMA BHS
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3278
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 3065 FEMA BHR
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2949
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2730 FEMA BHQ U/S XS of Walker Run Prop Bridge
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2620 BR Bridge on Site B Walker Run
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

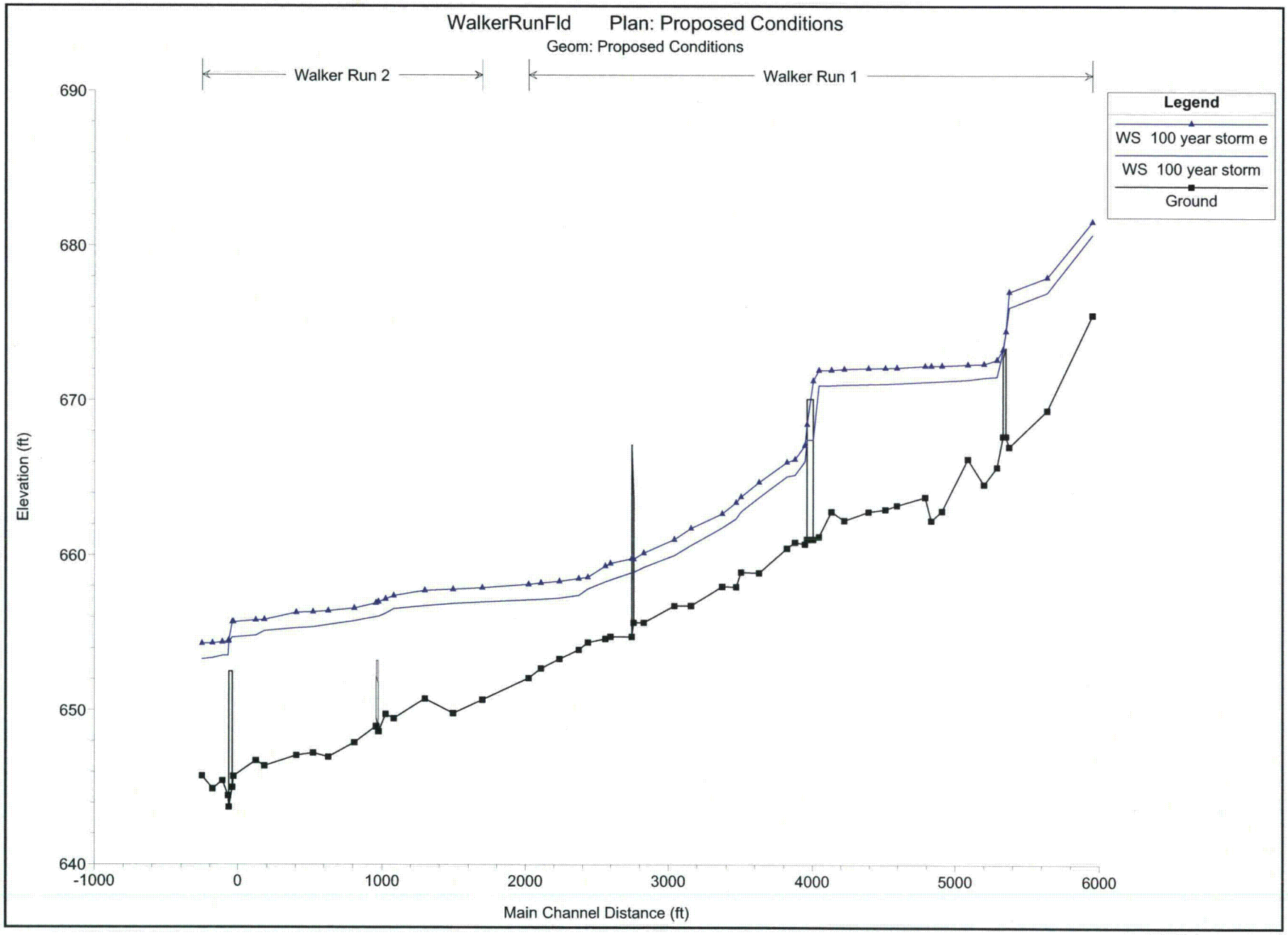

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2620 BR Bridge on Site B Walker Run
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2497 D/S XS of Walker Run Prop Bridge
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2462
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2339 FEMA BHP
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2274
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2139
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

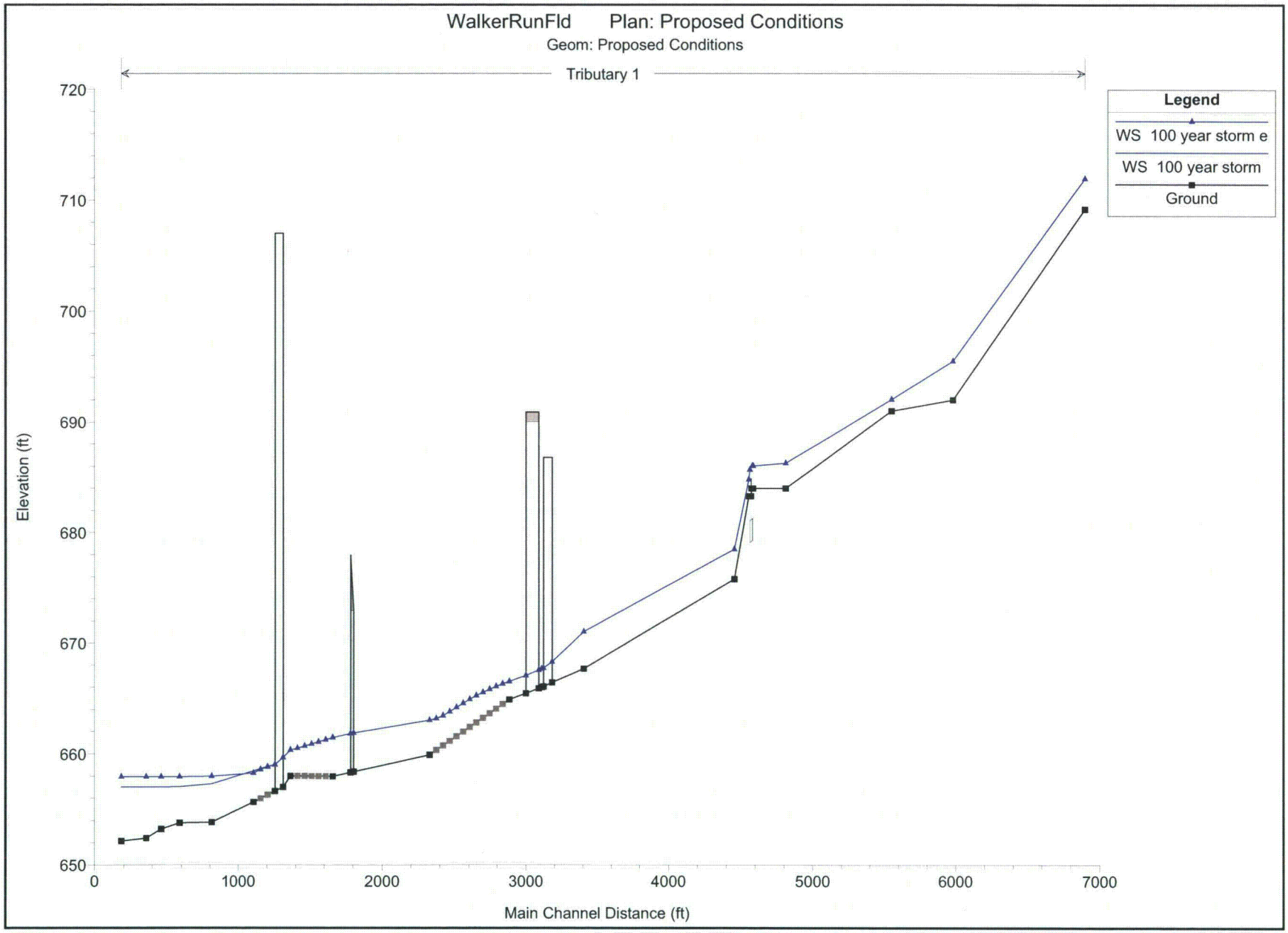

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 1 RS = 2010 FEMA BHO
River = Walker Run Reach = 1 RS = 1925
River = Walker Run Reach = 2 RS = 1602
River = Walker Run Reach = 2 RS = 1402
River = Walker Run Reach = 2 RS = 1208 FEMA BHN
River = Walker Run Reach = 2 RS = 990
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

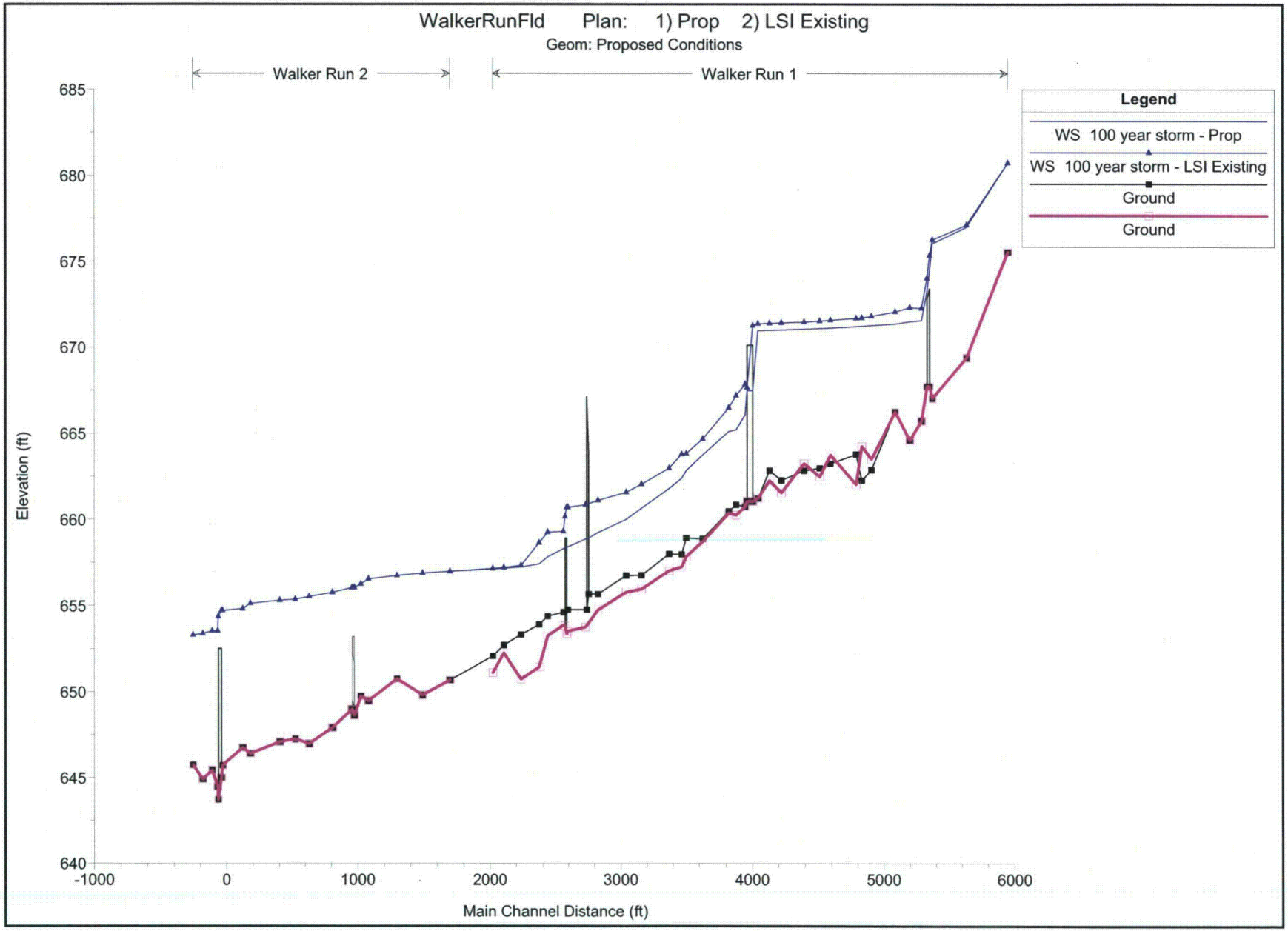

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 933 FEMA BHM
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 884 U/S XS of Farm Road Culvert
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 875 Culv Private Farm Road
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 875 Culv Private Farm Road
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 863 D/S XS Farm Road Culvert
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 715
.09
0
5
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

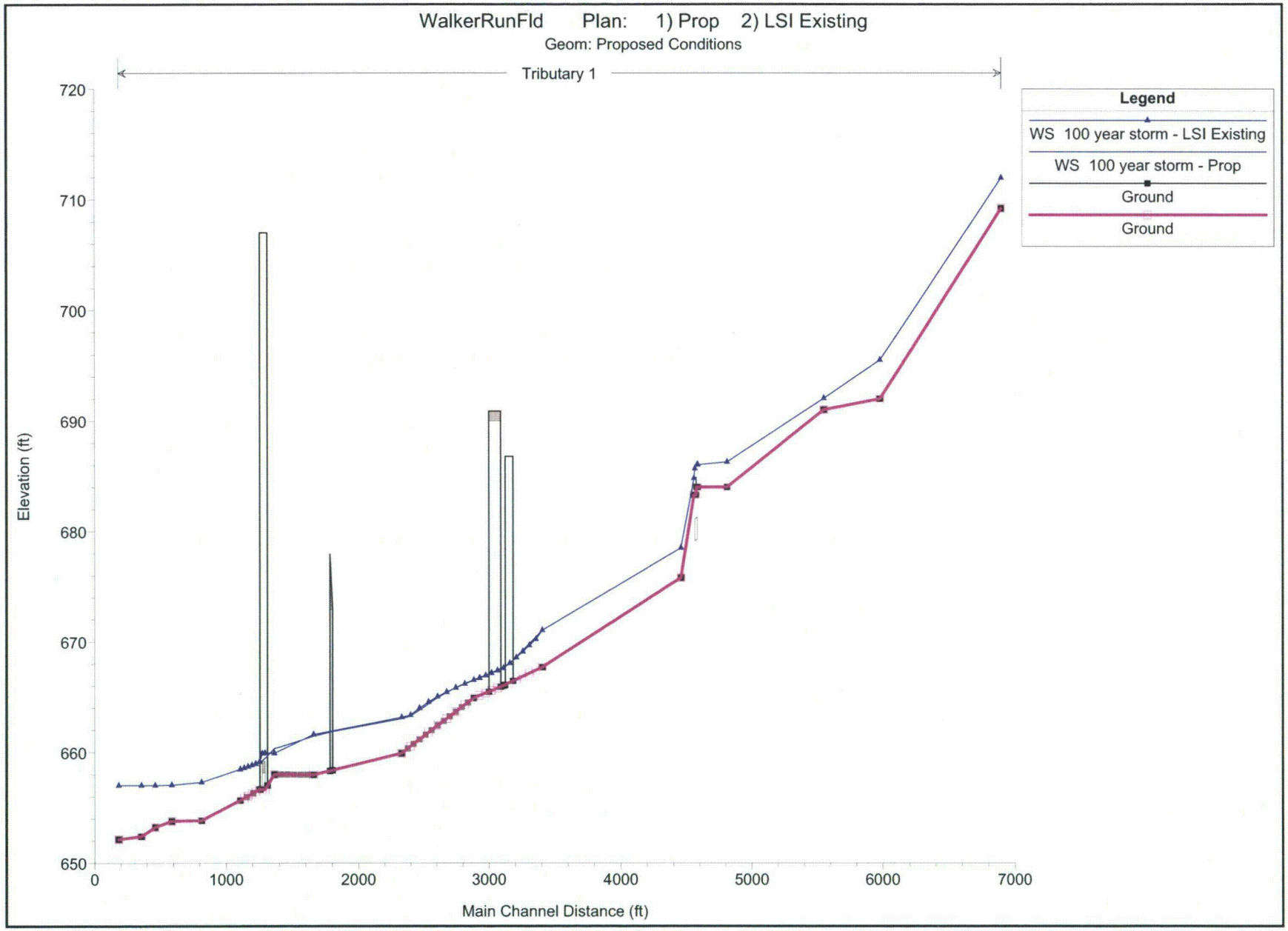

WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 536
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 428 FEMA BHL
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 350
.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 185
<.09
.09
0
5
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 147 FEMA BHK
.09
.09
0
5
Legend
WS 100 year storm e
WS 500 year storm
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = 011 U/S XS of Market Street Bridge
.09
.09
0
5
Legend
WS 100 year storm e
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = -10 BR Market Street
.09 .09
Legend
WS 100 year storm e
WS 500 year storm
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = -10 BR Market Street
.09 .09
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = -30 D/S XS of Market Street Bridge
.09 .09
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = -78
.09 .05 .09
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = -154
.09 .09
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
River = Walker Run Reach = 2 RS = -255 FEMA BHJ
.09 .09
Legend
WS 500 year storm
WS 100 year storm e
WS 100 year storm
Ground
Bank Sta
Elevation (ft)
Station (ft)


WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
Walker Run 2
Walker Run 1
Legend
WS 100 year storm e
WS 100 year storm
Ground
Elevation (ft)
690
680
670
660
650
640
-1000
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)


WalkerRunFld Plan: Proposed Conditions
Geom: Proposed Conditions
Tributary 1
Legend
WS 100 year storm e
WS 100 year storm
Ground
Elevation (ft)
720
710
700
690
680
670
660
650
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)


WalkerRunFld Plan: 1) Prop 2) LSI Existing
Geom: Proposed Conditions
Walker Run 2
Walker Run 1
Legend
WS 100 year storm - Prop
WS 100 year storm - LSI Existing
Ground
Ground
Elevation (ft)
685
680
675
670
665
660
655
650
645
640
-1000
0
1000
2000
3000
4000
5000
6000
Main Channel Distance (ft)


WalkerRunFld Plan: 1) Prop 2) LSI Existing
Geom: Proposed Conditions
Tributary 1
Legend
WS 100 year storm - LSI Existing
WS 100 year storm - Prop
Ground
Ground
Elevation (ft)
720
710
700
690
680
670
660
650
0
1000
2000
3000
4000
5000
6000
7000
Main Channel Distance (ft)

Appendix G:
Manning's Roughness Coefficient Conditions

Walker Run Existing Conditions Manning's "n" Values

Bell Bend Nuclear Power Plant
Salem Township, Luzerne County, PA
December 2010

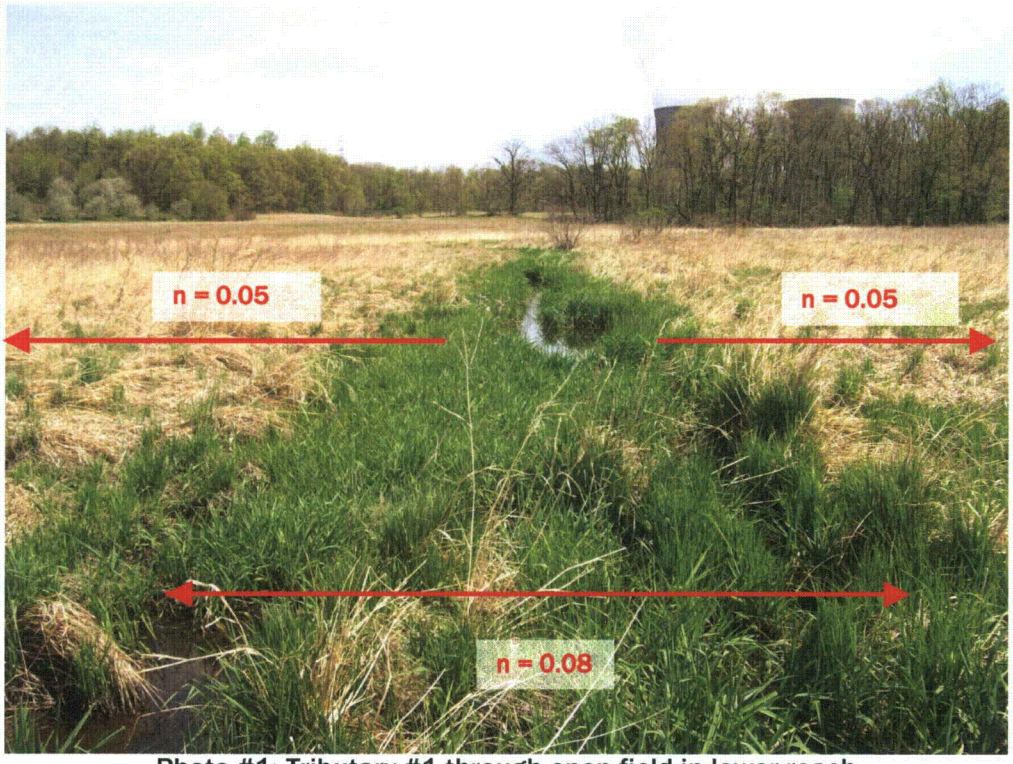


Photo #1: Tributary #1 through open field in lower reach

Photo #2: Tributary #1 through woods in upper reach

Appendix H:
Hydrology Data

Walker Run Flood Study Report
Bell Bend Nuclear Power Plant
Salem Township, Luzerne County, PA
Flow Study Comparison

Land Studies

Method	Combined Q_{100} (ft^3/s)	Tributary Q_{100} (ft^3/s)	Walker Run Q_{100} (ft^3/s)
FEMA	1860.0	—	1640.0
Hydraflow 1 (Rizzo data, Tc =IL regression)	2953.4	940.0	2259.2
Hydraflow 2 (Rizzo data, Tc =SCS Lagtime)	1392.9	538.2	1091.2
Hydraflow 3 (LSI data, Tc measured)	1877.2	303.5	1628.3
USGS Regression 1 (Rizzo data)	1088.9	361.4	909.0
USGS Regression 2 (LSI data)	1065.4	—	—

Hydraflow 1: (Rizzo Data, Tc = IL regression) (from Paul C. Rizzo Associates, Inc.'s BBNPP - Walker Run - Evaluation of Probable Maximum Flood Event)

(Tc computed from Clark Unit Hydrograph equation: $Tc = 1.54L^{0.875}S^{-0.181}$)

	Description	DA (mi^2)	DA (ac)	Tc (min)	L (ft)	S (ft/ft)	CN	Q_{100} (ft^3/s)
Subarea 2	Walker Run watershed	2.433	1557.12	124.8	17,900	0.013	76	**2259.22**
Subarea 3	Tributary watershed	0.685	438.4	72.6	10,950	0.025	76	**939.99**

Combined Q_{100}: **2953.35** ft^3/s

Hydraflow 2: (Rizzo Data, Tc = SCS Lagtime) (from Paul C. Rizzo Associates, Inc.'s BBNPP - Walker Run - Evaluation of Probable Maximum Flood Event)

(Tc computed from SCS Lag Formula: $Tc = 0.00526L^{0.8}(1000/CN-9)^{0.7}S^{-0.5}$

	Description	DA (mi^2)	DA (ac)	Tc (min)	L (mi)	S (ft/ft)	CN	Q_{100} (ft^3/s)
Subarea 2	Walker Run watershed	2.433	1557.12	316.6	17,900	0.013	76	**1091.18**
Subarea 3	Tributary watershed	0.685	438.4	154.1	10,950	0.025	76	**538.16**

Combined Q_{100}: **1392.9** ft^3/s

Hydraflow 3: (LSI Data, Tc = Measured)

(Tc and land use computations on following page)

	Description	DA (mi^2)	DA (ac)	Tc (min)	L (ft)	S (ft/ft)	CN	Q_{100} (ft^3/s)
Subarea 2	Walker Run watershed	2.433	1557.12	128.6	n/a	n/a	66	**1628.3**
Subarea 3	Tributary watershed	0.685	438.4	166.4	n/a	n/a	61	**303.5**

Combined Q_{100}: **1877.2** ft^3/s

Hydraflow 3 (LSI data, Tc Measured): Tc and Land Use Computations

Time of concentration

Tributary
Tc = 166.4 min

Sheet Flow	Shallow Concentrated Flow	Channel
L = 300 feet	L = 4,100 feet	L = 6,600 feet
S = 2.5 %	S = 7.3 %	S = 0.7 %
n = 0.24	unpaved	n = 0.08
		A = 70 ft^2
		P = 150 ft

Walker Run
Tc = 128.6 min

Sheet Flow	Shallow Concentrated Flow	Channel
L = 300 feet	L = 7,000 feet	L = 10,000 feet
S = 0.8 %	S = 4.5 %	S = 1.4 %
n = 0.24	unpaved	n = 0.05
		A = 100 ft^2
		P = 80 ft

Land Use

	Tributary	Walker Run
DA	438.4 ac	1557.1 ac
Woods	50% (219.2 ac)	60 % (934.3 ac)
Meadow	50% (219.2 ac)	40% (622.8 ac)
A Soils	20%	10%
B/D Soils	10%	–
C Soils	70%	90%
Woods		
A Soils	43.84 ac	93.43 ac
B Soils	21.92 ac	–
C Soils	153.44 ac	840.87 ac
Meadow		
A Soils	43.84 ac	62.28 ac
B Soils	21.92 ac	–
C Soils	153.44 ac	560.52 ac

USGS Regression 1: Rizzo Data (from Paul C. Rizzo Associates, Inc.'s BBNPP - Walker Run - Evaluation of Probable Maximum Flood Event)

Regression Equation: $Q_{100} = 925.8DA^{0.7278}(1+0.01F)^{-1.1342}(1+0.01U)^{0.4040}(1+0.01C)^{-1.2691}(1+0.01CA)^{-0.4637}$

	Description	DA (mi^2)	F (% cover forest)	U (% cover urban)	C (% carbonate)	CA (% cover wetlands)	Q_{100} (ft^3/s)
Subarea 2	Walker Run watershed	2.43	50	0	10	20	**909.0**
Subarea 3	Tributary watershed	0.685	50	0	10	20	**361.4**
Combined	Total	3.118	50	0	10	20	**1088.9**

USGS Regression 2: LSI Data

Regression Equation: $Q_{100} = 925.8DA^{0.7278}(1+0.01F)^{-1.1342}(1+0.01U)^{0.4040}(1+0.01C)^{-1.2691}(1+0.01CA)^{-0.4637}$

	Description	DA (mi^2)	F (% cover forest)	U (% cover urban)	C (% carbonate)	CA (% cover wetlands)	Q_{100} (ft^3/s)
Combined	Total	2.87	50	10	10	20	**1065.4**

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2008 by Autodesk, Inc. v6.052

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	2259.22	2	788	24,954,640	------	------	------	SA 2 (Walker)
2	SCS Runoff	939.99	2	758	7,041,988	------	------	------	SA 3 (Trib)
3	Combine	2953.35	2	784	31,996,620	1, 2	------	------	Sub-basins 2+3
5	SCS Runoff	1091.18	2	904	24,903,670	------	------	------	SA2 SCS Lag Tc
6	SCS Runoff	538.16	2	806	7,021,232	------	------	------	SA3 SCS Lag Tc
7	Combine	1392.90	2	896	31,924,910	5, 6	------	------	Lag Tc 2+3
9	SCS Runoff	1628.30	2	792	18,763,540	------	------	------	SA 2 (Walker) Tc-TR55
10	SCS Runoff	303.47	2	816	4,473,283	------	------	------	SA 3 (Trib) Tc- TR55
11	Combine	1877.17	2	794	23,236,800	9, 10	------	------	TR-55 2+3

F-1 1a

PAUL C. RIZZO ASSOCIATES, INC.
CONSULTANTS

By PJM Date 3/11/08 Subject BBNPP - Walker Run - Evaluation of Probable Maximum Flood Event Sheet No. 1 of 6
Chkd.By DW Date 3/31/08 Project No. 07-3891
Chkd.By FAM Date 03-31-08

PJM = Paul J Martinchich
FAM = Fehmida Mesania Fehmida Mesania
DJW = David Wallner (DW)

Purpose:

Estimate the Probable Maximum Flood (PMF) event for Walker Run, which flows adjacent to the BBNPP Site near Berwick, PA. This calculation evaluates and quantifies the flow in Walker Run due to runoff from the Probable Maximum Precipitation (PMP), or Storm (PMS), event.

The resultant stream levels in Walker Run are evaluated in a separate calculation.

References:

Clark, C.O., 1945, "Storage and the Unit Hydrograph," Transactions: American Society of Civil Engineers, Vol. 110, p. 1419-1488.

DJW, 3/07/08, "Probable Maximum Storm Event for Walker Run Watershed," Project No. 07-3891, RIZZO Calculation.

Mesania, Fehmida, 2008, "Verification & Validation for HEC-HMS 3.1.0," RIZZO, Project No. 08-9006.

Mesania, Fehmida, 2008, "Verification & Validation for HMR-52," RIZZO, Project No. 08-9006.

Hydrologic Engineering Center (HEC), USACE Water Resources Support Center, June 1978, "Hydrometeorological Report No. 51 (HMR-51): Probable Maximum Precipitation Estimates, United States East of the 105th Meridian."

Hydrologic Engineering Center, USACE Water Resources Support Center, April 1987, "Hydrometeorological Report No. 52 (HMR52): Probable Maximum Storm Computation (Eastern U.S.)."

Hydrologic Engineering Center (HEC), USACE Water Resources Support Center, December 2006, "HEC Hydrologic Modeling System (HEC-HMS), Version 3.1.0, Build 1206".

JDP, 3/05/08, "BBNPP, Walker Run - HEC-RAS Analysis," Project No. 07-3891, RIZZO Calculation.

4. Basin Losses

The HEC-HMS program is used to perform the runoff analyses. The SCS Curve Number Method will be used as the Basin Loss Method. The SCS method requires the input parameters, Curve Number (CN), Time of Concentration (T_c), Basin Lag Time (T_p), Basin Area (A_b), and Initial Abstraction (I_a).

CN: For the overall watershed, CN = 76 was selected based on SCS published values for Soil Type C and Grass/Woods mixture (see ***Sheet B5***).

Use CN = 76

I_a: From TR-55, Equation 2-4 (S = 1000/CN-10) and Equation 2-2 (I_a = 0.2S), for CN = 76, I_a is estimated to be 0.6316 inches.

Use I_a = 0.6316

5. Basin Transform

The Clark (1945) Method as presented by Straub, et.al. (2000) will be used as the Transform Method. The Clark method requires the input parameters:

L = Watercourse Length along stream to watershed Boundary (miles)
S = Watercourse Slope from 10% to 85% of stream length (ft/mile)

which in turn are used to calculate:
T_c = Time of Concentration (hours) and
R = Storage Coefficient (hours).

These parameters are shown on ***Table C-1*** on ***Sheet C-2***.

6. PMS Rainfall Hyetograph

The PMS Rainfall Hyetograph was developed in a separate calculation by RIZZO (DJW, 3/07/08). The rainfall hyetograph is included in ***Attachment E***.

By PJM Date 3/11/08
Chkd. By DW Date 3/31/08

Sheet No. C2 of 7

TABLE C-1
Calculation of Clark Parameters for Subbasin Areas

Sub-Basin	A (sq. mi.)	L (ft)	L (mi)	$L_{10\%}$ (ft)	$L_{85\%}$ (ft)	$El._{10\%}$ (ft)	$El._{85\%}$ (ft)	S (ft/mi)	S (ft/ft)	T_c (hr)	R (hr)	$R/(T_c+R)$ (dim)
SB-A1	0.979	13,200	2.500	1320	11,220	535	758	89.2	0.017	1.52	0.65	0.30
SB-A2	2.433	17,900	3.390	1790	15,215	658	893	69.3	0.013	2.08	0.87	0.30
SB-A3	0.685	10,950	2.074	1095	9,308	653	922	129.7	0.025	1.21	0.45	0.27
											AVG:	**0.29**
											STDEV:	**0.01**

Date

Chkd. By Date 3/31/08

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Sheet No. C3 of 7

In cooperation with the Illinois Department of Natural Resources, Office of Water Resources

Equations for Estimating Clark Unit-Hydrograph Parameters for Small Rural Watersheds in Illinois

By Timothy D. Straub, Charles S. Melching, and Kyle E. Kocher

Water-Resources Investigations Report 00–4184

Urbana, Illinois
2000

By PSM Date 3/11/08
Chkd. By AW Date 3/31/08

Sheet No. C6 of 7

Equation Development

For small rural watersheds in Illinois, three methods were used to develop new equations for estimating T_C and R. Similar to the Graf and others (1982b) study, a multiple-linear regression analysis was used to determine mathematical relations among watershed characteristics and (T_C+R), and an attempt was made to determine regional values of $R/(T_C+R)$. The second method involved using multiple-linear regression analysis to determine mathematical relations among watershed characteristics and average values of T_C and R for each watershed. No storm characteristics or seasonal effects were analyzed in the second method. The third method involved using multiple-linear regression analysis to determine mathematical relations among watershed, storm, and seasonal characteristics and values of T_C and R for each storm. Overall, the second method yielded the best equations, as described in the following sections.

Results Based on Methods Similar to the Graf and others (1982b) Study

In the first method, equations for estimating (T_C+R) were developed utilizing multiple-linear regression to relate the logarithm of the average (T_C+R) for each watershed to logarithms of watershed area and main-channel length and slope. The multiple-linear regression of logarithms resulted in an estimation equation

$$h_{pi} = aW_1^{b1}\ W_2^{b2}\ , \qquad (8)$$

where

h_{pi} is hydrograph parameter i [in this case (T_C+R)],
W_j are watershed characteristics j,
bj are exponents corresponding to watershed characteristics j, and
a is a coefficient.

Watershed characteristics were added one at a time to the regression model (eq. 8), and characteristics were retained in the regression model only if the corresponding exponents were statistically significant (the corresponding 95-percent confidence interval for the parameter did not include zero) and the sign of the exponent was correct from a physical viewpoint. For example, hydrograph-timing parameters should increase with increasing area and main-channel length and decrease with increasing main-channel slope. From the regression, an equation involving the length and slope was determined to yield the highest coefficient of determination (R^2=0.74).

Next, the average $[R/(T_C+R)]$ values for each watershed were plotted on a map of the State of Illinois. Contours were drawn to try to determine regional trends in the values, but all such attempts were unsuccessful. Before abandoning the method similar to that used by Graf and others (1982b) because of the inability to find regional trends in average $[R/(T_C+R)]$, the logarithm of these values were regressed against watershed characteristics similar to the previous regression, using values of average (T_C+R). All combinations of the regression yielded very poor coefficient of determination (R^2) values (highest equaling 0.38). With no reliable method of determining $[R/(T_C+R)]$, this method was abandoned.

Interestingly, the coefficient and exponents for the Graf and others (1982b) equation for (T_C+R) were not within the 95-percent confidence intervals when compared to the equation developed for (T_C+R) for this study, except for a slight overlap in the length exponent. The upper and lower confidence bounds for the length exponent were 0.650 and 0.339, respectively, for the (T_C+R) equation developed in this study.

Results Based on Average Values of T_C and R for Each Watershed

The second method, determined to be the overall best method in this study, utilized multiple-linear regression analysis to relate the logarithms of the average T_C and average R for each watershed to logarithms of watershed area and main-channel length and slope. Equations for the T_C and R estimations (in hours) that yield the highest R^2 values included main-channel length and slope and are

Equations Used

$$T_C = 1.54\ L^{0.875}\ S^{-0.181} \text{ and} \qquad (9)$$

$$R = 16.4\ L^{0.342}\ S^{-0.790}, \qquad (10)$$

where

L is the stream length measured along the main channel from the watershed outlet to the watershed divide, in mi, and (mi)
S is the main-channel slope determined from elevations at points that represent 10 and 85 percent of the distance along the channel (ft/mi)

U.S. Department of the Interior
U.S. Geological Survey

TECHNIQUES FOR ESTIMATING MAGNITUDE AND FREQUENCY OF PEAK FLOWS FOR PENNSYLVANIA STREAMS

by Marla H. Stuckey and Lloyd A. Reed

Water-Resources Investigations Report 00-4189

prepared in cooperation with

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION

Lemoyne, Pennsylvania
2000

U.S. DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

Charles G. Groat, Director

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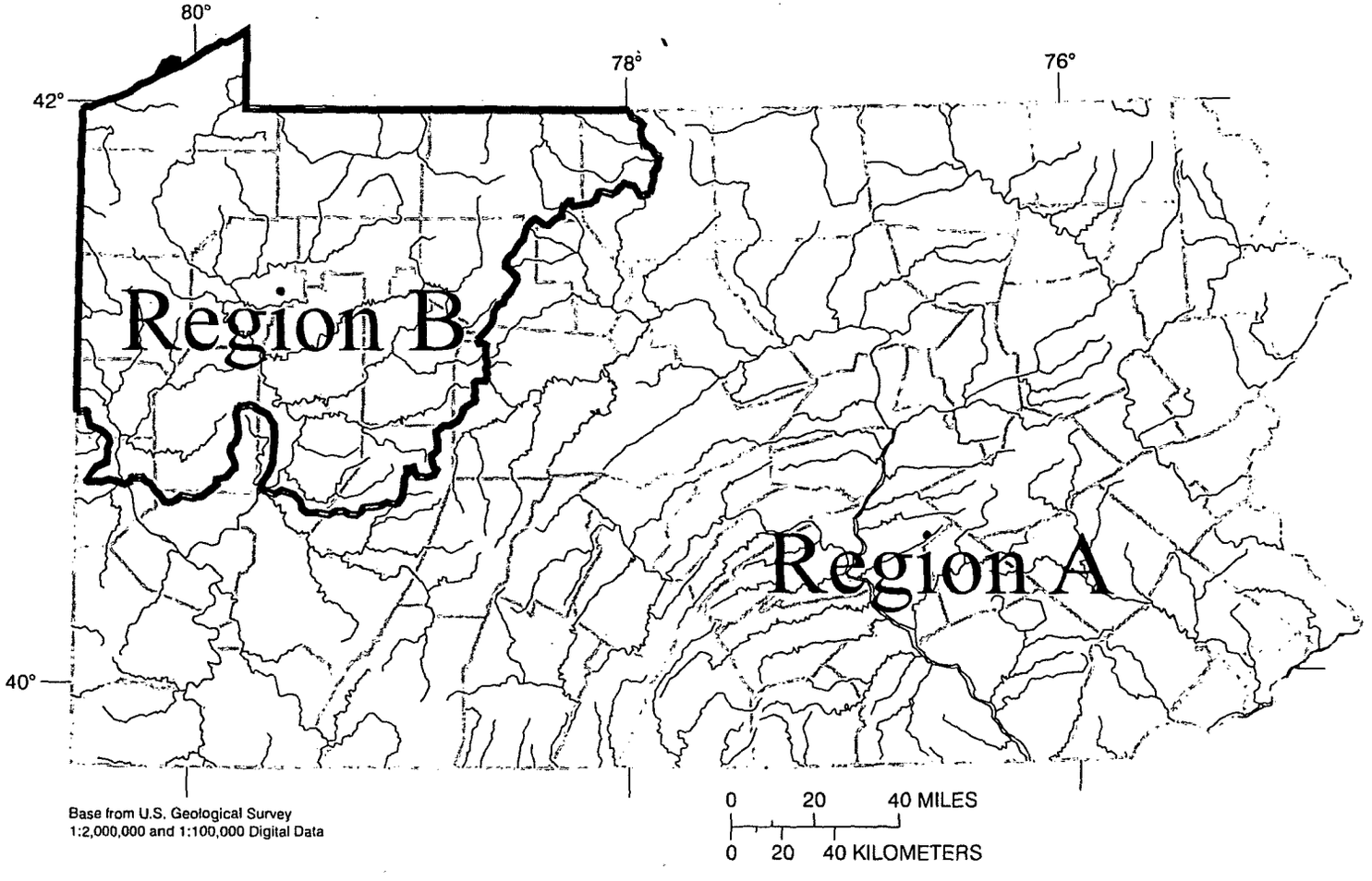


Figure 3. Flood-frequency regions in Pennsylvania.

Table 1. *Regression coefficients for use with regression equations for peak flows on Pennsylvania streams*

[Q_T, discharge for the T-year flood; ft^3/s, cubic feet per second; Q_{10}, 10-year flood flow; Q_{25}, 25-year flood flow; Q_{50}, 50-year flood flow; Q_{100}, 100-year flood flow; Q_{500}, 500-year flood flow; ---, basin characteristic coefficient not used in regression equation]

Q_T return flow (ft^3/s)	Basin characteristic coefficients						Residual standard error		Coefficient of determination (R^2)
	Intercept (A)	Drainage area (b)	Percentage forested area (c)	Percentage urban development (d)	Percentage carbonate area (e)	Percentage controlled area (f)	Log units	Percent	
Region A									
Q_{10}	2.5243	0.7770	-0.9712	1.0217	-1.7184	-0.5719	0.18	43	0.93
Q_{25}	2.7145	.7556	-1.0324	.7608	-1.5302	-.5302	.19	45	.91
Q_{50}	2.8441	.7414	-1.0821	.5785	-1.3955	-.4980	.21	50	.89
Q_{100}	2.9665	.7278	-1.1342	.4040	-1.2691	-.4637	.23	55	.87
Q_{500}	3.2294	.6994	-1.2666	.0208	-.9877	-.3834	.27	66	.82
Region B									
Q_{10}	2.3105	.7255	---	---	---	-1.2425	.12	28	.96
Q_{25}	2.4418	.7108	---	---	---	-1.3700	.13	30	.95
Q_{50}	2.5276	.7017	---	---	---	-1.4695	.14	33	.94
Q_{100}	2.6069	.6932	---	---	---	-1.5677	.16	38	.92
Q_{500}	2.7673	.6776	---	---	---	-1.8055	.19	45	.89

OR

Region A

$$Q_{10} = 334.4\ DA^{.7770}\ (1 + .01F)^{-.9712}\ (1 + .01U)^{1.0217}\ (1 + .01C)^{-1.7184}\ (1 + .01CA)^{-.5719}$$

$$Q_{25} = 518.2\ DA^{.7556}\ (1 + .01F)^{-1.0324}\ (1 + .01U)^{.7608}\ (1 + .01C)^{-1.5302}\ (1 + .01CA)^{-.5302}$$

$$Q_{50} = 698.4\ DA^{.7414}\ (1 + .01F)^{-1.0821}\ (1 + .01U)^{.5785}\ (1 + .01C)^{-1.3955}\ (1 + .01CA)^{-.4980}$$

$$Q_{100} = 925.8\ DA^{.7278}\ (1 + .01F)^{-1.1342}\ (1 + .01U)^{.4040}\ (1 + .01C)^{-1.2691}\ (1 + .01CA)^{-.4637}$$

$$Q_{500} = 1{,}696\ DA^{.6994}\ (1 + .01F)^{-1.2666}\ (1 + .01U)^{.0208}\ (1 + .01C)^{-.9877}\ (1 + .01CA)^{-.3834}$$

Region B

$$Q_{10} = 204.4\ DA^{.7255}\ (1 + .01CA)^{-1.2425}$$

$$Q_{25} = 276.6\ DA^{.7108}\ (1 + .01CA)^{-1.3700}$$

$$Q_{50} = 337.0\ DA^{.7017}\ (1 + .01CA)^{-1.4695}$$

$$Q_{100} = 404.5\ DA^{.6932}\ (1 + .01CA)^{-1.5677}$$

$$Q_{500} = 585.2\ DA^{.6776}\ (1 + .01CA)^{-1.8055}$$

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

BERWICK, PENNSYLVANIA (36-0611) 41.0667 N 76.25 W 587 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 2, Version 3
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2004

Extracted: Fri May 22 2009

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Docs | Return to State Map

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.34	0.52	0.64	0.84	1.03	1.21	1.32	1.66	2.04	2.41	2.84	3.18	3.75	4.33	5.90	7.34	9.28	11.17
2	0.40	0.62	0.76	1.01	1.25	1.46	1.58	1.98	2.44	2.89	3.40	3.80	4.47	5.14	6.96	8.62	10.83	12.98
5	0.47	0.72	0.89	1.22	1.53	1.80	1.96	2.43	3.01	3.58	4.21	4.65	5.43	6.19	8.14	9.92	12.26	14.58
10	0.52	0.80	0.98	1.36	1.74	2.08	2.27	2.82	3.50	4.20	4.92	5.41	6.28	7.09	9.15	11.02	13.46	15.93
25	0.58	0.89	1.10	1.55	2.01	2.50	2.74	3.40	4.25	5.18	6.07	6.61	7.61	8.48	10.68	12.66	15.23	17.91
50	0.63	0.96	1.19	1.70	2.23	2.85	3.15	3.91	4.92	6.08	7.12	7.72	8.82	9.74	12.02	14.08	16.73	19.59
100	0.69	1.03	1.28	1.85	2.47	3.26	3.63	4.50	5.69	7.16	8.37	9.03	10.24	11.19	13.54	15.64	18.36	21.39
200	0.74	1.10	1.37	2.00	2.72	3.72	4.17	5.17	6.59	8.43	9.87	10.58	11.91	12.86	15.25	17.38	20.13	23.34
500	0.82	1.21	1.50	2.23	3.08	4.42	5.02	6.24	8.01	10.51	12.29	13.08	14.57	15.48	17.86	19.98	22.72	26.17
1000	0.88	1.28	1.61	2.41	3.38	5.05	5.77	7.19	9.29	12.45	14.55	15.39	17.01	17.84	20.14	22.21	24.90	28.53

* These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

*** Upper bound of the 90% confidence interval**
Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.37	0.58	0.71	0.94	1.15	1.35	1.48	1.87	2.31	2.69	3.23	3.59	4.23	4.83	6.45	7.99	10.04	11.99
2	0.44	0.69	0.84	1.13	1.38	1.63	1.78	2.24	2.76	3.23	3.88	4.28	5.05	5.74	7.60	9.36	11.71	13.94
5	0.52	0.81	0.99	1.35	1.70	2.01	2.20	2.74	3.40	4.00	4.79	5.24	6.12	6.90	8.87	10.77	13.25	15.65
10	0.57	0.89	1.09	1.51	1.93	2.33	2.54	3.17	3.94	4.67	5.59	6.08	7.06	7.89	9.96	11.96	14.55	17.10
25	0.65	0.99	1.22	1.72	2.23	2.79	3.07	3.82	4.77	5.73	6.86	7.38	8.52	9.41	11.60	13.71	16.45	19.21
50	0.70	1.07	1.32	1.89	2.48	3.19	3.54	4.39	5.52	6.70	8.02	8.59	9.85	10.77	13.02	15.22	18.07	20.97
100	0.76	1.15	1.42	2.06	2.75	3.65	4.07	5.05	6.39	7.85	9.40	10.01	11.41	12.34	14.63	16.89	19.81	22.88
200	0.82	1.23	1.53	2.23	3.03	4.17	4.69	5.83	7.41	9.21	11.03	11.69	13.22	14.14	16.46	18.76	21.70	24.98
500	0.92	1.35	1.68	2.49	3.45	4.98	5.67	7.06	9.05	11.42	13.69	14.39	16.11	17.00	19.23	21.55	24.45	28.03
1000	0.99	1.44	1.80	2.71	3.80	5.72	6.56	8.17	10.56	13.44	16.16	16.88	18.77	19.56	21.68	23.94	26.79	30.57

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.

Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

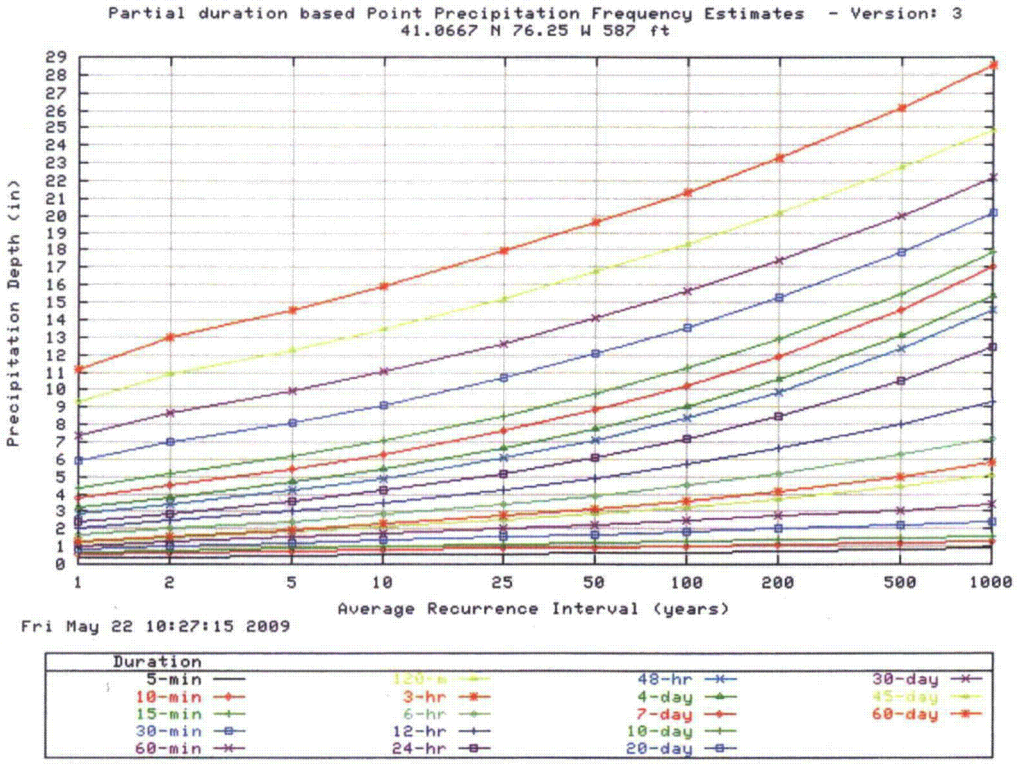
*** Lower bound of the 90% confidence interval**
Precipitation Frequency Estimates (inches)

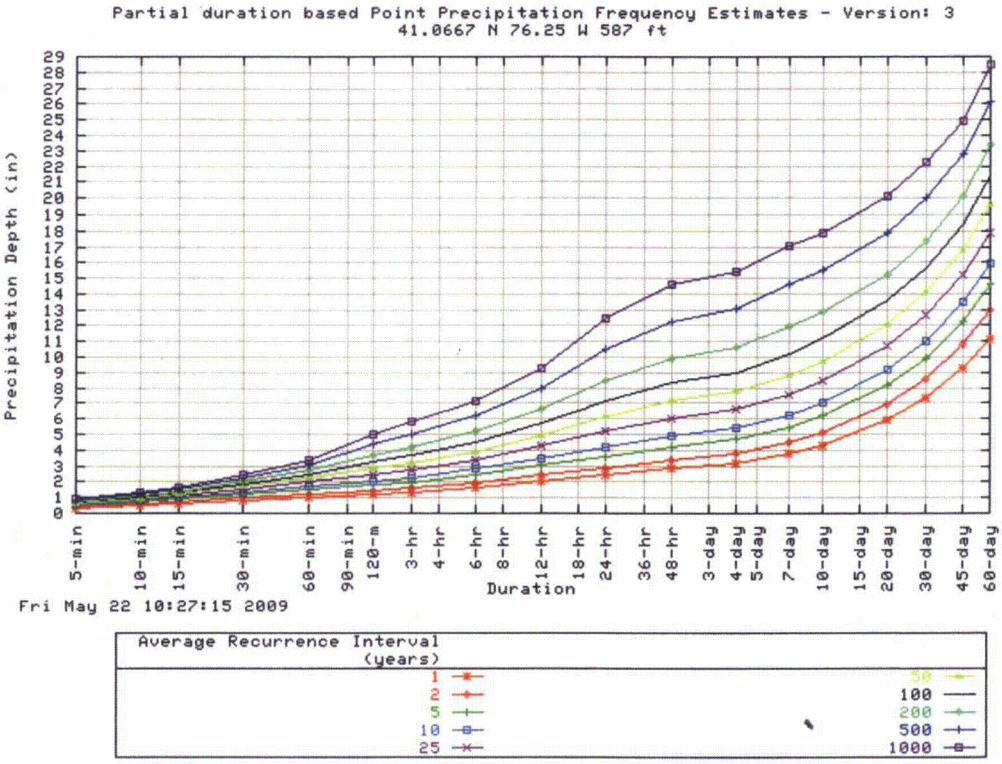
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.30	0.47	0.57	0.76	0.93	1.09	1.19	1.48	1.83	2.18	2.54	2.87	3.38	3.94	5.44	6.82	8.67	10.50
2	0.36	0.56	0.68	0.91	1.12	1.31	1.43	1.78	2.19	2.61	3.04	3.43	4.04	4.68	6.41	7.99	10.11	12.21
5	0.42	0.65	0.80	1.09	1.37	1.61	1.76	2.17	2.70	3.23	3.75	4.19	4.89	5.62	7.48	9.18	11.43	13.70
10	0.47	0.72	0.88	1.23	1.56	1.86	2.03	2.51	3.12	3.77	4.38	4.87	5.63	6.41	8.39	10.18	12.54	14.95
25	0.52	0.80	0.98	1.39	1.80	2.22	2.43	3.00	3.76	4.61	5.36	5.90	6.79	7.63	9.76	11.67	14.16	16.78
50	0.56	0.85	1.06	1.51	1.99	2.52	2.78	3.43	4.32	5.37	6.24	6.85	7.82	8.72	10.95	12.95	15.52	18.31
100	0.61	0.91	1.13	1.64	2.19	2.86	3.17	3.91	4.95	6.27	7.27	7.96	9.02	9.96	12.26	14.32	16.99	19.94
200	0.65	0.97	1.21	1.77	2.40	3.23	3.61	4.46	5.66	7.32	8.49	9.22	10.41	11.36	13.75	15.84	18.57	21.70
500	0.71	1.05	1.31	1.94	2.69	3.80	4.27	5.29	6.76	8.98	10.43	11.26	12.56	13.53	15.97	18.09	20.86	24.23
1000	0.76	1.11	1.39	2.08	2.92	4.28	4.84	6.01	7.73	10.48	12.18	13.10	14.51	15.46	17.89	19.98	22.75	26.30

* The **lower** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **less** than.

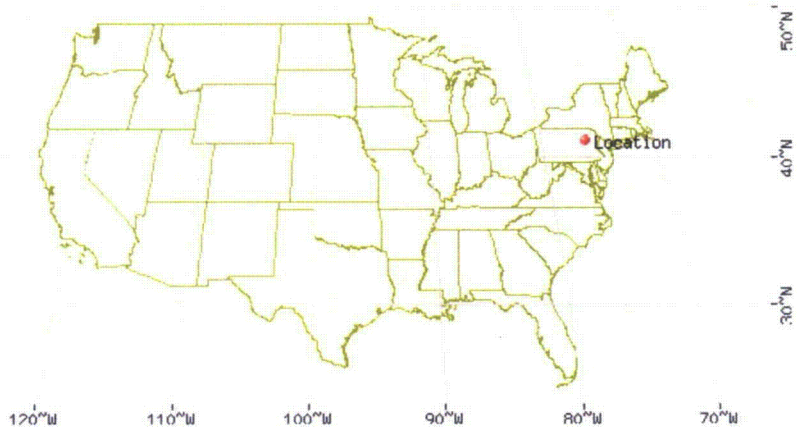
** These precipitation frequency estimates are based on a partial duration maxima series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

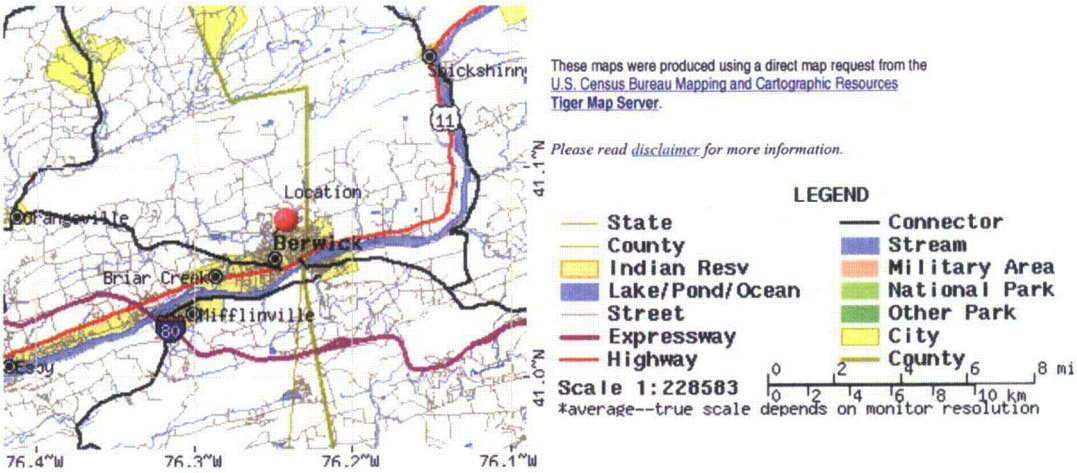
Text version of tables





Maps -





Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the USGS for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study, please refer to NOAA Atlas 14 Document.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (41.0667/-76.25). Digital ASCII data can be obtained directly from **NCDC**.

Hydrometeorological Design Studies Center
DOC/NOAA/National Weather Service
1325 East-West Highway
Silver Spring, MD 20910

(301) 713-1669
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Enclosure 3

FEMA Overview and Concurrence Form (MT-2 form 1) for each study

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	City of Katy Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
420625	Salem Township, Luzerne County	PA	420625	0020B	3/18/80

2. a. Flooding Source: Susquehanna River

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH) ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Bell Bend Nuclear Power Plant - Proposed Cooling Water Intake Structure

4. FEMA zone designations affected: A13, B (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

   b. The area of revision encompasses the following structures (check all that apply)

   Structures: ☐ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert
   ☐ Dam ☐ Fill ☐ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,400

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Terry Harpster, VP Bell Bend Project Dev	Company: PPL Bell Bend, LLC	
Mailing Address: 38 Bomboy Lane, Suite 2 Berwick, PA 18603	Daytime Telephone No.: 570-802-8111	Fax No.: 570-802-8119
	E-Mail Address: tlharpster@pplweb.com	
Signature of Requester (required): T Harpster	Date: Feb 4, 2011	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Karen Karchner, Zoning/ Building Code Official	Community Name: Salem Township	
Mailing Address: P.O. Box 405, 38 Bomboy Lane Berwick, PA 18603	Daytime Telephone No.: 570-752-4399	Fax No.: 570-752-4661
	E-Mail Address: salemtownship@pa.metrocast.net	
Community Official's Signature (required):	Date:	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting data. All documents submitted in support of this request are correct to the best of my knowledge. All analyses have been performed correctly and in accordance with sound engineering practices. All project works are designed in accordance with sound engineering practices to provide protection from the 1% annual chance flood. If "as-built" conditions data/plan provided, then the structure(s) has been built according to the plans being certified, is in place, and is fully functioning. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Benjamin J. Ehrhart	License No.: PE062219	Expiration Date: 9/30/2011
Company Name: LandStudies, Inc.	Telephone No.: 717-627-4440	Fax No.: 717-627-4660
Signature:		Date: 1-28-11

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☐ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL BENJAMIN J. EHRHART ENGINEER NO. PE062219

Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

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420625	Salem Township, Luzerne County	PA	420625	0020B	03/18/80

2. a. Flooding Source: Walker Run

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)

   ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Bell Bend Nuclear Power Plant- Walker Run Restoration

4. FEMA zone designations affected: A4, B, C (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☒ Regulatory Floodway Revision ☒ Base Map Changes

   ☐ Coastal Analysis ☒ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections

   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes

   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

   b. The area of revision encompasses the following structures (check all that apply)

   Structures: ☐ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert

   ☐ Dam ☐ Fill ☒ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,400

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

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Mailing Address: 38 Bomboy Lane, Suite 2 Berwick, PA 18603	Daytime Telephone No.: 570-802-8111	Fax No.: 570-802-8119
	E-Mail Address: tlharpster@pplweb.com	
Signature of Requester (required):	Date: Feb 4, 2011	

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	E-Mail Address: salemtownship@pa.metrocast.net	
Community Official's Signature (required):	Date:	

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BENJAMIN J. EHRHART

Seal (Optional)

Enclosure 4

Sample Consistency Letter

{Date}

Mr. Terry L. Harpster
VP-Bell Bend Project-Development
PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603

RE: Walker Run and Susquehanna River Flood Studies associated with the proposed Bell Bend Nuclear Power Plant site in Salem Township, Luzerne County, PA.

Dear Mr. Harpster,

Please be advised that the appropriate officials have reviewed the flood studies submitted to us in your {Initial transmittal date} transmittal. We have determined that your project is consistent with our municipal Floodplain and Stormwater Management Program.

If additional information is required, please contact me.

Sincerely,

{Name}
{Title}