



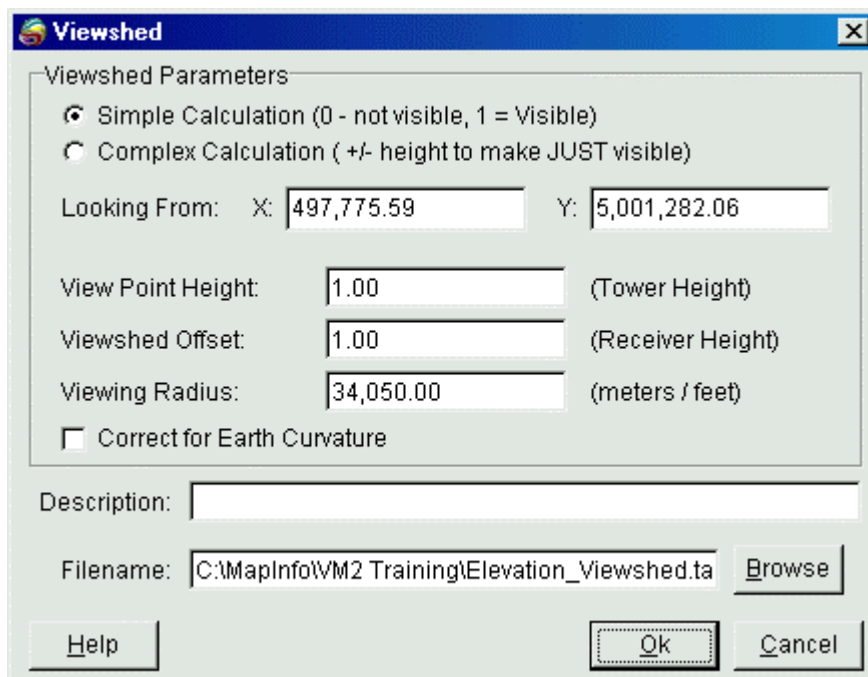
Viewshed

Viewshed is defined as a delineation process identifying all locations on a grid that are visually connected (visible in a direct line-of-sight) to a single observation point. The *Viewshed* function in *Vertical Mapper* computes visibility between one or more observation points (the View Point) and each of the cells in an elevation grid file (the Destination Cells) in one of two ways: as a simple visible/invisible answer for each of the destination cells; or as a computed value representing the height that each destination cell should be raised or lowered to make it **just** visible from the view point.

In other words, if a destination cell is not visible from the view point then a negative value is returned specifying the height below the line of sight. To become just visible this height would have to be added to the destination cell. If the destination cell is visible, then a positive value is returned specifying the height above the line of sight. The view point could be lowered by this height and remain just visible. For an instructional lesson on *Viewshed* refer to Lesson 8 of the *Installation and Tutorials* manual

The *Viewshed* command is designed to work with the *View Point Picker* tool found in the *Vertical Mapper* ButtonPad. The tool is used to identify the View Point from which intervisibility for an entire elevation grid file is calculated or it may be used to select an existing point present in the Map window.

- 1 From the *Vertical Mapper* ButtonPad, select the  tool. Using the left mouse button, select a point in the Map window of the open elevation grid file that will represent the point of origin for the *Viewshed* calculation. Once the point is selected, the *Viewshed* dialogue box will automatically appear.
- 2 Alternately, the user may select the *Viewshed Analysis* command directly from the  drop-down menu. This brings up the *Viewshed* dialogue box immediately followed by a dialogue prompting the user to select a viewing location from the Map window



The screenshot shows the 'Viewshed' dialog box with the following parameters:

- Viewshed Parameters**
 - Simple Calculation (0 - not visible, 1 = Visible)
 - Complex Calculation (+/- height to make JUST visible)
- Looking From: X: 497,775.59 Y: 5,001,282.06
- View Point Height: 1.00 (Tower Height)
- Viewshed Offset: 1.00 (Receiver Height)
- Viewing Radius: 34,050.00 (meters / feet)
- Correct for Earth Curvature

Description:

Filename: C:\MapInfo\VM2 Training\Elevation_Viewshed.ta

- The *Viewshed* dialogue box allows the user to set a number of *Viewshed Parameters* that control the calculation.
 - 1 The visibility values assigned to each cell in the new *Viewshed* grid can be calculated in one of two ways. The *Simple Calculation* creates a classified grid file and assigns either the category “Visible” or “Invisible” to each cell depending upon whether it is visible or invisible from the view point. If multiple view points are selected, each grid cell of the new classified grid is assigned a category “NumVisible_n”, where “n” is the number of view points visible from that cell and will range in value from 0 to the total number of view points used in the calculation.
 - 2 A *Complex Calculation* returns a value measured in grid Z-units. The value represents either the height the cell should be raised to make it **just** visible from the view point (a negative value since it lies below the sight line), or the height that the viewing point could be lowered to become **just** visible from the grid cell (a positive value since it lies above the sight line).
 - 3 The *Looking From* point is the point on the map from which all intervisibility calculations are made (the Viewpoint). The position is determined by entering known coordinates or by using the *View Point Picker* tool.
 - 4 A *View Point Height* value can be entered if, for example, the view point represents an observation or a transmission tower of known height.
 - 5 A *Viewshed Offset* setting allows users to add a height to account for the size of an object that is being viewed. For example, a user trying to measure a line of sight from a transmitting antenna to a receiving car antenna may wish to add a value of 1.5 metres at every grid location to better approximate the true height of the car antenna above the surface of the ground.
 - 6 The *Viewing Radius* is a setting that controls the maximum radius around the view point for which *Viewshed* is calculated.
 - 7 The *Correct for Earth Curvature* check box is selected if the *Viewshed* calculation covers an area of the earth’s surface that is large enough for earth curvature to have an impact on the visual exposure calculation. Line of sight is always a straight line, however, the curvature of the earth will impede straight line viewing over distances greater than 30 kilometres (20 miles). The earth curvature model used in the calculation is a constant radius sphere using the average of the earth’s radius measured at the pole and at the equator.

Note: The *Viewshed* function is only appropriate for use on a grid file which has, as its Z-value, a unit of elevation (feet or metres). If the *Viewshed* command encounters a grid file where the unit type is not recognized as being a unit of elevation measurement, a warning will occur and you will be unable to proceed with the command.