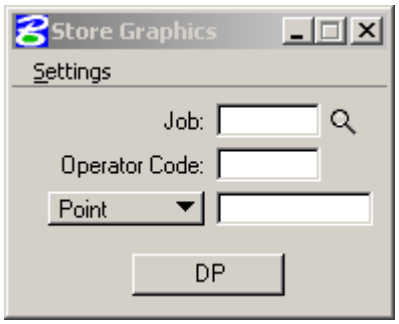
Store Graphics

The **Store Graphics** tool is utilized to store horizontal alignments into the coordinate geometry database from graphical elements in a 2D or 3D MicroStation file. The coordinate values of data points selected in the MicroStation file can be stored as GEOPAK points. Individual MicroStation arcs can be stored as GEOPAK curves. A continuous string of lines and arcs in the graphical file can be stored as a GEOPAK chain or parcel. Note that the **Store Graphics** tool within a 3D file utilizes only the XY coordinates, and no profile is generated.



Note: the accuracy of the data stored within the GPK file is based upon the precision of the MicroStation elements. Files with tighter working units (1:10000) produce more accurate geometric elements, and therefore stored graphics, than working units of 1:100.

In addition to storing elements into the coordinate geometry database, **Store Graphics** creates an ASCII file containing a series of GEOPAK commands documenting how the graphical elements are stored. With this file, you can modify and restore points, curves, parcels, or chains during subsequent coordinate geometry sessions.

Store Graphics Procedures

The **Store Graphics** dialog varies according to the specific storing operation. A unique window display is provided for storing points, curves, chains and parcels since each storing operation has different input requirements. The selection of the store point, curve, chain or parcel operation is determined by the option button.

The Job Number and Operator Code data are required for every storing operation. The Job Number determines the coordinate geometry database into which points, curves, chains or parcels are stored. The Job Number and the Operator Code both determine the name of the ASCII input file containing GEOPAK coordinate geometry commands that document the storing of elements. The naming convention for this input file is jJNoOC.inp where:

- JN = Job Number
- OC = Operator Code

This file provides a GEOPAK coordinate geometry input statement for every point, curve, chain or parcel that was stored. This file can be used in subsequent coordinate geometry sessions to modify and restore the points, curves, chains or parcels. If you enter a coordinate geometry session with the same Job Number and Operator Code as used in the Store Graphics window, a RESTORE command will load the input file and make it available for processing. The individual coordinate geometry statements can then be saved as a named input file into the coordinate geometry catalogue (see the coordinate geometry CAT command).

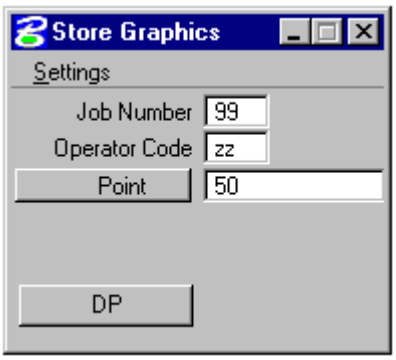
If you store several points, curves, chains or parcels in a single **Store Graphics** session, a single jJNoOC.inp file will be created. Each successive **Store Graphics** session with the same Job Number and Operator Code appends to the existing jJNoOC.inp file.

Points

Specific coordinate locations in the MicroStation file can be saved as GEOPAK coordinate geometry points.

The input fields shown in the dialog would store point number 50 into GEOPAK job 99. An input file named j99ozz.inp would contain the coordinate geometry store point command.

To Store a Point:



Populate the dialog.

Click DP.

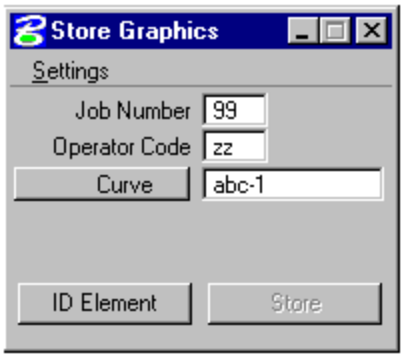
You are prompted "Select data point." A data point determines the coordinate value of the point to be stored.

The Alert message is displayed that the point is stored. The message applies the parameters defined in the Store Graphics window depicted above: Job Number 99, Operator Code zz and Point Number 50.

Curves

Individual circular arcs in the MicroStation file can be saved as GEOPAK curves.

The input fields shown above would store curve "abc-1" into GEOPAK job 99. An input file named j99ozz.inp would contain a coordinate geometry store point command for the curve PC as well as a store curve command for curve "abc-1"



To Store a Curve

Populate the dialog.

Click ID Element.

Identify and accept the arc to be stored.

Once an arc has been selected and accepted, the Store button unghosts indicating that the selected arc can now be stored as a GEOPAK curve. Clicking Store results in the curve being stored into the coordinate geometry database.

The Alert message appears. The message specifies the parameters defined in the Store Graphics window depicted above: Job Number "99," Operator Code "zz" and Curve "abc-1."

Chains

A series of connected lines and arcs can be stored as a GEOPAK chain. First, the **Settings** option in the upper left corner is utilized to select a chord definition, if desired. This is a toggle option.

To store a chain, three input fields (in addition to the Job Number and Operator Code) must be filled in. The **Chain** name shown above is sitel, while the **Beginning Station** would be station 10+00. The **Beginning Point** number is 100. The software applies sequential point numbers after point 100 as required. For example, if the chain required four points to be stored, point numbers 100 through 103 would be used. If point number 102 was previously stored, the software would issue a warning message and terminate the store chain operation unless the redefine mode in the GEOPAK User Preferences window was active.

If the chain you are attempting to store doesn't have any curves or spirals, the you can use the entire 15 characters for the chain name. If you have 9 or less curves, it will allow 13 characters.

This leaves the "-1, -2, -3 …. -9" for the curve names. If you have between 10 and 99 curves, it will allow 12 characters. This leaves the "-10, …. -99" for the curve names. If you have between 100 and 999 curves, it will allow 11 characters. This leaves the "-100, …., -999" for the curve names.

Three alternative methods are available for selecting component chain elements: **Complex Chain, Selection Set or Single Element**. The first two methods are identical in function to the MicroStation Selection Set and Automatic Create Complex Chain operations. For example, clicking **ID Element** with Selection Set active causes the software to invoke a standard MicroStation Selection Set command. The user employs Selection Set techniques to identify the elements to be included in the chain. Once the Selection Set procedure is complete, the Store button is available. Clicking **Store** results in the chain being stored into the coordinate geometry database. The single element option is utilized when only one element is to be used for the chain.

Once the dialog fields are complete, the sequence of operations to store a chain are summarized below for the Complex Chain method:

1) Click **ID Element**.

2) Identify and accept a line or arc that constitutes the beginning of the chain. The beginning element denotes where stationing begins. In this example, the beginning element is the element containing station 10+00.

3) Like the MicroStation Automatic Create Complex Chain, successive connected elements are highlighted one at a time for inclusion or rejection as long as the initial point of each subsequent element is within 0.75 master units (feet or meters) of the end point of the current element. As shown below, after the first element is selected and accepted, the next connected element is highlighted.

4) If more than a single element is located within tolerance to the next element end point, the message "Fork Accept/Reject" is displayed. A data point accepts the highlighted element. Pressing the reset cursor button rejects the highlighted element and highlights another.

5) Once the end of the chain is reached or the user presses the reset cursor button when no more connecting elements are available, the identification of component chain elements is complete. The highlighting is deactivated and the Store button changes from gray to black. Pressing the Store push button results in the chain being stored into the coordinate geometry database and the j99ozz.inp file being created.

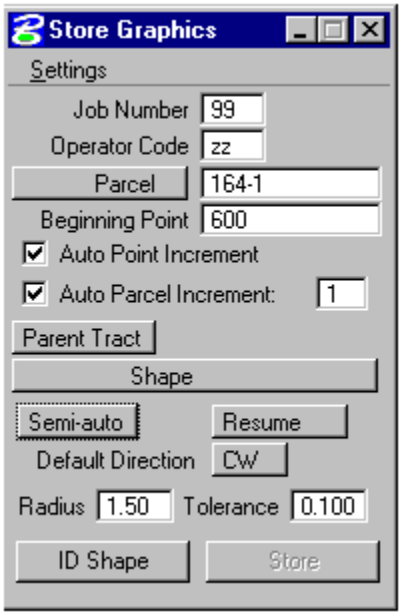
6) The STORE GRAPHICS NOTIFICATION message appears. Click **OK** to store.

Once the chain has been stored, the Draw Plan & Profile tool within the Design and Computation Manager can be used to draw stations onto the newly stored chain.

In addition, a description of the chain can be reviewed from within the coordinate geometry.

Parcels

The **Parcel Number** can be one to nine alphanumeric characters, as long as there are no spaces. The **Beginning Point** should be in a point range that does not have any other coordinate geometry points stored, as the Store Graphics command will overwrite them if the Set Redefine is active.



The **Auto Point Increment** and **Auto Parcel Increment** are useful if storing successive parcels. In these cases, assuming the toggles are active, the software will utilize the information for the first parcel. When the second parcel is stored, it will increase the parcel number by the amount in the Auto Parcel Increment box. For example, if the first parcel stored was 164-1, and the Auto Parcel Increment was set to three, the second parcel would be named 164-4. In order for this option to work, there must be a minimum of one number in the parcel number, not all alpha characters. The **Auto Point Increment** option utilizes a point number one greater than the last point number used on the previous parcel.

Options are supported for storing the **Parent Trac**t, **Taking, Easement**, or **Building**. Note that the Parent Tract for a parcel must be stored before the other options can be utilized.

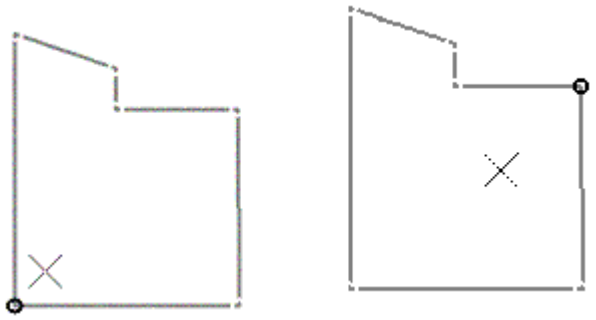
Parcels are closed chains, or in terms of MicroStation, a shape. Therefore, shape is the only supported option on the dialog. When the ID Shape button is pressed, GEOPAK scans for elements to create the parcel. These elements can be previously drawn into the MicroStation file or GEOPAK "visualized" elements. "Visualized" elements are GEOPAK generated elements via the visualization feature in the coordinate geometry. For two intersecting COGO visualized elements, the intersection is calculated in double precision. For an intersection between a COGO

visualized element and a MicroStation element, the MicroStation element is temporarily stored into COGO and a COGO based intersection is calculated. The graphical intersection is used for intersecting MicroStation elements.

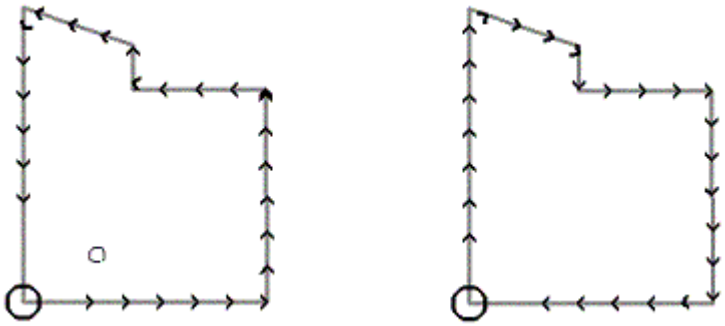
The direction in which GEOPAK moves around a parcel **(Default Direction**) can be either **CW** (clockwise) or **CCW** (counterclockwise). Note, however, that the direction can be overridden during the storing procedure.

Automatic Mode

After the dialog is populated and **ID Shape** is clicked, GEOPAK prompts to Select Data Point for Outer Shape. In response, the user should place a Data Point in the middle of the parcel shape. The software will then proceed vertically until it intersects with a line in the parcel and then continues around the parcel. Choose the Data Point carefully as it must be able to intersect the parcel with this vertical line. As the software is scanning, it selects the smallest possible area with the Data Point inside it. After the entire parcel is scanned, as the user moves the cursor, GEOPAK displays a circle at the closest vertex as depicted in the two graphics below. (The cursor is located at the X.)



If the area fill is active, the displayed circle will be filled. When the circle is on the desired initial vertex, select a data point. GEOPAK displays a larger circle at the selected vertex in addition to directional arrows based on the Default Direction (depicted below, left). A reset on the cursor changes the directional arrows (depicted below, right).



A final data point accepts the outlined parcel, the initial point, and the direction utilized to store the parcel. Select the **Store** button and an Alert Notification is seen on the screen. Clicking **OK** stores the parcel, while **Cancel** closes the Message with no storing occurring.

Note the radius of the circle is originally determined by the value in the **Radius** field. The **Tolerance** dictates to the software if two elements are closer together than the **Tolerance**, it

assumes they intersect. If they are farther apart than the Tolerance, it assumes they do not intersect.

Semi-Automatic Mode

The Semi-automatic mode is applicable when there are numerous lines intersecting a particular parcel requiring the designer to control where the software progresses along a particular parcel. In these congested areas, the automatic mode is not as useful as the semi-automatic mode.
To the right of the Semi-Auto option are several useful tools. These include:

- **Resume** - Indicates to the software that the selection of parcel elements is to commence again, usually utilized after a generic MicroStation command such as Window Area, Zoom In, or Zoom Out.

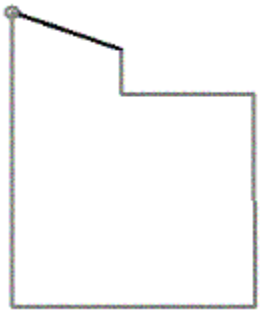
- **Time Out** - Indicates to the software that the selection of parcel elements is suspended, usually utilized before a generic MicroStation command such as Window Area, Zoom In, or Zoom Out.

- **Ball Enlarge** - This increases the size of the small filled circle at each vertex.

- **Ball Reduce** - This reduces the size of the small filled circle at each vertex.

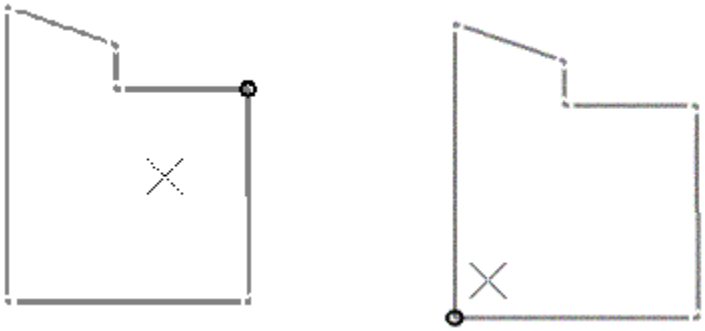
- **Ball Restore** - This returns the size of the small filled circle at each vertex to the original size.

Once the dialog is populated, and **ID Element** is clicked, we need to identify an element of the parcel. This is different from the automatic mode, where we selected a data point inside the parcel. Once the first element is selected, GEOPAK highlights the element and displays an Accept/Reject prompt. A reset allows the user to select another beginning line. Accepting the line (with another data point) places a filled circle at the vertex and also indicates the direction GEOPAK is scanning the parcel. A reset changes the scanning direction. The highlighted line and display circle are depicted in the illustration below.

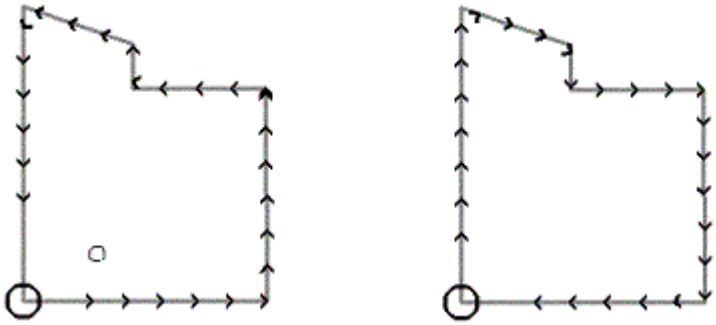


Selecting additional Data Points, the software continues around the parcel. Note the additional Data Points do not have to be on parcel elements, it simply signals to the software to select another connecting element. If an undesired element is selected, press Reset and GEOPAK selects another element. After the first element is highlighted and selected, the use of a Reset changes the direction of the sweep from clockwise to counterclockwise, and vice versa.

After a closed parcel is identified, GEOPAK displays a circle at the closest vertex. If the area fill is active, the displayed circle is filled.



When the circle is on the desired initial vertex, select a data point. GEOPAK displays a larger circle at the selected vertex in addition to directional arrows in the Default Direction (depicted below, left). A reset on the cursor changes the directional arrows (depicted below, right).



A final data point accepts the outlined parcel, the initial point, and the direction utilized to store the parcel. Select the **Store** button and an Alert Notification is seen on the screen.

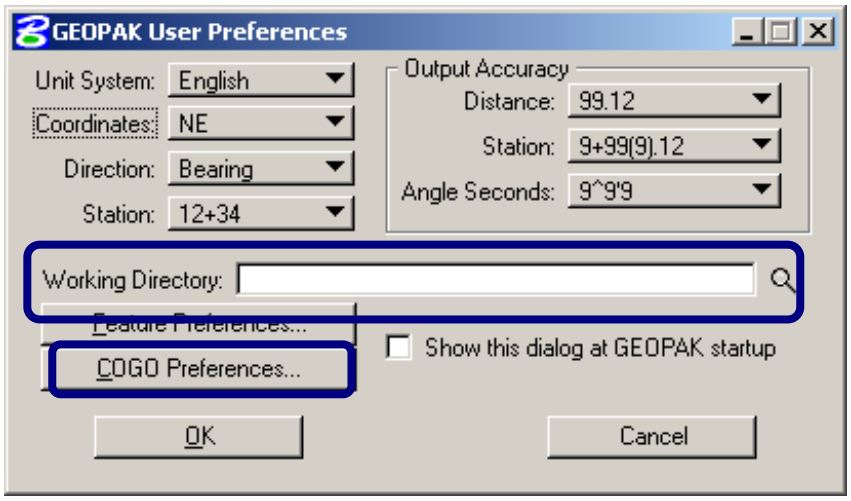
When **OK** is clicked, the parcel is stored, while **Cancel** closes the message with no storing occurring.

Extracting Plan Graphics Exercise

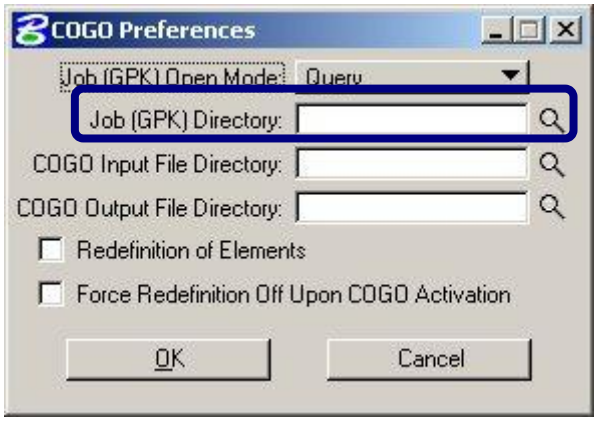
1. Open the following MicroStation file:

t:\de-proj\Carter\ J9P0359D\data\Plan_50_J5P0300.dgn

2. Go to **Applications>>GEOPAK Road>>User Preferences** and delete the working directory.



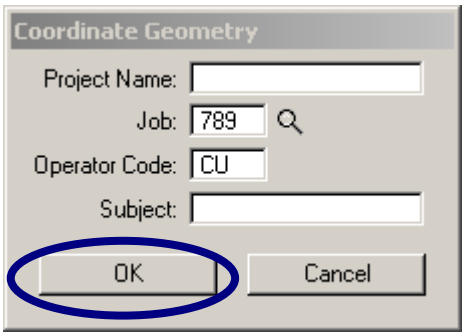
Then select **COGO Preferences** and delete the Job (GPK) Directory as well.



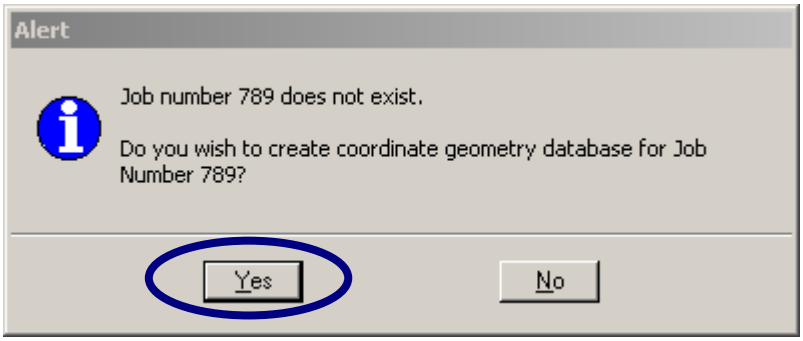
3. Open the **Coordinate Geometry** dialog.

Create **Job Number: 789**

Set the **Operator Code** to your initials.

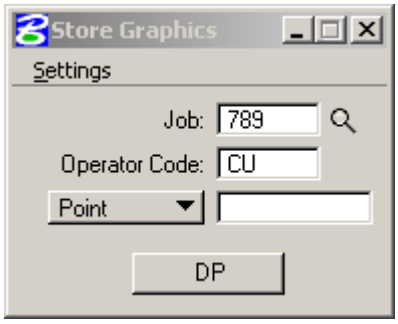


4. Since this coordinate geometry database does not exist, you will get the following message. Select **Yes** to the alert dialog to continue.



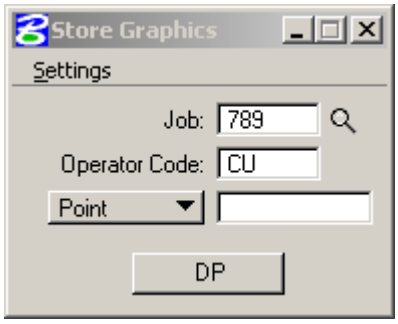
5. Using the Store Graphics tool extract the following chains:

Route 50
Bighorn
Ramp1
Ramp2
Ramp3
Ramp4a
Ramp4b



The chain description from the Designer's GPK are listed far below: Please check for accuracy in the Extracted chains vs. the Designer's chains.

6. Using the Store Graphics tool to extract the coordinates for the seven (7) orange power poles in the southwest corner of the project.




```
<*        1   PRINT POINT PP1 PP2 PP3 PP4 PP5 PP6 PP7

    Point                North              East
---------------    ---------------   ----------------
PP1                   999,142.6780     1,697,815.3310
PP2                   999,166.7460     1,698,010.0160
PP3                   999,164.1460     1,698,189.0990
PP4                   999,161.4800     1,698,388.6510
PP5                   999,158.8800     1,698,645.2750
PP6                   999,153.6120     1,698,897.6320
PP7                   999,149.2120     1,699,151.5890
```

Designer's Chain Descriptions

```
<*        1   DESCRIBE CHAIN ROUTE50

Chain ROUTE50 contains:
 1 CUR ROUTE50-1 3

Beginning chain ROUTE50 description
================================================================================

Point 1               N     999,551.4258 E   1,698,102.3443 Sta    445+30.940

Course from 1 to PC ROUTE50-1 S 82° 41' 55.09" E Dist 1,937.1386

                                  Curve Data
                                 *----------*
Curve ROUTE50-1
P.I.  Station          477+47.590  N        999,142.6274  E      1,701,292.9116
Delta       =      48° 08' 03.45" (LT)
Degree      =       2° 00' 00.00"
Tangent     =          1,279.5111
Length      =          2,406.7146
Radius      =          2,864.7890
External    =            272.7522
Long Chord  =          2,336.5617
Mid. Ord.   =            249.0413
P.C.  Station          464+68.079  N        999,305.2382  E      1,700,023.7755
P.T.  Station          488+74.793  N        999,979.2428  E      1,702,261.0145
C.C.                               N      1,002,146.7978  E      1,700,387.8564
Back        = S  82° 41' 55.09" E
Ahead       = N  49° 10' 01.47" E
Chord Bear  = N  73° 14' 03.19" E

Course from PT ROUTE50-1 to 3 N 49° 10' 00.95" E Dist 618.1073

Point 3               N   1,000,383.3969 E   1,702,728.6855 Sta    494+92.900

================================================================================
Ending chain ROUTE50 description


<*        2   DESCRIBE CHAIN BIGHORN

Chain BIGHORN contains:
 50 CUR BIGHORN1 55 CUR BIGHORN2 CUR BIGHORN3 54

Beginning chain BIGHORN description
================================================================================

Point 50              N   1,000,188.1341 E   1,700,104.5480 Sta      0+97.771

Course from 50 to PC BIGHORN1 S 1° 04' 27.81" W Dist 172.6189

                                  Curve Data
                                 *----------*
Curve BIGHORN1
P.I.  Station            3+46.668  N        999,939.2803  E      1,700,099.8810
Delta       =       7° 36' 59.87" (LT)
Degree      =       5° 00' 00.00"
Tangent     =             76.2787
Length      =            152.3326
```

```
Radius      =          1,145.9156
External    =              2.5360
Long Chord  =            152.2205
Mid. Ord.   =              2.5304
P.C.  Station            2+70.390  N      1,000,015.5456  E      1,700,101.3113
P.T.  Station            4+22.722  N        999,863.4983  E      1,700,108.5719
C.C.                               N        999,994.0590  E      1,701,247.0254
Back        = S   1° 04' 27.81" W
Ahead       = S   6° 32' 32.06" E
Chord Bear  = S   2° 44' 02.13" E

Course from PT BIGHORN1 to 55 S 6° 32' 25.64" E Dist 577.2777

Point 55              N     999,289.9778 E   1,700,174.3266 Sta     10+00.000

Course from 55 to PC BIGHORN2 S 6° 32' 25.64" E Dist 95.9071

                                   Curve Data
                                  *----------*
Curve BIGHORN2
P.I.  Station           12+29.058  N        999,062.4108  E      1,700,200.4215
Delta       =      13° 15' 20.41" (RT)
Degree      =       5° 00' 00.00"
Tangent     =            133.1511
Length      =            265.1134
Radius      =          1,145.9156
External    =              7.7099
Long Chord  =            264.5225
Mid. Ord.   =              7.6584
P.C.  Station           10+95.907  N        999,194.6948  E      1,700,185.2508
P.T.  Station           13+61.021  N        998,930.1726  E      1,700,184.8557
C.C.                               N        999,064.1342  E      1,699,046.7973
Back        = S   6° 32' 32.06" E
Ahead       = S   6° 42' 48.35" W
Chord Bear  = S   0° 05' 08.14" W

Course from PT BIGHORN2 to PC BIGHORN3 S 6° 42' 48.34" W Dist 440.3310

                                   Curve Data
                                  *----------*
Curve BIGHORN3
P.I.  Station           18+33.003  N        998,461.4269  E      1,700,129.6793
Delta       =       1° 06' 27.90" (LT)
Degree      =       1° 45' 00.00"
Tangent     =             31.6510
Length      =             63.3000
Radius      =          3,274.0445
External    =              0.1530
Long Chord  =             63.2990
Mid. Ord.   =              0.1530
P.C.  Station           18+01.352  N        998,492.8608  E      1,700,133.3794
P.T.  Station           18+64.652  N        998,429.9272  E      1,700,126.5876
C.C.                               N        998,110.1135  E      1,703,384.9748
Back        = S   6° 42' 48.35" W
Ahead       = S   5° 36' 20.44" W
Chord Bear  = S   6° 09' 34.40" W

Course from PT BIGHORN3 to 54 S 5° 36' 21.37" W Dist 283.6390

Point 54              N     998,147.6448 E   1,700,098.8801 Sta     21+48.291

================================================================================
Ending chain BIGHORN description
```

<* 3 DESCRIBE CHAIN RAMP1

```
Chain RAMP1 contains:
 CUR RAMP1-1 12

Beginning chain RAMP1 description
================================================================================

                                  Curve Data
                                 *----------*
Curve RAMP1-1
P.I.  Station            1+73.892  N        999,502.5730  E      1,699,002.9529
Delta       =      13° 50' 36.90" (LT)
Degree      =       4° 00' 00.00"
Tangent     =            173.8916
Length      =            346.0896
Radius      =          1,432.3945
External    =             10.5165
Long Chord  =            345.2483
Mid. Ord.   =             10.4399
P.C.  Station            0+00.000  N        999,524.6725  E      1,698,830.4713
P.T.  Station            3+46.090  N        999,522.3854  E      1,699,175.7121
C.C.                               N      1,000,945.4524  E      1,699,012.5111
Back        = S  82° 41' 55.19" E
Ahead       = N  83° 27' 27.92" E
Chord Bear  = S  89° 37' 13.64" E

Course from PT RAMP1-1 to 12 N 83° 27' 27.92" E Dist 965.6429

Point 12              N     999,632.4067 E   1,700,135.0668 Sta     13+11.732

================================================================================
Ending chain RAMP1 description
```

<* 4 DESCRIBE CHAIN RAMP2

```
Chain RAMP2 contains:
 CUR RAMP2-1 CUR RAMP2-2 23

Beginning chain RAMP2 description
================================================================================

                                  Curve Data
                                 *----------*
Curve RAMP2-1
P.I.  Station            3+55.639  N        999,363.2747  E      1,699,051.4932
Delta       =      37° 41' 55.21" (RT)
Degree      =       5° 30' 00.00"
Tangent     =            355.6390
Length      =            685.4304
Radius      =          1,041.7414
External    =             59.0330
Long Chord  =            673.1331
Mid. Ord.   =             55.8671
P.C.  Station            0+00.000  N        999,408.4720  E      1,698,698.7379
P.T.  Station            6+85.430  N        999,111.8000  E      1,699,302.9679
C.C.                               N        998,375.1775  E      1,698,566.3455
Back        = S  82° 41' 55.21" E
Ahead       = S  45° 00' 00.00" E
```

```
Chord Bear  = S  63° 50' 57.61" E

Course from PT RAMP2-1 to PC RAMP2-2 S 45° 00' 00.00" E Dist 205.6415

                                  Curve Data
                                 *----------*
Curve RAMP2-2
P.I.  Station           10+95.061  N        998,822.1475  E      1,699,592.6204
Delta       =      38° 17' 11.59" (LT)
Degree      =       9° 45' 00.00"
Tangent     =           203.9889
Length      =           392.6826
Radius      =           587.6490
External    =            34.3983
Long Chord  =           385.4173
Mid. Ord.   =            32.4961
P.C.  Station           8+91.072  N        998,966.3895  E      1,699,448.3784
P.T.  Station          12+83.754  N        998,798.3004  E      1,699,795.2106
C.C.                              N        999,381.9201  E      1,699,863.9090
Back        = S  45° 00' 00.00" E
Ahead       = S  83° 17' 11.59" E
Chord Bear  = S  64° 08' 35.80" E

Course from PT RAMP2-2 to 23 S 83° 17' 11.59" E Dist 371.5571

Point 23              N     998,754.8640 E   1,700,164.2200 Sta     16+55.312

==============================================================================
Ending chain RAMP2 description
```

<* 5 DESCRIBE CHAIN RAMP3

```
Chain RAMP3 contains:
 CUR RAMP3-1 CUR RAMP3-2 33

Beginning chain RAMP3 description
==============================================================================

                                  Curve Data
                                 *----------*
Curve RAMP3-1
P.I.  Station           3+74.603  N        999,415.5268  E      1,701,110.6688
Delta       =      42° 50' 18.76" (RT)
Degree      =       6° 00' 00.00"
Tangent     =           374.6034
Length      =           713.9757
Radius      =           954.9297
External    =            70.8473
Long Chord  =           697.4614
Mid. Ord.   =            65.9541
P.C.  Station           0+00.000  N        999,559.9547  E      1,701,456.3107
P.T.  Station           7+13.976  N        999,544.6358  E      1,700,759.0175
C.C.                              N      1,000,441.0563  E      1,701,088.1388
Back        = S  67° 19' 19.90" W
Ahead       = N  69° 50' 21.34" W
Chord Bear  = S  88° 44' 29.28" W

Course from PT RAMP3-1 to PC RAMP3-2 N 69° 50' 21.34" W Dist 196.8343

                                  Curve Data
                                 *----------*
Curve RAMP3-2
```

```
P.I.  Station           10+66.222  N        999,666.0391  E      1,700,428.3539
Delta       =      26° 42' 10.71" (LT)
Degree      =       8° 45' 00.00"
Tangent     =            155.4117
Length      =            305.1768
Radius      =            654.8089
External    =             18.1900
Long Chord  =            302.4224
Mid. Ord.   =             17.6983
P.C.  Station            9+10.810  N        999,612.4757  E      1,700,574.2434
P.T.  Station           12+15.987  N        999,648.3322  E      1,700,273.9542
C.C.                               N        998,997.7873  E      1,700,348.5602
Back        = N  69° 50' 21.34" W
Ahead       = S  83° 27' 27.95" W
Chord Bear  = N  83° 11' 26.70" W

Course from PT RAMP3-2 to 33 S 83° 27' 27.95" W Dist 139.7975

Point 33              N     999,632.4043 E   1,700,135.0671 Sta     13+55.784

================================================================================
Ending chain RAMP3 description
```

<* 6 DESCRIBE CHAIN RAMP4

```
Chain RAMP4 contains:
 40 CUR RAMP4-1 CUR RAMP4-2

Beginning chain RAMP4 description
================================================================================

Point 40              N     998,794.5897 E   1,700,168.8961 Sta      0+00.000

Course from 40 to PC RAMP4-1 N 83° 17' 11.59" W Dist 373.7932

                                  Curve Data
                                 *----------*
Curve RAMP4-1
P.I.  Station            5+89.291  N        998,863.4801  E      1,699,583.6455
Delta       =      90° 52' 54.61" (RT)
Degree      =      27° 00' 00.00"
Tangent     =            215.4980
Length      =            336.5994
Radius      =            212.2066
External    =             90.2352
Long Chord  =            302.4060
Mid. Ord.   =             63.3130
P.C.  Station            3+73.793  N        998,838.2876  E      1,699,797.6659
P.T.  Station            7+10.393  N        999,077.0875  E      1,699,612.1289
C.C.                               N        999,049.0391  E      1,699,822.4737
Back        = N  83° 17' 11.59" W
Ahead       = N   7° 35' 43.02" E
Chord Bear  = N  37° 50' 44.29" W

Course from PT RAMP4-1 to PC RAMP4-2 N 7° 35' 43.02" E Dist 1.4982

                                  Curve Data
                                 *----------*
Curve RAMP4-2
P.I.  Station            9+23.012  N        999,287.8410  E      1,699,640.2317
Delta       =      89° 42' 21.80" (RT)
Degree      =      27° 00' 00.00"
```

```
Tangent     =            211.1207
Length      =            332.2447
Radius      =            212.2066
External    =             87.1320
Long Chord  =            299.3346
Mid. Ord.   =             61.7695
P.C.  Station            7+11.891  N        999,078.5726  E      1,699,612.3269
P.T.  Station           10+44.136  N        999,261.0101  E      1,699,849.6406
C.C.                               N        999,050.5242  E      1,699,822.6717
Back        = N   7° 35' 43.02" E
Ahead       = S  82° 41' 55.18" E
Chord Bear  = N  52° 26' 53.92" E

================================================================================
Ending chain RAMP4 description
```

<* 7 DESCRIBE CHAIN RAMP4A

```
Chain RAMP4A contains:
 44 CUR RAMP4-2

Beginning chain RAMP4A description
================================================================================

Point 44              N     999,077.0875 E   1,699,612.1289 Sta      7+10.393

Course from 44 to PC RAMP4-2 N 7° 35' 43.02" E Dist 1.4982

                                 Curve Data
                                *-----------*
Curve RAMP4-2
P.I.  Station            9+23.012  N        999,287.8410  E      1,699,640.2317
Delta       =      89° 42' 21.80" (RT)
Degree      =      27° 00' 00.00"
Tangent     =            211.1207
Length      =            332.2447
Radius      =            212.2066
External    =             87.1320
Long Chord  =            299.3346
Mid. Ord.   =             61.7695
P.C.  Station            7+11.891  N        999,078.5726  E      1,699,612.3269
P.T.  Station           10+44.136  N        999,261.0101  E      1,699,849.6406
C.C.                               N        999,050.5242  E      1,699,822.6717
Back        = N   7° 35' 43.02" E
Ahead       = S  82° 41' 55.18" E
Chord Bear  = N  52° 26' 53.92" E

================================================================================
Ending chain RAMP4A description
```