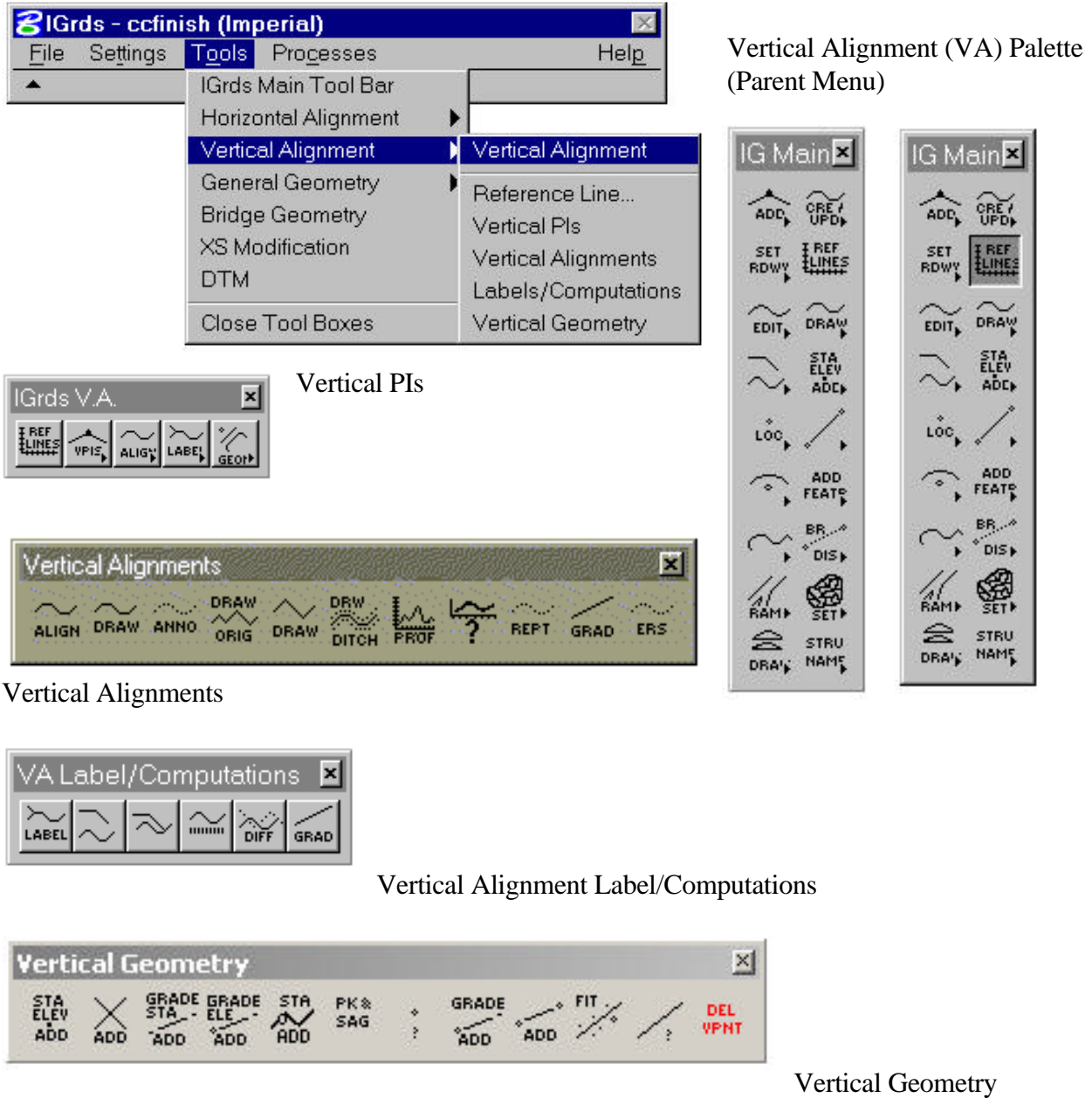


CHAPTER 5

VERTICAL ALIGNMENT (VA) COMMANDS



The IGrds Main Palette provides an alternate path to the Vertical Alignment icon command frames. Selecting a lower level icon initiates an IGrds command.

Figure 5-1.
Selecting and Displaying Vertical Alignment Tools

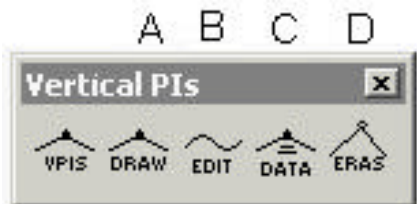
VERTICAL ALIGNMENT

DESCRIPTION NAME	MANUAL PAGE
INTRODUCTION	5-5
USING THE DYNAMIC VERTICAL ALIGNMENT PROCESS	5-8
SPECIAL CAUTIONS	5-9
VERTICAL GEOMETRY COMMANDS	5-10



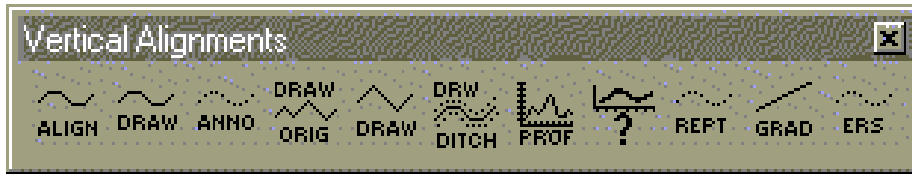
VERTICAL ALIGNMENT ICON COMMAND FRAME

KEY	COMMAND NUMBER	DESCRIPTION NAME	MANUAL PAGE
		REFERENCE LINE EDITOR	5-11
		DISPLAY PREFERENCES	5-15
A		VERTICAL POINTS OF INTERSECTION	5-17
B		VERTICAL ALIGNMENTS	5-42
C		VERTICAL ALIGNMENT LABEL COMPUTATIONS	5-57
D		VERTICAL GEOMETRY	5-67



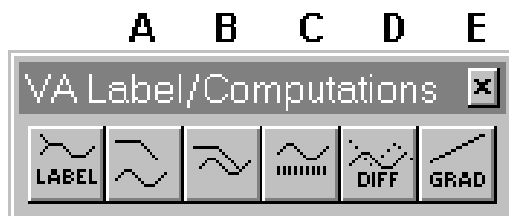
VERTICAL VPI's TOOL BOX

KEY	COMMAND NUMBER	DESCRIPTION NAME	MANUAL PAGE
		VERTICAL POINTS OF INTERSECTION	
A	915	DRAW VPIs	5-32
B		DESIGN PROFILE EDITOR	5-17
C	927	PLACE VPI DATA	5-33
		VERTICAL CURVE COMPUTE OPTIONS	5-26
D	928	ERASE VPI	5-35



VERTICAL ALIGNMENT TOOL BOX

KEY	COMMAND NUMBER	DESCRIPTION NAME	MANUAL PAGE
		VERTICAL ALIGNMENTS	
		ROADWAY DESIGN PARAMETERS	5-29
A	131	DRAW VA DESIGN PROFILE	5-42
B	117	ANNOTATE VERTICAL ALIGNMENT	5-37
C	106	DRAW ORIGINAL PROFILE	5-45
D	120	DRAW VA TANGENTS	5-48
E	133	DRAW DITCH PROFILES	5-49
F	753	PROFILES FROM DTM	5-52
G	124	IDENTIFY REFERENCE LINE/PROFILE	5-36
H	122	CREATE VA REPORT	5-39
I	101	COMPUTE GRADE	5-65
J		ERASE PROFILE DISPLAYS	5-55



**VERTICAL ALIGNMENT
LABEL/COMPUTATIONS TOOL BOX**

KEY	COMMAND NUMBER	DESCRIPTION NAME	MANUAL PAGE
A	907	COMPUTE/LABEL STATION AND ELEVATION	5-57
B	926	COMPUTE/LABEL PROFILE STATION AND ELEVATION	5-58
C	923	LABEL PROFILE ELEVATION	5-60
D	925	PROFILE ELEVATION DIFFERENCE	5-62
E	901	COMPUTE GRADE	5-65



**VERTICAL GEOMETRY
TOOL BOX**

KEY	COMMAND NUMBER	DESCRIPTION NAME	MANUAL PAGE
		VERTICAL GEOMETRY	
A	951	PLACE VPOINT AT LOCATION	5-67
B	952	PLACE VPOINT AT INTERSECTION OF TWO VLINES	5-69
C	953	PLACE VPOINT AT GRADE AND STATION OR HORIZONTAL DISTANCE	5-71
D	954	PLACE VPOINT AT GRADE AND ELEVATION OR VERTICAL DISTANCE	5-74
E	955	PLACE VPOINT AT PROFILE STATION AND ELEVATION	5-85
F	956	PLACE VPOINTS AT PEAKS AND SAGS OF PROFILE	5-87
		PROFILE SELECTION	5-87
		PEAK AND SAG EDITING	5-87
G	981	IDENTIFY VPOINT	5-83
H	961	PLACE VLINE AT GRADE	5-76
I	962	PLACE VLINE BETWEEN 2 VPOINTS (STRAIGHT EDGE)	5-78
J	963	VLINE THRU A SERIES OF VPOINTS	5-80
K	982	IDENTIFY VLINE	5-84
L	964	DELETE VPOINTS	5-90

INTRODUCTION

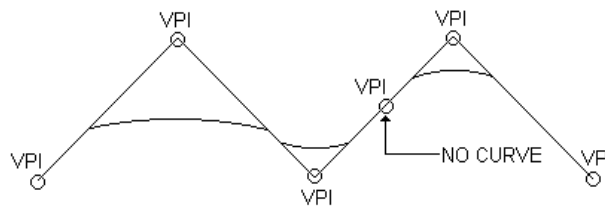
The Vertical Alignment (VA) subsystem of IGrds establishes and displays vertical alignments and profiles on one or more vertical graphic planes. You interactively review/revise existing roadway vertical alignments and/or create new vertical alignment data.

A Sight Distance Report based on design criteria is produced when a vertical alignment is created or a Vertical Alignment report is generated. An option for automatic computing of vertical curve lengths is available. Vertical Geometry commands to facilitate establishing alignments are also included.

Vertical alignments and profiles are displayed in a vertical graphic plane based on station and elevation coordinates rather than X,Y or N,E coordinates used in other IGrds subsystems. A reference line established with the REFERENCE LINE EDITOR command defines a vertical design plane with specified station limits. In order to establish a reference line for a roadway, you must have previously stored the horizontal alignment for the reference roadway in IGrds Working files. A reference line may also be established for a linear geometry element, as long as you have identified the element as having a profile associated with it. Scales for stations and elevations can differ. See Figure 5-2.

You may move from one vertical graphic plane to another vertical graphic plane by the SET ACTIVE ROADWAY (205) command, or changing the active roadway name on the various dialog boxes. A reference line may be defined for any roadway or profiled geometry element and "inset" into the IGrds graphic plane by a reference origin. You can extend, shorten, and move a reference line to a new location in the graphic plane.

A Vertical Alignment (VA) is a series of straight intersecting tangents or grade lines. Vertical curves may be placed between adjacent tangents at interior points of intersections (VPIs.)



The input for vertical alignments includes the VPI stations and elevations, and associated vertical curve data.

The roadway designation and stationing schemes for vertical alignments are the same as for horizontal alignments, including equations.

Vertical curve data required is illustrated in Figure 5-3.

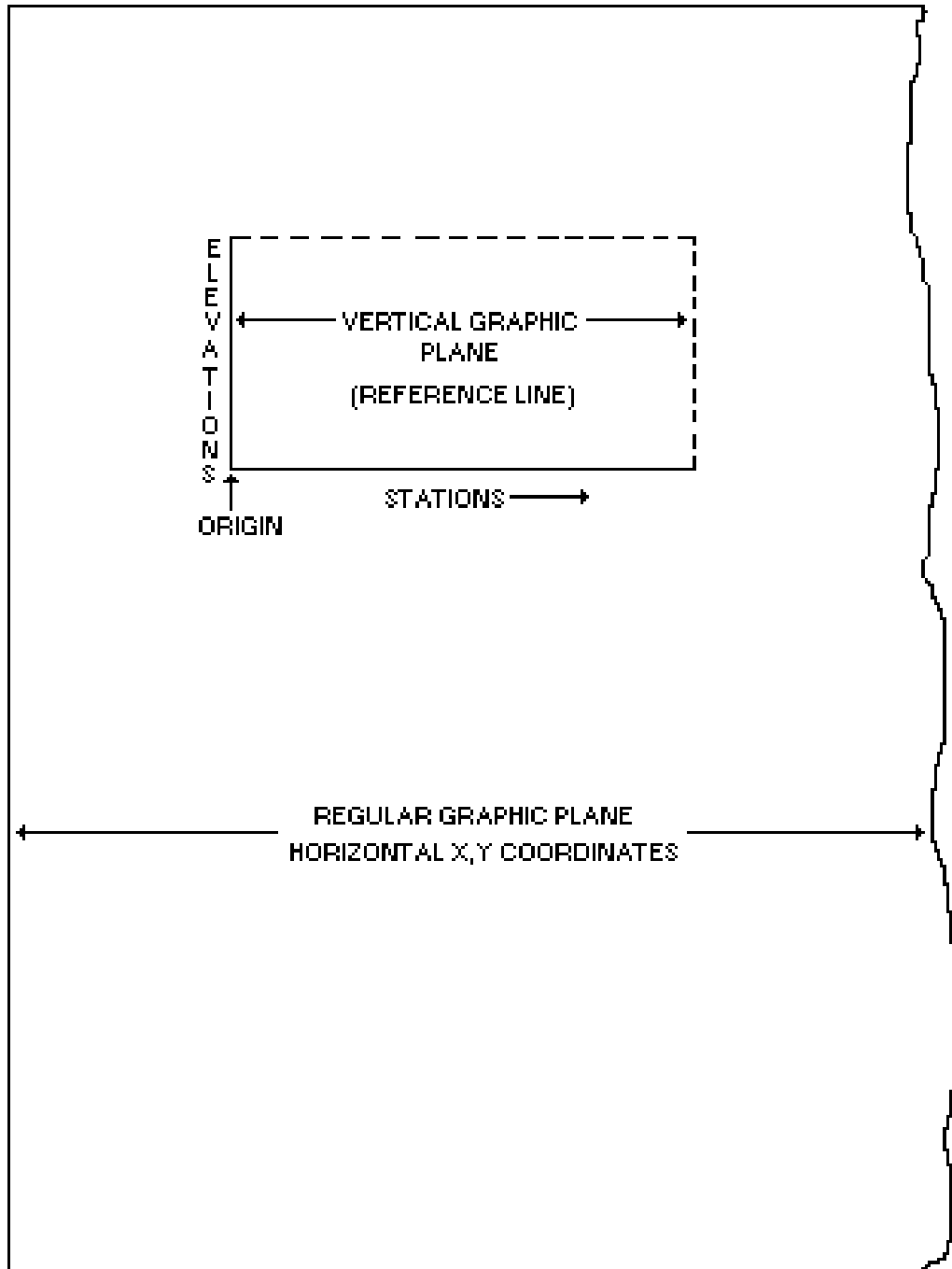


Figure 5-2.
Reference Line

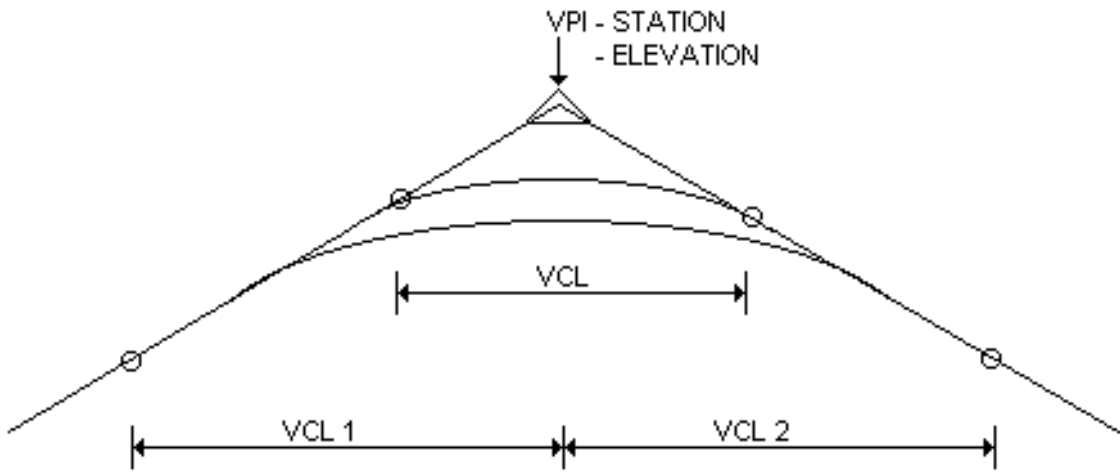


Figure 5-3
Vertical Curve Data

USING THE DYNAMIC VERTICAL ALIGNMENT PROCESS

Defining a vertical alignment requires simple basic data; the station, elevation and length of vertical curve for a series of Vertical PI's. The vertical alignment process features two methods that can be used: dynamic and non dynamic. The dynamic method is very similar to the old string line method used by designers, except that it allows you to see vertical curves rather than just straight lines as you move the PI location. Lets describe the typical process for using the dynamic process.

1. First define the vertical reference line for the selected design roadway.
2. Select the vertical alignment command and draw an original profile from cross sections or DTM for reference. (This can also be done directly on the vertical reference line dialog box.)
3. Select the Design Profile editor and select the add mode and dynamic mode.
4. Select C (compute) vertical curve length and Option, then select compute missing and adjust computed options. Also select and enter design parameters.
5. Digitize or select a location for the first PI (note you could move the cursor to the input screen and enter station and elevation and select apply, but that is better suited for precision input using the non dynamic mode which we will describe later).
6. Move the cursor to the next PI location, see the string line, from the previous PI. Note that the string line disappears when the defined maximum or minimum grade is exceeded. Selecting the data button will store the second PI.
7. Repeat this process for the third PI and note the dynamic string line now shows the vertical curve.
8. Repeat this process for the additional PI's.
9. At this point select update file and it will save your design profile. You could also close without saving and you can delete the profile and start over.

This completes the typical process for adding PI's. You can come back at any time and add additional intermediate PI's using the same method. But now lets describe using the dynamic\revise mode of the Design profile editor.

1. Select the design Profile editor and select the revise and dynamic mode.
2. Select a PI for revision and notice that it becomes attached to wherever you move your cursor. The data button will relocate the PI or the reject button will reset the PI to it's original location.
3. Now for some more sophisticated dynamic revision, first lock the back grade and then select a PI for revision. As you move your cursor the PI slides along the locked grade. Pretty neat!!! You can unlock the grade then change it and lock it again and move the PI along the revised grade. This same technique can be used to move the PI by holding the forward grade, the station or the elevation.

Once again when you are finished update the file. This dynamic mode is lots of fun and makes it very easy to define preliminary vertical alignments. However in final design, precision input is often required to match design constraints such as bridge clearances or intersecting roadways and the non dynamic mode is better to use. The primary difference is that the PI string lines do not become attached to the cursor. You can still select PI locations with the cursor or you can enter station elevation and VCL, but you must select Apply to draw the PI and update the alignment display. This non dynamic mode is also used for revising a vertical curve to fit through a VPT and for adding PNG, Finish Design, or Subgrade Design PI's.

The Recompute Profile allows you to recompute VCL's for PI's based on the design parameters. You can recompute all or compute just those that have no VCL. This could easily change some VCL's that you do not want to change so care should be used when recomputing the profiles.

Special Cautions

- a. You cannot add, change, or delete VPIs on a clipped reference line.
- b. A reference line for a baseline roadway provides for drawing any roadway profiles, including VPIs of other design roadways.
- c. A baseline roadway must be used for terrain data.
- d. IGrds performs horizontal position calculations for each design roadway automatically.
- e. You can specify up to 500 VPIs for each design roadway.

- f. You can designate a Reference Line as "clipped" when you create it. The following restrictions apply to "clipped" reference lines:
- IGrds does not display any elements (including VPIs) outside of the reference line station limits.
 - You cannot perform design actions such as ADD, REVISE, DELETE VPI, etc.
 - You cannot extend or shorten reference lines. (You can move them.)

Clipped reference lines are useful when preparing output plots such as plan profile sheets.

VERTICAL GEOMETRY COMMANDS

The Vertical Geometry commands perform geometry computations in the vertical plane, defined by a reference line. The reference line defines a plane based on station and elevation coordinates. The system observes distorted scales. The results of these computations may be used to define elements of vertical alignments.

These commands facilitate fitting vertical alignments to the constraints imposed by rehabilitation and other projects which must meet constraints.

Vertical Geometry commands both compute and store points and lines in the reference line plane. These elements are called VPOINTS and VLINES.

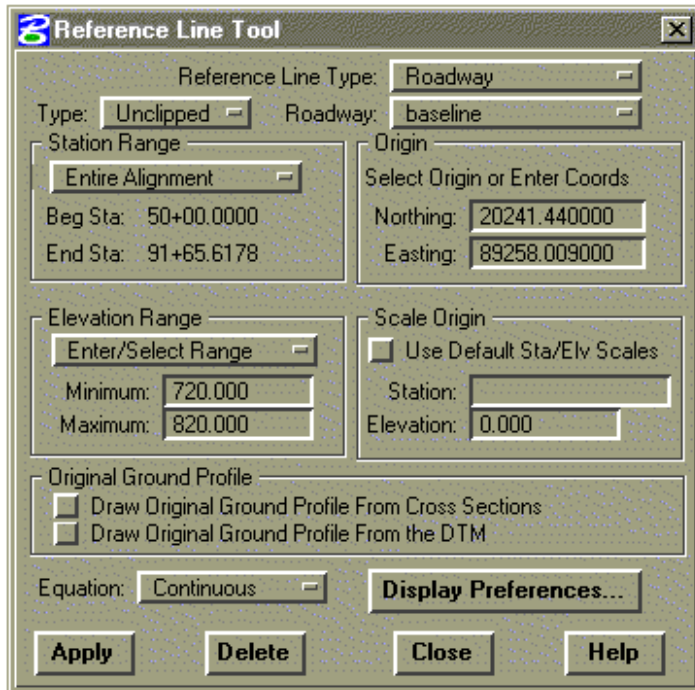
- When VPoints are created, they are stored as 3D Geometry Points and displayed in both the Vertical Reference Plane and 3D space. An optional offset value can be entered with VPoints.
- VLINES are stored as a point and percent grade.

To modify VLINE elements, you must delete them using the drafting system element delete command and re-establish them.

REFERENCE LINE EDITOR



The Reference Line Editor allows creation and editing of vertical alignment reference lines which define the vertical plane along the centerline of an alignment, or linear geometry element. The editor places the reference line with horizontal scale defining stationing along the alignment or geometry element and vertical



scale defining elevations at user defined locations. Locations and appearance of stationing, tic mark spacing, elevation spacing, and text size are all controlled by the user. When working in a 3D graphics file, the reference line must be placed in a top view for proper usage. Once a reference line is placed it can be used for other design purposes such as displaying various types of profiles and defining design profiles.

Type	<p>Select the Reference Line type:</p> <ul style="list-style-type: none"> • Unclipped • Clipped <p>Note that clipped reference lines cannot be used for design purposes (i.e., defining design profiles). They are intended for drafting purposes only. Note also that this option is disabled and defaults to “unclipped” for geometry element reference lines.</p>
Reference Type	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>

Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Station Range	<p>Select station range option</p> <p>Entire Alignment:</p> <ul style="list-style-type: none"> • Entire alignment station values will be used <p>Station/Station</p> <ul style="list-style-type: none"> • Enter or select the beginning and/or ending stations covering the range of stations to be drawn for the reference line. <p>Note that this option is disabled and defaults to “Entire alignment” for geometry elements. The beginning station is set to 0+00 (or 0+000) and the end station is set to the linear distance along the geometry element to the end expressed as a station value.</p>
Origin	Graphically select the origin of the reference line or enter coordinates.
Elevation Range	<p>Enter the maximum/minimum values for the elevation scale to be used for the reference line.</p> <p>Enter/Select Range</p> <ul style="list-style-type: none"> • Enter the elevation range to be used. <p>Scan Cross Sections</p> <ul style="list-style-type: none"> • Scan all stored cross sections to determine the maximum/minimum elevation range values to be used. The roadway must be associated with a baseline with stored cross sections for this option to work. This option is disabled and unavailable for geometry elements.

	<p>Scan DTM</p> <ul style="list-style-type: none"> The maximum/minimum elevation range to be used is determined by draping the alignment or geometry element over the DTM surface. A DTM surface must be set for this option to work.
Scale Origin	<p>This option allows the origin of the horizontal (stations) and vertical (elevations) scales of the reference line to be moved. The default location is at the begin station and minimum elevation. If the box is checked, the user can enter the desired location where the horizontal and vertical scales will intersect.</p>
Original Ground Profile	<p>These toggle buttons allow the user to display the Original Ground Profile (from Cross Sections and/or from the DTM) when the Reference Line is created. The Draw OG profile from Cross Sections will be grayed out when no cross sections exist for the roadway. The Draw OG profile from the DTM will be grayed out when a DTM has not been set.</p>
Equation	<p>This option controls the display of station equations in a reference line.</p> <p>Continuous:</p> <ul style="list-style-type: none"> The equation is labeled along the horizontal axis of the reference line and the reference line is drawn continuous through gap equations. <p>Break:</p> <ul style="list-style-type: none"> The equation is labeled along the horizontal axis of the reference line and the reference line is drawn with a break at locations of gap equations. <p>Note that for geometry elements, the Equations control option is hidden as no equations are allowed.</p>

Display Preferences	This action button displays the Display Preferences dialog box discussed on page 5-14.
Apply	Create or revise the reference line according to the information entered in the reference line tool.
Delete	Displays a confirmation dialog box that includes a toggle to additionally delete the VPI data for the roadway as well (the default setting for this toggle is stored in the .ini file). When the OK button is selected, the current reference line and all associated graphics displays are deleted.
Close	Closes the reference line tool.
Help	Access on line help.

DISPLAY PREFERENCES

This dialog box is activated from the Reference Line Editor tool. It provides for defining or revising preferences for Reference Line graphic.

Tic Mark Spaces	
Labels	• Enter or revise value.
Intermediate	• Enter or revise value.
Tic Mark Size	
Labels	• Enter or revise value.
Intermediate	• Enter or revise value.
Settings	
Vertical Exaggeration	• Enter or revise value.
Elevation Spacing	• Enter or revise value.
Text Height	
Stations	• Enter or revise value.
Elevations	• Enter or revise value.

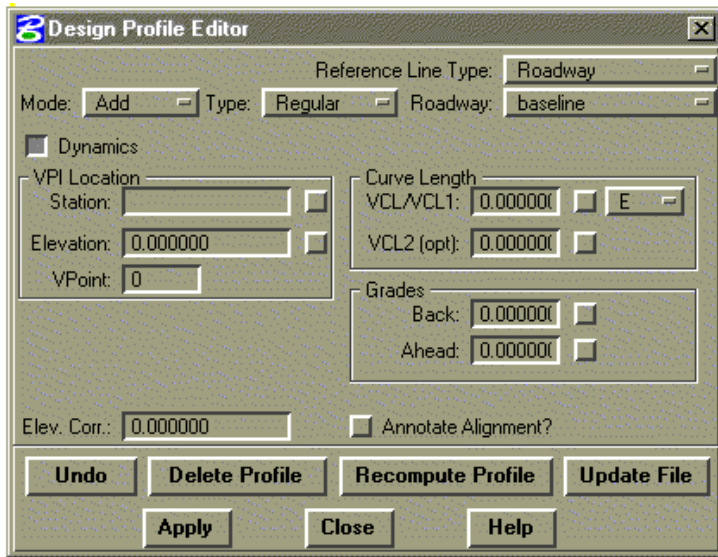
Margin Control	
Horizontal	<ul style="list-style-type: none">• Enter the distance to be added to the begin or end of the horizontal reference line scale.
Vertical	<ul style="list-style-type: none">• Enter the elevation amount to be added to the begin and end of the reference line elevation scale.
Label Reference Line	
Justification	<ul style="list-style-type: none">• Select location option.
Text Height	<ul style="list-style-type: none">• Enter or revise value.
Text Width	<ul style="list-style-type: none">• Enter or revise value.
OK	Click to use the values displayed in the Display Reference dialog box.
Cancel	Click to dismiss dialog box with no action.
Help	Click to display help for this display.

DESIGN PROFILE EDITOR



The Design Profile Editor is a powerful tool within IGrds that is used in all aspects of design profile creation and editing. The Design Profile Editor utilizes dynamic graphic techniques to show the profile geometry continuously while VPIs are being added and revised. A

valid reference line for a roadway or geometry element must exist before the Design Profile Editor can be used.



Mode	Select the edit mode to be used.
Revise	Select to allow revisions to existing VPIs.
Add	Select to allow VPIs to be added to the end of a profile or inserted between existing VPIs.
Delete	Select to allow deletion of individual VPIs.
Identify	Select to allow VPIs to be selected for identification.

Type	Select the type of VPI to be edited.
Regular	This mode is for editing regular design profile VPIs defined graphically or by precision input. Dynamic graphic mode is automatically on when using this VPI type. For Geometry element reference lines, the vertical curve calculation button is set to “E” (entered) and disabled.
PNG	This mode is for editing PNG VPIs, which specify profiles or parts of profiles where the original ground defines the profile grade elevation. Place PNG VPIs in pairs defining the beginning and ending of a PNG range. Additional PNG VPIs can be defined within ranges to alter offset or elevation correction settings. PNG VPIs will be placed at the specified/digitized station and original ground elevation. PNG VPIs are distinguished from regular VPIs by the letters PNG above the VPI symbol. This option is disabled for Geometry element reference lines.
VC Thru Point	<p>The Vertical Curve Thru Point type allows editing of VPIs such that the profile will pass through a known Vertical Geometry point. When this type is selected, an option button will appear allowing selection of one of seven options that can be used. Each option has different known and computed data. The various options are described below.</p> <p>Note: The following types of VPI computations are only available with the VPI ADD mode and are disabled in other modes. However, they can be used for both roadway and Geometry element reference lines.</p>

VPIs from DTM	This type allows VPIs to be computed from the associated DTM for roadways and for Geometry elements. VPIs are automatically generated for each roadway PI, or for geometry element's begin, end, and intermediate segment points (for chains). The VPI location, curve length, and grades entry boxes are replaced by a Station Range box that is the same as that used on the Reference Line Editor, and "Filter Points" toggle that allows the number of VPIs generated to be limited by user-defined offset and elevation tolerances.
VPIs from Finish Grade Design and VPIs from Subgrade Design	These two types allow VPIs to be computed from the Finish Grade Design or Subgrade Design surfaces for the Active Base Line. For these types, VPIs can only be generated for points that are located within the design limits. As with "VPIs from DTM", these types have the Location, Curve, and Grade boxes replaced by a Station Range box, but instead of a "point filter" box, they exhibit a "Design Surface Parameters" box which allows the baseline to be selected, as well as an increment which defines how closely together VPIs should be generated along the design surface.
Reference Line Type	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is "Roadway", then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is "Geometry Element", then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.

Dynamics	Click to turn on or turn off the dynamic graphic technique. By default, dynamics are enabled for “Regular”, and disabled for “PNG”, “VC Thru Point”, “VPIs from DTM”, “VPIs from Finished Grade Design”, and “VPIs from Subgrade Design”.
VPI Location	Graphically select or enter the VPI location. When the location is graphically selected from the screen, the VPI location is dynamically displayed in rubber band mode on the screen and the station and elevation values are dynamically updated in the respective entry fields.
Station	Enter or select the desired station. Check the hold box to keep the station value from changing as the cursor is moved on the screen (precision input).
Elevation	Enter or select the desired elevation. Check the hold box to keep the elevation value from changing as the cursor is moved on the screen (precision input).
Reference Road (PNG Type Only)	Select the roadway to be used to reference original ground elevations for the PNG profile. (See Figure 5-4)
Offset (PNG Type Only)	Enter the offset from the reference roadway to be used to compute original ground elevations for the PNG profile. (See Figure 5-5)
Curve Length	Enter the value for VCL or VCL1. The value for VCL2 can optionally be entered for unsymmetrical curves. See Figure 5-3. Check the hold box for VCL/VCL1 or VCL2 to hold the curve length. Hold flags for VCL1 are stored in the database and will prevent curve lengths from changing if automatic curve computations are performed.

Enter/Compute Option	<p>This option button allows the user to select whether curve lengths are entered by the user or automatically computed based on design speed and stopping/passing sight criteria. This option applies to symmetric curves only.</p> <ul style="list-style-type: none"> • Enter - The curve length is entered by the user. • Compute - The curve length is entered by the system-based user-specified criteria. When this option is selected, an additional button appears to allow the user to specify how curve lengths are to be computed and overlap conditions resolved. Design criteria, such as design speed and maximum/minimum grades can also be specified. See page 5-27 for more information.
Grades	<p>These fields dynamically show the Back and Ahead grades for the VPI being entered/edited during graphic profile editing. Check the hold boxes adjacent to each grade entry field to hold the current value. If a specific grade is desired, check the back or ahead grade hold flag, enter the grade value and press the tab or return keys.</p>
Elev. Corr.	<p>Enter the elevation correction (optional). This value is added or subtracted to the computed profile grade elevations along the profile up to and including the next VPI, according to agency specified rules. See the System and Concept manuals.</p>
Curve Thru Point (VC Thru Point Type Only)	<p>If the VPI Type is set to VC Thru Point, this option button appears. The seven options listed correspond to the seven VC Thru Point Options, which consist of various combinations of known and unknown data. See Figure 5-6 for an illustration of each option.</p> <p>For each option selected, the Design Profile Editor will conform to the known data (user input) by leaving these input fields active. Fields for unknown data (computed) are grayed out and are filled in when an Apply is done.</p>

	Since each option not only affects the VPI being edited, but also adjacent VPIs, these VPIs will be graphically modified so the user can see the profile changes required to accomplish the curve thru point fit.
Annotate Alignment?	Push to Annotate vertical alignment when the Recompute Profile push button is selected, or when this command is closed.
Undo	Click this button to remove all profile edits performed since the last "Update File" was selected. Note: The edits are removed "en masse", not one at a time, so this button should not be used if only one or two edits of a large number of edits are desired to be removed.
Delete Profile	Click this button to delete the design profile. Deletions are not permanent until the Update File button is pressed.
Recompute Profile	Click this button to recompute the profile with the most current information. This button is most often used when the VPI Type is PNG or VC Thru Point, since these types do not work in a full dynamic mode.
Update File	Click this button to save the current profile to the working file, and create a vertical alignment report for the current profile. Profiles in the process of being edited are stored in memory only. To make any profile edits permanent, the Update File button <u>must be pressed</u> . If the Design Profile Editor is closed with unsaved changes, an alert box will appear giving the user a final opportunity to update the file.
Apply	Click this button to save changes made to the current VPI to memory. If editing in dynamic mode, a data button is the same as an Apply. Apply is most commonly used when doing precision input or using the VC Thru Point VPI type.
Close	Click this button to close the Design Profile Editor.
Help	Click to display on line help.

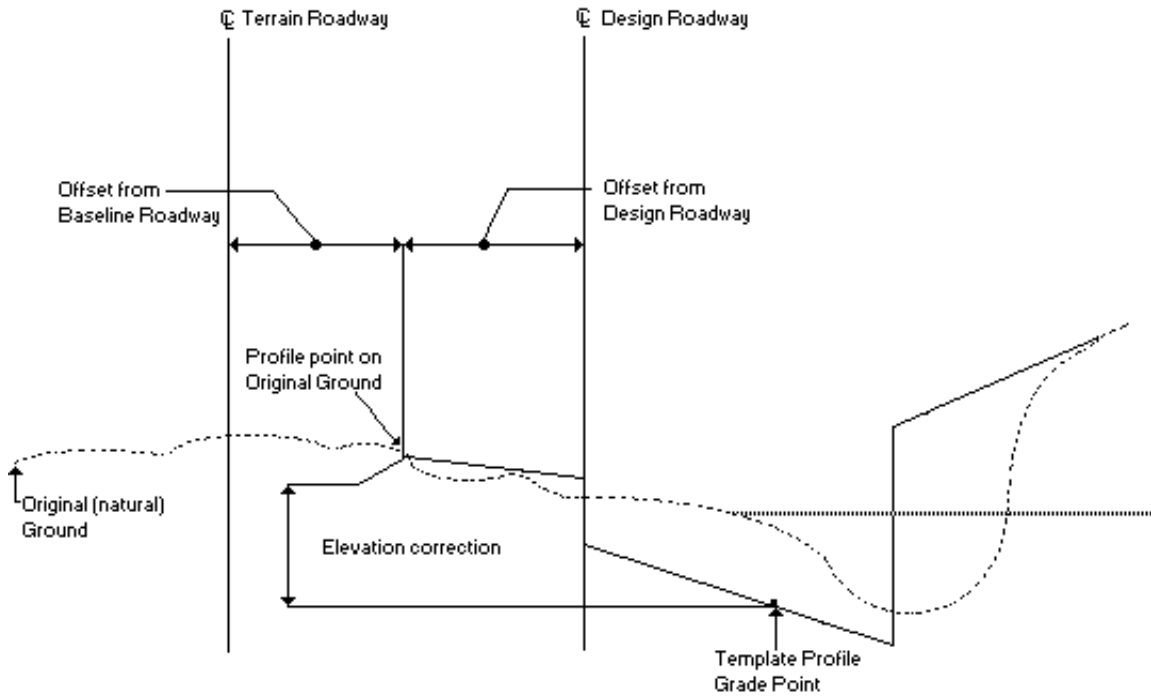


Figure 5-4
Cross Section View

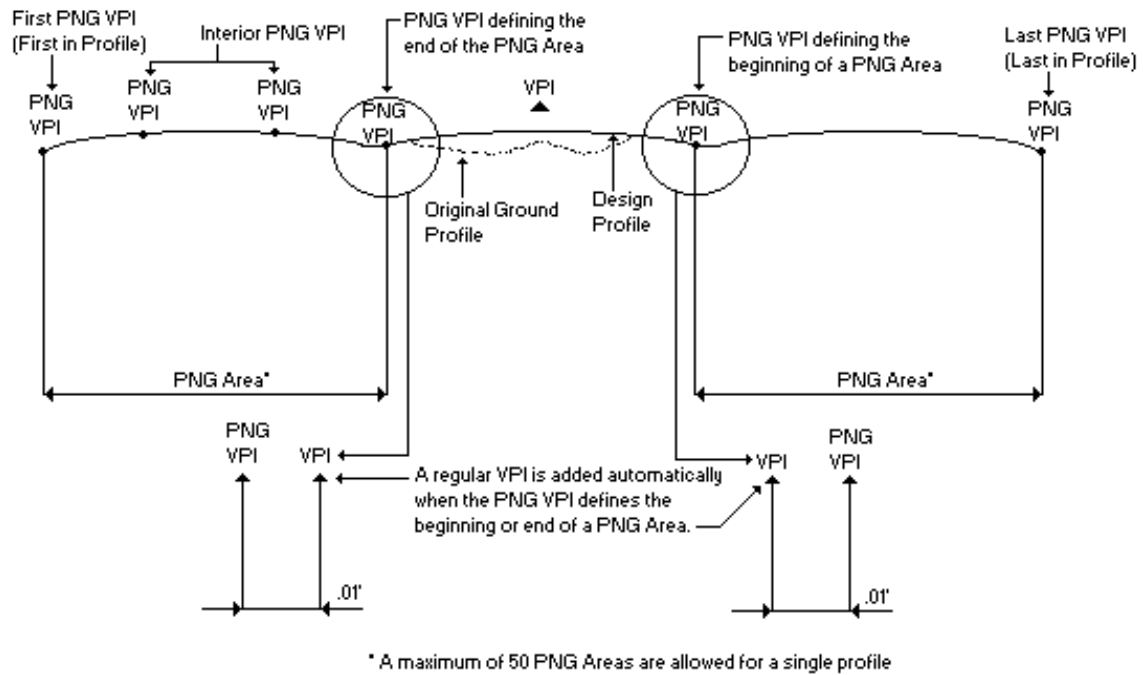
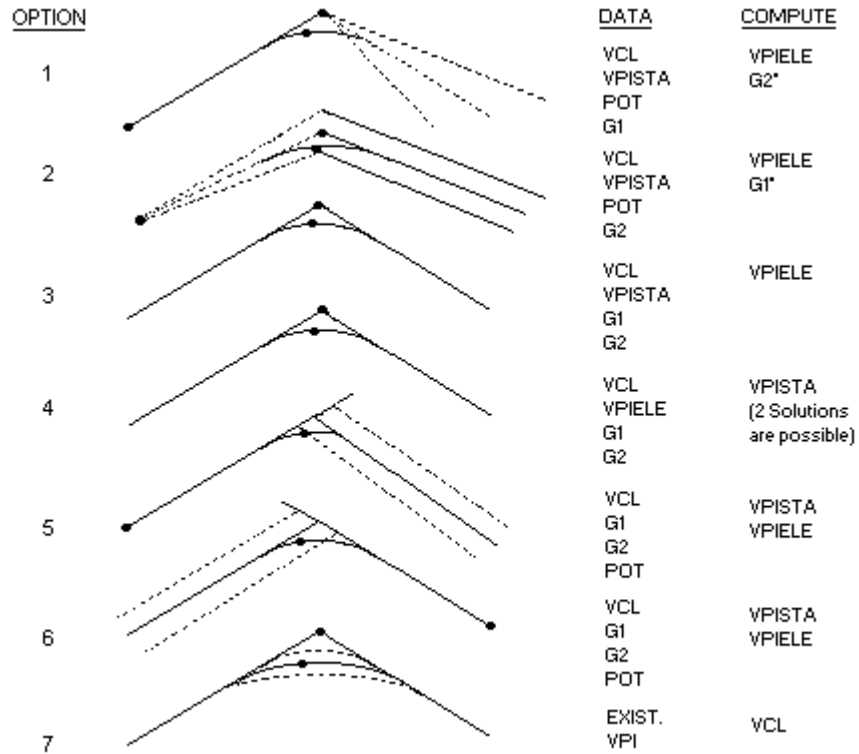


Figure 5-5
 Profile View

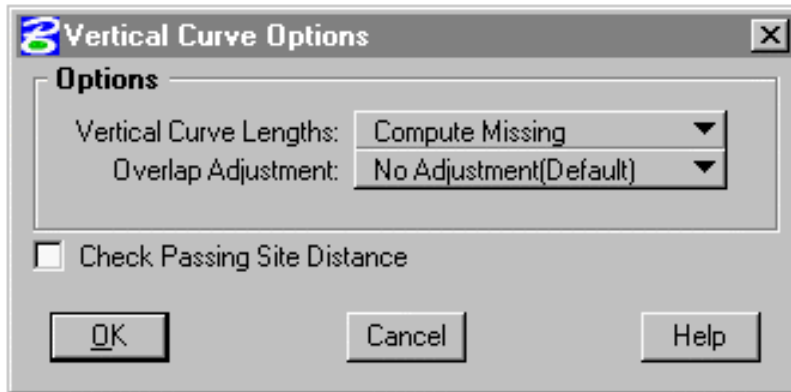


*PLACES A VLINE ON THE TANGENT

VCL	VERTICAL CURVE LENGTH
VPISTA	STATION OF VPI
VPIELE	ELEVATION OF VPI
G1 & G2	TANGENT GRADES
POT	POINT ON TANGENT

Figure 5-6
Vertical Curves Thru Fixed Point

VERTICAL CURVE COMPUTE OPTIONS



Vertical Curve Length

Options

Select desired option.

- Compute None (default). With this option **Overlap Adjustment** will be grayed out.
- Compute Missing. Curve length will be computed for interior VPIs* which have a zero length.
- Compute All. Curve length will be computed for each interior VPI*.

Overlap Adjustment

Options

Select desired option.

- No Adjustment (default). No curve lengths will be adjusted.
- Computed Lengths. Curve lengths which were computed during the execution of this command are eligible for adjustment.
- All curve lengths are eligible for adjustments.

* This pertains to interior PIs of a regular VPI sequence.

Check Passing Site Distance	Check this box for vertical curve calculations based on passing site distance. Otherwise, curves are computed based on stopping site distance.
OK	Click to execute the command.
Cancel	Click to exit the command with no action.
Help	Click to display HELP.

Notes: – *The Sight Distance Report is shown on the following page.*

- *No length computation or adjustment will be done for a VPI which has non zero VCL-2.*
- *Profile line codes are set in the IGrds Parameter file.*
- *Vertical curve lengths will be generated independently based on design criteria according to the VCL option selected prior to adjustment.*
- *Vertical curve lengths will be adjusted to resolve detected overlap cases according to the Overlap Adjustment Option selected. No adjusted VCL will be less than the length required for stopping sight distance. Unresolved overlaps are reported on the Sight Distance report*
- *VCL and Adjustment options are applied independently, but combinations of the options should be selected carefully to obtain the desired result. See VA Option Combinations chart on page 5-41.*

VA OPTION COMBINATIONS			
VCL Compute	Compute All	Compute Missing VCLs (VCL = 0)	Compute None
VCL Adjust			
Adjust Computed Lengths	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Compute Interior VCLs* ◦ Computed VCLs eligible for Adjustment 	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Compute Interior VCLs when not entered ◦ Computed VCLs eligible for Adjustment* 	<ul style="list-style-type: none"> ◦ Sight Distance Report
Adjust Any Length	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Compute Interior VCLs* ◦ Any VCL - eligible for Adjustment 	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Compute Interior VCLs* when not entered ◦ Any VCL - eligible for Adjustment* 	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Any VCL - eligible for Adjustment*
Do Not Adjust	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Compute Interior VCLs* 	<ul style="list-style-type: none"> ◦ Sight Distance Report ◦ Compute Interior VCLs* when not entered 	<ul style="list-style-type: none"> ◦ Sight Distance Report

* No VCL computation or adjustment when VCL2 is not zero (in this case, the total VCL = VCL1 + VCL2. Sight Distance is computed based on 2x, the shortest VCL1 or VCL2).

SIGHT DISTANCE CHECK

Compute Passing : No
 Max Grade : 4.00
 Min Grade : 0.00
 Options: Generate All VCLs - Adjust Any length

- DESIGN SPEED CRITERIA TABLE -

Begin Station	End Station	Design Speed	Minimum Stopping	Sight Distance		
				Design Stopping	Decision	Passing
30+00.000	42+31.090	60	75	85	175	407
42+31.090	47+20.662	30	30	30	145	217
47+20.662	59+09.983	70	95	111	200	482

Station	Elev	VCL1	VCL2	VCL	SAG Crest	VCL Basis	overlap Status	Sight Dis	Sight Dis check	Grade Fwd	Grade Check	K
30+00.000	759.160	0.000	0.000	0.000				0		0.5262	ok	0.000
30+37.000	759.355	36.000	0.000	36.000	crest	computed		88	stopping	-2.4031	ok	12.290
31+15.000	757.480	36.000	0.000	36.000	crest	computed		152	stopping	-3.9198	ok	23.735
33+91.000	746.662	125.000	0.000	125.000	sag	computed		84	stopping	3.4772	ok	16.899
37+81.000	760.223	36.000	0.000	36.000	crest	computed		137	stopping	1.7627	ok	20.998
40+11.000	764.277	36.000	0.000	36.000	sag	computed		208	decision	4.0000	ok	16.091
44+71.000	782.677	18.000	0.000	18.000	crest	set=stop		79	FAIL	1.0661	ok	6.135
44+83.792	782.813	18.000	0.000	18.000	crest	set=stop	overlap	164	FAIL	-0.2465	ok	13.713

VCL1 and VCL2 columns show input values. VCL column shows the final value of VCL or VCL1.

Indicates VCL was:

- entered
- computed
- adjusted
- set-stop
- held

Indicates Overlap between current and previous VPI

Stopping means OK for minimum stopping
 Decision means OK for decision
 Passing means OK for passing
 Fail Stop means not OK for minimum stopping
 Fail-OL means the VPI contributes to an overlap that cannot be resolved

ROADWAY DESIGN PARAMETERS

Provides for review or modification of design parameters used by several IGrds design processes. The dialog is initiated from the Set Roadways drop down dialog box, the Add/Insert/Revise dialog box, or if the user requests any automatic calculation such as curvature or superelevation without setting the design parameters for the roadway. (The roadway design parameters are set to default parameters for roadways upgraded from a previous version which did not have design parameters. When creating a new roadway the design parameters **MUST** be entered.)

Design parameters are stored for the roadway as well as for each PI in the alignment. The following parameters are defined for the Roadway only: Class, Maximum Grade, Minimum Grade, and Auto Reverse Length. All other parameters can be modified for the Roadway or the PI.

Roadway	The active roadway is displayed. Use the option button to select a new active roadway.
Load Defaults:	Opens a dialog with an option to select a set of default design parameters which may be changed in the ha.tbl file.
Design Characteristics	
Class	Use the option button to select <ul style="list-style-type: none"> • Major Arterial • Minor Arterial • Collector • Ramp • Frontage Road • Freeway
No. Lanes	Use the option button to select the number of lanes. The option button values may be changed in the ha.tbl file.
Lane Width	Use the option button to select the lane width. The option button values may be changed in the ha.tbl file.

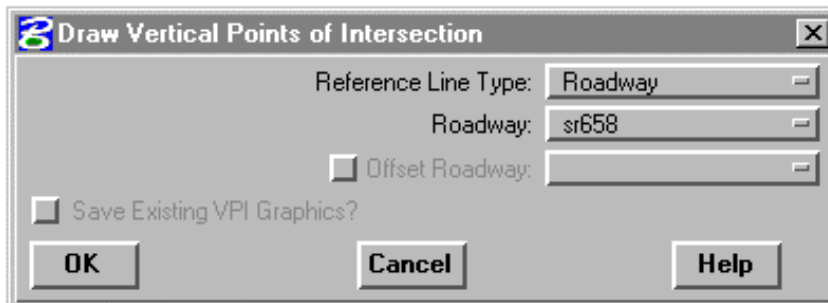
Location	Use the option button to select <ul style="list-style-type: none"> • Rural • Urban High Speed • Urban Low Speed
Terrain	Use the option button to select <ul style="list-style-type: none"> • Rolling • Level • Mountainous
Maximum Grade	<ul style="list-style-type: none"> • Enter maximum grade
Minimum Grade	<ul style="list-style-type: none"> • Enter minimum grade
Design Vehicle	Use the option button to select the particular design vehicle to use for the roadway. The option button values may be changed in the ha.tbl file.
Design Parameters	
Maximum e	Use the option button to select the maximum e value. The option button values may be changed in the ha.tbl file.
Design Speed	Use the option button to select the design speed value. The option button values may be changed in the ha.tbl file.
Maximum f	Displays the maximum f based on the design speed. This value may be changed in the ha.tbl file.
Running Speed	Displays the running speed based on the design speed. This value may be changed in the ha.tbl file.
Super Type	Use the option button to select <ul style="list-style-type: none"> • 0 • 1 • 2 • 3 • 4

Crown Runoff (If Super Type=0)	Enter crown runoff length.
Crown Rate (If Super Type=1,2,3)	Enter crown rate (normal cross slope rate).
Crown Runoff (If Super Type=4)	Value grayed out.
Stopping Sight Dist.	Displays the stopping sight distance based on design speed. This value may be changed in the ha.tbl file.
Auto Rev. Length (Type 0 & 4 Super Only)	Enter Auto Reverse Length for compound superelevation.
OK	Click to save the parameter values as set by this session.
Reset	Click to reset all parameter values to the value they had at the beginning of this session.
Cancel	Click to dismiss the dialog.

DRAW VPIs



This command displays VPIs from the IGrds Working files for the active roadway or profiled Geometry element.



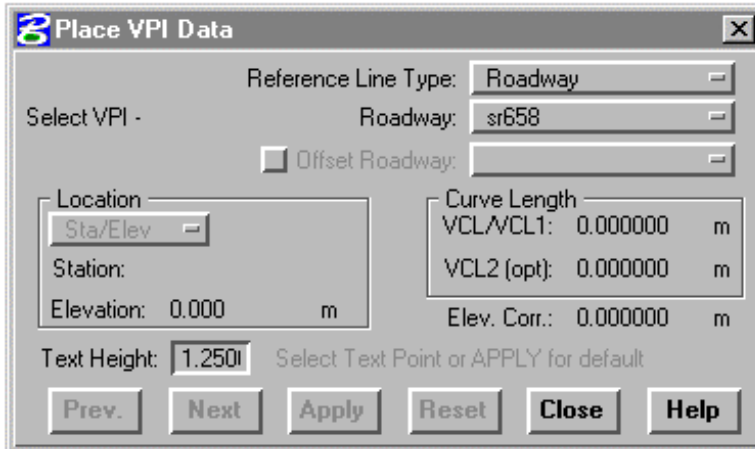
Only VPIs of the active roadway within the reference line boundary will be displayed with a clipped reference line. All VPIs of the active roadway or profiled Geometry element will be displayed on a non-clipped reference line.

Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Offset Roadway	Push to draw VPIs for an offset roadway and select the desired offset roadway. This is only active if the roadway selected is a base line.
Save Existing VPI Graphics	Push to save existing graphics. If the button is up, existing graphics will be deleted before drawing VPIs. Option is grayed when no prior graphics exist.
OK	Click to execute the command.
Cancel	Click to exit the command with no action.
Help	Click to display HELP.

PLACE VPI DATA



This command displays vertical curve data (the station, elevation, length of vertical curve, and external distance) for a selected VPI of the active roadway or profiled Geometry element at a user-defined location.



A sample format of the data follows:

- STA=21+75.000
(rehab 658)
- EL=754.484
- L=150.00
- E=0.319
- S=845.000
- =88.077
- EICor=0.090

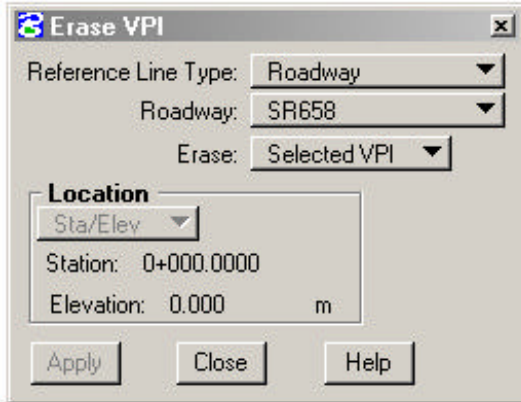
<p>Reference Line Type</p>	<p>Select the Reference Line Type.</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>

Offset Roadway	Push to draw VPIs for an offset roadway and select the desired offset roadway. This is only active if the roadway selected is a base line.
Prompt	
Select VPI	Select VPI for placing data. Station, Elevation, Vertical Curve Length, External Distance, Sight Distance, K Value, and Elevation Correction (if applicable) Data will be displayed for the selected VPI.
Text Height	Revise text height value if desired.
Prompt	
Select Text Point or Apply For Default	Select a point for location text or push Apply to place at default location.
Prev	Click to move back one VPI from the currently selected VPI.
Next	Click to move forward one VPI from the currently selected VPI.
Apply	Click to place data at default location.
Reset	Click to select a new VPI.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

ERASE VPI



This command allows erasing a selected VPI or all VPIs for a roadway or geometry element for which a vertical alignment has been defined. Use the DRAW VPI command to draw the VPIs again if desired.

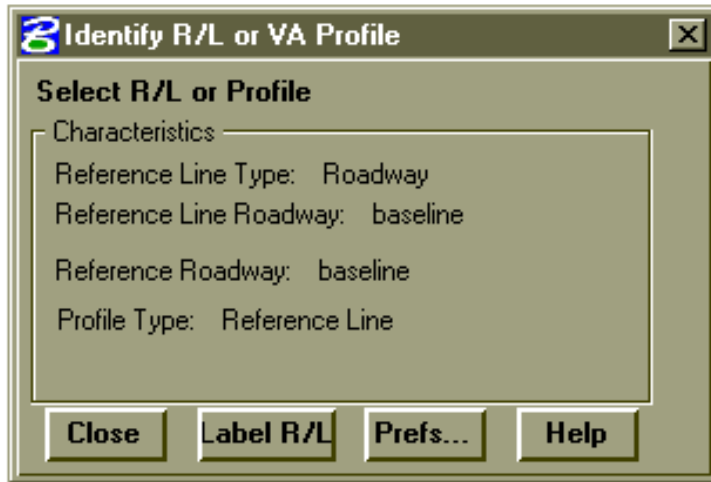


Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Erase	Decide whether to erase a single VPI or all VPIs for the selected roadway or geometry element.
Location	If a single VPI is to be erased, select the desired VPI. The station and the elevation of the VPI will be displayed in these fields.
Apply	Click to erase the VPIs selected.
Close	Click to close the dialog.
Help	Click to display help for this dialog.

IDENTIFY REFERENCE LINE/PROFILE

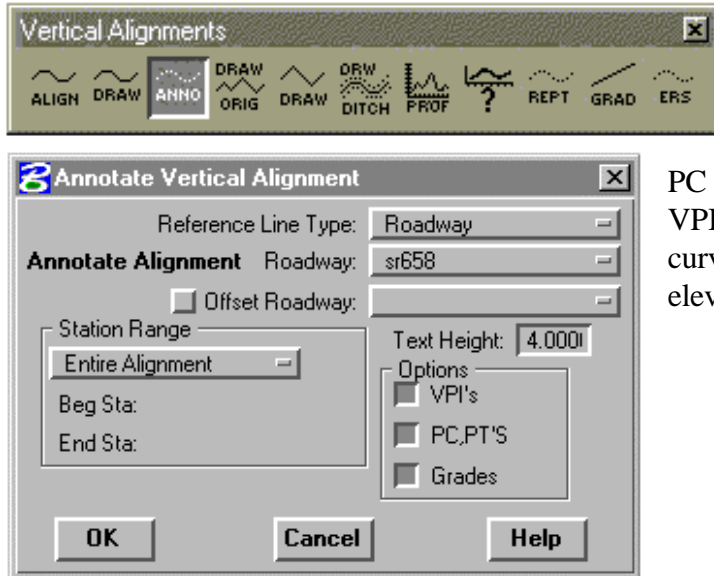


This command identifies a Reference Line or Selected Profile by displaying its roadway or Geometry element ID and type and optionally, labels the reference line.



Prompt	
Select R/L or Profile	Select the desired Reference Line or Profile. The characteristics will be displayed for the selected element.
Prompt	
Select Profile	Select desired profile. Profile characteristics will be displayed for the selected profile.
Label R/L	When a Reference Line is selected, this push button is available to optionally label the Reference Line.
Prefs...	When a Reference Line is selected, this push button is available to optionally change the Label Display characteristics.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

ANNOTATE VERTICAL ALIGNMENT

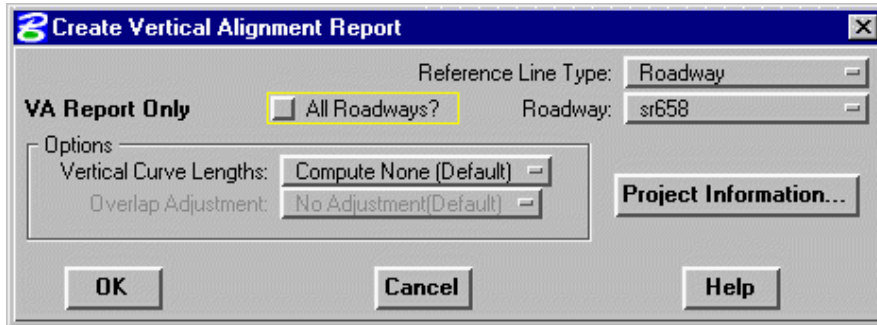


This command calculates and displays annotation for the active roadway's or profiled Geometry element's design profile. The annotation consists of the PC and PT symbols, the profile grade between VPIs, the VPI stations, the elevations and curve lengths, sight distance, k value and elevation correction, if applicable.

Reference Line Type	<p>Select the Reference Line type.</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
Geometry	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
Offset Roadway	<p>Push to draw VPIs for an offset roadway and select the desired offset roadway. This is only active if the roadway selected is a base line.</p>

Station Range	Select station range option. Entire Alignment <ul style="list-style-type: none">• Entire alignment station values will be used. Station/Station <ul style="list-style-type: none">• Enter or select the beginning and/or ending stations covering the range of stations to be displayed.
Options	If the button is up, annotation will be omitted. Push button for desired annotation options (one or more). <ul style="list-style-type: none">• VPIs• PC, PTs• Grades
OK	Click to execute the command.
Cancel	Click to exit the command with no action.
Help	Click to display HELP.

CREATE VA REPORT



This command creates a vertical alignment listing in the temporary report file (.tmp) for the given roadway(s) or profile Geometry element.

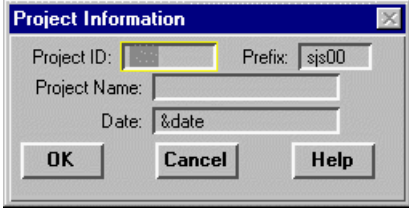
This command produces the same calculations and

listings as the Recompute Profile button on the Design Profile Editor, except it does not save the alignment. Note: The options for the vertical curve length computations and overlap adjustments are inactive for profiled Geometry elements.

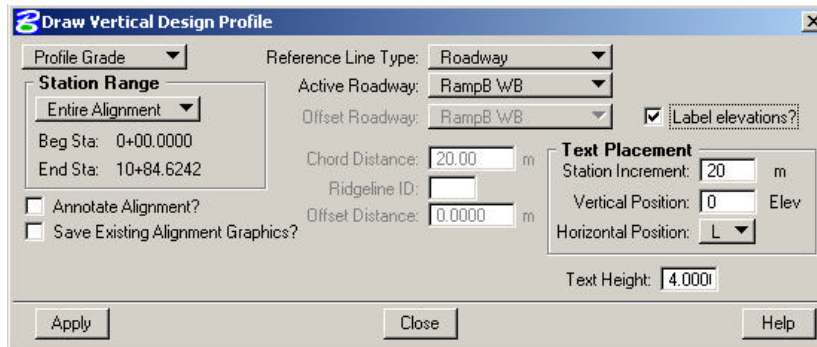
All Roadways?	Push to generate VA reports for all roadways currently in the IGrds Working files. If not pushed, the report will be produced for the specified roadway. This option is not available for Geometry elements.
Reference Line Type	Select the Reference Line Type. <ul style="list-style-type: none"> Roadway Geometry Element This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.

Vertical Curve Length	
Options	Select desired option. <ul style="list-style-type: none">• Compute None (default). With this option Overlap Adjustment will be grayed out.• Compute Missing. Curve length will be computed for interior VPIs* which have a zero length.• Compute All. Curve length will be computed for each interior VPI*.
Overlap Adjustment	
Options	Select desired option. <ul style="list-style-type: none">• No Adjustment (default). No curve lengths will be adjusted.• Computed Lengths. Curve lengths which were computed during the execution of this command are eligible for adjustment.• Any Length All curve lengths are eligible for adjustments.
OK	Click to execute the command.
Cancel	Click to exit the command with no action.
Help	Click to display HELP.

* This pertains to interior PIs of a regular VPI sequence.

	
Project Information	Click to review/change Project Information.
Project ID	Project Identification (up to 3 characters).
Prefix	Earthwork output file prefix.
Project Name	Project Name.
Date	Date to be shown on reports. “&date” is the current date.
OK	Click to save and use displayed data.
Cancel	Click to cancel dialog box.
Help	Click to display help for this dialog box.

DRAW VA DESIGN PROFILE



This command displays the vertical alignment (profile grade) for given roadway, offset roadway, or Geometry element. For roadways, the command can display an offset design profile from the horizontal centerline, Ridge Line profile for the active Roadway or profile for a

specified keypoint on the template. The active reference line is the same as the roadway or profiled Geometry element used to create the reference line. (Before drawing the profile, you must create a reference line for the roadway, the baseline, or Geometry element.)

If the active reference line is the baseline, profiles for all roadways may be displayed. If the active reference line is not the baseline, IGrds displays only the profile for that roadway or profiled Geometry element.

Profile Elevation Labels are placed optionally. The text placement and height parameters must be specified for this purpose.

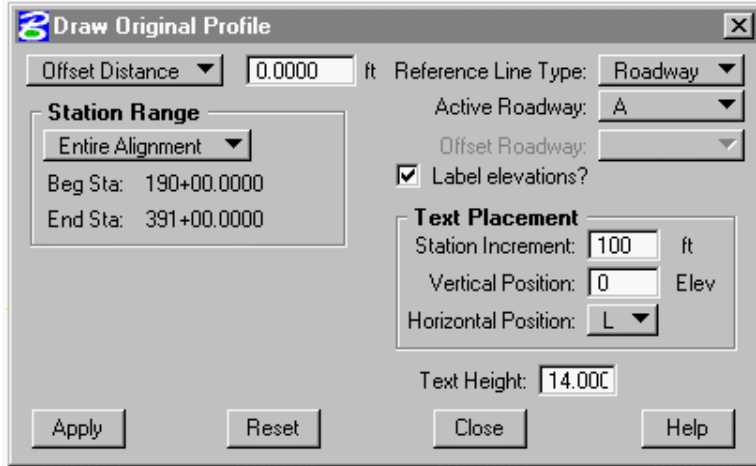
<p>Reference Line Type</p>	<p>Select the Reference Line Type.</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>

Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Draw Design Profile	<p>Select Option</p> <ul style="list-style-type: none"> • Profile Grade • Offset • Ridge Line • Keypoint • Offset Roadway <p>Note: Only the Profile Grade option is available for profiled Geometry elements.</p>
Station Range	<p>Select station range option.</p> <p>Entire Alignment</p> <ul style="list-style-type: none"> • Entire alignment station values will be used. <p>Station/Station</p> <ul style="list-style-type: none"> • Enter or select the beginning and/or ending stations covering the range of stations to be displayed.
Annotate Alignment?	Push to annotate vertical alignment after Draw Profile is complete.
Save Existing Alignment Graphics?	Push to save existing graphics. If not selected, existing graphics will be deleted before drawing profile. Option is grayed when no prior graphics exist.
Ridge Line ID	Enter desired ridge line number. The Ridge Line ID is zero at the template centerline and counts 1, 2, 3 ... left (L) or right (R) of the centerline. For example, if the first Ridge Line left of the centerline is desired, L1 is entered. Ridge line profile will be projected on reference line.
Keypoint	Select the desired keypoint from the option button. The profile for the selected keypoint will be projected on the Reference Line.

Offset Roadway	Select desired offset roadway. (Grayed out when Active Roadway is not a baseline.)
Offset Distance	Enter offset distance to desired offset profile.
Chord Distance	Enter chord distance for drawing offset design profiles (shorter distances give better profiles).
Label Elevations?	Push to place profile elevation labels on the profile.
Text Placement	
Station Increment	Enter desired increment for annotation.
Vertical Position	Select an elevation for labeling. Default: Just above the reference line.
Horizontal Position	Select left or right.
Text Height	Enter text height for elevation labels.
Apply	Click to execute the command.
Close	Click to close the dialog box and stops this command.
Help	Click to display HELP.

Note: Profile Line Codes are set in the IGrds Parameter file.

DRAW ORIGINAL PROFILE



This command calculates and displays the original profile (or an offset from the original profile) of a chosen roadway. The active roadway is the same as the roadway used to create the reference line. (Before drawing the profile, you must create a reference line for the roadway or create a reference line for the baseline roadway.)

If the active reference line is the baseline roadway, profiles for all roadways may be displayed. If the active reference line is for a roadway other than the baseline roadway, IGrds displays only the profile for that roadway.

Original ground profiles are based on cross sections. If the offset is past the terrain data, the system uses the last terrain elevation on the cross section, and writes a message in the .ERR file.

This command is not functional for profiled Geometry elements, as original profiles cannot be projected into a Geometry element type reference line.

Profile Elevation Labels are placed optionally. The text placement and text height parameters must be specified for this purpose.

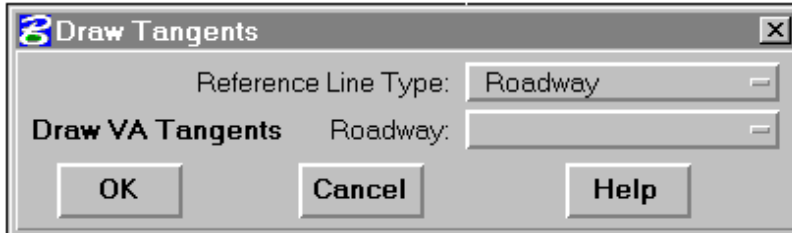
<p>Reference Line Type</p>	<p>Select the Reference Line Type.</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
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Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	This command is not available for Geometry Type Reference Lines.
Offset Roadway	Select desired offset roadway. (Grayed out when Active Roadway is not a baseline.)
Station Range	<p>Select station range option.</p> <p>Entire Alignment</p> <ul style="list-style-type: none"> • Entire alignment station values will be used. <p>Station/Station</p> <ul style="list-style-type: none"> • Enter or select the beginning and/or ending stations covering the range of stations to be displayed.
Draw Original Profile	<p>Select desired offset option:</p> <ul style="list-style-type: none"> • Offset Distance • Left Low Point • Right Low Point <p>For Offset Distance, enter the distance left or right. Left Low Point generates a profile through the lowest original terrain points left of the baseline. Right Low Point generates the same profile on the right.</p>

Label Elevations?	Push to place profile elevation labels on the profile.
Text Placement	
Station Increment	Enter desired increment for annotation.
Vertical Position	Select an elevation for labeling. Default: Just above the reference line.
Horizontal Position	Select left or right.
Text Height	Enter text height for elevation labels.
Apply	Click to execute the command.
Reset	Click to reset values.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

Note: Profile Codes are set in the IGrds Parameter file.

DRAW VA TANGENTS

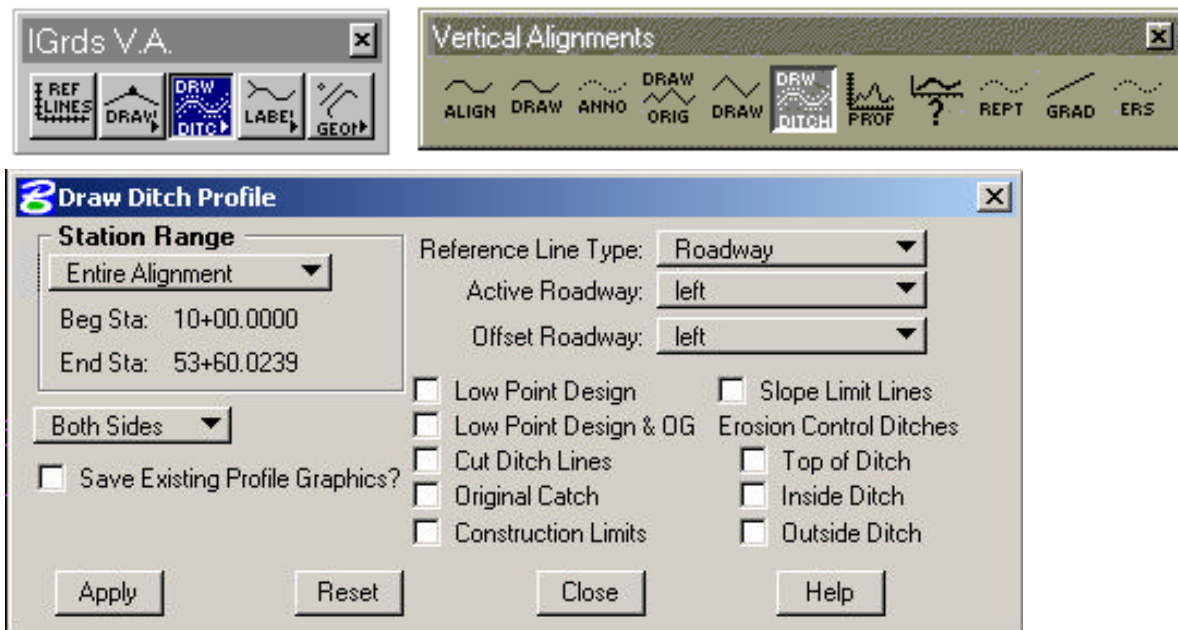


This command displays the tangent lines connecting the vertical alignment VPIs stored in the IGrds Working files for a given roadway or profiled Geometry element. (Display of

VPIs is not required.)

Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
OK	Click to execute the command.
Cancel	Click to exit the command with no action.
Help	Click to display HELP.

DRAW DITCH PROFILES



This command displays ditch profiles on the left and/or right side of the roadway. Options include:

- Computing the low point of the design surface.
- Computing the low point of the design surface including the original ground.
- The Cut Ditch which is the low point of the design surface between the shoulder point and original catch point.
- The Original Catch point (i.e., before Erosion Control Ditch).
- Construction Limits
- Slope Limit Lines
- The top, inside, and outside of the Erosion Control Ditch.

The active road-way is the same roadway that was used to create the reference line. (Before drawing the profile, you must create a reference line for the roadway or the baseline.)

If the active reference line is the baseline, profiles for all roadways may be displayed. If the active reference line is not the baseline, IGrds displays only the profile for that roadway.

If you make any horizontal or vertical alignment changes, IGrds does not indicate them in the ditch profile until the new design run is made.

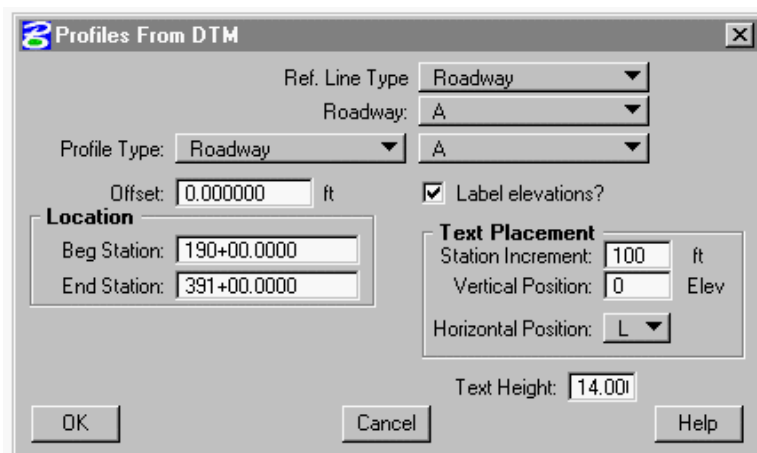
The command is not functional for profiled Geometry elements, as ditch profiles cannot be projected into a Geometry element type reference line.

Reference Line Type	Select the Reference Line Type. <ul style="list-style-type: none"> • Roadway • Geometry Element This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	This command is not available for Geometry Type Reference Lines.
Offset Roadway	Select desired offset roadway. (Grayed out when Active Roadway is not a baseline.)
Station Range	Select station range option. <p>Entire Alignment</p> <ul style="list-style-type: none"> • Entire alignment station values will be used. <p>Station/Station</p> <ul style="list-style-type: none"> • Enter or select the beginning and/or ending stations covering the range of stations to be displayed.
Which Side	Select option to draw selected profile for Left, Right, or Both sides.

Draw Options	<p>Push buttons for desired profiles (one or more).</p> <ul style="list-style-type: none"> • Low Point Design • Low Point Design & OG • Cut Ditch Lines • Original Catch • Construction Limits • Slope Limit Lines • Erosion Control Ditches <ul style="list-style-type: none"> Top of Ditch Inside Ditch Outside Ditch
Save Existing Profile Graphics?	<p>Push to save existing graphics. If not selected, existing graphics for selected profiles will be deleted before being drawn.</p>
Apply	<p>Click to execute the command.</p>
Reset	<p>Click to reset values.</p>
Close	<p>Click to dismiss dialog box.</p>
Help	<p>Click to display help for this command.</p>

Note: Profile Line Codes are set in the IGRDS Parameter file. "& OG" means the original ground outside of the catch points will be considered in determining the ditch (low point) elevation.

PROFILES FROM DTM



This command extracts profile data along an alignment, offset alignment, or profiled Geometry element, and displays the profile on the reference line for the alignment or Geometry element from a DTM surface for use by IGrds.

The SET DTM command must be executed to set the DTM surface during the current session before using this command. (Before drawing the profile, you must create

a reference line for the roadway or Geometry element.)

Profile Elevation Labels are placed optionally. The text placement and text height parameters must be specified for this purpose.

<p>Reference Line Type</p>	<p>Select the Reference Line Type.</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>

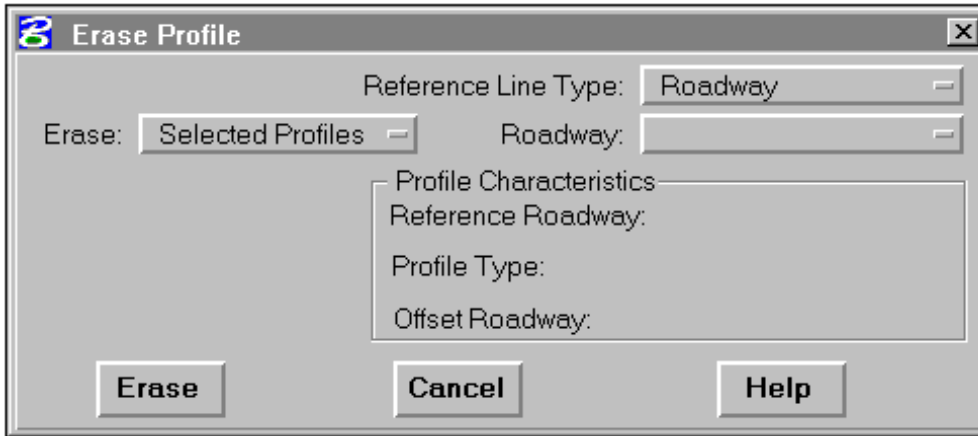
Profile Type	<p>Select the type of profile to be displayed in the reference line.</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>If Roadway is selected, an option list will display a list of all available alignments. Select the desired roadway. A profile from DTM will be generated for the alignment and projected into the reference line.</p> <p>If Geometry Element is selected, an edit field will appear to specify which geometry element to use. Enter or select the desired IGrds geometry or MicroStation element. A profile from DTM will be generated for the geometry element and projected into the reference line.</p>
Offset	<p>Enter \pm offset from the roadway centerline to the desired profile. Offset is not available for Geometry elements.</p>
Begin Station (of Profile)	<p>The beginning station of the roadway will be displayed.</p> <p>Enter or select beginning station for profile.</p>
End Station (of Profile)	<p>The end station of the roadway will be displayed.</p> <p>Enter or select ending station for profile.</p>
Label Elevations?	<p>Push to place profile elevation labels on the profile.</p>
Text Placement	
Station Increment	<p>Enter desired increment for annotation.</p>
Vertical Position	<p>Select an elevation for labeling. Default: Just above the reference line.</p>
Horizontal Position	<p>Select left or right.</p>

Text Height	Enter text height for elevation labels.
OK	Click to execute the command.
Cancel	Click to exit the command with no action.
Help	Click to display Help for this command.

ERASE PROFILE DISPLAYS



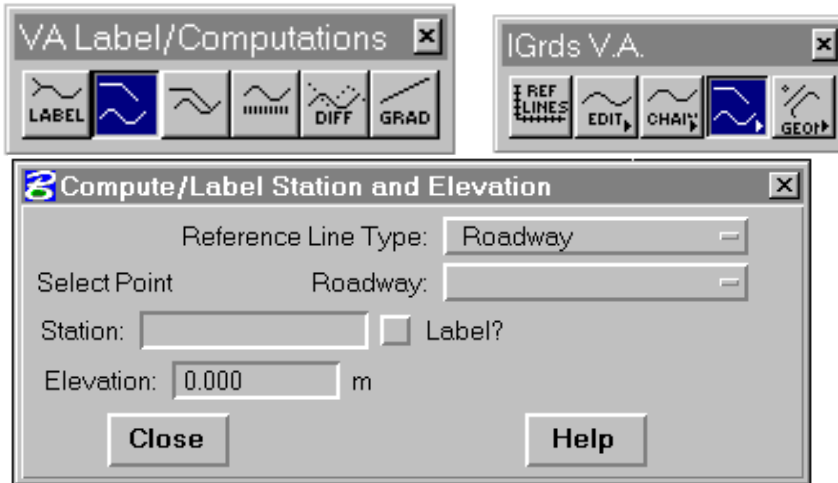
This command erases the Vertical Alignment and its VPIs from the active reference line. This command also erases original profile displays.



Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is "Roadway", then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is "Geometry Element", then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Erase	Select option. <ul style="list-style-type: none"> • Selected Profiles
Prompt	Select Profile to Erase <ul style="list-style-type: none"> • All profiles

Profile Characteristics	Characteristics of the selected profile will be displayed. (Grayed out when All Profiles is selected.)
Erase	Click to erase.
Cancel	Click to exit the command with no action.
Help	Click to display HELP.

COMPUTE/LABEL STATION AND ELEVATION



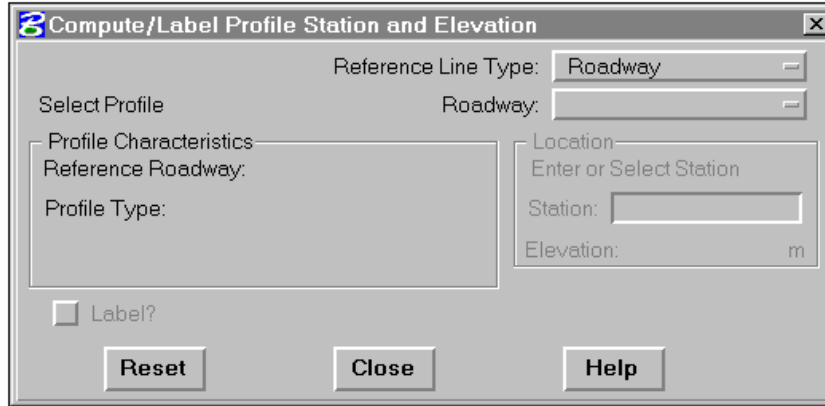
This command displays the station and elevation of a selected point on the active reference line. IGrds displays the station and elevation in the dialog box and in the form of a text node at a defined location. The text node recognizes IGrds text node parameters and options of LABEL, STACK, LEADER, and TERMINATOR.

Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Prompt	
Select Point	Selecting the desired point displays its station and elevation.
Label Prompt	
Select Text Placement Point	Enable this option to place a label text node containing the station and elevation. Digitize the location of the label.
Close	Click to dismiss dialog box.
Help	Click to display HELP.

COMPUTE/LABEL PROFILE STATION AND ELEVATION



This command displays the station and elevation of a selected point on a selected original or design profile for the active roadway, or on a profiled Geometry element.

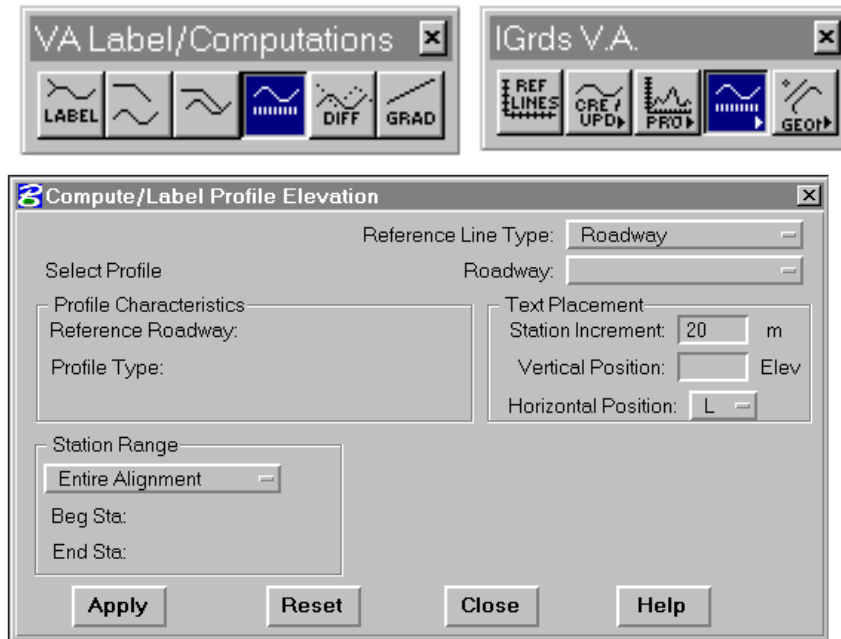


IGrds displays the station and elevation in the dialog box and in the form of a text node at a defined location. The text node recognizes IGrds text node parameters and options of LABEL, STACK, LEADER, and TERMINATOR.

<p>Reference Line Type</p>	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
<p>Prompt</p> <p>Select Profile Selecting the desired profile displays its characteristics.</p>	

Location	
Enter or Select Station Elevation	Enter a station value or select a point to define Station. The Elevation of the selected profile at the Station will be displayed.
Label Prompt	
Select Text Placement Point	Enable this option to place a label text node containing the station and elevation. Digitize the location of the label.
Reset	Click to reset values.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

LABEL PROFILE ELEVATION



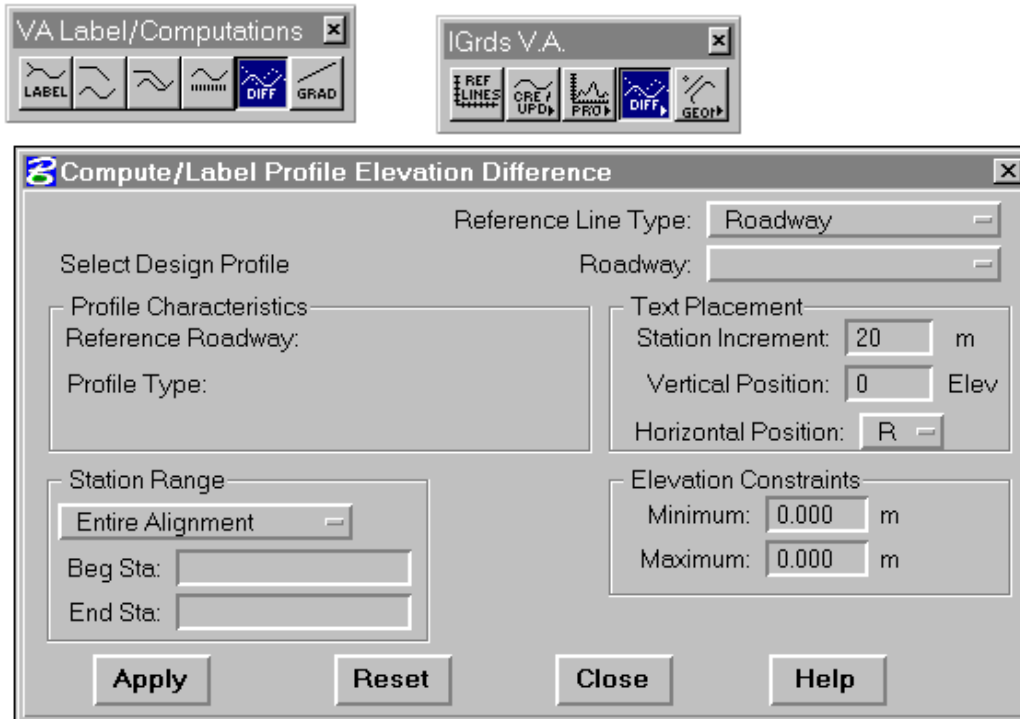
This command adds annotation of elevations for a profile which appears on the active reference line. The command places profile elevations at a chosen interval along the horizontal (station) axis. IGrds writes the elevations vertically and places them just to the left or right of even stations that correspond to the chosen interval.

The design roadway profile grade elevations do not take superelevation into account. To account for superelevation, you must select an offset (including 0. Offset) or a ridgetline profile.

<p>Reference Line Type</p>	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
<p>Prompt</p> <p>Select Profile</p>	<p>Selecting the desired profile displays Profile Characteristics.</p>

Text Placement	
Station Increment	Enter desired increment for annotation.
Vertical Position	Select or enter an elevation for the labeling. If left blank, the labeling will be done at the default position which is just above the reference line.
Horizontal Position	Select desired option for placing annotation. <ul style="list-style-type: none"> • L, Left • R, Right
Station Range	Select station range option. <p>Entire Alignment</p> <ul style="list-style-type: none"> • Entire alignment station values will be used. <p>Station/Station</p> <ul style="list-style-type: none"> • Enter or select the beginning and/or ending stations covering the range of stations to be displayed.
Apply	Click to execute the command.
Reset	Click to reset values.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PROFILE ELEVATION DIFFERENCE



This command calculates the elevation difference between a selected design profile and the original profile. IGrds calculates the original profile at the same roadway and offset as the selected design profile. The original profile does not need to be displayed. The system annotates elevation differences at a chosen interval along the horizontal (station) axis.

IGrds writes the elevations vertically and places them just to the left or right of even stations that correspond to the chosen interval.

The design roadway profile grade elevations do not take superelevation into account. To account for superelevation, you must select an offset (including 0. offset) or ridgeline profile.

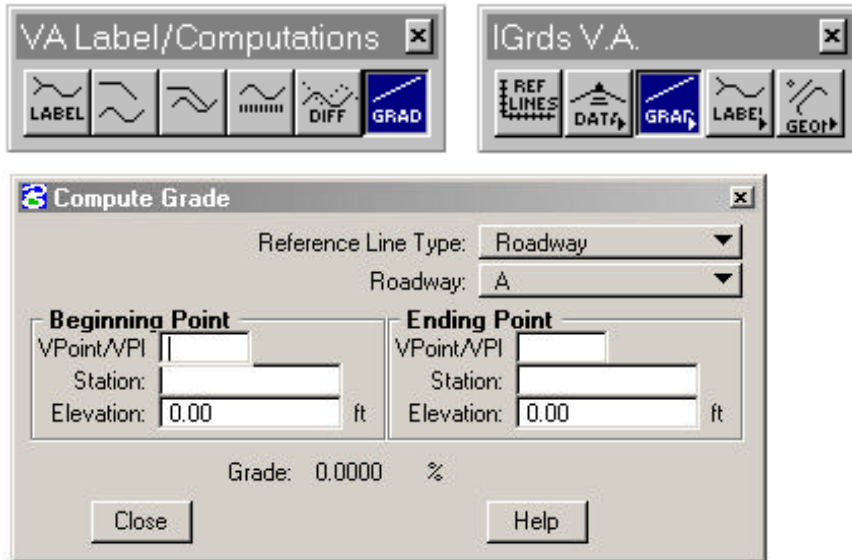
You can enter a maximum and/or minimum elevation difference constraint. IGrds marks the elevation differences between the design profile and original profile that exceed these constraints on the graphic display. They also appear in the temporary report file (.TMP).

This command is not functional for profiled Geometry elements, as original profiles cannot be projected into Geometry element reference lines.

Reference Line Type	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
Geometry	<p>This command is not available for Geometry Type Reference Lines.</p>
Prompt	
Select Profile	<p>Selecting the desired profile displays Profile Characteristics.</p>
Text Placement	
Station Increment	<p>Enter desired increment for annotation.</p>
Vertical Position	<p>Select or enter an elevation for the labeling. If left blank, the labeling will be done at the default position which is just above the reference line.</p>
Horizontal Position	<p>Select desired option for placing annotation.</p> <ul style="list-style-type: none"> • L, Left • R, Right

Station Range	Select station range option. Entire Alignment <ul style="list-style-type: none"> Entire alignment station values will be used. Station/Station <ul style="list-style-type: none"> Enter or select the beginning and/or ending stations covering the range of stations to be displayed. 				
Elevation Constraints	<table border="0"> <tr> <td>Minimum</td> <td>Enter the minimum elevation difference constraint.</td> </tr> <tr> <td>Maximum</td> <td>Enter the maximum elevation difference constraint.</td> </tr> </table>	Minimum	Enter the minimum elevation difference constraint.	Maximum	Enter the maximum elevation difference constraint.
Minimum	Enter the minimum elevation difference constraint.				
Maximum	Enter the maximum elevation difference constraint.				
Apply	Click to execute the command.				
Reset	Click to reset values.				
Close	Click to dismiss dialog box				
Help	Click to display help for this command.				

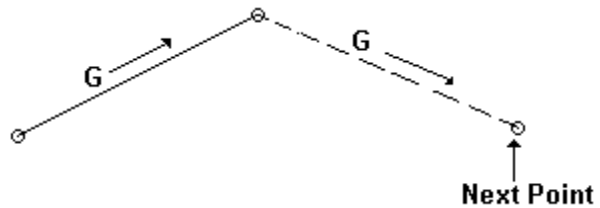
COMPUTE GRADE



This command computes and displays the grade between two selected points based on the active reference line.

<p>Reference Line Type</p>	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>

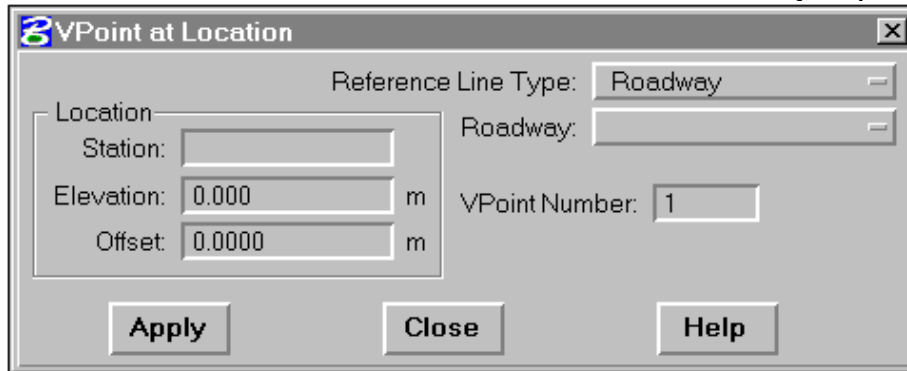
Beginning Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternately a VPoint number can be entered via keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Ending Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternately a VPoint number can be entered via keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Grade	Grade for the selected points will be displayed.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.



PLACE VPOINT AT LOCATION



This command establishes an IGrds vertical geometry point (VPOINT) and 3D Geometry Point at a defined location either by station, elevation, and offset or by digitized entry.



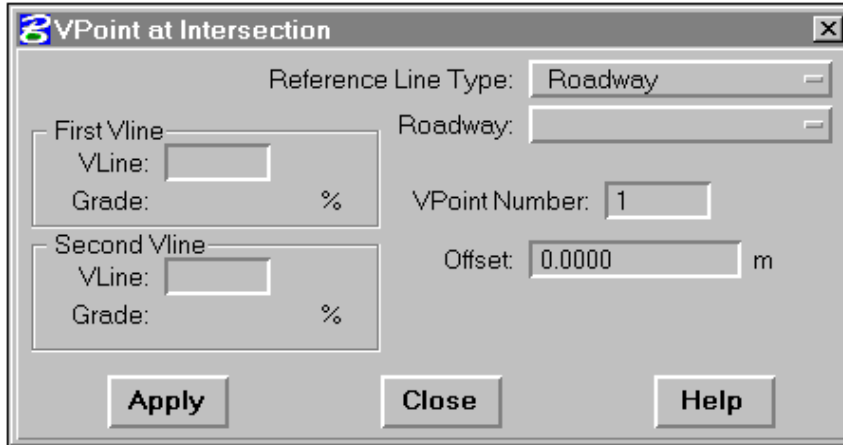
Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
VPoint Number	Enter desired VPoint number or if Geometry Auto numbering is on the next available geometry point number will be displayed.
Location	<p>Station Elevation Offset Digitize a point or enter Station and Elevation</p> <p>Enter the offset of the point from the roadway centerline or Geometry element. The default value is zero.</p>

Apply	Click to execute the command.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PLACE VPOINT AT INTERSECTION OF TWO VLINES



This command establishes an IGrds vertical geometry point (VPOINT) at the intersection of two vertical geometry lines (VLINES).



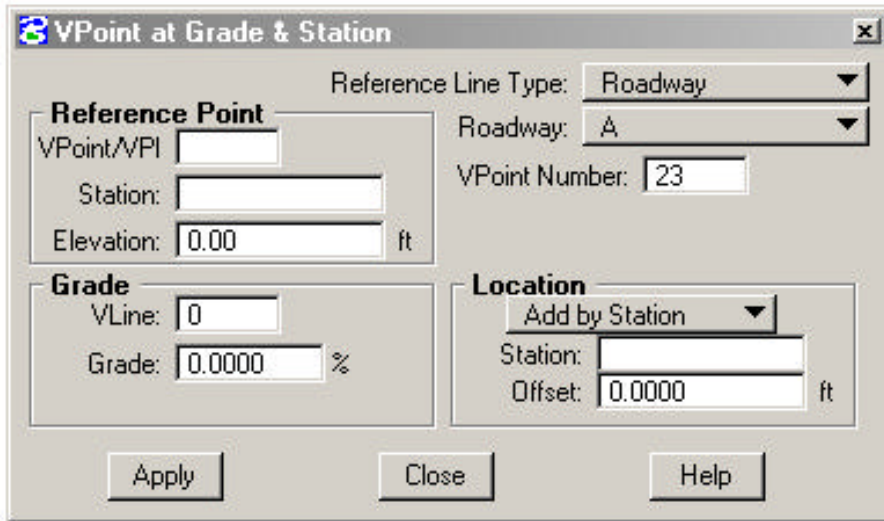
Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
VPoint Number	Enter desired VPoint number or if Geometry Auto numbering is on the next available geometry point number will be displayed.
First Vline	Push button and select first Vline. Vline number and grade will be displayed.

Second Vline	Push button and select second Vline. Vline number and grade will be displayed.
Offset	Enter \pm the offset of the point from the roadway centerline or Geometry element. The default value is zero.
Apply	Click to execute the command.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PLACE VPOINT AT GRADE AND STATION OR HORIZONTAL DISTANCE



This command places a point (VPOINT) at a specified grade and station (or horizontal distance) from a previously defined VPOINT, VPI, or from a point defined by station and elevation.



See Figure 5-7.

Reference Line Type	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
Geometry	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
VPoint Number	<p>Enter desired VPoint number or if Geometry Auto numbering is on the next available geometry point number will be displayed.</p>

Reference Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternatively a VPoint number can be entered via the keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Grade	Select option for indicating grade. <ul style="list-style-type: none"> • Enter Grade Enter the percent grade value. • Select VLine Select a VLine to define the desired grade. VLine number and grade will be displayed.
Location	Select Location Option <ul style="list-style-type: none"> • Add by Station Enter Station value or digitize the location • Add by Horizontal Distance Enter distance.
Offset	Enter the \pm offset of the point from the roadway centerline or Geometry element. The default value is zero.
Apply	Click to execute the command.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

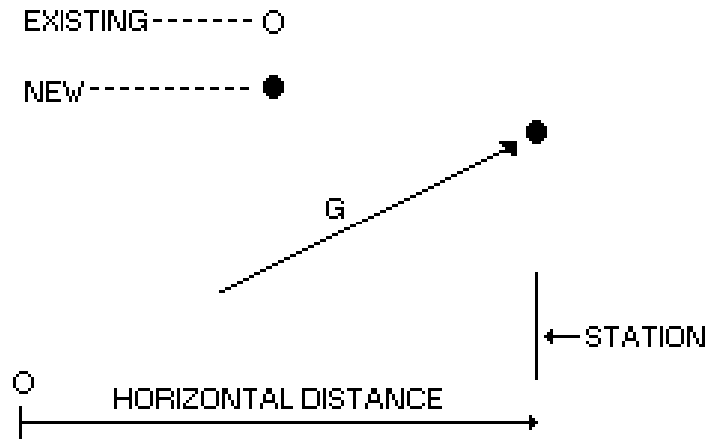


Figure 5-7
VPoint By Station Or Horizontal Distance (153)

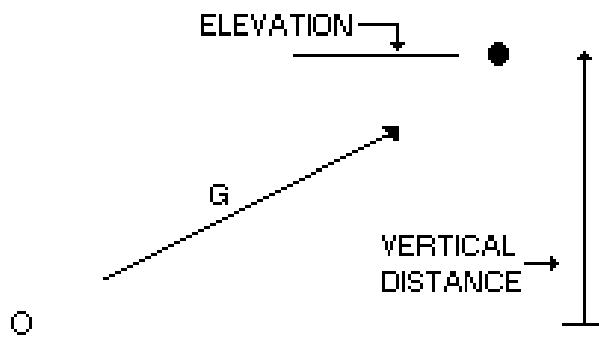
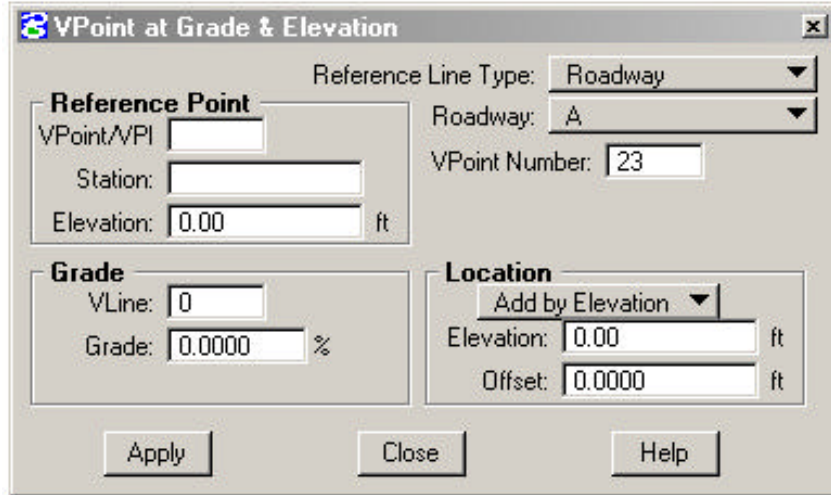


Figure 5-8
VPoint By Elevation Or Vertical Distance (154)

PLACE VPOINT AT GRADE AND ELEVATION OR VERTICAL DISTANCE



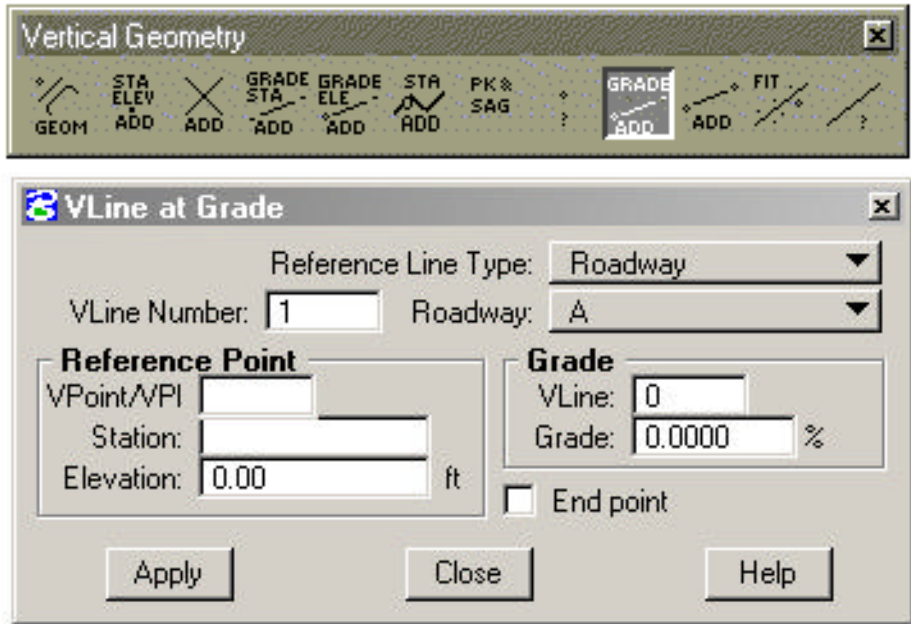
This command places a point (VPOINT) at a specified grade and elevation (or vertical distance) from a previously defined VPOINT, a VPI, or from a point defined by station and elevation.

See Figure 5-8.

<p>Reference Line Type</p>	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
<p>VPoint Number</p>	<p>Enter desired VPoint number or if Geometry Auto numbering is on the next available geometry point number will be displayed.</p>

Reference Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternatively a VPoint number can be entered via a keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Grade	Select Grade Option. <ul style="list-style-type: none"> • Enter Grade Enter the percent grade value. • Select VLine Select a VLine to define the desired grade. VLine number and grade will be displayed.
Location	Select Location Option <ul style="list-style-type: none"> • Add by Elevation Enter Elevation value or digitize the location. • Add by Vertical Distance Enter distance.
Offset	Enter the +/- offset of the point from the roadway centerline or Geometry element. The default value is zero.
Apply	Click to execute the command.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PLACE VLINE AT GRADE

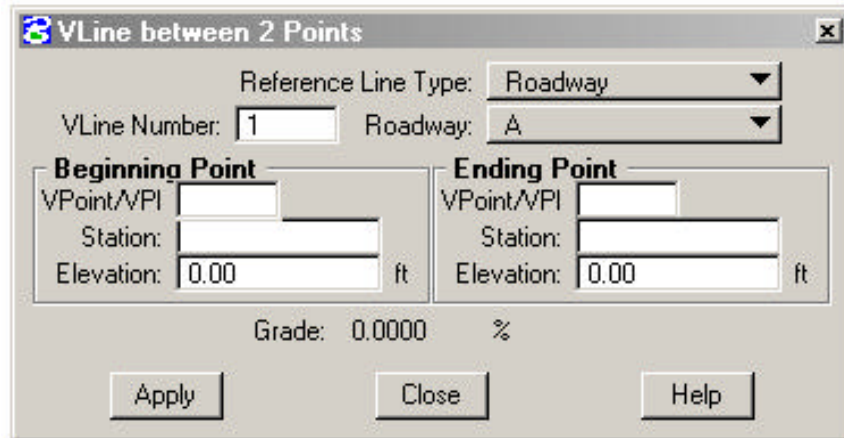


This command establishes an IGrds vertical geometry line (VLINE) at a specified grade from an existing VPoint, a VPI, or from a specified station and elevation.

<p>Reference Line Type</p>	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
<p>VLine Number</p>	<p>Enter desired VLine number.</p>

Reference Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternatively a VPoint number can be entered via a keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Grade	Select Grade option. <ul style="list-style-type: none"> • Enter Grade Enter the percent grade value. • Select VLine Select a VLine to define the desired grade. VLine number and grade will be displayed.
Digitize Approximate End Point	Push to digitize approximate end point and then digitize approximate end point of VLine.
Apply	Click to execute the command.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PLACE VLINE BETWEEN 2 VPOINTS

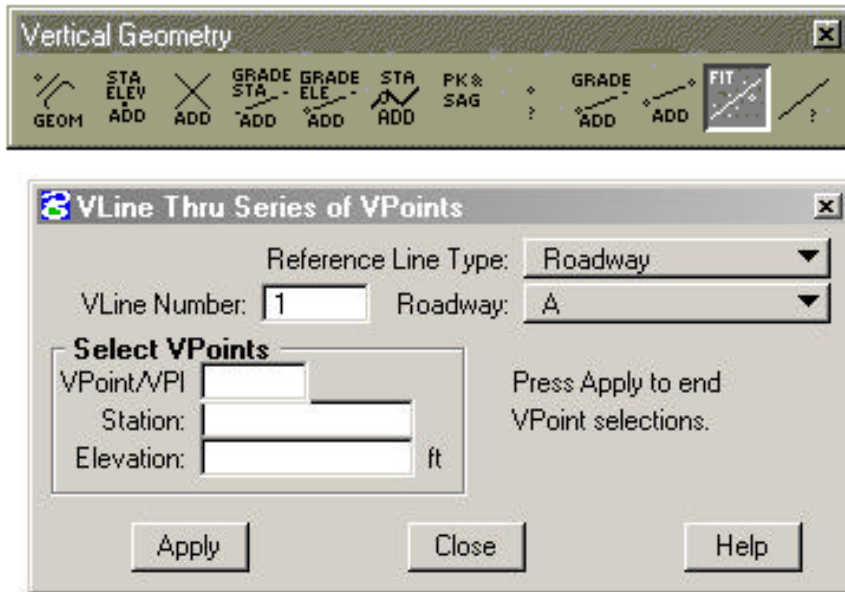


This command creates a vertical geometry line (VLINE) between 2 points. Each of the reference points can be a VPoint, A VPI, or a point defined by station and elevation. A temporary line is displayed between the two reference points. This line is replaced by the display of a VLINE when the Apply button is pressed.

Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
VLine Number	Enter desired VLine number.

Begin Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternatively a VPoint number can be entered via a keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
End Point	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternatively a VPoint number can be entered via a keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Apply	Click to execute the command.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

VLINE THRU A SERIES OF VPOINTS



This command calculates and displays a line (VLINE). The line is determined as the least squares fit through a series of points based on elevation coordinates only. The stations of the first and last points you enter mark the boundaries of the new line. See Figure 5-4.

<p>Reference Line Type</p>	<p>Select the Reference Line Type</p> <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
<p>Roadway</p>	<p>If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.</p>
<p>Geometry</p>	<p>If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.</p>
<p>VLine Number</p>	<p>Enter desired VLine number.</p>

Select VPoints	
VPoint/VPI	Select a VPoint or a VPI for a reference point. Alternatively a VPoint number can be entered via a keyboard.
Station	Digitize a reference point or enter a station value.
Elevation	Digitize a reference point or enter an elevation value.
Store	Click to store the point displayed under "Selected VPoints".
Apply	Click to end VPoint selections and create VLine through the series of points.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

EXISTING - - - - - ○
NEW ————— ●

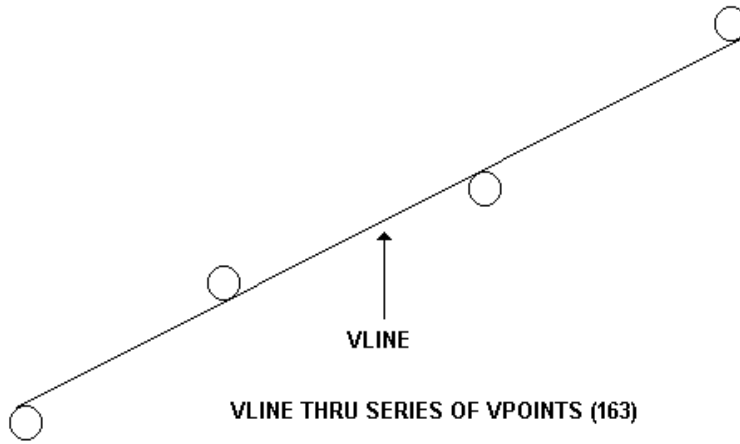


Figure 5-4

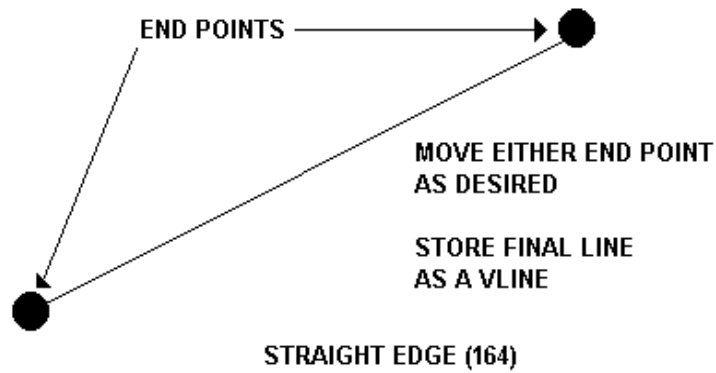
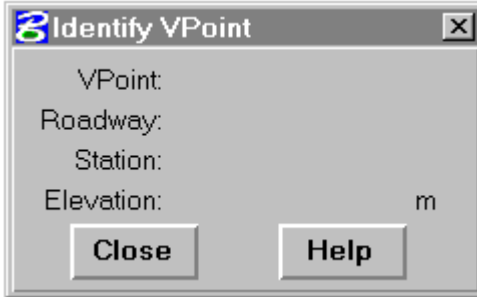


Figure 5-5

IDENTIFY VPOINT



This command identifies the following information for existing VPOINTS:



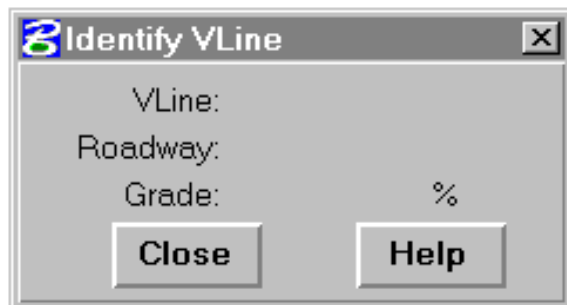
- Roadway (not for Geometry element)
- VPOINT ID
- Station
- Elevation

Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Prompt	
Select VPoint	Selecting the desired VPoint displays the Location Characteristics.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

IDENTIFY VLINE



This command identifies the following information for existing VLINEs:



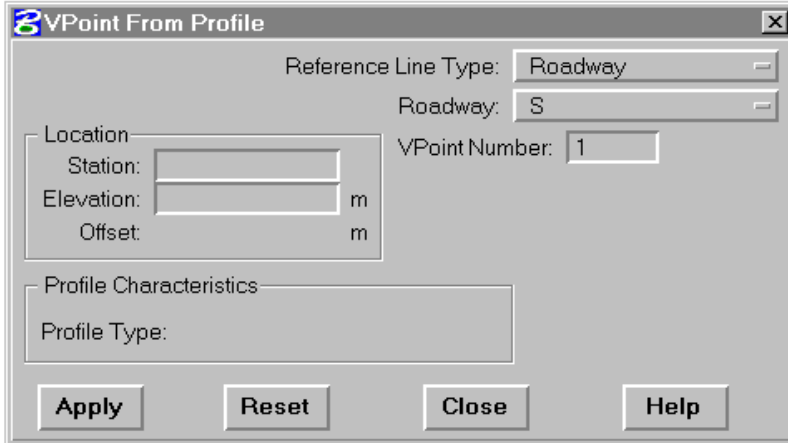
- Roadway (not for Geometry element)
- VLINE ID
- Grade

Reference Line Type	Select the Reference Line Type <ul style="list-style-type: none"> • Roadway • Geometry Element <p>This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.</p>
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.
Prompt	
Select VLine	Selecting the desired VLine displays the Location Characteristics.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PLACE VPOINT AT PROFILE STATION AND ELEVATION



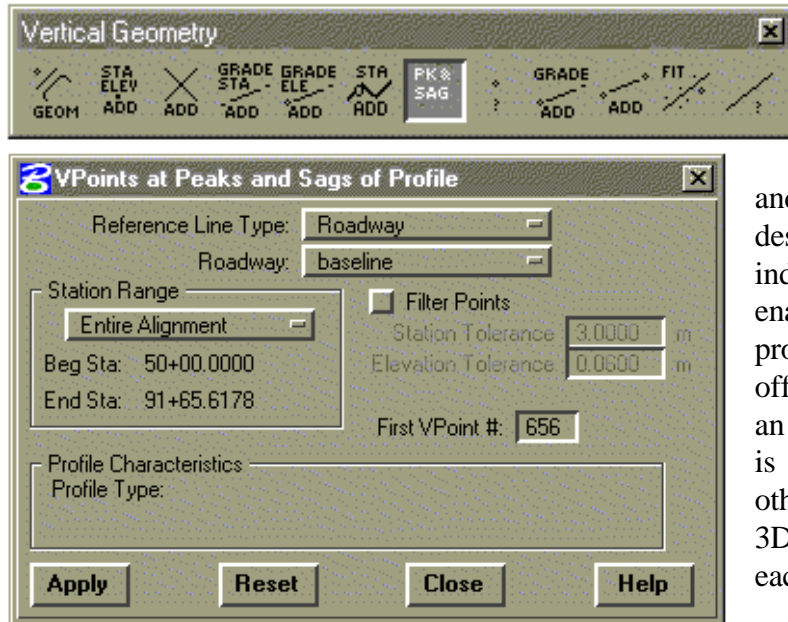
This command places a VPoint at the elevation of a selected profile at a user selected station. If the profile is at an offset (i.e., offset original ground profile), the point is placed using the offset. As with other vertical geometry commands, a 3D geometry point is also created by this command.



Reference Line Type	Select the Reference Line Type
	<ul style="list-style-type: none"> • Roadway • Geometry Element
	This option button selection determines whether the reference line defines a vertical plane for a roadway or a geometry element.
Roadway	If the reference line type selected is “Roadway”, then select the desired roadway. The currently active roadway is shown. Note that the horizontal alignment for the selected roadway must also exist.
Geometry	If the reference line type selected is “Geometry Element”, then select the desired linear geometry element. The currently active geometry element is shown. Note that the geometry element must have previously been defined as having a profile associated with it.

Location	Select the desired location. <ul style="list-style-type: none"> • Station Select or enter the desired station. • Elevation The elevation on the profile at the selected station is shown. This value can be edited if desired. • Offset The offset of the selected profile is shown, but not editable.
Profile Characteristics	The type of profile that has been selected is shown here (i.e., Design, Original Ground, Ditch, Offset Design).
VPoint Number	The next available VPoint number is shown. This is the same as the next available geometry point number.
Apply	Click to execute the command.
Reset	Click to reset values.
Close	Click to dismiss dialog box.
Help	Click to display help for this command.

PLACE VPOINTS AT PEAKS AND SAGS OF PROFILE



This command places VPoints at peak and sag points of a selected vertical alignment profile. The user determines the station range and the allowable proximity of the desired peaks and sags. In addition, individual peak and sag points can be enabled or disabled by the user. If the profile is at an offset (defined by an offset distance or an offset roadway, or an offset geometry element), the point is placed using that offset. As with other vertical geometry commands, a 3D geometry point is also created at each VPoint.

Profile Selection

A profile can be selected as soon as the dialog box for this command is displayed. However, the user is advised to review the options displayed on the dialog box before selecting a profile. Pressing the reset button on the mouse when the focus is on one of the station range input fields also enables the profile selection process. In addition, this process can be restarted by pushing the Reset push button. The characteristics of the profile are displayed when one is selected and the user is prompted to confirm or reject the selection. When the selection of a profile is confirmed, the peaks and sags that comply with the selection criteria are shown in temporary graphics on the profile display.

Peak and Sag Editing

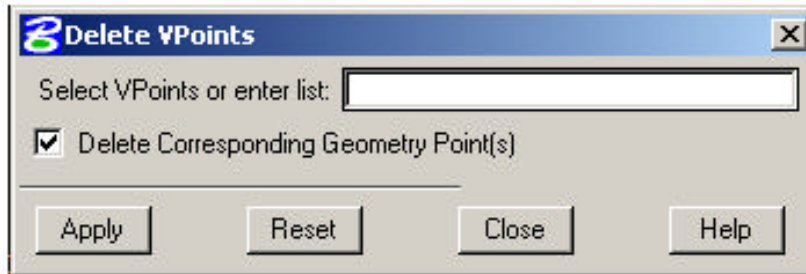
After a profile selection has been confirmed, the user is prompted to select a peak or a sag point to enable or disable it. When a peak or a sag point is selected, a new prompt asks to confirm or reject the selection.

After issuing a windowing command to navigate along the profile, it is possible that the dialog box is not visible. In this case, press the reset button on the mouse to redisplay the dialog box and the peak and sag points. If the dialog box is visible but the peak and sag points are not visible, then issue the “Update View” MicroStation command to display the peaks and sags.

Reference Line Type	Select one of the options listed below to specify whether the desired profile is defined by a roadway or a geometry element (Line, Arc, or Chain).
Roadway	This option indicates that the desired profile is defined by a roadway. Select the desired roadway from the options in the button labeled "Roadway".
Geometry Element	This option indicates that the desired profile is defined by a geometry line, arc, or chain. Select the desired roadway from the options in the button labeled "Geometry".
Station Range	These options define the range where peaks and sags are of interest.
Entire Alignment	Select this option when peaks and sags are of interest on the entire alignment or geometry element that defines the profile.
Station/Station	<p>Select this option when peaks and sags are of interest only on a range of stations. This option is valid only when the selected Reference line type is Roadway.</p> <p>Enter the desired range of stations in the fields labeled "Beg Sta:" and "End Sta:". Alternatively, you can digitize points on the display of the vertical profile to define the range of stations. Press the reset button on the mouse when the range of stations is correct to start the profile selection process.</p>
Filter Points	Check this box when the proximity of desired peaks and sags should be limited.
Station Tolerance	Enter the minimum horizontal spacing of desired peaks and sags.
Elevation Tolerance	Enter the minimum vertical spacing of desired peaks and sags.

First VPoint #	Enter the number of the first VPoint and corresponding first geometry point to be generated.
Profile Characteristics	The type of profile and its key attributes are shown here.
Apply	Click to execute the command. VPoints and geometry points are generated at each enabled peak and sag point within the specified station range.
Reset	Click to restart the profile selection process.
Close	Click to dismiss the dialog box.
Help	Click to display help for this command.

DELETE VPOINTS



This command is used to delete VPoints indicated in a list specified by the user. Optionally, the corresponding IGrds Geometry elements are deleted.

VPoint List	Select with the mouse the VPoints to delete or enter the list via keyboard (e.g., "P23,p45,P2").
Delete Corresponding Geometry Points	Check if the IGrds Geometry point corresponding to each VPoint in the list should also be deleted.
Apply	Click to execute the command.
Reset	Click to erase the VPoint list.
Close	Click to close the dialog box.
Help	Click to display help for this command.