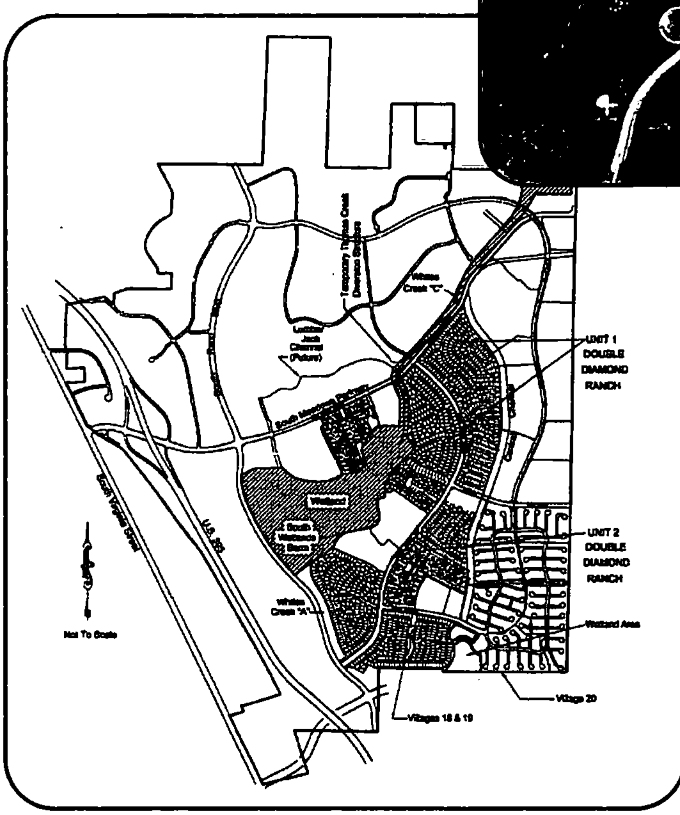
Addendum
Hydrologic and Hydraulic Analyses
Double Diamond Ranch

CENTRAL CHNL
@ WILBUR MAY
& CARAT



April, 2000
Job No. 9908

ADDENDUM
HYDROLOGIC AND HYDRAULIC ANALYSES
WILBUR MAY BLVD. AND DOUBLE DIAMOND PARKWAY
DOUBLE DIAMOND RANCH

City of Reno, Nevada

PREPARED FOR:
DOUBLE DIAMOND RANCH, LLC.
800 SOUTH MEADOWS PARKWAY, SUITE 100
RENO, NEVADA 89511

Nimbus Job No. 01150-9908
April 2000

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APPENDICES

1.0 INTRODUCTION

This report is an addendum to a report prepared by Nimbus Engineers titled *Hydrologic and Hydraulic Analysis, Wilbur May Blvd. and Double Diamond Pkwy., Double Diamond Ranch* (September 1998), hereinafter referred to as the original report. Specifics of the addendum are outlined below. A list of references are contained in the original report.

The Double Diamond Ranch is located in Reno, Nevada in the south Truckee Meadows. A vicinity map of the Double Diamond Ranch is shown in Figure 1. The area of the Double Diamond Ranch that is the subject of this addendum is shown on the hydraulic work map in Figure 2. The project area is described as: (1) a wetland bounded on the west by Double Diamond Villages 18 and 19, on the north by Wilbur May Boulevard, on the east by the Double Diamond Recreation Center and Village 20, and on the south by the Damonte Ranch subdivision; and (2) the Central Channel extending north from the culverts beneath Wilbur May Boulevard to a point approximately 200 feet downstream of the culverts beneath Carat Avenue (Figure 2). This addendum modifies the original hydrologic analysis (HEC-1) and hydraulic analysis (HEC-RAS).

The HEC-1 model was modified from the original analysis to reflect development in the Damonte Ranch because this development will affect peak flows through the Double Diamond Ranch (see Section 2.0). The contributing watershed for the present analysis lies upstream of Carat Avenue where it crosses the existing Central Channel and extends south to the constructed Whites Creek Branch 3 channel located along the south property boundary of the Damonte Ranch. This watershed was designated as W18RB in the Application for Conditional Letter of Map Revision (CLOMR) for Double Diamond Ranch (Nimbus, 1995). The subroutine of the CLOMR HEC-1 model that estimates runoff from W18RB, a subwatershed within the larger Whites Creek watershed, was used in the HEC-1 analysis that is part of the present report. The Branch 3 channel will convey flow from storms of magnitudes less than or equal to the 100-year event to Steamboat Creek. The channel will prevent flow from the Whites Creek watershed that is tributary to Branch 3 from discharging through the Damonte Ranch and the Double Diamond Ranch.

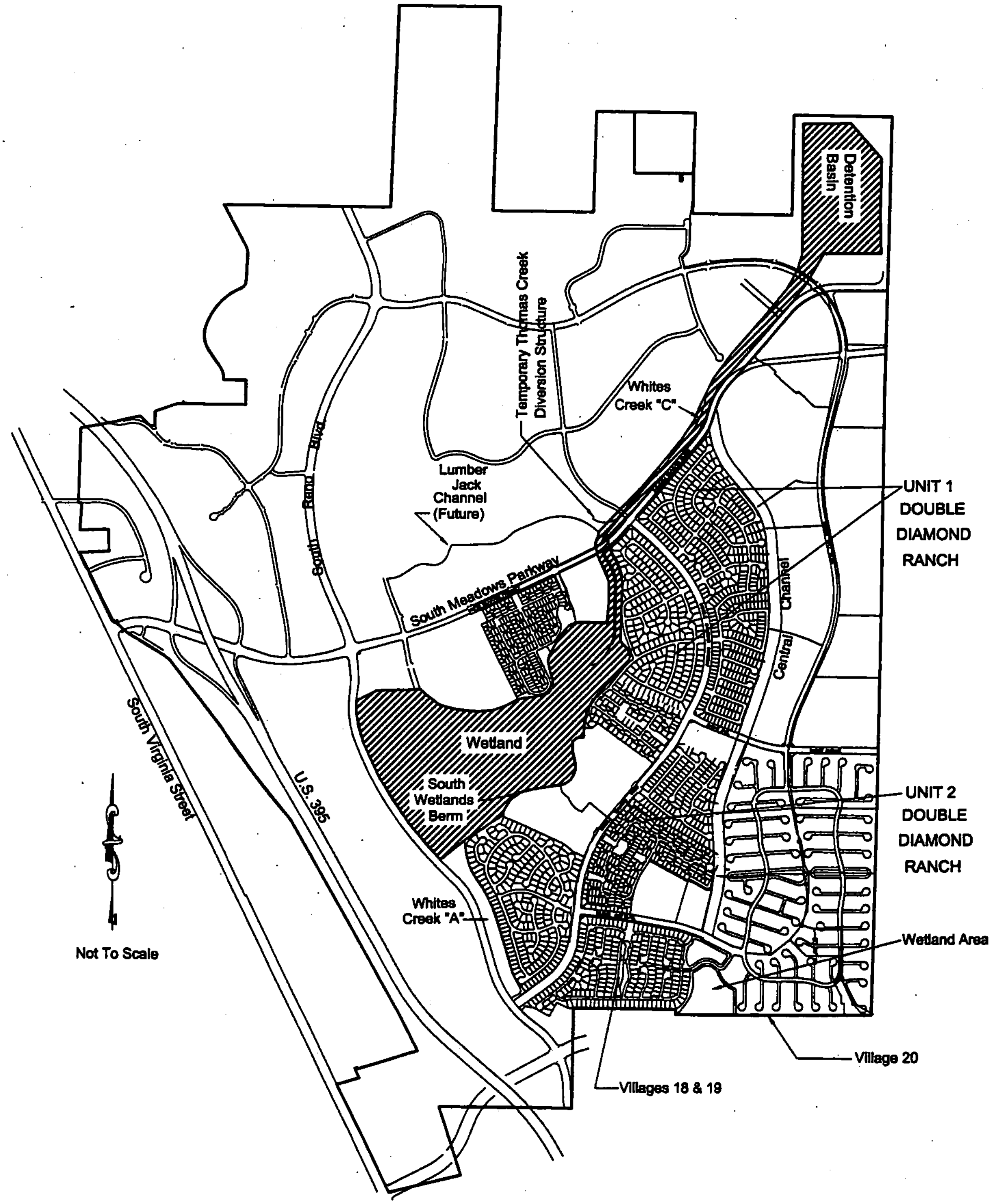

Figure 1
Vicinity Map

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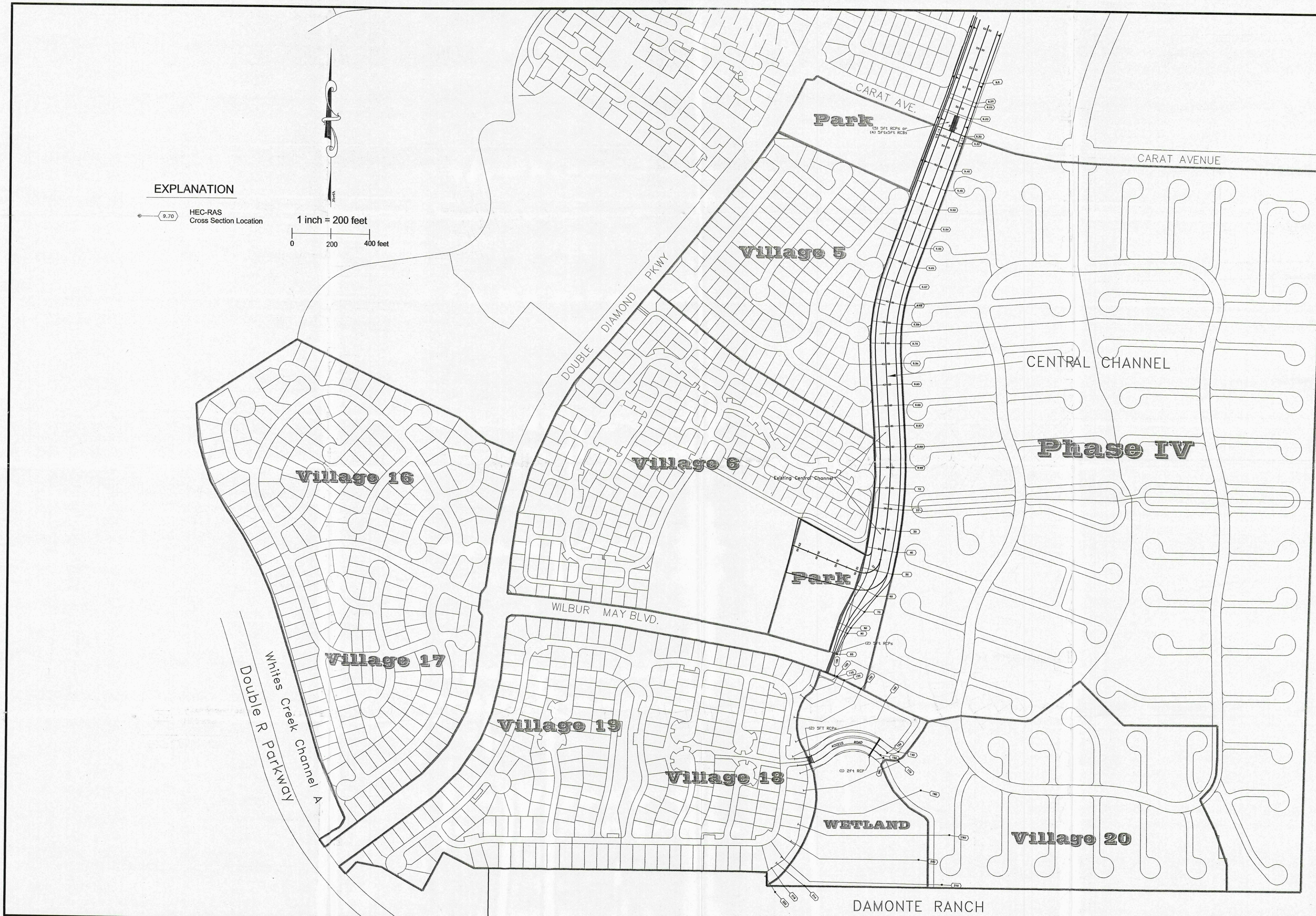
Nimbus Job #9908 *Date: April 2000*



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Revisions:

Scale:	1" = 200"
Contour Interval:	1ft
File Name:	908hwm_new
Drawn By:	kk
Designed By:	rj

FIGURE 2

HYDRAULIC WORKMAP - PROPOSED CONDITIONS

Double Diamond Ranch

Reno *Washoe County* *Nevada*

Sheet 1 of 1

Nimbus Job #

9908

Date: April 2000

The original HEC-RAS model was developed using a single channel to convey runoff, resulting from the 100-year storm event, from the Damonte Ranch in a northern direction, past Villages 18 and 19, through culverts beneath Wilbur May Boulevard, to the beginning of the existing Central Channel. In this addendum, the revised HEC-RAS model simulates flow through a wetland located east of Villages 18 and 19, beneath Wilbur May Boulevard and through the Central Channel to a point downstream of the culverts beneath Carat Avenue (see Section 3.0).

2.0 HYDROLOGIC ANALYSIS

The HEC-1 analysis in this addendum contains a revised estimate of the Soil Conservation Service (SCS) runoff curve number for the Damonte Ranch. The revised curve number reflects the impervious area within the proposed subdivision when development is completed. The Damonte Ranch is part of subwatershed W18RB within the larger Whites Creek watershed. In the original HEC-1 model, a curve number of 80 was used for W18RB. In the revised HEC-1 model, a curve number of 85 was used to reflect the higher runoff potential of the Damonte Ranch when development is completed.

The revised model contained three phases of development at Double Diamond: (1) Phase II which was modeled to include all of Villages 5 and 6 and portions of Villages 13, 14, and 15; (2) Phase III which include Villages 16, 17, 18, and 19; and (3) Phase IV which included Villages 7, 8, 9, 20, 21, 22, and 23. These development phases were included in the model in order to simulate runoff for final developed conditions and to allow adequate culvert capacity at Carat Avenue. Phase II development was based upon the Preliminary Storm Drainage Study, Phase II, Double Diamond Ranch, Villages 5, 6, 13, 14, & 15 by MacKay & Somps (1997) which also included storm-water discharge from Villages 16 and 17 via the parallel storm drains beneath Double Diamond Parkway labeled D10. Villages 7, 8, 9, 21, 22, and 23 (Phase IV) were modeled as one watershed discharging to the Central Channel because a detailed drainage plan was not available showing discharge points from each village to the Central Channel. Village 20 was modeled separately from the other Phase IV Villages and the flow was assumed to discharge to the wetland.

The original report contains a more detailed discussion of the hydrologic variables used in the HEC-1 model. HEC-1 modeling results for the 100-year, 24-hour storm event are summarized in Table 1. Complete HEC-1 modeling results are contained in Appendix A.

Table 1. Peak Flows Computed by HEC-1 at Selected Points and Corresponding Peak Flow Inputs to HEC-RAS, Double Diamond Ranch, Reno Nevada.

Location	HEC-1 Computation Point	HEC-RAS Cross Section Number	Peak Flow (cubic feet per second)	
			HEC-1[1]	HEC-RAS[2]
Discharge Point from Wetland through Culverts at Wilbur May Boulevard into the Central Channel	CB WET	220	266	300
Flow from Central Channel Combined with Discharges from Phase IV Villages and Village 6 Discharge Point E14 at Approximately 650 feet North of Wilbur May Boulevard	C14	30	467	500
Flow in Central Channel combined with Flow from Storm Drain Discharge Points D10 and D12 Located Approximately 350 Feet South of Carat Avenue	C10PRK	9.5	591	650

1. Peak flows calculated using the HEC-1 model and a precipitation depth 2.60 inches for the 100-year, 24-hour storm.

2. Peak flows were entered into the HEC-RAS model at the cross sections indicated. The flow rates remained at the rate listed above in the downstream direction until the flow was increased at a downstream cross section. For example, at the farthest upstream cross section (#220) the flow rate was held constant at 300 cubic feet per second (cfs) downstream to cross section 30 where the flow rate was increased to 500 cfs.

3.0 HYDRAULIC ANALYSIS

In the original hydraulic analysis, a HEC-RAS model was developed with a single channel (i.e., Phase 3 Central Channel) to convey the 100-year, 24-hour peak flow from subwatershed W18RB. A channel alignment was proposed from the southern property boundary of the Double Diamond Ranch northward, around Villages 18 and 19, through culverts beneath Wilbur May Boulevard, and finally northward to a point where the channel would join the existing Central Channel.

In the revised hydraulic analysis that is part of this addendum, a HEC-RAS model was developed through the wetland area located east of Villages 18 and 19, and along the Central Channel north of Wilbur May Boulevard to a point approximately 200 feet downstream of the Carat Avenue crossing over the Central Channel (Figure 2). Modeling results are contained in Appendix B. The 100-year, 24-hour storm event was modeled using peak flow rates that increased in a downstream direction from 300 cubic feet per second (cfs) through the wetland to 700 cfs upstream of Carat Avenue. Flow rates used in the HEC-RAS model were greater that those calculated by the HEC-1 model and are summarized in Table 1.

When the wetland area is completed, a low-flow channel capable of conveying the 2-year, 24-hour peak flow will meander through the wetland to maintain vegetation. Flows in excess of the 2-year, 24-hour storm will be conveyed to the channel over-bank area in the surrounding wetland. The conveyance capacity of the low-flow channel will be minimal and consequently the channel was not included in the revised HEC-RAS model. Each cross section within the wetland was modeled with a horizontal bottom. The elevations of the wetland bottom that were modeled will result in an excavation depth of approximately 5 to 6 feet below the existing land surface.

3.1 HEC-RAS Cross Sections

Cross-section locations modeled in HEC-RAS are shown on Figure 2. Cross sections 10 through 100 were taken from the original model for the channel from the upstream ends of the culverts beneath Wilbur May Boulevard, north, to the existing Central Channel. Cross sections 8.8 through 9.99 were added downstream of cross section 10 to a point downstream of Carat Avenue. Cross sections 105 through 220 were added in order to model the wetland from Wilbur May Boulevard to the northern property boundary of the Damonte Ranch.

Within the wetland area, additional cross sections were calculated by HEC-RAS using a program feature that interpolates cross sections. The interpolated cross sections are indicated by an asterisk next to the cross section number in the model output (Appendix B). The point where flow from the Damonte Ranch enters the wetland area (cross sections 220 through 214) was modeled as a trapezoidal channel with 3:1 side slopes and tops of the right banks set at the existing land surface elevation. This configuration reflects the grading plans south of the wetland area. The remaining cross sections in the wetland area were modeled across its entire width. Elevations at the ends of the cross-sections adjacent to Villages 18 and 19 (i.e., the western extent of cross sections 100 through 220) were set based upon the proposed grading plan for that area. Grading plans for Village 20, the recreation center, and the access road from Villages 18 and 19 to the recreation center, hereinafter known as the access road, have not been completed. Consequently, elevations at the eastern ends of cross sections were approximated. Side slopes of 3:1 were modeled at the western and eastern ends of the cross sections. The road deck elevation of the access road was approximated based upon the street improvement plan for Village 18.

The HEC-RAS modeling results demonstrate that the wetland, as modeled, has the capacity to convey 300 cfs because of the proposed excavation of the wetland below the existing grade. The Central Channel north of Wilbur May Boulevard will convey flow from the 100-year, 24-hour storm event provided that the culverts at Carat Avenue are sized properly (refer to Section 3.2). Cross-section and water-surface elevation data are summarized in Table 2.

Table 2. HEC-RAS Cross-Section Elevation Data, Double Diamond Ranch, Reno, Nevada.				
Cross Section #	Downstream Distance to Next Cross Section (feet)	Bottom Elevation (feet, msl)	Existing Wetland Elevation [1] (feet, msl)	100-Year Water-Surface Elevation (feet, msl)
220	50	4466.0	4469	4467.5
216	55	4465.6	4469	4466.8
214	40	4465.3	4468-70	4465.9
210	100	4465.0	4468-71	4465.3
200	100	4464.0	4468-71	4464.4
190	100	4463.0	4467-70	4463.3
180	100	4462.0	4467-68	4462.3
170	100	4457.0	4467	4461.3
160	20	4456.0	4466-67	4461.3
155	30	4455.9	4465-67	4461.0
150	40	4455.8	4465-67	4459.3
145	60	4455.6	4465-67	4459.6
140	100	4455.4	4464-65	4459.6
130	100	4454.9	4464-65	4459.6
120	60	4454.5	4463-64	4459.6
110	70	4454.3	4463-64	4459.6
105	25	4454.0	4463-64	4459.5
100	115	4453.8	4463	4459.2
95	110	4453.3	NA	4455.1
90	30	4453.14	NA	4455.0
80	100	4453.1	NA	4455.0
70	100	4453.0	NA	4454.7
60	100	4452.9	NA	4454.5
50	100	4452.8	NA	4454.4
40	100	4452.7	NA	4454.2
30	100	4452.3	NA	4453.9
20	100	4451.9	NA	4453.5
10	100	4451.5	NA	4453.1

Table 2, continued. HEC-RAS Cross-Section Elevation Data, Double Diamond Ranch, Reno, Nevada.				
Cross Section #	Downstream Distance to Next Cross Section (feet)	Bottom Elevation (feet, msl)	Existing Wetland Elevation [1] (feet, msl)	100-Year Water-Surface Elevation (feet, msl)
9.99	100	4451.1	NA	4452.6
9.98	100	4450.7	NA	4452.3
9.97	100	4450.3	NA	4451.9
9.96	100	4449.9	NA	4451.5
9.95	100	4449.5	NA	4451.1
9.94	100	4449.1	NA	4450.7
9.70	100	4448.7	NA	4450.4
9.69	100	4448.3	NA	4450.1
9.68	100	4447.9	NA	4449.9
9.67	100	4447.5	NA	4449.8
9.66	100	4447.1	NA	4449.7
9.65	100	4446.7	NA	4449.6
9.64	100	4446.3	NA	4449.6
9.50	100	4445.9	NA	4449.6
9.45	100	4445.5	NA	4449.5
9.40	140	4445.1	NA	4449.5
9.32	40	4444.5	NA	4449.5
9.30	90	4444.4	NA	4449.1
9.2	80	4444.0	NA	4446.5
9.05	20	4443.7	NA	4445.5
9.00	100	4443.6	NA	4445.4
8.80	0	4443.2	NA	4445.0

1. The wetland was modeled between cross sections 100 and 220. A trapezoidal channel was modeled downstream of Cross section 100.

Note: Elevation is in feet above mean sea level (msl).
NA= Not Applicable

3.2 Culverts

In the revised HEC-RAS model, culverts were modeled beneath the wetland access road, beneath Wilbur May Boulevard, and beneath Carat Avenue. The proposed culvert locations are shown in Figure 2.

Culverts were included beneath the proposed access road through the wetland at two locations. The multiple opening routine in HEC-RAS was used to model these culverts. Two 5-foot diameter reinforced concrete pipe (RCP) culverts and one 2-foot diameter RCP were modeled between cross sections 150 and 155. The invert elevations of the 5-foot diameter RCPs were set at 1-foot below the bottom of a proposed storm drain connecting to the RCPs beneath the access road (4455.8 feet, msl at road centerline). The invert elevation of the 2-foot diameter RCP was set at the same elevation as the 5-foot diameter RCPs. The 2-foot diameter culvert was intended to convey low-flows to the eastern portion of the wetland located north of the access road in order to maintain wetland vegetation.

In the original HEC-RAS model, two 5-foot diameter RCPs beneath Wilbur May Boulevard were included between cross sections 95 and 100. These same culverts were included in the revised model at the original invert elevation (4453.6 feet, msl at center line of road).

In developing the revised HEC-RAS model, the invert elevations of the RCPs beneath Wilbur May Boulevard and the access road were assumed to be fixed. Additionally, the invert elevation (4466 feet, msl) of the channel bottom (cross section 220) at the Damonte Ranch was obtained from Odyssey Engineering, Inc. This is the approximate elevation of the Damonte Channel as it exits the subdivision at the Damonte Ranch.

Two types of culverts were modeled beneath Carat Avenue between HEC-RAS cross sections 9.3 and 9.2. Separate HEC-RAS models were developed for the two types of culverts (Appendix B). In the first model, five 5-foot diameter RCPs were modeled beneath Carat Avenue. The water-surface elevations listed in Table 2 are based on this model. In the second model, four 5-foot wide by 5-foot high reinforced concrete box (RCB) culverts were modeled beneath Carat Avenue. The resulting water-surface elevations calculated by HEC-RAS were approximately the same as those listed in Table 2. Tabular output in Appendix B lists the water-surface elevations for both models. Either culvert configuration will allow approximately 1-foot of freeboard in the Central Channel at Carat Avenue.

3.3 Culvert Erosion Protection

Riprap erosion protection will be required downstream and upstream of the culverts beneath the wetland access road, Wilbur May Boulevard, and Carat Avenue. Design criteria for culvert outlet protection are specified in Section 807.3 and Figure 821 of the *Washoe County Hydrologic Criteria and Drainage Design Manual* (Washoe County, 1996) hereinafter referred to as the Washoe County Manual. The Washoe County Manual (Section 1102.3) requires riprap protection or an energy dissipator for velocities between 5 and 15 fps.

The 100-year, 24-hour storm peak flow that was calculated by the HEC-1 model was approximately 300 cfs through the wetland area. At the access road, the 5-foot diameter RCPs will convey approximately 280 cfs of the 300 cfs total. A flow velocity of 10.2 feet per second (fps) was calculated, by the HEC-RAS model, downstream of the 5-foot diameter RCPs at cross section 152 (Appendix B-Culvert Table). The following specifications for loose riprap were calculated based upon Section 807.3 of the Washoe County Manual. Downstream of the 5-foot diameter RCPs, a d_{50} of 10 inches (type-M riprap) will be required. Approximately 75 feet of riprap apron will be required downstream of the culvert. An apron width of approximately 45 feet will be required if a well-defined channel does exist downstream of the culvert. If a well-defined channel does exist, then the apron should extend across the channel bottom and up the side slopes extending at least 1 foot above the tail water elevation (4459.0 feet). The flow velocity calculated for the 2-foot diameter RCP beneath the access road was 7.0 fps with a 20 cfs discharge capacity of the total of 300 cfs (Appendix B- Culvert Table). The corresponding riprap protection downstream of the 2-foot RCP would require a d_{50} of approximately 4 inches for loose riprap (type VL), and an apron of approximately 40 feet in length and 20 feet in width.

The exit velocity calculated by the HEC-RAS model for the two RCPs beneath Wilbur May Boulevard was 10.5 fps for the 300 cfs discharge at cross section 97 (Appendix B-Culvert Table). The following riprap specifications were calculated using procedures outlined in the Washoe County Manual. If loose riprap is selected to protect the channel downstream of the culverts at Wilbur May Boulevard, a mean particle size (d_{50}) of 11 inches (type-M riprap) will be required. Approximately 75 feet of riprap apron would be required along the length of the channel downstream of the culverts, across the channel bottom, and up the side slopes extending at least 1 foot above the tail water elevation (4456.7 feet).

The exit velocity calculated by the HEC-RAS model for the five proposed RCPs beneath Carat Avenue was 9.6 fps for the 650 cfs discharge at cross section 9.29 (Appendix B-Culvert Table). If loose riprap is selected to protect the channel downstream of the Carat Avenue culverts, a mean particle size (d_{50}) of 10 inches (type-M riprap) will be required. Approximately 70 feet of riprap apron would be required along the length of the channel downstream of the culverts, across the channel bottom, and up the side slopes extending at least 1 foot above the tail water elevation (4447.3 feet).

Equivalent riprap sizes described for the outlets of each culvert listed above will also be required at the culvert inlets, but the dimensions of the aprons will be less.

Upstream of the access road, between cross sections 180 and 170, a 5-foot hydraulic drop over a 100-foot length was included in the HEC-RAS model. This hydraulic drop was modeled to match the culvert inverts at the access road and to minimize wetland excavation upstream of the access road. The velocity of water through this hydraulic drop was calculated by HEC-RAS to be 4.6 fps (i.e, at interpolated cross section 179*) or less across the width of the wetland. The calculated water velocities through the wetland were relatively slow (approximately 0.2 to 2.0 fps) because of the wide flow area at cross sections 160, and 190 through 210. The hydraulic drop resulted in a slight increase in water velocity between cross sections 180 and 170. Although the slope of the drop is 5 percent, the velocity is low because the flow velocity is distributed over the entire cross section rather than being confined to a narrow channel. Erosion protection will not be required through the hydraulic drop located between cross sections 180 and 170, because of the low water velocity. The wetland vegetation will provide adequate erosion protection at this location.

4.0 CONCLUSIONS

A potential design for the conveyance of storm-water discharge through the wetland area to the east of Double Diamond Ranch Villages 18 and 19 is presented in this addendum report. Using the HEC-RAS program, a hydraulic model of the wetland was developed to simulate a discharge of 300 cfs which exceeds the discharge from the 100-year, 24-hour event (268 cfs) estimated by the HEC-1 model. The wetland land-surface elevations and the culverts that were modeled will allow containment and conveyance of discharge from the 100-year, 24-hour storm event from the Damonte Ranch, through the wetland area, and to the existing Central Channel located north of the wetland.

The Central Channel will have the capacity to convey flow from the 100-year, 24 hour storm event downstream of the wetland and through culverts beneath Carat Avenue. Flow through the channel will include final development along both sides of the channel downstream from Wilbur May Boulevard to Carat Avenue. The flow for final development calculated by the HEC-1 model was 591 cfs. A flow rate of 650 cfs was modeled for the channel in the vicinity of Carat Avenue. The channel will convey 650 cfs with approximately 1-foot of free board provided that the culverts at Carat Avenue are sized properly (i.e., five, 5-foot diameter RCPs or four, 5-foot by 5-foot RCBs).

APPENDIX A

Hydrologic Analysis

HEC-1 Modeling Results

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*****************************************                    *****************************************
*                                       *                    *                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *                    *   U.S. ARMY CORPS OF ENGINEERS        *
*            JUN   1998                 *                    *   HYDROLOGIC ENGINEERING CENTER       *
*         VERSION 4.1                   *                    *         609 SECOND STREET             *
*                                       *                    *      DAVIS, CALIFORNIA 95616          *
* RUN DATE   06APR00  TIME  14:45:40    *                    *          (916) 756-1104               *
*                                       *                    *                                       *
*****************************************                    *****************************************


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                    XXXXXXX  XXXX     X     XXXXX   X
                    X     X  X        X             X
                    X     X  X        X     X       X
                    X     X  XXXXXXX   XXXXX       XXX


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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM
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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

            *Diagram
            ID   DOUBLE DIAMOND SUBDIVISION-PROJECT #9908
            ID   WHITES CREEK SUBBASIN W18RB-NORTH OF WHITES CREEK BRANCH #3 DIVERSION
            ID   ADD PHASE II CHANNEL TO EVALUATE CARAT AVENUE CULVERT
            ID   100-YEAR,24-HOUR MODEL
            ID   MODEL INCLUDES DOUBLE DIAMOND DEVELOPMENT PHASE II (VILLAGES 5 & 6 AND PARKS)
            ID   , PHASE III (VILLAGES 16, 17, 18, AND 19), AND PHASE IV (VILLAGES 7, 8, 9,
            ID   20, 21, 22, AND 23) PLUS WETLAND BETWEEN VILLAGES 18/19 & 20.
            ID   USE SUBBASIN AREAS FROM MACKAY & SOMPS
            ID   NIMBUS ENGINEERS, RENO, NEVADA
            ID   FILENAME: C:\HEC1\9908\CARATDD.DAT
            IT       4  1AUG98    1200     300  2AUG98    1200    1900
            IO       3       0
            IN      15

            KK   W18RB WHITES CREEK SUBBASIN W18RB-NORTH BOUNDARY OF WHITES CK MEADOW SUBDIV.
            KM         DAMONTE RANCH NORTH OF WHITES CK. BRANCH #3 AND SOUTH OF DOUBLE DIAMOND
            BA  0.2344
            PB     2.6
            PC     0.0    .002    .005    .008    .011    .014    .017    .020    .023    .026
            PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
            PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
            PC    .110    .115    .120    .126    .133    .140    .147    .155    .163    .172
            PC    .181    .191    .203    .218    .236    .257    .283    .387    .663    .707
            PC    .735    .758    .776    .791    .804    .815    .825    .834    .842    .849
            PC    .856    .863    .869    .875    .881    .887    .893    .898    .903    .908
            PC    .913    .918    .922    .926    .930    .934    .938    .942    .946    .950
            PC    .953    .956    .959    .962    .965    .968    .971    .974    .977    .980
            PC    .983    .986    .992    .995    .998    1.00
            LS              85
            UD    0.30
            *

            KK  V18-19 DOUBLE DIAMOND VILLAGES 18 & 19
            BA  0.0548
            LS              92
            UD    0.24
            *

            KK     V20 DOUBLE DIAMOND VILLAGE 20
            BA  0.0450
            LS              92
            UD    0.21
            *

            KK     WET WETLANDS # 5 & #6 BETWEEN VILLAGES 18/19 AND VILLAGE 20
            BA  0.0153
            LS              80
            UD    0.26
            *
```

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

  42        KK  CB WET COMBINE W18RB, V18-19, V20, & WET RUNOFF HYDROGRAPHS IN THE WETLAND
  43        KM         BETWEEN VILLAGES 18/19 AND VILLAGE 20
  44        HC       4
            *
            *

  45        KK   PH-IV PHASE IV DOUBLE DIAMOND DEVELOPMENT (VILLAGES 7,8,9,21,22,&23).
  46        KM         VILLAGE 20 WAS MODELED ABOVE WITH FLOW ENTERING THE WETLAND SOUTH
  47        KM         OF WILBUR MAY BLVD.  DETAILED DRAINAGE PLANS WERE NOT AVAILABLE
  48        KM         AND AS A RESULT THE PHASE IV VILLAGES LIST FOR PH-IV WERE COMBINED.
  49        KM         AS PLANS ARE DEVELOPED, THE VILLAGES CAN BE MODELED SEPARATELY.
  50        BA  0.1931
  51        LS              92
  52        UD    0.31
            *

  53        KK     E14 HYDROGRAPH FROM VILLAGE 6 DRAINAGE POINT E14
  54        KM   CALCULATE RUNOFF FROM SUBBASIN E14
  55        BA    .025
  56        LS              92
  57        UD    .225
            *

  58        KK     C14
  59        KM   COMBINE RUNOFF FROM E14 WITH CENTRAL CHANNEL FLOW (FLOW FROM RT1617 & PH-IV)
  60        HC       3
            *

  61        KK  E14-E1
  62        KM   ROUTE FLOW TO E1 ALONG CENTRAL CHANNEL
  63        RD     400    .004    .030             TRAP      100        3
            *

  64        KK      E1
  65        KM   CALCULATE RUNOFF FROM SUBBASIN E1-VILLAGE 5
  66        BA   .0058
  67        LS              92
  68        UD    .135
            *

  69        KK      C1
  70        KM   COMBINE RUNOFF FROM E1 WITH CENTRAL CHANNEL FLOW
  71        HC       2
            *

  72        KK   E1-E2
  73        KM   ROUTE FLOW TO E2 ALONG CENTRAL CHANNEL
  74        RD     300    .004    .030             TRAP      100        3
            *
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LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  75           KK      E2
  76           KM   CALCUALTE RUNOFF FROM SUBBASIN E2-VILLAGE 5
  77           BA    .003
  78           LS               92
  79           UD    .118
               *

  80           KK      C2
  81           KM   COMBINE RUNOFF FROM E2 WITH CENTRAL CHANNEL FLOW
  82           HC       2
               *

  83           KK   E2-E3
  84           KM   ROUTE FLOW TO E3 ALONG CENTRAL CHANNEL
  85           RD     300    .004    .030            TRAP     100       3
               *

  86           KK      E3
  87           KM   CALCULATE RUNOFF FROM SUBBASIN E3-VILLAGE 5
  88           BA   .0025
  89           LS               92
  90           UD    .119
               *

  91           KK      C3
  92           KM   COMBINE RUNOFF FROM E3 WITH CENTRAL CHANNEL FLOW
  93           HC       2
               *

  94           KK   E3-E4
  95           KM   ROUTE FLOW TO E4 ALONG CENTRAL CHANNEL
  96           RD     360    .004    .030            TRAP     100       3
               *

  97           KK      E4
  98           KM   CALCULATE RUNOFF FROM SUBBASIN E4-VILLAGE 5
  99           BA    .003
 100           LS               92
 101           UD    .113
               *

 102           KK      C4
 103           KM   COMBINE RUNOFF FROM E4 WITH CENTRAL CHANNEL FLOW
 104           HC       2
               *

 105           KK     D10
 106           KM   CALCULATE RUNOFF FROM SUBBASIN D10
 107           KM   SUBBASIN D10 IS LOCATED ALONG DOUBLE DIAMOND PKWY.  THE AREA DRAINED IS
 108           KM   COMPRISED OF PORTIONS OF VILLAGES 5,6,13,14,15,16 & 17 THAT BORDER THE PKWY.
 109           KM   THE D10 SYSTEM IS A PARALLEL STORM DRAIN SYSTEM
 110           KM   ALONG DOUBLE DIAMOND PARKWAY THAT DRAINS TO AN OPEN
 111           KM   CHANNEL ALONG THE SOUTH EDGE OF THE PARK LOCATED IMMEDIATELY SOUTHEAST OF
 112           KM   THE INTERSECTION OF CARAT AV. AND DOUBLE DIAMOND PKWY.
```

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

 113          BA   .122
 114          LS             92
 115          UD   .277
              *

 116          KK    D12
 117          KM   CALCULATE RUNOFF FROM SUBBASIN D12-VILLAGE 5
 118          BA  0.0166
 119          LS             92
 120          UD   0.173
              *

 121          KK    PARK
 122          KM   CALCULATE RUNOFF FROM PARK JUST SOUTH OF CARAT AVE
 123          BA   .0078
 124          LS             80
 125          UD     .14
              *

 126          KK  C10PRK
 127          KM   COMBINE HYDROGRAPHS FROM PARK, D10, D12 AND CENTRAL CHANNEL
 128          HC       4
              *

 129          KK  PK-CAR
 130          KM   ROUTE FLOW TO CARAT AVE ALONG CENTRAL CHANNEL
 131          RD     300    .004    .030            TRAP     100       3
 132          ZZ
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             SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE       (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

            (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

  14         W18RB
                .
                .
  30            .     V18-19
                .          .
                .          .
  34            .          .          V20
                .          .           .
                .          .           .
  38            .          .           .          WET
                .          .           .           .
                .          .           .           .
  42        CB WET.......................................
                .
                .
  45            .      PH-IV
                .          .
                .          .
  53            .          .          E14
                .          .           .
                .          .           .
  58           C14.........................
                V
                V
  61        E14-E1
                .
                .
  64            .         E1
                .          .
                .          .
  69            C1............
                V
                V
  72          E1-E2
                .
                .
  75            .         E2
                .          .
                .          .
  80            C2............
                V
                V
  83          E2-E3
                .
                .
  86            .         E3
                .          .
                .          .
  91            C3............
                V
                V
  94          E3-E4
                .
                .
   /            .         E4
                .          .
                .          .
 102            C4............
                .
```

```
              .
105           .         D10
              .           ..
              .           .
              .           .
              .           .         D12
              .           .           .
              .           .           .
121           .           .           .        PARK
              .           .           .           .
              .           .           .           .
126      C10PRK.....................................
              V
              V
129      PK-CAR
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************                                        ****************************************
*                                      *                                        *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                        *  U.S. ARMY CORPS OF ENGINEERS        *
*             JUN    1998              *                                        *  HYDROLOGIC ENGINEERING CENTER       *
*           VERSION 4.1                *                                        *        609 SECOND STREET             *
*                                      *                                        *     DAVIS, CALIFORNIA 95616          *
* RUN DATE   06APR00  TIME  14:45:40   *                                        *         (916) 756-1104               *
*                                      *                                        *                                      *
****************************************                                        ****************************************


                              DOUBLE DIAMOND SUBDIVISION-PROJECT #9908
                              WHITES CREEK SUBBASIN W18RB-NORTH OF WHITES CREEK BRANCH #3 DIVERSION
                              ADD PHASE II CHANNEL TO EVALUATE CARAT AVENUE CULVERT
                              100-YEAR,24-HOUR MODEL
                              MODEL INCLUDES DOUBLE DIAMOND DEVELOPMENT PHASE II (VILLAGES 5 & 6 AND PARKS)
                              , PHASE III (VILLAGES 16, 17, 18, AND 19), AND PHASE IV (VILLAGES 7, 8, 9,
                              20, 21, 22, AND 23) PLUS WETLAND BETWEEN VILLAGES 18/19 & 20.
                              USE SUBBASIN AREAS FROM MACKAY & SOMPS
                              NIMBUS ENGINEERS, RENO, NEVADA
                              FILENAME: C:\HEC1\9908\CARATDD.DAT

 12 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN          4  MINUTES IN COMPUTATION INTERVAL
                      IDATE     1AUG98  STARTING DATE
                      ITIME       1200  STARTING TIME
                         NQ        361  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     2AUG98  ENDING DATE
                     NDTIME       1200  ENDING TIME
                      ICENT         19  CENTURY MARK

                COMPUTATION INTERVAL     .07 HOURS
                     TOTAL TIME BASE   24.00 HOURS

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


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

              **************
              *            *
 14 KK        *   W18RB    *      WHITES CREEK SUBBASIN W18RB-NORTH BOUNDARY OF WHITES CK MEADOW SUBDIV.
              *            *
              **************

                                  DAMONTE RANCH NORTH OF WHITES CK. BRANCH #3 AND SOUTH OF DOUBLE DIAMOND

 13 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN         15  TIME INTERVAL IN MINUTES
                     JXDATE     1AUG98  STARTING DATE
```

JXTIME 1200 STARTING TIME

SUBBASIN RUNOFF DATA

BA SUBBASIN CHARACTERISTICS
TAREA .23 SUBBASIN AREA

PRECIPITATION DATA

17 PB STORM 2.60 BASIN TOTAL PRECIPITATION

18 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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28 LS SCS LOSS RATE
STRTL .35 INITIAL ABSTRACTION
CRVNBR 85.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

29 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .30 LAG

***

UNIT HYDROGRAPH
24 END-OF-PERIOD ORDINATES

34.	105.	225.	316.	340.	316.	265.	191.	133.	95.
70.	50.	36.	26.	19.	14.	10.	7.	5.	4.
3.	2.	1.	1.						

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

HYDROGRAPH AT STATION W18RB

TOTAL RAINFALL = 2.60, TOTAL LOSS = 1.34, TOTAL EXCESS = 1.26

FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.00-HR
157.	12.20	(CFS)	26.	8.	8.	8.
		(INCHES)	1.024	1.255	1.255	1.255
		(AC-FT)	13.	16.	16.	16.

CUMULATIVE AREA = .23 SQ MI

*** ***

```
              **************
              *            *
30 KK         *   V18-19   *      DOUBLE DIAMOND VILLAGES 18 & 19
              *            *
              **************
```

SUBBASIN RUNOFF DATA

31 BA SUBBASIN CHARACTERISTICS

TAREA .05 SUBBASIN AREA

PRECIPITATION DATA

PB STORM 2.60 BASIN TOTAL PRECIPITATION

18 PI INCREMENTAL PRECIPITATION PATTERN

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.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
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32 LS        SCS LOSS RATE
                  STRTL         .17  INITIAL ABSTRACTION
                 CRVNBR       92.00  CURVE NUMBER
                  RTIMP         .00  PERCENT IMPERVIOUS AREA

33 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG         .24  LAG

                                                  ***

                                             UNIT HYDROGRAPH
                                         20 END-OF-PERIOD ORDINATES
       14.       44.       83.       97.       89.       70.       44.       30.       20.       14.
        9.        6.        4.        3.        2.        1.        1.        1.        0.        0.

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

                   HYDROGRAPH AT STATION   V18-19

 TOTAL RAINFALL =    2.60, TOTAL LOSS =     .81, TOTAL EXCESS =    1.79

PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                 6-HR        24-HR       72-HR     24.00-HR
     58.     12.13      (CFS)       8.           3.          3.           3.
                      (INCHES)  1.426        1.784       1.784        1.784
                       (AC-FT)     4.           5.          5.           5.

                  CUMULATIVE AREA =      .05 SQ MI

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

          **************
          *            *
34 KK     *     V20    *      DOUBLE DIAMOND VILLAGE 20
          *            *
          **************

             SUBBASIN RUNOFF DATA

35 BA         SUBBASIN CHARACTERISTICS
                 TAREA          .05  SUBBASIN AREA

              PRECIPITATION DATA

17 PB            STORM         2.60  BASIN TOTAL PRECIPITATION

18 PI           INCREMENTAL PRECIPITATION PATTERN
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00			

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36 LS        SCS LOSS RATE
                STRTL          .17   INITIAL ABSTRACTION
               CRVNBR        92.00   CURVE NUMBER
                RTIMP          .00   PERCENT IMPERVIOUS AREA

   UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .21   LAG
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***

UNIT HYDROGRAPH
18 END-OF-PERIOD ORDINATES

15.	50.	84.	88.	72.	46.	29.	19.	12.	8.
5.	3.	2.	1.	1.	1.	0.	0.		

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

HYDROGRAPH AT STATION V20

TOTAL RAINFALL = 2.60, TOTAL LOSS = .81, TOTAL EXCESS = 1.79

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.00-HR
50.	12.13	(CFS)	7.	2.	2.	2.
		(INCHES)	1.426	1.784	1.784	1.784
		(AC-FT)	3.	4.	4.	4.

CUMULATIVE AREA = .05 SQ MI

*** ***

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          **************
          *            *
38 KK     *     WET    *     WETLANDS # 5 & #6 BETWEEN VILLAGES 18/19 AND VILLAGE 20
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*   *
****

SUBBASIN RUNOFF DATA

BA SUBBASIN CHARACTERISTICS

TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

17 PB STORM 2.60 BASIN TOTAL PRECIPITATION

18 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00			

40 LS SCS LOSS RATE

STRTL .50 INITIAL ABSTRACTION
CRVNBR 80.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

41 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .26 LAG

***

UNIT HYDROGRAPH
21 END-OF-PERIOD ORDINATES

3.	10.	20.	25.	24.	20.	14.	10.	7.	5.
3.	2.	2.	1.	1.	1.	0.	0.	0.	0.
0.									

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

HYDROGRAPH AT STATION WET

OTAL RAINFALL = 2.60, TOTAL LOSS = 1.64, TOTAL EXCESS = .96

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
8.	12.13	(CFS)	1.	0.	0.	0.
		(INCHES)	.782	.957	.957	.957
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

*** ***

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              **************
              *            *
 42 KK        *   CB WET   *      COMBINE W18RB, V18-19, V20, & WET RUNOFF HYDROGRAPHS IN THE WETLAND
              *            *
              **************
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BETWEEN VILLAGES 18/19 AND VILLAGE 20.

44 HC HYDROGRAPH COMBINATION

ICOMP 4 NUMBER OF HYDROGRAPHS TO COMBINE

***

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

HYDROGRAPH AT STATION CB WET

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
266.	12.13	(CFS)	42.	13.	13.	13.
		(INCHES)	1.125	1.393	1.393	1.393
		(AC-FT)	21.	26.	26.	26.

CUMULATIVE AREA = .35 SQ MI

*** ***

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              **************
              *            *
 45 KK        *    PH-IV   *      PHASE IV DOUBLE DIAMOND DEVELOPMENT (VILLAGES 7,8,9,21,22,&23).
              *            *
              **************
```

VILLAGE 20 WAS MODELED ABOVE WITH FLOW ENTERING THE WETLAND SOUTH
OF WILBUR MAY BLVD. DETAILED DRAINAGE PLANS WERE NOT AVAILABLE
AND AS A RESULT THE PHASE IV VILLAGES LIST FOR PH-IV WERE COMBINED.
AS PLANS ARE DEVELOPED, THE VILLAGES CAN BE MODELED SEPARATELY.

SUBBASIN RUNOFF DATA

50 BA SUBBASIN CHARACTERISTICS

TAREA .19 SUBBASIN AREA

PRECIPITATION DATA

```
17 PB              STORM        2.60  BASIN TOTAL PRECIPITATION

18 PI          INCREMENTAL PRECIPITATION PATTERN
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                  .01       .01       .02       .03       .03       .03       .06       .07       .07       .07
                  .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                  .01       .01       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00

51 LS          SCS LOSS RATE
                    STRTL          .17  INITIAL ABSTRACTION
                   CRVNBR        92.00  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

52 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .31  LAG

                                                  ***

                                                            UNIT HYDROGRAPH
                                                       25 END-OF-PERIOD ORDINATES
               26.        80.       170.       246.       271.       259.       221.       167.       116.        84.
               63.        46.        33.        24.        18.        13.         9.         7.         5.         4.
                3.         2.         1.         1.         0.

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

                           HYDROGRAPH AT STATION     PH-IV

 .OTAL RAINFALL =     2.60, TOTAL LOSS =      .81, TOTAL EXCESS =     1.79

PEAK FLOW      TIME                                 MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                        6-HR        24-HR        72-HR      24.00-HR
   180.       12.20        (CFS)            30.            9.           9.            9.
```

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            (INCHES)     1.426       1.782       1.782       1.782
             (AC-FT)       15.         18.         18.         18.

             CUMULATIVE AREA =     .19 SQ MI




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


          **************
          *            *
53 KK     *     E14    *      HYDROGRAPH FROM VILLAGE 6 DRAINAGE POINT E14
          *            *
          **************
                   CALCULATE RUNOFF FROM SUBBASIN E14

             SUBBASIN RUNOFF DATA

55 BA          SUBBASIN CHARACTERISTICS
                     TAREA           .03   SUBBASIN AREA

               PRECIPITATION DATA

17 PB                STORM          2.60   BASIN TOTAL PRECIPITATION

18 PI            INCREMENTAL PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                     .01       .01       .02       .03       .03       .03       .06       .07       .07       .07
                     .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                     .01       .01       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00

56 LS          SCS LOSS RATE
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                STRTL          .17  INITIAL ABSTRACTION
               CRVNBR        92.00  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

  UD         SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .22  LAG

                                                      ***

                                                 UNIT HYDROGRAPH
                                            19 END-OF-PERIOD ORDINATES
            7.       23.       42.       47.       41.       29.       18.       12.       8.        5.
            3.        2.        1.        1.        1.        0.        0.        0.       0.

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

                 HYDROGRAPH AT STATION       E14

  TOTAL RAINFALL =    2.60, TOTAL LOSS =     .81, TOTAL EXCESS =    1.79

 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                   6-HR        24-HR        72-HR       24.00-HR
     27.       12.13        (CFS)        4.           1.           1.            1.
                          (INCHES)    1.426        1.784        1.784         1.784
                           (AC-FT)       2.           2.           2.            2.

                CUMULATIVE AREA =       .03 SQ MI


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


         **************
         *            *
 58 KK   *      C14   *
         *            *
         **************
                  COMBINE RUNOFF FROM E14 WITH CENTRAL CHANNEL FLOW (FLOW FROM RT1617 & PH-IV)

 60 HC        HYDROGRAPH COMBINATION
               ICOMP            3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***

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

                 HYDROGRAPH AT STATION       C14

 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                   6-HR        24-HR        72-HR       24.00-HR
    467.       12.13        (CFS)       76.          24.          24.           24.
                          (INCHES)    1.240        1.543        1.543         1.543
                           (AC-FT)      38.          47.          47.           47.

                CUMULATIVE AREA =       .57 SQ MI


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


         **************
         *            *
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61 KK     *    E14-E1  *
          *             *
          ***************
                    ROUTE FLOW TO E1 ALONG CENTRAL CHANNEL

          HYDROGRAPH ROUTING DATA

63 RD       MUSKINGUM-CUNGE CHANNEL ROUTING
                    L         400.  CHANNEL LENGTH
                    S        .0040  SLOPE
                    N         .030  CHANNEL ROUGHNESS COEFFICIENT
                   CA          .00  CONTRIBUTING AREA
                SHAPE         TRAP  CHANNEL SHAPE
                   WD       100.00  BOTTOM WIDTH OR DIAMETER
                    Z         3.00  SIDE SLOPE

                                             ***

                         COMPUTED MUSKINGUM-CUNGE PARAMETERS
                              COMPUTATION TIME STEP
          ELEMENT    ALPHA     M       DT       DX      PEAK    TIME TO    VOLUME   MAXIMUM
                                                                 PEAK              CELERITY
                                      (MIN)    (FT)    (CFS)    (MIN)      (IN)     (FPS)

           MAIN       .19     1.60     1.55   200.00   466.80   731.09     1.54      4.31

                              INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

           MAIN       .19     1.60     4.00            464.72   732.00     1.54

   IUITY SUMMARY (AC-FT) - INFLOW= .4670E+02 EXCESS= .0000E+00 OUTFLOW= .4666E+02 BASIN STORAGE= .8610E-01 PERCENT ERROR=   -.1


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

                  HYDROGRAPH AT STATION   E14-E1

PEAK FLOW     TIME                         MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR      72-HR     24.00-HR
   465.      12.20      (CFS)       76.         24.        24.         24.
                     (INCHES)     1.239       1.541      1.541       1.541
                      (AC-FT)       38.         47.        47.         47.

                 CUMULATIVE AREA =     .57 SQ MI


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


          ***************
          *             *
64 KK     *        E1   *
          *             *
          ***************
                    CALCULATE RUNOFF FROM SUBBASIN E1-VILLAGE 5

          SUBBASIN RUNOFF DATA

66 BA       SUBBASIN CHARACTERISTICS
                TAREA         .01  SUBBASIN AREA
```

PRECIPITATION DATA

17 PB STORM 2.60 BASIN TOTAL PRECIPITATION

PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00			

67 LS SCS LOSS RATE

STRTL	.17	INITIAL ABSTRACTION
CRVNBR	92.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

68 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .14 LAG

***

UNIT HYDROGRAPH
12 END-OF-PERIOD ORDINATES

5.	15.	16.	10.	5.	3.	1.	1.	0.	0.
0.	0.								

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

HYDROGRAPH AT STATION E1

TOTAL RAINFALL = 2.60, TOTAL LOSS = .81, TOTAL EXCESS = 1.79

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
(CFS)	(HR)					
8.	12.07	(CFS)	1.	0.	0.	0.

```
              (INCHES)     1.427      1.785      1.785      1.785
               (AC-FT)        0.         1.         1.         1.

             CUMULATIVE AREA =      .01 SQ MI

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

          **************
          *            *
 69 KK    *      C1    *
          *            *
          **************
                COMBINE RUNOFF FROM E1 WITH CENTRAL CHANNEL FLOW

 71 HC         HYDROGRAPH COMBINATION
                  ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                ***

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

                 HYDROGRAPH AT STATION       C1

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR      24-HR      72-HR    24.00-HR
     469.     12.20      (CFS)        77.        24.        24.        24.
                      (INCHES)     1.241      1.544      1.544      1.544
                       (AC-FT)       38.        47.        47.        47.

             CUMULATIVE AREA =      .57 SQ MI

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

          **************
          *            *
 72 KK    *   E1-E2    *
          *            *
          **************
                ROUTE FLOW TO E2 ALONG CENTRAL CHANNEL

            HYDROGRAPH ROUTING DATA

 74 RD         MUSKINGUM-CUNGE CHANNEL ROUTING
                       L         300.  CHANNEL LENGTH
                       S        .0040  SLOPE
                       N         .030  CHANNEL ROUGHNESS COEFFICIENT
                      CA          .00  CONTRIBUTING AREA
                   SHAPE         TRAP  CHANNEL SHAPE
                      WD       100.00  BOTTOM WIDTH OR DIAMETER
                       Z         3.00  SIDE SLOPE

                                                                ***
                        COMPUTED MUSKINGUM-CUNGE PARAMETERS
                               COMPUTATION TIME STEP
           ELEMENT    ALPHA      M        DT       DX      PEAK    TIME TO    VOLUME    MAXIMUM
                                                                     PEAK               CELERITY
                                        (MIN)     (FT)    (CFS)     (MIN)      (IN)      (FPS)
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                 MAIN        .19       1.60       1.16    300.00    465.88    732.63      1.54      4.32

                                   INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                 MAIN        .19       1.60       4.00              465.24    732.00      1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4722E+02 EXCESS= .0000E+00 OUTFLOW= .4720E+02 BASIN STORAGE= .6902E-01 PERCENT ERROR=   -.1


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

                    HYDROGRAPH AT STATION    E1-E2

 PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                   6-HR       24-HR       72-HR     24.00-HR
    465.      12.20       (CFS)         77.         24.         24.         24.
                        (INCHES)      1.242       1.544       1.544       1.544
                         (AC-FT)        38.         47.         47.         47.

                   CUMULATIVE AREA =       .57 SQ MI


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

          **************
          *            *
    KK    *      E2    *
          *            *
          **************

                     CALCUALTE RUNOFF FROM SUBBASIN E2-VILLAGE 5

            SUBBASIN RUNOFF DATA

  77 BA        SUBBASIN CHARACTERISTICS
                     TAREA          .00  SUBBASIN AREA

               PRECIPITATION DATA

  17 PB              STORM        2.60  BASIN TOTAL PRECIPITATION

  18 PI          INCREMENTAL PRECIPITATION PATTERN
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                       .01       .01       .02       .03       .03       .03       .06       .07       .07       .07
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        .01      .01      .01      .01      .01      .01      .01      .01      .01      .01
        .01      .01      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
        .00      .00      .00      .00      .00      .00      .00

 78 LS        SCS LOSS RATE
                    STRTL          .17  INITIAL ABSTRACTION
                   CRVNBR        92.00  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

 79 UD        SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .12  LAG

                                              ***

                                         UNIT HYDROGRAPH
                                    11 END-OF-PERIOD ORDINATES
          4.       9.       8.       4.       2.       1.       0.       0.       0.       0.
          0.

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

                         HYDROGRAPH AT STATION        E2

   TOTAL RAINFALL =    2.60, TOTAL LOSS =     .81, TOTAL EXCESS =    1.79

 PEAK FLOW      TIME                         MAXIMUM AVERAGE FLOW
   (CFS)        (HR)                   6-HR       24-HR      72-HR     24.00-HR
       4.      12.00       (CFS)         0.          0.         0.           0.
                         (INCHES)     1.427       1.786      1.786        1.786
                          (AC-FT)        0.          0.         0.           0.

                        CUMULATIVE AREA =      .00 SQ MI


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

          **************
          *            *
 80 KK    *      C2    *
          *            *
          **************

                          COMBINE RUNOFF FROM E2 WITH CENTRAL CHANNEL FLOW

    HC        HYDROGRAPH COMBINATION
                   ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

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

                    HYDROGRAPH AT STATION        C2

   FLOW      TIME                              MAXIMUM AVERAGE FLOW
  FS)        (HR)                      6-HR        24-HR        72-HR      24.00-HR
  467.      12.20        (CFS)          77.          24.          24.          24.
                       (INCHES)       1.242        1.545        1.545        1.545
                        (AC-FT)         38.          47.          47.          47.

                       CUMULATIVE AREA =       .58 SQ MI

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

              **************
              *            *
 83 KK        *   E2-E3    *
              *            *
              **************

                       ROUTE FLOW TO E3 ALONG CENTRAL CHANNEL

            HYDROGRAPH ROUTING DATA

 85 RD        MUSKINGUM-CUNGE CHANNEL ROUTING
                        L          300.  CHANNEL LENGTH
                        S         .0040  SLOPE
                        N          .030  CHANNEL ROUGHNESS COEFFICIENT
                       CA           .00  CONTRIBUTING AREA
                    SHAPE          TRAP  CHANNEL SHAPE
                       WD        100.00  BOTTOM WIDTH OR DIAMETER
                        Z          3.00  SIDE SLOPE

                                                         ***
                              COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                     COMPUTATION TIME STEP
            ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO    VOLUME    MAXIMUM
                                                                        PEAK                CELERITY
                                           (MIN)     (FT)     (CFS)    (MIN)       (IN)      (FPS)

             MAIN        .19     1.60       1.16    300.00    463.23    732.45      1.54      4.31

                                    INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

             MAIN        .19     1.60       4.00              461.44    732.00      1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4749E+02 EXCESS= .0000E+00 OUTFLOW= .4747E+02 BASIN STORAGE= .7183E-01 PERCENT ERROR=   -.1

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

                    HYDROGRAPH AT STATION     E2-E3

 K FLOW      TIME                              MAXIMUM AVERAGE FLOW
  FS)        (HR)                      6-HR        24-HR        72-HR      24.00-HR
  461.      12.20        (CFS)          77.          24.          24.          24.
                       (INCHES)       1.243        1.544        1.544        1.544
                        (AC-FT)         38.          47.          47.          47.
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CUMULATIVE AREA = .58 SQ MI

* ** ***

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              **************
              *            *
86 KK         *     E3     *
              *            *
              **************
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CALCULATE RUNOFF FROM SUBBASIN E3-VILLAGE 5

SUBBASIN RUNOFF DATA

88 BA SUBBASIN CHARACTERISTICS

TAREA .00 SUBBASIN AREA

PRECIPITATION DATA

17 PB STORM 2.60 BASIN TOTAL PRECIPITATION

18 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00			

89 LS SCS LOSS RATE

STRTL .17 INITIAL ABSTRACTION

CRVNBR 92.00 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

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 90 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .12  LAG

                                                                  ***

                                                            UNIT HYDROGRAPH
                                                       11 END-OF-PERIOD ORDINATES
                 3.         8.         7.         3.         2.         1.         0.         0.         0.         0.
                 0.

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

                            HYDROGRAPH AT STATION       E3

   TOTAL RAINFALL =    2.60, TOTAL LOSS =     .81, TOTAL EXCESS =    1.79

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                        6-HR        24-HR       72-HR     24.00-HR
       3.      12.00         (CFS)            0.          0.          0.          0.
                          (INCHES)         1.427       1.786       1.786       1.786
                           (AC-FT)            0.          0.          0.          0.

                           CUMULATIVE AREA =      .00 SQ MI


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


            **************
            *            *
    KK      *        C3  *
            *            *
            **************
                              COMBINE RUNOFF FROM E3 WITH CENTRAL CHANNEL FLOW

 93 HC          HYDROGRAPH COMBINATION
                      ICOMP             2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

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

                            HYDROGRAPH AT STATION       C3

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                        6-HR        24-HR       72-HR     24.00-HR
     463.      12.20         (CFS)           77.         24.         24.         24.
                          (INCHES)         1.243       1.545       1.545       1.545
                           (AC-FT)           38.         48.         48.         48.

                           CUMULATIVE AREA =      .58 SQ MI


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


            **************
            *            *
 94 KK      *     E3-E4  *
            *            *
            **************
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                    ROUTE FLOW TO E4 ALONG CENTRAL CHANNEL

          HYDROGRAPH ROUTING DATA

 RD         MUSKINGUM-CUNGE CHANNEL ROUTING
                    L          360.  CHANNEL LENGTH
                    S         .0040  SLOPE
                    N          .030  CHANNEL ROUGHNESS COEFFICIENT
                   CA           .00  CONTRIBUTING AREA
                SHAPE          TRAP  CHANNEL SHAPE
                   WD        100.00  BOTTOM WIDTH OR DIAMETER
                    Z          3.00  SIDE SLOPE

                                                         ***
                             COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                    COMPUTATION TIME STEP
           ELEMENT    ALPHA       M        DT        DX      PEAK    TIME TO    VOLUME   MAXIMUM
                                                                       PEAK               CELERITY
                                          (MIN)     (FT)     (CFS)    (MIN)      (IN)     (FPS)

            MAIN       .19      1.60      1.40     360.00   460.01   733.94      1.54      4.30

                                   INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

            MAIN       .19      1.60      4.00              454.28   736.00      1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4772E+02 EXCESS= .0000E+00 OUTFLOW= .4769E+02 BASIN STORAGE= .8885E-01 PERCENT ERROR=   -.1

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

                 HYDROGRAPH AT STATION    E3-E4

 PEAK FLOW    TIME                        MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                6-HR      24-HR      72-HR     24.00-HR
   454.      12.27      (CFS)      77.        24.        24.        24.
                     (INCHES)    1.243      1.545      1.545      1.545
                      (AC-FT)      38.        48.        48.        48.

                 CUMULATIVE AREA =      .58 SQ MI

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

          **************
          *            *
  97 KK   *      E4    *
          *            *
          **************
                    CALCULATE RUNOFF FROM SUBBASIN E4-VILLAGE 5

          SUBBASIN RUNOFF DATA

  BA        SUBBASIN CHARACTERISTICS
                 TAREA          .00  SUBBASIN AREA

            PRECIPITATION DATA

 17 PB           STORM         2.60  BASIN TOTAL PRECIPITATION
```

18 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00			

100 LS SCS LOSS RATE

STRTL	.17	INITIAL ABSTRACTION
CRVNBR	92.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

101 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.11	LAG

***

UNIT HYDROGRAPH
10 END-OF-PERIOD ORDINATES

4.	10.	8.	4.	2.	1.	0.	0.	0.	0.

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

HYDROGRAPH AT STATION E4

TOTAL RAINFALL = 2.60, TOTAL LOSS = .81, TOTAL EXCESS = 1.79

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	24.00-HR
4.	12.00	(CFS)	0.	0.	0.	0.
		(INCHES)	1.427	1.786	1.786	1.786
		(AC-FT)	0.	0.	0.	0.

CUMULATIVE AREA = .00 SQ MI

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

           **************
           *            *
102 KK     *      C4    *
           *            *
           **************
                      COMBINE RUNOFF FROM E4 WITH CENTRAL CHANNEL FLOW

104 HC         HYDROGRAPH COMBINATION
                    ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

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

                    HYDROGRAPH AT STATION       C4

PEAK FLOW    TIME                          MAXIMUM AVERAGE FLOW
  (CFS)      (HR)                  6-HR       24-HR      72-HR     24.00-HR
    455.     12.27       (CFS)      78.         24.        24.          24.
                       (INCHES)    1.244      1.546      1.546        1.546
                        (AC-FT)     39.         48.        48.          48.

                    CUMULATIVE AREA =      .58 SQ MI


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

           **************
           *            *
105 KK     *     D10    *
           *            *
           **************
                      CALCULATE RUNOFF FROM SUBBASIN D10
                      SUBBASIN D10 IS LOCATED ALONG DOUBLE DIAMOND PKWY.  THE AREA DRAINED IS
                      COMPRISED OF PORTIONS OF VILLAGES 5,6,13,14,15,16 & 17 THAT BORDER THE PKWY.
                      THE D10 SYSTEM IS A PARALLEL STORM DRAIN SYSTEM
                      ALONG DOUBLE DIAMOND PARKWAY THAT DRAINS TO AN OPEN
                      CHANNEL ALONG THE SOUTH EDGE OF THE PARK LOCATED IMMEDIATELY SOUTHEAST OF
                      THE INTERSECTION OF CARAT AV. AND DOUBLE DIAMOND PKWY.

             SUBBASIN RUNOFF DATA

113 BA         SUBBASIN CHARACTERISTICS
                    TAREA          .12  SUBBASIN AREA

               PRECIPITATION DATA

 17 PB              STORM         2.60  BASIN TOTAL PRECIPITATION

 18 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.02	.03	.03	.03	.06	.07	.07	.07
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00			

114 LS SCS LOSS RATE

STRTL	.17	INITIAL ABSTRACTION
CRVNBR	92.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

115 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.28	LAG

***

UNIT HYDROGRAPH

23 END-OF-PERIOD ORDINATES

22.	68.	139.	183.	189.	165.	128.	85.	60.	43.
30.	21.	15.	10.	7.	5.	4.	3.	2.	1.
1.	1.	0.							

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

HYDROGRAPH AT STATION D10

TOTAL RAINFALL = 2.60, TOTAL LOSS = .81, TOTAL EXCESS = 1.79

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
119.	12.13	(CFS)	19.	6.	6.	6.
		(INCHES)	1.426	1.783	1.783	1.783
		(AC-FT)	9.	12.	12.	12.

CUMULATIVE AREA = .12 SQ MI

*** ***

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              **************
              *            *
116 KK        *    D12     *
              *            *
              **************

                            CALCULATE RUNOFF FROM SUBBASIN D12-VILLAGE 5

                SUBBASIN RUNOFF DATA

118 BA            SUBBASIN CHARACTERISTICS
                        TAREA          .02  SUBBASIN AREA

                  PRECIPITATION DATA

 17 PB                  STORM         2.60  BASIN TOTAL PRECIPITATION

 18 PI              INCREMENTAL PRECIPITATION PATTERN
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                        .01       .01       .02       .03       .03       .03       .06       .07       .07       .07
                        .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                        .01       .01       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00

119 LS            SCS LOSS RATE
                       STRTL           .17  INITIAL ABSTRACTION
                      CRVNBR         92.00  CURVE NUMBER
                       RTIMP           .00  PERCENT IMPERVIOUS AREA

    UD            SCS DIMENSIONLESS UNITGRAPH
                        TLAG           .17  LAG

                                                  ***

                                             UNIT HYDROGRAPH
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                                                          15 END-OF-PERIOD ORDINATES
              8.        29.        39.        34.        21.        12.         7.         4.         3.         1.
              1.         1.         0.         0.         0.

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

                      HYDROGRAPH AT STATION       D12

  TOTAL RAINFALL =     2.60, TOTAL LOSS =      .81, TOTAL EXCESS =     1.79

PEAK FLOW      TIME                               MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                    6-HR         24-HR        72-HR      24.00-HR
     20.      12.07         (CFS)        3.            1.           1.           1.
                         (INCHES)     1.427         1.785        1.785        1.785
                          (AC-FT)        1.            2.           2.           2.

                       CUMULATIVE AREA =       .02 SQ MI


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

           **************
           *            *
121 KK     *    PARK    *
           *            *
           **************
                        CALCULATE RUNOFF FROM PARK JUST SOUTH OF CARAT AVE

              SUBBASIN RUNOFF DATA

1[illegible] BA          SUBBASIN CHARACTERISTICS
                    TAREA          .01  SUBBASIN AREA

                PRECIPITATION DATA

 17 PB              STORM          2.60  BASIN TOTAL PRECIPITATION

 18 PI            INCREMENTAL PRECIPITATION PATTERN
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                      .01       .01       .02       .03       .03       .03       .06       .07       .07       .07
                      .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                      .01       .01       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
          .00      .00      .00      .00      .00      .00      .00

124 LS        SCS LOSS RATE
                STRTL        .50  INITIAL ABSTRACTION
               CRVNBR      80.00  CURVE NUMBER
                RTIMP        .00  PERCENT IMPERVIOUS AREA

125 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG        .14  LAG

                                                   ***

                                              UNIT HYDROGRAPH
                                         12 END-OF-PERIOD ORDINATES
         6.       20.       21.       14.        7.        4.        2.        1.        1.        0.
         0.        0.

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

                  HYDROGRAPH AT STATION     PARK

   TOTAL RAINFALL =    2.60, TOTAL LOSS =    1.64, TOTAL EXCESS =      .96

PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                    6-HR        24-HR       72-HR      24.00-HR
     6.       12.07        (CFS)         1.           0.          0.           0.
                         (INCHES)      .783         .958        .958         .958
                          (AC-FT)        0.           0.          0.           0.

                  CUMULATIVE AREA =       .01 SQ MI


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

          **************
          *            *
126 KK    *   C10PRK   *
          *            *
          **************
                    COMBINE HYDROGRAPHS FROM PARK, D10, D12 AND CENTRAL CHANNEL

128 HC        HYDROGRAPH COMBINATION
                ICOMP          4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                   ***

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

                  HYDROGRAPH AT STATION    C10PRK

PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
  (CFS)        (HR)                    6-HR        24-HR       72-HR      24.00-HR
   591.       12.20        (CFS)       100.          31.         31.          31.
```

(INCHES)	1.273	1.585	1.585	1.585
(AC-FT)	49.	62.	62.	62.

CUMULATIVE AREA = .73 SQ MI

*** ***

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              **************
              *            *
129 KK        *   PK-CAR   *
              *            *
              **************
```

ROUTE FLOW TO CARAT AVE ALONG CENTRAL CHANNEL

HYDROGRAPH ROUTING DATA

131 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	300.	CHANNEL LENGTH
S	.0040	SLOPE
N	.030	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	100.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.19	1.60	1.06	300.00	587.97	733.19	1.58	4.71

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.19	1.60	4.00		583.23	732.00	1.58	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6156E+02 EXCESS= .0000E+00 OUTFLOW= .6153E+02 BASIN STORAGE= .8385E-01 PERCENT ERROR= -.1

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

HYDROGRAPH AT STATION PK-CAR

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
583.	12.20	(CFS)	100.	31.	31.	31.
		(INCHES)	1.273	1.584	1.584	1.584
		(AC-FT)	49.	62.	62.	62.

CUMULATIVE AREA = .73 SQ MI

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	W18RB	157.	12.20	26.	8.	8.	.23		
HYDROGRAPH AT	V18-19	58.	12.13	8.	3.	3.	.05		
HYDROGRAPH AT	V20	50.	12.13	7.	2.	2.	.05		
HYDROGRAPH AT	WET	8.	12.13	1.	0.	0.	.02		
4 COMBINED AT	CB WET	266.	12.13	42.	13.	13.	.35		
HYDROGRAPH AT	PH-IV	180.	12.20	30.	9.	9.	.19		
HYDROGRAPH AT	E14	27.	12.13	4.	1.	1.	.03		
3 COMBINED AT	C14	467.	12.13	76.	24.	24.	.57		
ROUTED TO	E14-E1	465.	12.20	76.	24.	24.	.57		
HYDROGRAPH AT	E1	8.	12.07	1.	0.	0.	.01		
2 COMBINED AT	C1	469.	12.20	77.	24.	24.	.57		
ROUTED TO	E1-E2	465.	12.20	77.	24.	24.	.57		
HYDROGRAPH AT	E2	4.	12.00	0.	0.	0.	.00		
2 COMBINED AT	C2	467.	12.20	77.	24.	24.	.58		
ROUTED TO	E2-E3	461.	12.20	77.	24.	24.	.58		
HYDROGRAPH AT	E3	3.	12.00	0.	0.	0.	.00		
2 COMBINED AT	C3	463.	12.20	77.	24.	24.	.58		
ROUTED TO	E3-E4	454.	12.27	77.	24.	24.	.58		
HYDROGRAPH AT	E4	4.	12.00	0.	0.	0.	.00		
2 COMBINED AT	C4	455.	12.27	78.	24.	24.	.58		
HYDROGRAPH AT	D10	119.	12.13	19.	6.	6.	.12		
HYDROGRAPH AT	D12	20.	12.07	3.	1.	1.	.02		
HYDROGRAPH AT	PARK	6.	12.07	1.	0.	0.	.01		
4 COMBINED AT	C10PRK	591.	12.20	100.	31.	31.	.73		
ROUTED TO	PK-CAR	583.	12.20	100.	31.	31.	.73		

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
E14-E1	MANE	1.55	466.80	731.09	1.54	4.00	464.72	732.00	1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4670E+02 EXCESS= .0000E+00 OUTFLOW= .4666E+02 BASIN STORAGE= .8610E-01 PERCENT ERROR= -.1

E1-E2	MANE	1.16	465.88	732.63	1.54	4.00	465.24	732.00	1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4722E+02 EXCESS= .0000E+00 OUTFLOW= .4720E+02 BASIN STORAGE= .6902E-01 PERCENT ERROR= -.1

E2-E3	MANE	1.16	463.23	732.45	1.54	4.00	461.44	732.00	1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4749E+02 EXCESS= .0000E+00 OUTFLOW= .4747E+02 BASIN STORAGE= .7183E-01 PERCENT ERROR= -.1

E3-E4	MANE	1.40	460.01	733.94	1.54	4.00	454.28	736.00	1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4772E+02 EXCESS= .0000E+00 OUTFLOW= .4769E+02 BASIN STORAGE= .8885E-01 PERCENT ERROR= -.1

PK-CAR	MANE	1.06	587.97	733.19	1.58	4.00	583.23	732.00	1.58

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6156E+02 EXCESS= .0000E+00 OUTFLOW= .6153E+02 BASIN STORAGE= .8385E-01 PERCENT ERROR= -.1

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

APPENDIX B

Hydraulic Analysis

HEC-RAS Modeling Results

Option #1:

Five, 5-foot Diameter RCP Culverts

at Carat Avenue

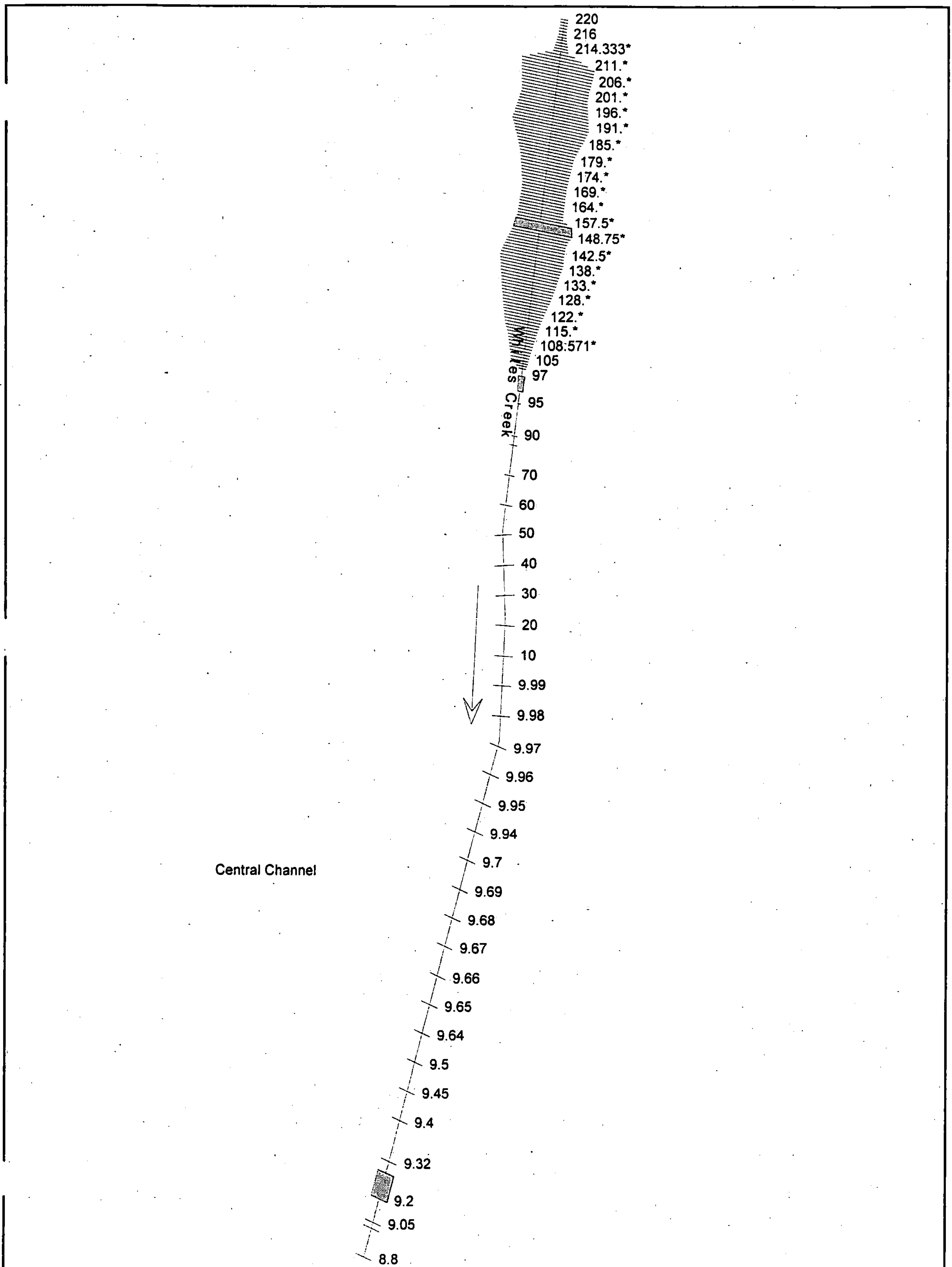
Project: ddcarat1.prj
Project Title: Double D-Carat Ave w/ 5 RCP Culverts
Project Directory: m:\jobs\9908\hydro\ras\wetland-CaratAv\

roject Plans

Plan (current)
Title: Central Chan. to Carat Ave-5 RCP Culverts
Short ID: DDCarat-5RCP
File: m:\jobs\9908\hydro\ras\wetland-CaratAv\ddcarat1.p01
Geometry:
Title:Central Chan. to Carat Av.-5 RCP culverts
File:m:\jobs\9908\hydro\ras\wetland-CaratAv\ddcarat1.g02
Flow:
Title:Wetland 300 base + 400 upstr.of Carat
File:m:\jobs\9908\hydro\ras\wetland-CaratAv\ddcarat1.f01

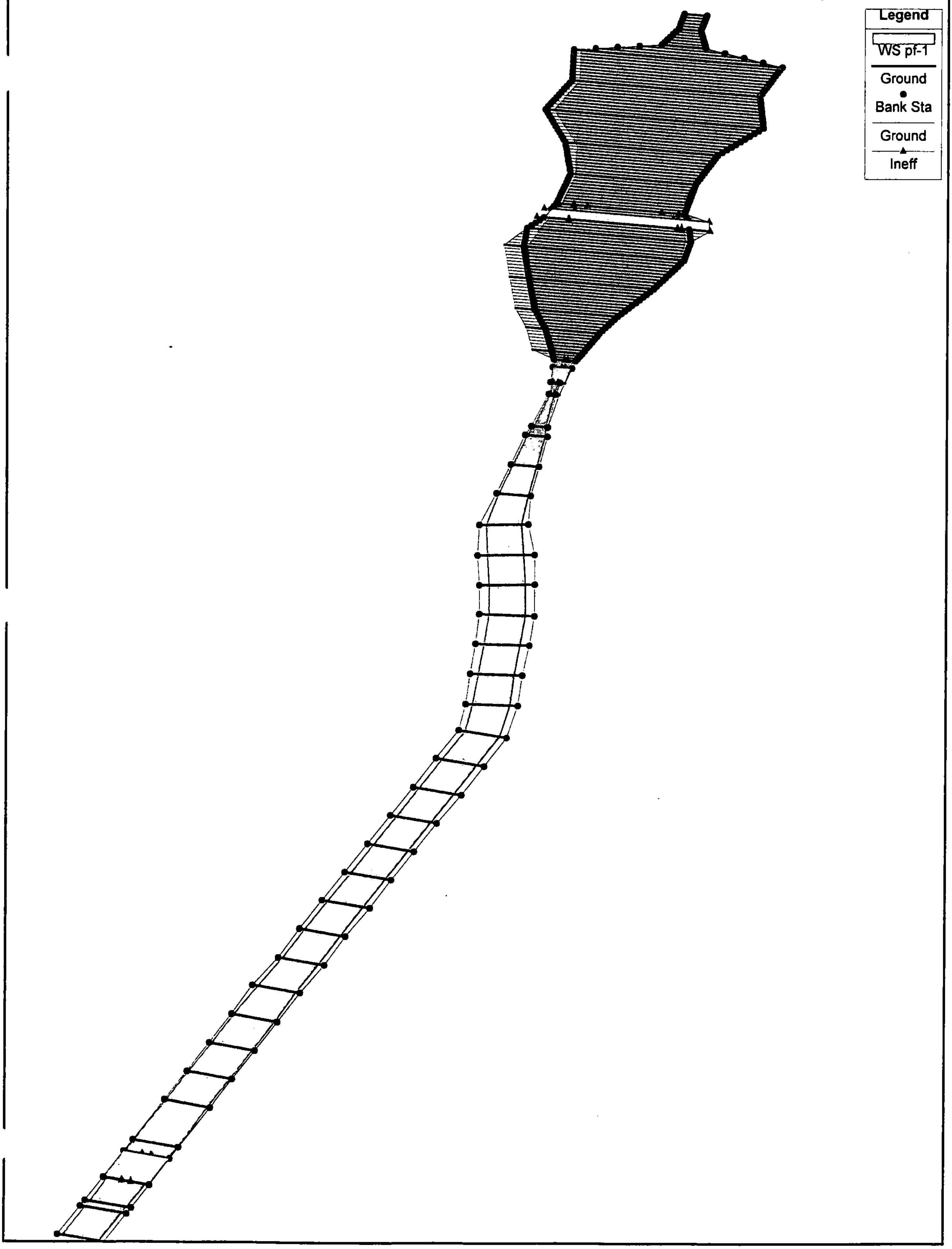
Current Plan Statistics

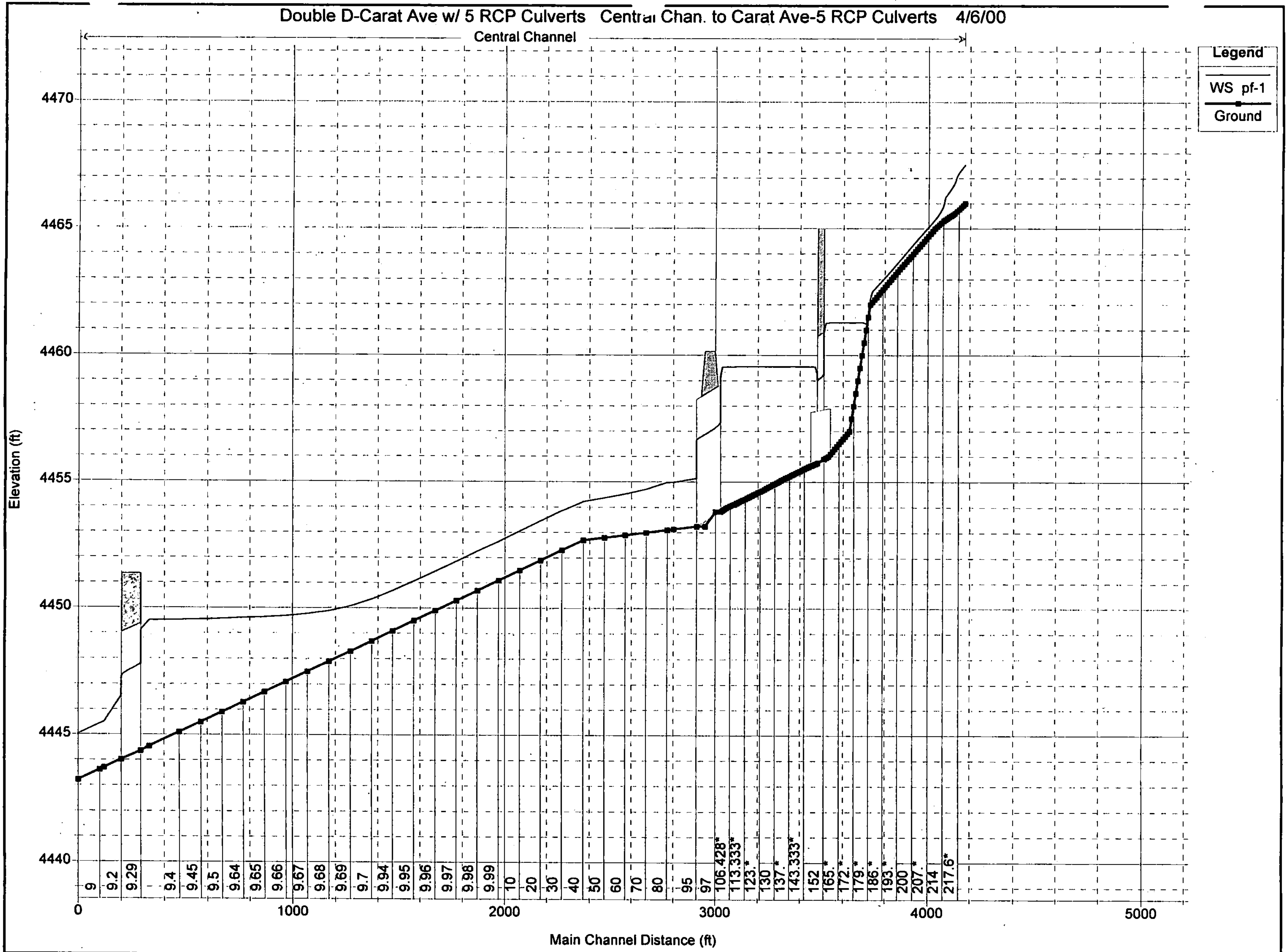
Number of:
Cross Sections = 147
User Input XSs = 50
Interpolated = 97
Culverts = 2
Bridges = 0
Mulitple Openings = 1
Inline Weirs = 0



220
216
214.333*
211.*
206.*
201.*
196.*
191.*
185.*
179.*
174.*
169.*
164.*
157.5*
148.75*
142.5*
138.*
133.*
128.*
122.*
115.*
108.571*
105
97
Whites Creek
95
90
70
60
50
40
30
20
10
9.99
9.98
9.97
9.96
9.95
9.94
9.7
9.69
9.68
9.67
9.66
9.65
9.64
9.5
9.45
9.4
9.32
9.2
9.05
8.8
Central Channel

Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

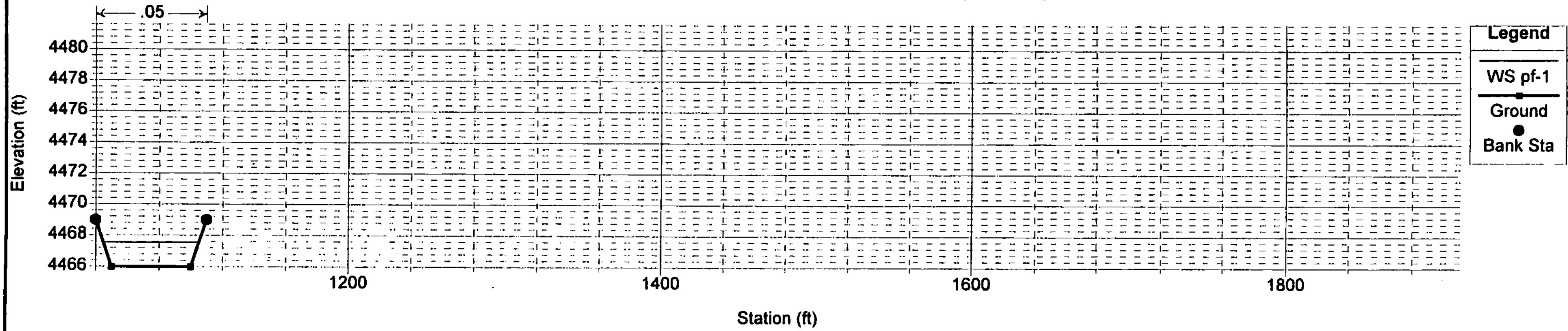




1 in Horiz. = 600 ft 1 in Vert. = 5 ft

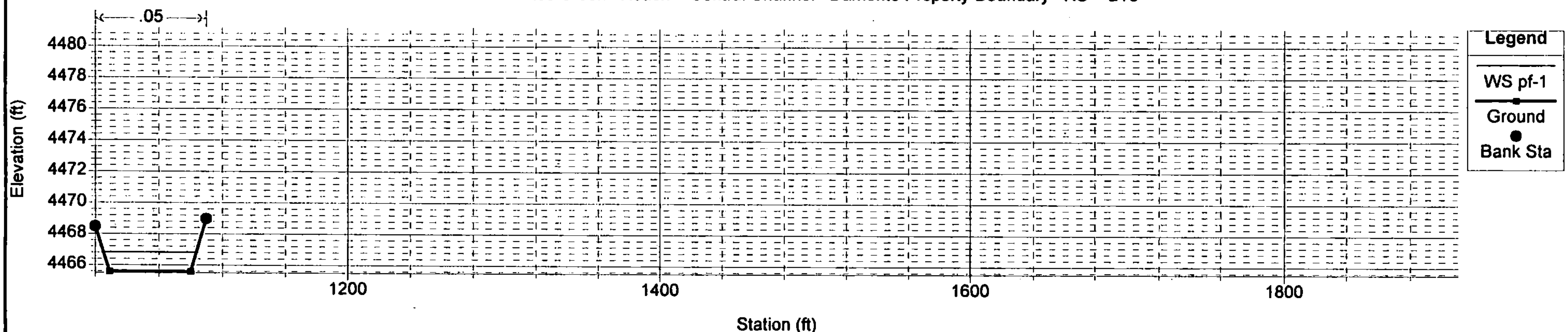
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel Damonte Property Boundary RS = 220



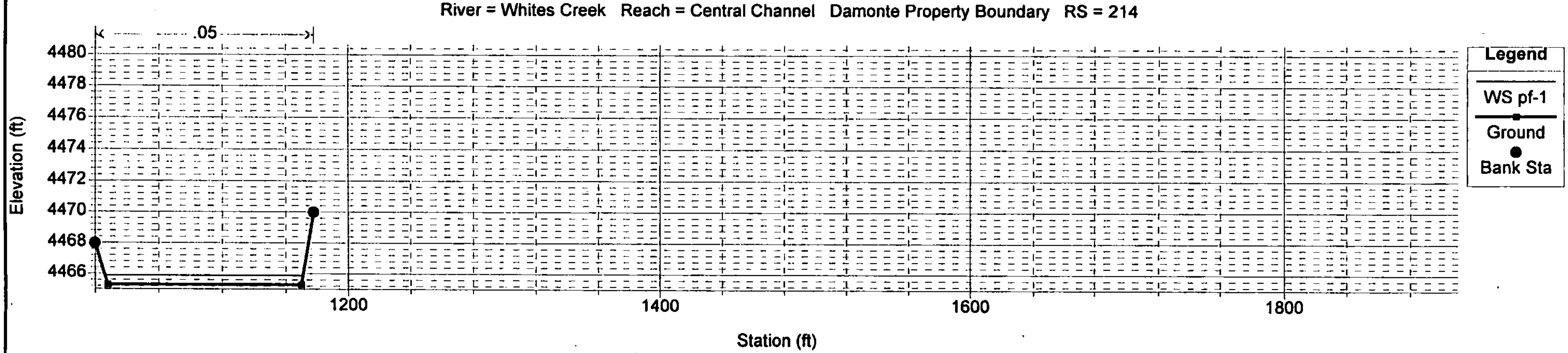
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel Damonte Property Boundary RS = 216



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

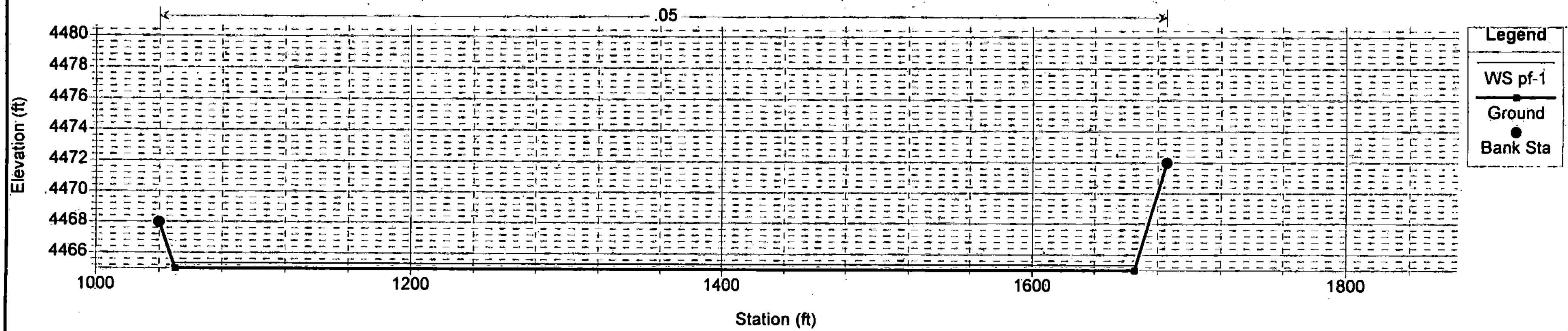
River = Whites Creek Reach = Central Channel Damonte Property Boundary RS = 214



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

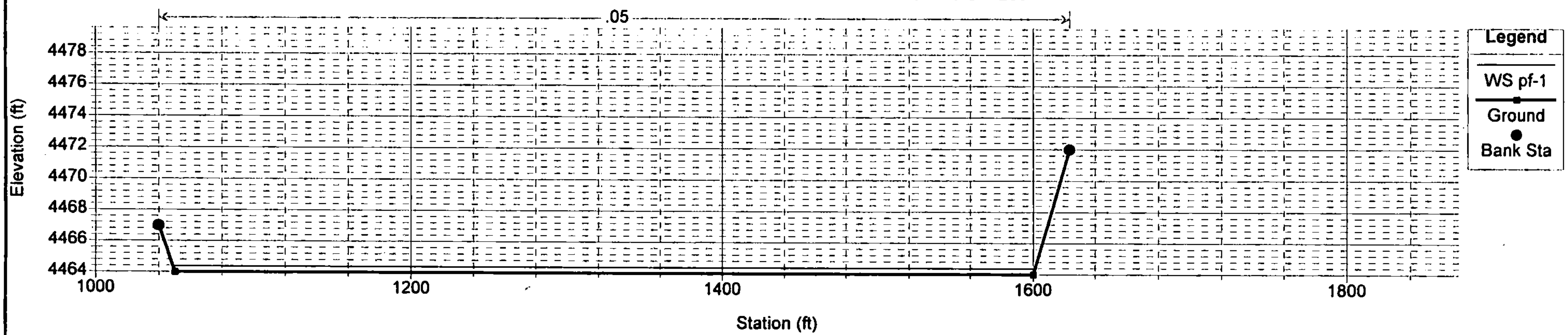
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel RS = 210



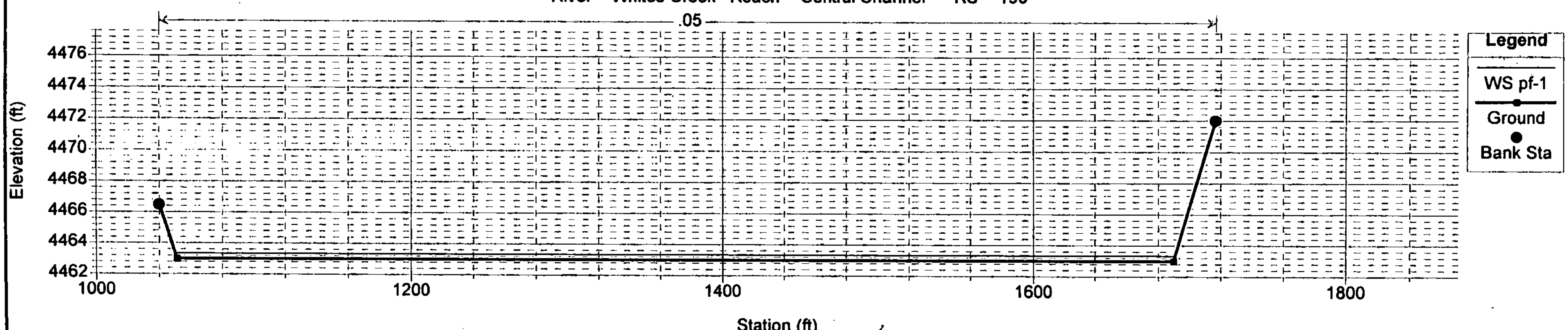
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel RS = 200



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

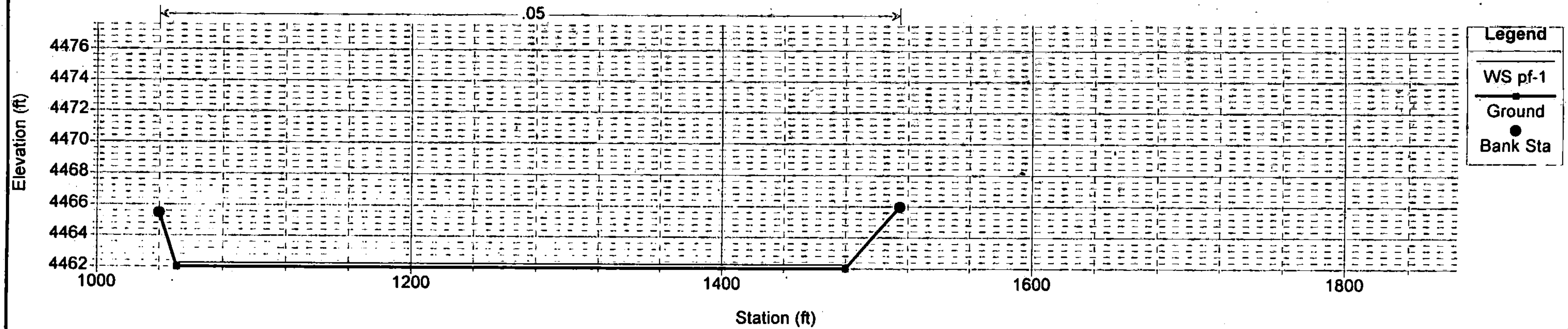
River = Whites Creek Reach = Central Channel RS = 190



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

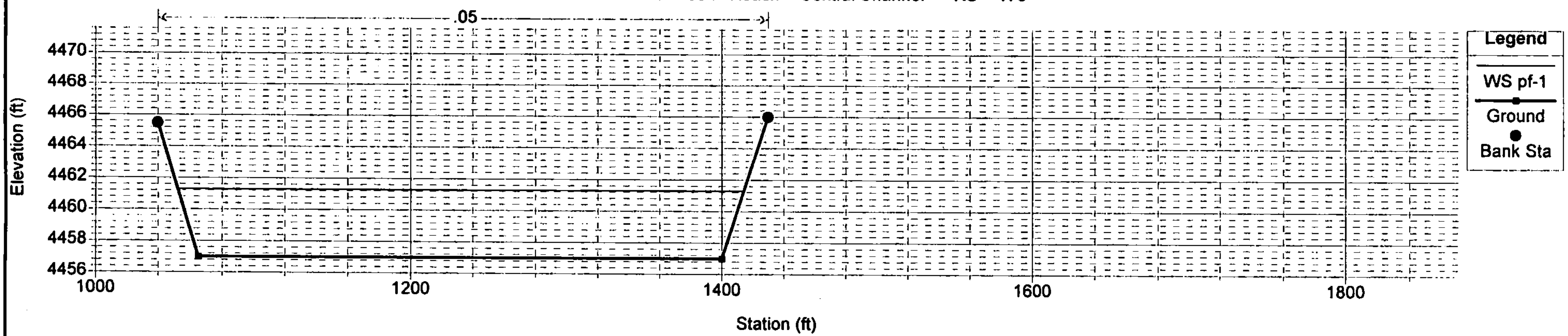
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

River = Whites Creek   Reach = Central Channel   RS = 180



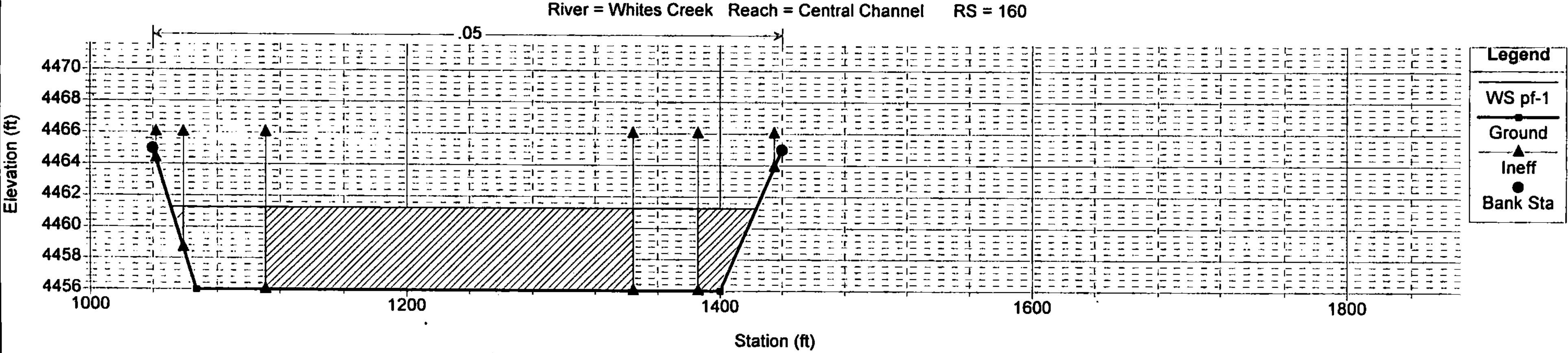
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

River = Whites Creek   Reach = Central Channel   RS = 170



Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

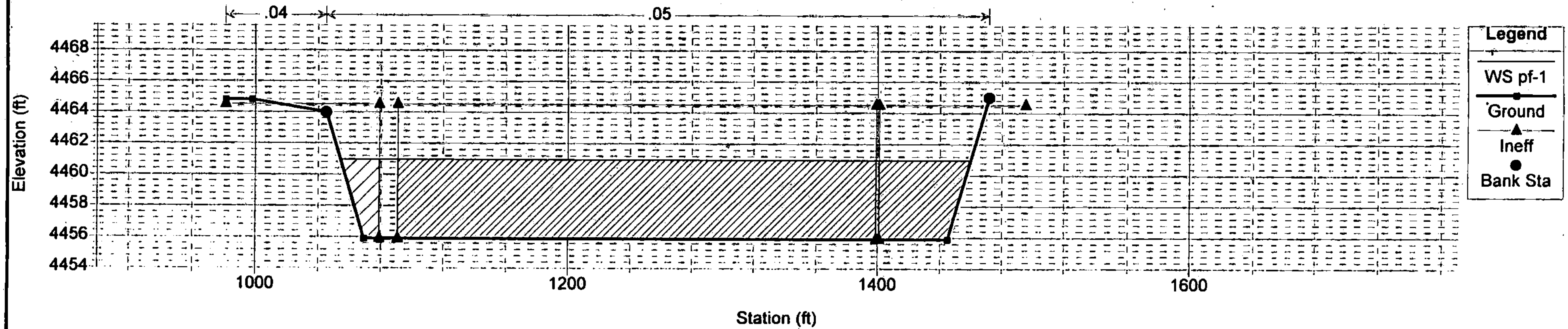
River = Whites Creek   Reach = Central Channel   RS = 160



1 in Horiz. = 100 ft   1 in Vert. = 10 ft

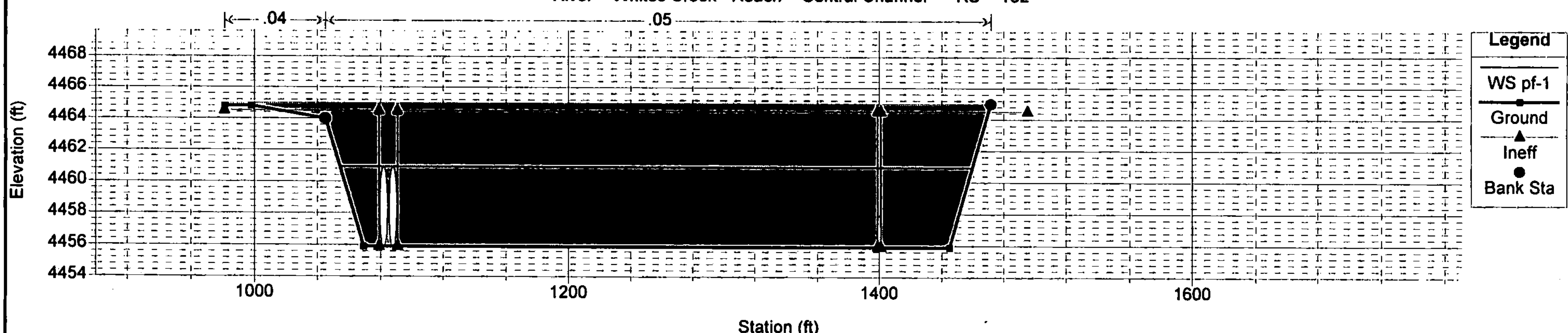
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

River = Whites Creek   Reach = Central Channel   Station 155 - Upstream end of culvert be   RS = 155



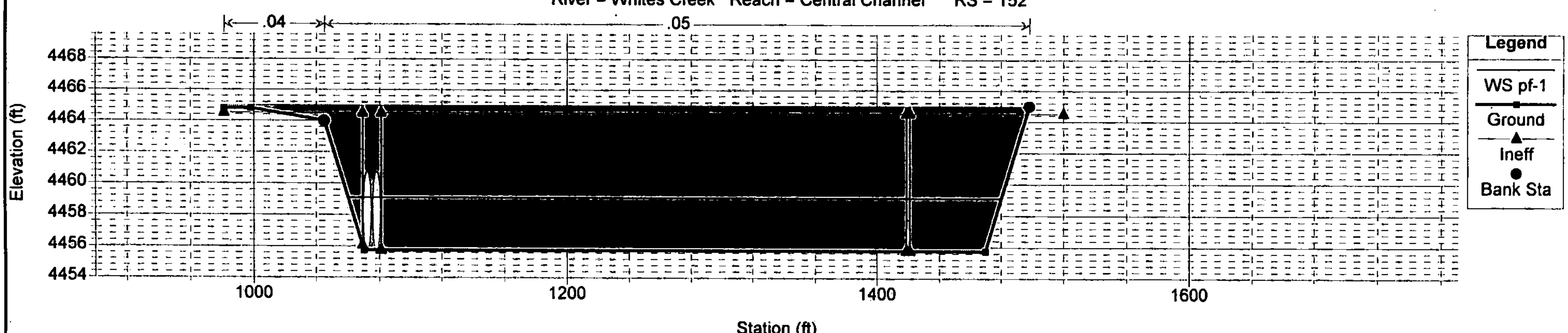
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

River = Whites Creek   Reach = Central Channel   RS = 152



Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

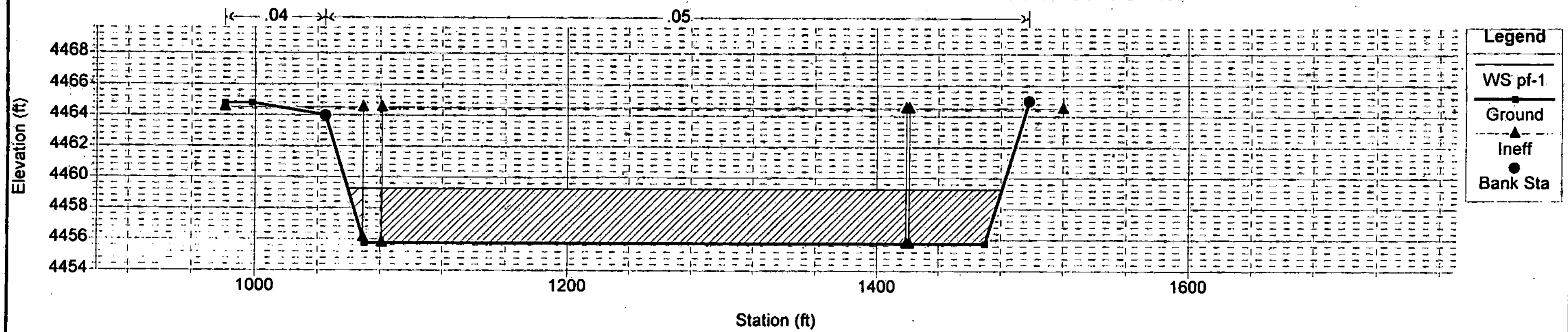
River = Whites Creek   Reach = Central Channel   RS = 152



1 in Horiz. = 100 ft   1 in Vert. = 10 ft

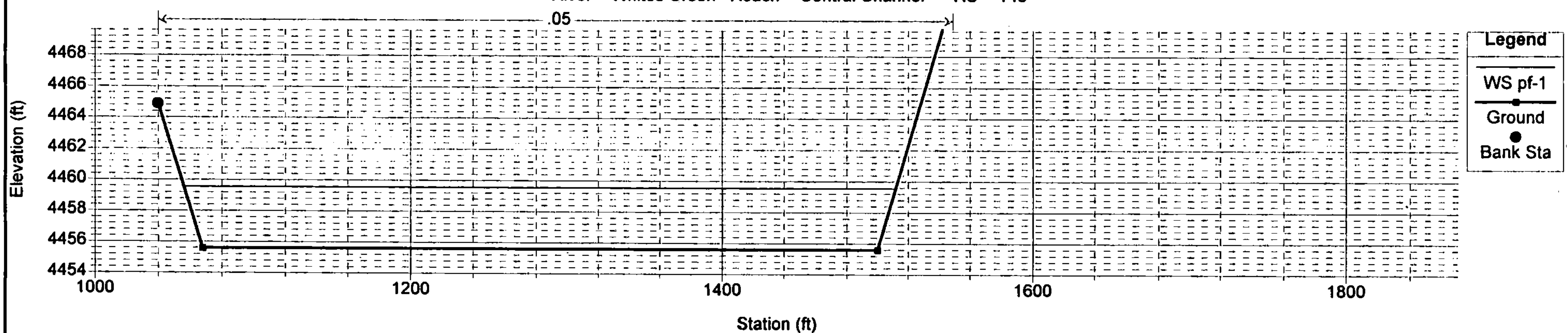
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel Station 150 - Downstream end of culvert RS = 150



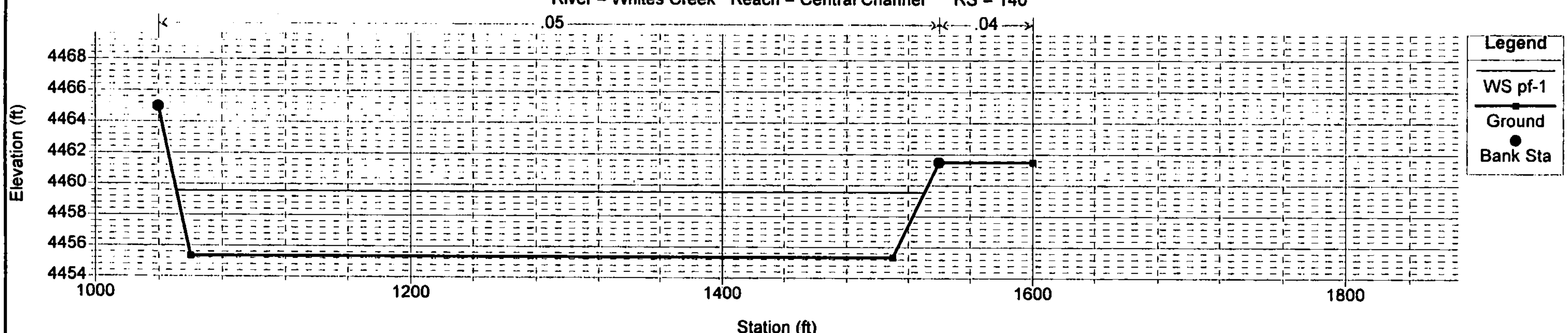
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel RS = 145



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

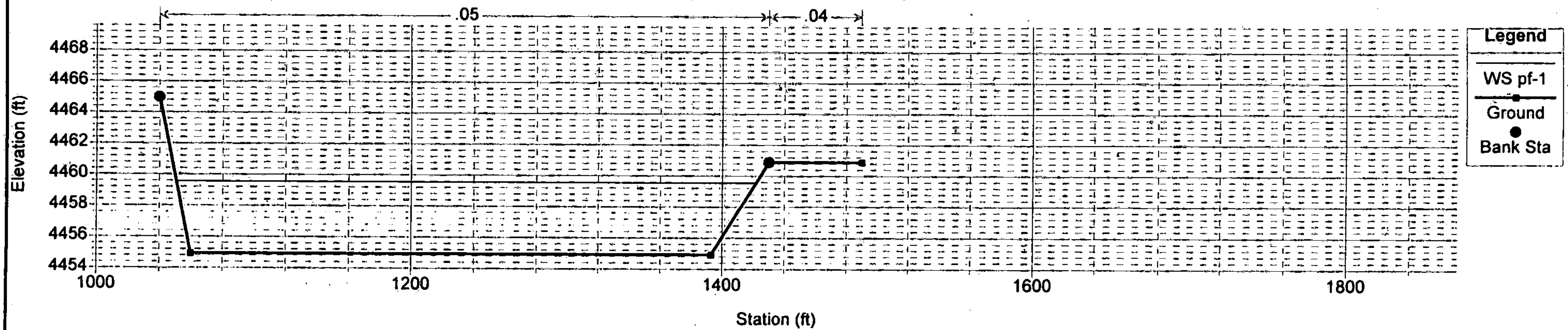
River = Whites Creek Reach = Central Channel RS = 140



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

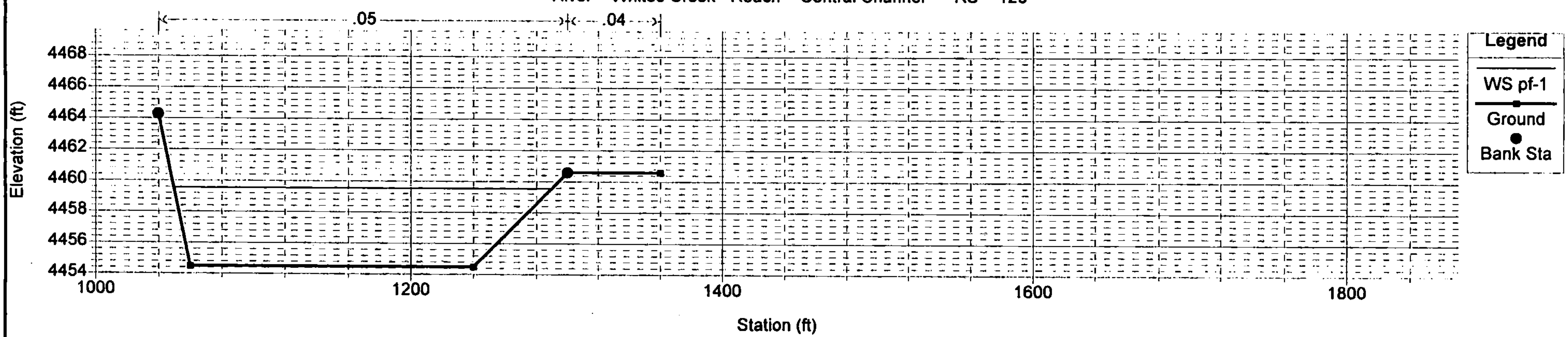
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel RS = 130



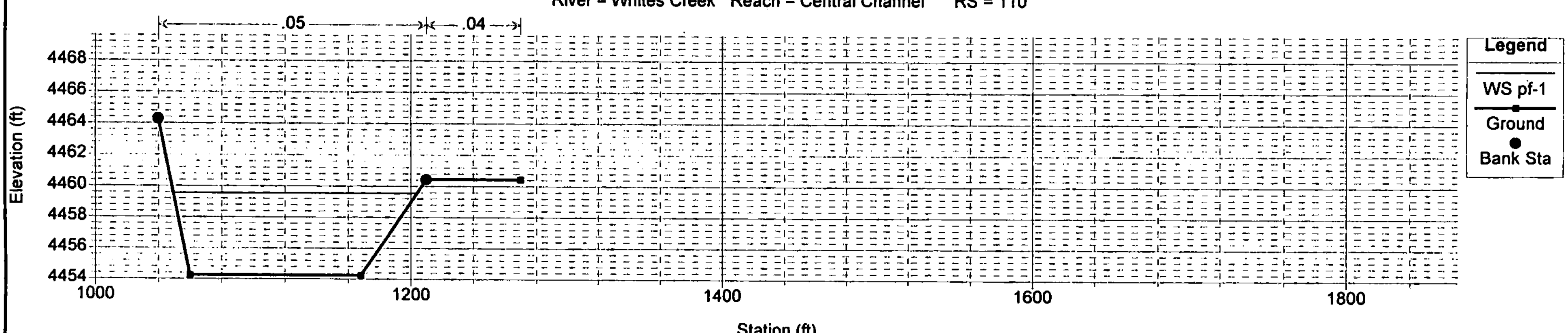
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

River = Whites Creek Reach = Central Channel RS = 120



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/4/00

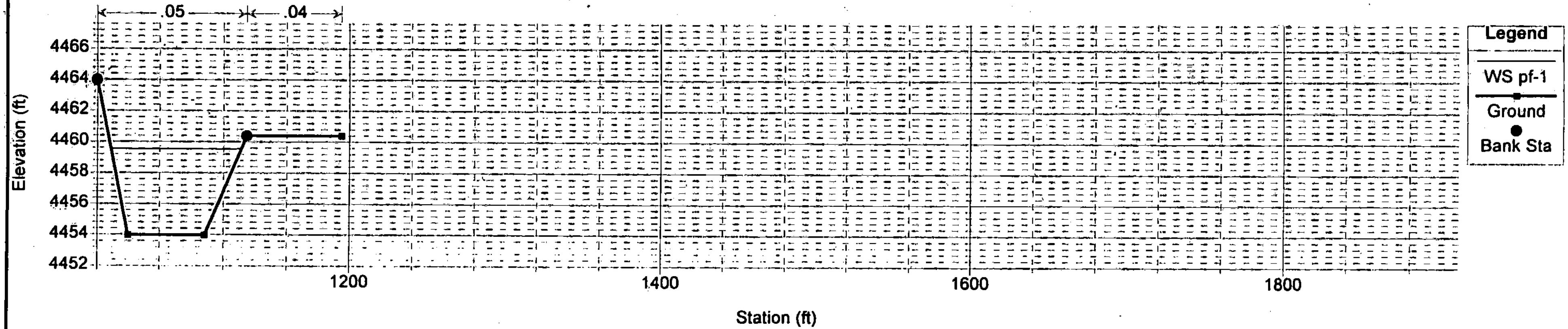
River = Whites Creek Reach = Central Channel RS = 110



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

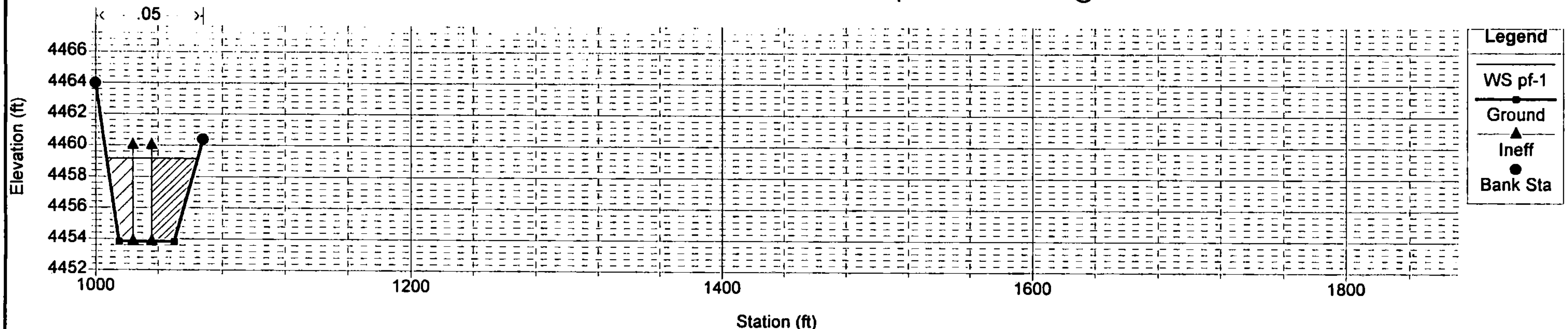
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

River = Whites Creek   Reach = Central Channel   RS = 105



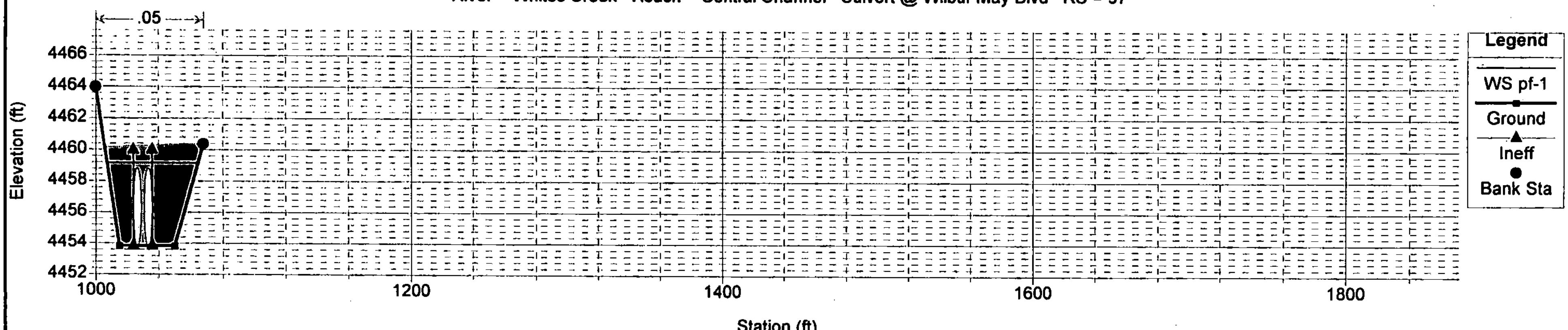
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

River = Whites Creek   Reach = Central Channel   Station 100 - Upstream end of culvert @   RS = 100



Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/4/00

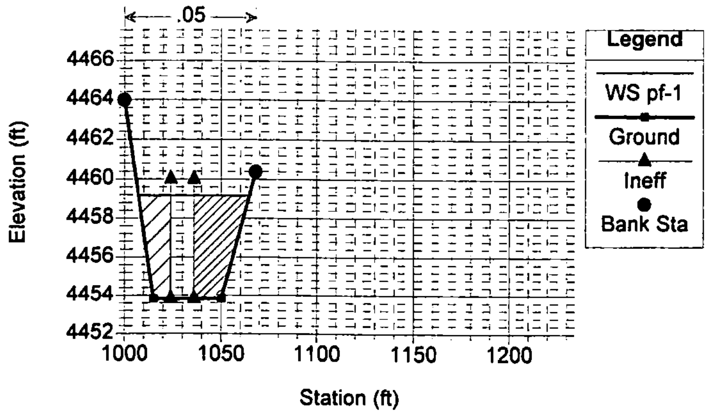
River = Whites Creek   Reach = Central Channel   Culvert @ Wilbur May Blvd   RS = 97



1 in Horiz. = 100 ft   1 in Vert. = 10 ft

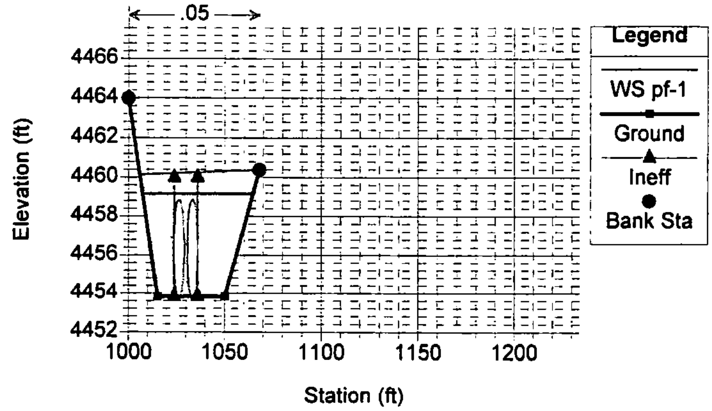
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 100 - Upstream end of culvert @ RS = 100



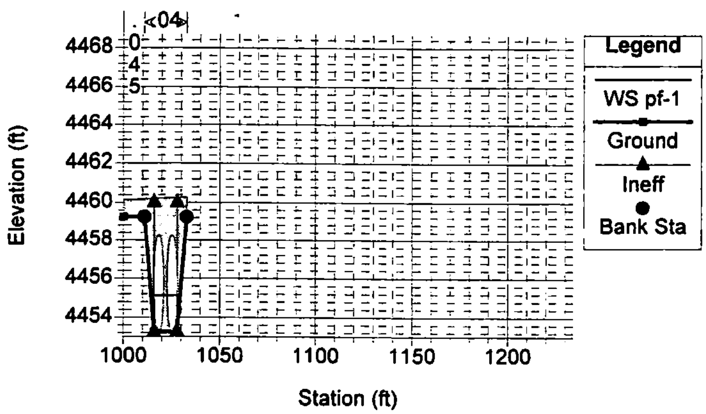
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Culvert @ Wilbur May Blvd RS = 97



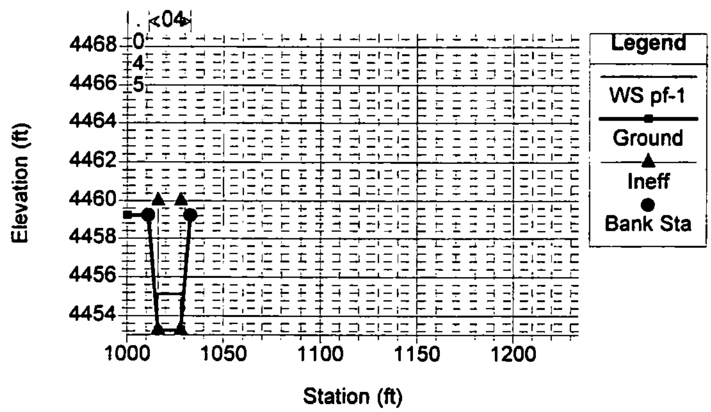
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Culvert @ Wilbur May Blvd RS = 97



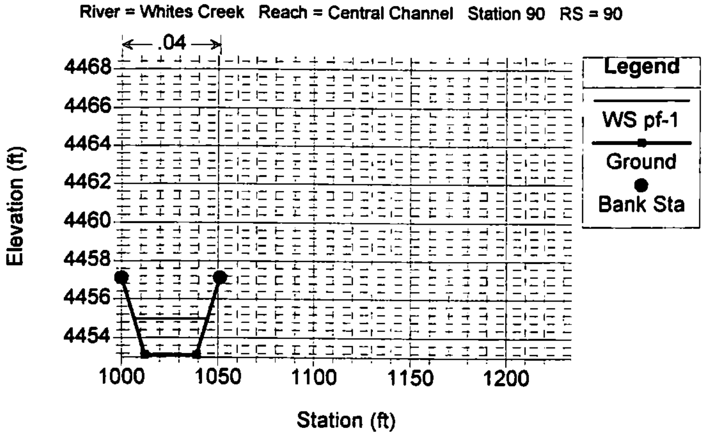
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 95 - Downstream end of culvert @ RS = 95



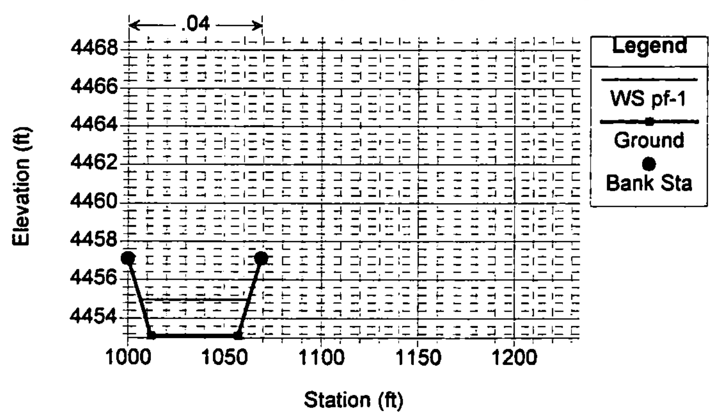
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 90 RS = 90



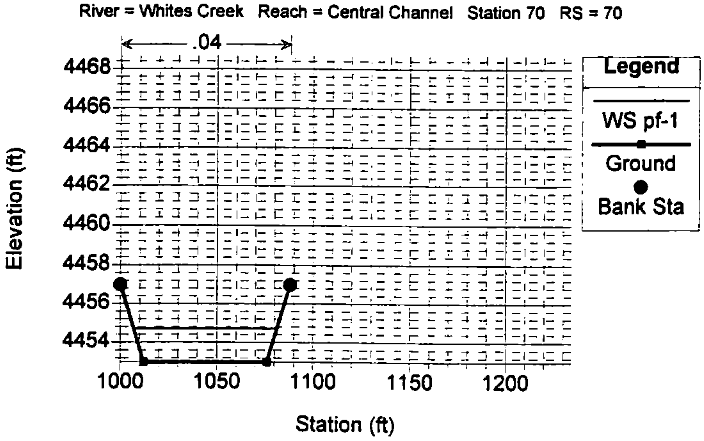
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 80 RS = 80



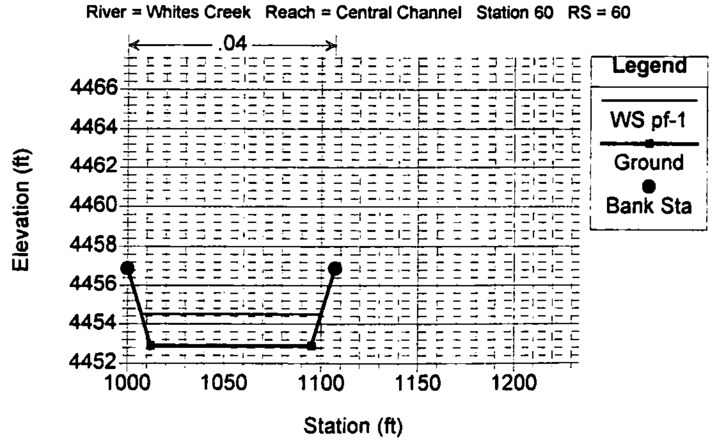
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 70 RS = 70



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

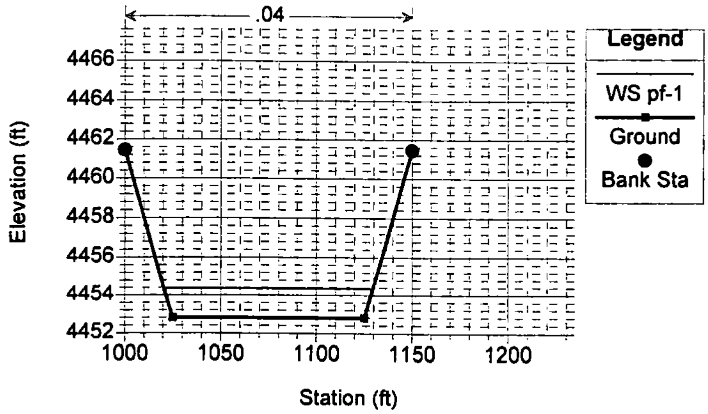
River = Whites Creek Reach = Central Channel Station 60 RS = 60



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

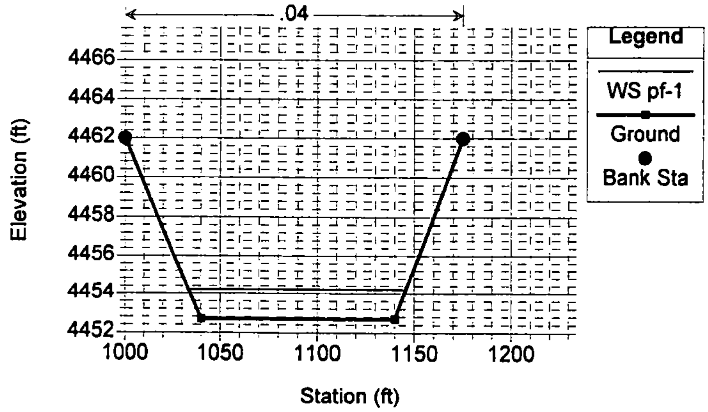
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 50 (33+00) - Entrance of Central RS = 50



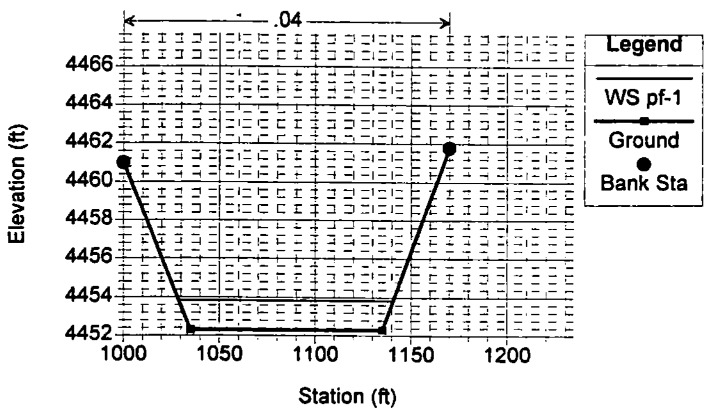
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 40 (34+00) RS = 40



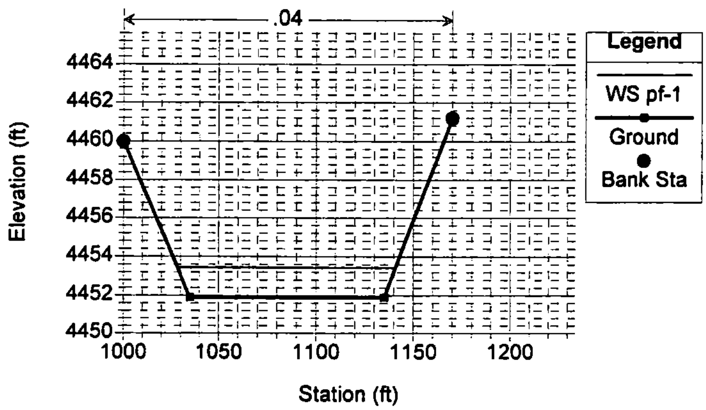
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 30 (35+00) RS = 30



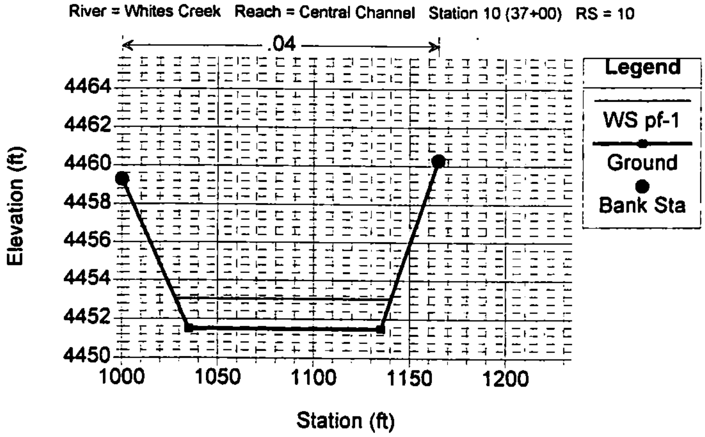
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 20 (36+00) RS = 20



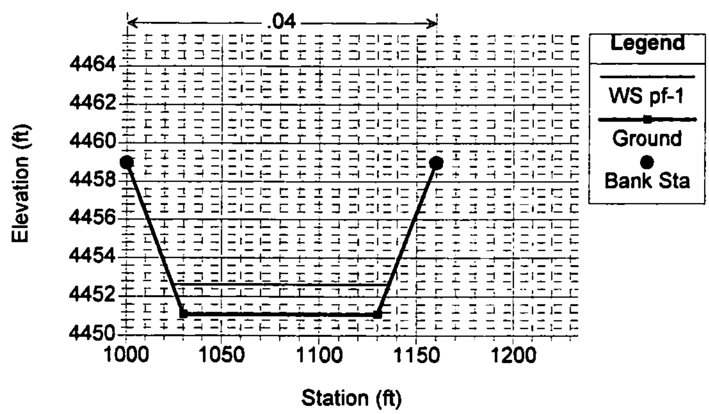
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 10 (37+00) RS = 10



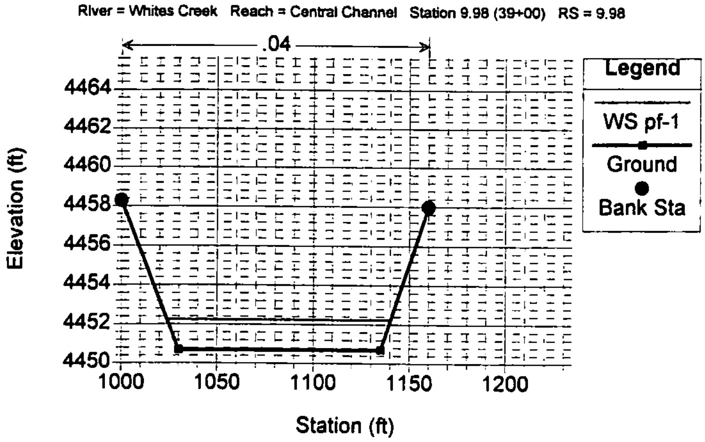
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.99 (38+00) RS = 9.99



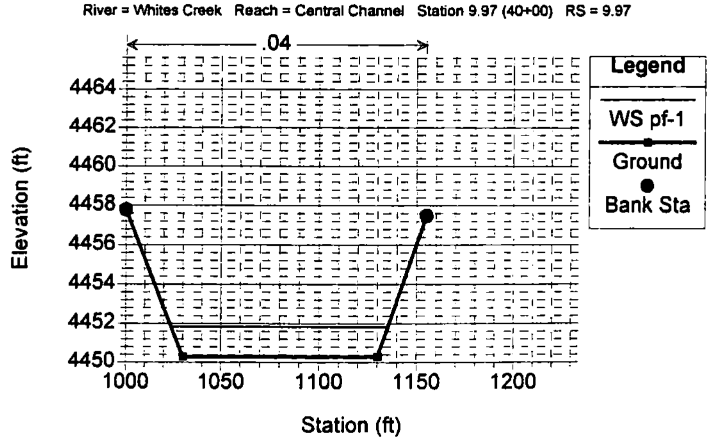
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.98 (39+00) RS = 9.98



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

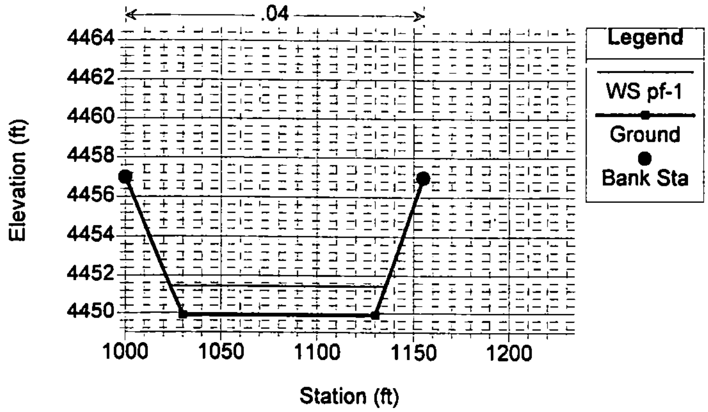
River = Whites Creek Reach = Central Channel Station 9.97 (40+00) RS = 9.97



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

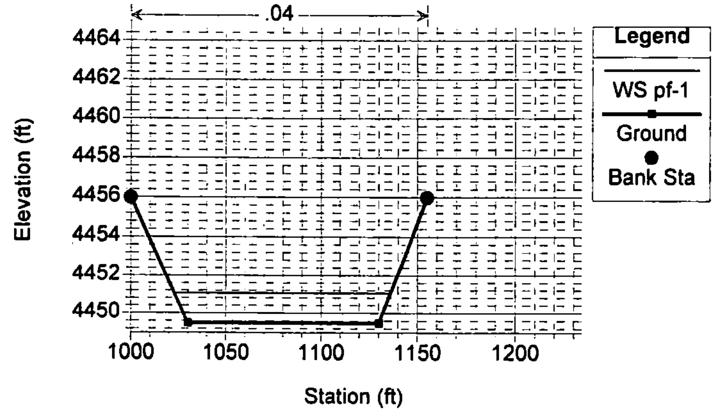
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   Station 9.96 (41+00)   RS = 9.96



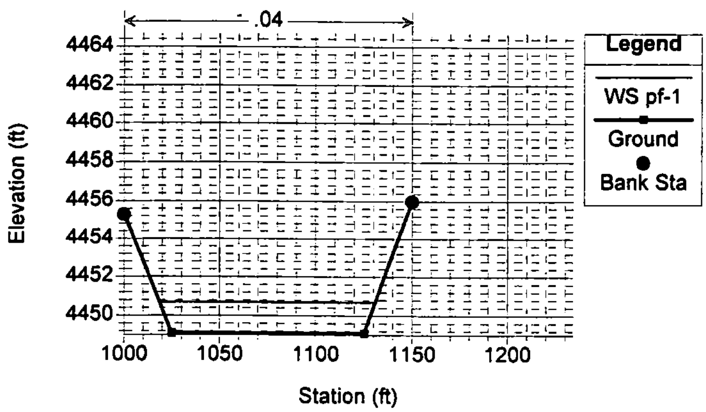
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   Station 9.95 (42+00)   RS = 9.95



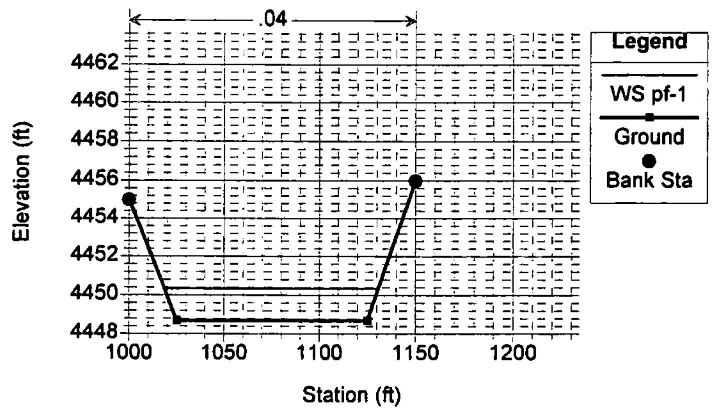
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   Station 9.94 (43+00)   RS = 9.94



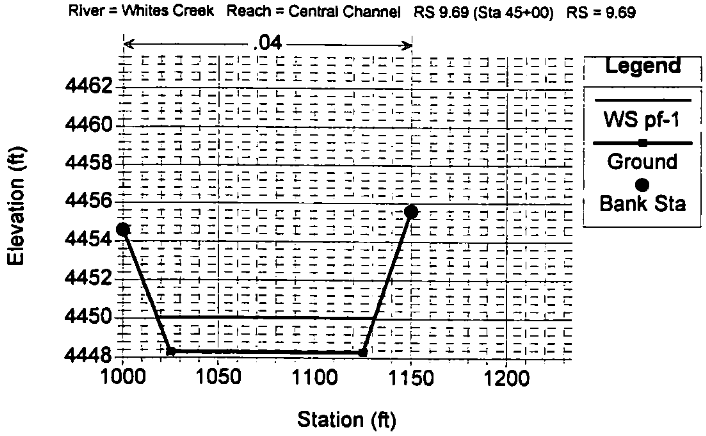
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   Mackay & Shomps point E2 (Sta 44+00)   RS = 9.7



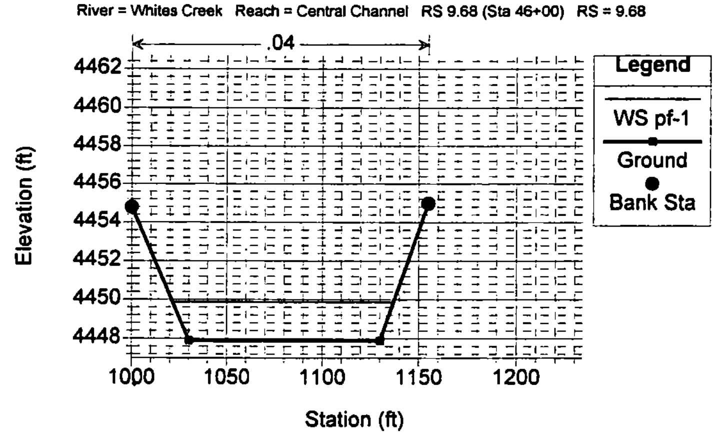
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   RS 9.69 (Sta 45+00)   RS = 9.69



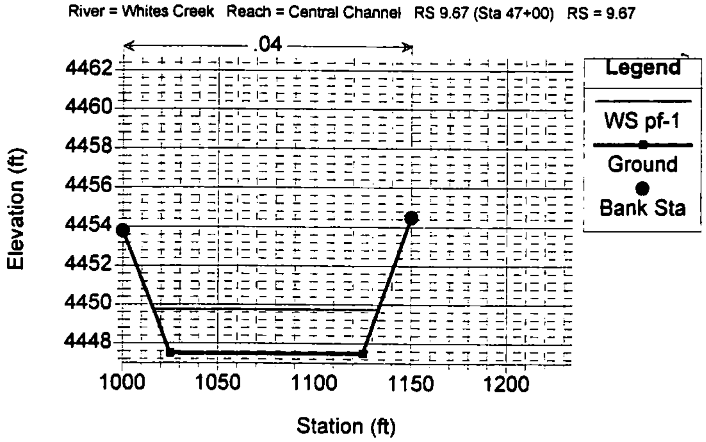
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   RS 9.68 (Sta 46+00)   RS = 9.68



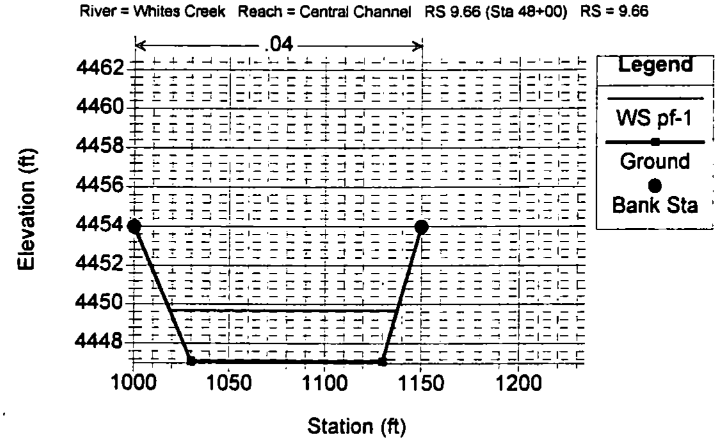
Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

River = Whites Creek   Reach = Central Channel   RS 9.67 (Sta 47+00)   RS = 9.67



Double D-Carat Ave w/ 5 RCP Culverts   Central Chan. to Carat Ave-5 RCP Culverts   4/6/00

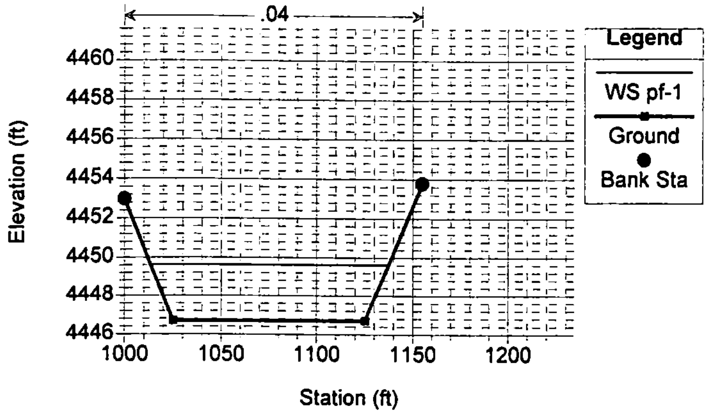
River = Whites Creek   Reach = Central Channel   RS 9.66 (Sta 48+00)   RS = 9.66



1 in Horiz. = 100 ft   1 in Vert. = 10 ft

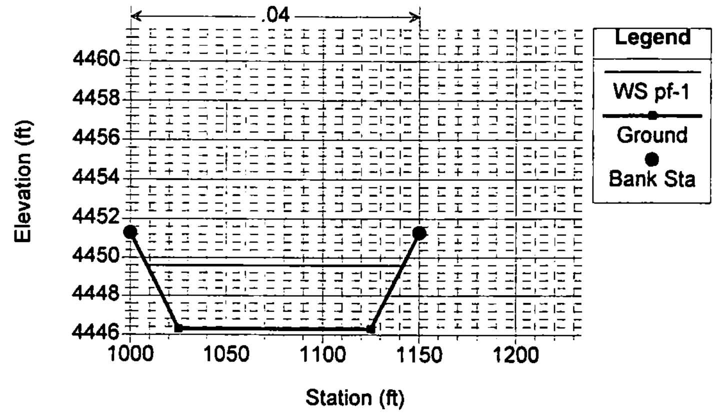
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.65 (Sta 49+00) RS = 9.65



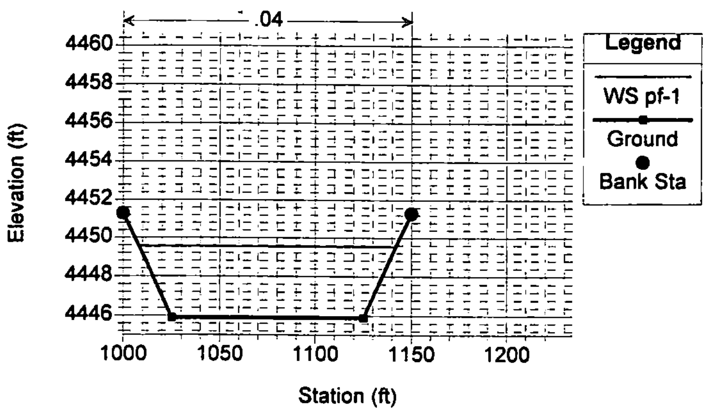
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.64 (Sta 50+00) RS = 9.64



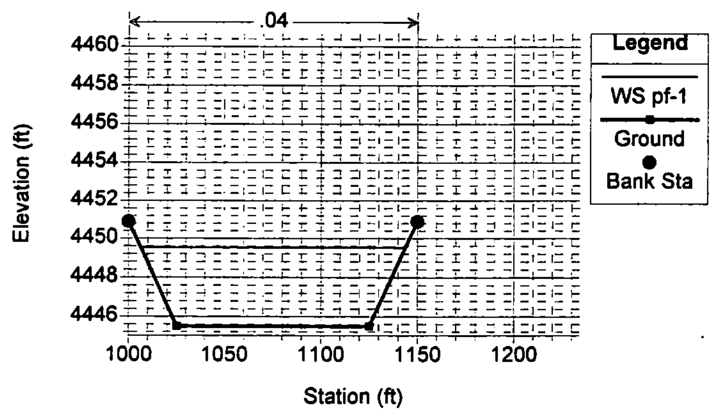
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Mackay & Somps point E4 (Sta 51+00) RS = 9.5



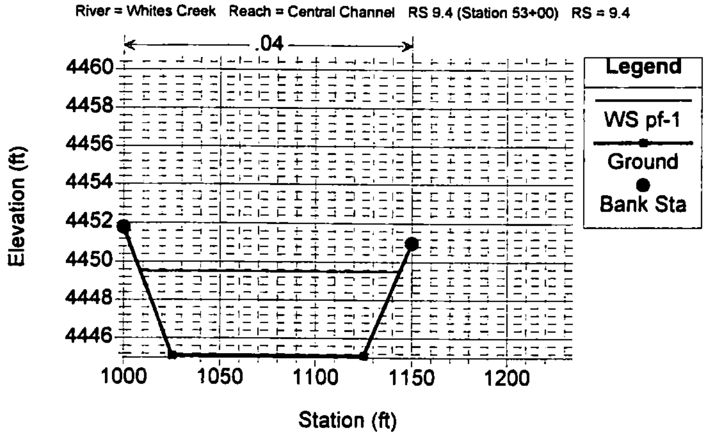
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.45 (Sta 52+00) RS = 9.45



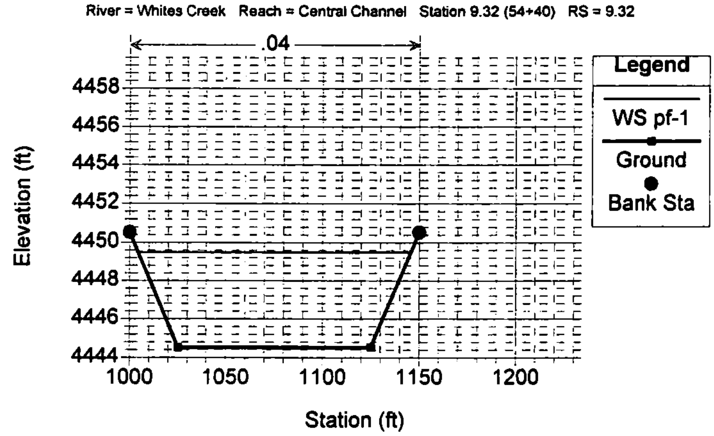
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.4 (Station 53+00) RS = 9.4



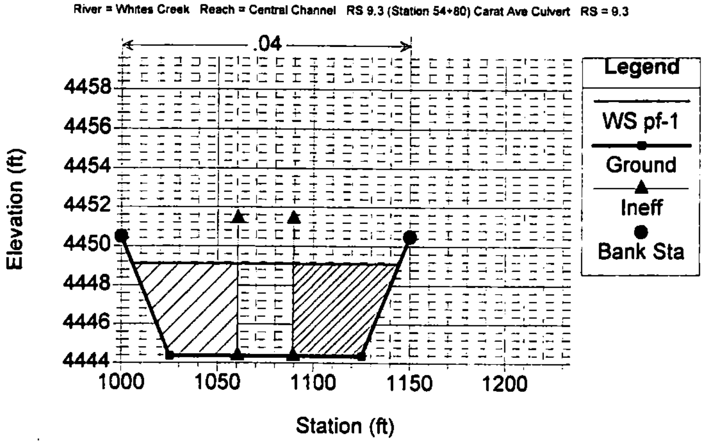
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.32 (54+40) RS = 9.32



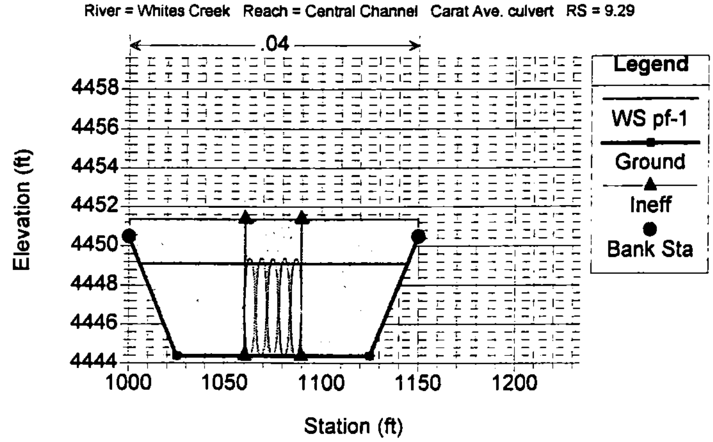
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.3 (Station 54+80) Carat Ave Culvert RS = 9.3



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

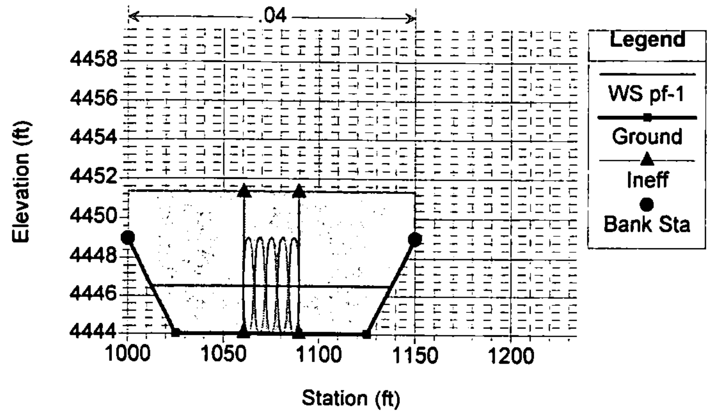
River = Whites Creek Reach = Central Channel Carat Ave. culvert RS = 9.29



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

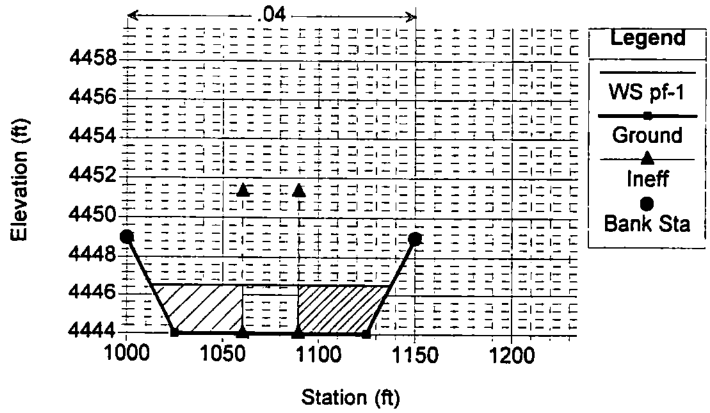
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Carat Ave. culvert RS = 9.29



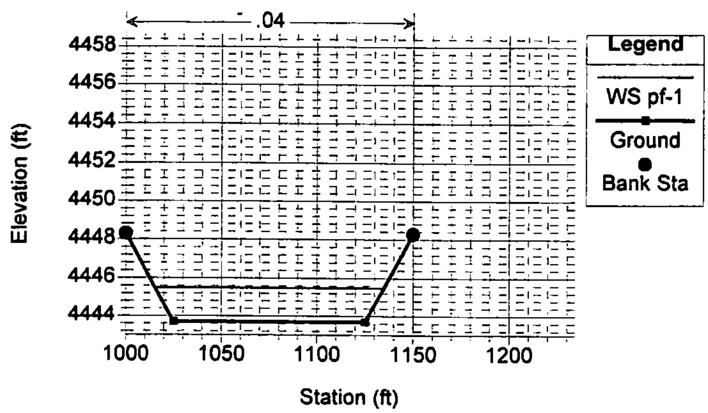
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.2 (Station 55+70) Carat Ave Culvert RS = 9.2



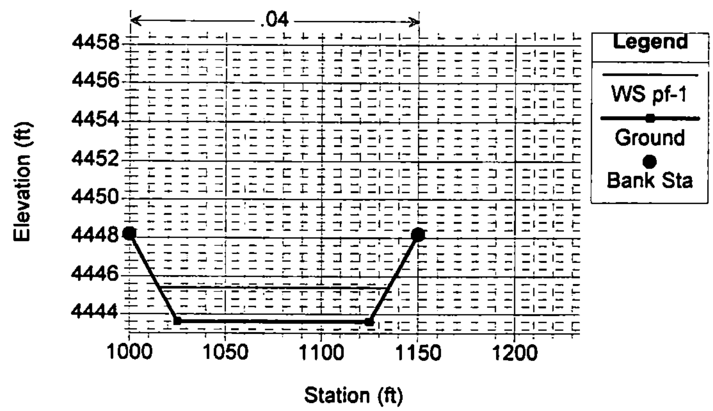
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.05 (56+50) RS = 9.05



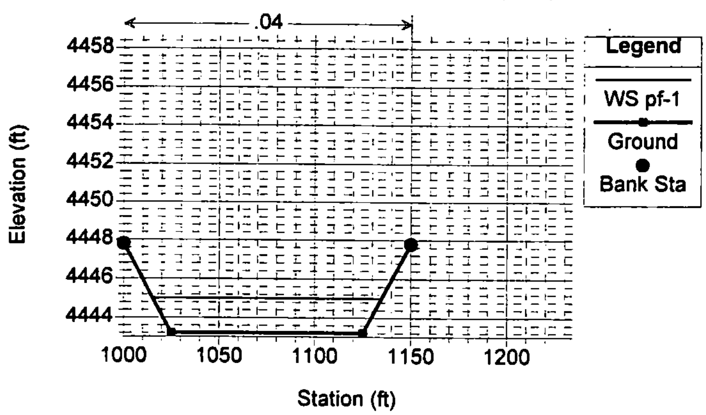
Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9 (56+70) RS = 9



Double D-Carat Ave w/ 5 RCP Culverts Central Chan. to Carat Ave-5 RCP Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 8.8 (57+70) RS = 8.8



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

HEC-RAS Plan: DDCarat-5RCP River: Whites Creek Reach: Central Channel

Reach	River Sta	Q Total	Length Chnl	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)	(ft/s)	(sq ft)	(ft)	
Central Channel	220	300.00	10.00	4466.00	4467.53	4467.01	4467.73	0.009187	3.55	84.47	60.22	0.53
Central Channel	219.2*	300.00	10.00	4465.92	4467.44		4467.64	0.009489	3.59	83.59	60.11	0.54
ntral Channel	218.4*	300.00	10.00	4465.84	4467.33		4467.54	0.009914	3.64	82.43	59.97	0.55
ntral Channel	217.6*	300.00	10.00	4465.76	4467.22		4467.43	0.010735	3.73	80.37	59.75	0.57
Central Channel	216.8*	300.00	10.00	4465.68	4467.08		4467.31	0.012353	3.90	76.86	59.40	0.60
Central Channel	216	300.00	9.17	4465.60	4466.82		4467.13	0.019582	4.51	66.45	58.35	0.75
Central Channel	215.666*	300.00	9.17	4465.55	4466.69		4466.93	0.016414	4.00	75.04	69.36	0.68
Central Channel	215.333*	300.00	9.17	4465.50	4466.57		4466.77	0.014466	3.63	82.71	80.52	0.63
Central Channel	215.*	300.00	9.17	4465.45	4466.45		4466.63	0.013234	3.35	89.49	91.78	0.60
Central Channel	214.666*	300.00	9.17	4465.40	4466.35		4466.50	0.012517	3.15	95.31	103.10	0.58
Central Channel	214.333*	300.00	9.17	4465.35	4466.24		4466.38	0.012310	3.00	99.87	114.48	0.57
Central Channel	214	300.00	10.00	4465.30	4465.89	4465.87	4466.15	0.040588	4.15	72.22	124.73	0.96
Central Channel	213.*	300.00	10.00	4465.22	4465.71		4465.81	0.018375	2.49	120.49	247.79	0.63
Central Channel	212.*	300.00	10.00	4465.15	4465.57		4465.63	0.013831	1.95	154.15	370.85	0.53
Central Channel	211.*	300.00	10.00	4465.08	4465.44		4465.49	0.012195	1.67	179.52	493.94	0.49
Central Channel	210	300.00	10.00	4465.00	4465.34		4465.37	0.009827	1.43	209.37	617.15	0.43
Central Channel	209.*	300.00	10.00	4464.90	4465.24		4465.27	0.009802	1.44	208.65	610.67	0.43
Central Channel	208.*	300.00	10.00	4464.80	4465.14		4465.18	0.009780	1.44	207.90	604.18	0.43
Central Channel	207.*	300.00	10.00	4464.70	4465.05		4465.08	0.009808	1.45	206.83	597.70	0.43
Central Channel	206.*	300.00	10.00	4464.60	4464.95		4464.98	0.009793	1.46	206.02	591.21	0.43
Central Channel	205.*	300.00	10.00	4464.50	4464.85		4464.89	0.009738	1.46	205.46	584.73	0.43
Central Channel	204.*	300.00	10.00	4464.40	4464.75		4464.79	0.009732	1.47	204.59	578.25	0.43
Central Channel	203.*	300.00	10.00	4464.30	4464.66		4464.69	0.009686	1.47	203.96	571.76	0.43
Central Channel	202.*	300.00	10.00	4464.20	4464.56		4464.59	0.009732	1.48	202.74	565.28	0.44
Central Channel	201.*	300.00	10.00	4464.10	4464.46		4464.50	0.009782	1.49	201.49	558.79	0.44
Central Channel	200	300.00	10.00	4464.00	4464.36		4464.39	0.010244	1.52	197.80	552.27	0.45
Central Channel	199.*	300.00	10.00	4463.90	4464.26		4464.29	0.010242	1.51	199.07	561.14	0.45
Central Channel	198.*	300.00	10.00	4463.80	4464.15		4464.19	0.010201	1.50	200.56	570.02	0.44
Central Channel	197.*	300.00	10.00	4463.70	4464.05		4464.08	0.010216	1.49	201.72	578.89	0.44
Central Channel	196.*	300.00	10.00	4463.60	4463.95		4463.98	0.010238	1.48	202.82	587.76	0.44
Central Channel	195.*	300.00	10.00	4463.50	4463.84		4463.88	0.010220	1.47	204.14	596.64	0.44
Central Channel	194.*	300.00	10.00	4463.40	4463.74		4463.77	0.010209	1.46	205.42	605.51	0.44
Central Channel	193.*	300.00	10.00	4463.30	4463.64		4463.67	0.010156	1.45	206.94	614.39	0.44
Central Channel	192.*	300.00	10.00	4463.20	4463.53		4463.57	0.010208	1.44	207.82	623.26	0.44
Central Channel	191.*	300.00	10.00	4463.10	4463.43		4463.46	0.010217	1.44	208.94	632.14	0.44
Central Channel	190	300.00	10.00	4463.00	4463.34		4463.37	0.009416	1.39	215.32	641.07	0.42
ntral Channel	189.*	300.00	10.00	4462.90	4463.24		4463.27	0.009368	1.41	212.82	620.20	0.42
entral Channel	188.*	300.00	10.00	4462.80	4463.15		4463.18	0.009227	1.42	210.88	599.37	0.42
Central Channel	187.*	300.00	10.00	4462.70	4463.06		4463.09	0.009089	1.44	208.87	578.56	0.42
Central Channel	186.*	300.00	10.00	4462.60	4462.97		4463.00	0.009035	1.45	206.20	557.76	0.42
Central Channel	185.*	300.00	10.00	4462.50	4462.88		4462.91	0.008948	1.47	203.69	537.01	0.42
Central Channel	184.*	300.00	10.00	4462.40	4462.79		4462.82	0.008907	1.49	200.78	516.29	0.42
Central Channel	183.*	300.00	10.00	4462.30	4462.70		4462.74	0.008807	1.51	198.20	495.64	0.42
Central Channel	182.*	300.00	10.00	4462.20	4462.61		4462.65	0.008796	1.54	194.94	475.05	0.42
Central Channel	181.*	300.00	10.00	4462.10	4462.52		4462.56	0.008840	1.57	191.24	454.54	0.43
Central Channel	180	300.00	10.00	4462.00	4462.25	4462.25	4462.37	0.058383	2.82	106.36	431.94	1.00
Central Channel	179.*	300.00	10.00	4461.50	4461.65	4461.75	4461.98	0.290332	4.61	65.08	421.27	2.07
Central Channel	178.*	300.00	10.00	4461.00	4461.25	4461.25	4461.38	0.064300	2.96	101.45	412.63	1.05
Central Channel	177.*	300.00	10.00	4460.50	4461.28	4460.76	4461.29	0.001443	0.95	315.51	407.92	0.19
Central Channel	176.*	300.00	10.00	4460.00	4461.28		4461.29	0.000289	0.59	508.28	402.31	0.09
Central Channel	175.*	300.00	10.00	4459.50	4461.28		4461.28	0.000101	0.43	692.94	396.25	0.06
Central Channel	174.*	300.00	10.00	4459.00	4461.28		4461.28	0.000046	0.35	869.46	389.83	0.04
Central Channel	173.*	300.00	10.00	4458.50	4461.28		4461.28	0.000025	0.29	1037.70	383.14	0.03
Central Channel	172.*	300.00	10.00	4458.00	4461.28		4461.28	0.000015	0.25	1197.52	376.22	0.02
Central Channel	171.*	300.00	10.00	4457.50	4461.28		4461.28	0.000010	0.22	1348.82	369.12	0.02
Central Channel	170	300.00	10.00	4457.00	4461.28		4461.28	0.000007	0.20	1491.55	361.86	0.02
Central Channel	169.*	300.00	10.00	4456.90	4461.28		4461.28	0.000006	0.20	1528.05	362.80	0.02
Central Channel	168.*	300.00	10.00	4456.80	4461.28		4461.28	0.000006	0.19	1564.68	363.77	0.02
Central Channel	167.*	300.00	10.00	4456.70	4461.28		4461.28	0.000006	0.19	1601.26	364.75	0.02
Central Channel	166.*	300.00	10.00	4456.60	4461.28		4461.28	0.000005	0.18	1638.15	365.76	0.02
Central Channel	165.*	300.00	10.00	4456.50	4461.28		4461.28	0.000005	0.18	1675.17	366.80	0.01
Central Channel	164.*	300.00	10.00	4456.40	4461.28		4461.28	0.000004	0.18	1712.34	367.85	0.01
Central Channel	163.*	300.00	10.00	4456.30	4461.28		4461.28	0.000004	0.17	1749.65	368.94	0.01
Central Channel	162.*	300.00	10.00	4456.20	4461.28		4461.28	0.000004	0.17	1786.93	370.04	0.01
Central Channel	161.*	300.00	10.00	4456.10	4461.28		4461.28	0.000004	0.16	1824.53	371.16	0.01
Central Channel	160	300.00	10.00	4456.00	4461.27	4456.72	4461.28	0.000049	0.62	485.17	372.27	0.05
Central Channel	157.5*	300.00	10.00	4455.95	4461.28		4461.28	0.000003	0.15	1983.70	390.11	0.01
Central Channel	155	300.00	30.00	4455.90	4460.97	4458.32	4461.26	0.002317	4.22	71.03	406.09	0.33
Central Channel	152	Mult Open										
Central Channel	150	300.00	10.00	4455.75	4459.26	4458.18	4459.84	0.008024	6.12	49.01	421.27	0.58
entral Channel	148.75*	300.00	10.00	4455.71	4459.55		4459.55	0.000007	0.19	1612.19	431.18	0.02
entral Channel	147.5*	300.00	10.00	4455.67	4459.55		4459.55	0.000006	0.18	1660.41	439.37	0.02
Central Channel	146.25*	300.00	10.00	4455.64	4459.55		4459.55	0.000006	0.18	1704.74	447.52	0.02
Central Channel	145.	300.00	10.00	4455.60	4459.55		4459.55	0.000006	0.17	1754.18	455.71	0.02
Central Channel	144.166*	300.00	10.00	4455.56	4459.55		4459.55	0.000005	0.17	1784.17	458.83	0.02
Central Channel	143.333*	300.00	10.00	4455.52	4459.55		4459.55	0.000005	0.17	1814.72	462.11	0.01
Central Channel	142.5*	300.00	10.00	4455.48	4459.55		4459.55	0.000005	0.16	1845.94	465.59	0.01

HEC-RAS Plan: DDCarat-5RCP River: Whites Creek Reach: Central Channel (Continued)

Reach	River Sta	Q Total	Length Chnl	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)	(ft/s)	(sq ft)	(ft)	
Central Channel	141.666*	300.00	10.00	4455.43	4459.55		4459.55	0.000005	0.16	1882.64	469.44	0.01
Central Channel	140.833*	300.00	10.00	4455.39	4459.55		4459.55	0.000004	0.16	1916.28	473.82	0.01
Central Channel	140	300.00	10.00	4455.35	4459.55		4459.55	0.000004	0.15	1952.33	479.21	0.01
Central Channel	139.*	300.00	10.00	4455.31	4459.55		4459.55	0.000004	0.16	1922.99	468.30	0.01
Central Channel	138.*	300.00	10.00	4455.27	4459.55		4459.55	0.000004	0.16	1892.76	457.41	0.01
Central Channel	137.*	300.00	10.00	4455.22	4459.55		4459.55	0.000004	0.16	1865.93	446.56	0.01
Central Channel	136.*	300.00	10.00	4455.18	4459.55		4459.55	0.000004	0.16	1833.85	435.69	0.01
Central Channel	135.*	300.00	10.00	4455.14	4459.55		4459.55	0.000005	0.17	1800.89	424.84	0.01
Central Channel	134.*	300.00	10.00	4455.10	4459.55		4459.55	0.000005	0.17	1767.07	414.00	0.01
Central Channel	133.*	300.00	10.00	4455.06	4459.55		4459.55	0.000005	0.17	1732.37	403.18	0.01
Central Channel	132.*	300.00	10.00	4455.01	4459.55		4459.55	0.000005	0.18	1700.70	392.40	0.01
Central Channel	131.*	300.00	10.00	4454.97	4459.55		4459.55	0.000005	0.18	1663.98	381.61	0.02
Central Channel	130	300.00	10.00	4454.93	4459.55		4459.55	0.000005	0.18	1626.57	370.83	0.02
Central Channel	129.*	300.00	10.00	4454.89	4459.55		4459.55	0.000006	0.19	1574.22	357.63	0.02
Central Channel	128.*	300.00	10.00	4454.84	4459.55		4459.55	0.000006	0.20	1524.18	344.48	0.02
Central Channel	127.*	300.00	10.00	4454.80	4459.55		4459.55	0.000007	0.20	1469.52	331.33	0.02
Central Channel	126.*	300.00	10.00	4454.76	4459.55		4459.55	0.000007	0.21	1413.79	318.20	0.02
Central Channel	125.*	300.00	10.00	4454.71	4459.55		4459.55	0.000008	0.22	1359.78	305.13	0.02
Central Channel	124.*	300.00	10.00	4454.67	4459.55		4459.55	0.000008	0.23	1301.74	292.05	0.02
Central Channel	123.*	300.00	10.00	4454.63	4459.55		4459.55	0.000009	0.24	1242.64	279.00	0.02
Central Channel	122.*	300.00	10.00	4454.59	4459.55		4459.55	0.000010	0.25	1182.45	265.96	0.02
Central Channel	121.*	300.00	10.00	4454.54	4459.55		4459.55	0.000011	0.27	1123.45	252.99	0.02
Central Channel	120	300.00	10.00	4454.50	4459.55		4459.55	0.000013	0.28	1060.98	240.00	0.02
Central Channel	118.333*	300.00	10.00	4454.46	4459.55		4459.55	0.000014	0.30	1002.61	225.78	0.03
Central Channel	116.666*	300.00	10.00	4454.42	4459.55		4459.55	0.000016	0.32	943.33	211.60	0.03
Central Channel	115.*	300.00	10.00	4454.38	4459.55		4459.55	0.000018	0.34	882.72	197.32	0.03
Central Channel	113.333*	300.00	10.00	4454.33	4459.55		4459.55	0.000021	0.36	822.67	183.10	0.03
Central Channel	111.666*	300.00	10.00	4454.29	4459.55		4459.55	0.000024	0.39	759.54	168.76	0.03
Central Channel	110	300.00	10.00	4454.25	4459.55		4459.55	0.000029	0.43	695.46	154.45	0.04
Central Channel	109.285*	300.00	10.00	4454.21	4459.55		4459.55	0.000033	0.46	650.39	144.21	0.04
Central Channel	108.571*	300.00	10.00	4454.17	4459.55		4459.55	0.000038	0.50	604.42	133.92	0.04
Central Channel	107.857*	300.00	10.00	4454.13	4459.55		4459.55	0.000045	0.54	557.83	123.66	0.04
Central Channel	107.142*	300.00	10.00	4454.10	4459.55		4459.55	0.000054	0.59	509.36	113.37	0.05
Central Channel	106.428*	300.00	10.00	4454.06	4459.54		4459.55	0.000067	0.65	461.30	103.10	0.05
Central Channel	105.714*	300.00	10.00	4454.02	4459.54		4459.55	0.000084	0.73	412.29	92.77	0.06
Central Channel	105	300.00	8.33	4453.98	4459.54		4459.55	0.000111	0.83	362.58	82.47	0.07
Central Channel	103.333*	300.00	8.33	4453.93	4459.54		4459.55	0.000132	0.90	331.63	74.66	0.08
Central Channel	101.666*	300.00	8.33	4453.88	4459.53		4459.55	0.000160	1.00	299.97	66.84	0.08
Central Channel	100	300.00	115.00	4453.83	4459.17	4456.51	4459.51	0.002659	4.68	64.08	57.51	0.36
Central Channel	97	Culvert										
Central Channel	95	300.00	110.00	4453.25	4455.14	4455.93	4457.86	0.054386	13.24	22.66	15.15	0.36
Central Channel	90	300.00	30.00	4453.14	4454.99	4454.61	4455.37	0.010019	4.99	60.13	38.09	0.70
Central Channel	80	300.00	100.00	4453.11	4454.97		4455.13	0.003724	3.18	94.35	56.19	0.43
Central Channel	70	300.00	100.00	4453.00	4454.71		4454.81	0.002534	2.54	118.25	74.26	0.35
Central Channel	60	300.00	100.00	4452.90	4454.52		4454.59	0.001841	2.11	142.12	92.71	0.30
Central Channel	50	300.00	100.00	4452.80	4454.37		4454.42	0.001417	1.83	163.98	109.05	0.26
Central Channel	40	300.00	100.00	4452.70	4454.22		4454.27	0.001561	1.86	161.04	112.24	0.27
Central Channel	30	500.00	100.00	4452.30	4453.85		4454.00	0.004009	3.04	164.73	111.98	0.44
Central Channel	20	500.00	100.00	4451.90	4453.45		4453.60	0.003995	3.03	165.24	112.57	0.44
Central Channel	10	500.00	100.00	4451.50	4453.05		4453.19	0.004039	3.04	164.52	112.24	0.44
Central Channel	9.99	500.00	100.00	4451.10	4452.63		4452.78	0.004214	3.08	162.08	111.63	0.45
Central Channel	9.98	500.00	100.00	4450.70	4452.25		4452.38	0.003679	2.91	171.70	116.43	0.42
Central Channel	9.97	500.00	100.00	4450.30	4451.86		4452.00	0.004003	3.04	164.61	111.62	0.44
Central Channel	9.96	500.00	100.00	4449.90	4451.46		4451.60	0.003979	3.03	165.16	112.07	0.44
Central Channel	9.95	500.00	100.00	4449.50	4451.07		4451.21	0.003877	2.99	167.13	113.26	0.43
Central Channel	9.94	500.00	100.00	4449.10	4450.69		4450.83	0.003696	2.96	168.93	112.19	0.43
Central Channel	9.7	500.00	100.00	4448.70	4450.35		4450.48	0.003274	2.85	175.22	112.21	0.40
Central Channel	9.69	500.00	100.00	4448.30	4450.08		4450.18	0.002562	2.64	189.25	113.13	0.36
Central Channel	9.68	500.00	100.00	4447.90	4449.88		4449.97	0.001760	2.34	213.65	115.60	0.30
Central Channel	9.67	500.00	100.00	4447.50	4449.76		4449.82	0.001137	2.04	244.83	117.01	0.25
Central Channel	9.66	500.00	100.00	4447.10	4449.68		4449.73	0.000725	1.77	281.90	118.68	0.20
Central Channel	9.65	500.00	100.00	4446.70	4449.63		4449.67	0.000463	1.52	328.13	124.01	0.17
Central Channel	9.64	500.00	100.00	4446.30	4449.60		4449.63	0.000300	1.30	384.49	133.00	0.13
Central Channel	9.5	650.00	100.00	4445.90	4449.56		4449.59	0.000359	1.52	427.52	133.85	0.15
Central Channel	9.45	650.00	100.00	4445.50	4449.53		4449.56	0.000256	1.36	478.36	137.33	0.13
Central Channel	9.4	650.00	140.00	4445.10	4449.51		4449.54	0.000191	1.25	518.77	135.16	0.11
Central Channel	9.32	650.00	40.00	4444.54	4449.49		4449.51	0.000127	1.09	597.58	141.22	0.09
Central Channel	9.3	650.00	90.00	4444.36	4449.12	4446.85	4449.47	0.002001	4.70	138.16	138.80	0.38
Central Channel	9.29	Culvert										
Central Channel	9.2	650.00	80.00	4444.02	4446.53	4446.53	4447.77	0.016858	8.92	72.90	125.24	0.99
Central Channel	9.05	650.00	20.00	4443.70	4445.50	4444.77	4445.67	0.004003	3.28	198.00	119.60	0.45
Central Channel	9	650.00	100.00	4443.62	4445.42		4445.59	0.004001	3.28	198.07	119.69	0.45
Central Channel	8.8	650.00		4443.22	4445.02	4444.29	4445.19	0.004005	3.28	198.01	119.68	0.45

HEC-RAS Plan: DDCarat-5RCP River: Whites Creek Reach: Central Channel Culvert Table

Reach	River Sta		E.G. US.	W.S. US.	E.G. IC	E.G. OC	Min Top Rd	Culv Q	Q Weir	Delta WS	Culv Vel In	Culv Vel Out
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(ft)	(ft/s)	(ft/s)
Central Channel	152	Culv Grp #1	4461.26	4460.93	4461.26	4461.23	4465.00	277.89		1.85	9.85	10.20
Central Channel	152	Culv Grp #2	4461.26	4461.19	4458.85	4461.26	4465.00	22.11		1.47	7.04	7.04
Central Channel	97	W.May-5'RCPs	4459.51	4459.17	4459.51	4459.43	4460.20	300.00		4.03	10.18	10.48
Central Channel	9.29	Carat-5'RCPs	4449.47	4449.12	4449.47	4449.45	4451.36	650.00		2.59	9.08	9.58

Option #2:

Four, 5-foot by 5-foot RCB Culverts

at Carat Avenue

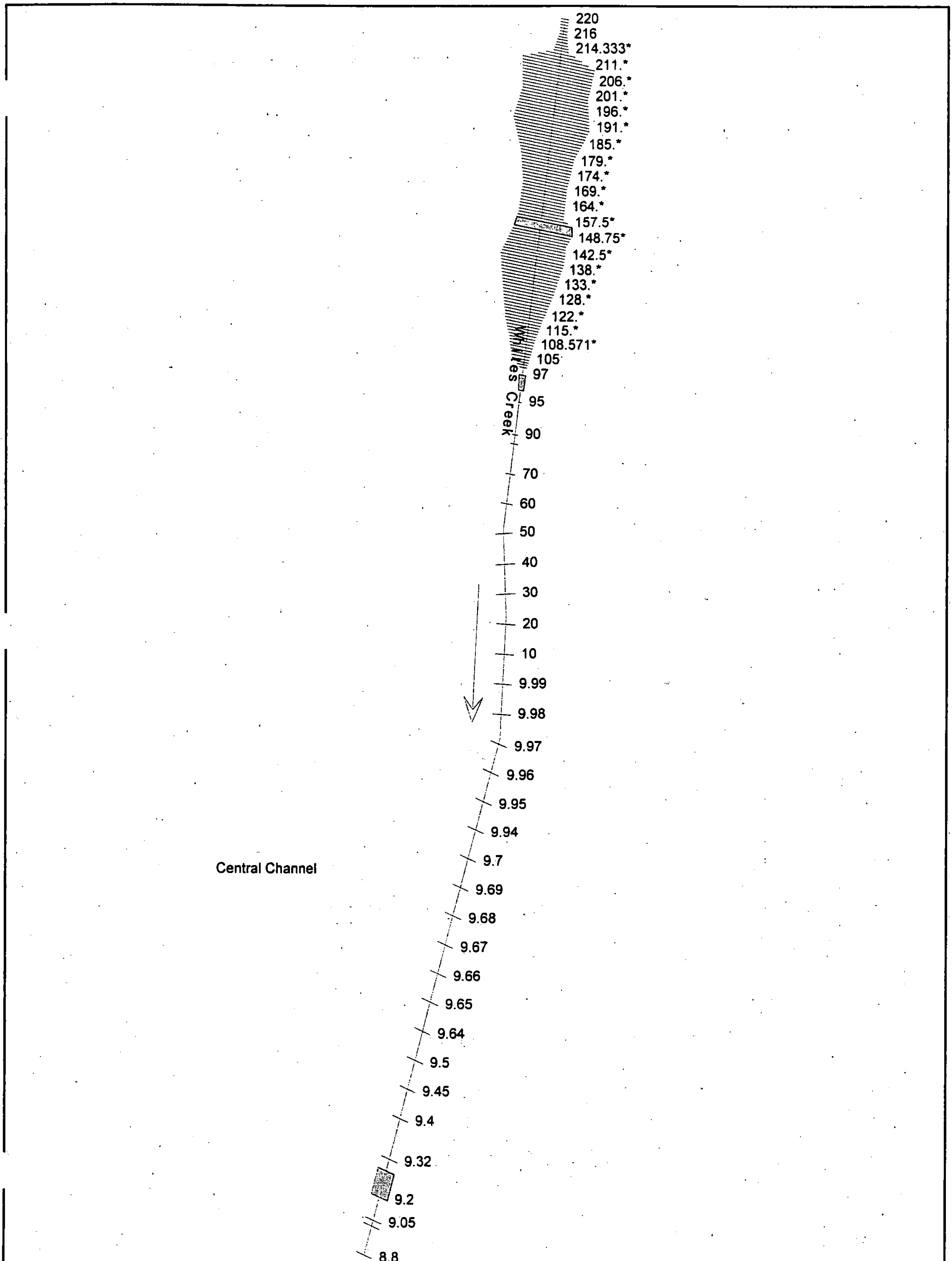
Project: ddcarat3.prj
Project Title: Double D-Carat Ave w/ 4RCB Culverts
Project Directory: m:\jobs\9908\hydro\ras\wetland-CaratAv\

'roject Plans

Plan (current)
Title: Central Chan. to Carat Ave-4RCB Culverts
Short ID: DDCarat-4RCB
File: m:\jobs\9908\hydro\ras\wetland-CaratAv\ddcarat3.p01
Geometry:
Title:Central Chan. to Carat Av.-4RCB culverts
File:m:\jobs\9908\hydro\ras\wetland-CaratAv\ddcarat3.g02
Flow:
Title:Wetland 300 base + 400 upstr.of Carat
File:m:\jobs\9908\hydro\ras\wetland-CaratAv\ddcarat3.f01

Current Plan Statistics

Number of:
Cross Sections = 147
User Input XSs = 50
Interpolated = 97
Culverts = 2
Bridges = 0
Mulitple Openings = 1
Inline Weirs = 0



220
216
214.333*
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108.571*
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Whites Creek
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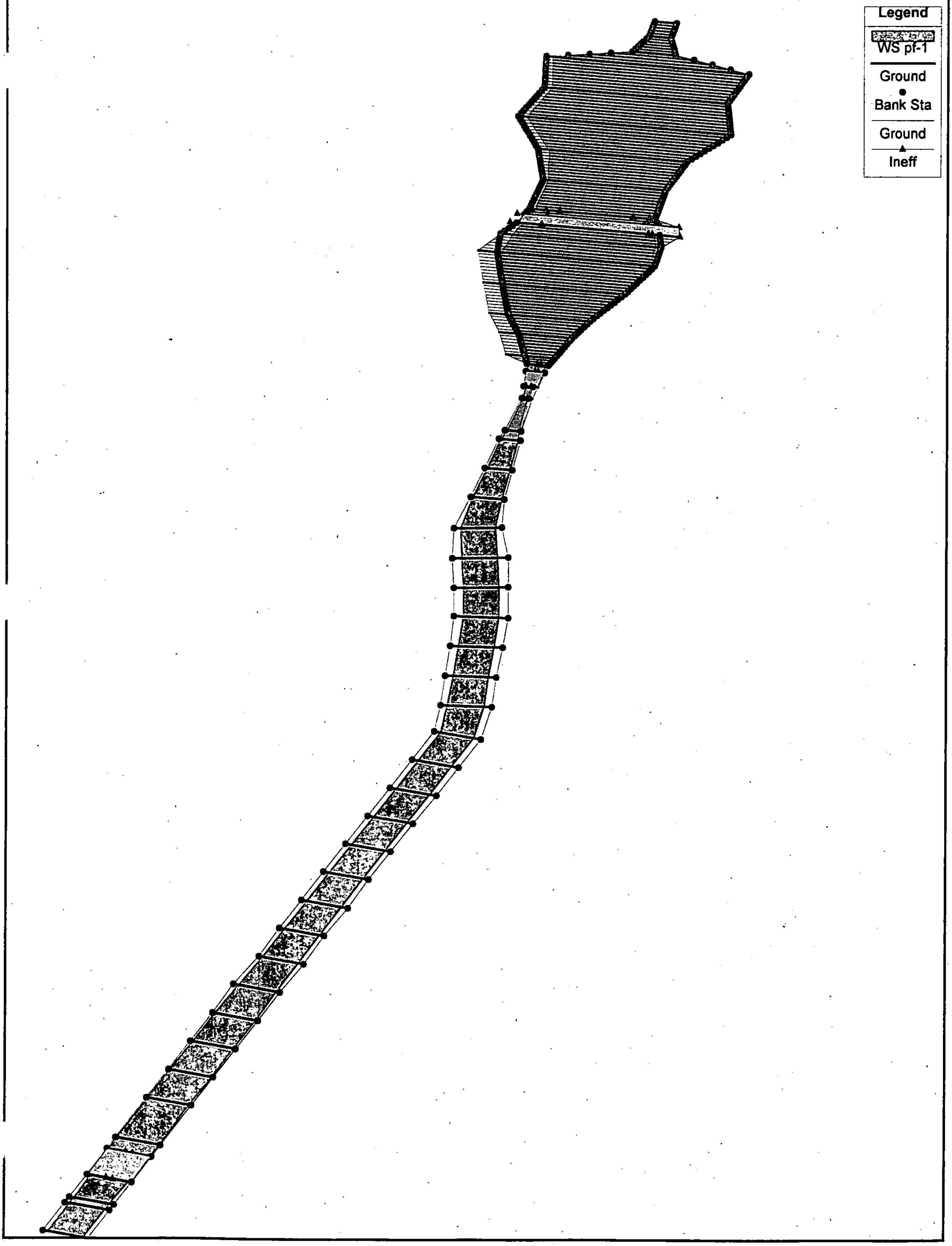
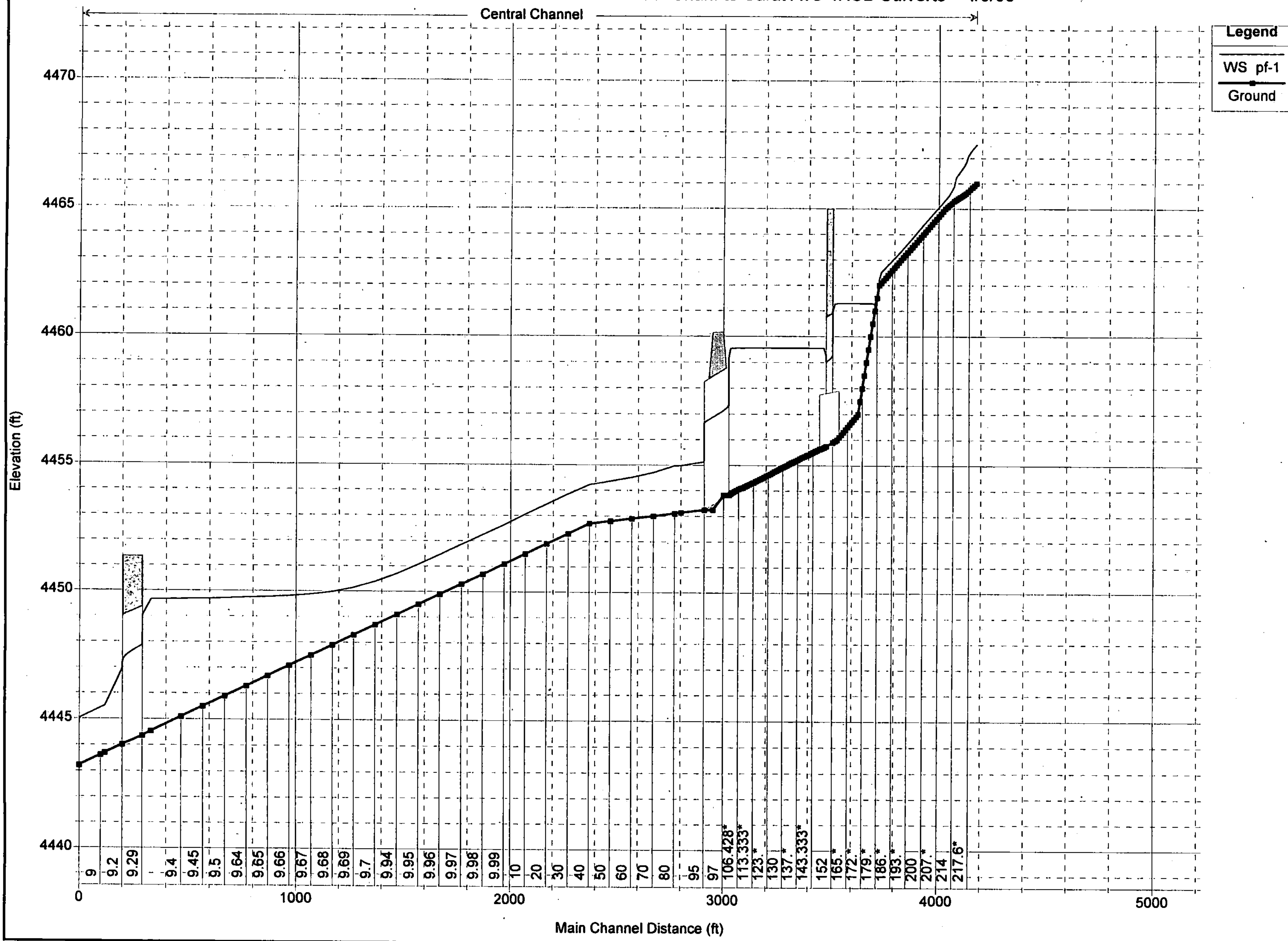
9.66
9.65
9.64
9.5
9.45
9.4
9.32
9.2
9.05
8.8
Central Channel

Double D-Carat Ave w/ RCB Culverts Central Chan. to Carat Ave-RCB Culverts 4/5/00



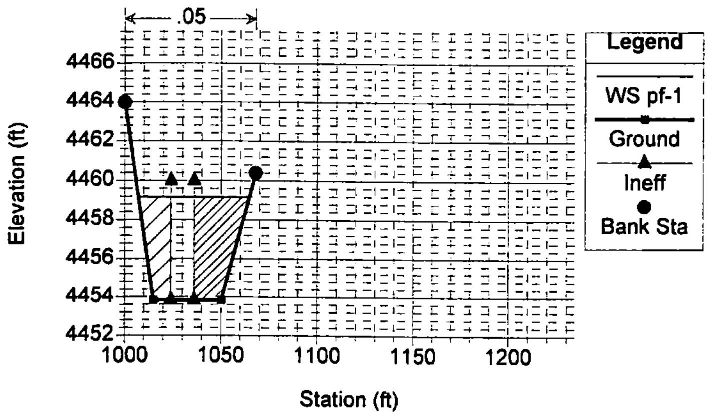
Double D-Carat Ave w/ 4RCB Culverts Cen... Chan. to Carat Ave-4RCB Culverts 4/6/00



1 in Horiz. = 600 ft 1 in Vert. = 5 ft

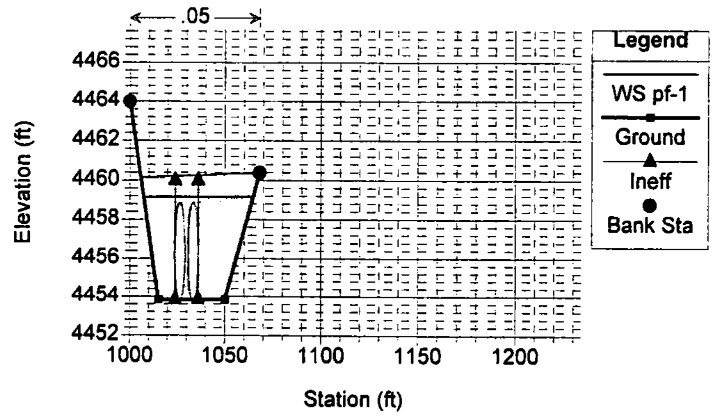
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 100 - Upstream end of culvert @ RS = 100



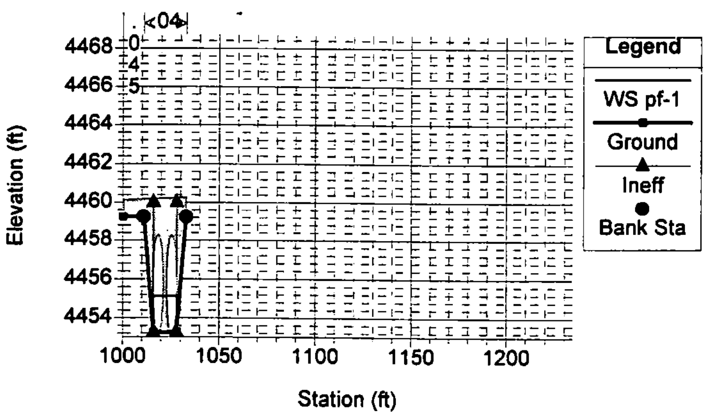
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Culvert @ Wilbur May Blvd RS = 97



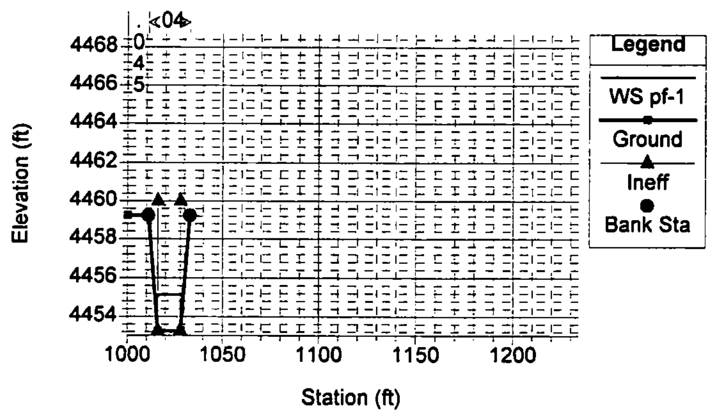
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Culvert @ Wilbur May Blvd RS = 97



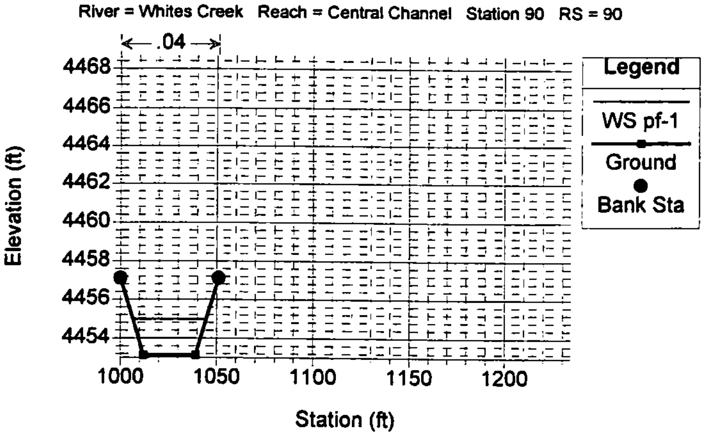
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 95 - Downstream end of culvert @ RS = 95



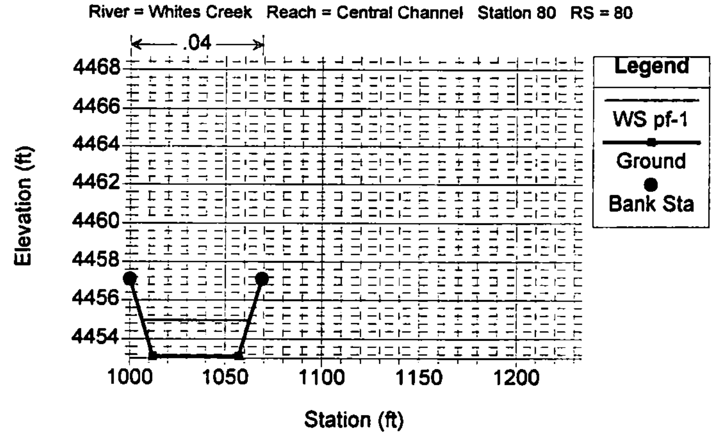
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 90 RS = 90



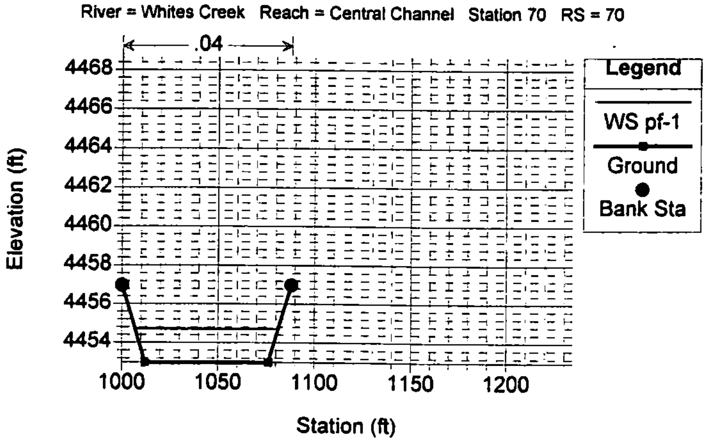
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 80 RS = 80



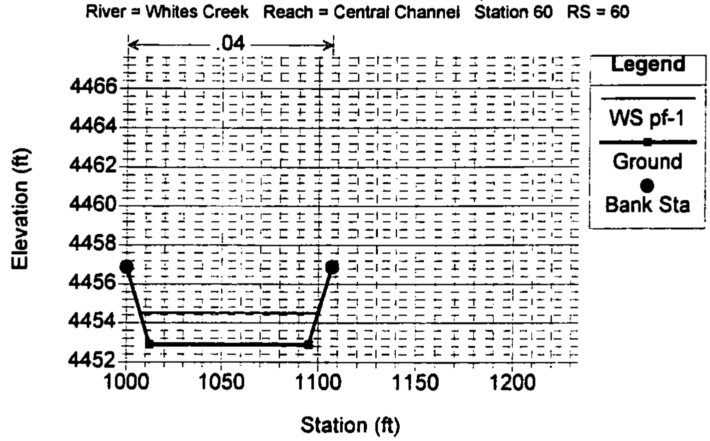
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 70 RS = 70



Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

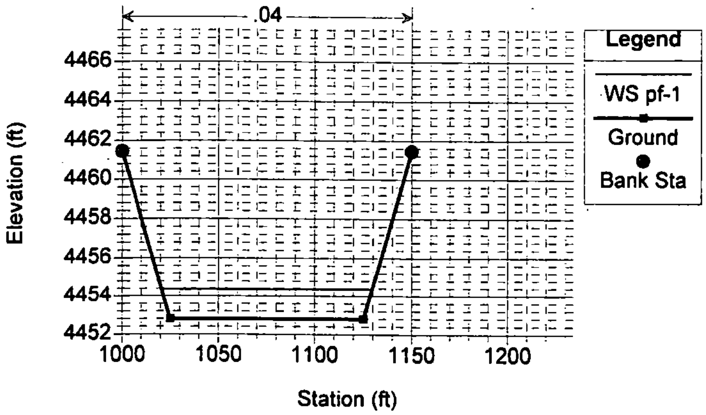
River = Whites Creek Reach = Central Channel Station 60 RS = 60



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

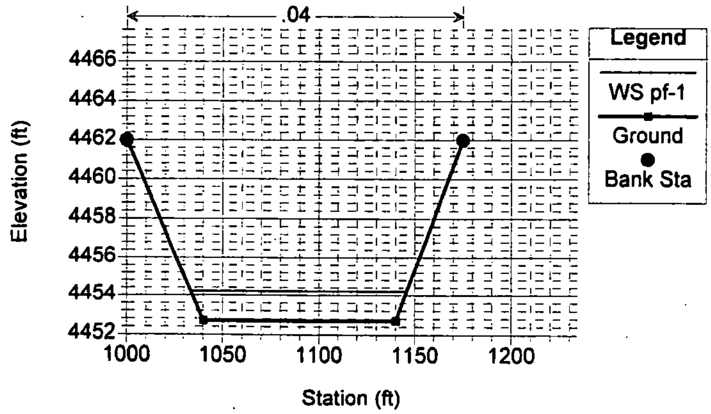
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 50 (33+00) - Entrance of Central RS = 50



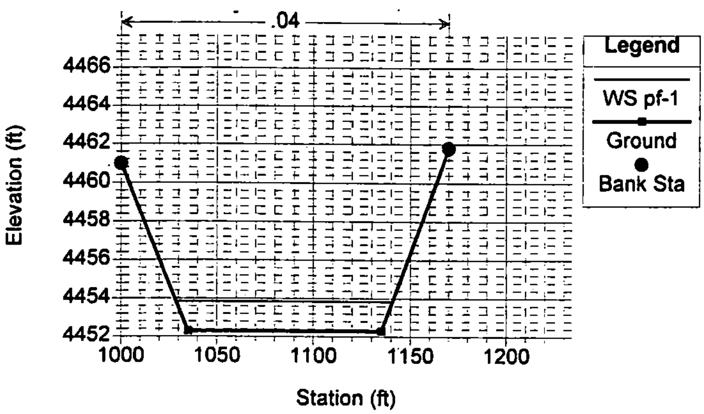
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 40 (34+00) RS = 40



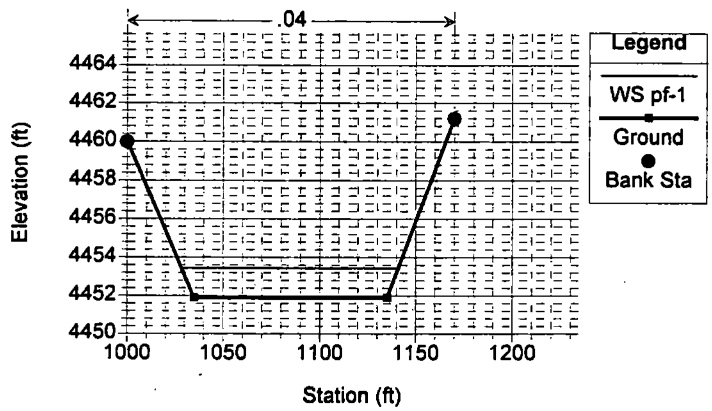
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 30 (35+00) RS = 30



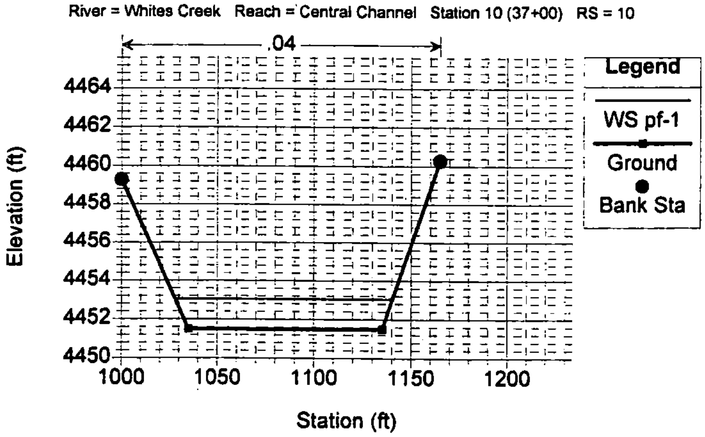
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 20 (36+00) RS = 20



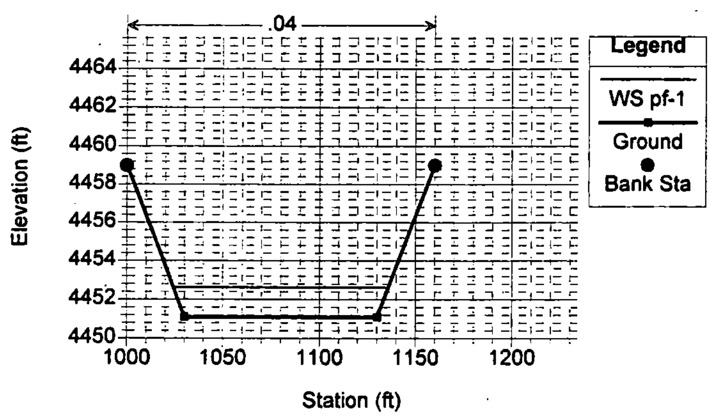
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 10 (37+00) RS = 10



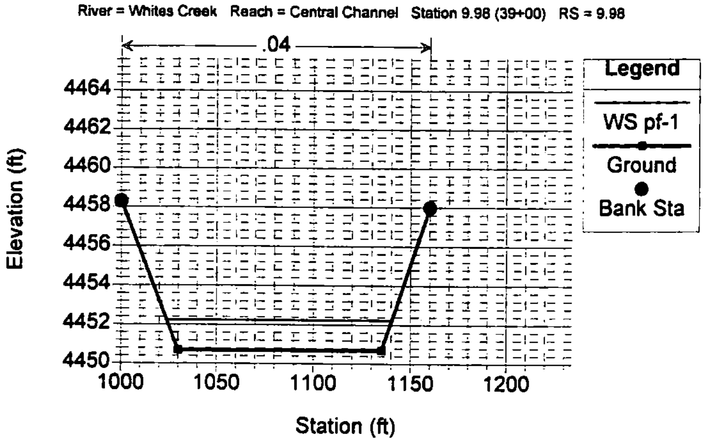
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.99 (38+00) RS = 9.99



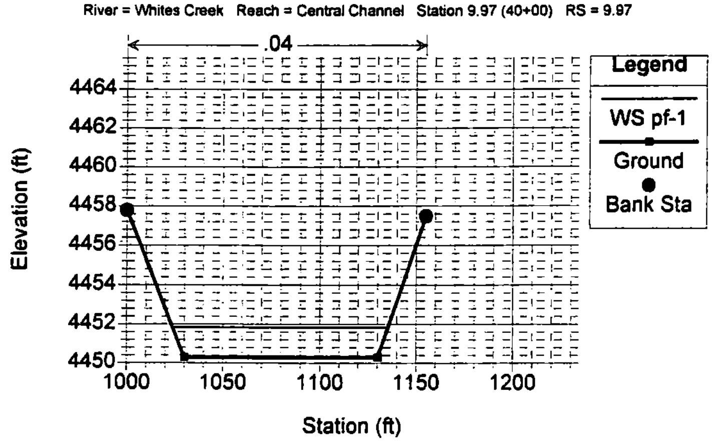
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.98 (39+00) RS = 9.98



Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

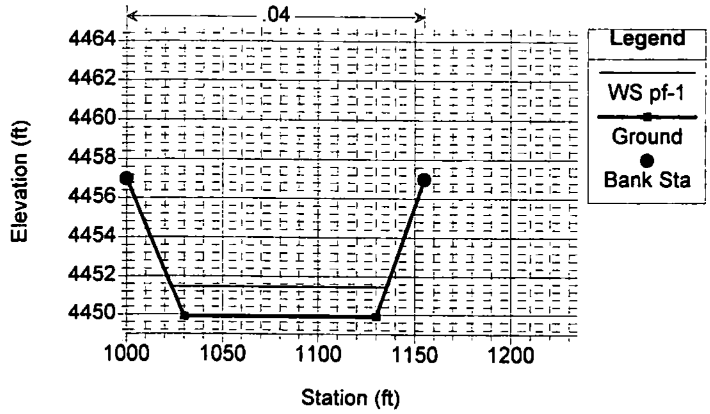
River = Whites Creek Reach = Central Channel Station 9.97 (40+00) RS = 9.97



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

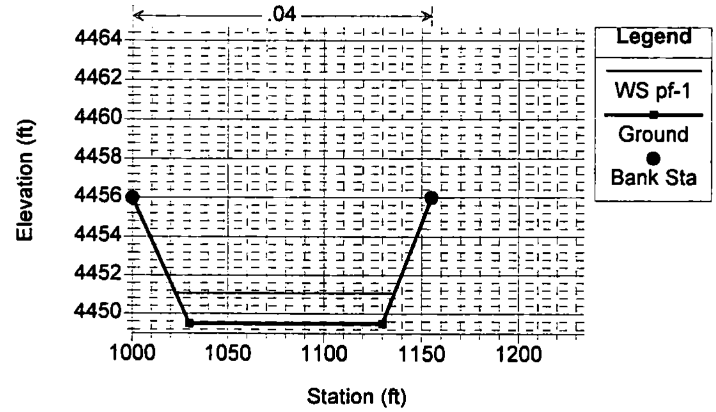
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.96 (41+00) RS = 9.96



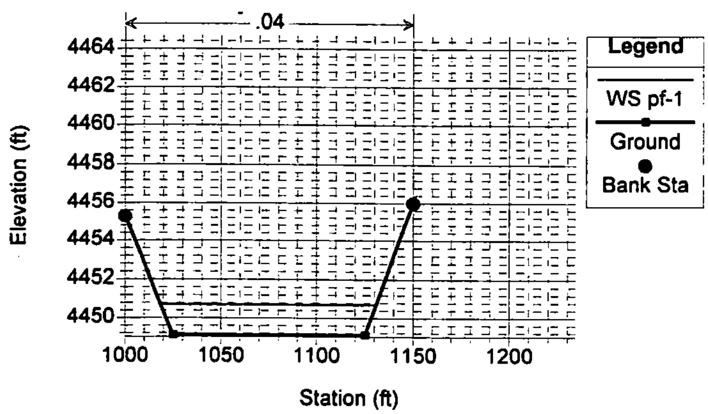
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.95 (42+00) RS = 9.95



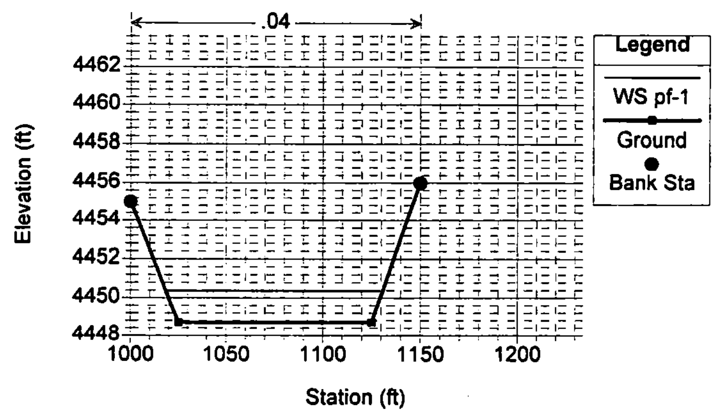
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.94 (43+00) RS = 9.94



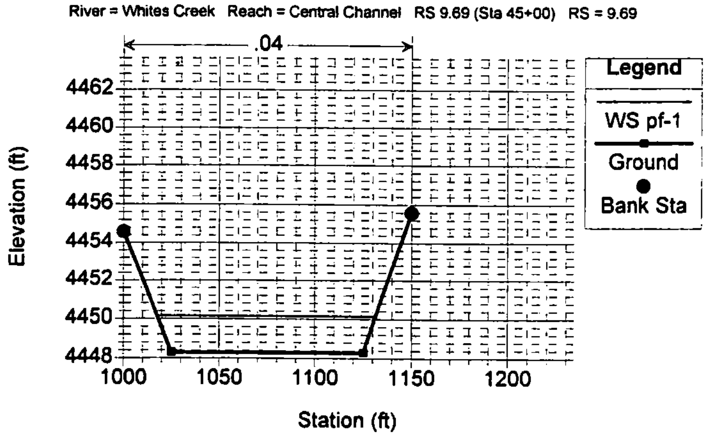
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Mackay & Shomps point E2 (Sta 44+00) RS = 9.7



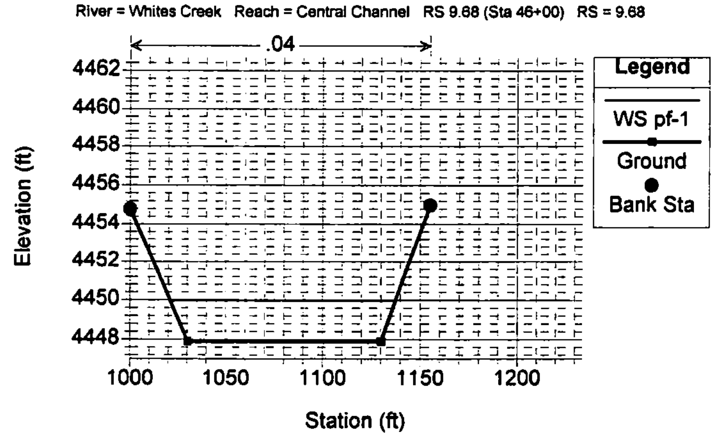
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.69 (Sta 45+00) RS = 9.69



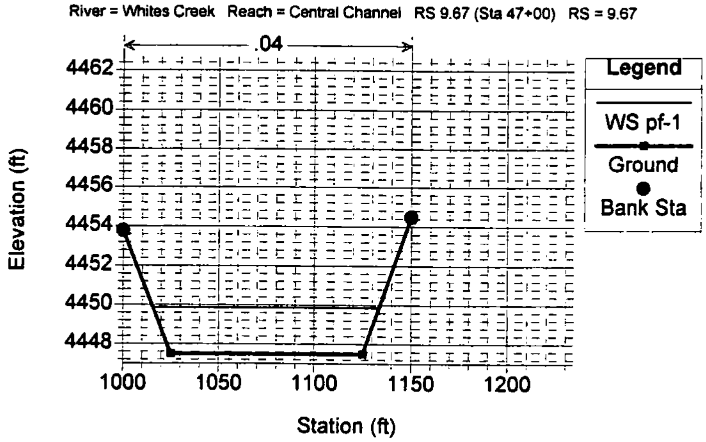
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.68 (Sta 46+00) RS = 9.68



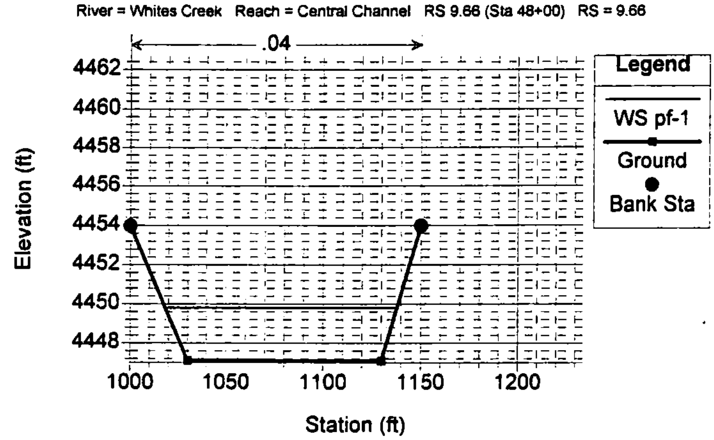
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.67 (Sta 47+00) RS = 9.67

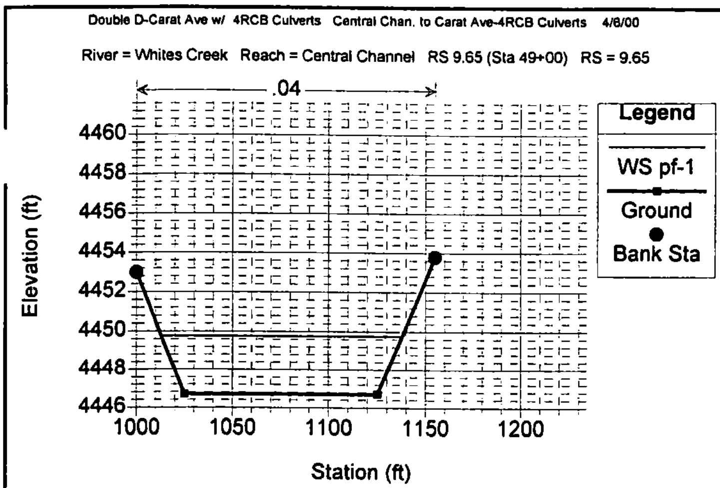


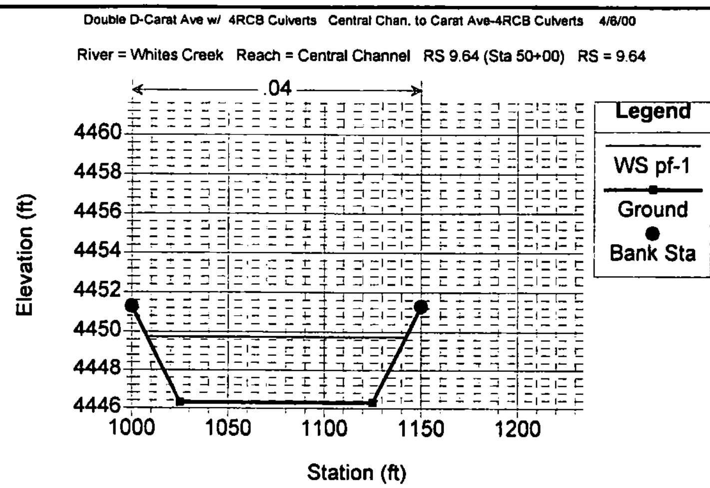
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

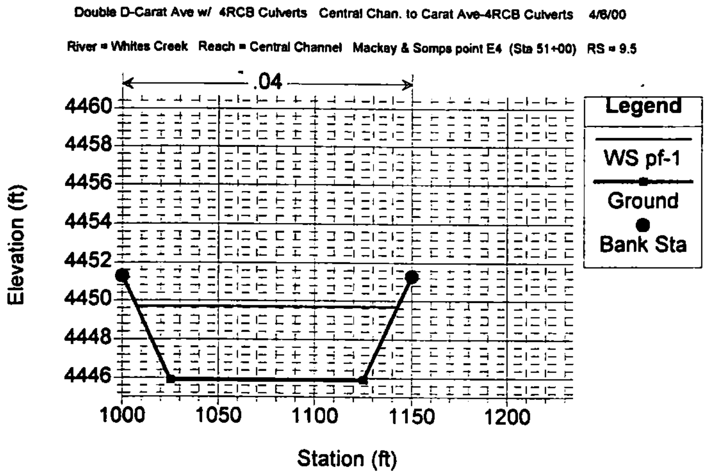
River = Whites Creek Reach = Central Channel RS 9.66 (Sta 48+00) RS = 9.66

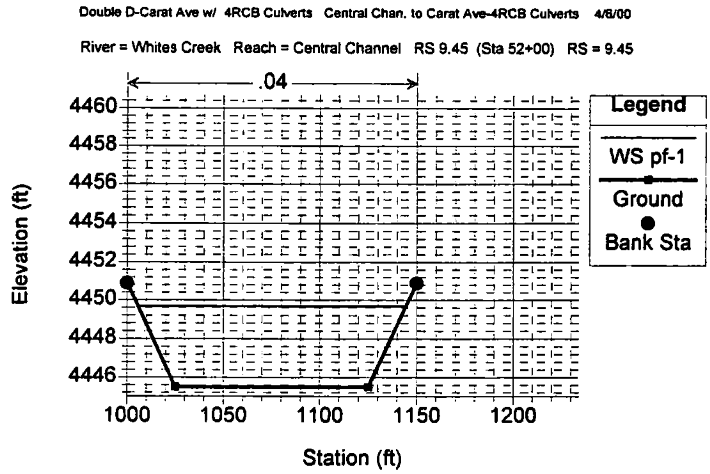


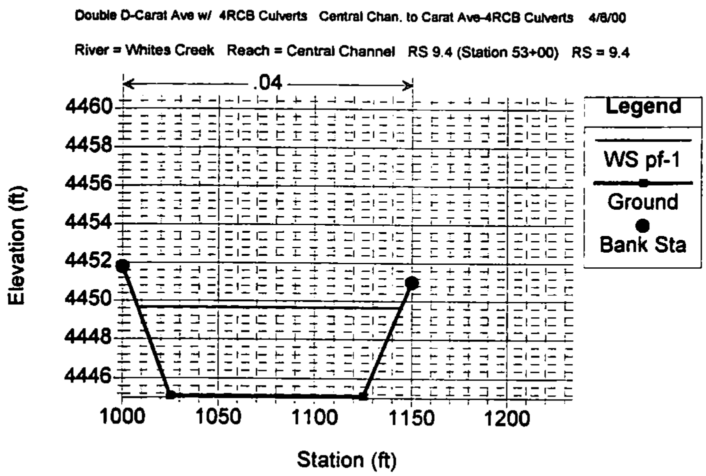
1 in Horiz. = 100 ft 1 in Vert. = 10 ft

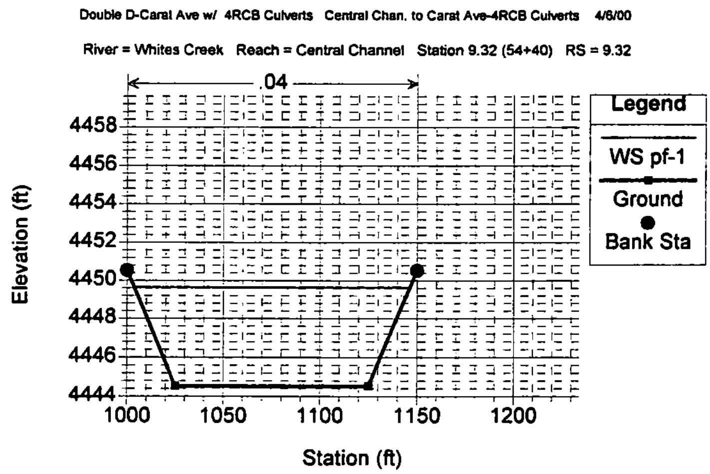


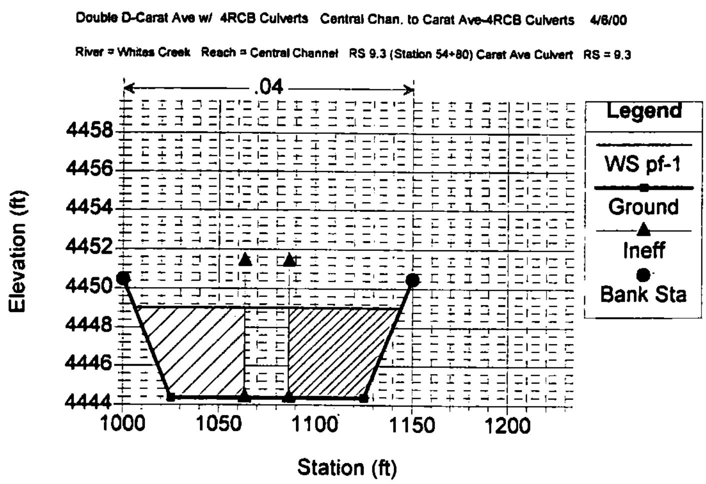


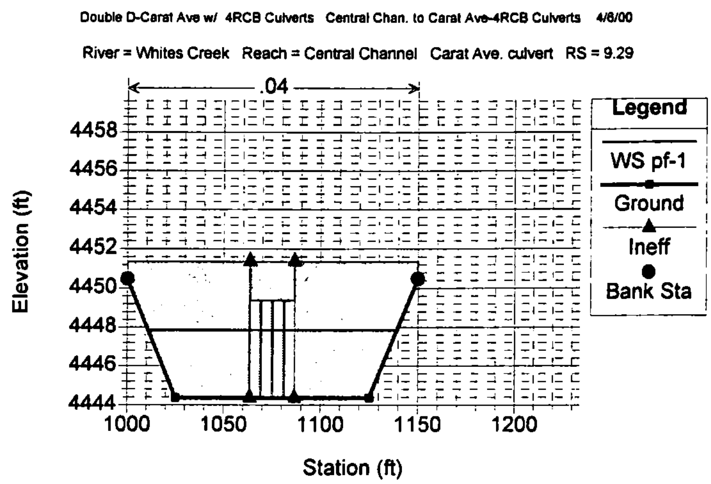








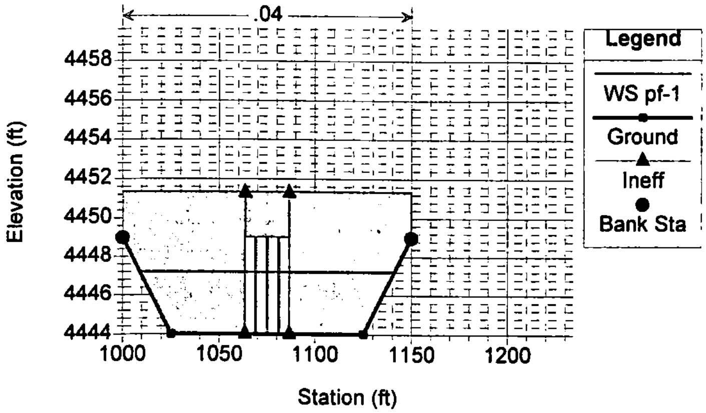




1 in Horiz. = 100 ft 1 in Vert. = 10 ft

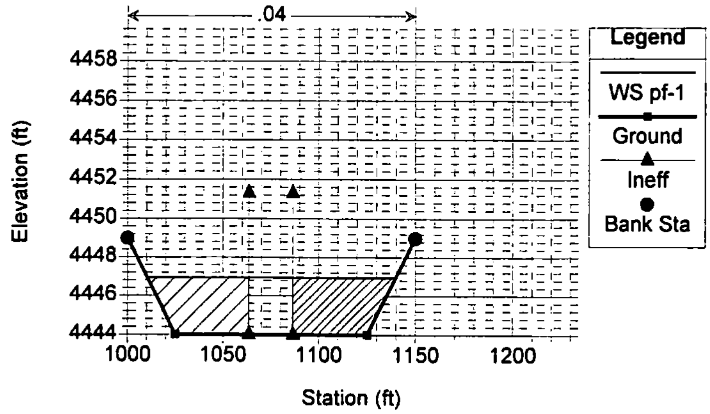
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Carat Ave. culvert RS = 9.29



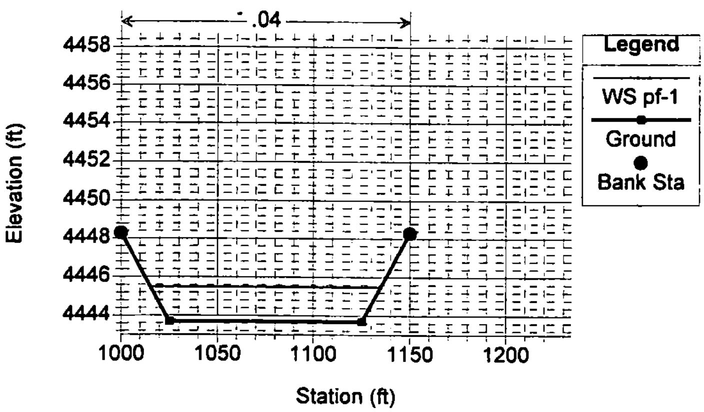
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel RS 9.2 (Station 55+70) Carat Ave Culvert RS = 9.2



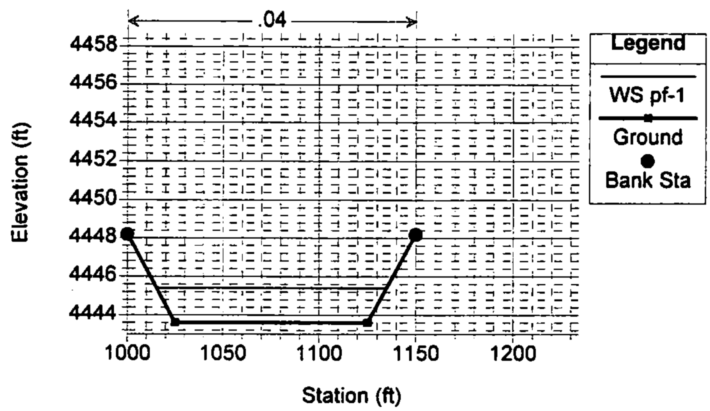
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9.05 (56+50) RS = 9.05



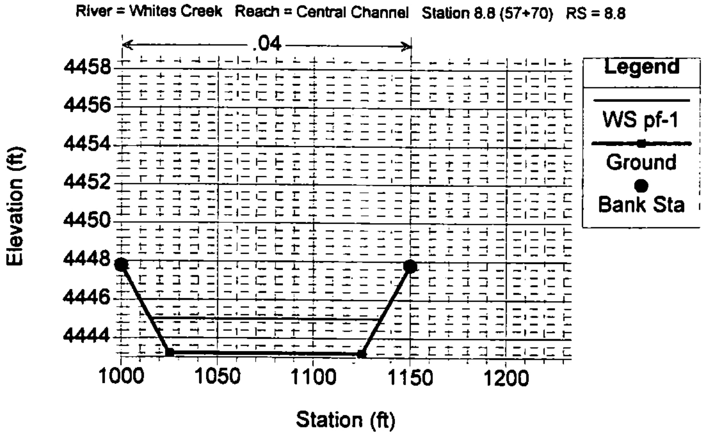
Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 9 (56+70) RS = 9



Double D-Carat Ave w/ 4RCB Culverts Central Chan. to Carat Ave-4RCB Culverts 4/6/00

River = Whites Creek Reach = Central Channel Station 8.8 (57+70) RS = 8.8



1 in Horiz. = 100 ft 1 in Vert. = 10 ft

HEC-RAS Plan: DDCarat-4RCB River: Whites Creek Reach: Central Channel

Reach	River Sta	Q Total	Length Chnl	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)	(ft/s)	(sq ft)	(ft)	
Central Channel	220	300.00	10.00	4466.00	4467.53	4467.01	4467.73	0.009187	3.55	84.47	60.22	0.53
Central Channel	219.2*	300.00	10.00	4465.92	4467.44		4467.64	0.009489	3.59	83.59	60.11	0.54
Central Channel	218.4*	300.00	10.00	4465.84	4467.33		4467.54	0.009914	3.64	82.43	59.97	0.55
Central Channel	217.6*	300.00	10.00	4465.76	4467.22		4467.43	0.010735	3.73	80.37	59.75	0.57
Central Channel	216.8*	300.00	10.00	4465.68	4467.08		4467.31	0.012353	3.90	76.86	59.40	0.60
Central Channel	216	300.00	9.17	4465.60	4466.82		4467.13	0.019582	4.51	66.45	58.35	0.75
Central Channel	215.666*	300.00	9.17	4465.55	4466.69		4466.93	0.016414	4.00	75.04	69.36	0.68
Central Channel	215.333*	300.00	9.17	4465.50	4466.57		4466.77	0.014466	3.63	82.71	80.52	0.63
Central Channel	215.*	300.00	9.17	4465.45	4466.45		4466.63	0.013234	3.35	89.49	91.78	0.60
Central Channel	214.666*	300.00	9.17	4465.40	4466.35		4466.50	0.012517	3.15	95.31	103.10	0.58
Central Channel	214.333*	300.00	9.17	4465.35	4466.24		4466.38	0.012310	3.00	99.87	114.48	0.57
Central Channel	214	300.00	10.00	4465.30	4465.89	4465.87	4466.15	0.040588	4.15	72.22	124.73	0.96
Central Channel	213.*	300.00	10.00	4465.22	4465.71		4465.81	0.018375	2.49	120.49	247.79	0.63
Central Channel	212.*	300.00	10.00	4465.15	4465.57		4465.63	0.013831	1.95	154.15	370.85	0.53
Central Channel	211.*	300.00	10.00	4465.08	4465.44		4465.49	0.012195	1.67	179.52	493.94	0.49
Central Channel	210.*	300.00	10.00	4465.00	4465.34		4465.37	0.009827	1.43	209.37	617.15	0.43
Central Channel	209.*	300.00	10.00	4464.90	4465.24		4465.27	0.009802	1.44	208.65	610.67	0.43
Central Channel	208.*	300.00	10.00	4464.80	4465.14		4465.18	0.009780	1.44	207.90	604.18	0.43
Central Channel	207.*	300.00	10.00	4464.70	4465.05		4465.08	0.009808	1.45	206.83	597.70	0.43
Central Channel	206.*	300.00	10.00	4464.60	4464.95		4464.98	0.009793	1.46	206.02	591.21	0.43
Central Channel	205.*	300.00	10.00	4464.50	4464.85		4464.89	0.009738	1.46	205.46	584.73	0.43
Central Channel	204.*	300.00	10.00	4464.40	4464.75		4464.79	0.009732	1.47	204.59	578.25	0.43
Central Channel	203.*	300.00	10.00	4464.30	4464.66		4464.69	0.009686	1.47	203.96	571.76	0.43
Central Channel	202.*	300.00	10.00	4464.20	4464.56		4464.59	0.009732	1.48	202.74	565.28	0.44
Central Channel	201.*	300.00	10.00	4464.10	4464.46		4464.50	0.009782	1.49	201.49	558.79	0.44
Central Channel	200.*	300.00	10.00	4464.00	4464.36		4464.39	0.010244	1.52	197.80	552.27	0.45
Central Channel	199.*	300.00	10.00	4463.90	4464.26		4464.29	0.010242	1.51	199.07	561.14	0.45
Central Channel	198.*	300.00	10.00	4463.80	4464.15		4464.19	0.010201	1.50	200.56	570.02	0.44
Central Channel	197.*	300.00	10.00	4463.70	4464.05		4464.08	0.010216	1.49	201.72	578.89	0.44
Central Channel	196.*	300.00	10.00	4463.60	4463.95		4463.98	0.010238	1.48	202.82	587.76	0.44
Central Channel	195.*	300.00	10.00	4463.50	4463.84		4463.88	0.010220	1.47	204.14	596.64	0.44
Central Channel	194.*	300.00	10.00	4463.40	4463.74		4463.77	0.010209	1.46	205.42	605.51	0.44
Central Channel	193.*	300.00	10.00	4463.30	4463.64		4463.67	0.010156	1.45	206.94	614.39	0.44
Central Channel	192.*	300.00	10.00	4463.20	4463.53		4463.57	0.010208	1.44	207.82	623.26	0.44
Central Channel	191.*	300.00	10.00	4463.10	4463.43		4463.46	0.010217	1.44	208.94	632.14	0.44
Central Channel	190.*	300.00	10.00	4463.00	4463.34		4463.37	0.009416	1.39	215.32	641.07	0.42
Central Channel	189.*	300.00	10.00	4462.90	4463.24		4463.27	0.009368	1.41	212.82	620.20	0.42
Central Channel	188.*	300.00	10.00	4462.80	4463.15		4463.18	0.009227	1.42	210.88	599.37	0.42
Central Channel	187.*	300.00	10.00	4462.70	4463.06		4463.09	0.009089	1.44	208.87	578.56	0.42
Central Channel	186.*	300.00	10.00	4462.60	4462.97		4463.00	0.009035	1.45	206.20	557.76	0.42
Central Channel	185.*	300.00	10.00	4462.50	4462.88		4462.91	0.008948	1.47	203.69	537.01	0.42
Central Channel	184.*	300.00	10.00	4462.40	4462.79		4462.82	0.008907	1.49	200.78	516.29	0.42
Central Channel	183.*	300.00	10.00	4462.30	4462.70		4462.74	0.008807	1.51	198.20	495.64	0.42
Central Channel	182.*	300.00	10.00	4462.20	4462.61		4462.65	0.008796	1.54	194.94	475.05	0.42
Central Channel	181.*	300.00	10.00	4462.10	4462.52		4462.56	0.008840	1.57	191.24	454.54	0.43
Central Channel	180	300.00	10.00	4462.00	4462.25	4462.25	4462.37	0.058383	2.82	106.36	431.94	1.00
Central Channel	179.*	300.00	10.00	4461.50	4461.65	4461.75	4461.98	0.290332	4.61	65.08	421.27	2.07
Central Channel	178.*	300.00	10.00	4461.00	4461.25	4461.25	4461.38	0.064300	2.96	101.45	412.63	1.05
Central Channel	177.*	300.00	10.00	4460.50	4461.28	4460.76	4461.29	0.001443	0.95	315.51	407.92	0.19
Central Channel	176.*	300.00	10.00	4460.00	4461.28		4461.29	0.000289	0.59	508.28	402.31	0.09
Central Channel	175.*	300.00	10.00	4459.50	4461.28		4461.28	0.000101	0.43	692.94	396.25	0.06
Central Channel	174.*	300.00	10.00	4459.00	4461.28		4461.28	0.000046	0.35	869.46	389.83	0.04
Central Channel	173.*	300.00	10.00	4458.50	4461.28		4461.28	0.000025	0.29	1037.70	383.14	0.03
Central Channel	172.*	300.00	10.00	4458.00	4461.28		4461.28	0.000015	0.25	1197.52	376.22	0.02
Central Channel	171.*	300.00	10.00	4457.50	4461.28		4461.28	0.000010	0.22	1348.82	369.12	0.02
Central Channel	170.*	300.00	10.00	4457.00	4461.28		4461.28	0.000007	0.20	1491.55	361.86	0.02
Central Channel	169.*	300.00	10.00	4456.90	4461.28		4461.28	0.000006	0.20	1528.05	362.80	0.02
Central Channel	168.*	300.00	10.00	4456.80	4461.28		4461.28	0.000006	0.19	1564.68	363.77	0.02
Central Channel	167.*	300.00	10.00	4456.70	4461.28		4461.28	0.000006	0.19	1601.26	364.75	0.02
Central Channel	166.*	300.00	10.00	4456.60	4461.28		4461.28	0.000005	0.18	1638.15	365.76	0.02
Central Channel	165.*	300.00	10.00	4456.50	4461.28		4461.28	0.000005	0.18	1675.17	366.80	0.01
Central Channel	164.*	300.00	10.00	4456.40	4461.28		4461.28	0.000004	0.18	1712.34	367.85	0.01
Central Channel	163.*	300.00	10.00	4456.30	4461.28		4461.28	0.000004	0.17	1749.65	368.94	0.01
Central Channel	162.*	300.00	10.00	4456.20	4461.28		4461.28	0.000004	0.17	1786.93	370.04	0.01
Central Channel	161.*	300.00	10.00	4456.10	4461.28		4461.28	0.000004	0.16	1824.53	371.16	0.01
Central Channel	160	300.00	10.00	4456.00	4461.27	4456.72	4461.28	0.000049	0.62	485.17	372.27	0.05
Central Channel	157.5*	300.00	10.00	4455.95	4461.28		4461.28	0.000003	0.15	1983.70	390.11	0.01
Central Channel	155	300.00	30.00	4455.90	4460.97	4458.32	4461.26	0.002317	4.22	71.03	406.09	0.33
Central Channel	152	Mult Open										
Central Channel	150	300.00	10.00	4455.75	4459.26	4458.18	4459.84	0.008024	6.12	49.01	421.27	0.58
Central Channel	148.75*	300.00	10.00	4455.71	4459.55		4459.55	0.000007	0.19	1612.19	431.18	0.02
Central Channel	147.5*	300.00	10.00	4455.67	4459.55		4459.55	0.000006	0.18	1660.41	439.37	0.02
Central Channel	146.25*	300.00	10.00	4455.64	4459.55		4459.55	0.000006	0.18	1704.74	447.52	0.02
Central Channel	145	300.00	10.00	4455.60	4459.55		4459.55	0.000006	0.17	1754.18	455.71	0.02
Central Channel	144.166*	300.00	10.00	4455.56	4459.55		4459.55	0.000005	0.17	1784.17	458.83	0.02
Central Channel	143.333*	300.00	10.00	4455.52	4459.55		4459.55	0.000005	0.17	1814.72	462.11	0.01
Central Channel	142.5*	300.00	10.00	4455.48	4459.55		4459.55	0.000005	0.16	1845.94	465.59	0.01

HEC-RAS Plan: DDCarat-4RCB River: Whites Creek Reach: Central Channel (Continued)

Reach	River Sta	Q Total	Length Chnl	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)	(ft/s)	(sq ft)	(ft)	
Central Channel	141.666*	300.00	10.00	4455.43	4459.55		4459.55	0.000005	0.16	1882.64	469.44	0.01
Central Channel	140.833*	300.00	10.00	4455.39	4459.55		4459.55	0.000004	0.16	1916.28	473.82	0.01
Central Channel	140	300.00	10.00	4455.35	4459.55		4459.55	0.000004	0.15	1952.33	479.21	0.01
Central Channel	139.*	300.00	10.00	4455.31	4459.55		4459.55	0.000004	0.16	1922.99	468.30	0.01
Central Channel	138.*	300.00	10.00	4455.27	4459.55		4459.55	0.000004	0.16	1892.76	457.41	0.01
Central Channel	137.*	300.00	10.00	4455.22	4459.55		4459.55	0.000004	0.16	1865.93	446.56	0.01
Central Channel	136.*	300.00	10.00	4455.18	4459.55		4459.55	0.000004	0.16	1833.85	435.69	0.01
Central Channel	135.*	300.00	10.00	4455.14	4459.55		4459.55	0.000005	0.17	1800.89	424.84	0.01
Central Channel	134.*	300.00	10.00	4455.10	4459.55		4459.55	0.000005	0.17	1767.07	414.00	0.01
Central Channel	133.*	300.00	10.00	4455.06	4459.55		4459.55	0.000005	0.17	1732.37	403.18	0.01
Central Channel	132.*	300.00	10.00	4455.01	4459.55		4459.55	0.000005	0.18	1700.70	392.40	0.01
Central Channel	131.*	300.00	10.00	4454.97	4459.55		4459.55	0.000005	0.18	1663.98	381.61	0.02
Central Channel	130	300.00	10.00	4454.93	4459.55		4459.55	0.000005	0.18	1626.57	370.83	0.02
Central Channel	129.*	300.00	10.00	4454.89	4459.55		4459.55	0.000006	0.19	1574.22	357.63	0.02
Central Channel	128.*	300.00	10.00	4454.84	4459.55		4459.55	0.000006	0.20	1524.18	344.48	0.02
Central Channel	127.*	300.00	10.00	4454.80	4459.55		4459.55	0.000007	0.20	1469.52	331.33	0.02
Central Channel	126.*	300.00	10.00	4454.76	4459.55		4459.55	0.000007	0.21	1413.79	318.20	0.02
Central Channel	125.*	300.00	10.00	4454.71	4459.55		4459.55	0.000008	0.22	1359.78	305.13	0.02
Central Channel	124.*	300.00	10.00	4454.67	4459.55		4459.55	0.000008	0.23	1301.74	292.05	0.02
Central Channel	123.*	300.00	10.00	4454.63	4459.55		4459.55	0.000009	0.24	1242.64	279.00	0.02
Central Channel	122.*	300.00	10.00	4454.59	4459.55		4459.55	0.000010	0.25	1182.45	265.96	0.02
Central Channel	121.*	300.00	10.00	4454.54	4459.55		4459.55	0.000011	0.27	1123.45	252.99	0.02
Central Channel	120	300.00	10.00	4454.50	4459.55		4459.55	0.000013	0.28	1060.98	240.00	0.02
Central Channel	118.333*	300.00	10.00	4454.46	4459.55		4459.55	0.000014	0.30	1002.61	225.78	0.03
Central Channel	116.666*	300.00	10.00	4454.42	4459.55		4459.55	0.000016	0.32	943.33	211.60	0.03
Central Channel	115.*	300.00	10.00	4454.38	4459.55		4459.55	0.000018	0.34	882.72	197.32	0.03
Central Channel	113.333*	300.00	10.00	4454.33	4459.55		4459.55	0.000021	0.36	822.67	183.10	0.03
Central Channel	111.666*	300.00	10.00	4454.29	4459.55		4459.55	0.000024	0.39	759.54	168.76	0.03
Central Channel	110	300.00	10.00	4454.25	4459.55		4459.55	0.000029	0.43	695.46	154.45	0.04
Central Channel	109.285*	300.00	10.00	4454.21	4459.55		4459.55	0.000033	0.46	650.39	144.21	0.04
Central Channel	108.571*	300.00	10.00	4454.17	4459.55		4459.55	0.000038	0.50	604.42	133.92	0.04
Central Channel	107.857*	300.00	10.00	4454.13	4459.55		4459.55	0.000045	0.54	557.83	123.66	0.04
Central Channel	107.142*	300.00	10.00	4454.10	4459.55		4459.55	0.000054	0.59	509.36	113.37	0.05
Central Channel	106.428*	300.00	10.00	4454.06	4459.54		4459.55	0.000067	0.65	461.30	103.10	0.05
Central Channel	105.714*	300.00	10.00	4454.02	4459.54		4459.55	0.000084	0.73	412.29	92.77	0.06
Central Channel	105	300.00	8.33	4453.98	4459.54		4459.55	0.000111	0.83	362.58	82.47	0.07
Central Channel	103.333*	300.00	8.33	4453.93	4459.54		4459.55	0.000132	0.90	331.63	74.66	0.08
Central Channel	101.666*	300.00	8.33	4453.88	4459.53		4459.55	0.000160	1.00	299.97	66.84	0.08
Central Channel	100	300.00	115.00	4453.83	4459.17	4456.51	4459.51	0.002659	4.68	64.08	57.51	0.36
Central Channel	97	Culvert										
Central Channel	95	300.00	110.00	4453.25	4455.14	4455.93	4457.86	0.054386	13.24	22.66	15.15	0.36
Central Channel	90	300.00	30.00	4453.14	4454.99	4454.61	4455.37	0.010019	4.99	60.13	38.09	0.70
Central Channel	80	300.00	100.00	4453.11	4454.97		4455.13	0.003724	3.18	94.35	56.19	0.43
Central Channel	70	300.00	100.00	4453.00	4454.71		4454.81	0.002534	2.54	118.25	74.26	0.35
Central Channel	60	300.00	100.00	4452.90	4454.52		4454.59	0.001841	2.11	142.12	92.71	0.30
Central Channel	50	300.00	100.00	4452.80	4454.37		4454.42	0.001417	1.83	163.98	109.05	0.26
Central Channel	40	300.00	100.00	4452.70	4454.22		4454.27	0.001561	1.86	161.04	112.24	0.27
Central Channel	30	500.00	100.00	4452.30	4453.85		4454.00	0.004009	3.04	164.73	111.98	0.44
Central Channel	20	500.00	100.00	4451.90	4453.45		4453.60	0.003995	3.03	165.24	112.57	0.44
Central Channel	10	500.00	100.00	4451.50	4453.05		4453.19	0.004039	3.04	164.52	112.24	0.44
Central Channel	9.99	500.00	100.00	4451.10	4452.63		4452.78	0.004214	3.08	162.08	111.63	0.45
Central Channel	9.98	500.00	100.00	4450.70	4452.25		4452.38	0.003683	2.91	171.64	116.43	0.42
Central Channel	9.97	500.00	100.00	4450.30	4451.86		4452.00	0.003999	3.04	164.66	111.63	0.44
Central Channel	9.96	500.00	100.00	4449.90	4451.46		4451.60	0.003962	3.02	165.38	112.08	0.44
Central Channel	9.95	500.00	100.00	4449.50	4451.07		4451.21	0.003825	2.98	167.85	113.32	0.43
Central Channel	9.94	500.00	100.00	4449.10	4450.71		4450.84	0.003565	2.93	170.85	112.32	0.42
Central Channel	9.7	500.00	100.00	4448.70	4450.39		4450.51	0.003029	2.78	179.55	112.49	0.39
Central Channel	9.69	500.00	100.00	4448.30	4450.15		4450.25	0.002251	2.54	197.11	113.64	0.34
Central Channel	9.68	500.00	100.00	4447.90	4449.98		4450.06	0.001494	2.22	225.03	116.37	0.28
Central Channel	9.67	500.00	100.00	4447.50	4449.88		4449.93	0.000955	1.93	258.76	117.91	0.23
Central Channel	9.66	500.00	100.00	4447.10	4449.81		4449.85	0.000612	1.68	297.55	119.63	0.19
Central Channel	9.65	500.00	100.00	4446.70	4449.77		4449.80	0.000395	1.45	345.47	125.15	0.15
Central Channel	9.64	500.00	100.00	4446.30	4449.74		4449.77	0.000258	1.24	403.69	134.44	0.13
Central Channel	9.5	650.00	100.00	4445.90	4449.71		4449.74	0.000312	1.45	447.55	135.23	0.14
Central Channel	9.45	650.00	100.00	4445.50	4449.68		4449.71	0.000225	1.30	499.32	138.73	0.12
Central Channel	9.4	650.00	140.00	4445.10	4449.67		4449.69	0.000170	1.20	539.72	136.39	0.11
Central Channel	9.32	650.00	40.00	4444.54	4449.65		4449.67	0.000114	1.05	619.74	142.52	0.09
Central Channel	9.3	650.00	90.00	4444.36	4449.03	4447.27	4449.60	0.003395	6.05	107.45	138.04	0.49
Central Channel	9.29	Culvert										
Central Channel	9.2	650.00	80.00	4444.02	4446.95	4446.95	4448.39	0.016005	9.63	67.48	129.46	0.99
Central Channel	9.05	650.00	20.00	4443.70	4445.50	4444.77	4445.67	0.004003	3.28	198.00	119.60	0.45
Central Channel	9	650.00	100.00	4443.62	4445.42		4445.59	0.004001	3.28	198.07	119.69	0.45
Central Channel	8.8	650.00		4443.22	4445.02	4444.29	4445.19	0.004005	3.28	198.01	119.68	0.45

HEC-RAS Plan: DDCarat-4RCB River: Whites Creek Reach: Central Channel

Culvert Table

Reach	River Sta	E.G. US.	W.S. US.	E.G. IC	E.G. OC	Min Top Rd	Culv Q	Q Weir	Delta WS	Culv Vel In	Culv Vel Out
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(ft)	(ft/s)	(ft/s)
Central Channel	152 Culv Grp #1	4461.26	4460.93	4461.26	4461.23	4465.00	277.89		1.85	9.85	10.20
Central Channel	152 Culv Grp #2	4461.26	4461.19	4458.85	4461.26	4465.00	22.11		1.47	7.04	7.04
Central Channel	97 W.May-5'RCPs	4459.51	4459.17	4459.51	4459.43	4460.20	300.00		4.03	10.18	10.48
Central Channel	9.29 Carat5x5RCBs	4449.60	4449.03	4449.40	4449.60	4451.36	650.00		2.08	9.27	10.15

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