

## *Quick-2 Sample Problems Documentation*

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## **INTRODUCTION**

This document includes six problems with sample data sets for use in the Quick-2 program. These problems are intended to reinforce the information found in the Quick-2 online tutorial and to demonstrate some of the program functionality that was not discussed in that online resource.

Screen captures illustrating the results for each sample problem can be found in the "**Solutions**" section at the end of this document. After completing each sample problem, you can verify your results with the answers in the "Solutions" section. Look for the references to the solutions throughout the document.

**Sample Problem 1: Normal Depth for a Trapezoidal Cross Section**

This sample problem outlines the steps for finding the depth of flow in a trapezoidal channel. To start this sample problem, select "**File**" from the pull-down menu bar and click on "**New**". Create a new file in the directory of your choice and click the "**Open**" button, followed by the "**OK**" button to open your new file.

Select "**Normal Depth**" from the "**Method**" pull-down menu bar and click on "**Trapezoidal**" on the fly-out menu. Type "**1**" as the ID of your Cross Section and complete the calculation with the input information included below.

1. Manning's n = **0.035**     <TAB> or <ENTER>
2. Slope = **0.005**             <TAB> or <ENTER>
3. LSide Slope (H:V) = **2**     <TAB> or <ENTER>
4. RSide Slope (H:V) = **3**     <TAB> or <ENTER>
5. Bottom Width (ft) = **10**   <TAB> or <ENTER>
6. Discharge (cfs) = **300**    <TAB> or <ENTER>
7. Click the "**Begin Calculation**" button and scan the newly calculated data in the 'Output Data' column.

**Compare your results with those in the "Solutions" section (Problem 1, Solution 1).**

You can view the graphic plots by selecting "**View**" from the menu bar and following the steps outlined below.

1. Click on "**Rating Curve**" to view a Rating Curve plot in a new window ("**Solutions**": **Problem 1, Solution 2**).
2. Click on the "**Plot Now!**" Button to view a Cross Section plot ("**Solutions**": **Problem 1, Solution 3**).
3. To Print, click the "**Print!**" button.
4. Close the graph by closing the window.

You can view the output data report files by selecting "**View**" from the menu bar and following the steps outlined below.

1. Click on "**Summary Output**". The output is shown in a separate file, which can be viewed using the Windows Write program. You can modify the data and save the file under a new name and directory. Modifying this file will not affect your main Quick-2 file, which contains the source data for these separate output files ("**Solutions**": **Problem 1, Solution 4**).
2. Close the output file by closing the window.
3. Click on "**Detailed Input/Output**" and view the results ("**Solutions**": **Problem 1, Solution 5**).
4. Close the output file by closing the window.
5. Click on "**Rating Curve Data**" and view the results ("**Solutions**": **Problem 1, Solution 6**).
6. Close the output file by closing the window.

**Sample Problem 2: Normal Depth for an Irregular Cross Section**

This sample problem outlines the steps for finding the depth of flow in an irregular cross section. You can start this sample problem from the file created in Sample Problem 1, or you can create a new file for this example. Once you have made your choice, select "**Normal Depth**" from the "**Method**" pull-down menu bar and click on "**Irregular Cross Section**" on the fly-out menu. Type "**1.1**" as the ID of your Cross Section and complete the calculation with the input information included below.

1. Enter the ground points using the data below:

<u>Stat</u>		<u>Elev</u>	
<b>362</b>	<Enter>	<b>505.0</b>	<Enter>
<b>425</b>	<Enter>	<b>499.1</b>	<Enter>
<b>509</b>	<Enter>	<b>498.0</b>	<Enter>
<b>512</b>	<Enter>	<b>496.9</b>	<Enter>
<b>602</b>	<Enter>	<b>496.9</b>	<Enter>
<b>605</b>	<Enter>	<b>498.2</b>	<Enter>
<b>732</b>	<Enter>	<b>500.1</b>	<Enter>
<b>1020</b>	<Enter>	<b>504.7</b>	<Enter>

2. When you are finished entering the ground point data and are sure they are correct, press the "**Save Points**" button.
3. EG Slope = **0.0029 ft/ft** <Enter>
4. Channel Bank Stations
 

<b>Left</b>	<b>509</b>	<Enter>
<b>Right</b>	<b>605</b>	<Enter>
5. Manning's n values
 

<b>Left</b>	<b>0.065</b>	<Enter>
<b>Channel</b>	<b>0.040</b>	<Enter>
<b>Right</b>	<b>0.060</b>	<Enter>
6. Discharge = **3000 cfs** <Enter>
7. Click the "**Compute**" button ("**Solutions**": **Problem 2, Solution 1**).
8. Click on "**File**", then click on "**Close/Save**" to save and close your work.

**Sample Problem 3: Channel Capacity for a Rectangular Cross Section**

This sample problem outlines the steps for finding the channel capacity for a rectangular cross section. To start this sample problem, select "**File**" from the pull-down menu bar and click on "**New**". Create a new file in the directory of your choice and click the "**Open**" button, followed by the "**OK**" button to open your new file.

Select "**Channel Capacity**" on the "**Method**" pull-down menu bar, then click on "**Rectangular**" from the fly-out menu. Type "**1**" as the ID of your Cross Section and complete the calculation with the input information included below.

1. Manning's n = **0.035**      <Enter>
2. Slope (ft/ft) = **0.01**      <Enter>
3. Bottom Width (ft) = **10**      <Enter>
4. Depth (ft) = **5**      <Enter>
5. Click the "**Begin Calculation**" button and scan the newly calculated data in the 'Output Data' column.

**Compare your results with those in the "Solutions" section (Problem 3, Solution 1).**

Once you are finished viewing the output on the screen, you can view the different graph and report options that are available by Clicking on "**View**" from the main menu bar.

**Sample Problem 4: Channel Capacity for a Triangular Cross Section**

This sample problem outlines the steps for finding the channel capacity for a triangular cross section. To start this sample problem, select "**File**" from the pull-down menu bar and click on "**New**". Create a new file in the directory of your choice and click the "**Open**" button, followed by the "**OK**" button to open your new file.

Select "**Channel Capacity**" from the "**Method**" pull-down menu bar and select "**Triangular**" from the fly-out menu. Type "**12.1**" as the ID of your Cross Section and complete the calculation with the input information included below.

1. Manning's n = **0.015**      <Enter>
2. Slope (ft/ft) = **0.02**      <Enter>
3. LSide Slope (H:V) = **5**      <Enter>
4. RSide Slope (H:V) = **3**      <Enter>
5. Depth (ft) = **3**      <Enter>
6. Press the "**Compute**" button ("**Solutions**": **Problem 4, Solution 1**).

Notice the warning message ("**Solutions**": **Problem 4, Solution 2**). FEMA does not accept supercritical depth elevations for use in determining Base Flood Elevations (unless the channel has been specifically designed to operate under supercritical flow conditions). The critical depth elevation should be used instead ("**Solutions**": **Problem 4, Solution 3**).

Once you are finished viewing the output on the screen, you can look at the different graph and report options that are available by clicking on "**View**" from the main menu bar.

**Sample Problem 5: Channel Capacity for a Circular Cross Section**

This sample problem outlines the steps for finding the channel capacity for a circular cross section. You can start this sample problem from the file created in Sample Problem 4, or you can create a new file for this example. Once you have made your choice, select "**Channel Capacity**" from the "**Method**" pull-down menu bar and select "**Circular**" from the fly-out menu. Type "**12.2**" as the ID of your Cross Section and complete the calculation with the input information included below.

1. Manning's n = **0.013**      <Enter>
2. Slope (ft/ft) = **0.005**      <Enter>
3. Diameter (in) = **36**      <Enter>
4. Depth (ft) = **3**      <Enter>
5. Press the "**Begin Calculation**" button and scan the newly computed data in the 'Output Data' column ("**Solutions**": **Problem 5, Solution 1**).

You can view the graphic plots by selecting "View" from the menu bar and following the steps outlined below.

1. Click on "**View**" from the menu bar.
2. Click on "**Rating Curve**" to view the Rating Curve plot in a new window ("**Solutions**": **Problem 5, Solution 2**).
3. Click on the "**Plot Now!**" button to view the Cross Section plot, which is just a circle in this case ("**Solutions**": **Problem 5, Solution 3**).

Notice that the rating curve "tails back in" to the left. This happens because maximum flow in a pipe actually occurs at approximately 95% full flow. As the pipe flows above 95%, the increase in the friction loss in the pipe actually reduces the amount of discharge it can carry.

**Sample Problem 6: Step-Backwater for Irregular Cross Sections**

This sample problem outlines the steps for completing a step backwater calculation for irregular cross sections. To start this sample problem, select "**File**" from the pull-down menu bar and click on "**New**". Create a new file in the directory of your choice and click the "**Open**" button, followed by the "**OK**" button to open your new file.

Select the "**Method**" pull-down menu bar, then click on "**Step-Backwater**" from the fly-out menu.

**CROSS SECTION # 1**

Type "**1**" as the ID of your Cross Section and complete the calculation with the input information included below.

1. Enter the ground points using the data below:

<u>Stat</u>		<u>Elev</u>	
<b>362</b>	<Enter>	<b>505.0</b>	<Enter>
<b>425</b>	<Enter>	<b>499.1</b>	<Enter>
<b>509</b>	<Enter>	<b>498.0</b>	<Enter>
<b>512</b>	<Enter>	<b>496.9</b>	<Enter>
<b>602</b>	<Enter>	<b>496.9</b>	<Enter>
<b>605</b>	<Enter>	<b>498.2</b>	<Enter>
<b>732</b>	<Enter>	<b>500.1</b>	<Enter>
<b>1020</b>	<Enter>	<b>504.7</b>	<Enter>

2. When you are finished entering the ground point data and are sure they are correct, press the "**Save Points**" button.
3. A dialog box pops up giving you information about how to begin your initial calculation. Once you click "**OK**" the cursor will be in the 'WS Elev' text box. For this Step-Backwater analysis, we will begin the initial calculation using an EG (Energy Grade) slope, which approximates the downstream channel slope ("**Solutions**": **Problem 6, Solution 1**).
4. EG Slope = **0.0029 ft/ft** <Enter>
5. Channel Bank Stations
 

<b>Left</b>	<b>509</b>	<Enter>
<b>Right</b>	<b>605</b>	<Enter>
6. Manning's n values
 

<b>Left</b>	<b>0.065</b>	<Enter>
<b>Channel</b>	<b>0.040</b>	<Enter>
<b>Right</b>	<b>0.060</b>	<Enter>



7. Discharge = **3000 cfs**    <Enter>
8. Click the "**Compute**" button ("**Solutions**": **Problem 6, Solution 2**).

### CROSS SECTION # 2

To add another cross section to this Step-Backwater analysis, click the "**New X-Sec**" button and repeat the above procedure using the data below.

(Note that for this next cross section, when you Save your ground points, the cursor will be at the Channel Bank Stations text box, since you do not have to input starting water surface elevation or slope data after the first cross section).

1. Type "**2**" as the ID of your Cross Section, and press <Enter>.
2. Enter the ground points using the data below:

<u>Stat</u>		<u>Elev</u>	
<b>1</b>	<Enter>	<b>510.0</b>	<Enter>
<b>150</b>	<Enter>	<b>504.8</b>	<Enter>
<b>233</b>	<Enter>	<b>502.2</b>	<Enter>
<b>236</b>	<Enter>	<b>500.9</b>	<Enter>
<b>331</b>	<Enter>	<b>500.9</b>	<Enter>
<b>334</b>	<Enter>	<b>501.8</b>	<Enter>
<b>402</b>	<Enter>	<b>505.5</b>	<Enter>
<b>591</b>	<Enter>	<b>510.1</b>	<Enter>

3. When you are finished entering the ground point data and are sure they are correct, press the "**Save Points**" button. Note that the cursor is now inside the Left Channel Bank Station text box. This is because, after the first cross section, you do not have to put in a starting water surface elevation or slope.
4. Channel Bank Stations
 

<b>Left</b>	<b>233</b>	<Enter>
<b>Right</b>	<b>334</b>	<Enter>
5. Manning's n values
 

<b>Left</b>	<b>0.055</b>	<Enter>
<b>Channel</b>	<b>0.040</b>	<Enter>
<b>Right</b>	<b>0.060</b>	<Enter>

## 6. Reach Lengths

**Left**        **450**    **<Enter>**  
**Channel**    **450**    **<Enter>**  
**Right**       **450**    **<Enter>**

7. Discharge            **3000 cfs**        **<Enter>**

8. Click the "**Compute**" button and scan the newly computed data. (Note that there is a critical depth message in the message box. This indicates that the program could not arrive at an energy balance, and so had to compute the critical depth at this section) ("**Sections**": **Problem 6, Solution 3**).

**CROSS SECTION # 3**

To add another cross section to this Step-Backwater analysis, click the "**New X-Sec**" button and repeat the above procedure using the data below.

1. Type "**3**" as the ID of your Cross Section, and press **<Enter>**.
2. Enter the ground points using the data below:

<u>Stat</u>		<u>Elev</u>	
<b>1</b>	<b>&lt;Enter&gt;</b>	<b>512.0</b>	<b>&lt;Enter&gt;</b>
<b>433</b>	<b>&lt;Enter&gt;</b>	<b>510.1</b>	<b>&lt;Enter&gt;</b>
<b>600</b>	<b>&lt;Enter&gt;</b>	<b>506.3</b>	<b>&lt;Enter&gt;</b>
<b>614</b>	<b>&lt;Enter&gt;</b>	<b>504.9</b>	<b>&lt;Enter&gt;</b>
<b>701</b>	<b>&lt;Enter&gt;</b>	<b>504.8</b>	<b>&lt;Enter&gt;</b>
<b>725</b>	<b>&lt;Enter&gt;</b>	<b>506.5</b>	<b>&lt;Enter&gt;</b>
<b>866</b>	<b>&lt;Enter&gt;</b>	<b>511.1</b>	<b>&lt;Enter&gt;</b>
<b>1240</b>	<b>&lt;Enter&gt;</b>	<b>512.1</b>	<b>&lt;Enter&gt;</b>

3. When you are finished entering the ground point data and are sure they are correct, press the "**Save Points**" button.
4. Channel Bank Stations
 

**Left**    **600**    **<Enter>**  
**Right**   **725**    **<Enter>**
5. Manning's n values
 

**Left**        **0.065**   **<Enter>**  
**Channel**    **0.040**   **<Enter>**  
**Right**       **0.060**   **<Enter>**

6. Reach Lengths  
    **Left**        **490**    <Enter>  
    **Channel**    **490**    <Enter>  
    **Right**      **490**    <Enter>
7. Discharge = **3000 cfs**    <Enter>
8. Click the "**Compute**" button and scan the newly computed data  
    (**"Solutions": Problem 6, Solution 4**).

Now run this Quick-2 computation using the HEC-2 program. To do this, first select "**File**" from the pull-down menu bar and click on "**Save / Run As HEC-2 File**". You will be asked for a new name for the HEC-2 file input file. To keep it simple, just keep the same file name that you are using but change the extension to ".dat" . This file is now in HEC-2 file format. Click on "**Save**" then "**OK**" to save the file.

Select "**HEC-2 Output**" in the "**View**" pull-down menu bar to run the HEC-2 program in a DOS window ("**Solutions": Problem 6, Solution 5**). When the calculation is complete, you can close that window. The HEC-2 results will appear as an output file (hec2.out) in the Write program. You may view the file ("**Solutions": Problem 6, Solution 6**) and save it under a different directory or name just like any other text file. Note that to print all of the data so that they fit the width of the page, you may have to select all of the output and change the font size to "8" and the page orientation to "landscape".

Once you are finished viewing the HEC-2 output file, close the Write program, click on "**File**", and then "**Exit**" to close the program.

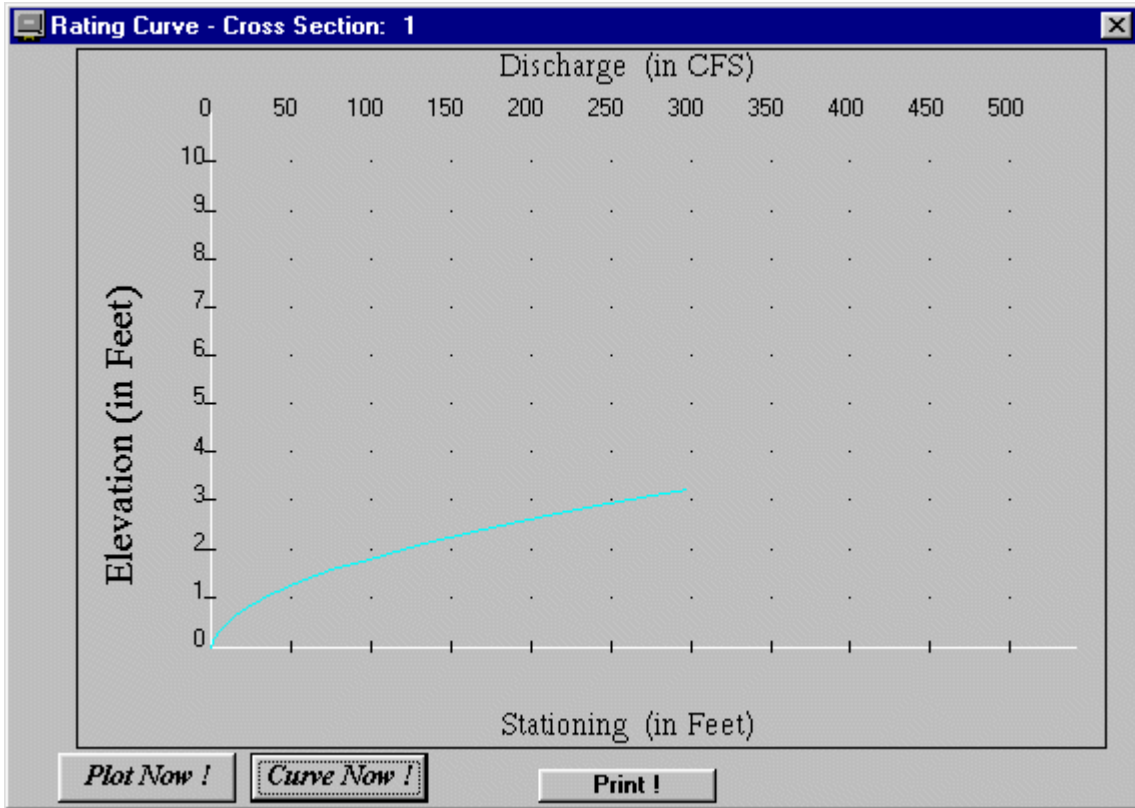
**SOLUTIONS**

**Problem 1: Normal Depth for a Trapezoidal Cross Section**

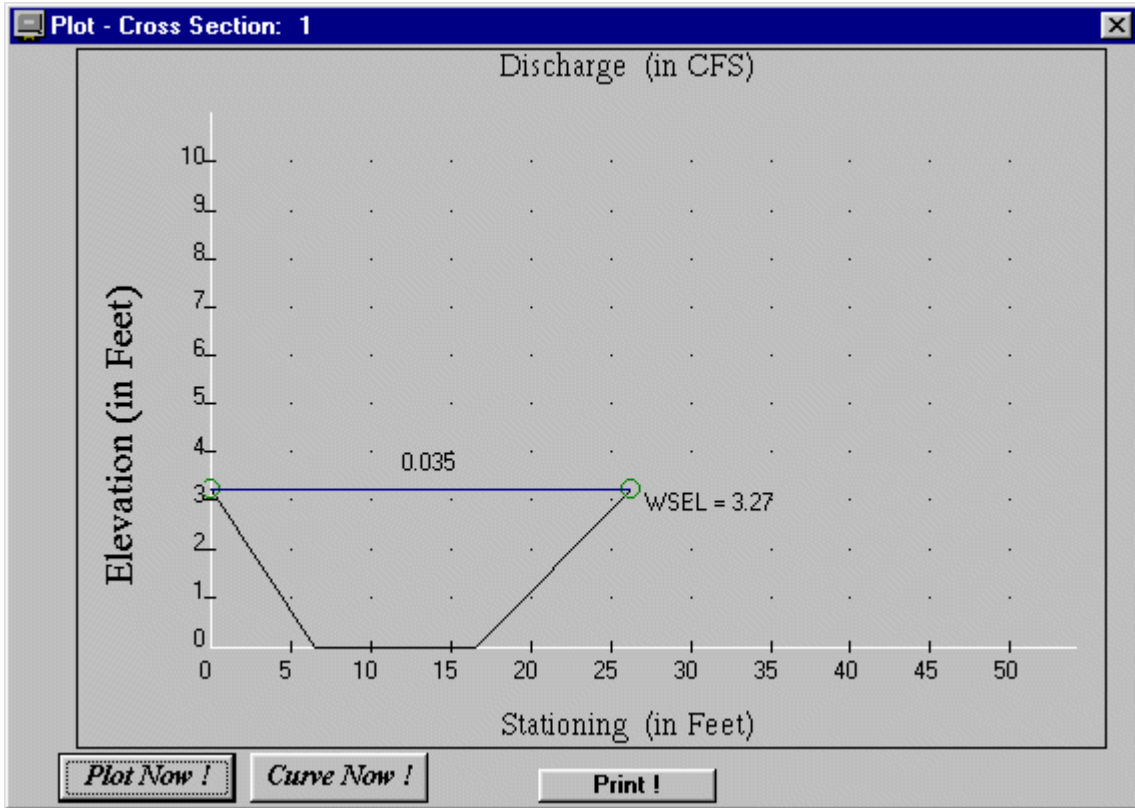
Solution 1:

Cross Section		Trapezoidal Channel	
1		Input Data	Output Data
Manning's n	0.035	Depth (ft)	3.27
Slope (ft/ft)	0.005	Crit Depth (ft)	2.45
LSide Slope (H:V)	2	Crit Slope (ft/ft)	.015705
RSide Slope (H:V)	3	Velocity (ft/s)	5.04
Bottom Width (ft)	10	Top Width (ft)	26.4
Discharge (cfs)	300	Area (sq ft)	59.6
Depth (ft)		Froude #	.59
		Flow Type	Sub-Critical

Solution 2:

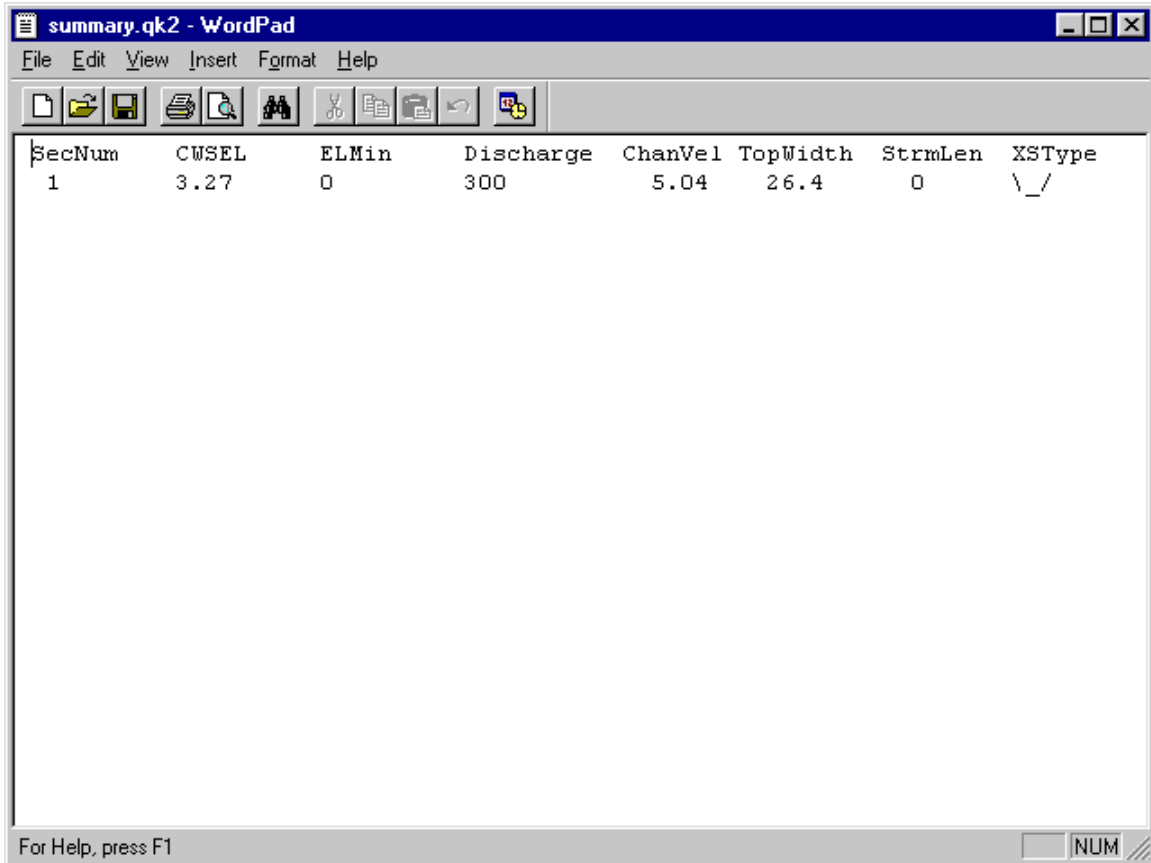


Solution 3:

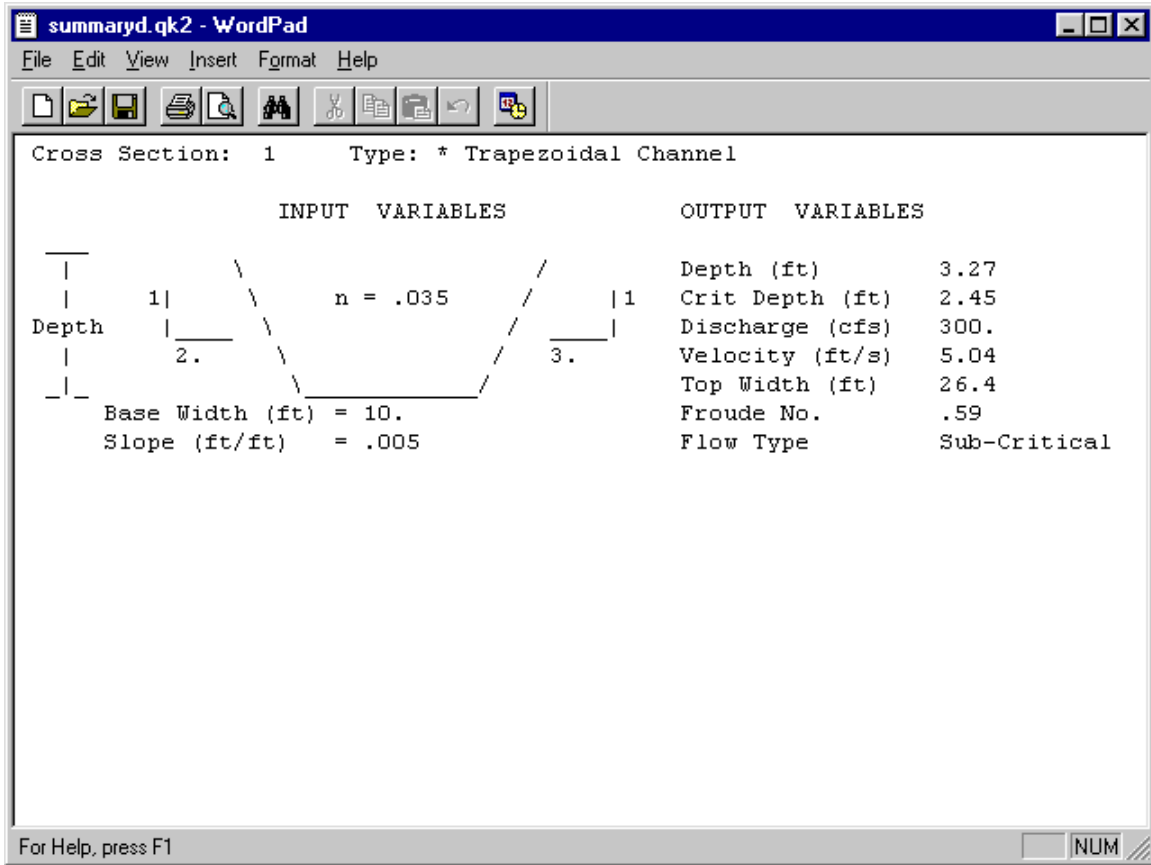


**Problem 1: Normal Depth for a Trapezoidal Cross Section**

Solution 4:



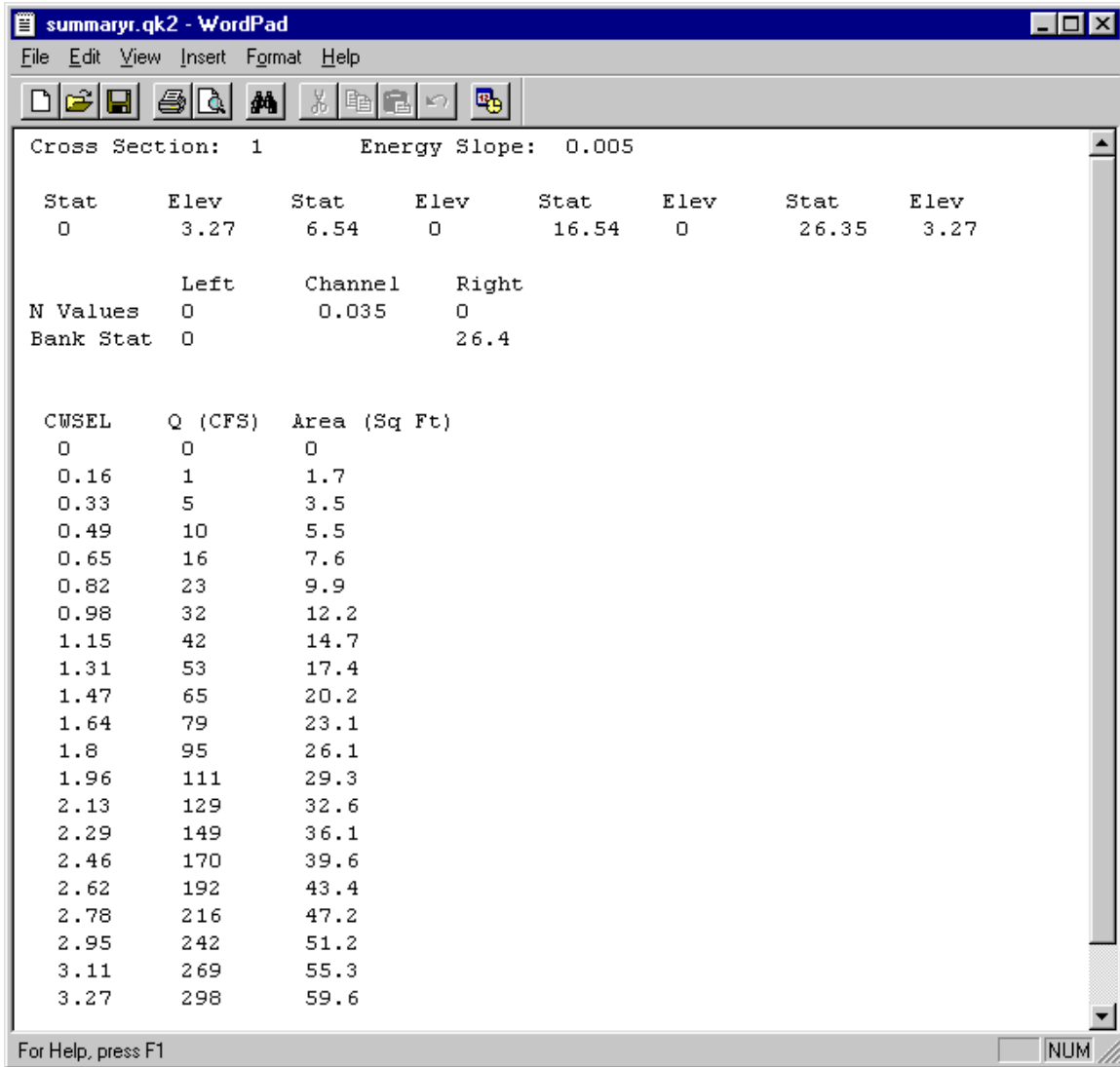
Solution 5:



**Problem 1: Normal Depth for a Trapezoidal Cross Section**



Solution 6:



summary.qk2 - WordPad

File Edit View Insert Format Help

Cross Section: 1 Energy Slope: 0.005

Stat	Elev	Stat	Elev	Stat	Elev	Stat	Elev
0	3.27	6.54	0	16.54	0	26.35	3.27

	Left	Channel	Right
N Values	0	0.035	0
Bank Stat	0		26.4

CWSEL	Q (CFS)	Area (Sq Ft)
0	0	0
0.16	1	1.7
0.33	5	3.5
0.49	10	5.5
0.65	16	7.6
0.82	23	9.9
0.98	32	12.2
1.15	42	14.7
1.31	53	17.4
1.47	65	20.2
1.64	79	23.1
1.8	95	26.1
1.96	111	29.3
2.13	129	32.6
2.29	149	36.1
2.46	170	39.6
2.62	192	43.4
2.78	216	47.2
2.95	242	51.2
3.11	269	55.3
3.27	298	59.6

For Help, press F1

NUM

**Problem 1: Normal Depth for a Trapezoidal Cross Section**

**Problem 2: Normal Depth for an Irregular Cross Section**

Solution 1:

Quick-2 V2.0 File: C:\Program Files\Quick2\Sample1 - [Normal Depth Method - Irregular Cha...]

File Method Section View Help

Cross Section 1.1 Station Elevation Insert Delete INPUT

Ground Points 8 Save Points Starting ...

Station	Elev	Station	Elev	Station	Elev	Station	Elev	Station	Elev
362	505	425	499.1	509	498	512	496.9	602	496.9
605	498.2	732	500.1	1020	504.7				

WS Elev or Depth (ft) EG Slope 0.0029

LEFT CHANNEL RIGHT

Channel Bank 509 605

Manning's n 0.065 0.040 0.060

Reach Len (ft)

Loss Coefficients Contr. 0.1 Exp. 0.3

Discharge (cfs) 3000

Compute New X-Section

OUTPUT

Crit Depth (ft) 499.92

WS Elev 501.03 Depth (ft) 4.13 Top Width (ft) 385 Flow Type Sub-Critical

EG Elev 501.32 Ch Vel (f/s) 5.1 K Ratio 1 Froude # .5

**Problem 3: Channel Capacity for a Rectangular Cross Section**

Solution 1:

Cross Section		Rectangular Channel	
1		Input Data	Output Data
Manning's n	0.035	Discharge (cfs)	391.2
Slope (ft/ft)	0.01	Crit Depth (ft)	3.62
LSide Slope (H:V)	0	Crit Slope (ft/ft)	.024097
RSide Slope (H:V)	0	Velocity (ft/s)	7.82
Bottom Width (ft)	10	Top Width (ft)	10.
Discharge (cfs)		Area (sq ft)	50.
Depth (ft)	5	Froude #	.62
		Flow Type	Sub-Critical

**Problem 4: Channel Capacity for a Triangular Cross Section**

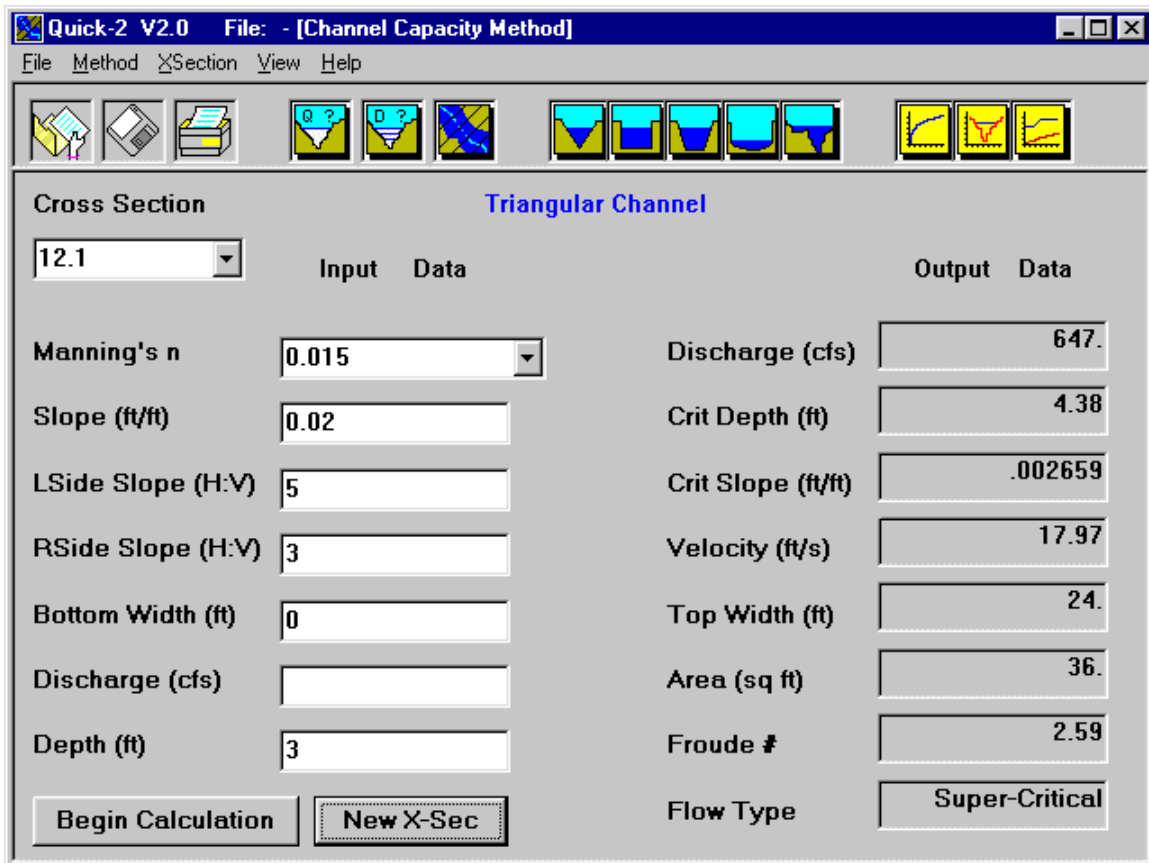
Solution 1:

Input Data		Output Data	
Manning's n	0.015	Discharge (cfs)	647.
Slope (ft/ft)	0.02	Crit Depth (ft)	
LSide Slope (H:V)	5	Crit Slope (ft/ft)	
RSide Slope (H:V)	3	Velocity (ft/s)	17.97
Bottom Width (ft)	0	Top Width (ft)	24.
Discharge (cfs)		Area (sq ft)	36.
Depth (ft)	3	Froude #	2.59
		Flow Type	Super-Critical

Solution 2:



Solution 3:



Problem 4: Channel Capacity for a Triangular Cross Section

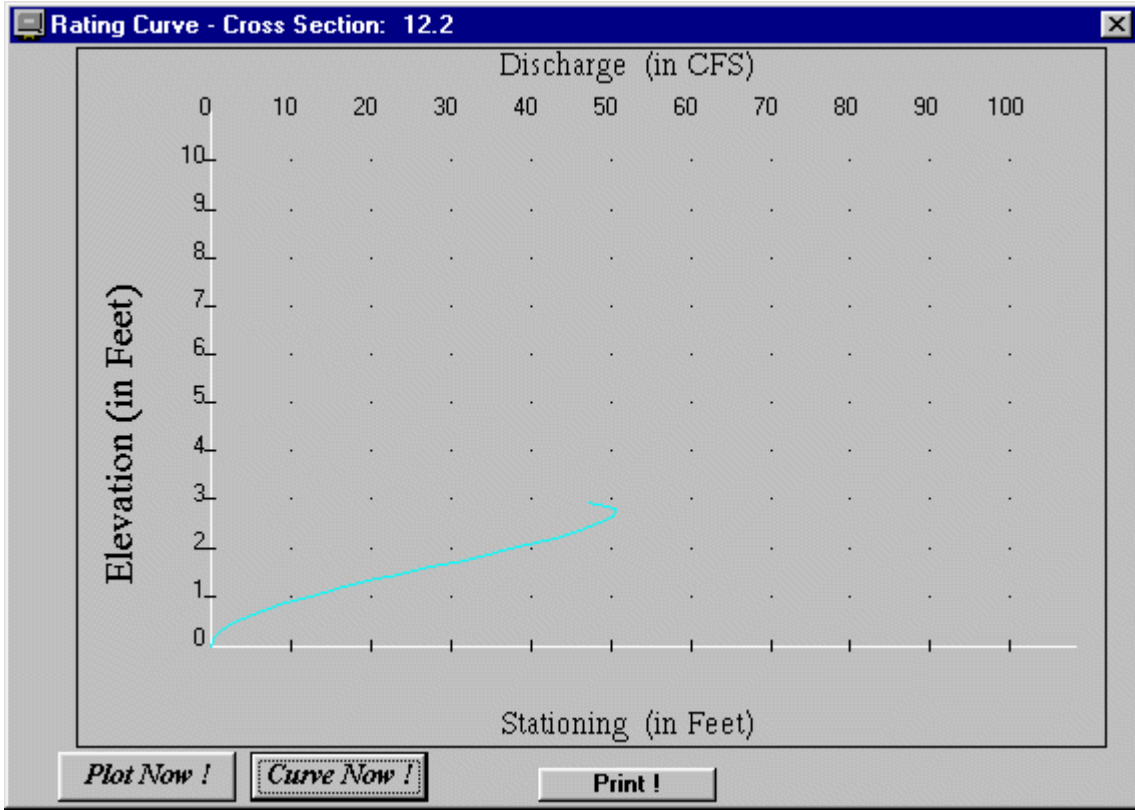
**Problem 5: Channel Capacity for a Circular Cross Section**

Solution 1:

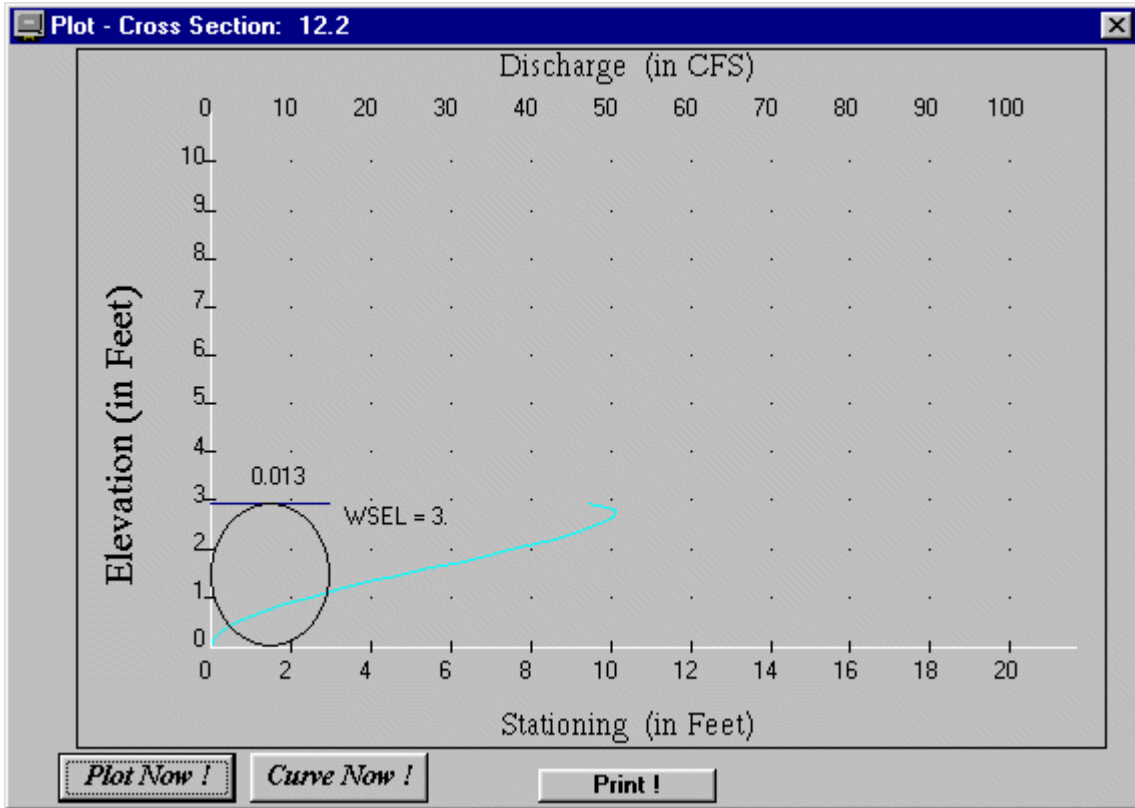
The screenshot shows the 'Step-Backwater Analysis - [Channel Capacity Method]' software window. The interface includes a menu bar (File, Method, Section, View, Help) and a toolbar with various icons. The main area is titled 'Cross Section Circular Channel' and features a dropdown menu set to '12.2'. Below this, there are two columns: 'Input Data' and 'Output Data'. The 'Input Data' column contains fields for Manning's n (0.013), Slope (ft/ft) (0.005), LSide Slope (H:V) (0), RSide Slope (H:V) (0), Diameter (in) (36), Discharge (cfs) (empty), and Depth (ft) (3). The 'Output Data' column contains fields for Discharge (cfs) (47.2), Crit Depth (ft) (2.23), Crit Slope (ft/ft) (.006114), Velocity (ft/s) (6.67), Top Width (ft) (3.), Area (sq ft) (7.1), Froude # (.77), and Flow Type (Sub-Critical). At the bottom, there are buttons for 'Begin Calculation' and 'New X-Sec'.

Cross Section		Circular Channel	
12.2		Input Data	Output Data
Manning's n	0.013	Discharge (cfs)	47.2
Slope (ft/ft)	0.005	Crit Depth (ft)	2.23
LSide Slope (H:V)	0	Crit Slope (ft/ft)	.006114
RSide Slope (H:V)	0	Velocity (ft/s)	6.67
Diameter (in)	36	Top Width (ft)	3.
Discharge (cfs)		Area (sq ft)	7.1
Depth (ft)	3	Froude #	.77
		Flow Type	Sub-Critical

Solution 2:



Solution 3:



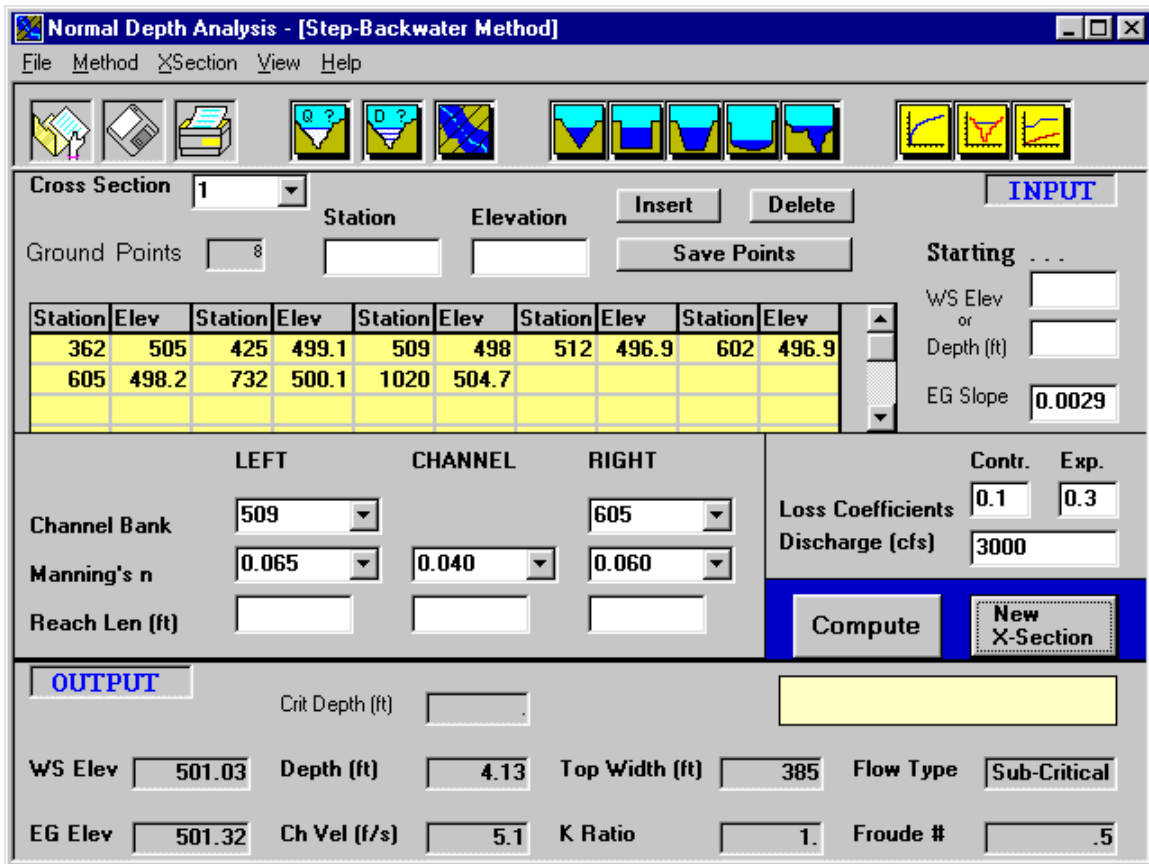


**Problem 6: Step-Backwater for Irregular Cross Sections**

Solution 1:



Solution 2:



Solution 3:

**Save File - [Step-Backwater Method]**

File Method Section View Help

Cross Section:

Ground Points: 

 Previous X-Sec:

Station	Elev	Station	Elev	Station	Elev	Station	Elev	Station	Elev
1	510	150	504.8	233	502.2	236	500.9	331	500.9
334	501.8	402	505.5	591	510.1				

WS Elev:   
 or  
 Depth (ft):   
 EG Slope:

	LEFT	CHANNEL	RIGHT
Channel Bank	<input type="text" value="233"/>		<input type="text" value="334"/>
Manning's n	<input type="text" value="0.055"/>	<input type="text" value="0.040"/>	<input type="text" value="0.060"/>
Reach Len (ft)	<input type="text" value="450"/>	<input type="text" value="450"/>	<input type="text" value="450"/>

Contr. Loss Coefficients: 
 Exp. Loss Coefficients:

Discharge (cfs):

**OUTPUT**

Crit Depth (ft): 
NO ENERGY BALANCE ... COMPUTING CRITICAL DEPTH

WS Elev	<input type="text" value="503.96"/>	Depth (ft)	<input type="text" value="3.06"/>	Top Width (ft)	<input type="text" value="197"/>	Flow Type	<input type="text" value="Critical"/>
EG Elev	<input type="text" value="505.1"/>	Ch Vel (f/s)	<input type="text" value="8.93"/>	K Ratio	<input type="text" value=".47"/>	Froude #	<input type="text" value="1.06"/>

Solution 4:

**Step-Backwater Analysis - [Step-Backwater Method]**

File Method Section View Help

Cross Section **3**

Ground Points

Station	Elev	Station	Elev	Station	Elev	Station	Elev	Station	Elev
1	512	433	510.1	600	506.3	614	504.9	701	504.8
725	506.5	866	511.1	1240	512.1				

Previous X-Sec  
 WS Elev   
 or  
 Depth (ft)   
 EG Slope

	LEFT	CHANNEL	RIGHT
Channel Bank	<input type="text" value="600"/>		<input type="text" value="725"/>
Manning's n	<input type="text" value="0.065"/>	<input type="text" value="0.040"/>	<input type="text" value="0.060"/>
Reach Len (ft)	<input type="text" value="490"/>	<input type="text" value="490"/>	<input type="text" value="490"/>

Contr.  Exp.   
 Loss Coefficients  
 Discharge (cfs)

**OUTPUT**

Crit Depth (ft)

WS Elev  Depth (ft)  Top Width (ft)  Flow Type   
 EG Elev  Ch Vel (f/s)  K Ratio  Froude #

Solution 5:

```

MS-DOS Finished - h2
Auto
C:\Program Files\Quick2>cd c:\windows\system
C:\WINDOWS\SYSTEM>hec2.exe INPUT=hec2.dat OUT=hec2.out TAPE95=hec2.t95

Starting profile number 1

      CWSEL for cross section      1.000 is      501.02
      CWSEL for cross section      2.000 is      503.95
      CWSEL for cross section      3.000 is      508.55

Normal program termination

C:\WINDOWS\SYSTEM>
    
```

Solution 6:

```

1*****
* HEC-2 WATER SURFACE PROFILES *
* *
* Version 4.6.2; May 1991 *
* *
* RUN DATE 16MAY00 TIME 22:52:29 *
*****

                                X X XXXXXXXX XXXXX XXX
                                X X X X X X X
                                X X X X
                                XXXXXXXX XXXX XXX
                                X X X X XXXX X
                                X X X X X X X
                                X X XXXXXXXX XXXXX XXX

1
16MAY00 22:52:29
    
```