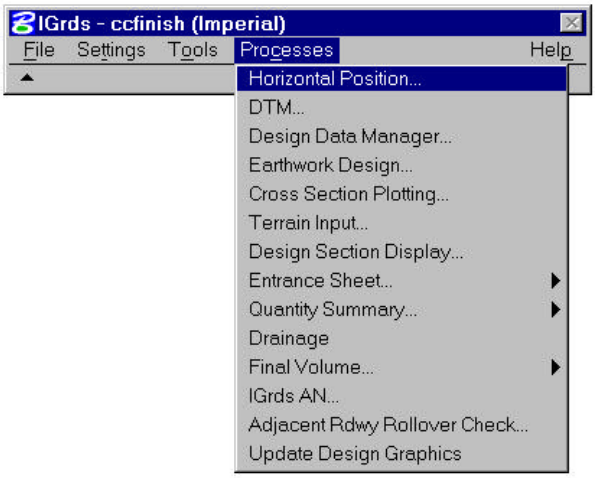
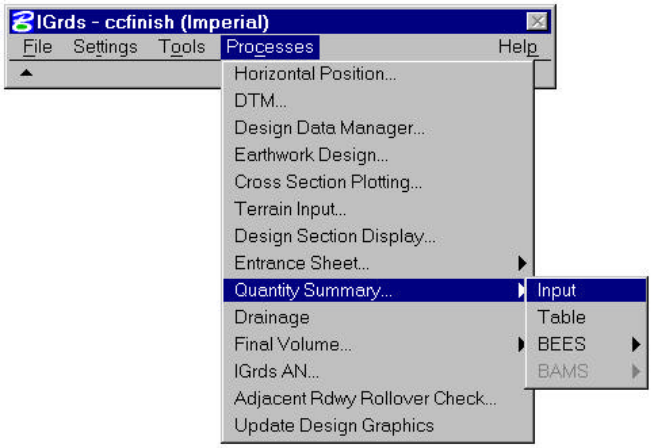
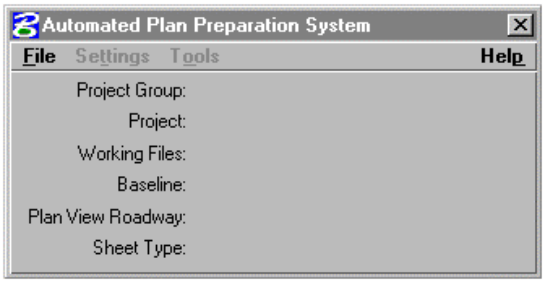
CHAPTER 11

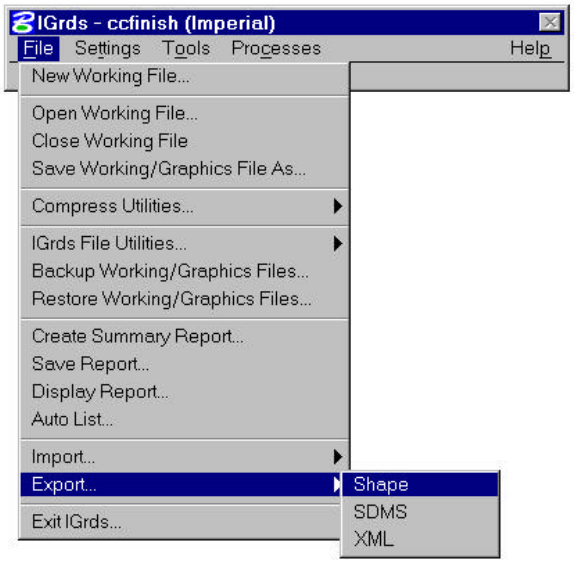
PLAN PREPARATION AND CONSTRUCTION SUPPORT PROCESSES

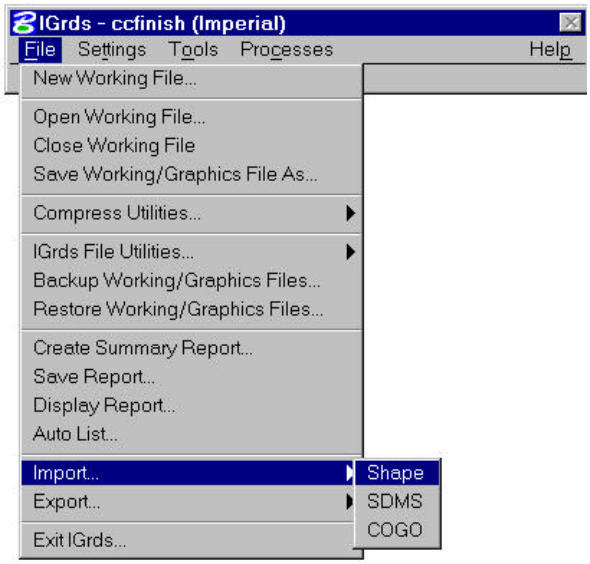




Automated Plan Preparation System Menu







XML Commands Menu

SDMS Commands Menu

Figure 11-1
Plan Preparation and Support Processes Menus

INTRODUCTION

The Plan Preparation and Construction Support Processes are discussed in this chapter. Each process is discussed individually, including a description of the user interface and processing. The processes include the following:

Cross Section Plot

The Cross Section Plot process is used to request generation of cross section plots on plan, standard, or special drawing sheets that may be either gridded or non-gridded.

Quantity Summary

The Quantity Summary process is used for inputting Quantity Summary (QS) items as IGrds geometry elements and creating graphic tables which summarize the QS items of a given type, or types, in a form suitable for inclusion in plans, and subsequent entry into the Basic Engineering Estimating System (BEES). The main QS process includes three subprocesses to support these functions: QS Input, QS Table, and QS BEES.

Automated Plan Preparation System (IGapps)

The Automated Plan Preparation System of IGrds (IGapps) is a system that provides designers with the capability to create plan and profile drawings from IGrds roadway design files.

Through the use of IGapps, roadway plan and profile information in continuous form can be reformatted into a standard set of plan and profile drawings of any desired scale. This is accomplished by executing the IGapps program and entering the necessary data in the dialogs provided for that purpose.

Survey Data Management System (SDMS)

The Survey Data Management System (SDMS) data format is used by IGrds to export and import geometry, alignment, and cross section data.

XML Format Processes

The XML Export Processes are used by IGrds to export geometry, alignment, and cross section data using the XML format.

CONTENTS	**MANUAL PAGE**

CROSS SECTION PLOT

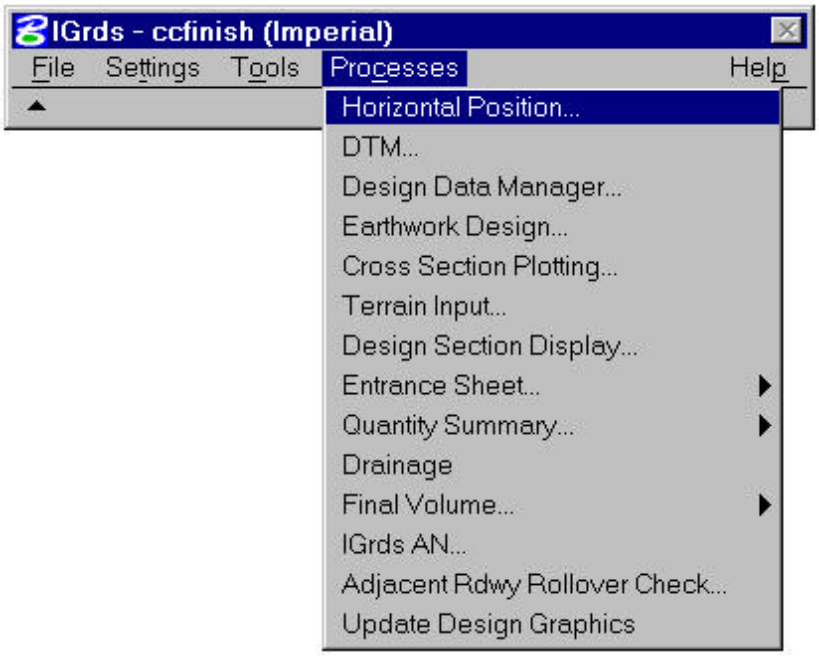
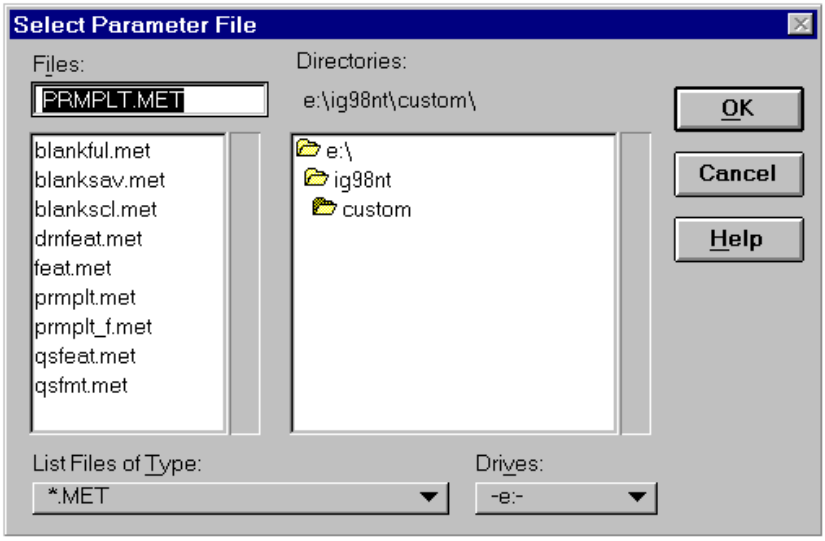


Figure 11-2
Cross Section Plot Menu

CONTENTS **CROSS SECTION PLOT**	**MANUAL** **PAGE**

CROSS SECTION PLOT



This process is used to request generation of cross section plots on plain, standard, or special drawing sheets that may be either gridded or non-gridded. The cross section plotting process is accessed by selecting Processes on the IGrds menu bar, and then selecting the Cross Section Plotting option on the Processes pulldown option list. This action causes the Select Parameter File menu to be displayed. (This menu is typical of all the file selection menus encountered in this process, so the following description applies to them all and will not be repeated elsewhere.)

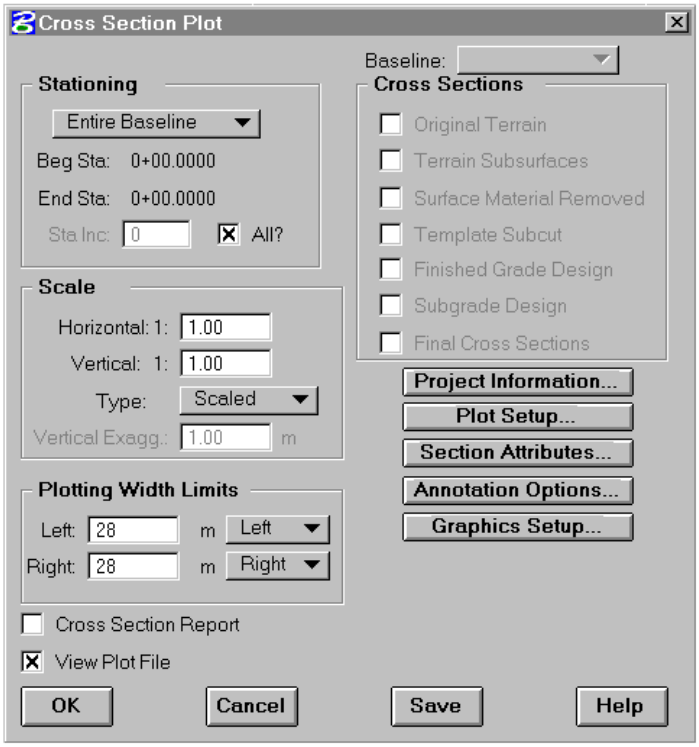
The default parameter file shown in the Name field is controlled by the IG_IMP_XSPLOT and IG_MET_XSPLOT environment variables for imperial and metric respectively. These environment variables are set in the IGrds startup script (ig98.bat) which is located in the IGrds /bin directory.

Selection of the parameter file initializes the process with a default set of plot parameters. However, these parameters may be modified during the process, and saved under a new name for use with other plot requests. This is accomplished on the Cross Section Plot menu through the Save option.

In order for Cross Section Annotation to work on multiple roadways. The roadways must use all finished grade templates or use all subgrade templates.

Name	Displays the name of the current plot parameter file. A different file in the list of files may be keyed in or a selection can be made from within the list.
Directory	This is a "read only" display of the current directory in which the current named files is found. See Directories.
Filter	Displays the current default name extension, *.imp for Imperial, or *.met for Metric files.
Directories	Displays a list of directories used to set the Directory path leading to the parameter file. Use the cursor to change the Directory path as required.

Files	Displays a list of files available for use under the current Directory path and Filter designation. The current file appearing in the Name field is highlighted. Clicking on a different name places that file name in the Name field.
OK	Select OK to cause the selected parameter file to become the current parameter file used in the plotting process.
Cancel	Select Cancel to close the menu without taking any action. The default file remains in effect.



Selecting OK or Cancel on the Select Parameter File menu causes the Cross Section Plot menu shown here to be displayed.

There are five auxiliary dialogs which are accessed by the buttons in the lower right area of this dialog. They provide for other plot specifications and are described on the following pages. They should be reviewed to make sure the desired results will be produced by this process.

Baseline	Select the desired baseline roadway.
Stationing	Select option. • Entire baseline The beginning and ending stations of the alignment are displayed. • Station to Station Enter or select the desired beginning and/or ending station where plotting is to start and stop.

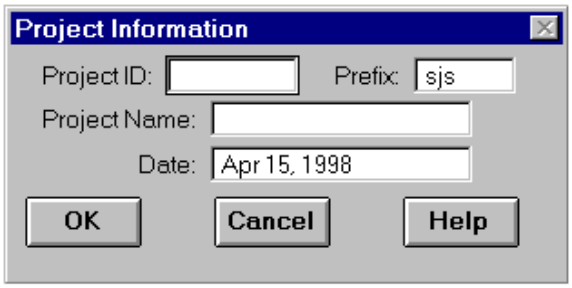
All?	Push to plot all sections in the selected station range.
Sta Inc	Enter station increment for sections if All is not pushed.
Scale	
Horizontal	Enter the horizontal scale factor for the plots.
Vertical	Enter the vertical scale factor for the plots.
Type	Select option. • Full Size Selecting Full Size causes the cross sections to be plotted at a full 1:1 ratio; i.e., 1 ft = 1 ft or 1m = 1m. • Scaled Selecting Scaled causes the cross sections to be plotted to the input scale ratios; i.e., 1ft = 10 ft, 1m = 5m, etc.
Vertical Exagg.	Displays the current vertical scale exaggeration factor. The default is 1 ft or 1m. Enter a different value as desired. (Only available when Type is set to Full Size.)
Plotting Width Limits	Enter Left and Right plotting width limits, and select respective width direction switches, Left or Right, for each. See Figures 11-2 and 11-3.
Cross Section Report	Push to generate report.
View Plot File	Select to remain in the cross section graphics file when the process is finished.

Cross Section Options	Push desired options for section types to be included on plots (1 or more). Only those section types that exist will appear active, all others will be grayed out. • Original Terrain • Terrain Subsurfaces • Surface Material Removed • Template Subcut • Finished Grade Design • Subgrade Design • Final Cross Sections
Project Information	Click to display the Project Information dialog box (see page 11-10).
Plot Setup	Click to display the plot setup dialog box (see page 11-11).
Section Attributes	Click to display the Section Attributes dialog box (see page 11-15).
Annotation Options	Click to display the Annotation Options dialog box (see page 11-17).
Graphics Setup	Click to display the Graphics Setup menu (see page 11-21).
OK	Click to execute the process.
Cancel	Click to cancel dialog box.
Save	Click to save the current menu settings in a new or revised plot parameter file. Clicking on the option causes a display of the Save parameter File menu where a new file can be created to save the changes or the current file can be rewritten as modified.
Help	Click to display help for the process.

Note: When cross section plots are requested, IGrds will suspend operation until the plotting is finished. During this pause, an hour glass will appear. Cross section plots are placed in a .dgn file called [workfile]plt.dgn where [workfile] is the current working file name.

The current station being processed is shown in the message field at the lower left corner of the MicroStation window.

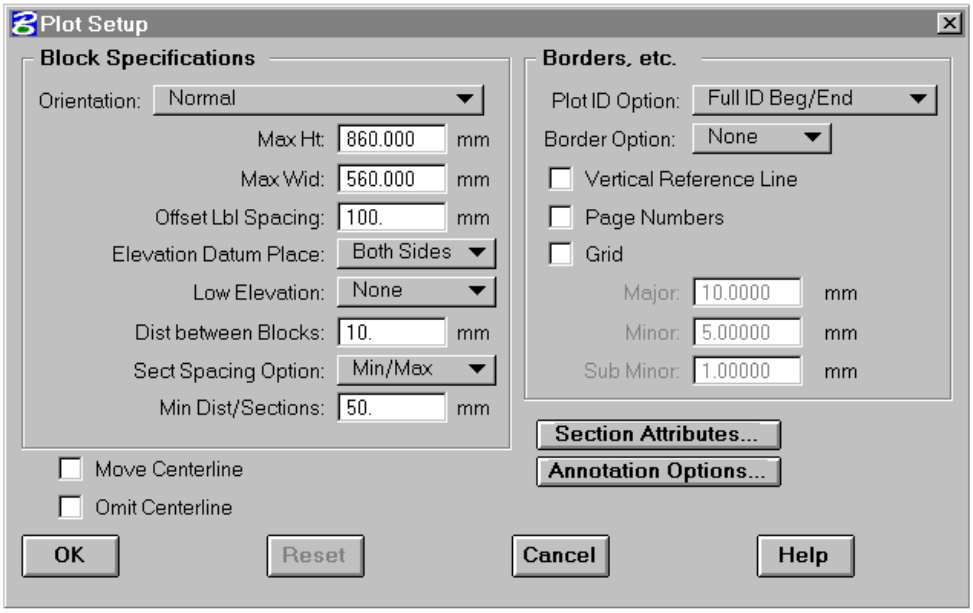
PROJECT INFORMATION



This dialog displays Project Information to be placed on Cross Section plots and listings.

Project ID	Project Identification (up to 3 characters).
Prefix	Earthwork output file prefix.
Project Name	Project Name.
Date	The system date (&date) will be displayed. Enter a different date if desired.
OK	Click to use displayed data.
Cancel	Click to cancel dialog.
Help	Click to display help for this dialog.

PLOT SETUP



This dialog box appears when the Plot Setup option is selected on the Cross Section Plot menu. It is used to specify Setup parameters for cross section plots.

Block Specifications	
Orientation	Select • Normal • Rotated Lt. Just. • Rotated Center Just • Rotated Rt. Just. • Rotated Specify Centerline Position (CL Pos. input box appears.) Enter Distance to Centerline (See Figure 11-5.)
Max Height	Enter the maximum plot height in ft or m. Default is shown. Not usable when Border Option is Ref. File. (See Figure 11-5.)
Max Width	Enter the maximum plot width in ft or m. Default is shown. Not usable when Border Option is Ref. File. (See Figure 11-5.)
Offset Lbl Spacing	Enter the spacing, in ft or m, for the offset labels that appear along the bottom edge of the sheet or right edge for rotated plots. (See Figures 11-3, 11-4, 11-6.)

Elevation Datum Place:	Select • Both Sides Places reference elevations on the left and right edges of each cross section plot. • None Datum elevations are not annotated. (See Figure 11-10.)
Low Elevation	Select • Both Sides Places the elevation of the lowest point of the centerline and right of the centerline on each side of the cross section plot area. • None Low elevations are not annotated.
Distance Between Blocks	Enter Distance, in ft or m, that should be kept between blocks of cross sections. The default value is displayed. (See Figure 11-6.)
Sect Spacing Options	Select the cross section vertical spacing option • Min/Max • CL to CL • Best Fit (See Figure 11-7.)
Min Dist/ Sections	Enter the minimum distance between cross sections in ft or m. (See Figures 11-6 and 11-7.)
Move Centerline	Push to move location of Centerline arrow when it falls outside of terrain. (See Figure 11-8.)
Omit Centerline	Push to omit Centerline arrow when it falls between terrain ranges. (See Figure 11-8.)

Borders, Etc.

Plot ID Option Select option for Plot ID content and location.

- Full ID Beg/End (of Plot)
- Full ID All (Sheets)
- Short ID Beg/End (of Plot)
- Short ID All (Sheets)

Border Option Select option for Border.

- None
  Plot without a border.

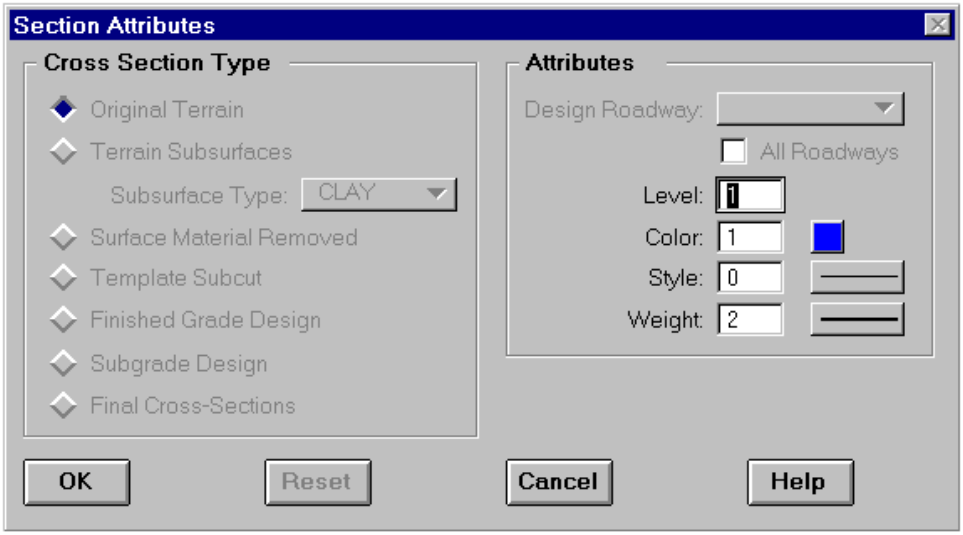
- Standard
  Plot the cross sections with the Standard border.

- Ref. file
  Plot the cross sections with a user supplied Reference file. The reference file option will attach a .dgn file to the plot graphics file for the borders. The reference file is specified in the parameter file. The .dgn file used for the reference file must be in the directory specified by the environment variable MS_RFDIR. MS_RFDIR is set in ig98.bat. (See Figures 11-3 and 11-4.)

- Custom
  Plot the cross sections using a user specified cell for the sheet border. This cell must be stored in the IGrds cell library. The cell name to be used is specified in the plot parameter file using the SHEETCELL directive. See the last two pages of "Changes to file prmplt.imp for IGrds Release 98" and "Changes to file prmplt.met for IGrds Release 98" for the changes for sheet border cells to the plot parameter files.

Vertical Reference Line	Push to activate.
Page Numbers	Push to activate, causing page numbers to be plotted on each sheet of cross sections.
Grid	Push to create a user specified grid. Usable with Border options None or Standard only. (See Figure 11-9.)
Major	Enter the Major Grid spacing in ft or m.
Minor	Enter the Minor Grid spacing in ft or m.
Sub Minor	Enter the Sub Minor Grid spacing in ft or m.
Section Attributes	Click to display the Section Attributes dialog box (see page 11-15).
Annotation Options	Click to display the Annotation Options dialog box (see page 11-17).
OK	Click to save current Plot Setup specifications.
Reset	Click to reset Plot Setup specifications to previous settings.
Cancel	Click to cancel subprocess without changing the Plot Setup specifications.
Help	Click to display Help for the subprocess.

SECTION ATTRIBUTES



This menu appears when the Section Attributes option button is selected on either the Cross Section Plot menu or the Plot Setup menu.

This subprocess is used to specify Attributes for Cross Section Plots.

Attribute must be established for each Cross Section Type and Subsurface. Default values will be used if they are not established.

Cross Section Type

Push the button for the desired cross section or subsurface type, and then establish attributes for that type. Click OK after each type is set. Repeat for each type to be plotted.

- Original Terrain
  Select to change the Original Terrain Attributes.

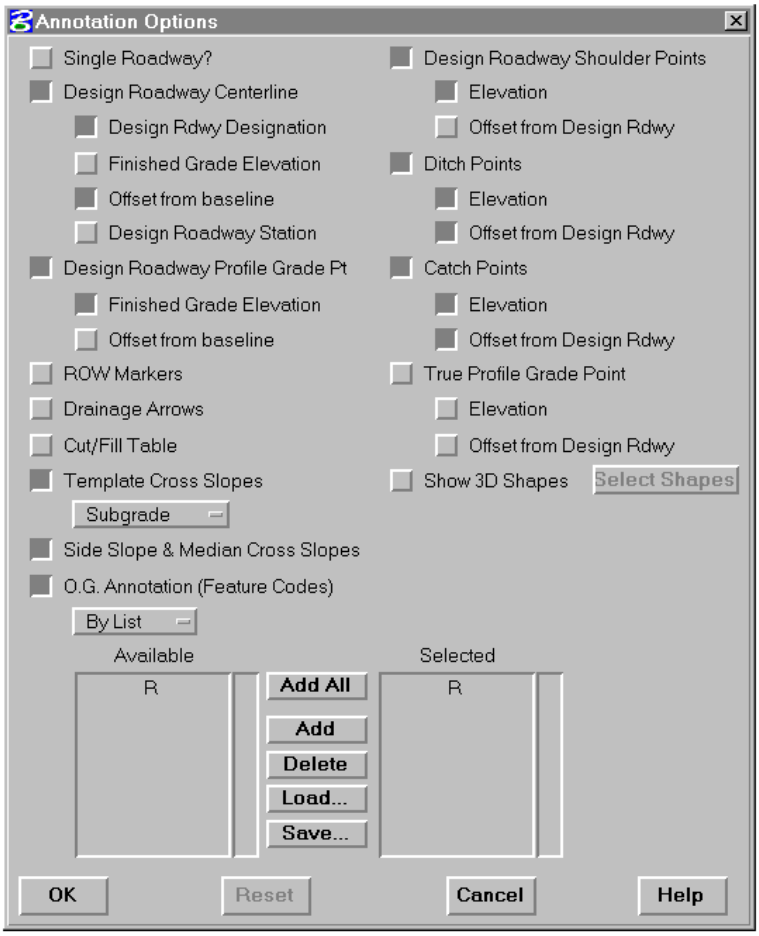
- Terrain Subsurfaces (Grayed out if none present)
  Select to change the Terrain Subsurface Attributes, and the Subsurface Material Type option. Select the proper material type if different than shown.

- Surface Material Removed (Grayed out if none present). Select to change the Surface Material Removed Attributes.

- Template Subcut (Grayed out if none present)
  Select to change the Template Subcut Attributes.

	• Finished Grade Design (Grayed out if none present.) Select to change the Finished Grade Design Attributes. • Subgrade Design Select to change the Subgrade Design Attributes. • Final Cross Sections (Grayed out if none present) Select to change the Final Cross Sections Attributes.
Attributes	
Design Roadway	Select Roadway. Select the design roadway name to which the attributes are to apply. (Not selectable for one roadway.) The current name is displayed.
All Roadways	Push this button in if the attributes are to be applied to all roadways. (Not selectable for one roadway.)
Level	Enter the level on which the cross section type (or terrain subsurface type) is to appear. The default level is shown.
Color	Enter the number of, or select the color to be applied to the cross section type line.
Style	Enter the number of, or select the line style to be used for the cross section type line.
Weight	Enter the number of, or select the line weight to be used for the cross section type line.
OK	Click to save current attributes (each type).
Reset	Click to reset attributes to previous settings.
Cancel	Click to cancel subprocess without changing attributes.
Help	Click to display Help for the subprocess.

ANNOTATION OPTIONS



This menu appears when the Annotation Options button is selected on either the Cross Section Plot menu or the Plot Setup menu.

This dialog provides for selecting annotation options to be used in plotting Cross Sections.

Push buttons for desired options. Some options exclude others.

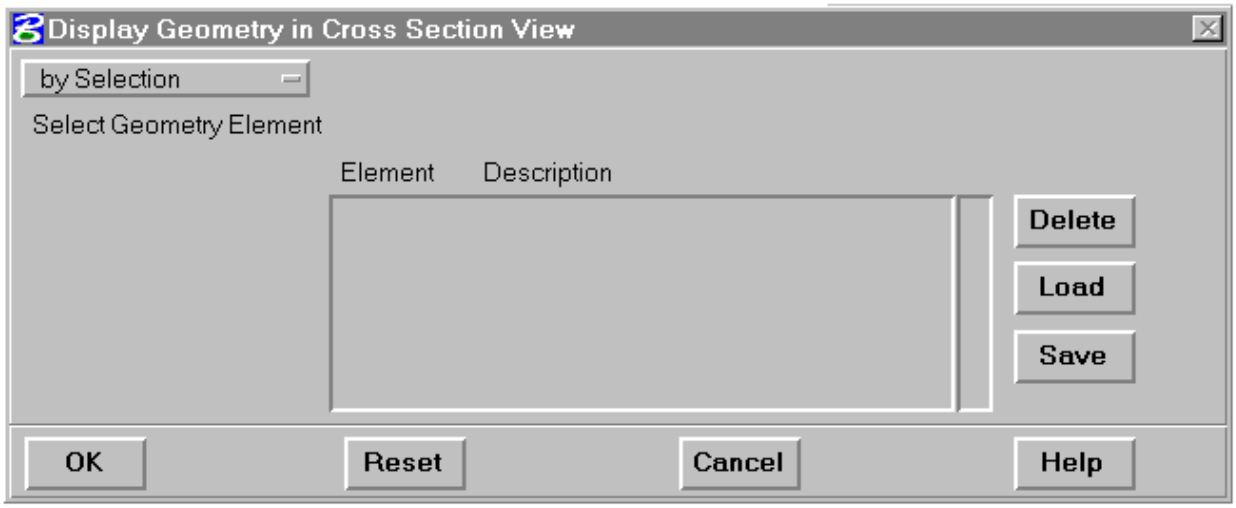
Single Roadway	Push to activate the Single Roadway option for plot orientation and spacing. No other annotation options may be used with this option. See Figure 11-11.
Design Roadway Centerline	Push to annotate the centerline of each design roadway with the sub options that follow.
Design Roadway Designation	Push to include in annotation.
Finished Grade Elevation	Push to include in annotation.
Offset From Base Line	Push to include in annotation.
Design Roadway Station	Push to include in annotation.

Design Roadway Profile Grade Point	Push to annotate the profile grade point of each design roadway with the sub options that follow.
Finished Grade Elevation	Push to include in annotation.
Offset From Baseline	Push to include in annotation.
ROW Markers	Push to annotate ROW Markers.
Drainage Arrows	Push to show Drainage Arrows.
Cut/Fill Table	Push to show Cut/Fill Table (End Areas).
Template Cross Slopes	Push to show cross slope annotation on roadway surface segments (shoulder to shoulder). Select the design surface to be annotated either finish grade or subgrade.
Sideslope and Median Cross Slopes	Push to show cross slope annotation on sideslope and median segments (shoulder to catch and between roadways).
O. G. Annotation (Feature Codes)	Enable option if original ground feature coded points are to be annotated and color coded.
Feature Selection Options	By List - All feature codes are loaded in the "Available" list box. By default, all feature codes from this list are loaded in the "Selected" List Box. The "Delete" list box option is used to remove unwanted selections (see below). By Class - All feature code classes are loaded in the Available list box. Selected classes from this list are loaded in the Selected list box.

List Box Options	Add All - All feature codes from the Available list are loaded in the Selected list box by clicking the Add All action button. This is done by default when the dialog box is opened. Add - Select feature codes in the Available list by highlighting, then click the Add action button to load them in the Selected list box. Delete - Select feature codes in the Selected list box by highlighting, then remove them from the Selected list box by clicking the Delete action button.
Load...	Press this button to display the standard file open dialog to allow loading of previously saved feature codes. The default extension for feature code save files is .tfc. The contents of the .tfc file will be appended to the selected list.
Save...	Press this button to save the contents of the "Selected" list to a .tfc file. A standard file save dialog will appear.
Design Roadway Shoulder Points	Push to annotate the shoulder points of each design roadway with the sub options that follow.
Elevation	Push to include in annotation.
Offset From Design Rdwy	Push to include in annotation.
Ditch Points	Push to annotate Ditch Points with the sub options that follow.
Elevation	Push to include in annotation.
Offset From Design Rdwy	Push to include in annotation.

Catch Points	Push to annotate Catch Points with the sub options that follow.
Elevation	Push to include in annotation.
Offset From Design Rdwy	Push to include in annotation.
True Profile Grade Point	Push to display the true profile grade point. (Applies to the "off template control option".)
Elevation	Click to annotate the elevation of the point.
Offset From Design Rdwy	Click to annotate the offset of the point from the design roadway.
Show 3D Shapes	Enable option if selected 3D geometry elements are to be displayed.
Select Shapes	Click the option button to select 3D geometry elements. See discussion on page 11-20.
OK	Click to save current attributes.
Reset	Click to reset attributes to previous settings.
Cancel	Click to cancel subprocess without changing attributes.
Help	Click to display Help for the subprocess.

DISPLAY GEOMETRY IN CROSS SECTION VIEW

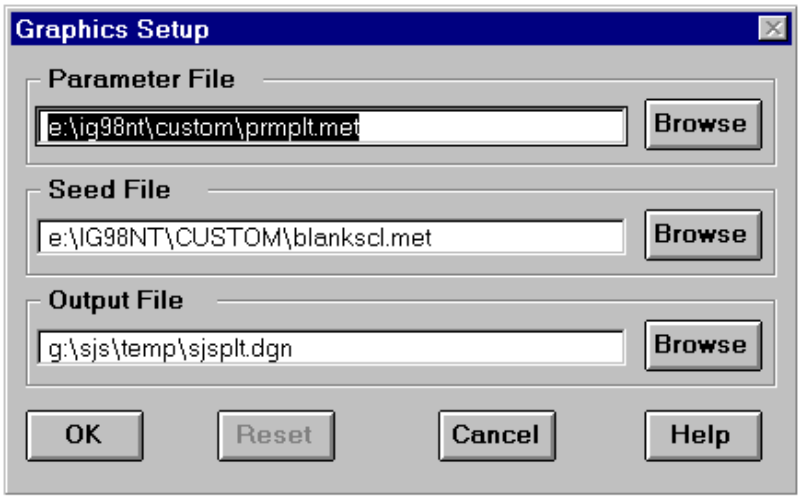


This dialog box is activated when the Select Shapes action button on the Annotation Option dialog box is clicked. It allows for the selection of 3D geometry elements to be shown on the plotted cross sections.

Element Selection Options	By Selection - Point at the element in the graphic area. The element is added to the list box upon confirmation. With Fence Block - Define a rectangular area in the graphic area. All elements within the fence are added to the list box. With Fence Shape - Define an irregular fence in the graphic area. All elements within the fence are added to the list box.
List Box Options	
Delete	Click to delete the highlighted record from the Selection List.
Load	Click to load the list box from a saved file. (See Load Geometry Element List from File, page 4-102.)
Save	Click to save the list box elements to a file. (See Save Geometry Element List to File, page 4-102.)

Apply	Click to execute command.
Reset	Click to reset values.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

GRAPHICS SETUP



The Graphics Setup menu appears when the Graphics Setup option button on the Cross Section Plot menu is selected. This menu has several uses. First, a new Parameter File can be selected without exiting the Cross Section Plot menu and re-entering the process where the Parameter File is initially selected. Second, a Seed File can be selected, containing background plot information on level 63, on which the cross section data will be plotted. The default is blanksave.imp/met found in the directory specified by the environment variables IG_IMP_XSPLOT and IG_MET_XSPLOT. The levels 1-62 will be deleted and any line work on level 63 will be left. Any .dgn file can be used. Last, a cross section plot Output File can be specified instead of using the IGrds system default name.

Parameter File	Displays the current Parameter File name including the directory path. Enter a new path and name, or select one with the Browse option, to change the current file.
Browse	Select the Browse option to display the Load Parameter File Browse menu and select a new file.
Seed File	Displays the current Seed File Name including the directory path. Enter a new path and name, or select one with the Browse option, to change the current file.
Browse	Select the Browse option to display the Plot Seed File Browse menu and select a new file.
Output File	Displays the current Output File name including the directory path. Enter a new path and name, or select one with the Browse option, to change the current file.
Browse	Select the Browse option to display the Output Plot File browse menu and select a new file.

OK	Select OK to activate the files that were newly selected and are now named in the file name input boxes.
Reset	Currently inactive.
Cancel	Select Cancel to close the menu without making any changes to the current files.
Help	Select Help to display information about this process.

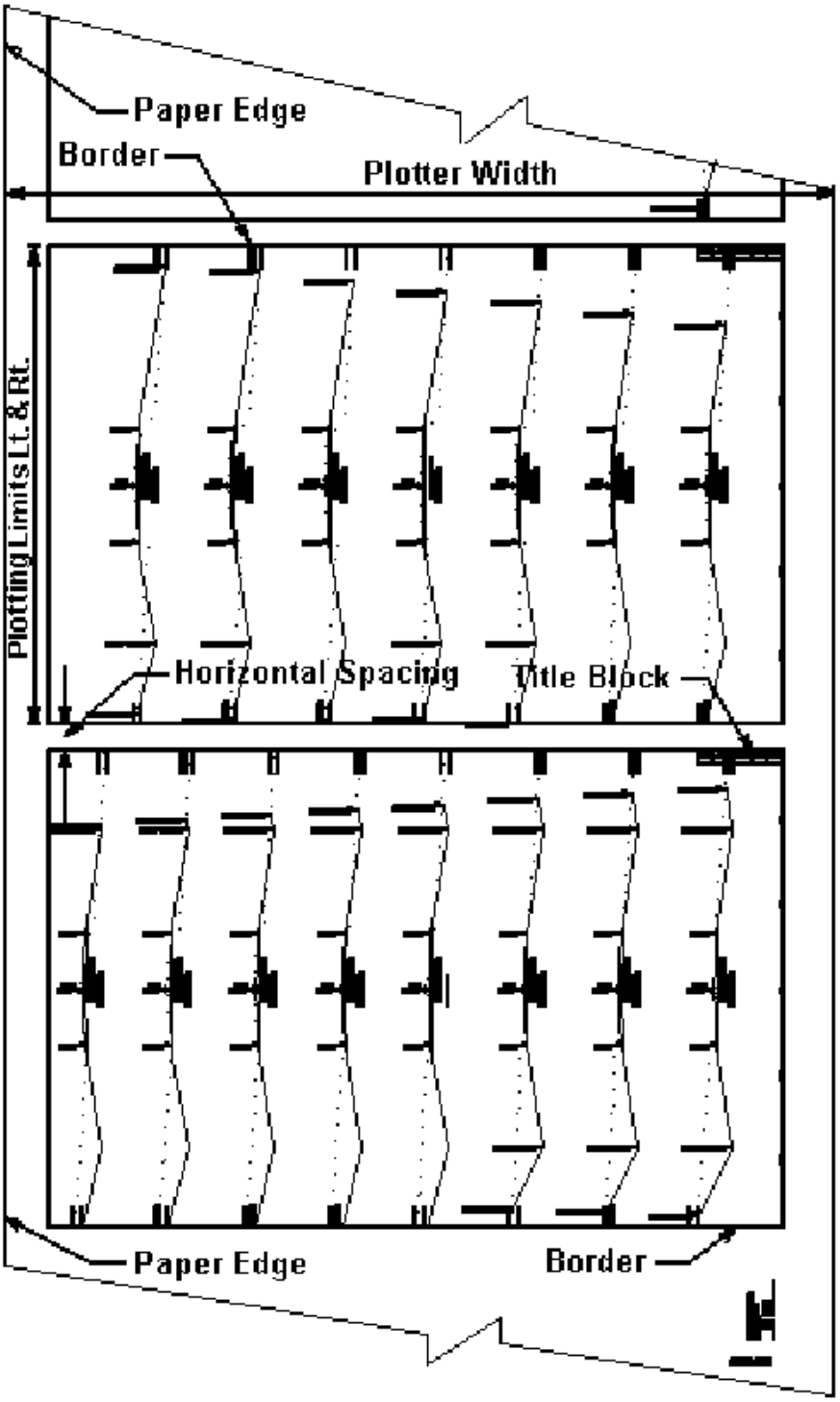


Figure 11-3
Cross Sections with Normal Orientation

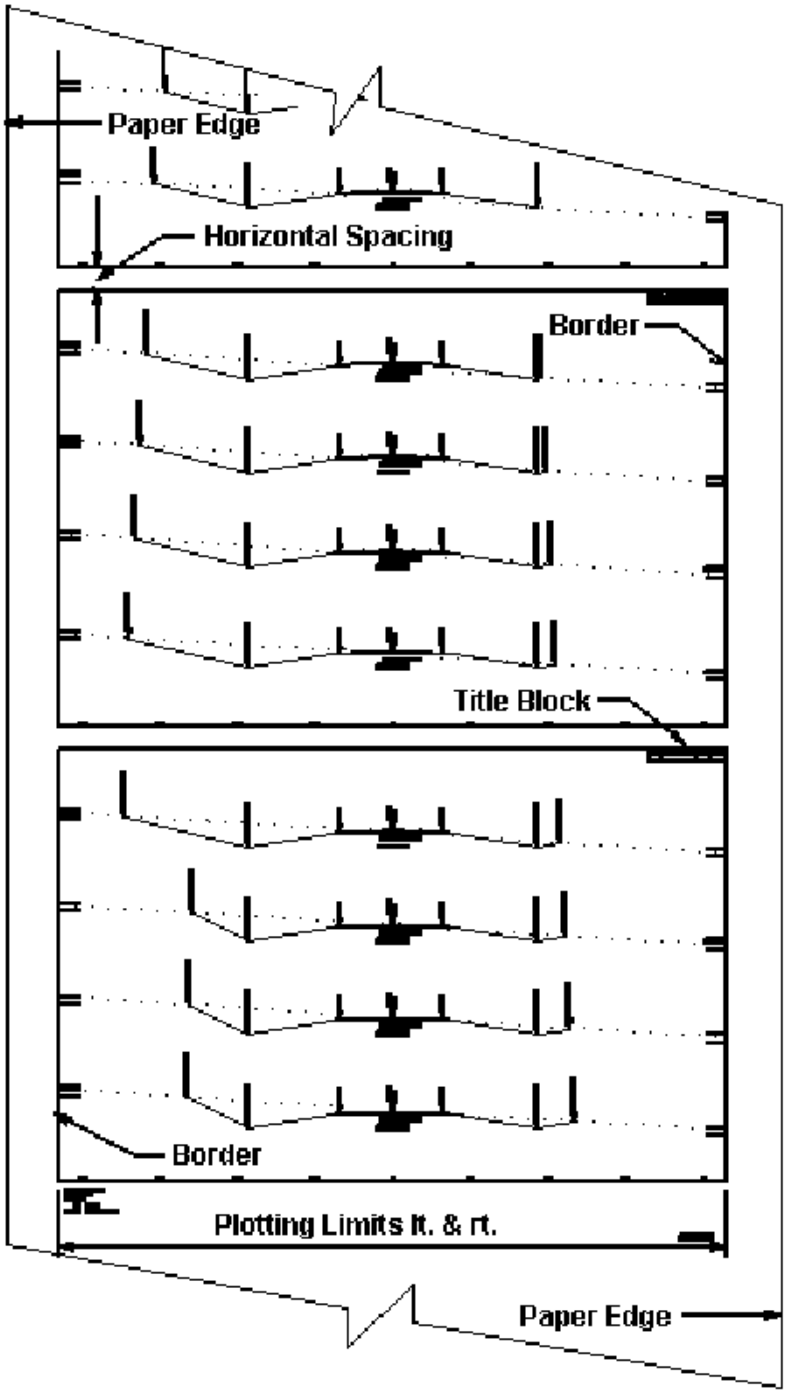


Figure 11-4
Cross Sections - 90° Rotation

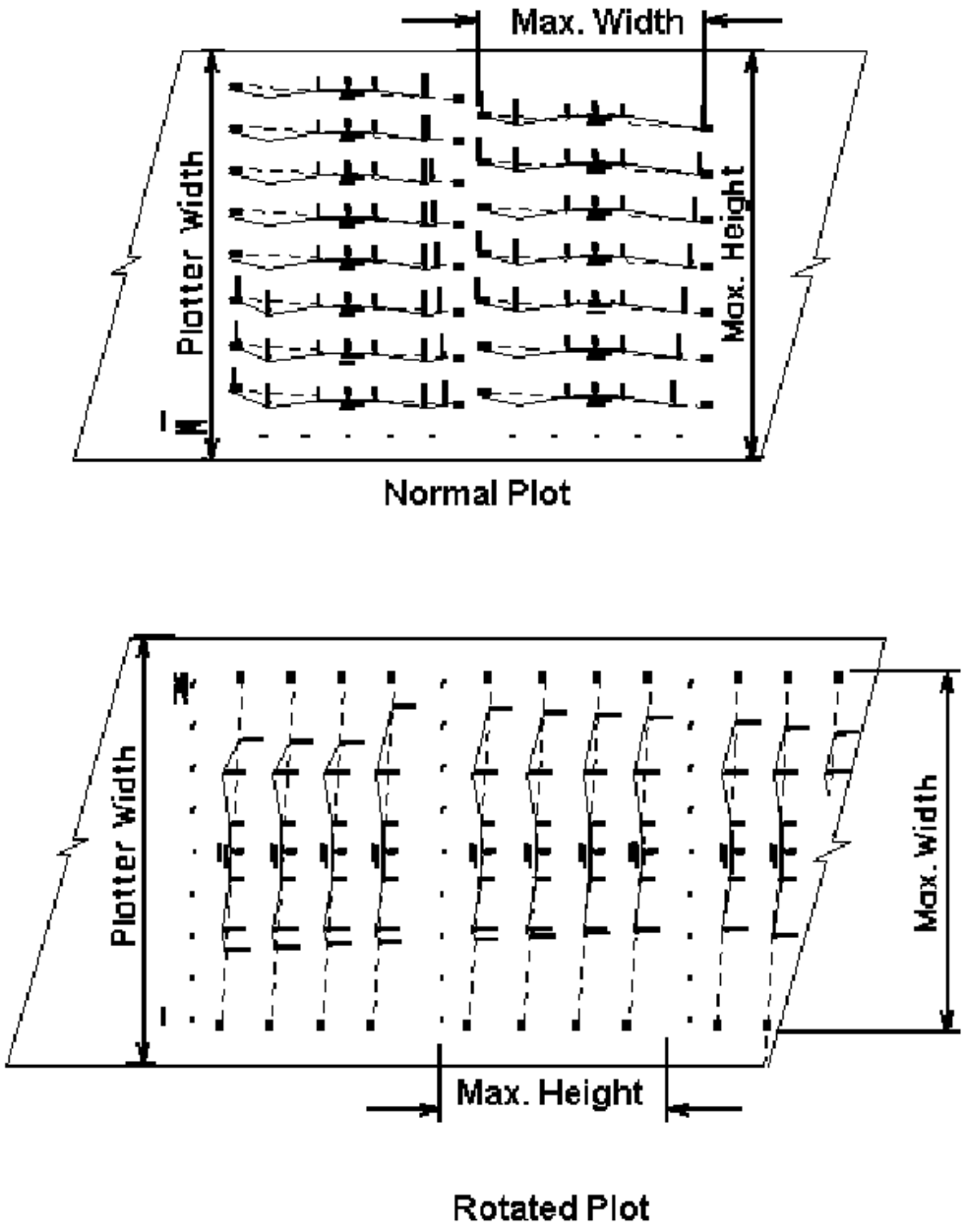


Figure 11-5
Plot Orientation

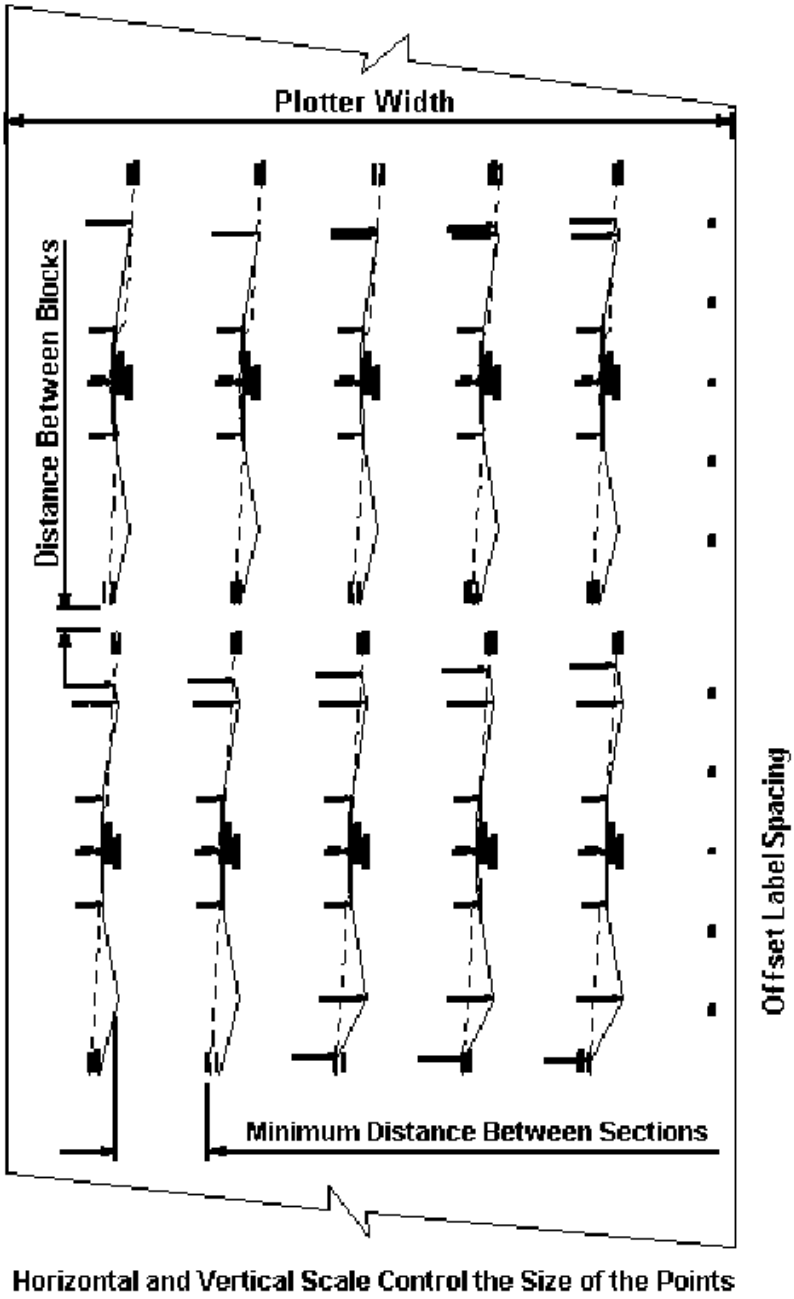
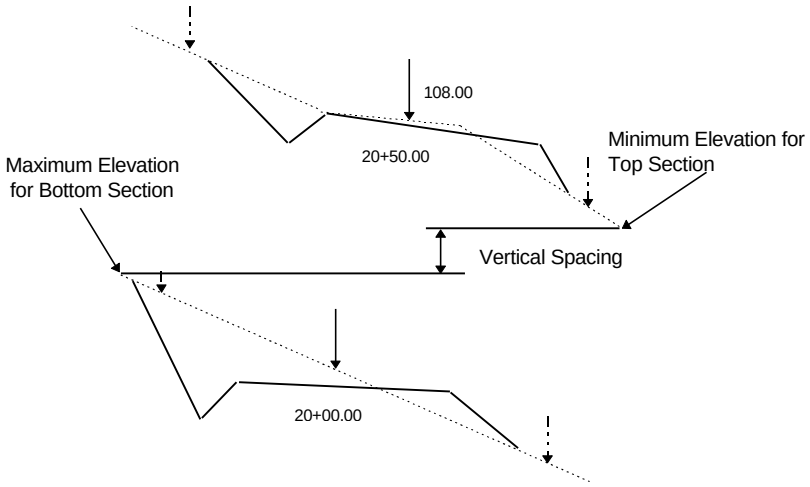
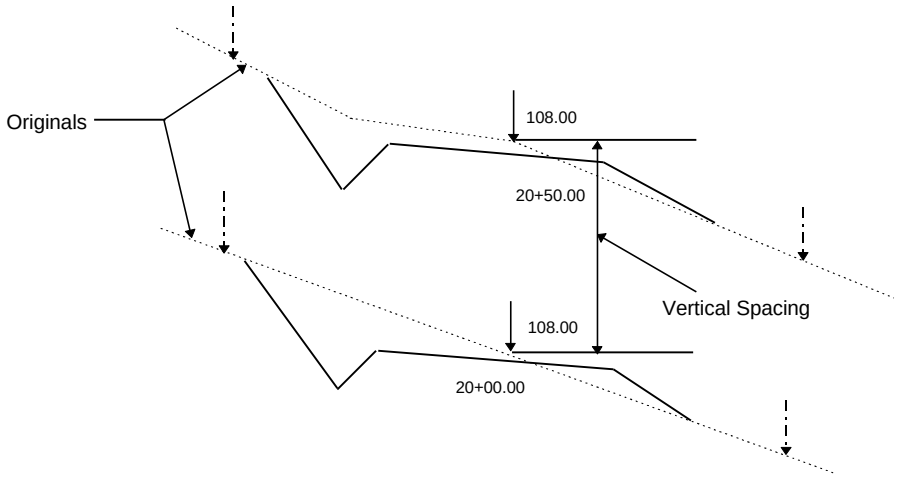


Figure 11-6
Cross Section Plot Layout

Minimum/Maximum



Centerline to Centerline



Best Fit

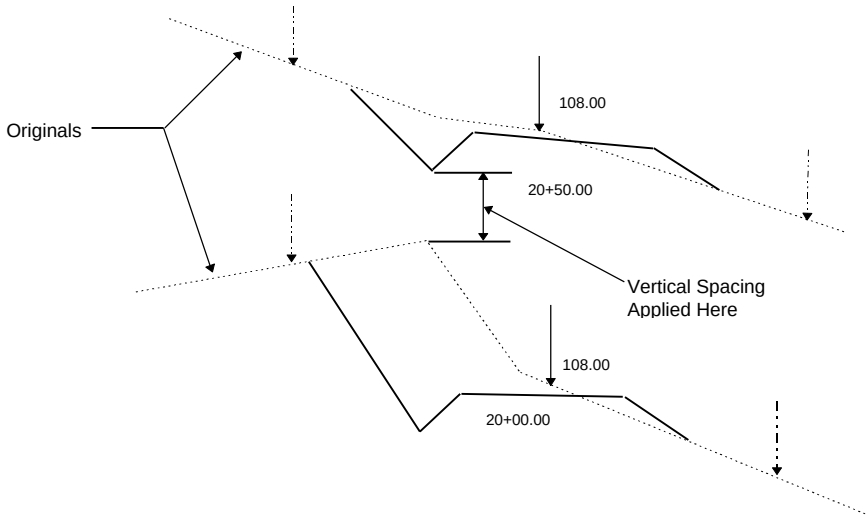


Figure 11-7
Section Spacing Options

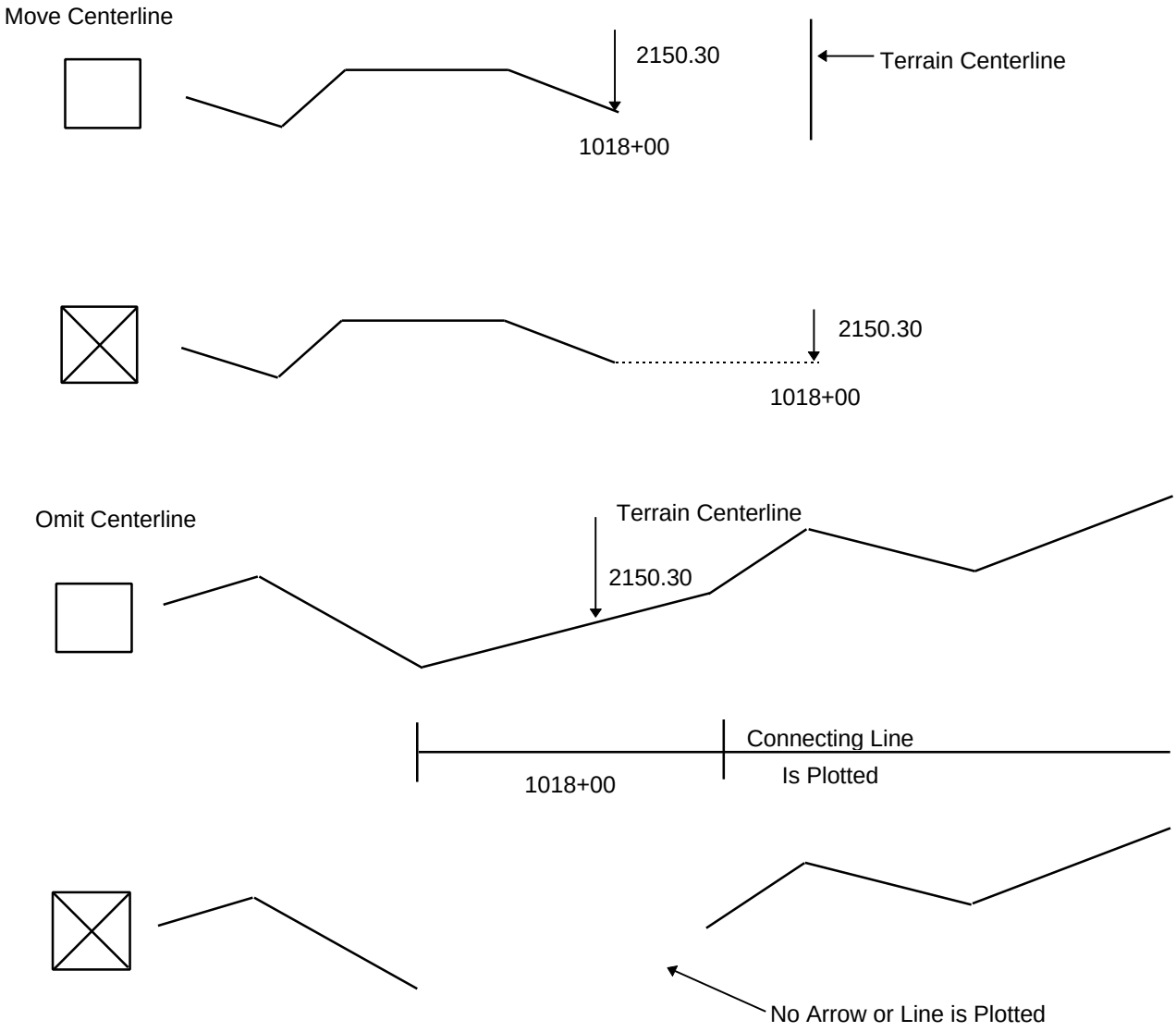


Figure 11-8
Move/Omit Centerline

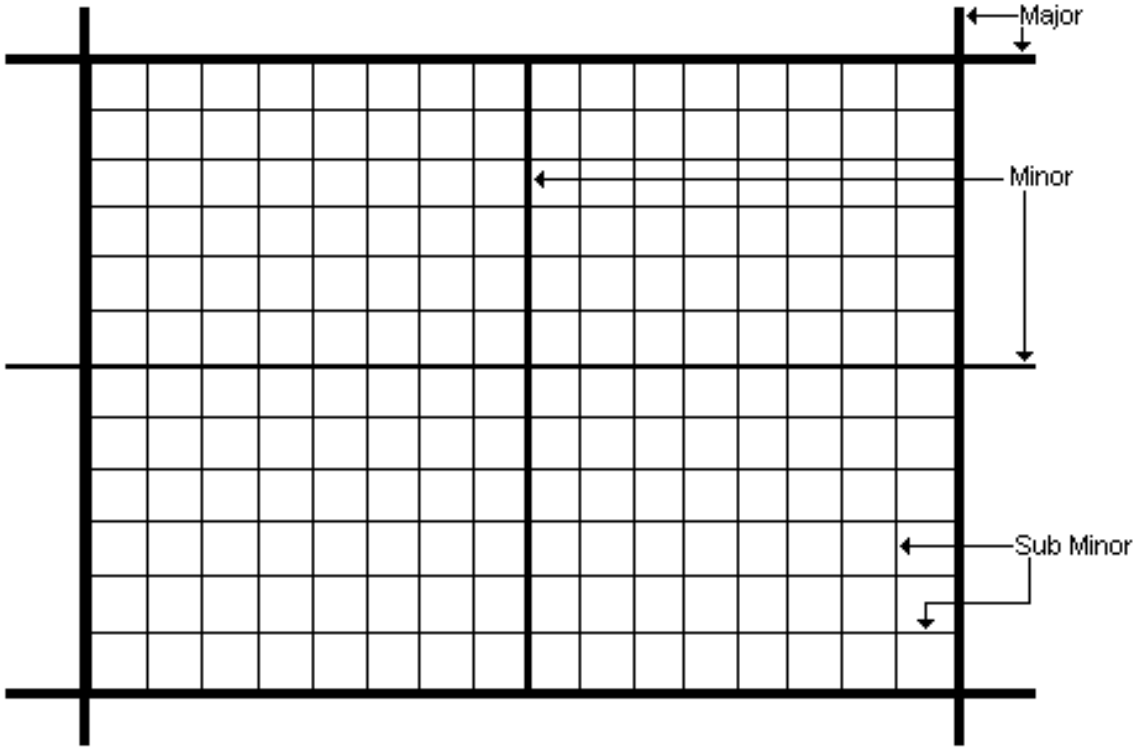


Figure 11-9
Plot Grid

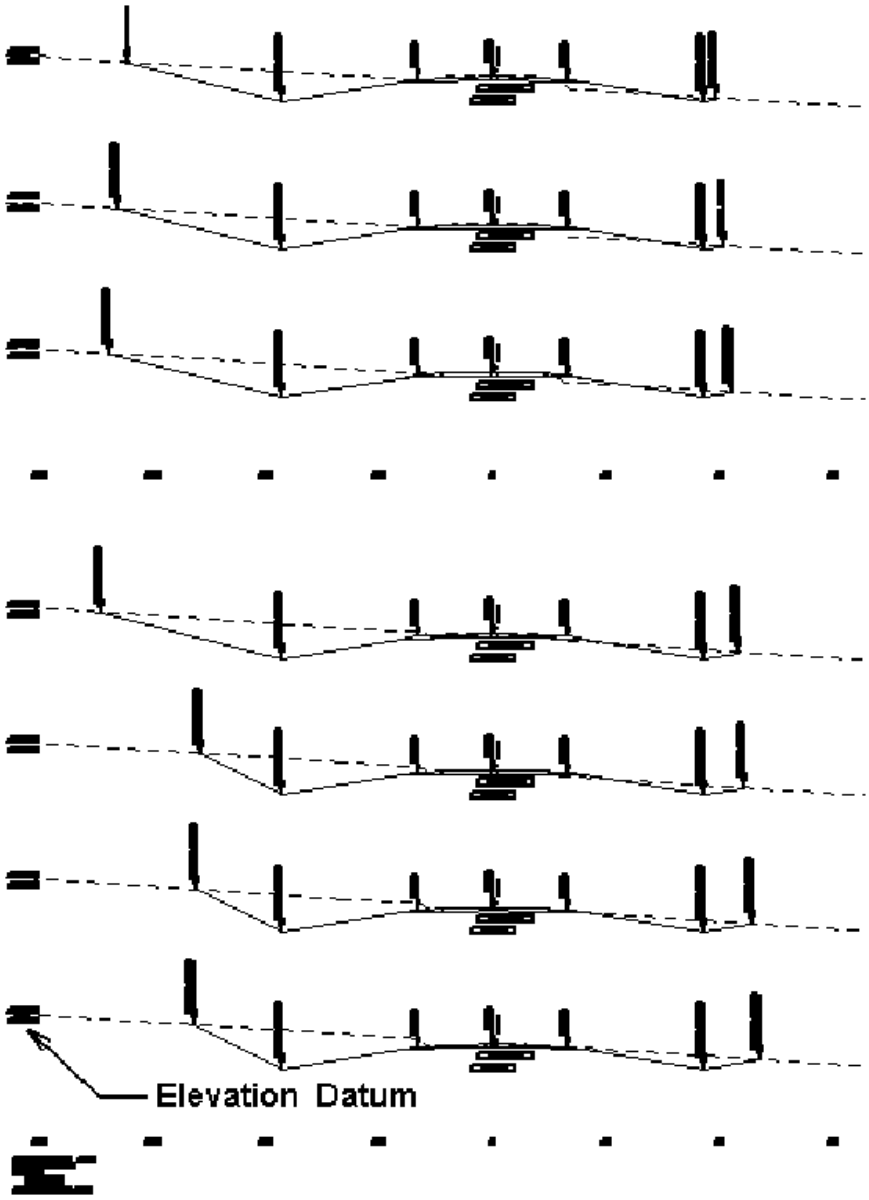


Figure 11-10
Vertical Reference Line

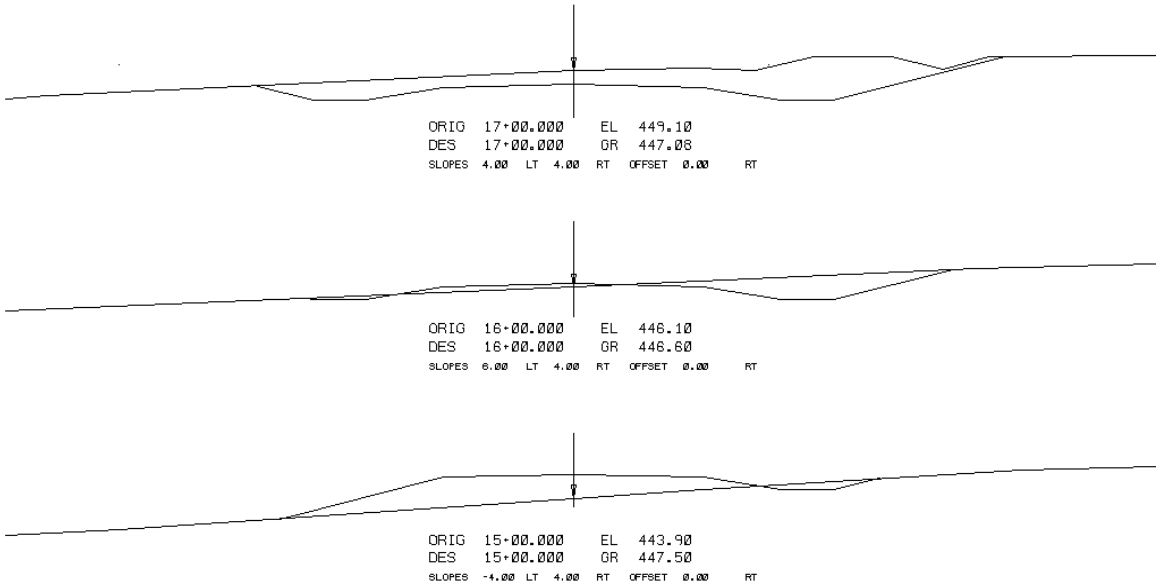


Figure 11-11
Single Roadway Option

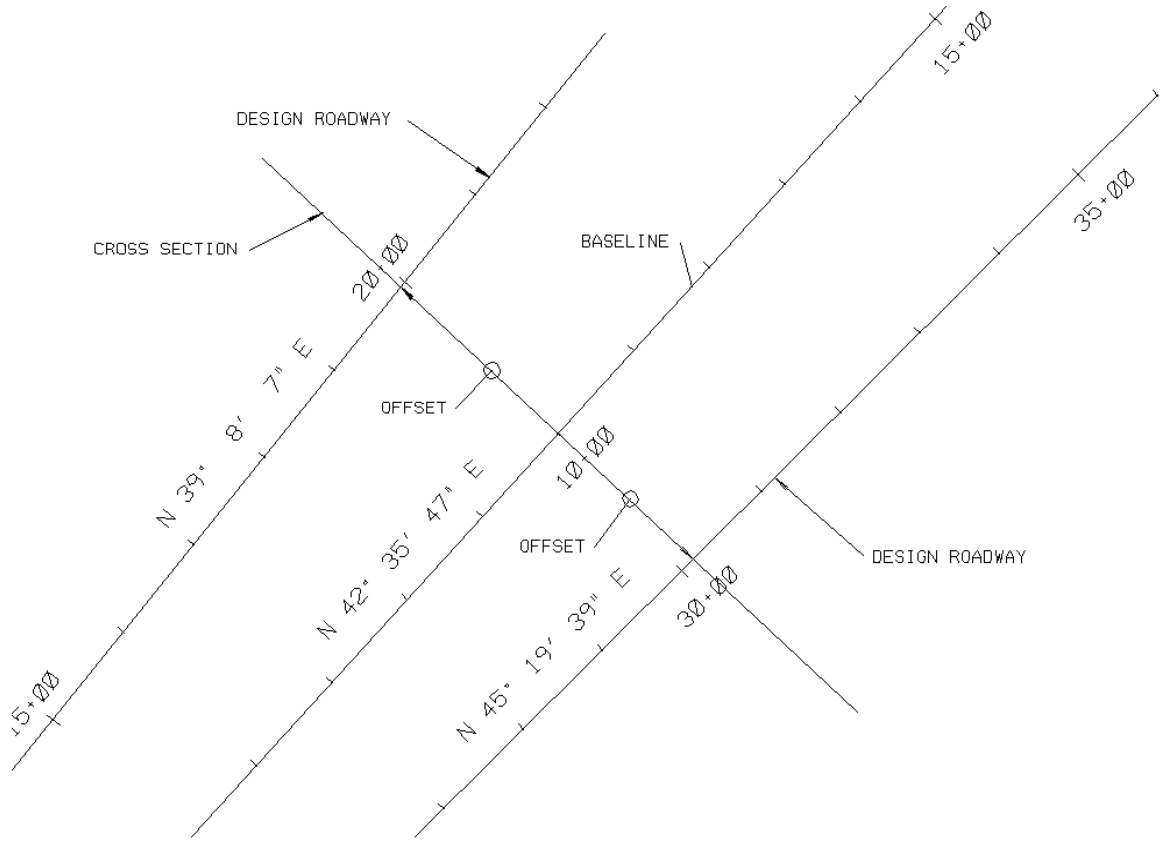


Figure 11-12
Annotation Options
(All Other Options)

QUANTITY SUMMARY

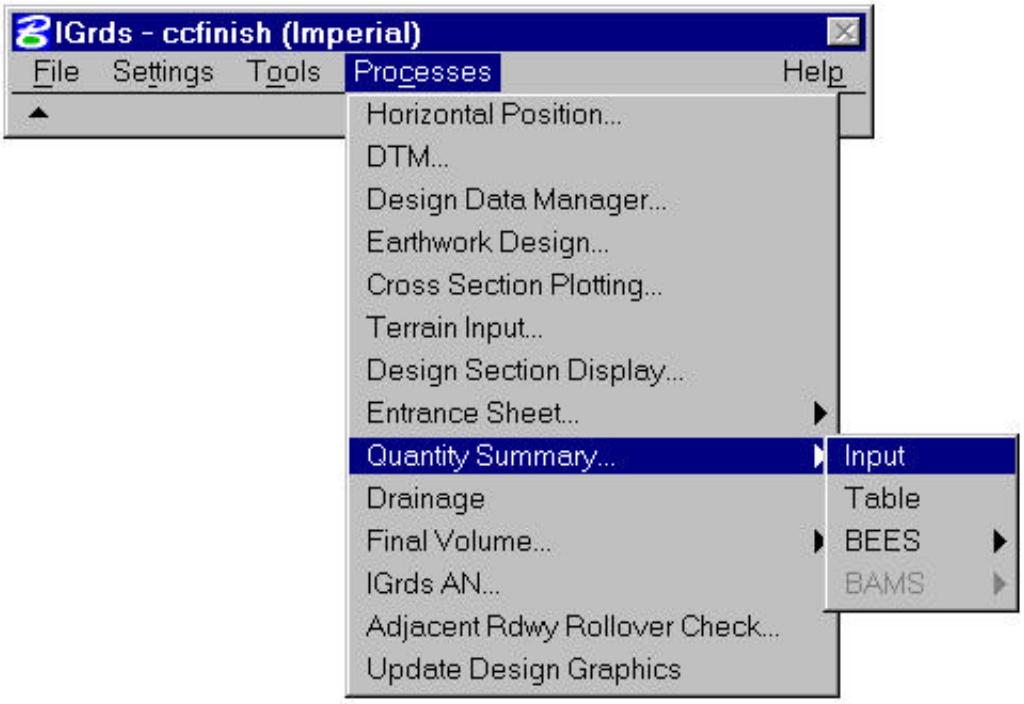


Figure 11-13
Quantity Summary Commands Menu

CONTENTS **QUANTITY SUMMARY**	**MANUAL PAGE**

QUANTITY SUMMARY

INTRODUCTION

This section describes the process for inputting Quantity Summary (QS) items as IGrds geometry elements and creating graphic tables which summarize the QS items of a given type, or types, in a form suitable for inclusion in plans, and subsequent entry into the Basic Engineering Estimating System (BEES). The main QS process includes three subprocesses to support these functions:

- QS Input
- QS Table
- QS BEES

In order to function properly, the QS process requires that four files be available:

- Imperial QS Feature Code File (qsfeat.imp)
- Metric QS Feature Code File (qsfeat.met)
- Imperial QS Format File (qsfmt.imp)
- Metric QS Format File (qsfmt.met)

Imperial and metric versions are required for the QS Feature Code file and the QS Format file because the data within each of these files is, in some cases, "units dependent". For example, within the feature code file is a multiplier factor used for converting standard units (i.e., sq ft, m^2) to alternate units (i.e., acres, hectares), and, within the format file, QS table units are specified for table headings (i.e., LF or M, SQFT or M^2, etc.). These files are accessed by the QS process using the environment variables defined below. The environment variables should be defined and exported in the IGrds 98 script which should point the environment variables to each file within the directory defined as "$IG_DIR" custom. See the release read.me file for more details. It is intended that these files be modified, as necessary, by authorized users to obtain the results desired.

The QS process creates four additional files, under certain circumstances. The four files actually consist of two files for Imperial file processing and two files for metric file processing. One of the files of each pair of files is used to save QS table graphic parameters for future recall by the user. The other file of each pair is used to save QS table column parameters for future recall by the user. Neither of the files will be created unless the QS user requests that the process save QS table graphic and/or column parameters. The IGrds 98 script defines environment variables for each of these files. See the release read.me file for more detail.

These files are not ASCII files and should not be manipulated by the QS users, except to store and retrieve QS display and column parameters within the QS process. The four files are placed in the user's "home" directory, so each individual user can have his own set of saved parameters and formats.

The QS process operates within the IGrds 98 MDL MicroStation environment on HP, Sun, and CLIPPER workstations under the UNIX operating system and PC under NT. The QS process basically allows the user to enter (i.e., input) IGrds geometry points, chains, and shapes to represent construction project items that need to be summarized in tables on Quantity Summary (QS) plan sheets and also totaled in the Basic Engineering Estimating System (BEES). The QS process allows the user to automatically display graphic QS tables and to create BEES input data for items that have been input. Geometry points are used for QS point-type items that are totaled as individual units (i.e., EA). Geometry shapes are used for QS area-type items that are totaled in area measurements (i.e., SQFT, SQYD, M^2, etc.). Geometry chains are used for QS linear-type items that are totaled in linear measurements (i.e., LF, m, etc.). Since QS linear item totals are derived from the computed QS chain lengths, it is very important that QS chains created from existing geometry line, arc or chain elements be carefully constructed to insure that chain lengths are correct. The QS process uses the same chain creation utility as is used in the IGrds Geometry process. This utility requires the user to carefully select the "correct end" of the Geometry element (i.e., line, arc, or chain) to be included in the chain to be created. With this utility, the element end that is selected determines the direction of the selected element in the chain to be created. If the wrong end of a geometry line element is selected, the resulting chain may contain a doubled or tripled length for the selected line because of additional "connecting line segments" that must be inserted to make the chain continuous. A more detailed discussion of QS chain creation requirements is given in the QS input section of this document.

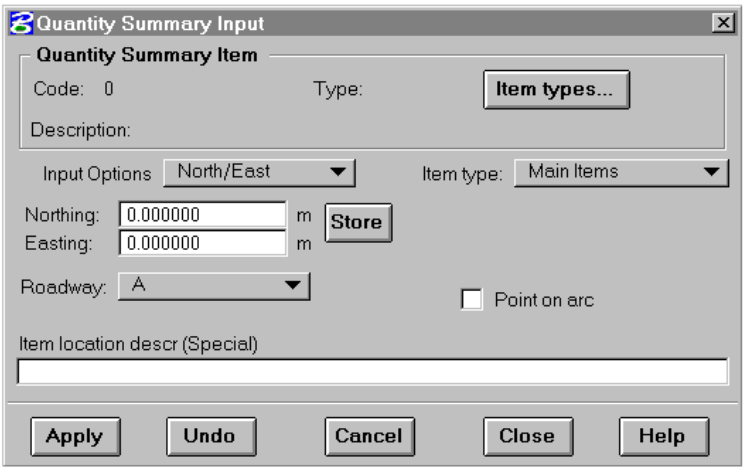
The QS process functions use dialog boxes that contain all possible commands the user can initiate by single clicking the left mouse button (M1) on the desired command. The process allows the QS user to perform other IGrds and/or MicroStation commands at the same time as QS.

To initiate the QS process, the user clicks M1 on the Processes area in the top level menu bar. This will initiate a pull-down menu, with one of the choices being "Quantity Summary". Clicking M1 on this area will bring up a side bar menu with three choices:

- QS Input
- QS Table
- QS BEES

The user then clicks M1 on whichever of these functions he desires to perform.

QS INPUT PROCESS

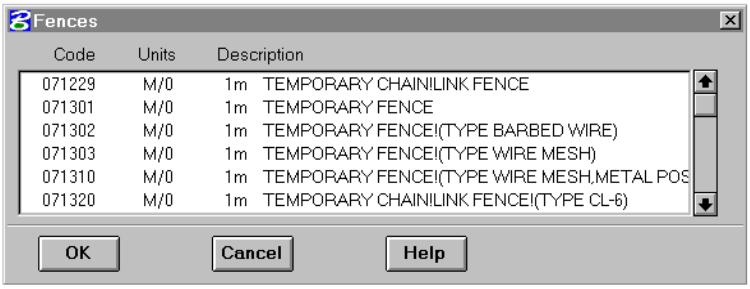


This dialog box will appear if the user clicks on QS Input.

To input QS data, the user first sets the QS item code to the item code that is desired to be input. This can only be done by:

1. Setting the Item Type option button to the desired type (main items, appurtenances, or MBGR appurtenances). The Main Items option is the default and will be used most of the time.

2. Clicking on the Item Types.... button and selecting the desired QS item group from the list box that is displayed. Another list box is then displayed which contains all available item codes for the item group that was selected. Select the desired item from this list. Both list boxes are shown here.



The user may scan either box by using the scroll bar on the right. When the appropriate group/code is found, the user simply clicks on the group/code and the group/code is highlighted. When the proper group has been selected on the first box, the user clicks on the OK box and a second list box appears. The second box can be scanned as necessary. When the proper code has been selected and highlighted, the user clicks on the OK box and the selected code is placed in the code field; the type of item is placed in the type field; and the item description is placed in the description field. Note that the second list box shows the type of standard/alternative units specified for each item code in the user-created ASCII QS code table. Note also, that different units may be specified for the same item code by duplicating an item code in the code table as many times as necessary to specify the different units

required. Each duplicate code must be made unique by adding an extra digit (1-9) preceding the duplicated item codes.

The next thing is to be sure that the reference roadway is properly set. It will automatically have been set to whatever the IGrds active roadway is, if one has been previously set in IGrds. It will be blank if no active roadway was set in IGrds. In any case, the QS user should be sure the proper reference roadway has been set.

The reference roadway for QS Input is used in three ways:

1. For QS Input, the reference roadway is used to place a QS item in the proper location when the user specifies that input is to be done by station and offset (i.e., the station/offset will be calculated along the reference roadway).

2. For QS Table generation, the reference roadway stored with each QS item is used to calculate the station/offset which is necessary for the location description of each item in the Table.

3. For QS Table generation, the reference roadway stored with each QS item can be used to segregate items by roadway in the displayed tables, if the user should so desire. For this circumstance, only items associated with a single given roadway would be included in the QS Tables.

The next consideration is to indicate the method of data input desired. This is done by clicking on one of the three options under the Input Options option button. The functions of the three options are described below.

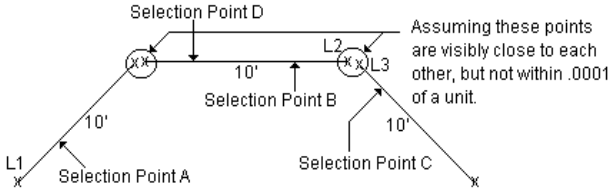
1. North/East Option - allows the user to indicate the location he desires to place a QS item by digitizing the position in the graphics window using the left mouse (M1) button. For point items, a tentative point is displayed at each location selected. For linear (and area) items, a tentative line is displayed for each location selected after the initial location.

   This option also allows the user to key-in the N,E coordinates, if known, for a given location by clicking M1 on the north and south "keyboard entry" field displayed below the Input Option button. After keying in northing/easting values, the user should click the Store button to store the location as a QS input point. This will produce the same results as digitizing a location with M1.

2. Select Element Option - allows the user to select, with the M1 button, an existing IGrds geometry element which defines the precise location desired for a QS item. For QS point type items, only geometry point elements are selectable. For QS linear and area items, point, line, arc, or chain elements may be selected. Tentative points or lines are displayed similar to the first option. The selection process involves clicking on the IGrds geometry element with M1. A prompt is displayed in the graphic screen prompt field identifying the geometry element type and number. The user accepts the selected element by clicking M1, or rejects it by clicking M3. If the user accepts the element, it is automatically stored as input in the QS process.

   This option also allows the user to key in the element ID of a geometry element for which the ID is known. This can be accomplished by clicking M1 on the Text Input box displayed beside the Select Element or Enter ID prompt and entering the desired element ID (e.g., P123, L21, A12, etc.). After entering the ID, the user hits the Store button to store the element as a QS input element. After the Store button is hit, the ID field is cleared for the next input.

   Note: With this option, to avoid incorrect chain lengths previously discussed in this document, special care must be taken when graphically selecting and when keying in the element IDs for geometry elements, especially line elements. The diagram below illustrates how an incorrect chain length can result from improper use of this capability.



   If elements L1, L2 and L3 are keyed in, the resulting chain created would visibly appear okay, given the assumption stated above. However, the approximate length of the chain would be 50' instead of 30' because line L2 was constructed backwards in relation to L1 and L3. The same problem would be exhibited if the lines were graphically selected at selection points A, B and C, because the B selection point forces line L2 to be backward relative to L1 and L3.

To correct this situation, the user should either graphically select L2 at selection point D, instead of B, or modify line L2 to be constructed in the opposite direction before it is keyed in.

Also, if lines L1, L2 and L3 were constructed so that the "almost coincident" points were actually coincident (within a .0001 of a unit), then the chain would be constructed with a length of approximately 30', no matter which directions L1, L2 and L3 were constructed or no matter where the lines were selected.

3. Station/Offset Option - allows the user to enter the station and offset location at which the QS item, or portion of an item, is to be placed. When the Station/Offset option button is selected, two Text Input boxes and a Store button are displayed. One box is for Station and the other is for Offset. The user should click on each Text box and enter the station and offset that is desired. After entry of this information, the user should click on the Store button to compute the location defined by the input station and offset, and store this location as a QS input point. Tentative points and lines will be displayed as with the other options and the fields will be cleared for the next input.

The input method can be changed at any time during the input process (i.e., the user can use each of the input methods to enter a single linear QS item where some points are entered using the north/east "digitize point" and/or "key-in" method, some points are entered using the "select element" or "key-in ID" method, some points are entered using the "station/offset" method). Clicking M1 on the Cancel box eliminates (i.e., deletes) all previously entered tentative points that have not been "applied". Clicking M1 on the Undo box deletes the last tentative point entered. This box may continue to be used until the desired number of tentative points have been deleted.

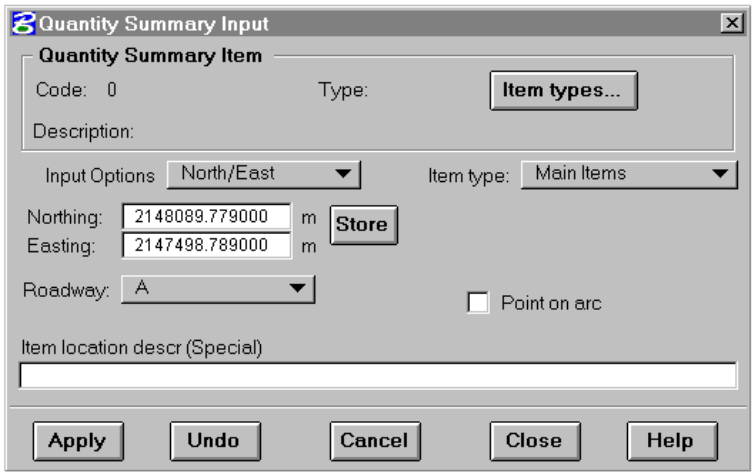
Clicking M1 on the Apply box makes previously entered tentative points into permanent QS items which cannot be deleted with the Undo or Cancel boxes. They can be deleted using the normal IGrds Geometry Element Delete command. If the user needs help, clicking M1 on the Help box displays instructions for using the QS Data Input process.

When the user has completed the input of QS data items, clicking M1 on the Close box terminates the QS Data Input process and closes the Data Input window. Any remaining tentative points entered that have not been "applied" will remain as tentative points in the next input session.

There are several special buttons/boxes that will need to be used under certain circumstances:

- Point on Arc toggle button
- # of Occurrences box
- Item Type option button
  - Main Items
  - Appurtenances
  - MBGR Appurts
- Special Item Location Description box

The Point on Arc button should be clicked with M1 to be "on" whenever the user desires to enter an arc as part of a linear QS item. When this button is "on", the prompt field below the button will prompt the user to enter the next point on the arc. If no points have previously been entered, the user is prompted for, and should enter, the first point on the arc. If a previous line or arc point has been entered, the user is prompted for, and should enter, the second or approximate mid-point on the arc. If the second point on the arc has been entered, the user is prompted for, and should enter, the end point of the arc. After the end point has been entered, a tentative arc is displayed and the Point on Arc button is automatically switched to the "off" setting. If the user wishes to enter another arc, he must set the box again to the "on" setting. Arc points may be entered using any of the input options previously described. Note: This button is operational only for the input of linear/area items. It is replaced by the # of Occurrences box when point items are specified for input.



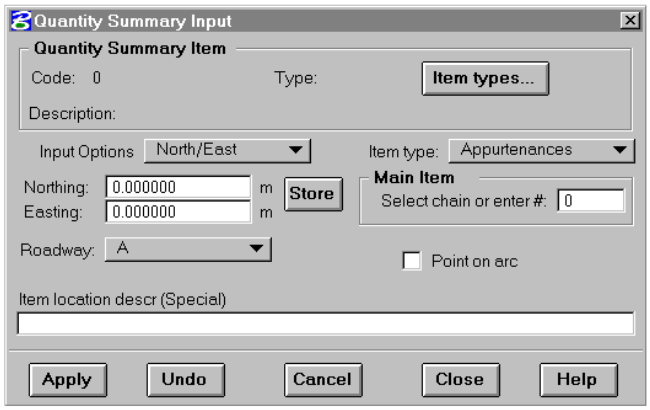
The # of Occurrences box is displayed and operational only when point type items are specified for input. This includes standard point items, appurtenance point items, and MBGR appurtenance point items. The purpose of this box is to allow the user to input a single point item that represents multiple instances of that point item. This is accomplished by the user specifying in the # of Occurrences box the number of multiple instances that are desired for each point item that is to be input. The default value for this box is 1. Therefore, if the user does not overtly enter some number in the box greater than 1, each point item input will automatically represent only one instance of the item. If a number n greater than 1 is entered in the box, the next point item entered will represent n occurrences (or instances) of that point item. This implies that a QS table that is subsequently created for this particular item code would list multiple quantities for each item entered with "# of occurrences" greater than 1. After a single "Multiple-occurrence" item has been entered, the # of Occurrences box is automatically reset to 1, so the user may continue to enter single occurrence items without having to go back and manually reset the box to 1. If another multiple occurrence item is to be input, the user must set the box again to the appropriate number desired. Automatic resetting of the box to 1 insures that the user will not inadvertently enter several items with multiple occurrences by mistake.

The Item Type option button has three options:

a. Main Items
b. Appurtenances
c. MBGR Appurts

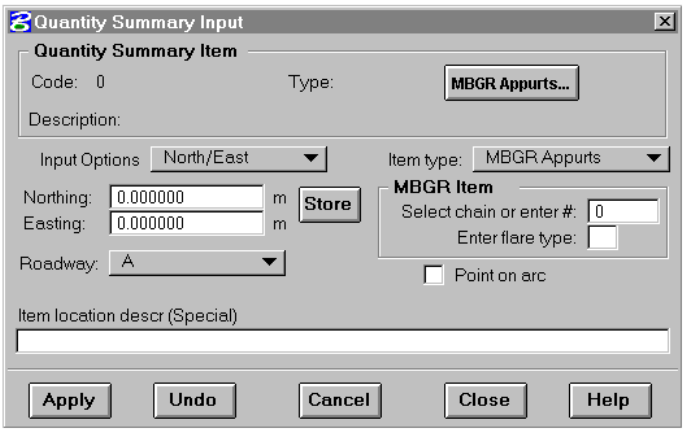
The default input option which will be used most of the time for QS input is the Main Items input option. This option basically allows the user to enter all standard QS items (point, linear, and area). This type of input was previously discussed at the beginning of this section.

The other two options are for special types of QS data input that allow the user to associate QS point items with linear items as they are being input, so that special QS tables can later be created that summarize the linear items together with associated point items.



The Appurtenances input option allows the user to enter any standard point item as an appurtenance associated with any linear chain or area shape. If the user clicks M1 to select this option, the QS Data Input dialog box will be modified as shown here. In order to associate point items with a chain/shape, the user must first identify a previously entered chain/shape to which the appurtenances to be input are to be associated. This is done by clicking M1 on the Select Chain or Enter # text input box. When the focus shifts to this box, the user can enter the chain ID (i.e., C21, etc.), or he can select the desired chain by clicking M1 on the graphic screen. If the user selects a chain from the graphic screen, the selected chain is highlighted. The following information is displayed in the MicroStation menu bar prompt field concerning the selected chain: QS item code, associated roadway and the chain's description (if it has a special user-defined description), or the chain's beginning and end station along the given roadway (if no description exists).

After identifying the chain/shape, the specific point type item code to be input must be selected by clicking M1 on the Item Type ... button. This button works the same as previously described for standard QS data input, except that if a linear/area group is selected on the first list box (listing all groups of item codes), then the second list box will not list any items because appurtenances for this input option must be standard point type items. If a point type item group is selected, the second list box lists all defined point type item codes for the selected group. One of the items should be selected by highlighting and clicking the OK button. The selected code will automatically be placed in the code text box. Input can then proceed in the same manner as for standard QS point items.

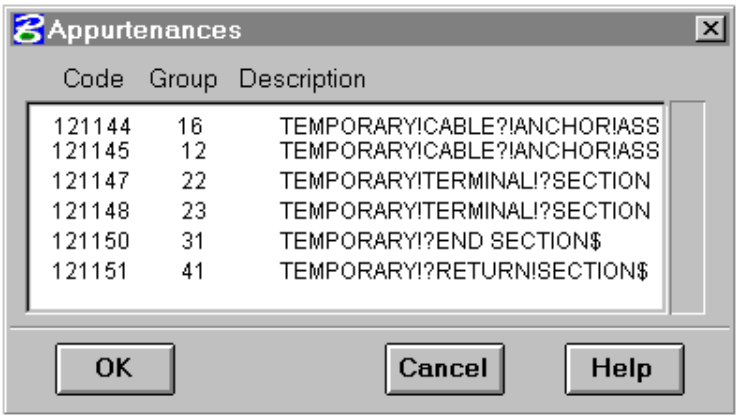


The MBGR Appurts input option allows the user to enter MBGR appurtenances that are associated with metal beam guard railing (MBGR) items. If the user clicks M1 to select this option, the QS Data Input dialog box will be modified as shown here.

MBGR appurtenances, like cable anchor assemblies, terminal sections, end sections, and return sections, must always be associated with a specific MBGR linear

item, or chain. In order to enter these MBGR appurtenances, the user must first identify the previously entered metal beam guard railing to which the appurtenances to be input are to be associated. This is done by clicking M1 on the Select Chain or Enter # text input box. When the focus shifts to this box, the user can enter the chain ID (i.e., C21, etc.), or he can select the desired chain by clicking M1 on the graphic screen. If the user selects a chain from the graphic screen, the selected chain is highlighted. The following information is displayed in the MicroStation menu bar prompt field concerning the selected chain: QS item code, associated roadway and the chain's description (if it has a special user-defined description), or the chain's beginning and end station along the given roadway (if no description exists).

The user also enters the flare type that is to be associated with the selected MBGR chain, if it has not already been entered. This is accomplished by clicking M1 on the Flare Type text entry box and entering the flare type number to be associated. If a flare type was previously entered, the flare type number will automatically fill in the flare type input box when the selected chain is accepted. It is legitimate for no flare type to be associated with a given MBGR. In this case, the user should leave the flare type input box blank.



After defining the chain and flare type, the specific MBGR appurtenance item code to be input must be selected by clicking M1 on the MBGR Appurts... button. This will cause a single list box shown at left to be displayed which lists all possible MBGR appurtenance codes defined. The user should highlight the code desired for input, click OK, and the code will automatically be placed in the code text box. Input can then proceed in the same manner as for standard QS point items.

The Special Item Location Description box is to be used whenever the user wishes to attach a special location description to a QS item (e.g., a location description like "Corner of First and Elm Streets") instead of the automatically generated station/offset location on the roadway. To enter a special description, the user should click M1 on this box and enter the desired description. For linear or area items, this description will be stored when the Apply box is selected. For point items, the description is stored for each point as they are entered.

QS TABLE PROCESS

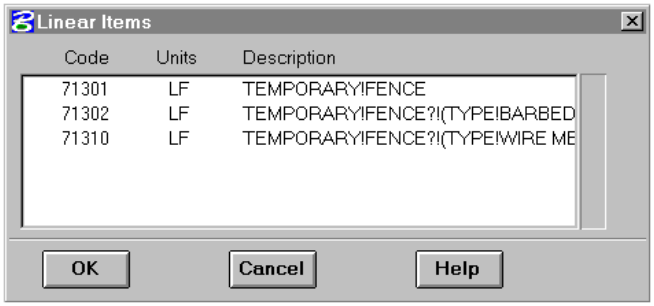
This dialog box will appear if the user clicks M1 on the QS Table box in the side menu beside the Quantity Summary box in the pull down menu below the Applications box in the top level menu bar.

As with the QS Input process, the first thing the user must do is to select the QS item code, or codes, for which a QS Table is to be displayed. The mechanism for accomplishing this is an option button with six possible options for listing existing "Item List Options" elements:

- Area Items - Lists all area items
- Linear Items - Lists all linear items
- Point Items - Lists all point items
- Combined Items - A combination of all point, linear, and area items
- Appurtenances - Lists all point and MBGR appurtenance items associated with linear (standard and MBGR) and area items
- MBGR Items - Lists all MBGR linear items

Each option displays a list box with only the items of the type specified that have been previously entered using the QS Input process. The list box heading identifies the type of items in the list (i.e., area, linear, point, etc.), and each item listed contains the BEES item number, item units, and a description of the particular item. The list box also has OK and Cancel buttons to dismiss the box. One or more may be selected from the list by clicking M1 on the item(s). When the user is satisfied with the highlighted items he has selected, he clicks the OK button. All selected items codes will be automatically input into the codes text entry box and the associated type will be displayed in the type field. The Cancel button closes the list box without inputting any code into the code field.

The main QS Table Request box with the Item List Option button activated and linear fence codes listed in the code field are shown here. Also shown is the list box displayed when the "linear items" option is clicked on and specific items are selected for the summary table.



The list boxes have scroll bars to facilitate viewing all of the item types that have been input for a given grouping.

There are a number of different types of summary tables which can be displayed with the QS Table Request dialog box:

- Standard Table with a single item
- Standard Table with multiple items of the same type (e.g., all point items)
- Standard Table with multiple items of various types (point, linear, area combined together)

TEMPORARY FENCE

STATION TO STATION				LF
234' LT "a"	0+73	224' LT "a"	4+51	378
173' RT "a"	1+40	177' RT "a"	5+51	411
142' RT "b"	217+89	151' RT "b"	214+32	358
174' LT "b"	217+96	164' LT "b"	214+35	361
TOTAL				1508

Standard Single Item Table

GATE (TYPE GATEWAY)

STATION	GATE (TYPE GATEWAY) EA	GATE (TYPE 4' WIRE MESH) EA	GATE (TYPE 5' WIRE MESH) EA
LT "a" 1+24	1		
RT "a" 2+06	1		
LT "b" 217+39	1		
RT "b" 217+40	1		
LT "a" 3+55		1	
RT "a" 4+76		1	
LT "b" 214+91		1	
RT "b" 215+06		1	
LT "a" 1+73			2
LT "a" 8+17			3
RT "a" 3+95			4
RT "a" 10+04			5
TOTAL	4	4	14

- Standard Table with single or multiple items of same or various types and appurtenances (standard point items associated with linear/area items)
- MBGR Table with single or multiple linear MBGR items and associated point type MBGR appurtenances.

Examples of each type of table are shown to the left.

Standard Multi Item Table

GATE (TYPE GATEWAY)

STATION TO STATION	GATE (TYPE GATEWAY) EA	TEMPORARY FENCE LF	EROSION CONTROL SEED(STRAW TYPE 1, COMMERCIAL FERTILIZER) SQFT
LT "a" 1+24	1		
RT "a" 2+06	1		
LT "b" 217+39	1		
RT "b" 217+40	1		
LT "a" 0+73 LT "a" 4+51		378	
RT "a" 1+40 RT "a" 5+51		411	
RT "b" 217+83 RT "b" 214+32		358	
LT "b" 217+96 LT "b" 214+35		361	
LT "a" 0+95 LT "a" 3+02			19303.6
LT "a" 5+99 LT "a" 9+03			29027.2
TOTAL	4	1508	48330.5

Standard Multi Item Table With Different Item Types

GATE (TYPE GATEWAY)

STATION	GATE (TYPE GATEWAY) EA	FENCE (TYPE BARBED WIRE METAL POST) LF	EROSION CONTROL SEED(STRAW TYPE 1, COMMERCIAL FERTILIZER) SQFT	GATE (TYPE 4' WIRE MESH) EA
LT "a" 1+24	1			
RT "a" 2+06	1			
LT "b" 217+39	1			
RT "b" 217+40	1			
LT "a" 5+42	1			
LT "a" 6+29	1			
RT "b" 202+59	1			
RT "a" 9+89	1			
RT "a" 11+44	1			
LT "a" 10+32 LT "a'		413		
RT "a" 10+70 RT "a'		314		
LT "a" 0+95 LT "a'			19303.6	
LT "a" 5+99 LT "a'			29027.2	
LT "a" 4+25 LT "a'		604		2
TOTAL	9	1331	48330.8	2

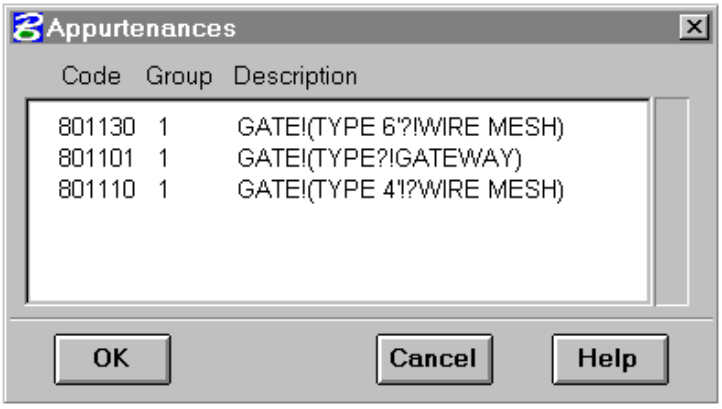
Standard Multi Item Table with Different Item Types and Associated Appurtenances

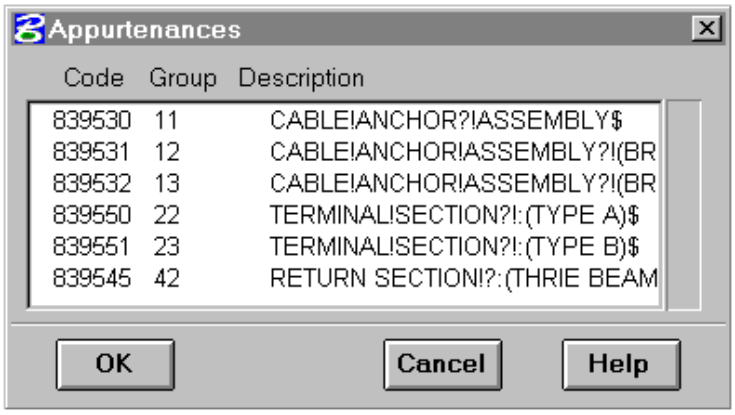
METAL BEAM GUARD RAILING

STATION TO STATION	METAL BEAM GUARD RAILING LF	METAL BEAM GUARD RAILING (STEEL POST) LF	CABLE ANCHOR ASSEMBLY (BREAKAWAY (TYPE A) EA	CABLE ANCHOR ASSEMBLY (BREAKAWAY (TYPE B) EA	FLARE TYPE	TERMINAL SECTION (TYPE A) EA	TERMINAL SECTION (TYPE B) EA	END SECTION EA
159' LT "b" 200+77 120' LT "b" 206+49	599							
94' RT "b" 207+83 61' RT "b" 201+54	883							
35' LT "a" 23+08 108' RT "a" 24+27	520		2	2		2	2	
87' LT "a" 19+23 98' LT "a" 25+99	676		2	2	3	1	2	
78' LT "b" 201+42 31' LT "b" 204+05		264						
77' LT "b" 205+00 60' LT "b" 206+63		164						
33' LT "a" 19+42 38' LT "a" 22+20		278						
35' LT "a" 23+08 44' LT "a" 25+37		229						
487' LT "a" 3+13 462' LT "a" 7+54		442						
TOTAL	2458	1377	4	4		3	4	4

MBGR Combined Linear and Point Item Types

All item codes (including MBGR linear and point items) can be displayed in the standard type table format. Only linear/area items (including linear MBGR) can be displayed as primary items in the combined type tables where associated point-type appurtenances are displayed along side one or more primary linear/area items. Only MBGR linear items can be displayed as primary items in the MBGR type tables where associated point-type MBGR appurtenances are displayed along side one or more MBGR primary linear items.





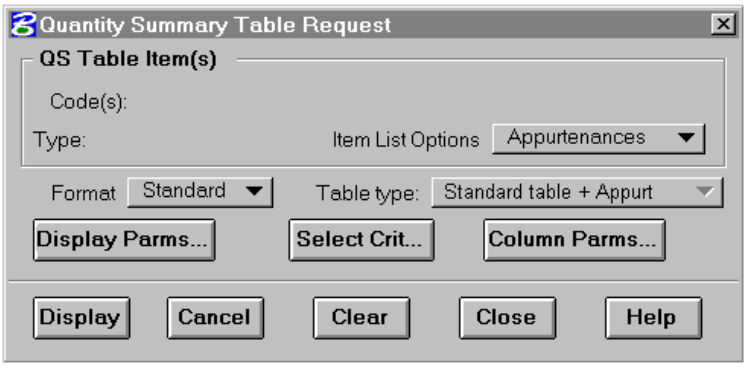
The QS Table Request dialog box contains a Table: option button that allows the user to select which "type" of QS table is to be generated. The option button has three options:

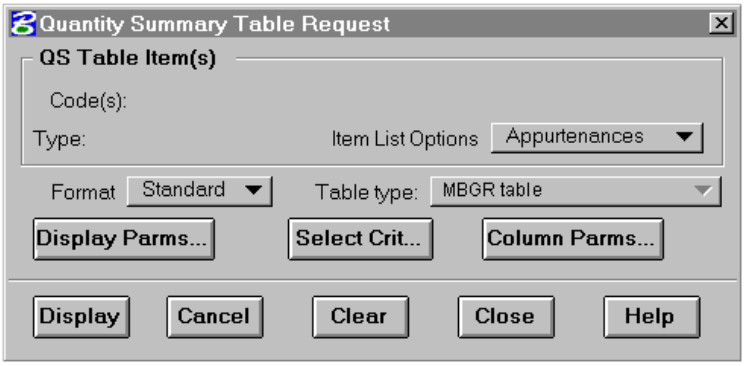
- Standard Table
- Standard Table + Appurtenances
- MBGR Table

Under the Standard Table option, the QS Table Request dialog box is displayed as previously shown.

Under the Standard Table + Appurtenances or MBGR Table options, the dialog box is modified to display as shown to the left. This will allow the user to specify appurtenances (standard or MBGR) that are desired to be displayed along with the standard linear/area or MBGR linear code(s) specified.

In order to specify the appurtenances (standard or MBGR) desired to be included in the combined QS table, the user should click M1 on the Appurtenances button. This action will cause a list box shown at left to be displayed that contains all of the appurtenance types (standard or MBGR) associated with the particular standard linear/area or MBGR linear item code(s) specified. The list contains code numbers, group numbers, and descriptions similar to other list boxes. Item selection is basically done the same way. There is an additional button on this list box that is labeled All which allows the user to select all codes associated with the linear code(s). This button will be used most of the time to insure that the combined QS table contains the linear/area items and all associated appurtenances.





Selection of items and clicking OK or clicking All cause the Appurts text input box to be filled with the Appurtenance codes desired. The list box is then erased, and the user is ready to continue with the QS Table Display process. The main dialog boxes at left show the results of selecting Appurtenance items from the list box.

The QS Table Request dialog box contains four special buttons that are used to request special functions for the standard tables as well as the Standard Table + Appurtenances and MBGR combined tables. The special buttons are listed below.

- Format Option
- Column Parameters
- Display Parameters
- Select Criteria

Format Option Button

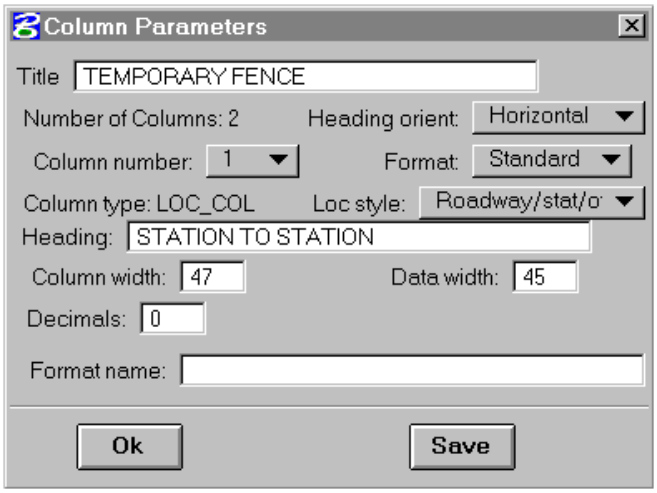
The Format Option button currently has five options: Standard, Special #1, Special #2, Special #3, and Custom. The Standard and Special #1-3 options are currently defined in the qsfmt.imp and qsfmt.met files. These provide the user with various table formats which specify different table parameters such as column width, data width, totaling, etc. The Custom option allows the user to recall a previously saved table format that was customized by the user to fit a particular table requirement. Basically, in the format files, there are separate format definitions for point, linear, area and MBGR items for the Standard option and each of the Special options.

If the Standard or Special #1-3 options are selected, the format associated with the option selected and the item type will be used as the table format. For example, if the item to be summarized is a point type item and the Standard format option is selected, then the QS Table display process will use the Standard format definition for point items to display the table. Initially, all column parameters for the QS Table to be created are set based upon the format selected with this option button.

The Format Option functions like a typical option button with each option selection changing the displayed button to be the last selected option. The Custom option button additionally pops up a separate list box which contains a list of names of previously saved customized formats. The user should select the desired name and click on OK, or Cancel to dismiss the box. The list box also has a Delete button which can be clicked on to delete whichever name has been highlighted (i.e., selected) from the customized format file.

A detailed discussion of the qsfmt files and their relationship to the QS Feature Code files (i.e., qsfeat files) is included in the Appendix of this document.

Column Parameters Button



Clicking M1 on the Column Parameters button displays the dialog box shown here.

The overall purpose of this box is to allow the user to tailor various table parameters for each column of the table to produce the QS table desired. Specifically, the function of each box within this dialog box is as follows:

1. Title Box - initially shows default title to be used for table. The default title is obtained from the description in the feature code table for the first code specified. If the user desires to define some other title, he should click M1 on this box and enter the desired title.

2. Number of Columns - indicates how many columns the table will have. Nothing can be entered in this field.

3. Heading Orient - specifies whether all of the "quantity" column headings for the QS table to be generated should be displayed horizontally or vertically. Horizontal setting implies all column headings will be horizontal. Vertical implies that the "location" column will remain horizontal, but all other columns will have vertical heading text [except the units (EA, LF, SQFT, etc.) will also remain horizontal]. Heading orientation does not apply to MBGR type tables.

4. Column Number - specifies the column with which the displayed parameters are associated. To switch from one column to the next, the user clicks M1 on the option button to select the desired column parameters.

5. Format - allows the user to change the format for each column individually. This option button operates exactly like the format option button on the main QS Table Request dialog box. However, this option overrides the general format setting from the main dialog box, so that each individual column can use different format parameters. This is particularly helpful for creating tables with different "types" of items combined (points, linear, and area). The Format button does apply to MBGR tables and is not displayed in that case.

6. Column Groups... - is displayed when an MBGR table is requested that contains several appurtenance items that are to be grouped together under a single major heading. This button initiates a Column Groups dialog box that displays the following:

    a. Number of Groups - specifies the number of groupings of multiple MBGR appurtenances. No entry is allowed in this field.

    b. Group Number - option button which allows user to switch between groups.

    c. Heading - displays heading for each group of columns. User may enter desired heading or use default from feature code table.

    d. Lowest Column - displays beginning column number of grouping. No entry is allowed in this field.

    e. Highest Column - displays ending number of grouping. No entry is allowed in this field.

7. Column Type - indicates the column type parameter that was specified in the format files. The types available are:

   LOC_COL - Column 1 only, location column (no quantity values)

   QNT_STD - Columns 2-n, standard quantity column (i.e., the quantities computed and displayed are to be in units for points, feet for linear, and square feet for areas.

   QNT_ALT - Columns 2-n, alternate quantity column; displayed quantities should be multiplied by the factor specified in the QS item file for this item (i.e., displayed quantities can be anything desired: yards, miles, etc. for linear and square yards, acres, etc., for areas).

   MBGR_XX - Columns n+1 to end, MBGR Appurtenance columns, organized in four basic groups of point items: cable anchor assemblies, terminal sections, end sections and return sections. The XX is a two-digit type designation denoting to which group an item code belongs.

   MBGR_FLR - Columns n+1 to end, MBGR flare type column special MBGR column for flare type designation only.

   MBGR_GRP # - Grouping of columns n+1 to end under a group heading.

   No entry is allowed in this field.

8. Location Style - refers to how the location is to be presented and only applies to column 1 of the table, which always contains the location description. The option button has the following three options:

   Roadway/stat/off - Implies the location should contain roadway, station, offset distance, and offset direction

   Omit off dist - Same as above, except omit offset distance

   Roadway/stat - Implies the location should only contain roadway and station

   The user may click M1 on the option desired.

9. Item Code - specifies the QS item code associated with a given column. No entry is allowed in this field (only applicable to columns 2-n). Item code display replaces Location Style display for columns 2-n.

10. Heading - specifies column heading. The user clicks M1 on this box and enters a new column heading if he desires.

11. Column Width - specifies the number of characters wide that the given column can be. The user may change this as desired; however, if he makes it too small, values may not fit and displayed data could be truncated or "***" could be displayed.

12. Data Width - specifies the maximum number of characters wide any data value can be. This can be changed, as necessary, to produce tables with a good appearance. The data width will always be centered within the column width, and the data values are always displayed right justified in the data field for numeric values and left justified in the field for alpha characters, so adjusting the width of the data field can help center the values in the column.

13. Decimal - specifies how many decimals will be displayed on quantity values and on station values in the location description. This can be changed as required.

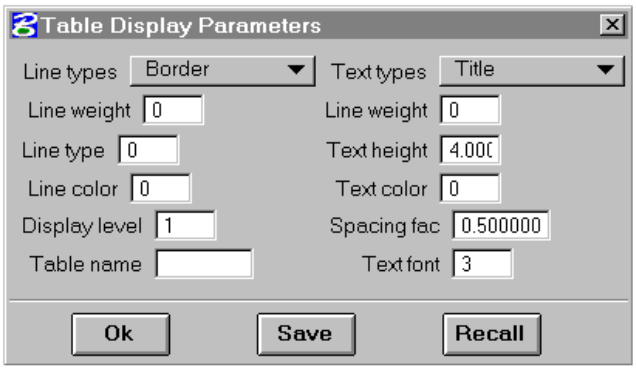
14. Display Total Button - displays a toggle button for columns containing quantity values that allows the user to specify that the column should have, or not have, totals displayed at the bottom of the column.

15. Format Name - allows entry of a unique name under which the currently defined format can be save by clicking on the Save button.

16. Save Button - saves all table format parameters under the unique name specified in the format name text box by clicking M1.

17. OK Button - signals when the user is satisfied with the table parameter setting. Clicking M1 on it stores all parameter changes that were made for later use in the table creation process and closes the Column Parameters dialog box.

Display Parameters Button



Clicking M1 on the Display Parameters button displays the dialog box shown here.

The line and text types are selected using an option button for each one. For lines, there are six options; and for text, there are five options. All other line and text parameters are input using text entry boxes where each box is initialized to the current active parameter in the graphic system. The six line type options available for customizing the lines on the table displays are as follows:

° Border - Table border (perimeter).

° Heading - Horizontal line under main headings and subheadings (if any exist).

° Heading Col - Vertical lines separating each main heading.

° Subheading - Horizontal line separating heading from subheadings (if any exist).

° Subhead Col - Vertical lines separating all subheading columns that may exist in the table.

- ROW Separ - Horizontal lines separating all item entries in the table.

The five text type options available for customizing the text on the table displays are as follows:

- Title - Title text for the table.

- Heading - Heading text for each main column heading.

- Subheading - Subheading text for all subheadings that exist in the table.

- Item - Item text for each item's location and quantity values.

- Total - Total text for totals of all items.

The input boxes for each of the line types include line weight, line type, and line color. The input boxes for each of the text types include text line weight, text height/width, text color, text spacing factor, and text font. All of these parameters are fairly standard, except for the text spacing factor. This parameter defines how much space is desired above, and below, each text type. The space is defined as a factor that is applied to the text height to obtain the spacing. For example, if the user wishes to have a "one half text height" space above and below table text, then a ".5" spacing factor should be entered in this box. The default for this parameter is .5.

The display level parameter allows the user to define the desired level in which the lines and text of the QS table will be displayed.

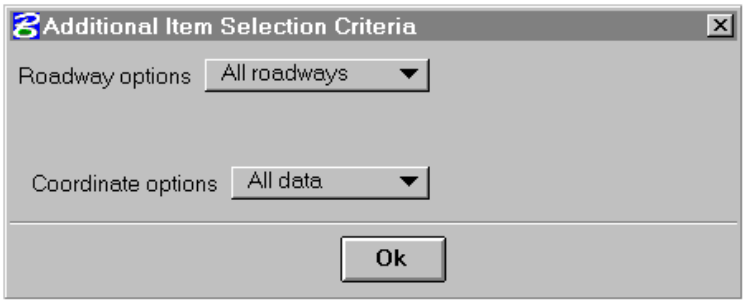
The "table name" parameter lets the user define a unique name under which the current display parameters can be saved for recall later. Clicking the Save button saves all current table display parameters under the unique name specified in the Table Name text box. The OK button signals when the user is satisfied with the table display parameter settings. Clicking it stores all parameter changes for later use in the table creation process and closes the Display Parameters dialog box.

The Recall button pops up a separate list box which contains a list of all names under which table display parameters were previously saved. This list box has OK, Cancel, and Help buttons which operate in the standard way. To recall previously saved display parameters, the user should select the desired name and click on OK. OK or Cancel dismiss the box. Help pops up a box with help information.

SELECT CRITERIA

There are currently several types of selection criteria which can be used within the QS process to filter out QS items. These include:

- Single Roadway
- Station Range
- Edit Window (fence within graphic system)



Clicking M1 on the Select Criteria button displays the dialog box shown here with criteria defaults set:

With the criteria shown above in effect, all QS data for all roadways will be included in the summary.

The Roadway Options option button has two options:

- All Roadways (default)
- Single Roadway

If the All Roadways option is in effect, no additional information is needed to be displayed.

If the Single Roadway option is selected, two additional boxes are displayed:

- Roadway Text Input box - defaulted to the current active roadway

- Station Range Option button, with two options:

  - Entire Roadway (default)
  - Station to Station

The roadway can be changed to some other roadway by clicking M1 on the roadway option button and selecting the desired roadway letter. If the Entire Roadway option is in effect, no additional information needs to be displayed.

If the Station to Station option is selected, two additional text boxes are displayed to allow the user to enter a beginning and ending station for the desired station range. The station text boxes should each be clicked on and the proper station entered into each field. Station values should be integer numbers without the station "+"s.

The figure here shows how the box looks when a station range has been input.

The Coordinate Options option button has two options:

- All Data (Default)
- Edit Window

Neither option displays any further information, but the user should be sure that he has identified an appropriate fence in the graphic system if he intends to select the Edit Window option.

The OK button sets the QS item selection criteria to be whatever is currently in the criteria box and erases the dialog box.

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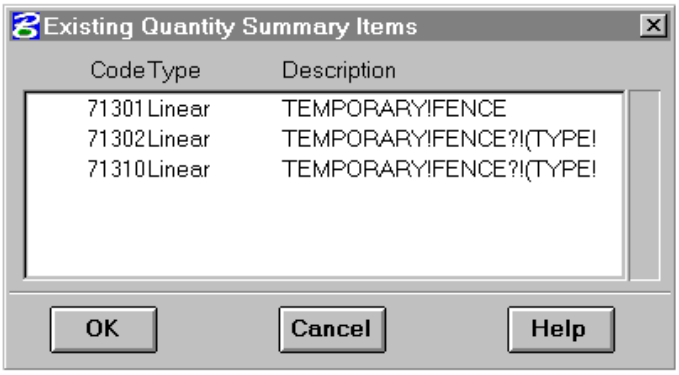
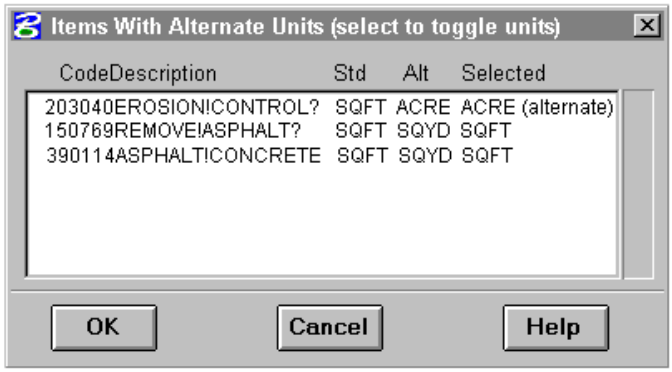
QS BEES PROCESS

Selection of the QS BEES menu box displays another side bar menu box offering the following two options:

- All Items
- Selected Items





If Selected Items menu button is clicked, the QS BEES process displays the list box shown at left containing code, type, and description for all codes that were input. The user should use this dialog box if he desires to select only specific QS items to be included in the BEES file. Selection of the desired codes can be made in the standard way with the M1 button. The OK and Cancel buttons function in the standard way.

Selection of the All Items option will immediately execute the BEES data creation process, if there are no QS items to be summarized that are defined in the QS Item Code table to have "alternate" quantity units. If there is at least one QS item for which there is a choice of quantity units, a list is displayed that lists the items for which a choice of units must be made. An example of the list box displayed is shown here.

This list box identifies the item codes, descriptions, standard quantity units, alternate quantity units, and selected quantity units to be used for BEES quantity values and units. The standard units are always set in the list box as the default units selected for BEES quantity calculations. If the alternate units are desired to be used for a specific code, that code can be clicked on and the selected units will toggle between standard and alternative units. The OK button executes the BEES data creation process using the units specified in the list box and erases the list box. The Cancel button erases the list box without creating a BEES file.

The BEES data creation process creates an ASCII file which is named with the IGrds working file name plus an extension of ".bee". The .bee file contains an ASCII record for each code for which items were input. Each record contains the BEES item code (six digits), the units for the quantities, and the total number of units input for the specific item code. These data are output in a format that is identical to that which the BEES process uses for input.

AUTOMATED PLAN PREPARATION SYSTEM (IGapps)

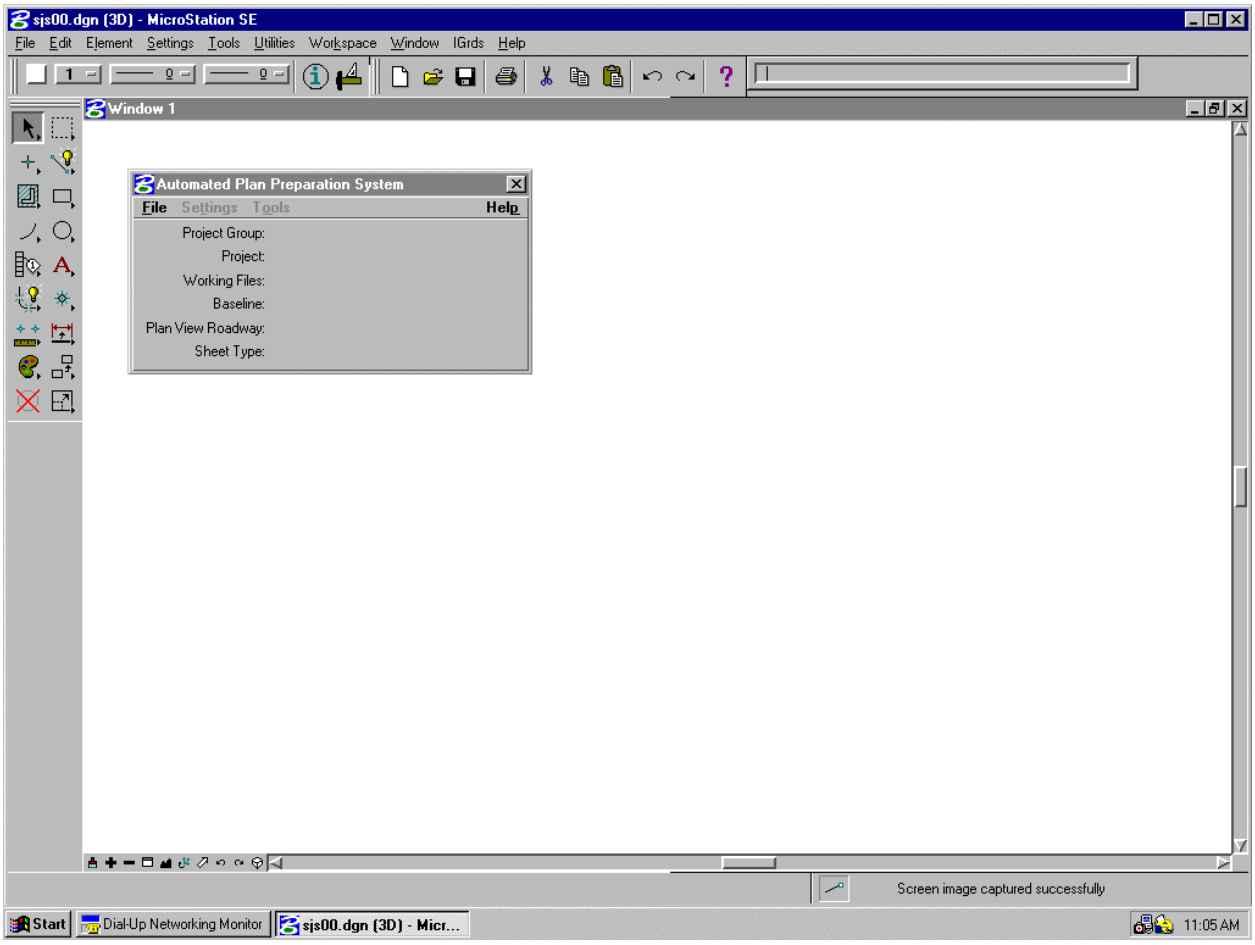


Figure 11-14
Automated Plan Preparation System Menu Window

AUTOMATED PLAN PREPARATION SYSTEM (IGapps)

INTRODUCTION

The Automated Plan Preparation System of IGrds (IGapps) is a system that provides the designer with the capability to create plan only, profile only, plan and profile and plan/profile drawings from IGrds roadway design files.

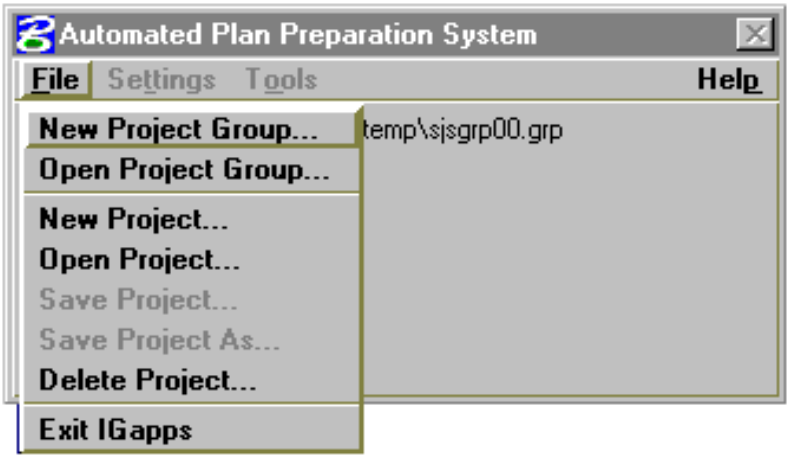
Through the use of IGapps, roadway plan and profile information in continuous form can be reformatted into a standard set of plan drawings of any desired scale. This is accomplished by executing the IGapps program and entering the necessary data in the dialogs provided. These dialogs will be described in the following sections.

Executing IGapps

IGAPPS is an MDL application that is activated by typing “mdl load igapps” in the MicroStation command window. The MicroStation environment must be entered via the current release IG icon to insure certain environment variables needed by IGapps are set. Once loaded, the IGapps menu bar will appear as shown at the top of page 11-64.

FILE MENU

When execution of IGapps begins, the dialog box shown below is displayed. It consists of a menu bar and an area that displays the current project group, project name, working file name, baseline roadway, plan view roadway, and the sheet type.



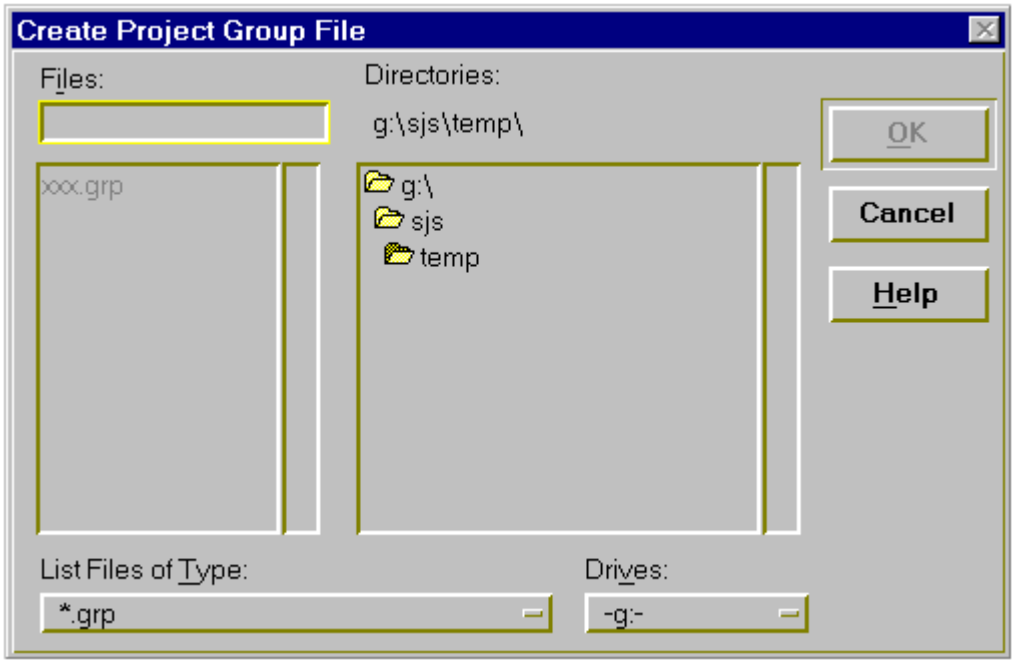
The menu bar has four selectable pull down dialogs from which to choose. These are: File, Settings, Tools and Help. A discussion of each of these options follows.

Selecting File on the menu bar reveals the available file options: New Project Group, Open Project Group, New Project, Open Project, Save Project, Save Project As, Delete Project, and Exit IGapps. Select the desired option by clicking on it which will then display a new dialog box where appropriate, or initiate the desired action.

New Project Group

If New Project Group is chosen the New Group File list box dialog is displayed. It is from this dialog that the name of the new group file to store IGapps projects is entered.

The New Project Group dialog box shown below is typical of the file selection dialogs used throughout IGrds. Details will not be repeated here.



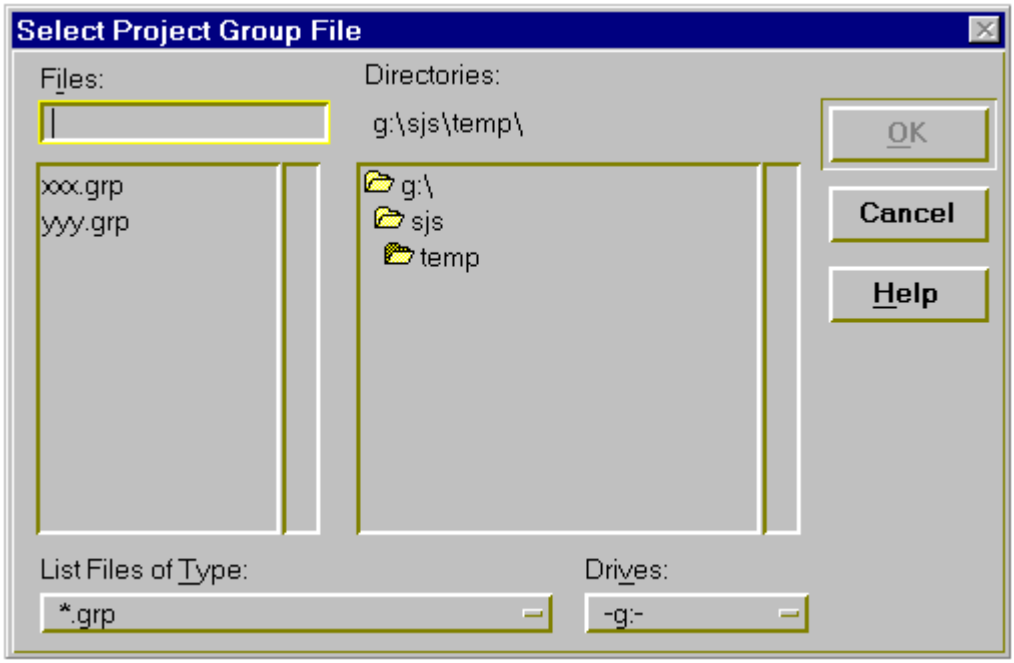
Name	Set the correct directory path and enter the appropriate name.
OK	Click on OK to assign the file to the process. (Clicking OK also brings up the New Project dialog.
Cancel	Select Cancel to close this dialog without taking any action.

Note: When an existing file name is entered, a warning will be issued in an Alert box asking if it is okay to overwrite the existing project group file. If it is, select OK, If not, select Cancel to stop the action and take other actions.

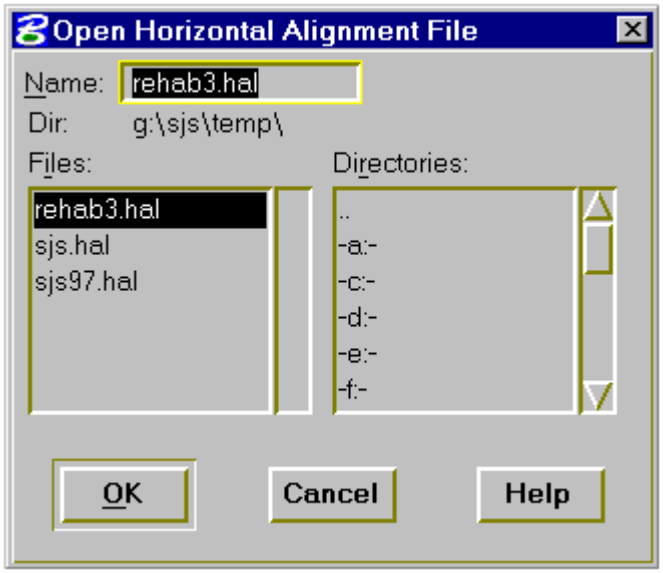
Open Project Group

If Open Project Group is chosen, then an Open Group File list box dialog is displayed showing a list of previously saved IGapps project group files (.grp). It is from this dialog that the group file containing the IGapps projects is selected.

The Open Project Group dialog box shown below is another typical of file selection dialog.



Name	Set the correct directory path as required and click on the desired file to highlight it.
OK	Click on OK to retrieve the file. (The name of the IGapps project group will appear in the IGapps dialog box.)
Cancel	Select Cancel to close this dialog without taking any action.

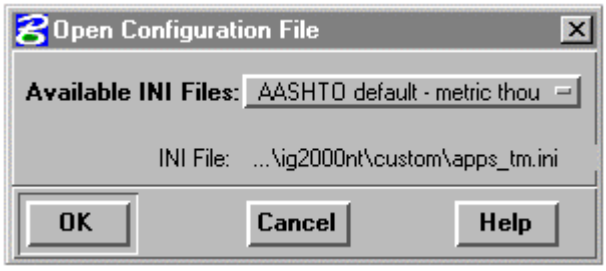


New Project

If New Project is chosen, then an Open Working File dialog box is displayed. It is from this dialog box that the working files containing the data to be developed into drawing sheets is selected.

The Open Working File dialog box show below is another typical file selection dialog box.

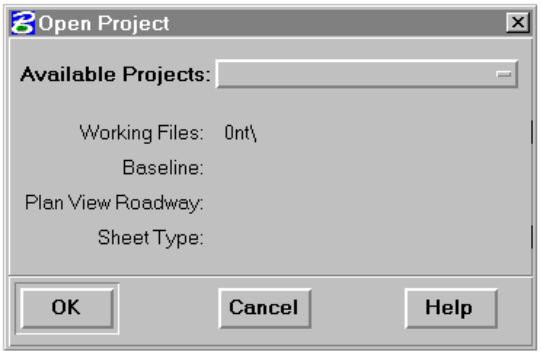
Name	Set the correct directory path as required and click on the desired file to highlight it.
OK	Click on OK to retrieve the file. (The project name (‘untitled’) and the working files will appear in the IGapps dialog box. The project settings dialog box will also appear.)
Cancel	Select Cancel to close this dialog without taking any action.



Open Configuration File

On the OK of the New Project dialog box, the Open Configuration File dialog box is displayed. It is from this dialog box that the configuration file for the project is selected. The available configuration files are shown.

Available INI Files	Displays the available configuration files. Select the desired configuration file.
OK	Click OK to use the configuration file.
Cancel	Select Cancel to close this dialog box without taking an action.



Open Project

If Open Project is chosen, then the Open Project dialog box shown below is displayed showing the available projects within the current project group file. Choosing the required project allows for the recreation of plan sheet drawings developed at an earlier session. After the project is retrieved, the sheet files can be restored by using the Create Sheets command under the Tools menu. The working files, baseline roadway, plan view roadway and the sheet type are displayed for the selected project.

Available Projects	Displays the available projects within the current project group file. Select the desired project to open.
OK	Click on OK to retrieve the project.
Cancel	Select Cancel to close this dialog without taking any action.

Save Project

If Save Project is chosen, the current project information is saved to the project name displayed in the IGapps menu dialog box. If the current project has not been saved previously, the Save As Project dialog box is displayed. The Save Project As dialog box is show below.

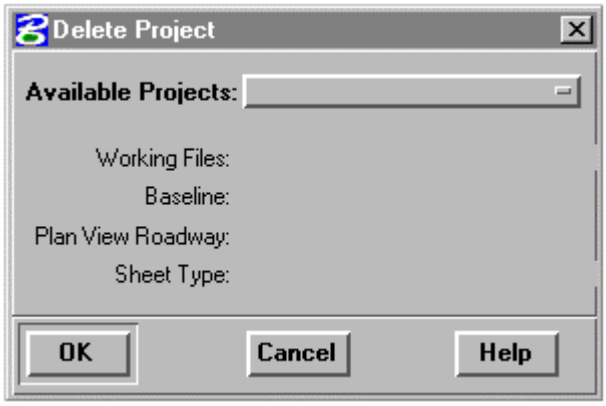
Project	Enter the name of the IGapps project to be save in the current project group file.
OK	Select OK to save the IGapps project.
Cancel	Select Cancel to close the dialog without taking any action.

Save Project As

If Save Project As is chosen, then the Save Project As dialog box is displayed showing the current project group file. This dialog box provides entry of a new project name. This dialog box is identical to the one described above.

Note: When an existing project name is entered, a warning will be issued in an Alert box asking if it is okay to overwrite the existing project. If it is, select OK, If not, select Cancel to stop the action and take other actions.

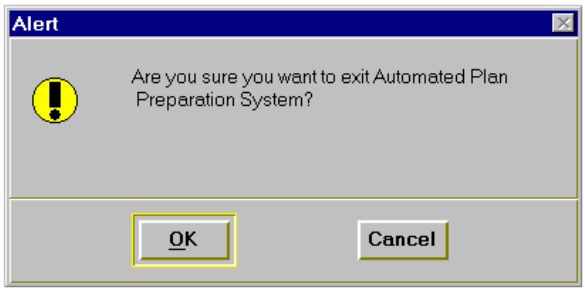
Delete Project



If Delete Project is chosen, then the Delete Project dialog box shown on the left is displayed showing the available projects within the current project group files. The working files, baseline roadway, plan view roadway, and the sheet types are displayed for the selected project.

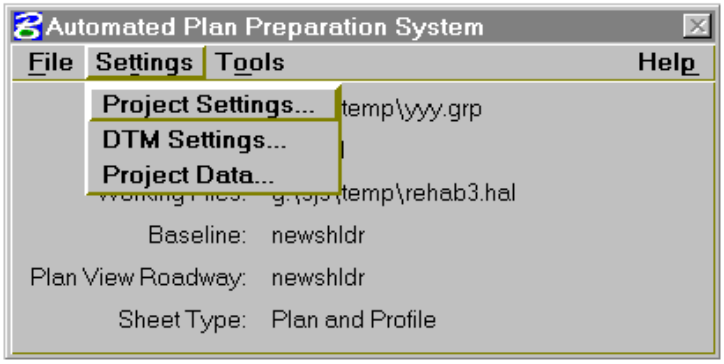
Available Projects	Displays the available projects within the current project group file. Select the desired project to delete.
OK	Click on OK to delete this project.
Cancel	Select Cancel to close this dialog.

Exit IGapps



If Exit IGapps is chosen, a Exit Alert warning box is displayed asking if it is okay to exit IGapps. If it is, select OK. If the current project has been changed, then an Alert warning box is displayed asking to save the current project. If the project is to be saved, select OK. Selecting OK brings up the Save Project As dialog box discussed above. Select Cancel to exit IGapps without saving the project. If it is not, select Cancel.

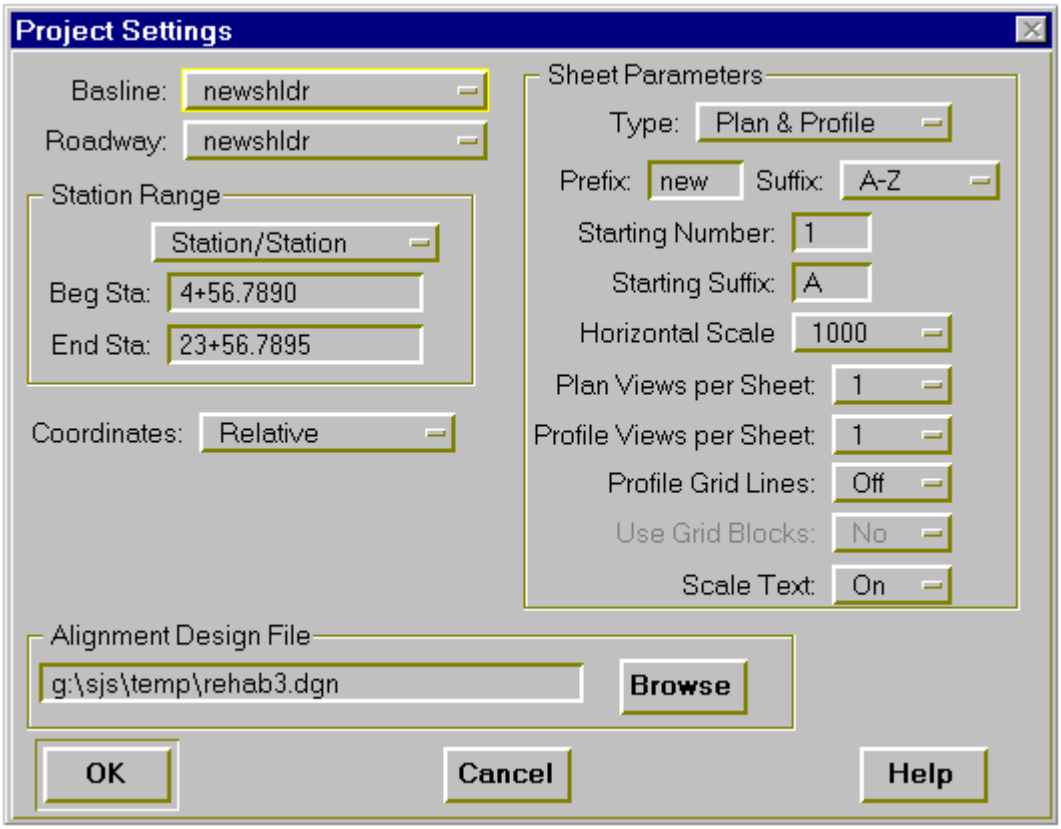
SETTINGS MENUS



Select Settings on the menu bar to reveal the available Settings options: Project Settings, DTM Settings and Project Data. Select the desired option by clicking on it which will then display a new dialog box where appropriate.

Project Settings

Selecting this Project Settings option displays the Project Settings dialog box shown below. The Project Settings dialog box is used to specify among other things the baseline and plan roadway names and the station range over which the drawings are to be created.



Baseline	Select the name of the baseline roadway, if any, from the available pull down list. (If none, select None.)
Roadway	Select the name of the roadway from the pull down list for which sheets are to be created.
Station Range	Select station range option.
Entire Alignment	Entire alignment station values will be used.
Station/Station	Enter the beginning and/or ending stations covering the range of stations to be used for the project.
Coordinates	Select the desired coordinate type. Relative coordinates place the sheets at a specified location (defined in the configuration file) in the design file. Real World coordinates place the sheets at the location that matches the alignment file coordinates.
Alignment File	Select the design file that contains the alignment drawings. This is defaulted to the active design file.
Sheet Parameters	
Type	Select the type of plan sheet to be used for the project. Available sheet types are: plan only, profile only, plan/profile and plan and profile.
Prefix	Enter a 3 character prefix for the design files that contain the sheets that will be created for this project. The default is the first 3 characters of the plan view roadway name.

Suffix	Select the type of suffix used in numbering profile sheets.
A-Z	The suffix will contain uppercase letters starting with 'A' and ending in 'ZZ'.
a-z	The suffix will contain lowercase letters starting with 'a' and ending in 'zz.'
none	There will be no suffix on the profile sheet number.
Starting Number	The starting number of the plan sheets.
Starting Suffix	The starting letter of the profile sheet suffix.
Horizontal Scale	Select the scale to be used with the project.
Plan Views per Sheet	Select the number of plan views on a sheet.
Profile Views per Sheet	Select the number of profile views on a sheet.
Profile Grid Lines	Select to draw grid lines on the profile sheet or the profile section of the plan/profile sheet.
Use Grid Blocks	Select the number of grid blocks use to calculate the height of the reference line for plan/profile sheets. This option is only available if Profile Grid Lines is “ON”.
Scale Text	Select to scale the text that gets drawn on the sheet. The scale is determined from the configuration file by the Horizontal Scale value.
OK	Select OK to calculate the sheet data and/or to save the settings.
Cancel	Select Cancel to close the dialog without taking any action.

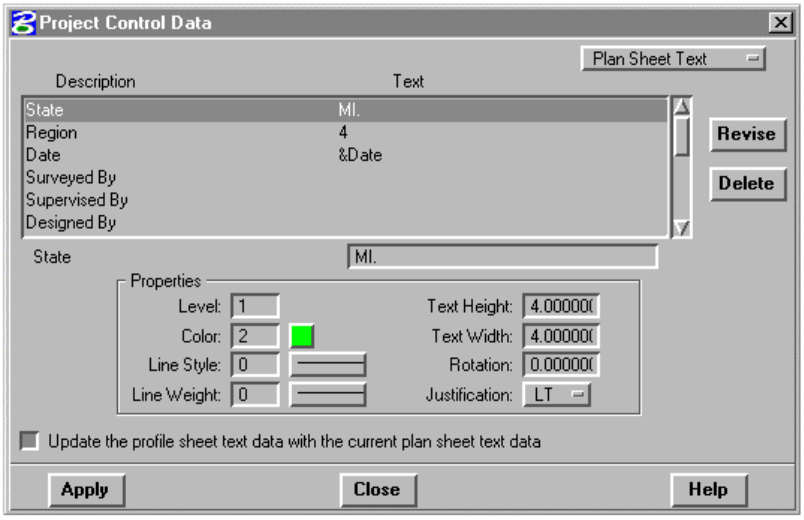
Note: If the following items are changed in the Project Settings dialog box: baseline roadway name, plan view roadway name, station range or horizontal scale, the current sheet data will be deleted and recreated.

DTM Settings

Selecting the DTM Settings menu item will display the standard IGrds Set DTM Surface dialog box. See Chapter 7 page 7 for more details.

Project Control Data

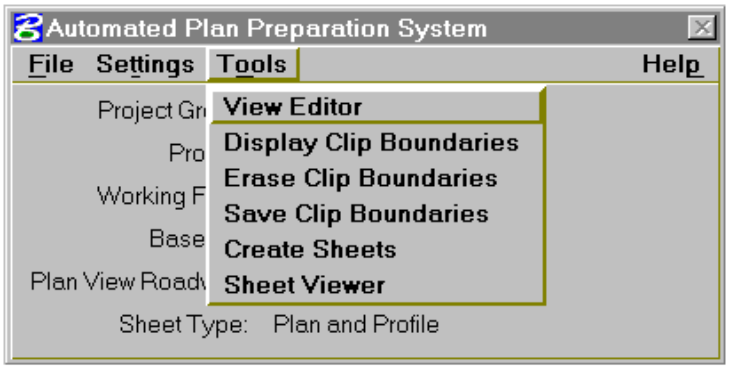
Selecting this Settings option displays the Project Control Data dialog shown below.



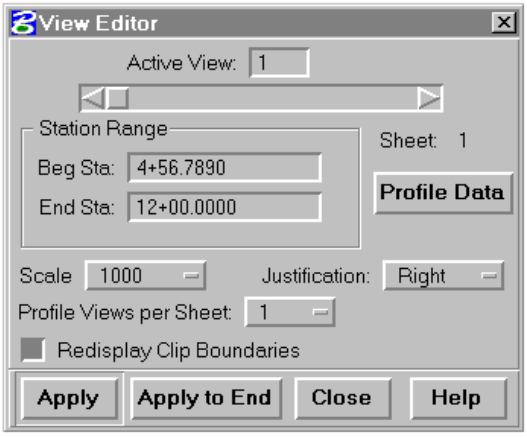
Sheet Type	Select the sheet type for the text to be entered. Types are plan sheet or profile sheet. If creating plan/profile sheets the plan sheet type will be used.
Description	A description ID for the data entered.
Text	Enter the text to be display for the description (maximum of 32 characters).
Level	Enter the level of the text.
Color	Enter the color of the text.
Line Style	Enter or select the line style of the text.
Line Weight	Enter or select the line weight of the text.
Text Height	Enter the height of the text.
Text Width	Enter the width of the text.
Rotation	Enter the rotation angle of the text
Justification	Select the justification of the text

Update the Profile Sheet Text Data with the Current Plan Sheet Text Data	Check if the current text items are to be applied to the profile sheet.
Revise	Revise the selected text item with the data appearing in the list box edit fields.
Delete	Delete the selected item in the list box.
Apply	Select the Apply button after all Project Control Data has been added or edited and it is desired to permanently save the records in their current form.
Close	Select the Close button to close the dialog.

TOOLS MENUS



Selecting Tools on the menu bar reveals the available Tools options: View Editor, Display Clip Boundaries, Erase Clip Boundaries, Save Clip Boundaries, Create Sheets, and Sheet Viewer. Select the desired option by clicking on it which will then display a new dialog box where appropriate.



View Editor

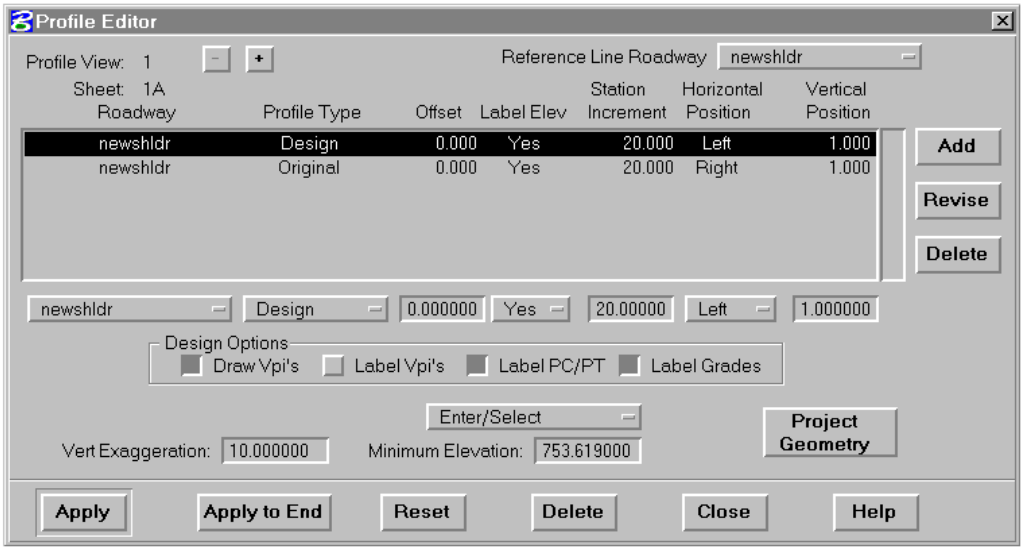
Selecting this Tools option brings up the View Editor dialog box shown below. This dialog box is used to define the station range, scale, justification and number of profiles views for the sheet.

Active View	Displays the active plan view number. To change to another view, enter the value or use the View Scroll Bar.
View Scroll Bar	Slide the scroll bar to the right or left to select a higher or lower numbered view or click on the right or left arrows until the desired view number appears in the Active View number fields.
Sheet	Display the sheet number for the current plan view.
Profile Data	Select the Profile Data button to display the Profile Data dialog box to make modifications to the profile data associated with the active view.

Station Range	
Beginning Station	Displays the beginning station of each plan view. The Begin Station is editable for each view. The default for the first view is the beginning station enter in the Project Settings dialog. Thereafter it is defaulted to the previous view's ending station.
Ending Station	Displays the default ending station of each plan view. The value may only be changed to a lesser value.
Scale	Set the horizontal scale of the active view. The default is the horizontal scale set for the entire project in the Project Settings dialog box.
Justification	Set the desired justification for the profile as starting at the left side of the sheet, ending at the right side of the sheet, or begin centered within the sheet.
Grid Blocks	Select the number of grid blocks on the profile sheets associated with the current plan view. This option is only available for plan/profile sheets. Grid Blocks is only available if the Use Grid Blocks option is set to "Yes" on the project settings dialog box.
Profile Views Per Sheet	Select the number of profile views contained on the profile sheets associated with the current plan view.
Redisplay Clip Boundaries	Toggle on or off to redraw the clip boundaries when the Apply or Apply to End buttons are selected.
Apply	Select the Apply button to apply and store the view data to the current plan view only.
Apply to End	Select the Apply to End button to apply and store the view data to the current and all remaining views in the plan set. The profile data for the remaining views will be reset back to the default profile data from the configuration file.
Close	Select Close to close the dialog.

Profile Editor

Selecting the Profile Data button on the View Editor dialog box displays the Profile Editor dialog box shown below. This dialog box is used to set the parameters required for plotting the various profiles on the profile or plan/profile sheets.



Profile View	Displays the current profile view number.
Sheet	Displays the sheet number that will contain the current profile view.
+	Selecting the + button will increment the profile view number by one and updates the data for the profile view in the list box and data fields.
-	Selecting the - button will decrement the profile view number by one and updates the data for the profile in the list box and data fields.
Reference Line Roadway	Select the desired roadway for the reference line to be used for the current profile view.
Roadway	Select the desired roadway for the profile.

Type	Select one of the profile types for plotting. Available types are: Original, Design, Left Ditch, Right Ditch, Left Ditch with Terrain, Right Ditch with Terrain, Tangents, DTM, Right Low Point, Left Low Point, and Ridgeline.
Offset	Enter the offset distance for the selected profile.
Label Elevations	Select Yes to label elevations for the selected profile. Select No for no elevation labeling.
Station Increment	Enter the distance between elevation labels for the selected profile.
Horizontal Position	Select the desired location for the elevation label.
Vertical Position	Enter the distance from the minimum elevation to label the elevations.
Design Options	(Active only for the Design profile type)
Draw VPIs	Select to draw the VPI symbols.
Label VPIs	Select to draw the VPIs labels
Label PC/PT	Select to draw symbols at the PCs and PTs of all vertical curves.
Label Grades	Select to draw the vertical alignment gradient labels.
Add	Select the Add button to add the selected profile to the Profile Editor list box.
Revise	Select the revise button to revise the selected profile with the data in the edit fields.
Delete	Select the Delete button to delete a highlighted Profile Editor record from the list box.
Vertical Exaggeration	Enter a value for the vertical exaggeration.

Minimum Elevation	Enter the minimum value for the elevation scale to be used for the reference line.
Enter/Select	Enter the elevation to be used.
Scan Cross Sections	Scan all stored cross sections to determine the minimum elevation to be used. The profile roadway must be associated with a baseline with stored cross sections for this option to work.
Scan DTM	The minimum elevation range to be used is determined by draping the alignment over the DTM surface. A DTM surface must be set for this option to work.
Project Geometry	Select the Project Geometry button to display the Project Geometry dialog box. This allows the addition of geometry elements to be display within the current profile view. See Chapter 4, page 101 for more details.
Apply	Select the Apply button to apply and store the view data to the current profile view only.
Apply to End	Select the Apply to End button to apply and store the view data to the current profile view and all subsequent plan views.
Reset	Select the Reset button to restore the current profile view data to the default profile data.
Delete	Select the Delete button to delete all profile data for the current profile view. When this is selected, a dialog box asking to delete the current view for all remaining profiles is displayed.
Close	Select Close to close the dialog. If profile data has been change but not saved, a warning alert dialog will be displayed to ask if the data is to be saved.

Display Clip Boundaries

Selecting this Tools option displays the clip boundary polygons for the plan view roadway of the current project. If any clip boundaries already are drawn for the plan view roadway, they are deleted before redrawing the current ones. The clip boundaries are drawn using the active MicroStation element attributes.

Erase Clip Boundaries

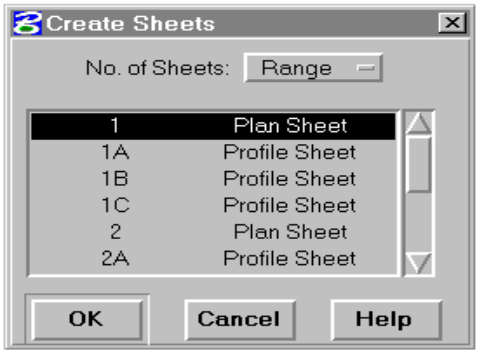
Selecting this Tools option erases only the clip boundary polygons for the plan view roadway of the current project.

Save Clip Boundaries

Selecting this Tools option allows the selection of a clip boundary polygon to be saved. This will allow the modification of the clip boundary polygons from the default size using the MicroStation Modify element palette. Only clip boundary polygons that are associated with the plan view roadway of the current project will be selectable.

Note: If the size of the clip boundary polygon is changed to be larger than the dimensions of the plan sheet area, the clip area will overlap the sheet.

Create Sheets



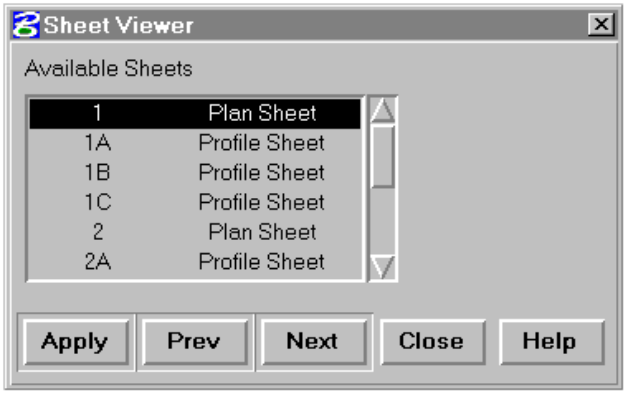
Selecting this Tools option displays the Create Sheets dialog box. This dialog box is used to create one, multiple, or all sheet design files for the current project. The dialog box shown on the left has the range option selected.

No. of Sheets	Select the desired number of sheets to create. Available options are All, Range or Single.
OK	Select OK to create the selected sheet design files.
Cancel	Select Cancel to close the dialog without taking any action.

The All option for the number of sheets will create all stored sheets for the current project. The Range option will allow the selection of multiple sheets to be created from a list box showing all available sheets. The Single option will allow the selection of only one sheet to be created from a list box showing all available sheets. The first column in the list box is the sheet number and the second column is the type of sheet.

Note *Only the sheet design files that are selected to be created will be overwritten if they exist. If the number of sheets in the project has changed, there could be old sheet design files that still exist.*

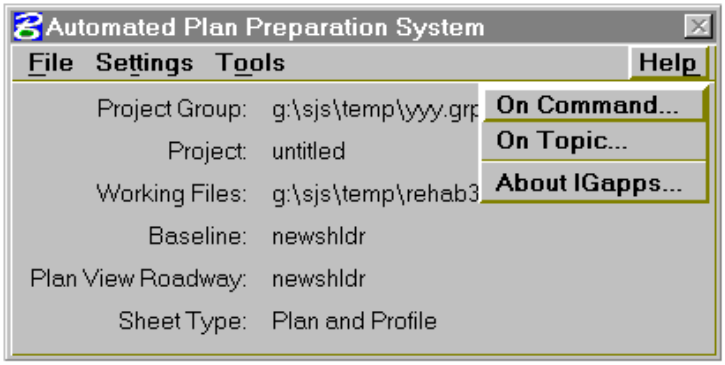
Sheet Viewer



The selection of this Tools option displays the Sheet Viewer dialog box shown below. This allows the selection of a single sheet design file to view. The list box is similar to the list box on the Create Sheet dialog box.

Apply	Select the Apply button to display the selected sheet. Double clicking on the sheet in the list box will also display the selected sheet.
Prev	Select the Prev button to display the previous sheet in the list box.
Next	Select the Next button to display the next sheet in the list box.
Close	Select Close to close the dialog.

HELP MENU



Click on Help to reveal the available options and select the option to display the current Help menu for IGapps.

SURVEY DATA MANAGEMENT SYSTEM (SDMS)

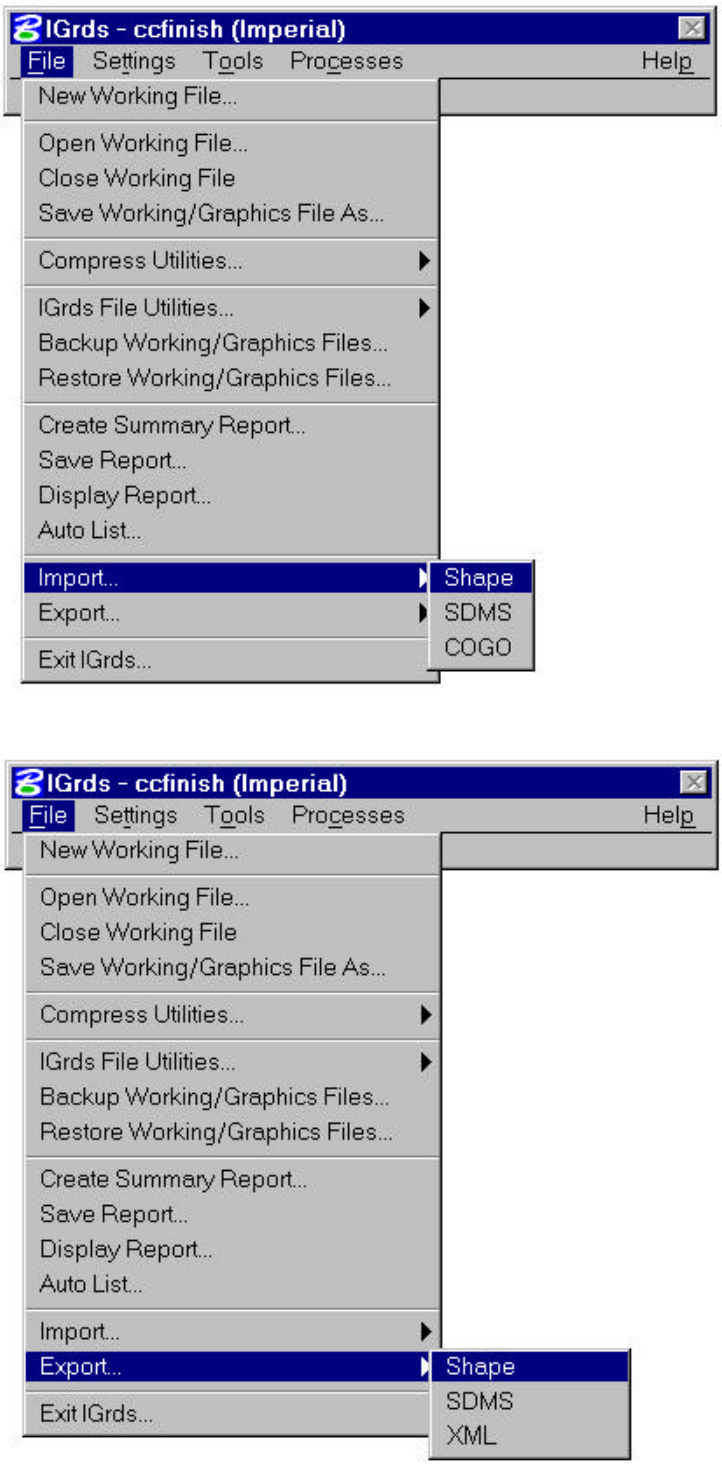
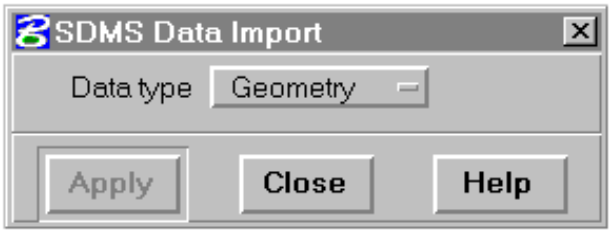


Figure 11-16
SDMS Commands

The current SDMS Import and Export processes support the SDMS 3.4 format, data tags, and specifications as defined in the AASHTO SDMS Data Structure Technical Guide for Release 3.4, dated September 1998.

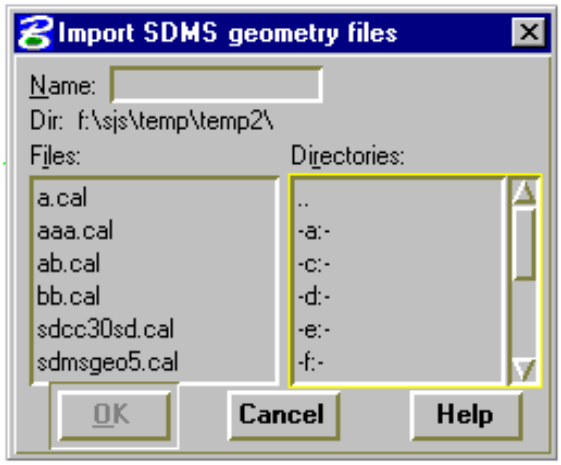
IMPORTATION OF SDMS DATA FOR THE IGrds GEOMETRY, HORIZONTAL ALIGNMENT, CROSS SECTION, AND VERTICAL ALIGNMENT PROCESSES



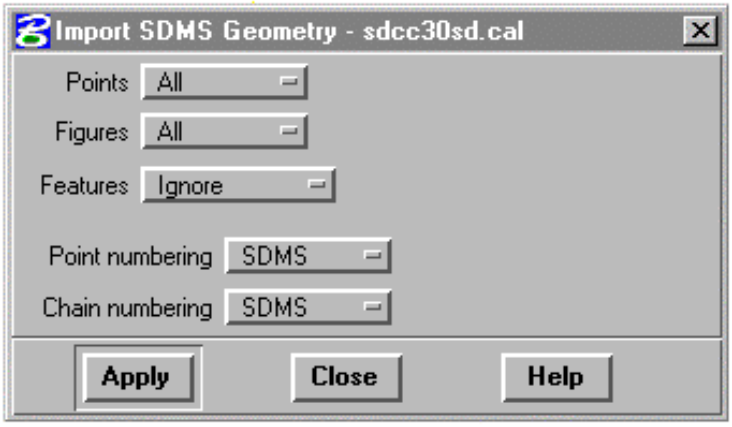
To run any of the IGrds/SDMS data import processes, the user should click on the "File" button in the General IGrds menu bar, then click on Import on the Pulldown menu, then SDMS on the side bar menu. A dialog box will pop up that looks like the dialog box on the left.

The user can select Geometry (default), HA, VA, or XSection using the data type option button.

Import SDMS .CAL Data to IGrds Geometry



To activate the IGrds Geometry Import process, click on the Apply button with the option button set to Geometry. The list box shown on the left will pop up for the user to select the SDMS .cal file or key-in the file name of the .cal SDMS data file which is to be imported into IGrds.



When the file has been selected, the user should click OK and the dialog box on the left will be displayed for the user to establish the criteria parameters for the data import process.

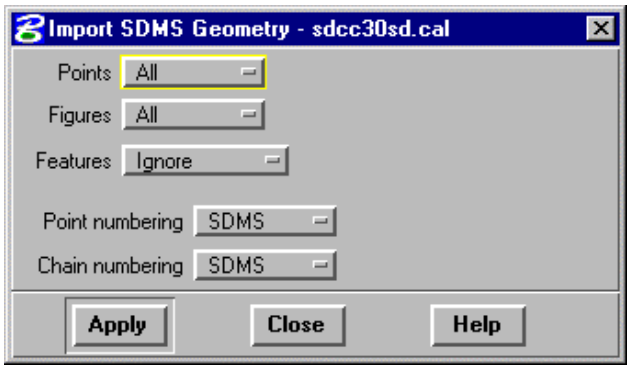
Option buttons for Points and Figures allow the user to select All/None/Selected options for each type of data. If the user clicks the All option, the import process will include all the point data or figure data in the SDMS file. None means exclude all points or figures. The Selected option displays an additional option button that gives the user two ways of entering data. The user can key-in a series of elements and ranges of elements, or he can select/key-in a filename containing previously entered criteria. An example of the keyed-in criteria string might be 1,3,10-20.

For criteria that is very complex (that the user intends to use more than once), any text editor may be used to create an ASCII .lst file that contains the point, figure, and/or feature code criteria desired. The File option pops up a file list box with all .lst files found in the current directory which allows the user to select one of the .lst files or key-in another filename containing the criteria desired. The format of the ASCII .lst file is as follows:

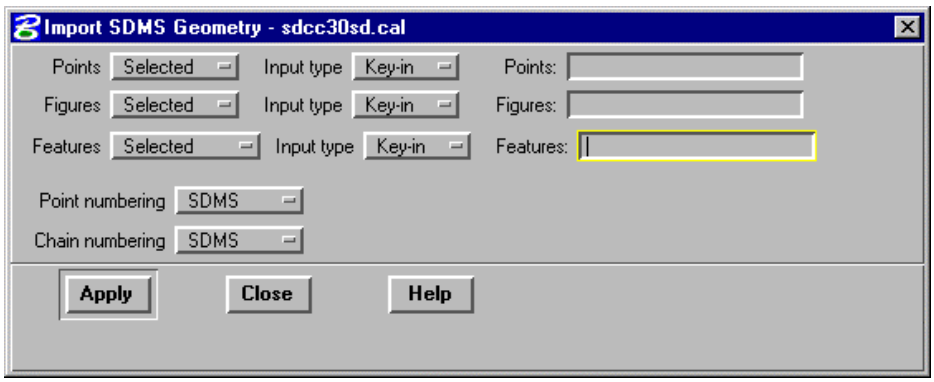
points: 1-5,7,10-20,etc.
figures: 11-17,23,etc.
features: CURB,102,105,SDWK,etc.

The .lst file is especially helpful when the same list of features needs to be repeatedly extracted from a number of SDMS .cal files.

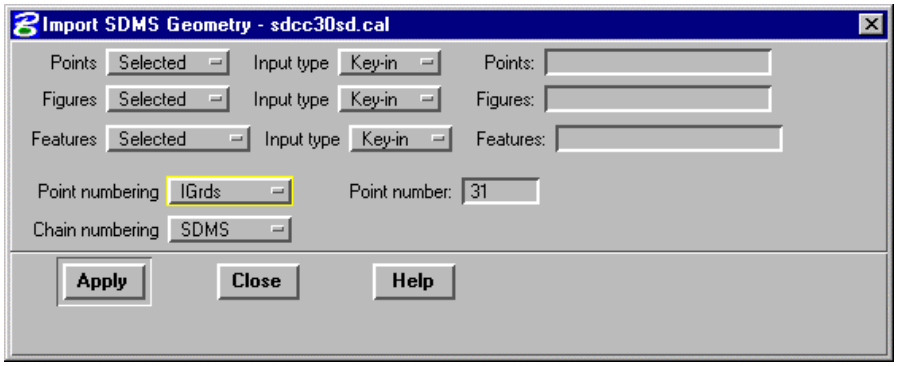
The "Features" criteria has three options: All featured, Ignore, or Selected. The All featured option imports all elements that have a feature code. The Ignore option imports all elements regardless of the feature code. The Selected option works the same as for Points/Figures. The figures on the next page show this dialog box with various options selected. Also shown is the list box for .lst files.



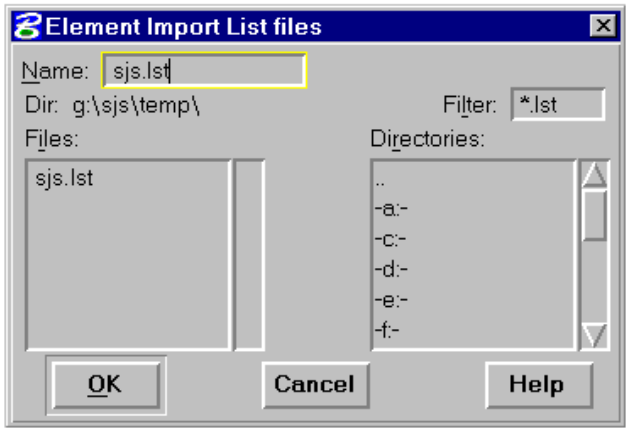
Import SDMS Geometry dialog with no Points and All Figures and All Features selected.



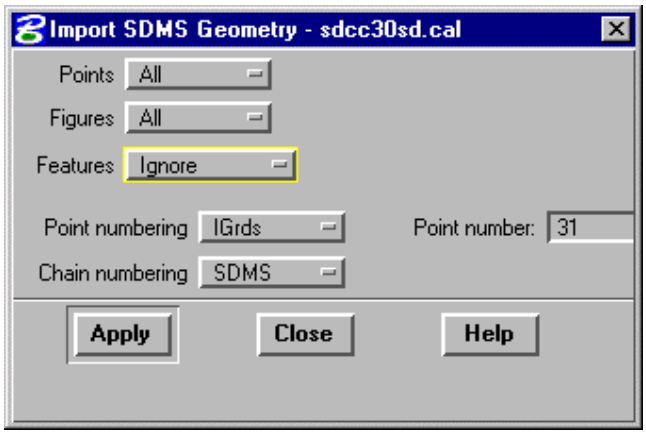
Import SDMS Geometry dialog with Points, Figures, and Features set to “Selected” and Input Type set to “Key-In”.



Import SDMS Geometry dialog with Points, Figures, and Features set to "Selected" and Input Type set to "File".



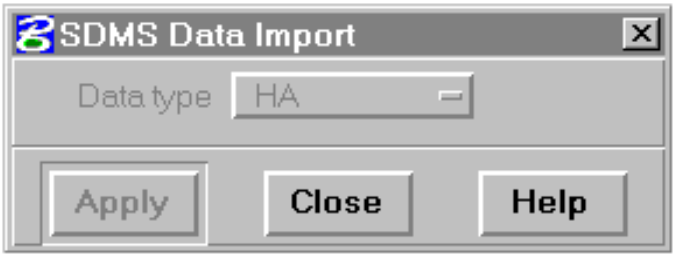
This dialog appears if the Input Type shown in the above dialogs is set to "File".



The Point and Chain numbering criteria have two options, IGrds and SDMS. Click IGrds to use the IGrds next available Point/Chain number. Click SDMS to use the point and figure numbers from the SDMS input data file. For IGrds point and chain numbering, the user may enter the specific point or chain number with which the import process should begin.

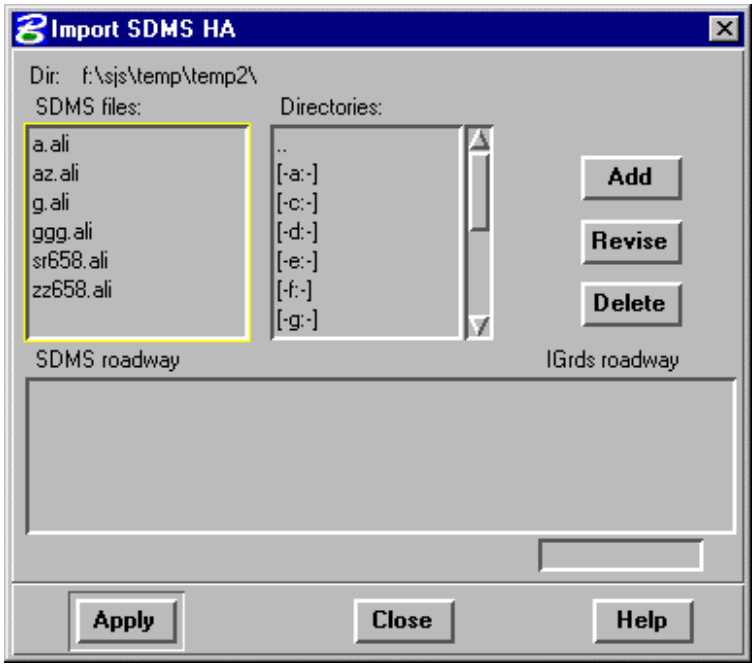
When the user is completely satisfied with the criteria that has been established, the Apply button should be clicked to start the data import process. When the "hour glass" icon disappears and the prompt "SDMS Geometry import process complete" is displayed, the processing is complete and the user can window to see the graphically displayed IGrds Geometry data that has been imported.

Import SDMS .ALI Data To IGrds Horizontal Alignment



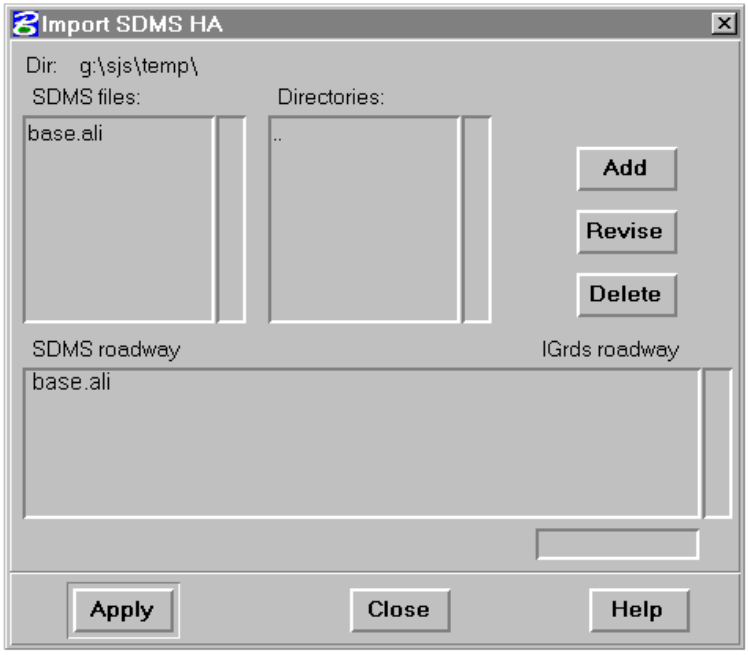
To activate the IGrds Horizontal Alignment (HA) Import process, click on the Apply button with the option button set to HA as shown below.

The list box shown below will pop up for the user to select the SDMS .ali file and key-in the IGrds alignment name (roadway) that is to be associated with the alignment in the .ali file.

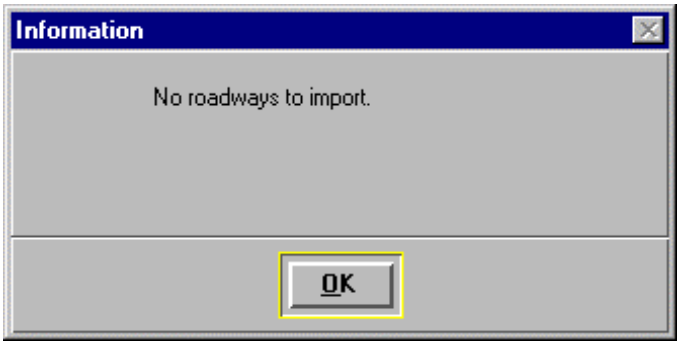


The user should first select the SDMS .ali file that is to be imported. This is done by clicking on the desired file name. The selected filename will be highlighted and it will also be displayed below the large roadway text box. The user should now enter (key-in) an IGrds roadway ID (currently a single letter) in the text box (just above the Help button) on which the focus is currently located. No Carriage Return should be keyed-in as this would try to initiate the process without any roadway data specified in the roadway text box. To add the .ali filename and the IGrds roadway ID specified to the roadway text box, the user should click on the Add button.

The user may continue to select .ali files, enter IGrds roadway IDs, and add them to the roadway text box for all of the files in the .ali list box. The import process will convert all .ali files that the user specifies to be imported. The following figure shows how the dialog box might look after one file and one IGrds roadway have been entered.

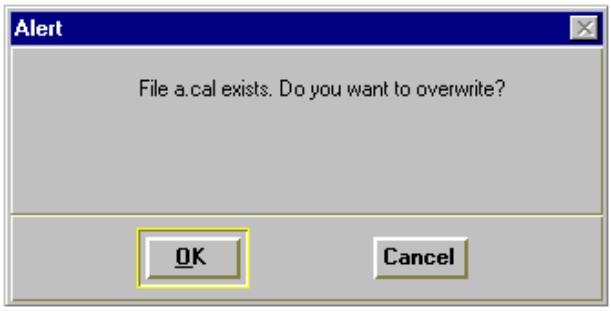


The Revise and Delete buttons are for editing information that has been added to the roadway text box. If a line in the box (.ali file and IGrds roadway) needs to be revised or deleted, the user should first click the line desired. The import process will highlight the line and display it below the roadway box for editing. However, only the IGrds roadway ID can be edited. If the highlighted line is to be deleted, all that is necessary to do is to click the Delete button. If the line needs revising, the user should revise the IGrds roadway ID as necessary and then click the Revise button. There are several error message boxes that may be displayed when necessary. They are discussed below.

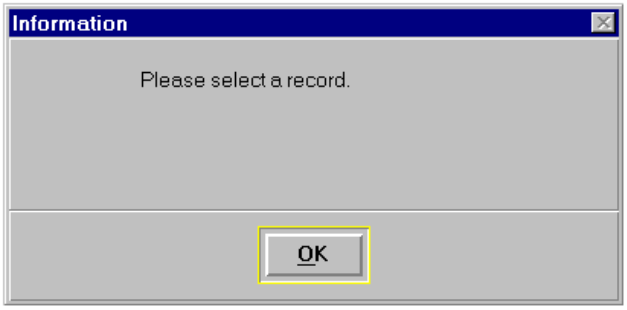


If Apply is clicked without selecting an .ali input file and entering an IGrds roadway, the error box on the left will be displayed.

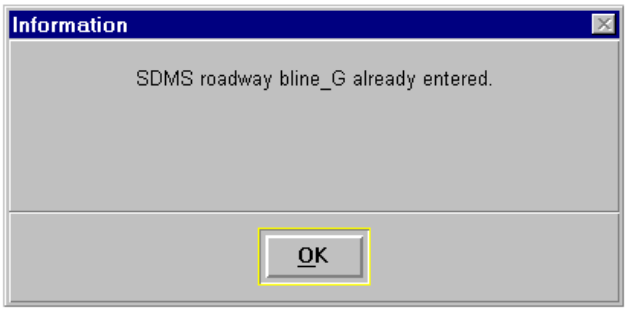
If the user did not select the SDMS .ali file and/or highlight the .ali file and IGrds roadway for either Add, Revise or Delete, the error message box on the left will be displayed.



If an IGrds roadway is specified that already exists in the current IGrds working files, the user is warned with the error box on the left.



If no record has been selected the error message box on the left will pop up.

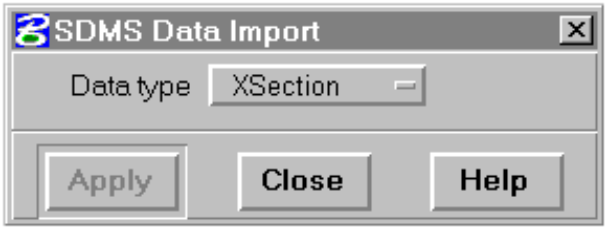


If the user tries to Add an SDMS roadway that has already been entered, the error message box on the left will pop up.

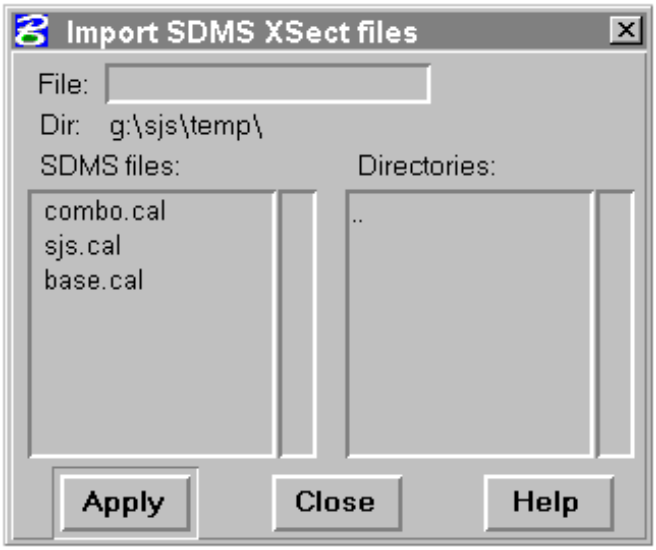
When the user is completely satisfied with the SDMS .ali files that he has selected and the associated IGrds roadway names that he has entered, the Apply button should be clicked to start the HA data import process. When the "hour glass" icon disappears and the prompt "SDMS HA import process complete" is displayed, the processing is complete. The imported HA data is not automatically displayed, so to see a display of the imported HA data, the normal IGrds alignment create/update and annotate commands should be used to display the imported roadways.

Note: After an alignment is imported from SDMS, the IGrds Create/Update command must be used to properly display and utilize the alignment.

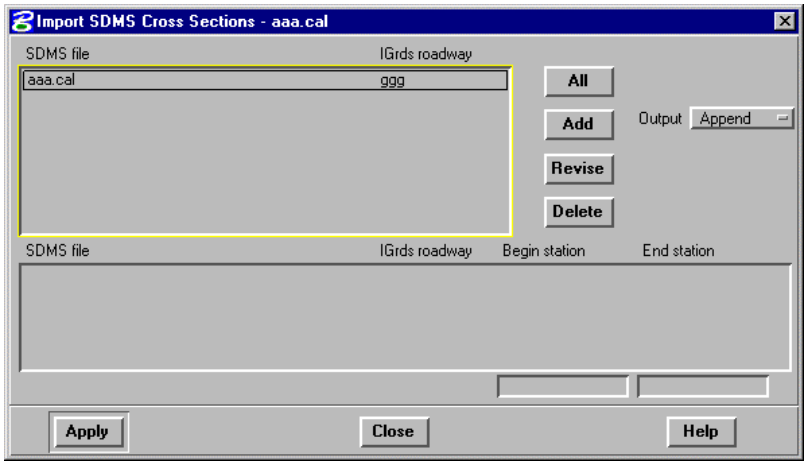
Import SDMS .CAL Data To IGrds Cross Section (Terrain Only)



To activate the IGrds Terrain Cross Section Import process, click on the Apply button with the option button set to XSection as shown here.



The list box shown here will pop up for the user to select the SDMS .cal file which contains the SDMS terrain cross section data that is to be imported into IGrds. The user may change directories as necessary, but only one file is allowed to be selected for processing. After selecting the file, the user should click Apply to continue the process.

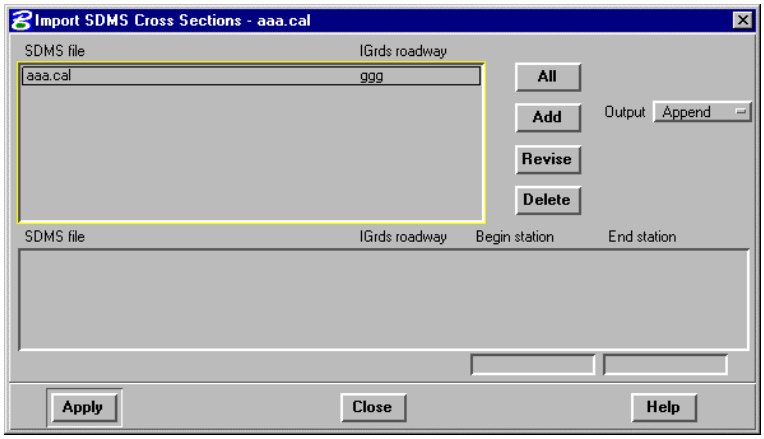


The dialog box shown on the left is displayed when the Apply button is hit.

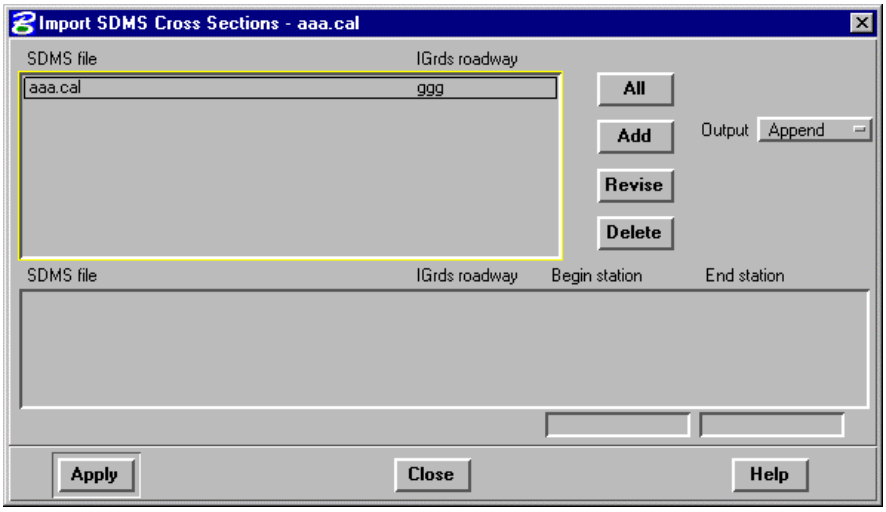
Cross section data is always associated with a specific roadway or alignment which defines the locations for the stationed cross sections. The SDMS .cal file must contain an HA: tag which defines the name of the SDMS alignment which is associated with each cross section data set in the .cal file. Since importing cross section data into IGrds would be meaningless without an IGrds alignment associated with the imported cross section data, the import process requires the user to import the associated horizontal alignment data into IGrds prior to attempting to import the cross section data. A list of all SDMS horizontal alignments that have been imported into the current IGrds working file is maintained in an ASCII file with the filename: "working filename.imp".

The SDMS alignment IDs (names) are stored in the .imp file along with the IGrds alignment name that was associated with each SDMS alignment when it was imported. The cross section data import process checks the .imp file and the given SDMS .cal file which can have multiple sets of cross section data associated with different alignments. All SDMS alignment names found in the .cal file that have a matching name found in the .imp file are displayed initially in the dialog box above for input data selection. Both the SDMS roadway name(s) and the associated IGrds roadway name(s) are displayed.

If no roadway names are displayed, no cross section data can be imported. The user should check the .cal file to make sure it identifies the associated horizontal alignment and then make sure that the horizontal alignment has been imported into IGrds.



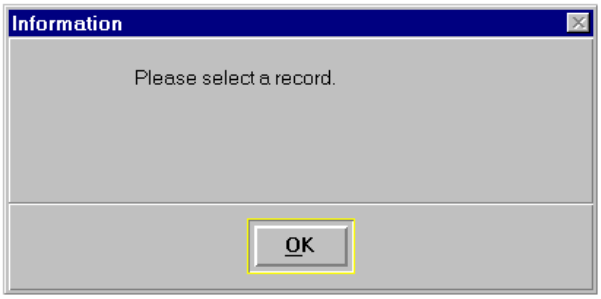
The user has two ways to select one or more cross section data sets to be imported. If the All button is clicked, all cross section data listed in the SDMS/IGrds roadway text box are automatically displayed in the text box below it along with the station range(s) set to Begin and End. The other selection method is to click on the desired SDMS/IGrds roadway name. This results in both roadway names being displayed in the text edit field just above the Apply, Close, and Help buttons. Default values for the station range are displayed in the Begin and End station text boxes as "Begin" and "End". The user may edit the station range by double-clicking the entry in either text box and keying-in in the desired begin and/or end station value. The SDMS/IGrds roadway names are not editable, only the station range values may be edited. A Carriage Return should <u>not</u> be hit after editing the station range values, as this will cause the import process to try to execute without any input data specified. To add the SDMS roadway, IGrds roadway, begin station, and end station to the text box above the edit field, the user should click on the Add button. The figure on the left shows how the dialog box might look after one data set has been selected.



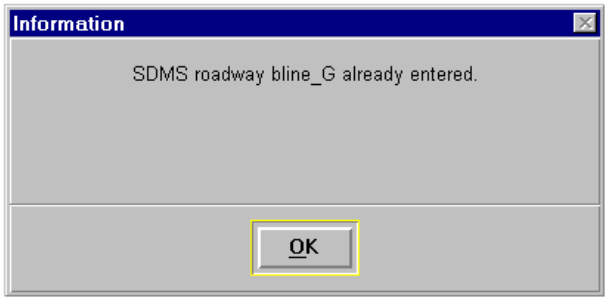
If the SDMS .cal file contains multiple data sets for which alignment data has been previously imported to IGrds, the user may continue to select SDMS/IGrds roadway names, enter station ranges for the cross section data to be imported, and add them to the text box as previously described. The import process will convert all data sets that are defined in the text box. The figure below shows the dialog box after the station range values have been edited.

The Revise and Delete buttons are for editing information that has been added to the input data text box. If a station range on a line in the box needs to be revised or the whole line needs to be deleted, the user should first click the line desired. The import process will highlight the line and display it below the input data box for editing. However, only the station range can be edited. If the highlighted line is to be deleted, all that is necessary to do is to click the Delete button. If the line needs revising, the user should revise the station range as necessary, and then click to the Revise button. The Output button has two options: Replace and Append. Replace wipes out all of the existing terrain cross sections for the given baseline alignment and replaces them with those cross sections that were requested to be imported. Append leaves all existing terrain cross section data as they were before the import, except it adds or replaces the specific cross sections specified in the range to be imported. There are several error message boxes that may be displayed when necessary. They are discussed below.

If the user did not select an input data set for either Add, Revise, or Delete, the error message box on the left will be displayed.



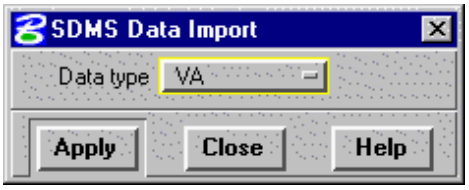
If no record has been selected for Revise or Delete, the error message box on the left will pop up.



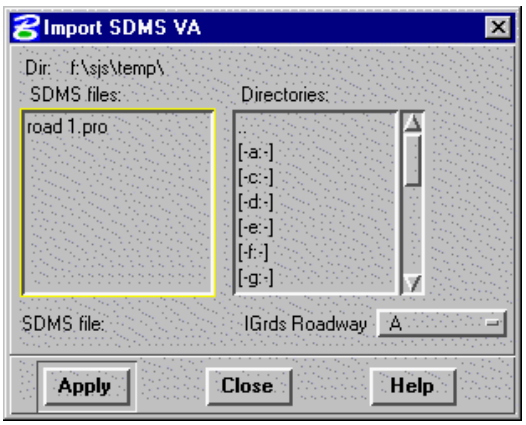
If the user tries to Add an SDMS roadway that has already been entered, the error message box on the left will pop up.

When the user is completely satisfied with the cross section input data specified, the Apply button should be clicked to start the cross section data import process. When the "hour glass" icon disappears and the prompt "SDMS XSect import process complete" is displayed, the processing is complete. The imported cross section data is not automatically displayed, so to see a display of the imported cross section data, the normal IGrds Cross Section Modification display command can be used to display the imported cross sections.

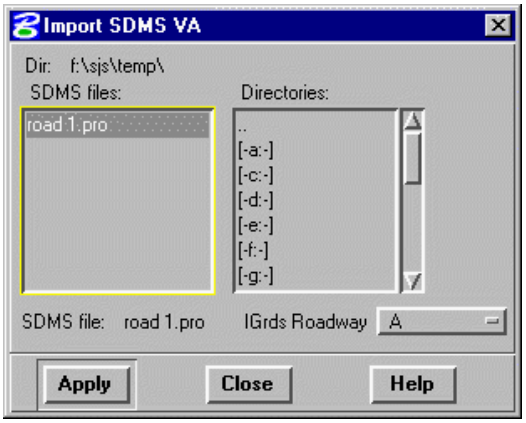
Import SDMS .PRO Data to IGrds Vertical Alignment



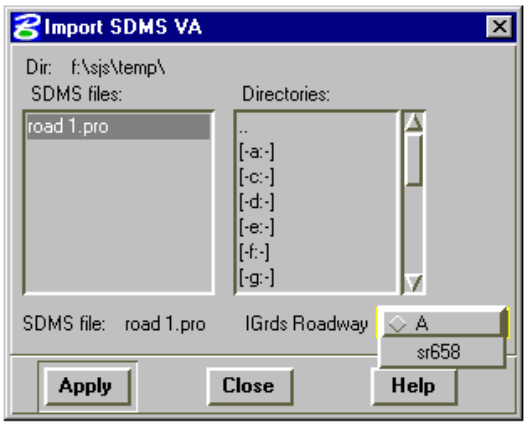
To activate the IGrds Vertical Alignment (VA) Import process, click on the Apply button with the option button set to VA as shown below.



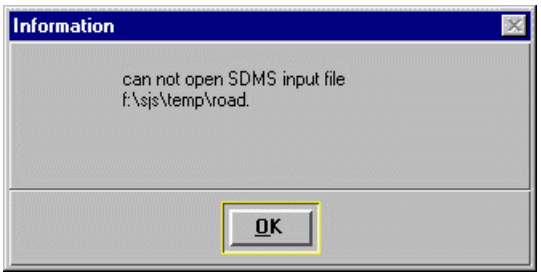
The list box shown on the left will pop up for the user to select the SDMS .pro file and select the IGrds alignment name (roadway) that is to be associated with the alignment in the .pro file.



The user should first select the SDMS .pro file that is to be imported. This is done by clicking on the desired file name. The selected filename will be highlighted and it will also be displayed below the list box. The user should now select an IGrds roadway ID using the roadway tool.



The import process will convert one .pro file at a time. The figure on the left shows how the dialog box might look after one file and one IGrds roadway have been selected.

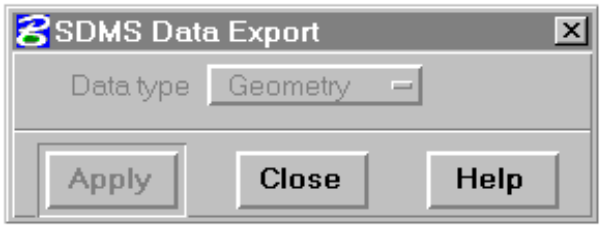


If Apply is clicked without select a .pro input file, the error box on the left will be displayed.

Since the roadway option button always specifies the active roadway as the default, care should be taken to make sure that the .pro file selected correlates with the roadway selected.

When the user is completely satisfied with the SDMS .pro file that he has selected and the associated IGrds roadway name that he has selected, the Apply button should be clicked to start the VA data import process. When the “hour glass” icon disappears and the prompt “SDMS VA import process complete” is displayed, the processing is complete. The imported VA data is not automatically displayed. To see a display of the imported VA data, the user must create a reference line, if one does not currently exist. The user can display the profile, VPIs, and annotation for the imported roadway.

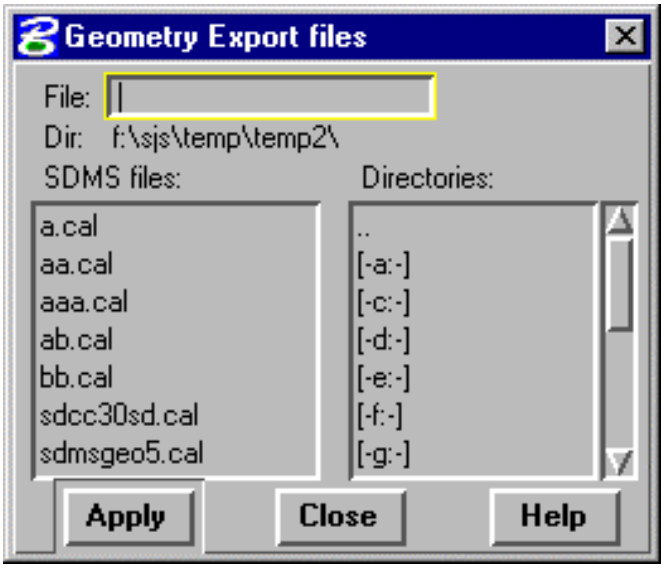
EXPORTATION OF IGrds GEOMETRY, HORIZONTAL ALIGNMENT, CROSS SECTION, AND VERTICAL ALIGNMENT DATA TO SDMS DATA



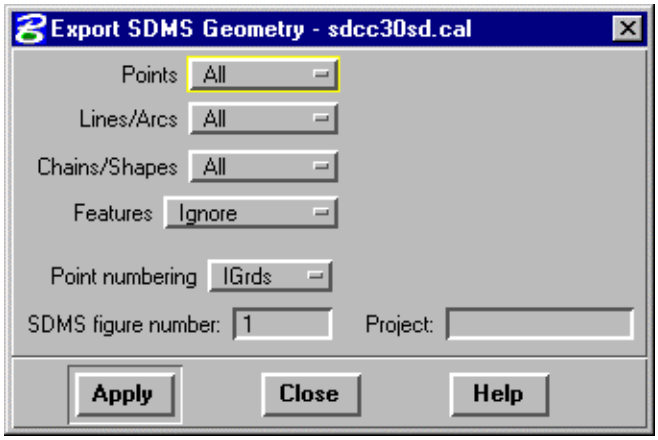
To run any of the IGrds/SDMS data export processes, the user should click on the "File" button in the General IGrds menu bar, then click on Export on the Pulldown menu, then SDMS on the side bar menu. A dialog box will pop up that looks like the one shown on the left.

The user can select Geometry (default), HA, XSection, or VA using the data type option button.

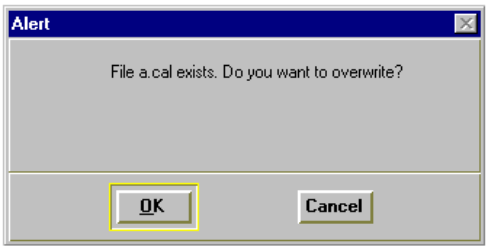
Export IGrds Geometry to SDMS .CAL Data



To activate the IGrds Geometry Export process, click on the Apply button with the option button set to Geometry. The list box shown below will pop up for the user to select the directory into which the .cal file that is to be created will be placed. If the user wishes to overwrite an existing file, it may be selected (highlighted) from the list of files in the list box or keyed-in to the file text box. Otherwise, a new .cal file name should be keyed-in to the File text box which will be created and will contain the IGrds Geometry data that has been converted to SDMS .cal file format.



When the file has been keyed-in or selected, the user should click Apply and the following dialog box will be displayed for the user to establish the criteria parameters for the data export process.

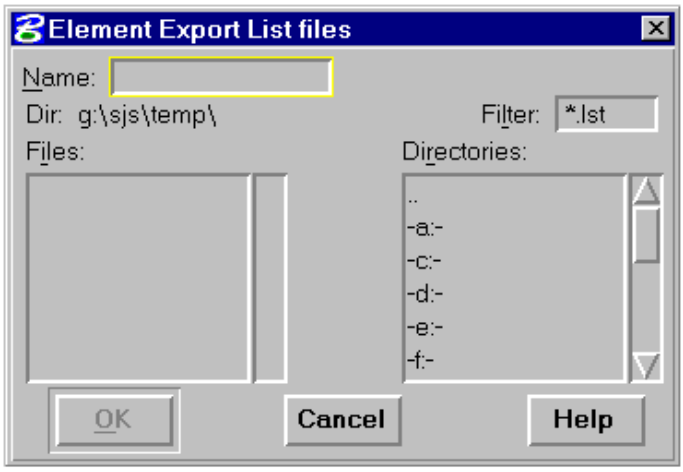


If the .cal file already exists, the message box on the left will pop up.

Option buttons for points, lines/arc, and chains/shapes allow the user to select All/None/Selected options for each type of data. If the user clicks the All option, the export process will include all IGrds point data, line/arc, data, and chain/shape data in the SDMS file. None means exclude all points, lines/arcs, or chains/shapes. The Selected option displays an additional option button that gives the user two ways of entering data. The user can key-in a series of elements and ranges of elements, or he can select/key-in a filename containing previously entered criteria. An example of the keyed-in criteria string might be: 1,3,10-20.

For criteria that is very complex (that the user intends to use more than once), any text editor may be used to create an ASCII .lst file that contains the point, line/arc, and chain/shape, and/or feature code criteria desired. The File option pops up a file list box with any .lst files found in the current directory which allows the user to select one of the .lst files or key-in another filename containing the criteria desired. The format of the ASCII .lst file is as follows:

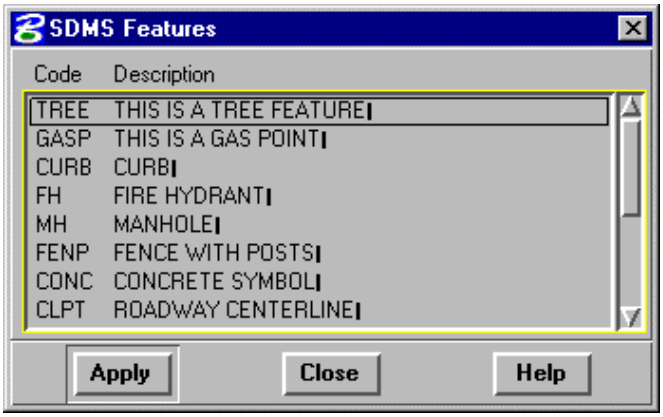
points: 1-5,7,10-20,etc.
lines/arcs: 11-17,23,etc.
chains/shapes: 6-9,11,14-17,etc.
features: CURB,102,105,SDWK,etc.



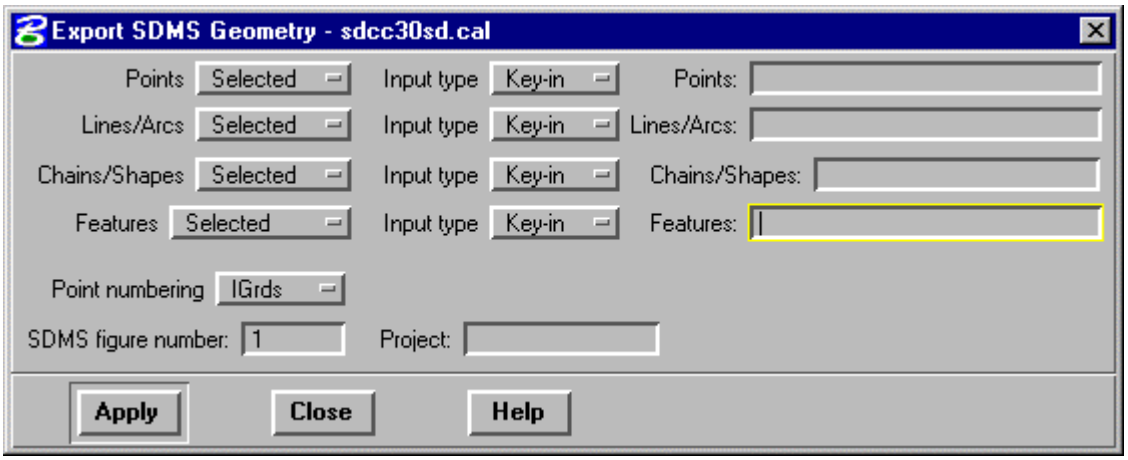
The .lst file is especially helpful when the same list of features needs to be extracted from various IGrds Geometry files or repeatedly from a single IGrds Geometry file.

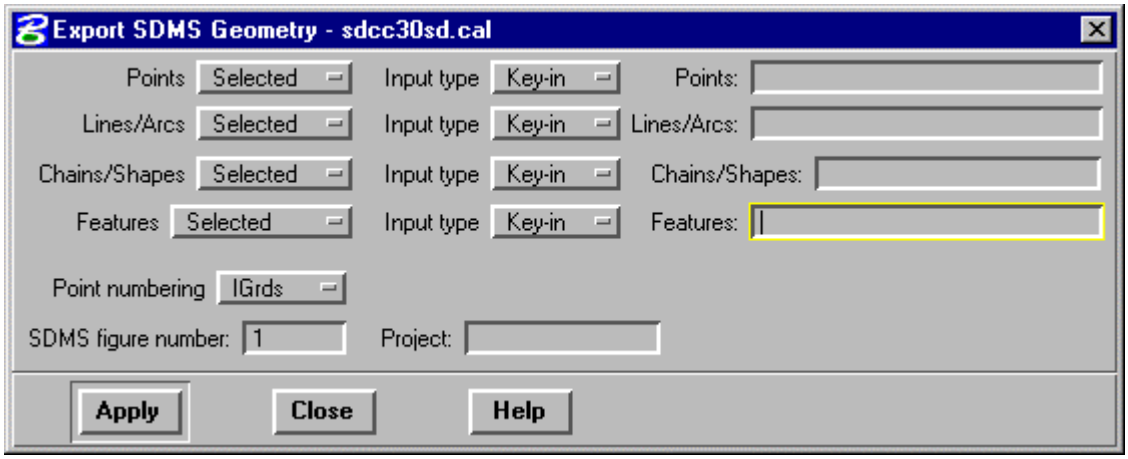
The "Features" criteria has three options: All featured, Ignore, or Selected. The All featured option exports all elements that have a feature code. The Ignore option exports all elements regardless the feature code. The Selected option pops up a feature list box which allows the user to select one or more of the feature codes to be used in selecting IGrds Geometry data to be exported. The format of the IGrds ASCII feature file .imp or .met is as follows:

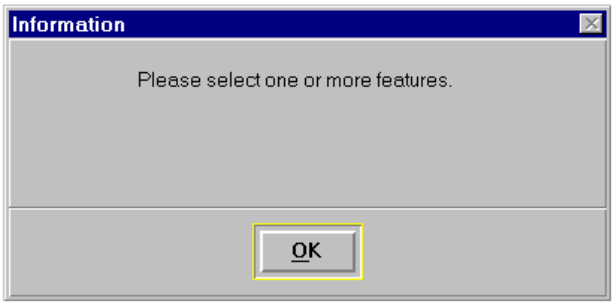
Code	Description
101	THIS IS FEATURE NO. 1.
102	THIS IS FEATURE NO. 2.
103	THIS IS FEATURE NO. 3.



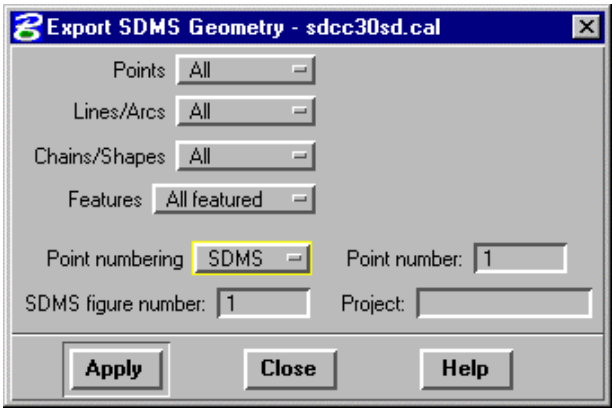
The figures on the left show this dialog box with various options selected. Also shown is the list box for feature code file.







If the user did not select any feature code record from the feature list box, the error message shown will pop up:

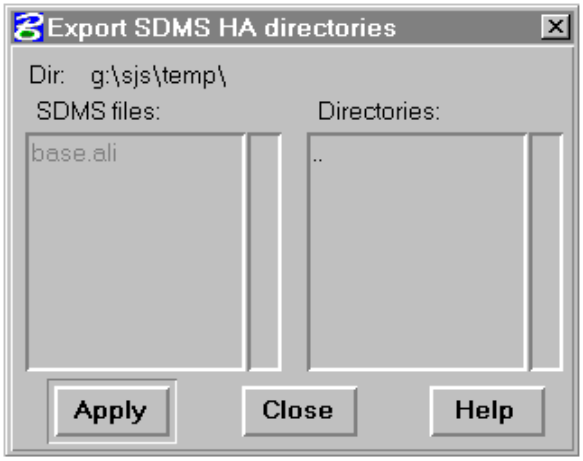


The Point numbering criteria has two options IGrds and SDMS. Click IGrds to number points in the SDMS .cal file exactly as they are numbered in the IGrds Geometry file. An option for numbering linear items in the SDMS .cal file with IGrds Line/Arc and Chain/Shape numbers was not possible because all IGrds lines, arcs, chains, and shapes become SDMS figures, and there would be duplications of figure numbers when IGrds lines/arcs have the same numbers as IGrds chains/shapes. For SDMS point numbering, the user may enter the specific SDMS point number with which the export process should begin or accept the default of 1. In the SDMS figure number text box, the user may specify the beginning SDMS figure number or accept the default of 1. A project name/number may be entered into the project text box if the user so desires. The exported SDMS file will contain the given project name/number as a header record for the file.

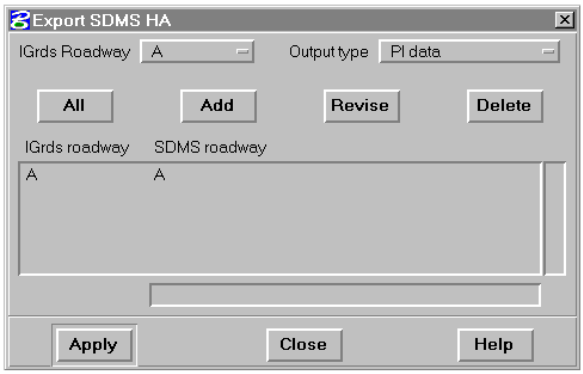
When the user is completely satisfied with the criteria that has been established, the Apply button should be clicked to start the data export process. When the "hour glass" icon disappears and the prompt "SDMS file xxx.cal created:" is displayed, the processing is complete and the user may use any ASCII file editor to look at the SDMS .cal file that was created.

Export IGrds Horizontal Alignment to SDMS .ALI Data

To activate the IGrds Horizontal Alignment (HA) Export process, click on the Apply button with the option button set to HA as shown below.

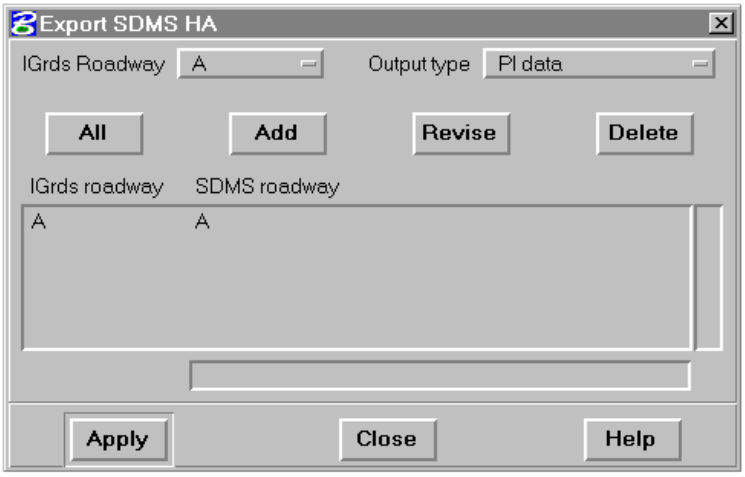


The list box shown on the left will pop up for the user to select the directory into which the SDMS .ali file(s) that are to be created will be placed. The SDMS files shown in the list box are in gray and the user can not select any of these files. They help the user to identify that he is in the correct directory and help to prevent him from specifying a SDMS .ali output file that already exists. When the user is satisfied with the directory that has been specified the Apply button should be clicked to continue with the export IGrds HA process.



When the Apply button is clicked, a dialog box will pop up that looks like the dialog on the left.

The IGrds Roadway option button contains all of the IGrds roadway names that can be exported from the current IGrds working file. The user may click the All button and the process will automatically fill in the large roadway text box with all of the IGrds roadway names and the associated SDMS roadway names which are initially the same as the IGrds names. If the user does not desire to export all of the IGrds roadways listed, then the desired roadways should be selected individually by clicking on them one at a time using the IGrds Roadway option button. When a single IGrds roadway is clicked on, it is highlighted and displayed below the large roadway text box under the IGrds roadway heading and in the editable SDMS roadway text box. The user may edit the SDMS roadway ID by double clicking on the default SDMS roadway ID in the text box below the large roadway text box, and entering a new SDMS roadway ID. No Carriage Return should be keyed-in as this would try to initiate the process without any roadway data specified in the roadway text box. To add the IGrds roadway and the SDMS roadway names specified to the roadway text box, the user should click on the Add button.

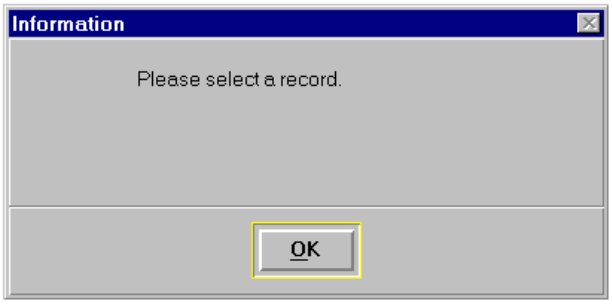


The user may continue to select IGrds roadways, enter SDMS roadway IDs, and add them to the roadway text box for all of the roadways in the IGrds roadway option button as he desires. The process will export all IGrds roadways that the user specifies in the large roadway text box. For each IGrds roadway specified, a separate .ali file will be created that will contain the HA data for the given roadway in SDMS .ali format. Each SDMS .ali file created will be named with the SDMS roadway name associated with the IGrds roadway specified in the large roadway text box. The figure to the left shows how the dialog box might look after one IGrds roadway has been selected, one SDMS roadway name has been entered and both were added to the large roadway text box.

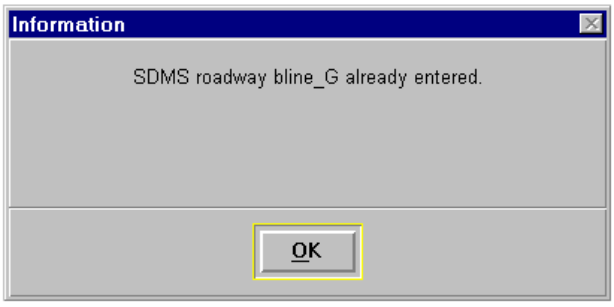
The Revise and Delete buttons are for editing information in the large roadway text box. If a line in the box (IGrds and SDMS roadway) needs to be revised or deleted, the user should first click the line desired. The export process will highlight the line and display it below the roadway box for editing. However, only the SDMS roadway ID can be edited. If the highlighted line is to be deleted, all that is necessary to do is to click the Delete button. If the line needs revising, the user should revise the SDMS roadway ID as necessary and then click the Revise button. There are several error message boxes that may be displayed when necessary. They are discussed below.

If no roadways have been selected, the error message box on the left will pop up.

If the user did not select the SDMS/IGrds roadway and/or highlight the SDMS/IGrds roadway for either Add, Revise, or Delete, the error message box on the left will be displayed.



If no record has been selected for the Revise or Delete functions, the error message box on the left will pop up.



If the user tries to enter the same roadway twice into the large roadway text box, the user is warned with the error box on the left.

When the user is completely satisfied with the IGrds roadways that he has selected and the associated SDMS roadway names that he has entered, the Apply button should be clicked to start the HA data export process. When the "hour glass" icon disappears and the prompt "SDMS file created" is displayed, the processing is complete and the user may use any ASCII file editor to look at the SDMS .ali file(s) that were created.

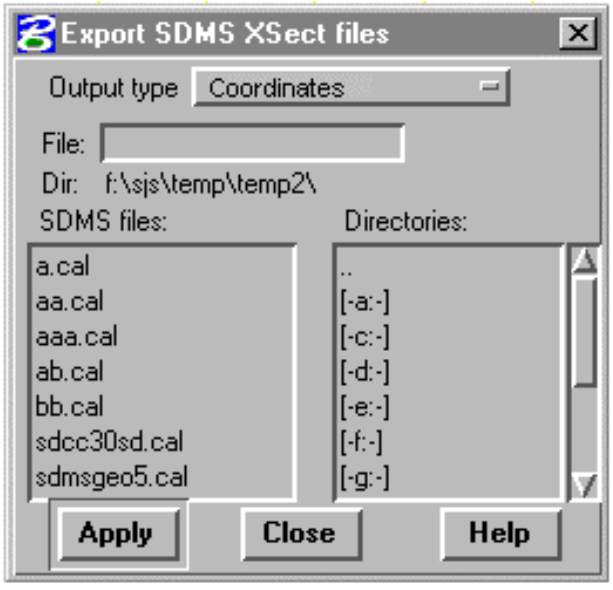
Export IGrds Design Cross Sections (Finished Grade or Subgrade) to SDMS Data (.CAL File)

To activate the IGrds cross section Export process, click on the Apply button with the option button set to XSection as shown on the left.

The list box shown on the left will pop up for the user to select the type of output format and identify the directory and output file into which the converted cross section data will be placed.

The "output type" option button has two options

- Station/Offset (default)
- Coordinates

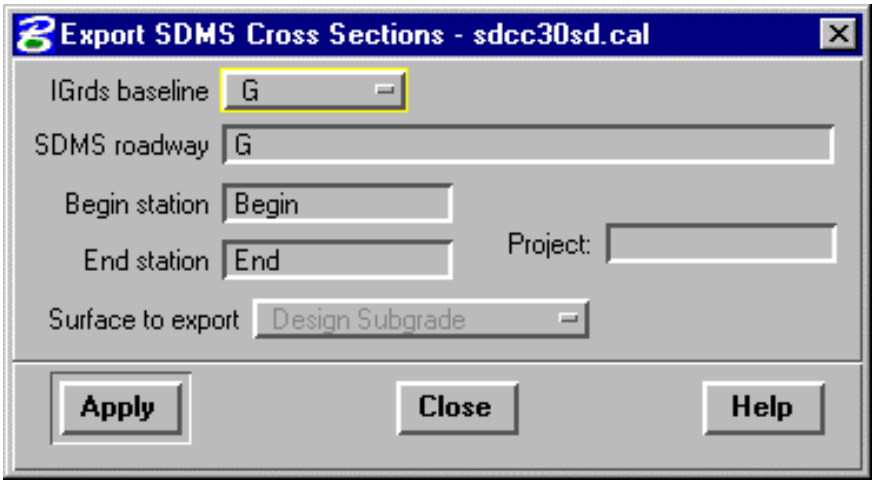


The “coordinates”option converts IGrds cross section data (finished grade or subgrade) into SDMS .cal file “X,Y,Z” format. With this option, each cross section point is converted from station, offset, and elevation form in IGrds to point #, X, Y, Z, feature code, and description in SDMS format. This form of data is basically the form required by the construction staking process.

The "station/offset" option converts IGrds cross section data (finished grade or subgrade) into SDMS .cal file “SOE” format. With this option, the IGrds station, offset, and elevation data form essentially remains in the same SOE form, only the SOE data must be converted to the SDMS format in the .cal file. Regardless of which option is selected, a list of .cal files will be displayed in the list box for possible selection.

After selecting the output type, the user must select or enter an output filename. If the user wishes to overwrite an existing file, it may be selected (highlighted) from the list of files in the list box or keyed-in to the file text box. Otherwise, a new file name should be keyed-in to the File text box. See figures to the left.

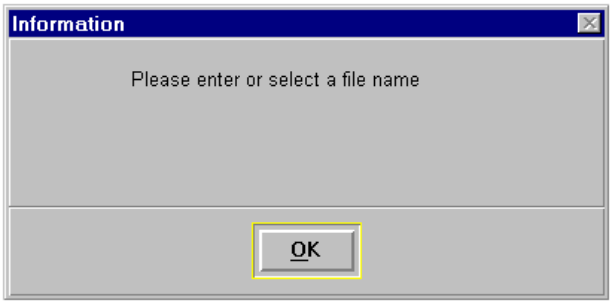
When the filename has been keyed-in or selected, the user should click OK and the dialog box will be displayed on the next page.



The dialog box on the left allows the user to:

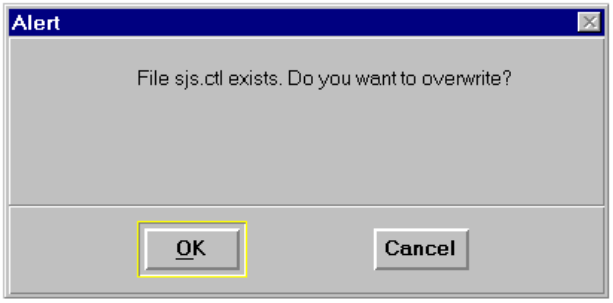
- Select the IGrds baseline for which cross section data will be exported.
- Select the type of IGrds design cross section data that is to be exported.
- Enter an SDMS alignment name to be associated with the exported cross section data.
- Establish the range of stations on the selected baseline for which cross section data is to be exported.
- A project name may be entered into the project text box.

If the current IGrds working file has multiple baselines, the user may use the option button to select which baseline is to be used in the export process. Currently, there are four types of design cross section data that the user may select to be exported: Finished Grade (default) and Subgrade, Surface Removal, and Template Subcut. The user may enter an SDMS alignment name to be associated with the exported cross section data or the default name may be used which is the same as the IGrds baseline ID. The user may elect to set the station range for exporting cross section data to be the entire alignment by default or to be from one station on the given baseline to another by entering a beginning and/or ending station value in the text box. A project name may be entered that will be included with the cross section data in the .cal file.



There are a number of error message boxes that may be displayed when necessary. They are discussed below.

If the user does not enter or select a filename on the list box prior to clicking Apply, the error message box on the left will pop up.



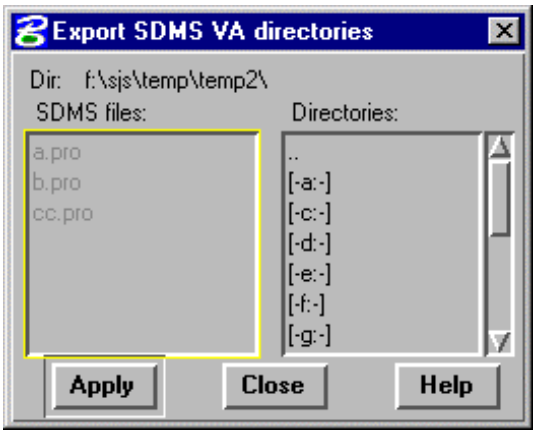
If the file entered already exists, the error message box on the left pops up.

If no IGrds baseline is selected and no SDMS alignment name is entered, the error message box on the left pops up.

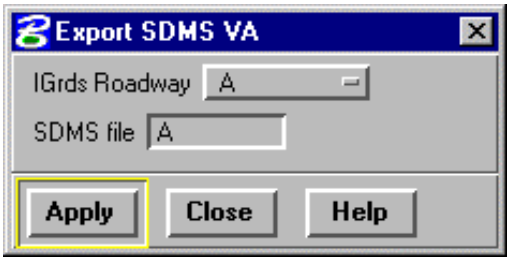
When the user is completely satisfied with the input and criteria data that he has selected and entered, the Apply button should be clicked to start the XSection data export process. When the "hour glass" icon disappears and the prompt "SDMS file xxx.cal created" is displayed, the processing is complete and the user may use any ASCII file editor to look at the SDMS .cal file that was created.

Export IGrds Vertical Alignment to SDMS .PRO Data

To activate the IGrds Vertical Alignment (VA) Export process, click on the Apply button with the option button set to VA as shown on the left.



The list box shown on the left will pop up for the user to select the directory into which the SDMS .pro file(s) that are to be created will be placed. The SDMS files shown in the list box are in gray and the user cannot select any of these files. They help the user to identify that he is in the correct directory and help to prevent him from specifying a SDMS .pro output file that already exists. When the user is satisfied with the directory that has been specified, the Apply button should be clicked to continue with the export IGrds VA process.



When the Apply button is clicked, a dialog box will pop up that looks like the dialog on the left.

The IGrds Roadway option button contains all of the IGrds roadway names that can be exported from the current IGrds working file. The user may select the desired alignment by clicking on the option button. If the default SDMS file name, which is the same as the IGrds roadway, is acceptable, then the user may hit the Apply to initiate the VA export process. Otherwise, a new SDMS file name may be entered, followed by hitting the Apply.

After hitting the Apply, the “hour glass” will briefly appear while VA export is processing. When the “hour glass” icon disappears and the prompt “SDMS file created” is displayed, the processing is completed and the user may use any ASCII file editor to look at the SDMS.pro file that was created.

XML EXPORT PROCESSES

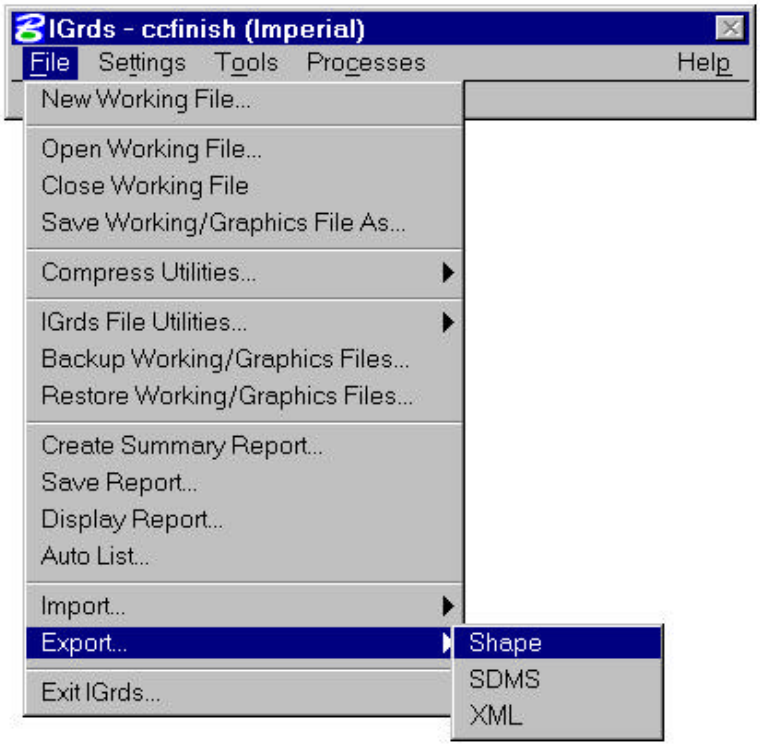
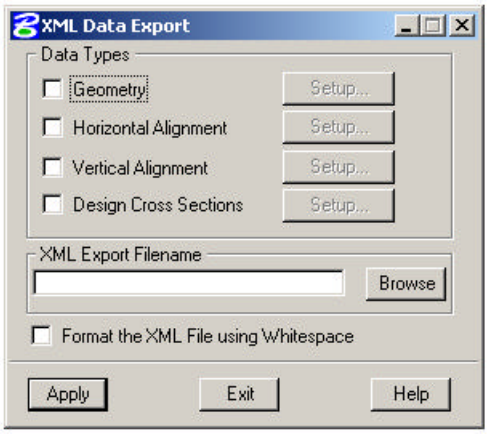


Figure 11-17
XML Commands

CONTENTS **XML EXPORT PROCESSES**	**MANUAL** **PAGE**

EXPORTATION OF IGrds GEOMETRY, HORIZONTAL ALIGNMENT, CROSS SECTION, AND VERTICAL ALIGNMENT DATA TO XML FORMAT



To run any of the IGrds/XML data export processes, the user should click on the "File" button in the General IGrds menu bar, then click on Export on the Pulldown menu, then XML on the side bar menu.

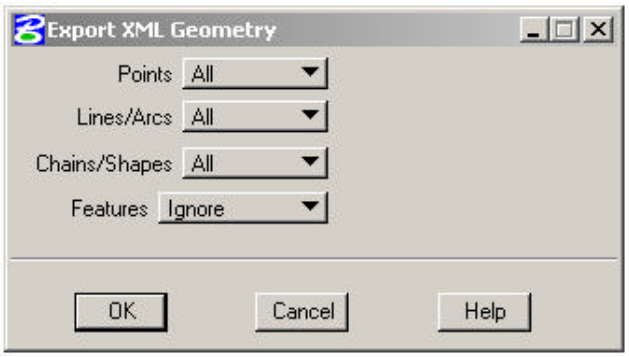
The dialog box shown here will be displayed for the user to establish the criteria parameters for the data export process. The user can select Geometry, Horizontal Alignment, Vertical Alignment, Design Cross Section Data by clicking the toggle. When each toggle is clicked, the Setup… action button is activated. The user can then make refined selections by clicking the appropriate Setup… buttons. These buttons launch dialog boxes that allow the user to set the exact data to be exported.

The user must enter an export filename or use the Browse button to select an existing file to overwrite or create a new file. This file will contain the IGrds Design Data that has been converted to XML format.

The XML file format using the whitespace toggle produces two different formatting options. With the toggle not set, the XML file is packed with no Tabs or Carriage Returns. This option makes the XML file size as compact as possible, but would be impossible to make sense of the file with a standard text editor. With the toggle set to use whitespace, the file is formatted using Tabs and Carriage Returns, which makes the XML file readable with the standard text editor. Note that an internet web browser is the preferred method of viewing an XML file. Either format of whitespace or no whitespace will display the same using a web browser.

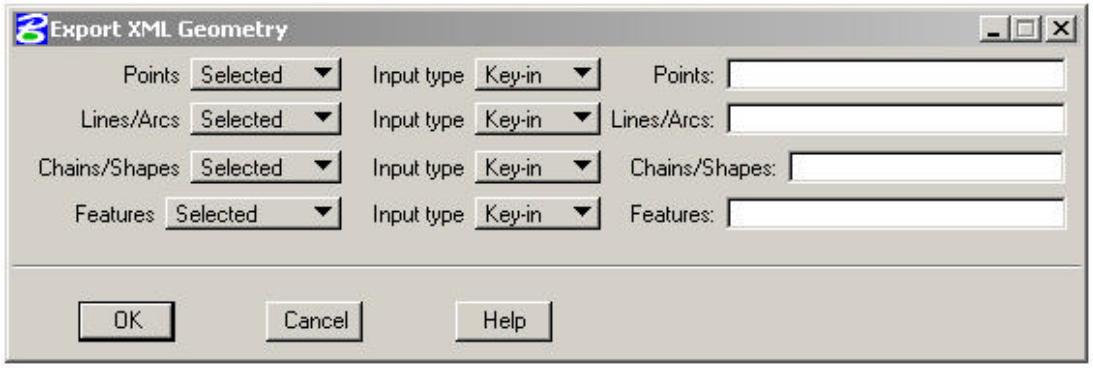
When the user is completely satisfied with the criteria that has been established, the Apply button should be clicked to start the data export process. When the "hour glass" icon disappears and the prompt "XML export complete" is displayed, the processing is complete and the user may use any browser to look at the XML export file that was created.

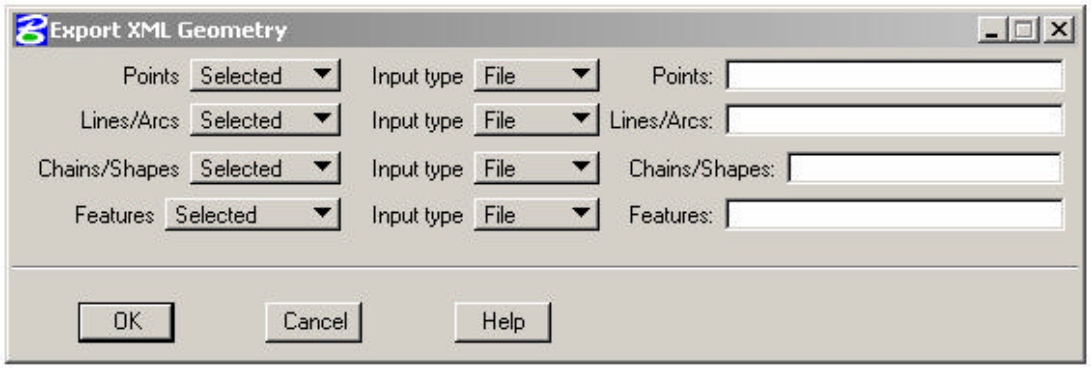
SETUP IGrds GEOMETRY FOR XML FORMAT



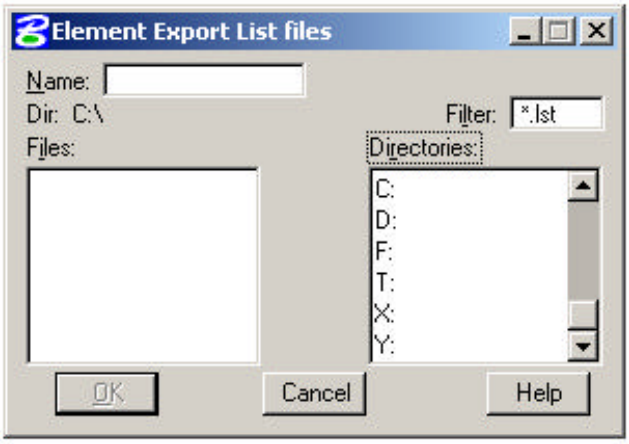
When the Geometry Setup… button on the XML Data Graphic dialog is pressed, the dialog shown at the left is launched. It is used to make refined selections for Geometry data to be exported.

Option buttons for points, lines/arc, and chains/shapes allow the user to select All/None/Selected options for each type of data. If the user clicks the All option, the export process will include all IGrds point data, line/arc data, and chain/shape data in the XML file. None means exclude all points, lines/arc, or chains/shapes. The Selected option displays an additional option button that gives the user two ways of entering data. The user can key-in a series of elements and ranges of elements, or he can select/key-in a filename containing previously entered criteria. An example of the keyed-in criteria string might be: 1,3,10-20.



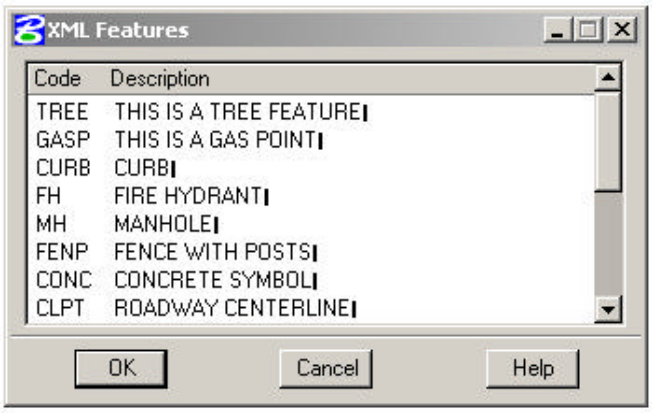


For criteria that is very complex (that the user intends to use more than once), any text editor may be used to create an ASCII .lst file that contains the point, line/arc, and chain/shape, and/or feature code criteria desired. The File option pops up a file list box with any .lst files found in the current directory that allows the user to select one of the .lst files or key-in another filename containing the criteria desired. The format of the ASCII .lst file is as follows:



points: 1-5,7,10-20,etc.
lines/arcs: 11-17,23,etc.
chains/shapes: 6-9,11,14-17,etc.
features: CURB,102,105,SDWK,etc.

The .lst file is especially helpful when the same list of features needs to be extracted from various IGrds Geometry files or repeatedly from a single IGrds Geometry file.

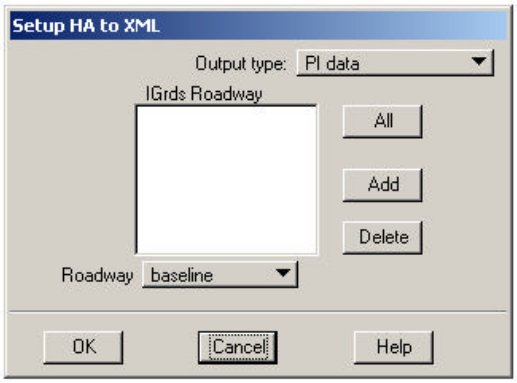


The "Features" criteria has three options: All featured, Ignore, or Selected. The All featured option exports all elements that have a feature code. The Ignore option exports all elements regardless of the feature code. The Selected option pops up a feature list box that allows the user to select one or more of the feature codes to be used in selecting IGrds Geometry data to be exported. The format of the IGrds ASCII feature file .imp or .met is as follows:

Code	Description
101	THIS IS FEATURE NO. 1.
102	THIS IS FEATURE NO. 2.
103	THIS IS FEATURE NO. 3.

When the user is satisfied with the geometry selections, then the setup is completed by pressing the OK button. Hitting the Cancel button will exit the process with no action.

SETUP IGrds HORIZONTAL ALIGNMENT FOR XML FORMAT



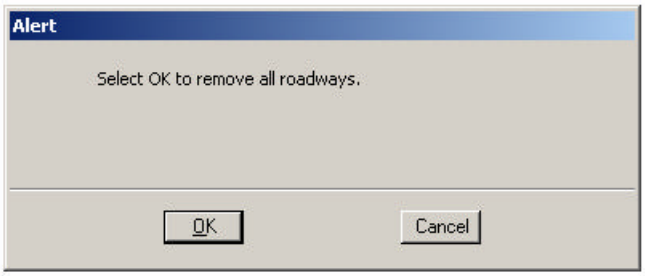
When the Horizontal Alignment Setup… button on the XML Export dialog is pressed, the dialog shown at the left is launched. It is used to select which IGrds Horizontal Alignments should be exported.

The IGrds Roadway option button contains all of the IGrds roadway names that can be exported from the current IGrds working file. The user may click the All button and the process will automatically fill in the roadway list box with all of the IGrds roadway names.

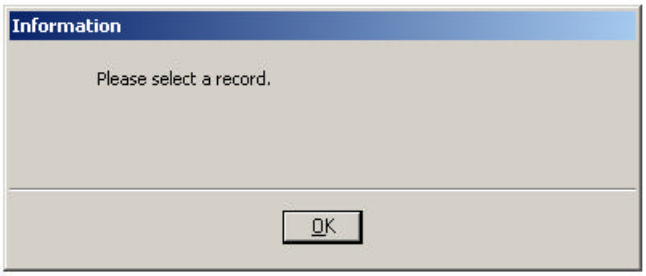
If the user does not desire to export all of the IGrds roadways listed, then the desired roadways should be selected individually by clicking on them one at a time using the IGrds Roadway option button. When a single IGrds roadway is clicked on, it is highlighted and displayed below the roadway list box. The Add button is then used to move the roadway into the roadway list box. The Output Type Option button is used to select whether the horizontal alignments to be exported will be defined using the PI data method or the geometry element method.

The Delete button is used for eliminating information in the large roadway list box. If a line in the box needs to be deleted, the user should first click the line desired. The process will highlight the line and display it below the roadway box and all that is necessary to do is to click the Delete button. There are several error message boxes that may be displayed when necessary. They are discussed below.

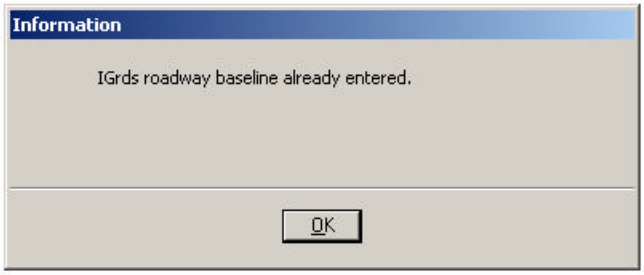
If no roadways have been selected, the error message box below will pop up.



If the user did not highlight the IGrds roadway to Delete, the error message box below will be displayed.

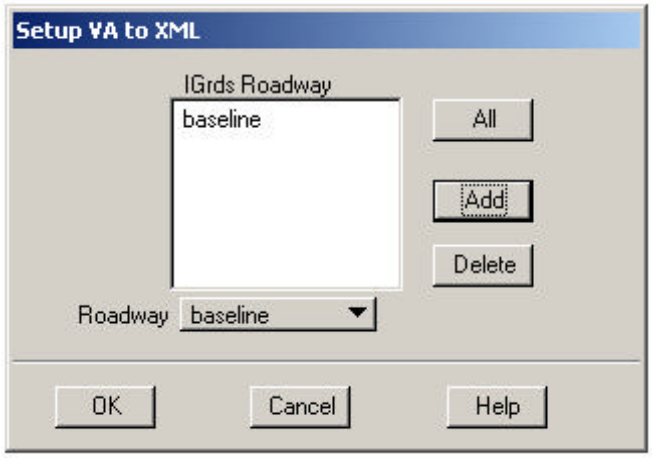


If the user tries to enter the same roadway twice into the roadway list box, the user is warned with the error box below.



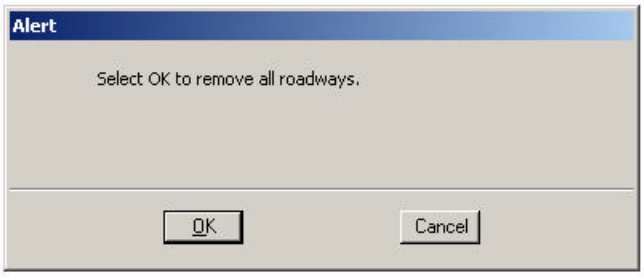
When the user is completely satisfied with the IGrds roadways that he has selected, the OK button should be clicked to complete the setup process.

SETUP IGrds VERTICAL ALIGNMENT FOR XML FORMAT

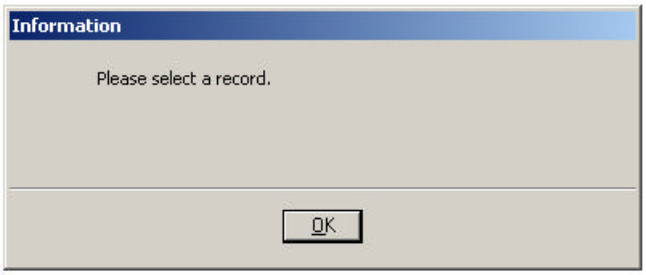


When the Vertical Alignment Setup… button is pressed, the dialog shown at the left is displayed. It is used to select which IGrds Vertical Alignments will be exported. The IGrds Roadway option button contains all of the vertical alignments that can be exported from the current working file. The user may click the All button and the process will automatically fill the Roadway list box with all of the roadway names. If the user does not desire to export all of the vertical alignments, then the desired roadways are selected individually by clicking them one at a time. They are displayed below the roadway list box. The Add button is used to move the roadway into the roadway list box. The Delete button is used to remove roadways from the list box. If a line in the box needs to be deleted, the user clicks on the line and the process highlights the line and displays it below the roadway box and all that is necessary to do is click the Delete button. there are several error message boxes that may be displayed as revisions. They are discussed below.

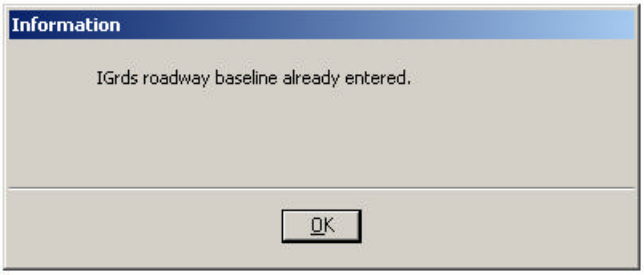
If no roadways have been selected, the error message box below will pop up.



If no records has been selected for the Delete function, the error message box below will pop up.

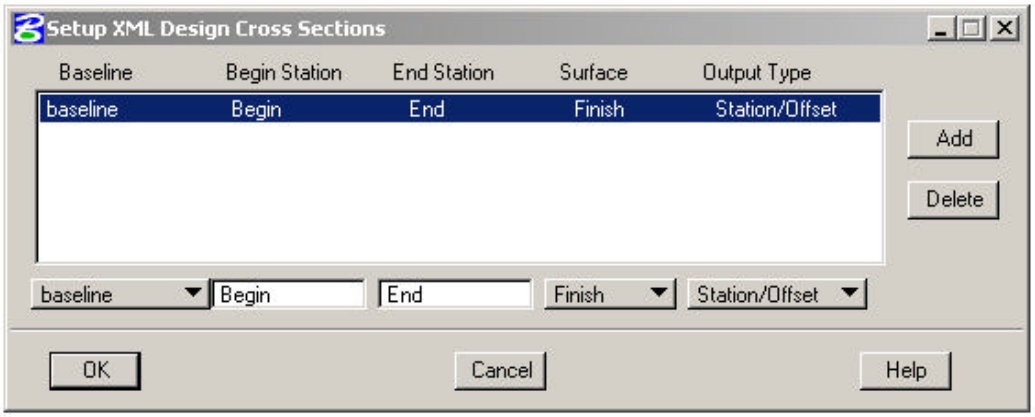


If the user tries to enter the same roadway twice into the large roadway list box, the user is warned with the error box below.



When the user is completely satisfied with the IGrds roadways that he has selected, the OK button should be clicked to complete the VA data setup process.

SETUP IGrds DESIGN CROSS SECTIONS (FINISHED GRADE OR SUBGRADE) FOR XML FORMAT



When the **Design Cross Section Setup…** button is pressed, the **Setup XML Design Cross Sections** dialog shown here is displayed. It allows the user to establish criteria, by baseline, for the export of design cross section data using the tools shown below the list box.

First, the user selects the baseline from the option button, and then enters the station limits for the extraction. The "Begin" and "End" indicators are left as is if the user wishes to extract the entire baseline. The user then selects the Surface: Finish Grade or Subgrade and the Format: Coordinates or Station and Offset. The user then selects the "Add" action button to load the export specification in the list box. The "Delete" action button is used to remove a highlighted selection from the list box.

The user may load as many specifications as required in the list box. When the user is satisfied with all the selections in the list box, the "OK" action button is pressed to store the setup. The "Cancel" button exits the process with no action and Help is available by pressing the "Help" action button.