

Intro to V8

1. Introduction

Information in this document is based on the following software versions: MicroStation V8 2004 Edition (08.05.02.35), Geopak 2004 Edition (08.05.02.35), and Office 2003 (with Office SP1).

This document is intended as an introduction of this new software for T.D.O.T. Design Division users who are switching from MicroStation J (V7), Geopak 2001 and Office 97. Changes to current functions and many new functions are described, but not all changes are presented, in the following sections.

General Enhancements

- The maximum physical size of the DGN file is limited only by the disk space available. Some users may have run into this limitation when area patterning large areas. Extremely large files **are not** recommended since processing time for some procedures will increase dramatically.
- There are no restrictions on referencing between 2D and 3D DGN files. It will no longer be necessary to convert Survey topo 3D DGN files to 2D in order to use the information with other plans 2D DGN files.
- MicroStation V8 stores design coordinates in double precision floating point. The use of double precision floating coordinates allows for a high degree of accuracy and a working volume with each axis roughly 2 million times larger than the axes in V7. We will no longer have a problem maintaining bearings on short lines when they are extended.

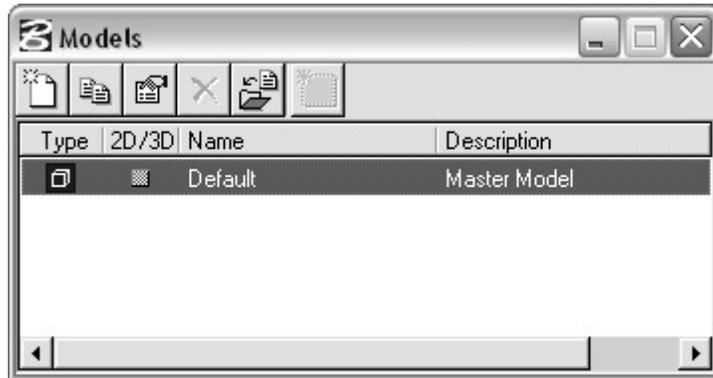
Models

A MicroStation V8 DGN file is composed of one or more models. A model is a container for elements.

When you draw, or place elements, in a MicroStation DGN file, you are creating a model. A model can be either 2D or 3D, and is stored as a discrete object within the DGN file. It may be helpful to think of a DGN file as a box that can contain both 3D and 2D objects, or models, any of which you can view individually.

Cell libraries are DGN files with models for each defined cell. Cells are automatically stored as individual models when created.

When you first create a new DGN file from one of the seed files, this provides the empty container setup with a default model ready for you to create your design. If you use a 2D seed file, then the default setup is 2D, while a 3D seed file defaults to a 3D setup.



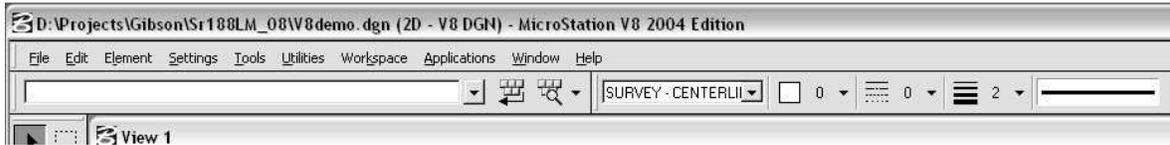
Models in T.D.O.T. Design Division DGN Files

The **Default** model will be used for all DGN graphics except for cells in cell libraries at this time. We are maintaining our project DGN files as done previously with MicroStation J (V7). As the use of MicroStation V8 is incorporated into our work, we may find advantages in expanding the use of models.

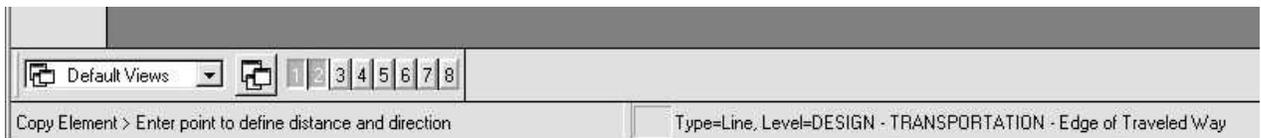
2. MicroStation Interface

Status Bar instead of Command Window

Status Bar in conjunction with Key-in window and Attributes tool bar replace the Command Window as used in MicroStation J (V7).

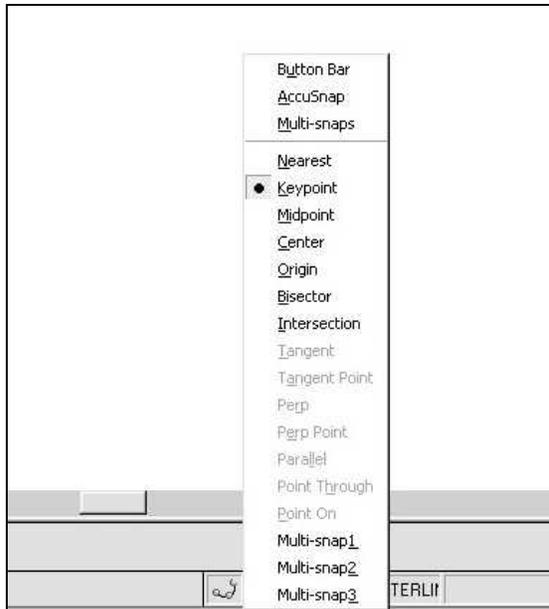


Status Bar displays **Command prompts** and **Messages** on the left of the bar. In the center of the message area just to the left of the word “Type” shown below is the **Message Center**. Click on the bar there to open the Message Center dialog to review previous messages.

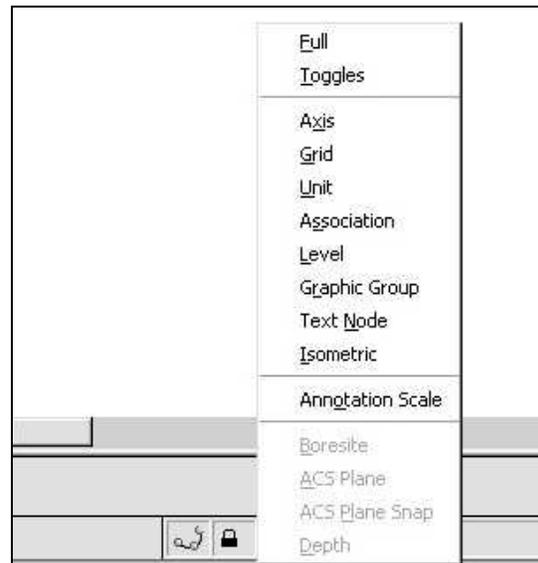


On the far right of the Status Bar are several other fields with pop up menus when you left or right click on them

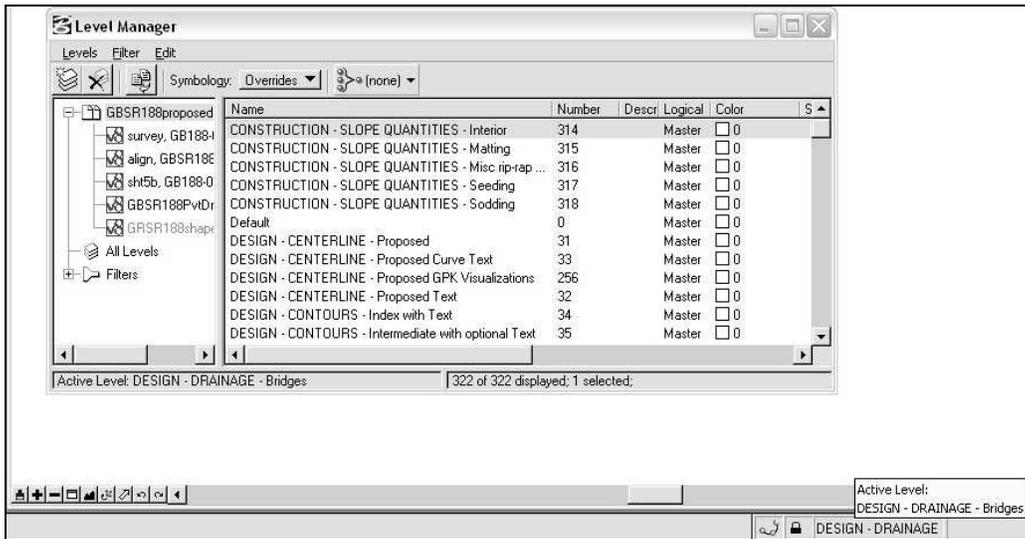
Snaps



Locks

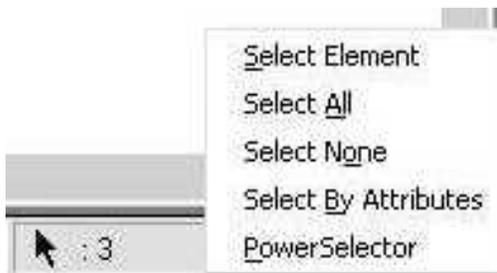


Active Level, when you click on this field the Level Manager dialog is opened.

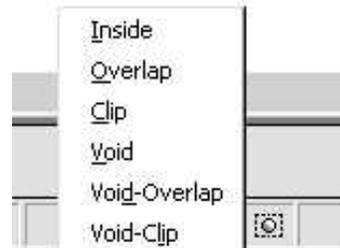


When Selection Sets or Fences are active icons are shown:

Selection Sets



Fence Modes

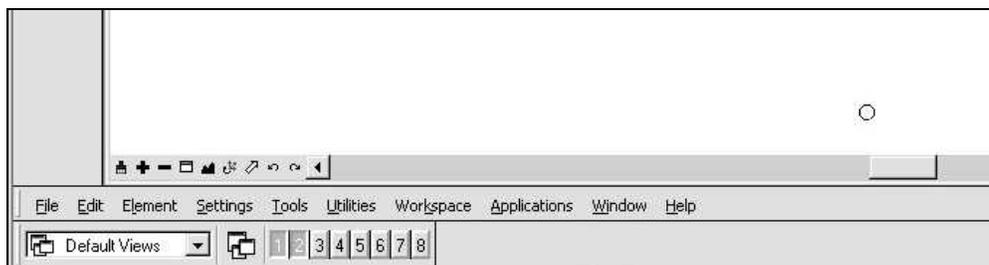


Dockable Menu Bar

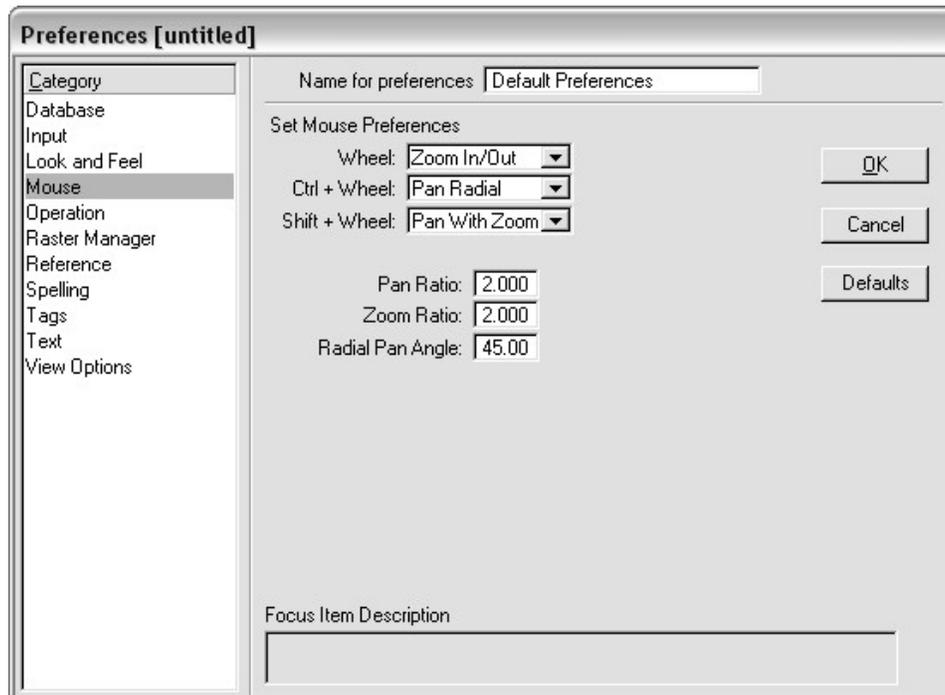
Un-Docked



Docked at bottom



Mouse Control Preferences



Includes several new options for mouse wheel.

Right Clicking to customize Interface

To hide or show a tool

1. Open the tool box that contains the tool icon.
2. Position the pointer within the tool box and right-click.
A pop-up menu opens. Enabled tools are indicated with checkmarks.
3. Choose the pop-up menu item for the tool you want to hide or show.

Dialog Control Options

Many dialogs now include column headers which can be turned on or off to control what is shown in the dialog. Right click on the header bar and choose the pop-up menu item for the column you want to hide or show

3. MicroStation Levels

DGNLIB Files

DGN level library files, **TDOTmain.dgnlib** & **TDOTxsection.dgnlib** are the main source for standard levels, level filters & text styles. T.D.O.T. Design Division DGN seed files have these settings imported into them from those files.

See document file [CADDV8.pdf](#) for further information.

TDOTmain.dgnlib

Name	Number	Used
CONSTRUCTION - SLOPE QUANTITIES - Interior	314	
CONSTRUCTION - SLOPE QUANTITIES - Matting	315	
CONSTRUCTION - SLOPE QUANTITIES - Misc rip-rap headwalls etc	316	
CONSTRUCTION - SLOPE QUANTITIES - Seeding	317	
CONSTRUCTION - SLOPE QUANTITIES - Sodding	318	
Default	0	
DESIGN - CENTERLINE - Proposed	31	
DESIGN - CENTERLINE - Proposed Curve Text	33	
DESIGN - CENTERLINE - Proposed GPK Visualizations	256	
DESIGN - CENTERLINE - Proposed Text	32	
DESIGN - CONTOURS - Index with Text	34	
DESIGN - CONTOURS - Intermediate with optional Text	35	
DESIGN - DRAINAGE - Bridges	49	
DESIGN - DRAINAGE - Bridges and Cross Drains Size Text	50	
DESIGN - DRAINAGE - Cross Drains	257	
DESIGN - DRAINAGE - Side Drains - 42 Inches and greater	259	
DESIGN - DRAINAGE - Side Drains - less than 42 Inches	258	
DESIGN - DRAINAGE - Special Ditches	260	
DESIGN - DRAINAGE - Storm Sewer	51	
DESIGN - DRAINAGE - Text	52	

TDOTxsection.dgnlib

Name	Number	Used
Default	0	
DESIGN - DRAINAGE - Ditch Bottom Point	51	
DESIGN - DRAINAGE - Special Ditch Width Text	52	
DESIGN - DRAINAGE - Structures Linework	49	
DESIGN - DRAINAGE - Text	50	
DESIGN - EARTHWORK - Excavation Limit Lines	59	
DESIGN - EARTHWORK - Shapes	29	
DESIGN - PROFILE - Private Drive Vertical Curve Text	33	
DESIGN - ROW - Linework	45	
DESIGN - ROW - Text	46	
DESIGN - SCRATCH - User 1	30	
DESIGN - SHEET - Corner Text	62	
DESIGN - SHEET - Light Grid	63	
DESIGN - SHEET - Linework	61	
DESIGN - SHEET - Plot Shape	28	
DESIGN - SURFACE - Bridge Surface Construction Lines	43	
DESIGN - TYPICAL - Bench Elevation Text	35	
DESIGN - TYPICAL - Bench Slope Text	37	
DESIGN - TYPICAL - Bench Width Text	36	
DESIGN - TYPICAL - Bridge Deck Median Barriers	42	

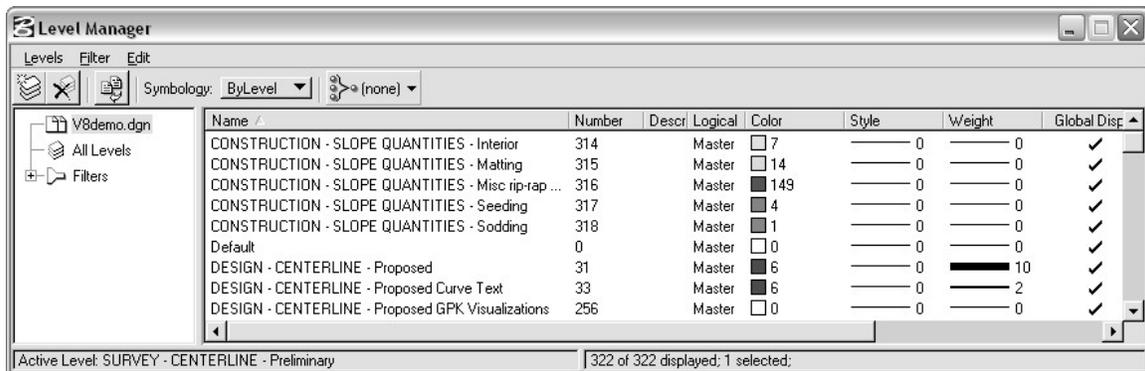
V7 Levels vs. V8 Levels

The most notable change in MicroStation V8 is the expanded level structure. Several old MicroStation J (V7) levels have been expanded to multiple levels. This will allow more precise control on what is shown on our plans sheets as well as providing more flexibility when developing those plans.

Most old V7 levels still contain the same type of data they did previously and as such are still included on the sheets where they were used in V7. One exception to this are the levels for profile graphics which are now on all new levels. A special level filter is provided that includes both V8 and V7 levels for profile graphics so that you do not have to move those graphics to their new levels.

Level Manager

Level Manager is used to manage level names, level filters and other level definitions. Users should use Level Display for general control of levels. That tool is described with some detail in the next section. Users may use Level Manager to control special level symbology settings.



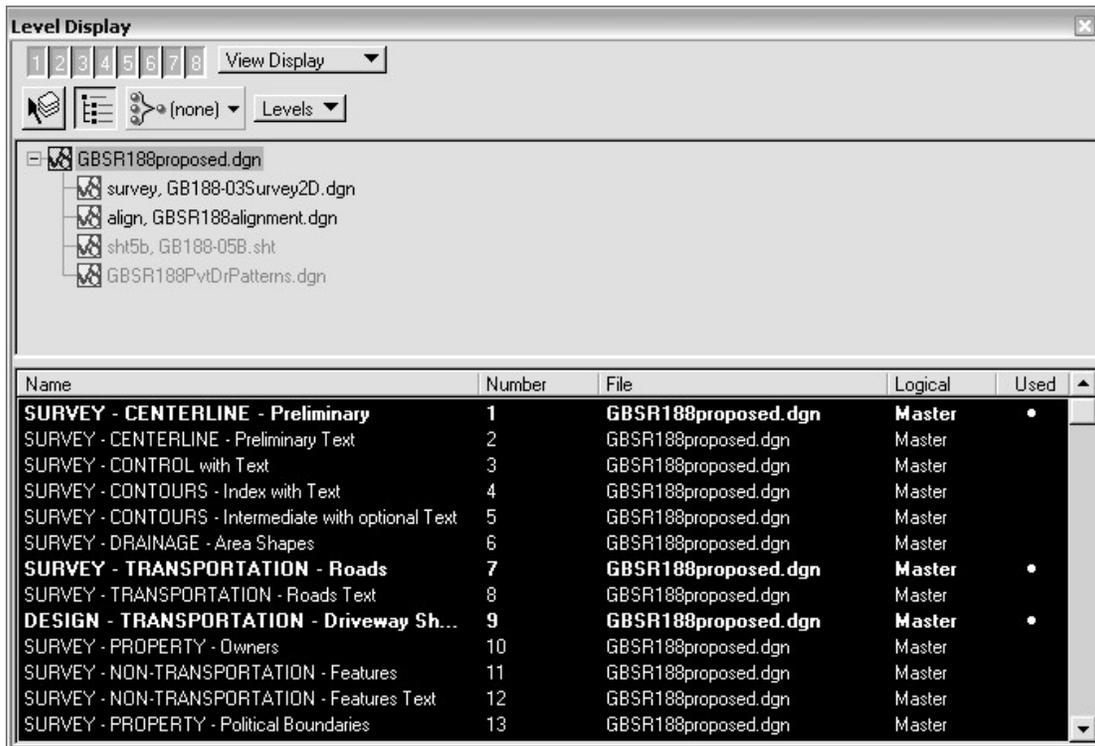
ByLevel Symbology

MicroStation V8 provides ByLevel symbology to define symbology based on the level. The Attributes tool bar is shown below with ByLevel attributes set.



In the Level Manager dialog switch mode from ByLevel to Overrides in order to set or use old style Level Symbology to supersede normal element displays.

Level Display



Level Display mode

Sets the operating mode for this dialog box

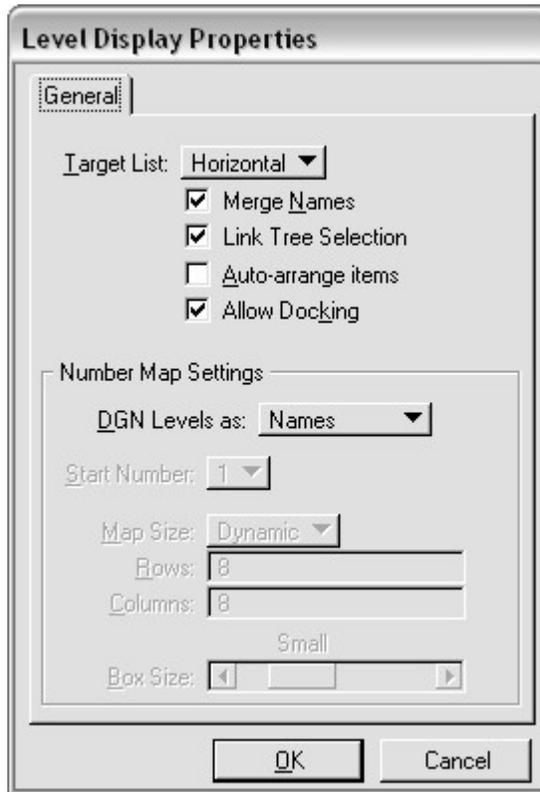


- View Display** Changes in the level display affect the chosen view in the active model. Recommended for general application.
- Global Freeze** Changes in the level display affect all views in all models in the open file. When Global Freeze is on, elements on the frozen levels **are not displayed** and **cannot be printed** (plotted).

The Global Freeze setting also affects references. If a level is frozen, any references on it are not displayed, and cannot be printed or plotted.
- Global Display** Changes in the level display affect all views in all models in the open file.

Properties

Right click in dialog area near top.



Target List

Sets the orientation of the Level Display dialog box. The Target Tree is the DGN file list including the master DGN file and its reference files.

Horizontal Sets the Level Display dialog box to display the Target Tree above the list box.

Vertical Sets the Level Display dialog box to display the Target Tree on the left and the list box on the right side.

Merge Names

When multiple targets are selected, only unique level names are displayed. For example, if 10 instance of the same level name exists that level name will only appear once.

Link Tree Selection

Links the actions of the Level Manager and the Level Display dialog box.

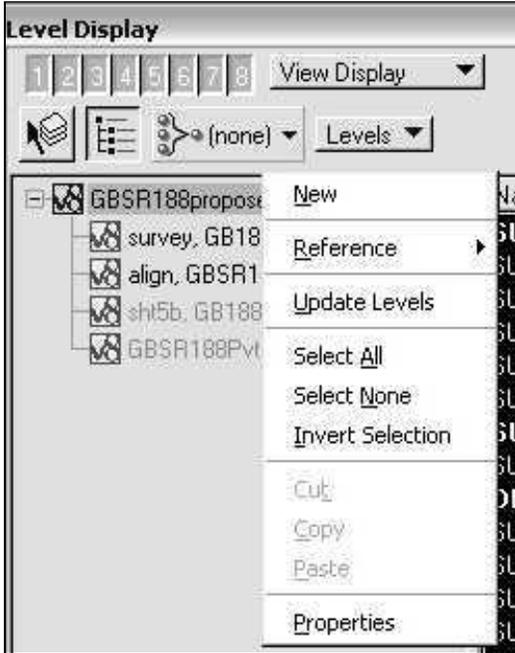
Auto-arrange items

If on, icons in the tool bar wrap when the dialog box is resized.

Allow Docking

If on, the next time you open the Level Display dialog box, it will be available for docking.

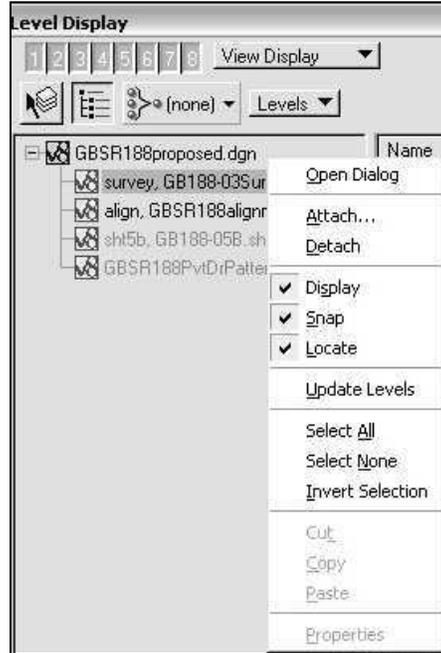
Additional Right Click Options Master DGN



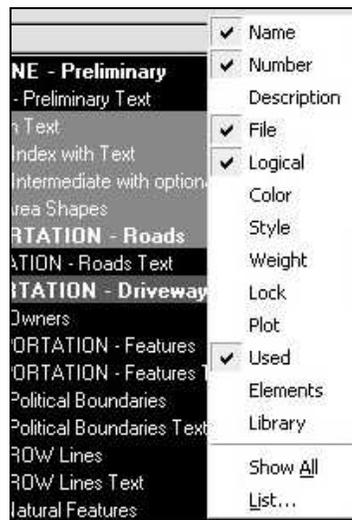
Levels area



Reference DGNs

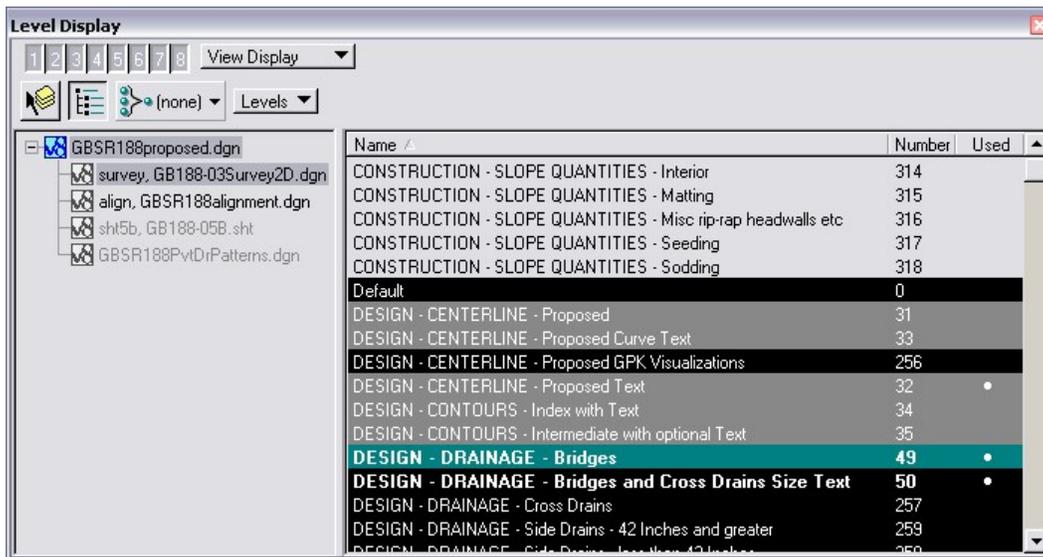


Level Header List

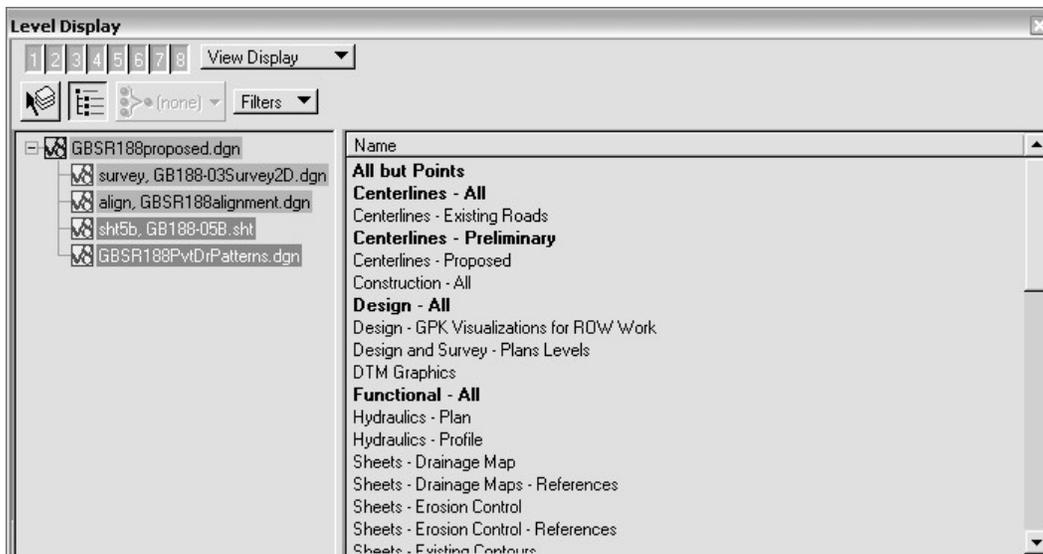


Levels Color Coding

Green	active level
Black	level display is on
Background Gray	level display is off
Dark Gray	level display is off in at least one view or file
Dimmed Gray	level is globally off
Bold	level contains graphics
Not Bold	empty level



Level Filters



Using Level Filters for Level Display Control

The screenshot shows a CAD software interface with a plan view of a road design. The road is labeled "PROP. S.R., 188". It features two bridges: "REG. PROP. BRIDGE STA. 115+02.00" and "END PROP. BRIDGE STA. 116+22.00". The road has various curves and limits of construction. The Level Display panel is open, showing a list of levels. The "Proposed Layout" level is selected and highlighted in black.

Level Display

1 2 3 4 5 6 7 8 View Display

Filters (none) Filters

Name
GB108A~1.DGN
survey, GB188-03Survey2D.dgn
align, GBSR188alignment.dgn
sht5b, GB188-05B.sht
GBSR188PvtDrPatterns.dgn

Using Level Filters for Level List Control

The screenshot shows the Level Display panel with a detailed list of levels. The "DESIGN - DRAINAGE - Bridges and Cross Drains Size Text" level is selected and highlighted in black.

Level Display

1 2 3 4 5 6 7 8 View Display

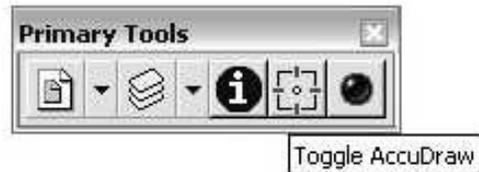
Design Levels

Name	Number	Used
DESIGN		
DESIGN - CENTERLINE - Proposed	31	•
DESIGN - CENTERLINE - Proposed Curve Text	33	•
DESIGN - CENTERLINE - Proposed GPK Visualizations	256	
DESIGN - CENTERLINE - Proposed Text	32	•
DESIGN - CONTOURS - Index with Text	34	
DESIGN - CONTOURS - Intermediate with optional Text	35	
DESIGN - DRAINAGE - Bridges	49	•
DESIGN - DRAINAGE - Bridges and Cross Drains Size Text	50	•
DESIGN - DRAINAGE - Cross Drains	257	
DESIGN - DRAINAGE - Side Drains - 42 Inches and greater	259	
DESIGN - DRAINAGE - Side Drains - less than 42 Inches	258	
DESIGN - DRAINAGE - Special Ditches	260	
DESIGN - DRAINAGE - Storm Sewer	51	
DESIGN - DRAINAGE - Text	52	
DESIGN - EROSION CONTROL - Devices	58	
DESIGN - EROSION CONTROL - Devices Text and Legends	261	
DESIGN - PROFILE - Drainage - Bridges Drains and Ditches	262	
DESIGN - PROFILE - Drainage - Bridges Drains and Ditches Text	263	

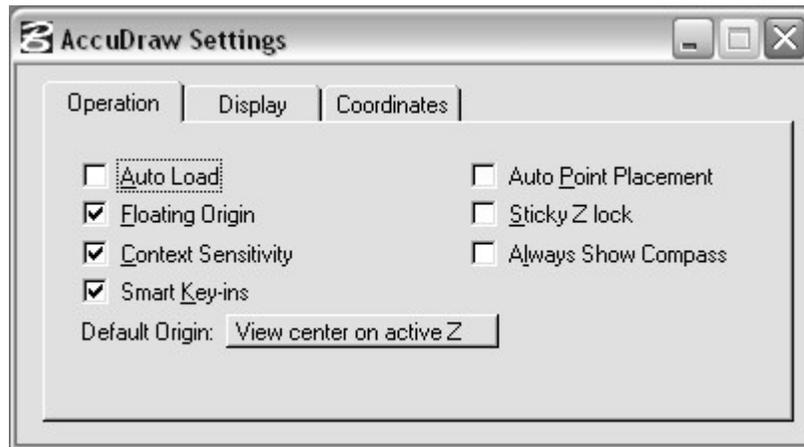
4. MicroStation Tools

AccuDraw

Temporarily disable from **Primary Tools** bar

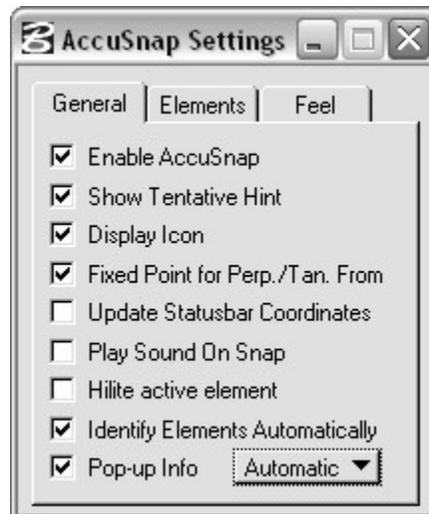


Prevent **Auto Load** from drop down option **Settings>AccuDraw**

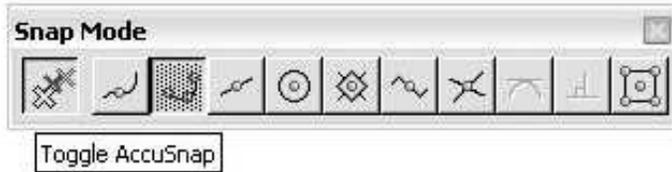


AccuSnap

From the Status Bar Snap options, **AccuSnap Settings** opens

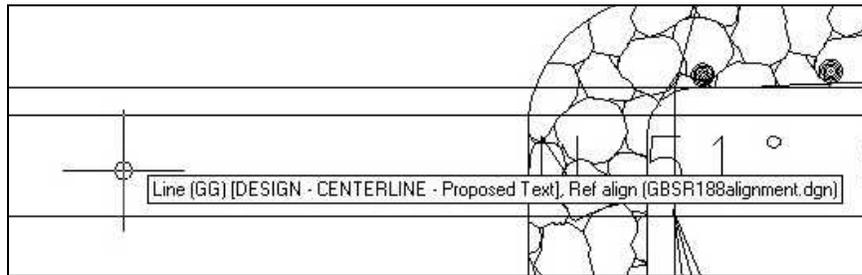


From Button Bar



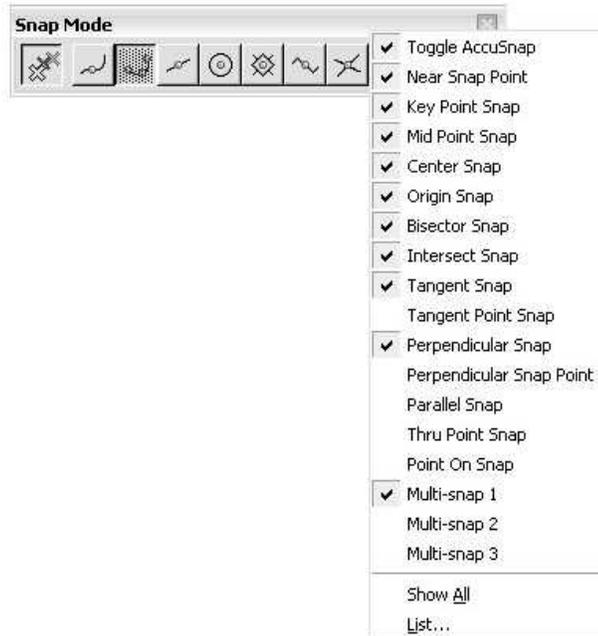
Great tool except in large crowds of graphics. To change settings from button bar, right click and choose **Properties**.

Another function controlled with AccuSnap is **Pop-up Info** which displays element information when the cursor pauses over the element.



In **Automatic** mode, AccuSnap must be turned on for pop up info to appear. In **Tentative** mode it appears whenever you tentative snap to an element.

Right Click on the Snap button bar to control what snap options are shown.



Multi-Snaps

This function provides the ability to do various types of snaps in a specific order. To change settings from button bar, right click and choose **Properties**. From the Status bar choose option **MultiSnaps**.

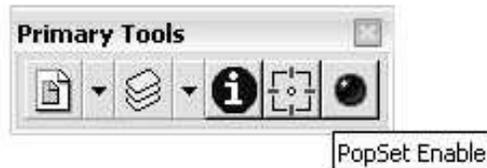
Right click in the settings dialog to set order of snaps to be used.



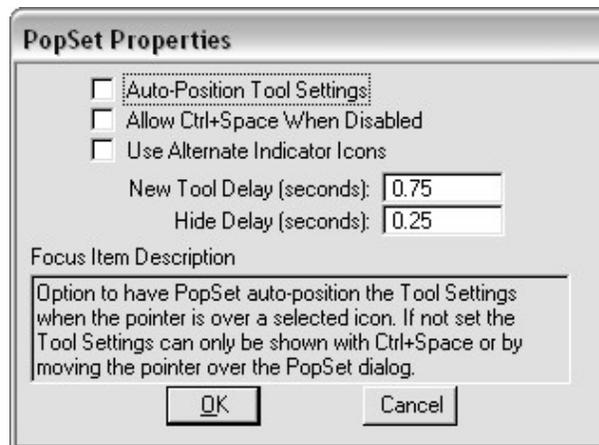
3 MultiSnap set ups are available for use, MultiSnap 1, MultiSnap2 & MultiSnap3 from button bar or Status Bar

Pop-Set

Used to make the tool settings dialog pop up when over the active command icon and then go away after time specified in its properties dialog. Green color indicates PopSet is on and red indicates that it is off.



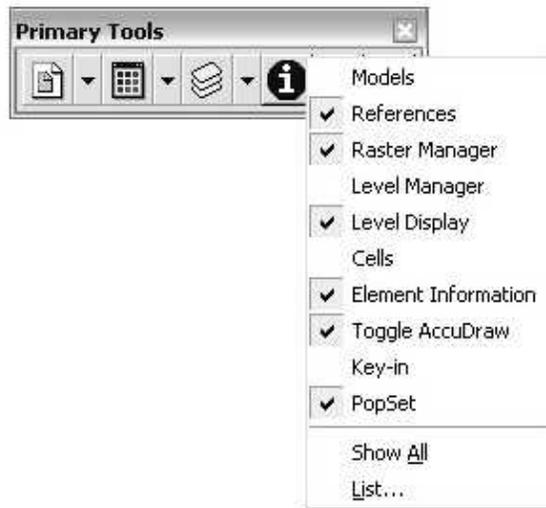
Right click over PopSet and choose **Properties** to set controls.



Alternate Indicator Icons include + or – to show status as off or on.

Primary Tools

Right Click on Primary Tools to control what icons are shown

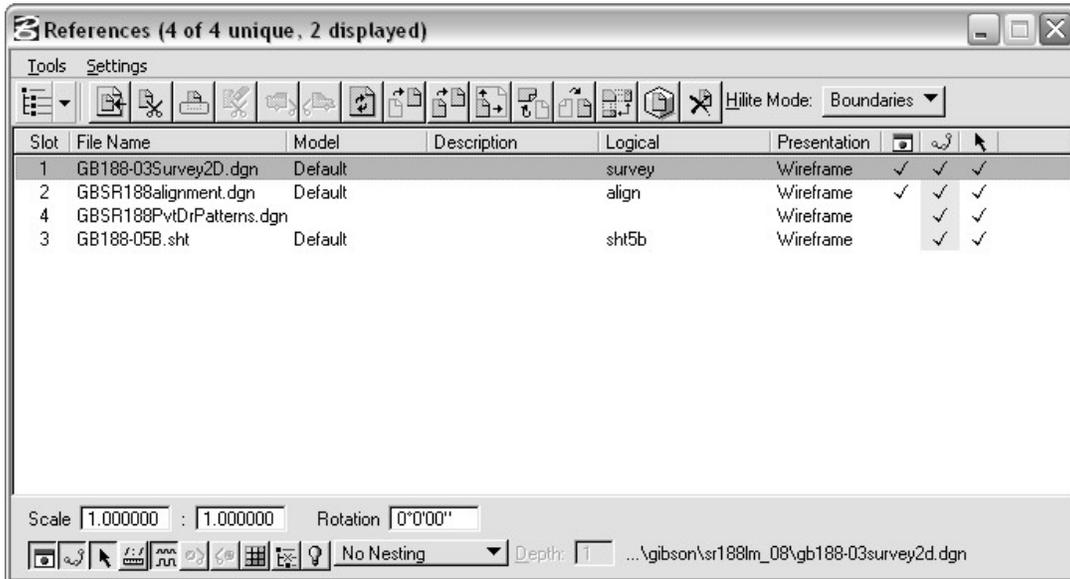


Pop-Up Dialogs are available from down arrows on Primary Tools. Dialog remains up as long as cursor does not pass across a view window which releases the dialog. Clicking on the regular command icon opens the dialog in the regular manner where they remain opened.



Reference Dialog

Now includes all reference tools as icons at top of dialog.



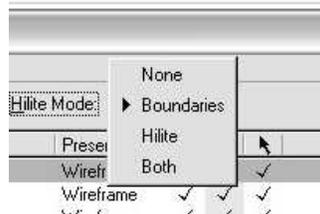
Hilite Modes

None — Displays the reference without a dashed border or highlighting.

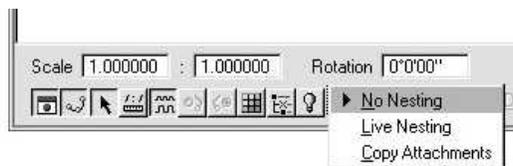
Boundaries — Places a dashed border around the reference.

Hilite — Highlights references.

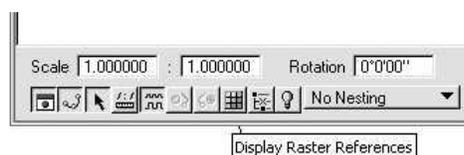
Both — Places a dashed border and highlights the reference.



Nesting and other attachment settings

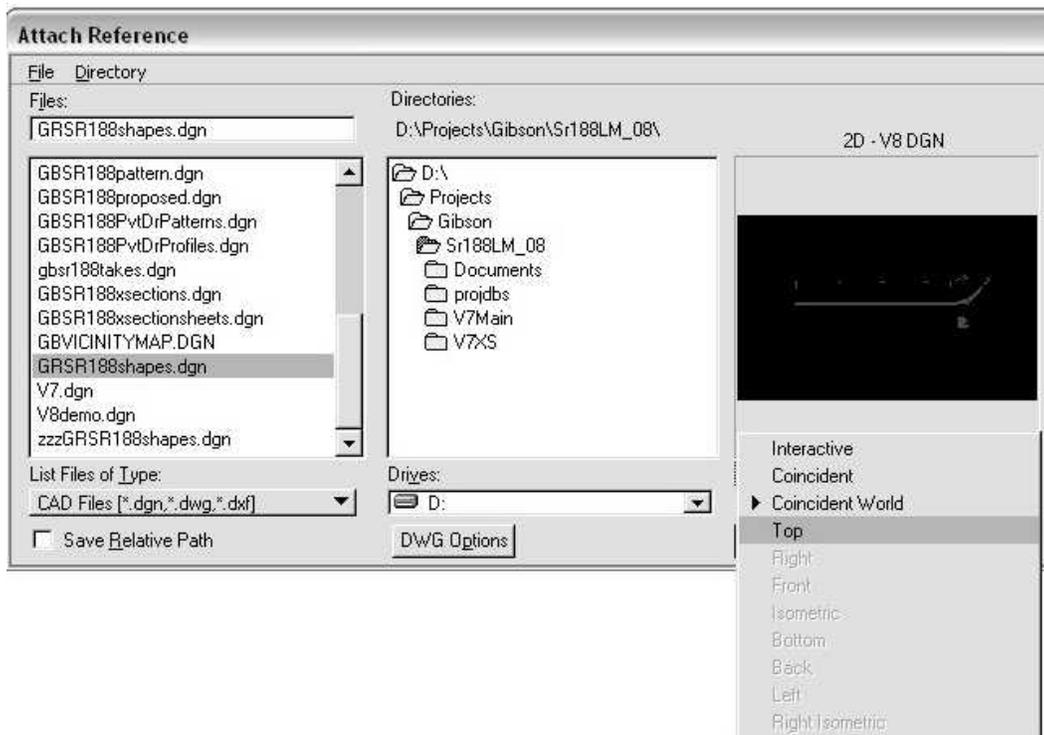


To control display of nested raster references, click on the Display Raster References icon.



Attachment Modes:

- Interactive** To attach through the Reference Attachment Settings dialog box. Similar to the attachment procedure with MicroStation J(V7). Use this method when attaching saved views as references.
- Coincident** To align the reference with regard to design plane coordinates only
- Coincident – World** To align the reference with the active model with regard to both Global Origin and design plane coordinates.



Attachment modes also include all standard view orientations such as Top for 2D or 3D and Right, Front, etc. for 3D.

Clip Boundary now includes option to clip with Element instead of Fence.



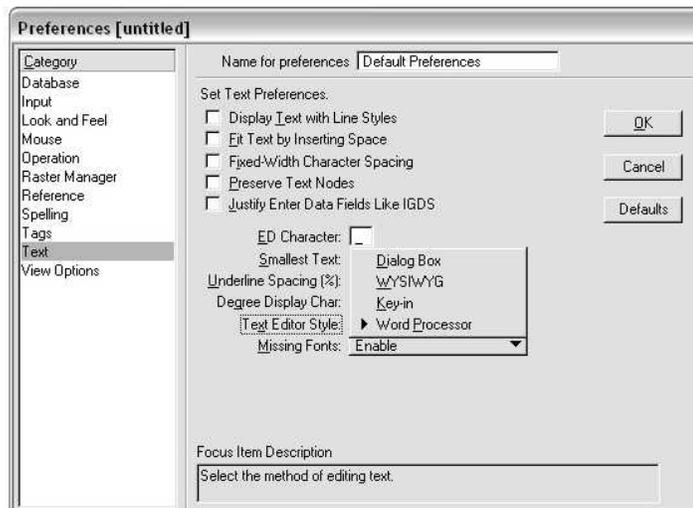
Text Editor

It is recommended that users **not** set text styles in the Tool Settings dialog when placing new text. When set in this manner, MicroStation only sets the color and the standard text size for 50 scale sheets. The correct weight and level **are not** set.

Instead use the **Text Styles Plus** program which activates text styles and sets the active level, color and weight. This is described in the T.D.O.T. Interface section of this document.

Text Editor Window Styles

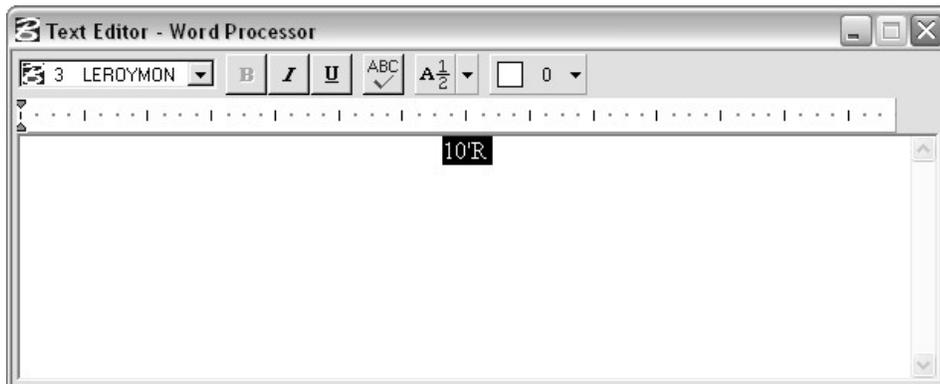
- Word Processor The word processor is the default format. Recommended for use.
Dialog Box The window format as used in previous versions of MicroStation.
WYSIWYG The WYSIWYG Quick Edit window. Includes keypad in dialog
Key-in The Key-in window.



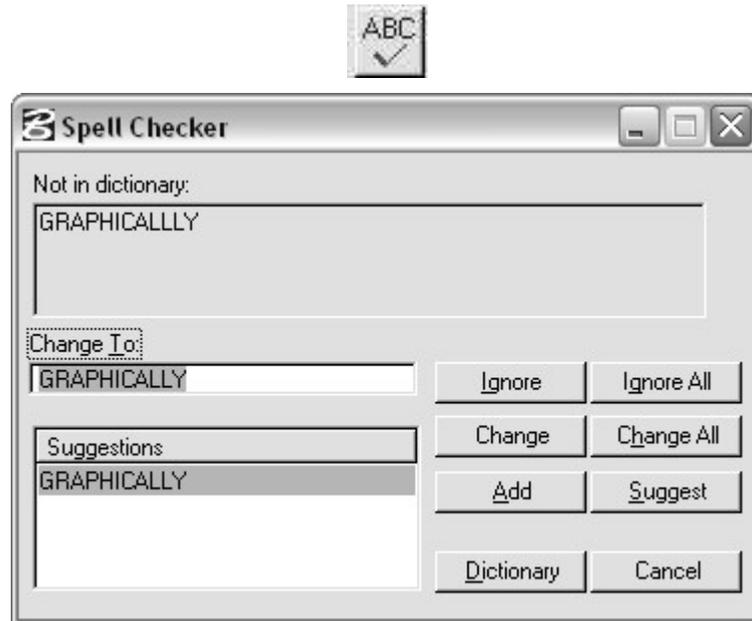
Editing Text

Text string is marked when editor opens. To completely replace simply start typing. Otherwise use cursor to click in area for change.

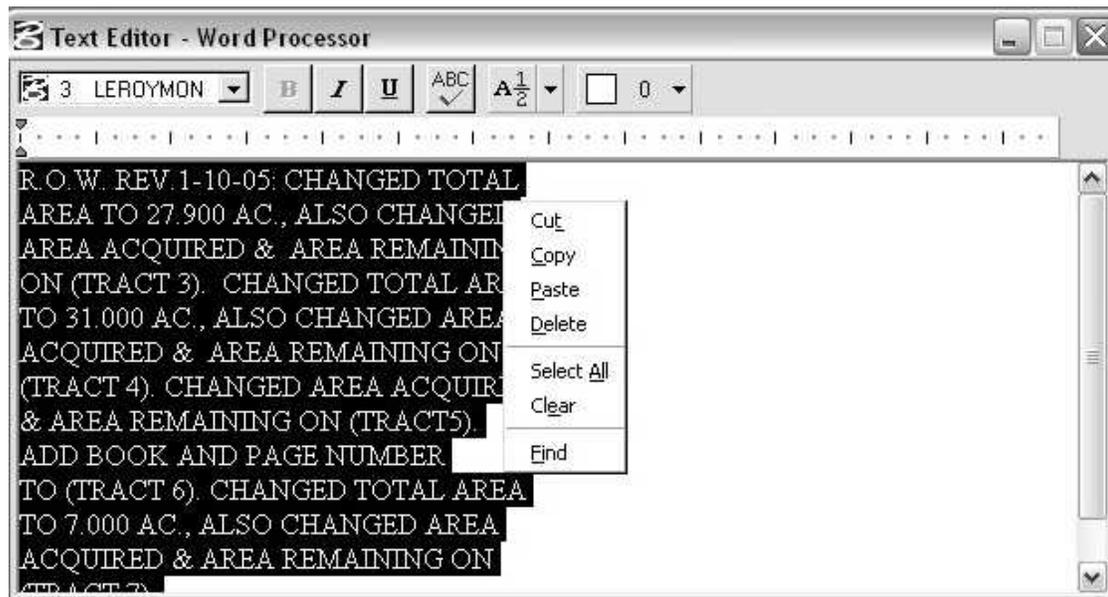
Data point in view to apply changes. This data point can select another text element for editing.



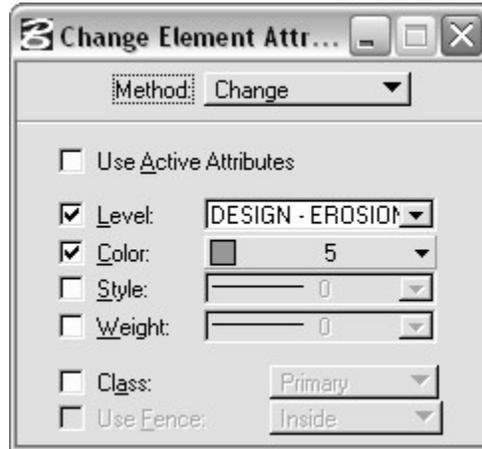
The Word Processor style of text editor includes a Spell Checker. Just click on the ABC icon at the top of the dialog.



Right click options within text editor window.



Change Element Attributes



Method sets whether you want to Change or Match and Change selected element attributes.

It is no longer necessary to reset the current active attributes to change an element's symbology, etc. but those settings can still be used if desired.

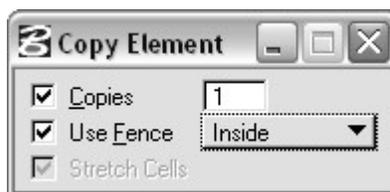
If Use Active Attributes is on while using the Match/Change mode the active attributes are changed to the element's attributes selected to match.

Match attributes “fromcursor”

The new keyword **fromcursor** can be used with the match key-in command to match any or all of an existing element's attributes by merely hovering the pointer over the element and entering the key-in. To best take advantage of this enhancement, assign key-ins of this form to a function key. **AccuSnap must be enabled to use these keyins.**

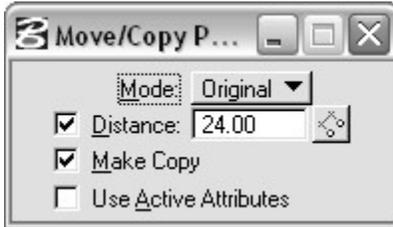
1. With AccuSnap enabled, hover the pointer over the element whose level and attributes you want matched.
2. Key in MATCH ELEMENT FROMCURSOR.
All element attributes are changed to that of the highlighted element.

Copy Element



Command now includes number of copies option. Distance from original controls spacing of copies. If fences mode is set to Stretch, Stretch Cells control is enabled.

Move\Copy Parallel



Mode

Determines the method by which the gap created, by moving two connected elements to a parallel location, is filled such as with Line Strings or Complex Chains.

Miter Extends or shortens connecting segments while maintaining the angle of their connections.

Round Fills the gap with a rounded arc between the two moved elements.

Original Fills the gap in the same manner as the MicroStation J (V7) implementation of this tool; the resulting element is the same type as the original element.

For some element types — for example, ellipses — Original does not produce a true parallel offset. With an ellipse Miter or Round results in a B-spline, a true parallel offset, rather than an ellipse.

Distance

If on, sets the distance to move.

Define Dist(ance)

Clicking the Define Dist button lets you define the distance to move, graphically with two data points. When you have defined the distance, the Distance setting is turned on automatically and the defined distance value is displayed in its field.

Use Active Attributes

If on, the moved or copied element takes on the active attributes.

If off, the moved or copied element retains the attributes of the existing element.

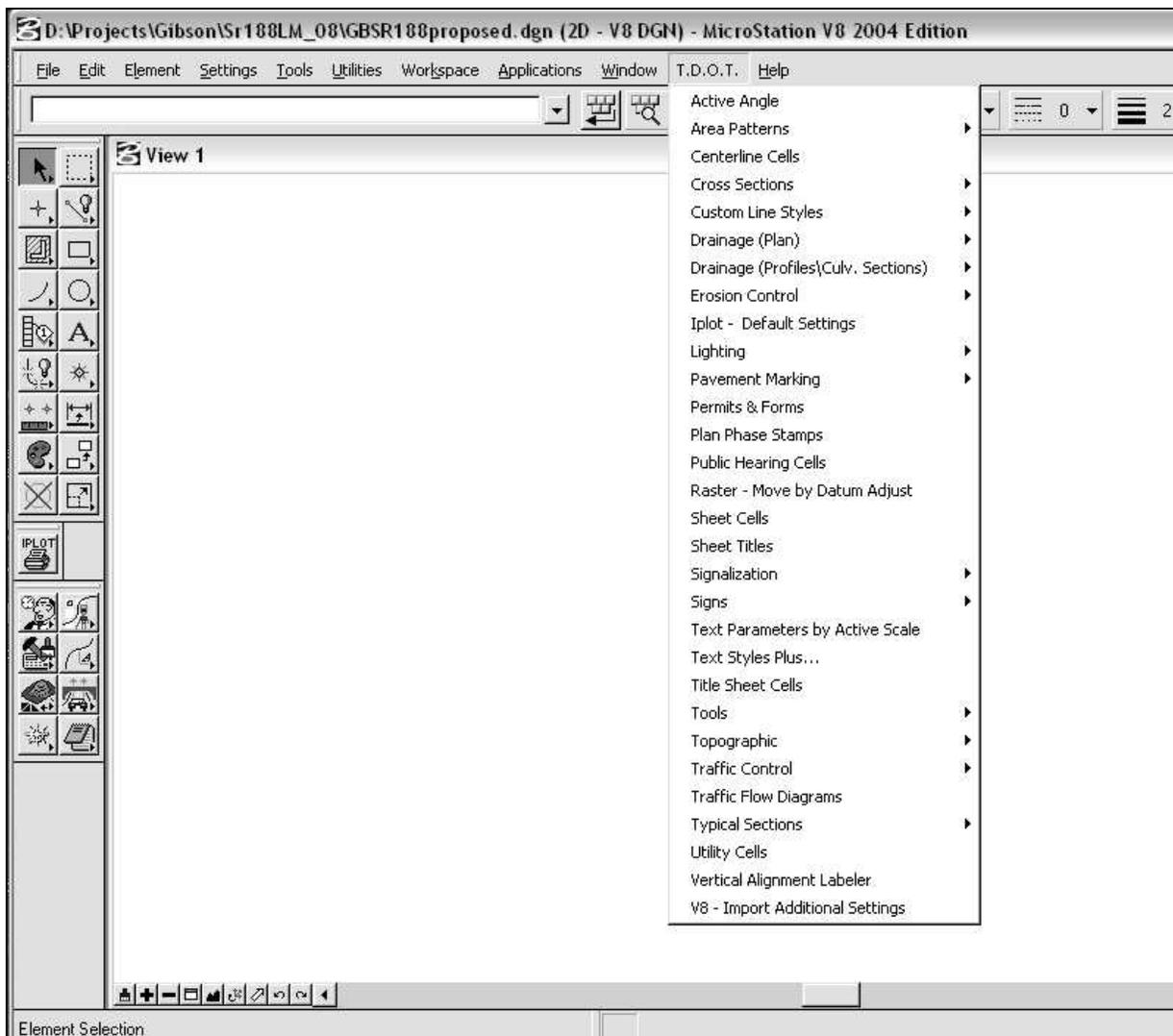
5. TDOT Interface

New MicroStation visual basic applications have been developed to provide access to cells and to perform other customized functions. These programs and other functions now available from MicroStation & Geopak replace the old T.D.O.T. Design Division tutorial system and the UCM programs used to run it.

Note that with V8 this interface is set up separately from the default MicroStation interface so to use it , go to MicroStation Manager and set the **Interface** in option at bottom to **TDOT**.

T.D.O.T. Drop Down Menu

This menu provides a quick way to access most of the Design Division's customized functions. Options now access new MicroStation visual basic applications.

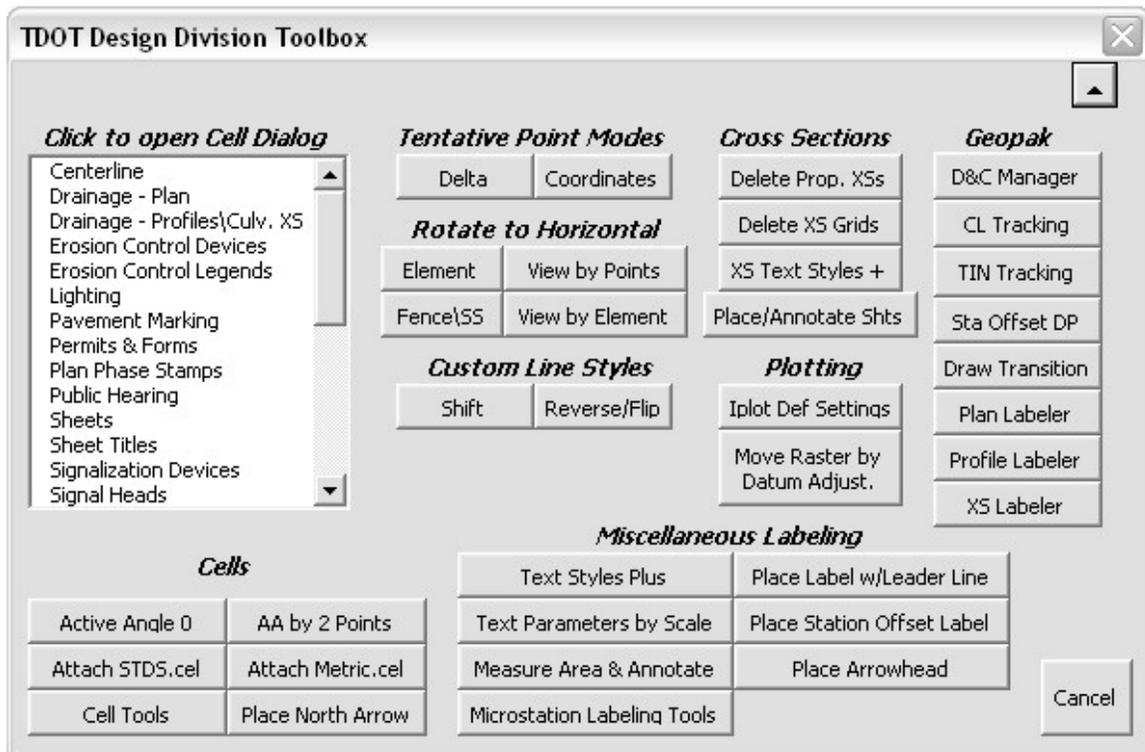


The following sections describe some of the programs available through the TDOT interface. See document [TDOTDesignDivisionPrograms.pdf](#) for information on all functions.

TDOT Design Division Toolbox

This program\dialog provides access to many of the tools, commands and functions used most often by T.D.O.T. Design Division personnel.

It is an alternative to access of them through the TDOT interface drop down menu or Geopak's D&C Manager. Essentially this tool box is a combination of the old Tools and Main tutorials used in MicroStation J (V7).

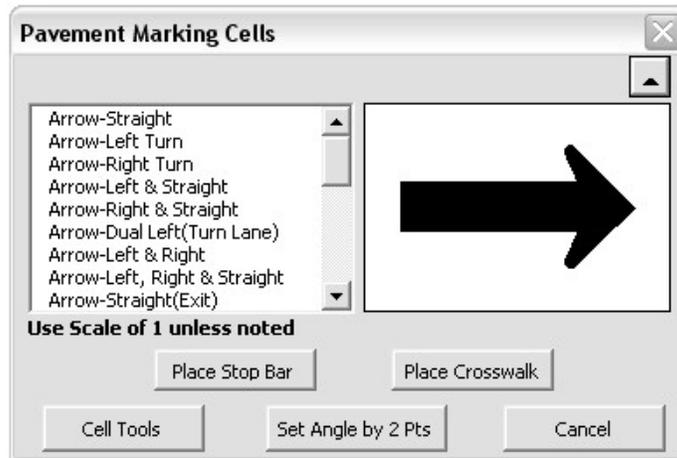


The TDOT Design Division Tool Box is available from MicroStation menu bar at **T.D.O.T.>Tools>Design Division Tool Box**

or from Geopak's D&C Manager at **Drafting Standards > Tools > Design Toolbox**

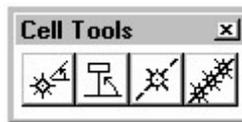
Cell Dialogs

All cell dialogs are in the same basic format, a cell pick list by description on the left with a viewing window on the right. At the bottom of the dialog are the Cell Tools option and other special programs that might be needed or used in conjunction with these cells. A “window shade” minimize button is located on the upper right.



Scroll down the cell list and pick any cell. That cell is made active and the Place Cell command is started. Adjustments can be made for angle and scale in the tool Settings dialog prior to placing cell as needed using these basic controls.

Click on the **Cell Tools** button in the cell dialog. This opens MicroStation’s Cell Tools tool box



These are special cell placement tools including:

- | | |
|------------------------|--|
| Place Cell & Rotate | places cell by data point with dynamic rotation
(includes default angle used if a Reset is given) |
| Place Cell On & Rotate | places cell on an element with dynamic rotation
(includes default angle used if a Reset is given) |
| Place Cell On | places cell on an element at specified angle
(cuts hole in element) |
| Place Cell Along | places cell along an element at specified spacing, offset
and angle |

Signs

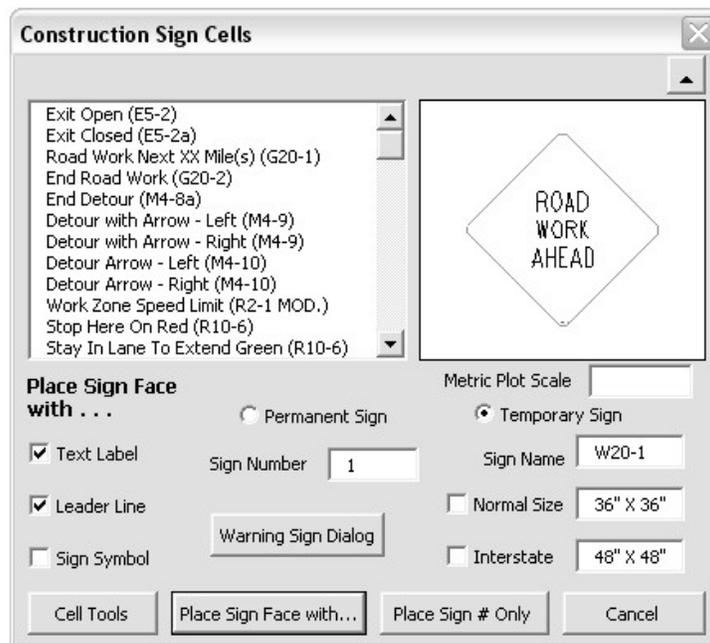
Sign face cell dialogs are somewhat further customized from regular cell dialogs. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including a text label, leader line and sign symbol (single post & face).

Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement.

A command button is provided to place permanent sign # only.

Since English sign face cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset in the DGN file to match the specified plot scale.



The Highway Route Sign Cells dialog also includes a text entry field to automatically fill in the route number on the sign face when placed with the **Place Sign Face with ...** command.

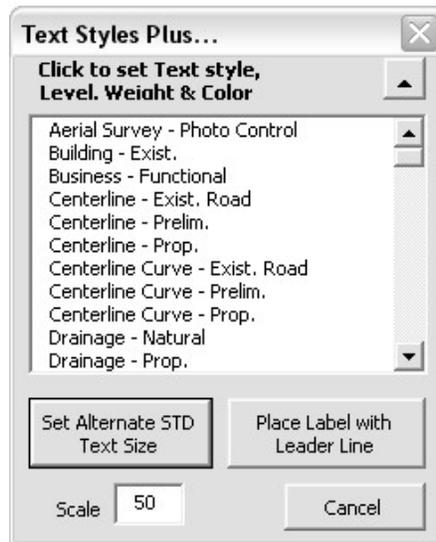
Signs are available in the following groups: **Blank Signs, Construction, Highway Route, Regulatory, School, Tennessee and Warning**. Some signs are found in more than one group to accommodate the users work

Text Styles Plus

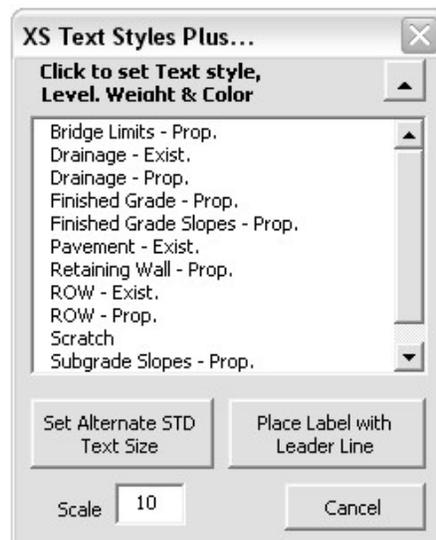
This program activates text styles and sets the active level, color and weight. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the text size in conjunction with the standard size associated with the text style.

A command button is provided to access T.D.O.T. Design Division MicroStation Basic macro which is used to set any standard text size based on scale (command button: Alternate STD Text Size).

A command button is provided to access the Place Label with Leader Line vba program.



Since cross sections use a separate level structure from the rest of the T.D.O.T. Design Division DGN files, a special version of this program is provided named **XS Text Styles Plus**.



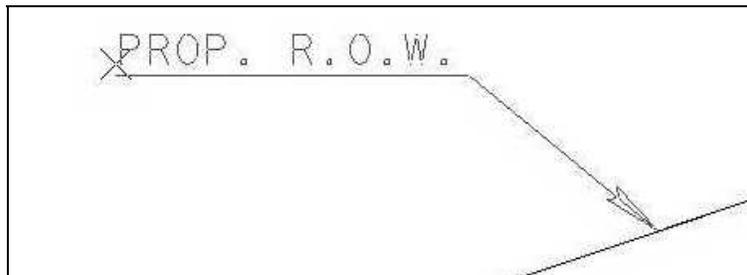
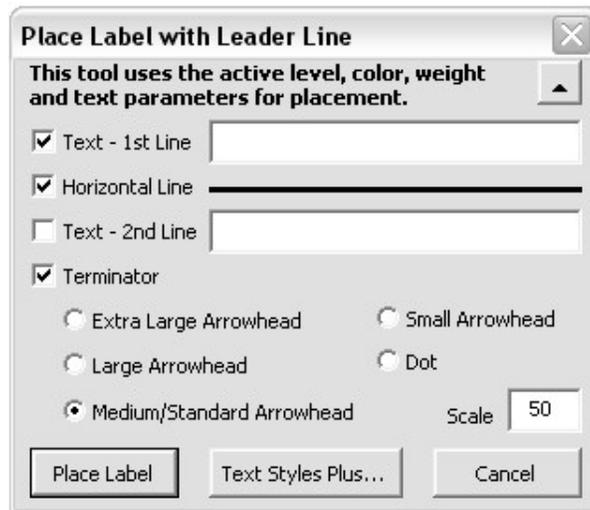
Place Label with Leader Line

This program places general labels with leader lines. Options include 1 or 2 lines of text, horizontal line and choice of terminators including arrowheads or a dot. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the terminator cell scale when included. Graphics are placed at the current active level, symbology & text parameters. All label graphics are combined in a graphic group for easy movement or deletion.

The most efficient use of this tool is in conjunction with the Text Style Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

ALL options on the dialog can be adjusted on the fly as the label is placed.

This tool can be used without the placement of text to simply place a leader line. If a horizontal line is included without text then the length of the line is set at 10 character widths of the current text size.

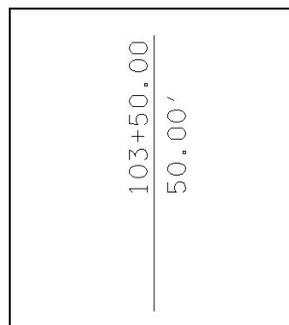
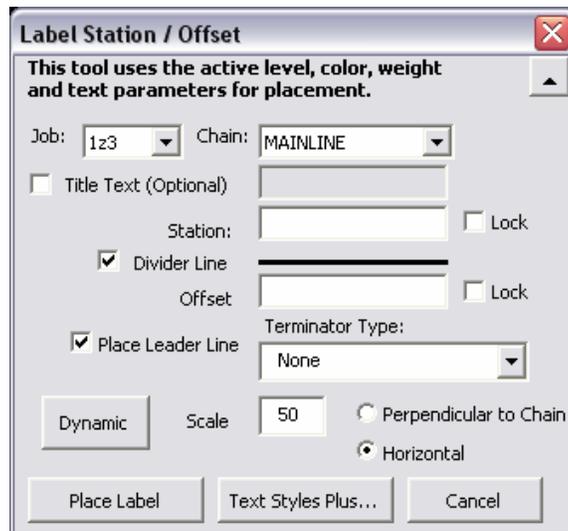


Label Station / Offset

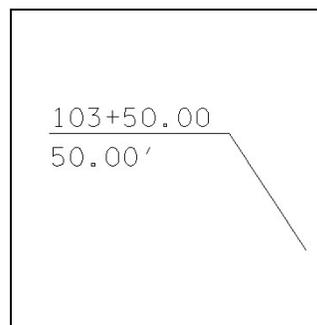
This program places a station and offset label based on a data point, or a station and offset keyed in by the user with the Geopak job number and chain name. Options include title text, line separating station and offset, leader line and choice of terminator including arrowheads or a dot. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the terminator cell scale when included. Graphics are placed at the current active level, symbology & text parameters. All text and the divider line are combined in one graphic group and the leader and terminator combined in another.

The most efficient use of this tool is in conjunction with the Text Styles Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

Label can be placed as a flag or perpendicular to the horizontal alignment.



Perpendicular to Chain



Horizontal with View

After using this tool, the job number and chain name are remembered and will be used to populate those fields when the dialog is opened again as long as the previously defined job number is found in the current active folder.

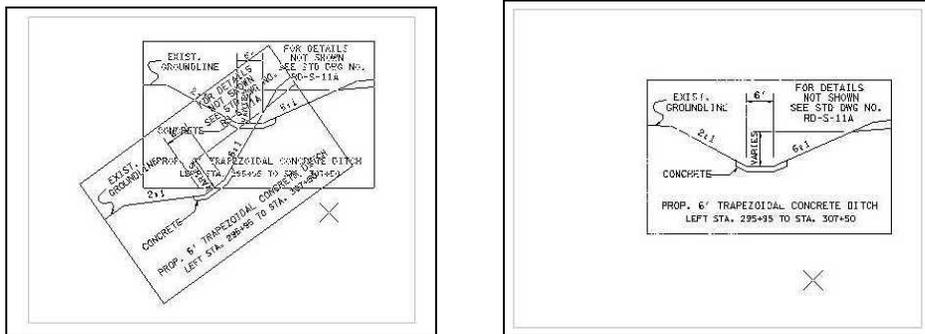
This tool can be used simply as a horizontal alignment tracking device with dynamic mode without placing labels.

Rotate Fence/Selection Set Horizontal

This program is much like the old command but now rotates fence contents or selection sets horizontal to the view based on 2 points which define the desired horizontal. One other change in functionality, graphics in a fence are shown dynamically during rotation to make it easier for correct placement by the user.

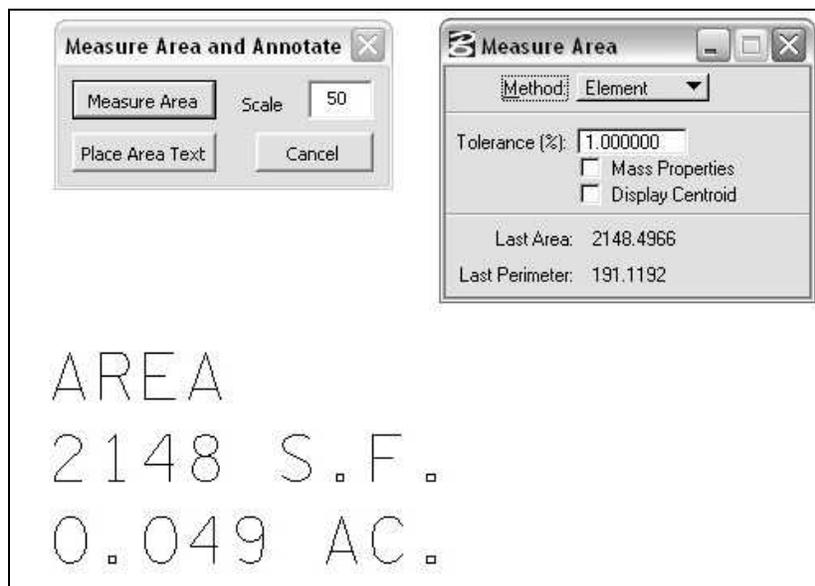
A fence or selection set must be active at the time the command is accessed. If both are present then the fence is processed

This is an alternative to the Rotate Element to Horizontal vba program for groups of un-associated elements as well as for element types not supported by that command.



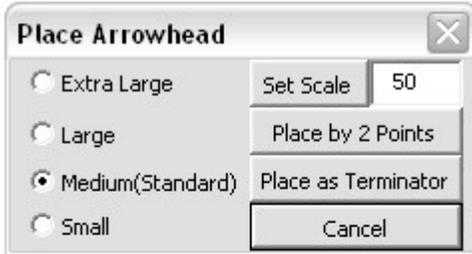
Measure Area and Annotate

The main change from the old program is that users are no longer restricted in the ways in which the area can be calculated. Any method available with MicroStation's Measure Area command can be used. Once you are satisfied with an area that has been calculated, simply click on the Place Area Text button to place the area text label. Area text is given in square feet & acres for English files and in square meters, square feet, hectares & acres.



Other New Tool Dialogs

Most tools include prompts which will appear in the message fields on the Status Bar. Others also include dialogs for users to enter control values and settings.



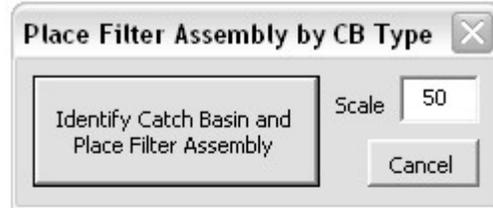
Place Arrowhead [X]

Extra Large Set Scale 50

Large Place by 2 Points

Medium(Standard) Place as Terminator

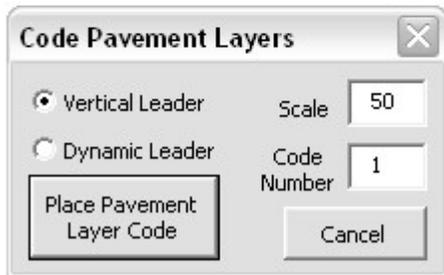
Small Cancel



Place Filter Assembly by CB Type [X]

Identify Catch Basin and Place Filter Assembly Scale 50

Cancel



Code Pavement Layers [X]

Vertical Leader Scale 50

Dynamic Leader Code Number 1

Place Pavement Layer Code Cancel



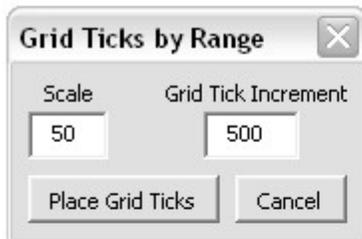
Place Crosswalk [X]

Standard - Parallel

Longitudinal

Width 6

Place Crosswalk Cancel

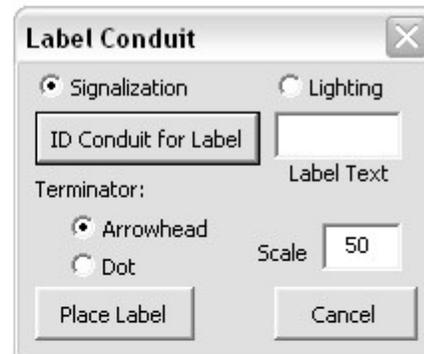


Grid Ticks by Range [X]

Scale Grid Tick Increment

50 500

Place Grid Ticks Cancel



Label Conduit [X]

Signalization Lighting

ID Conduit for Label Label Text

Terminator:

Arrowhead Scale 50

Dot

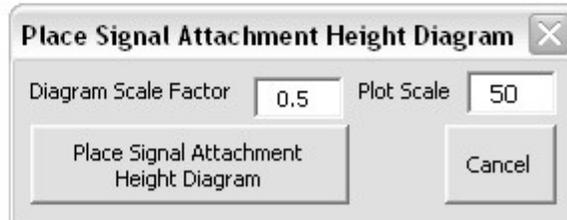
Place Label Cancel



Place Mast Arm by Length [X]

Mast Arm Length 0

Place Mast Arm Cancel



Place Signal Attachment Height Diagram [X]

Diagram Scale Factor 0.5 Plot Scale 50

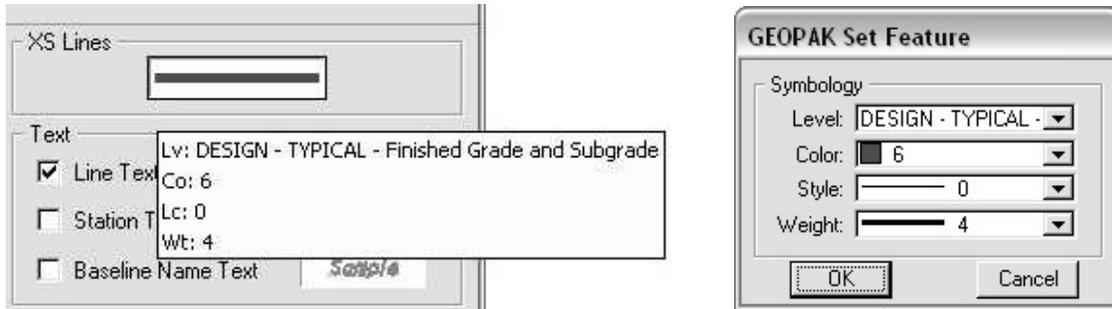
Place Signal Attachment Height Diagram Cancel

6. Geopak

The Geopak Road training manual for T.D.O.T. Design Division personnel, **TDOTGEOPAKRoadCourseGuide.pdf**, has been updated for V8 and now follows our standard workflows more closely. That document, along with the class files, are available from the CADD V8 web page at

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_design/design/v8/v8design.htm

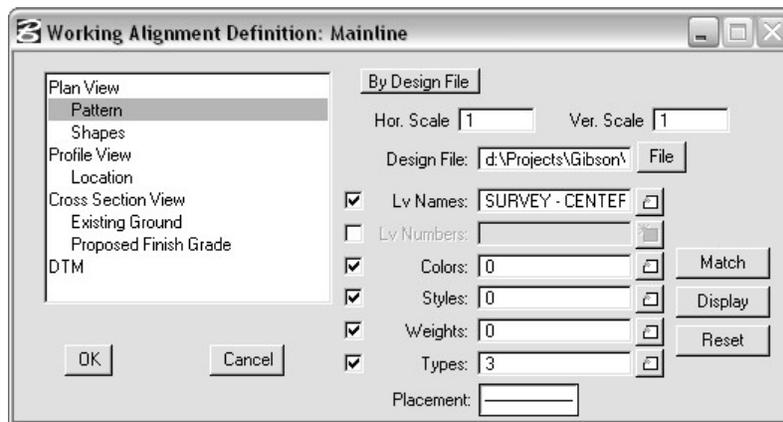
Symbology Control Settings



Several symbology control areas now make use of a symbology display window. Double clicking in the window opens the **Geopak Set Feature** dialog.

NOTE: Due to the way this functions within Geopak, if you open a file which does not include the level that is specified, the level is automatically changed to the Default level. To avoid this problem, simply close cross section dialogs before going to non-cross section DGNs or avoid checking your pattern line settings under the working alignment while you are still in the cross section DGN.

Working Alignments



In the **Define** dialog of Working Alignments there has been one change. Under **Pattern & Existing Ground** there is now a separate symbology set up for **Placement**. The symbology controls shown in the dialog are used for search functions when trying to find the items. The symbology review window identified as Placement controls the symbology if new instances of these items are placed. For our workflows both symbology set ups would be the same usually.

COGO

New Navigator Icon

All icons for navigators throughout Geopak have been changed to this icon.



Dialog Icons

Several of the icons on the COGO dialog have been revised but except for COGO Navigator icon they really haven't changed dramatically.



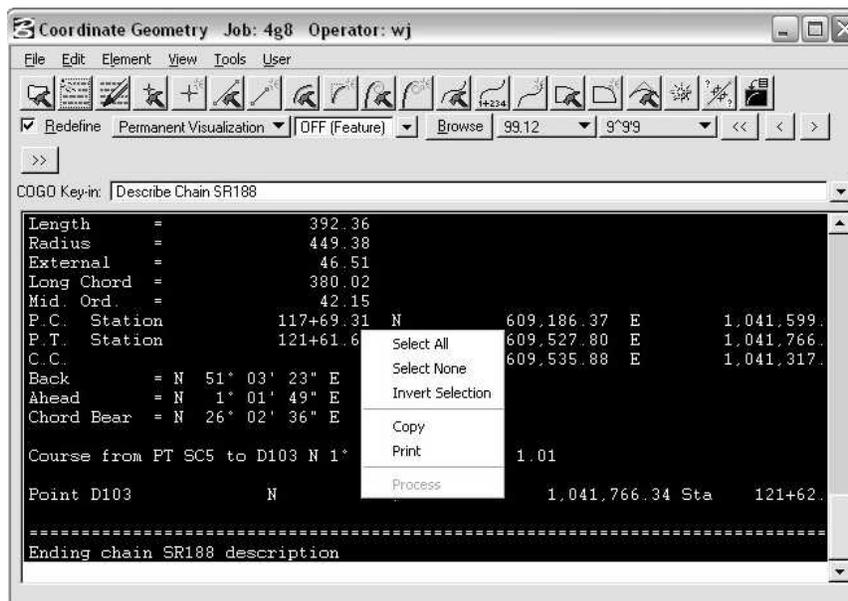
All element list, print, delete commands have been combined onto element Utility tools including: **Point Utility, Curve Utility, Line Utility, Chain Utility, Parcel Utility, Profile Utility**. Their new icons are the ones with the hammer.

Note: Most Design Division users use **COGO Navigator** to do these functions, so if you would like to remove the Utility tools from the icons shown on the COGO dialog go to **View>Icons>Customize This Group** and click off the Element Utility options.

Also now available from the COGO dialog are direct connections to the accuracy settings in user preferences for **Distance** and **Angle** values.

Print from Output Window

You can now print directly from the COGO output window. Select what you want printed or right click and choose Select All and then right click and pick the Print option.



Horizontal Alignment tools

Place P.I. Alignment

The new **Place PI Alignment** tool enables the user to create, review, or modify PI based alignments in a table format. The various fields in the table can be manually changed. New PI points can be added. Existing PI points can be moved or deleted. Another tool removes curve overlaps. During a session the PI alignment is shown dynamically on the screen.

Curves can be modified with several dynamic options:

- dynamic PI location
- dynamic pass thru point
- curve / spiral properties

Tangents can also be modified in several options:

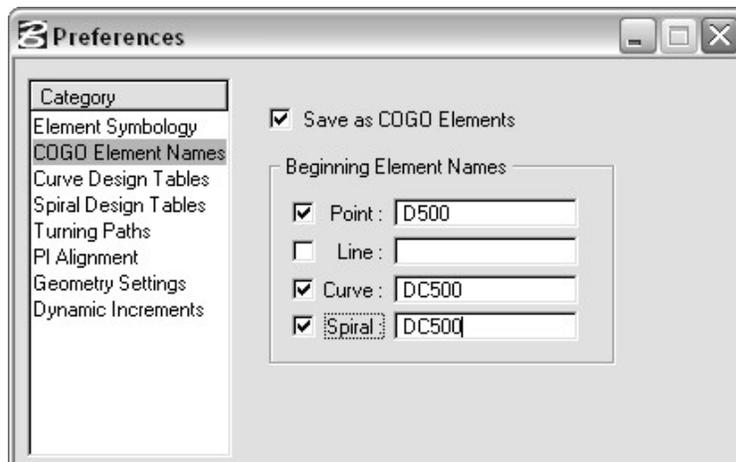
- direction
- distance
- distance tangent segment

To access this new tool open the Horizontal Alignment tool menu. From the drop down it's **Applications>Geopak Road>Geometry>Layout Alignments Horizontal**.

This tool does not modify existing curves & spirals. When these are changed and the alignment is saved, new curves are created. In fact, even if they are not changed, saving the alignment will cause them to be recreated. Points & Chains are modified/re-defined.

Set PI Alignment Preferences

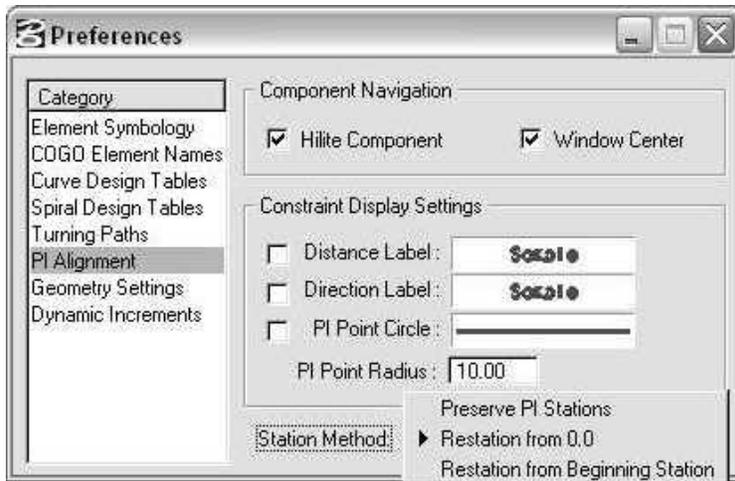
Under drop down option **File>Preferences** first set the **COGO Element names** which will be used for new elements created. At this time, the Place PI Alignment tool **does not** use the values shown for curves and spirals. Rather it uses the chain name and adds **_(#)** to name curves.



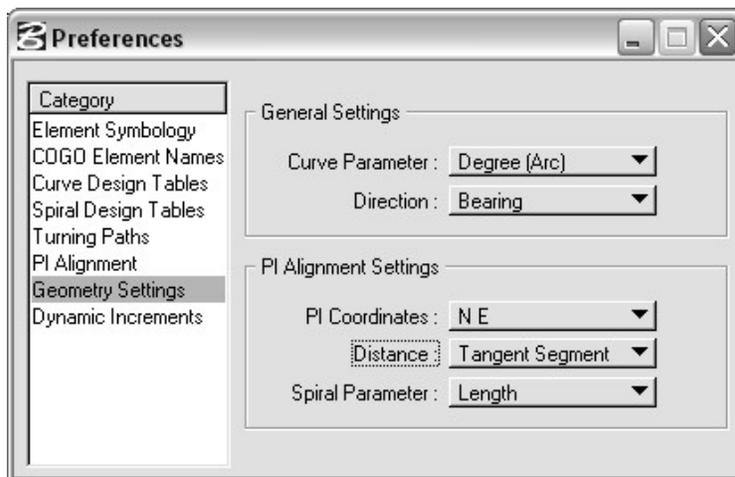
Second set the **PI Alignment** preferences. The most critical of these settings is the **Station Method**. It's options include:

- Preserve PI Stations **Not** recommended for our work in most cases. Whenever any modification is made, equation points are generated after all curves.
- Restation from 0.0 Recommended for new alignments and modification of existing alignments.
- Restation from Beginning Station This setting can be used when saving your new or revised alignment.

If you are getting ready to use the Place PI Alignment tool set Station Method to **Restation from 0.0**.

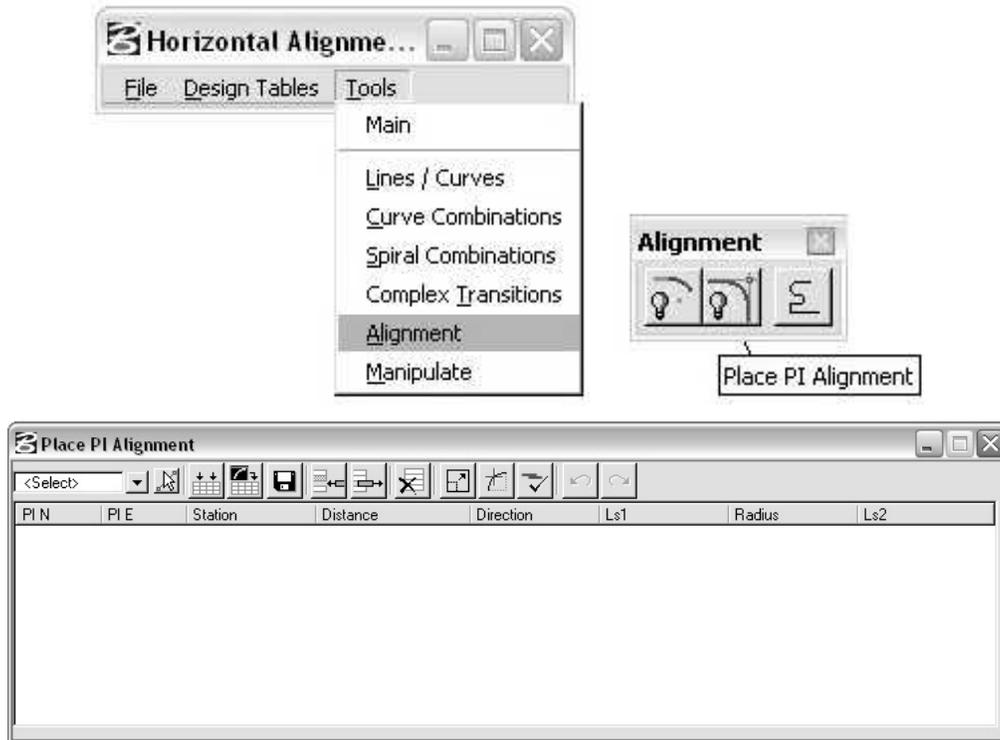


Under **Geometry Settings** make sure the following settings are made.



Place P.I. Alignment Dialog

To access this new tool go to the drop down option **Tools> Alignment**. This will open the **Alignment** tool bar. **Place PI Alignment** is the icon showing a PI with sub-tangents.



The following list describes the icons/commands available across the top of the dialog.



Select Chain from list ,or by the icon, graphically pick the chain / alignment. Click icon, then select one element of a visualized chain.



After the chain has been specified, clicking this button loads the chain into the list box.



Load Graphic Element to Table, allows the user to pick a graphic element to build an alignment from. This data will **replace** any data currently in the list box. Examples might be a line, line string, arc or complex chain.



Saves the chain.



Insert a PI Point - Highlight a PI or tangent line in the list box, then click. This creates a new PI with the same values as the one before it and should always be followed by data pointing its location in the MicroStation view.



Delete a PI Point - Highlight a PI line in the list box, then click.



Clear Alignment Table – Be Careful ! this clears the list box completely.



Move Element - click and dynamically move the highlighted alignment element



Modify Curve Radius - click and dynamically set curve radius.



Check Overlaps - If two curves or spirals are overlapping, the overlap is removed.



Undo & Redo. During modification of an alignment the dialog might need to be “refreshed”. Just click Undo and then Redo to re-display table values

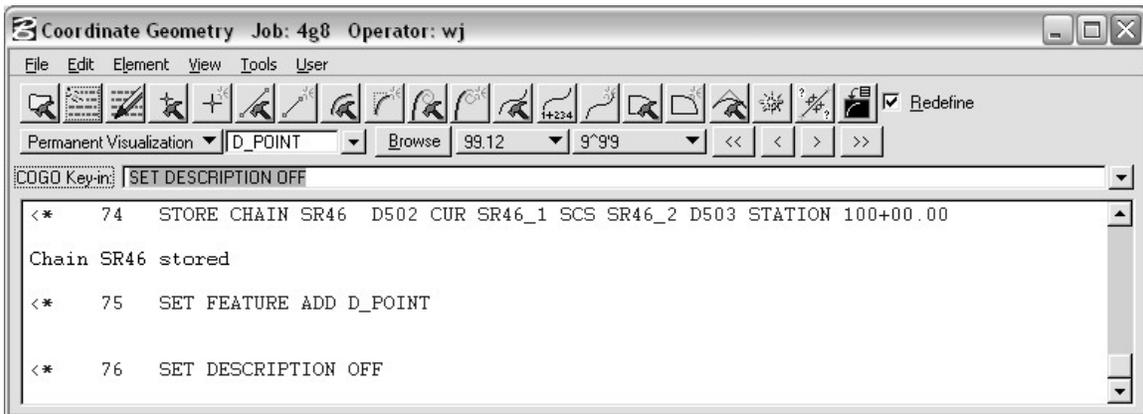
When using this tool to set up a new chain, the first PI will have the coordinates 0,0 or if other alignment work has just been done, perhaps the coordinates from the last PI change. Due to this oddity it is recommended that you ignore this PI and when setting the next PI, set it at the true beginning of your alignment and go on from there. When all PIs are set, click on the line for the first PI which is not needed and click on the Remove PI button. You could edit the coordinates or try to move it but this work around seems the simplest.

New chain set up in progress, notice there is no chain name or station values ...

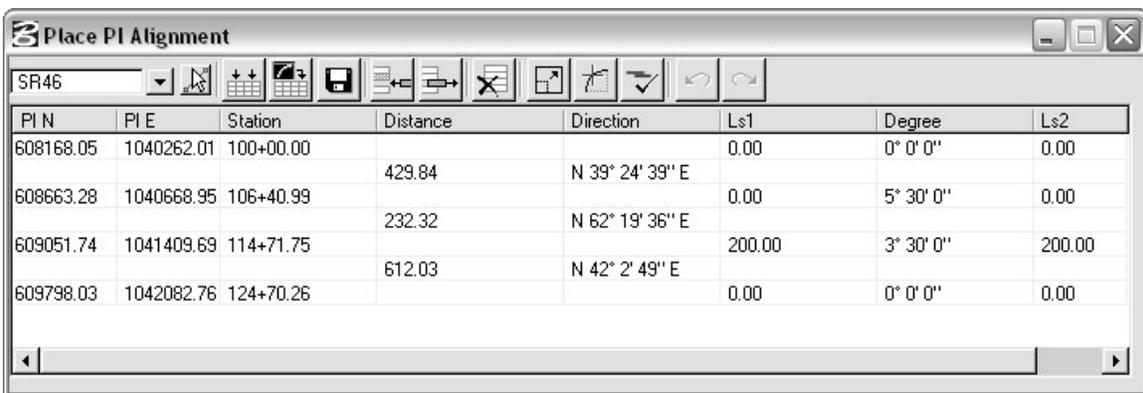
The screenshot shows a software interface with two windows. The top window, titled 'View 1', displays a technical drawing of a road alignment with several curves and straight segments. The bottom window, titled 'Place PI Alignment', contains a table with the following data:

PI N	PI E	Station	Distance	Direction	Ls1	Degree	Ls2
608168.05	1040262.01	+00.00	429.84	N 39° 24' 39" E	0.00	0° 0' 0"	0.00
608663.28	1040668.95	+00.00	232.32	N 62° 19' 36" E	0.00	5° 30' 0"	0.00
609051.74	1041409.69	+00.00	612.03	N 42° 2' 49" E	200.00	3° 30' 0"	200.00
609798.03	1042082.76	+00.00			0.00	0° 0' 0"	0.00

Nothing is written to the GPK file until you click on the Save button. Since this tool recreates the curves each time the alignment is saved, it is recommended that you avoid saving excessively. When you click the Save button, the **Save Chain As ...** dialog is opened. Enter the chain name, beginning station value and click OK. COGO commands are generated and processed in the COGO dialog.



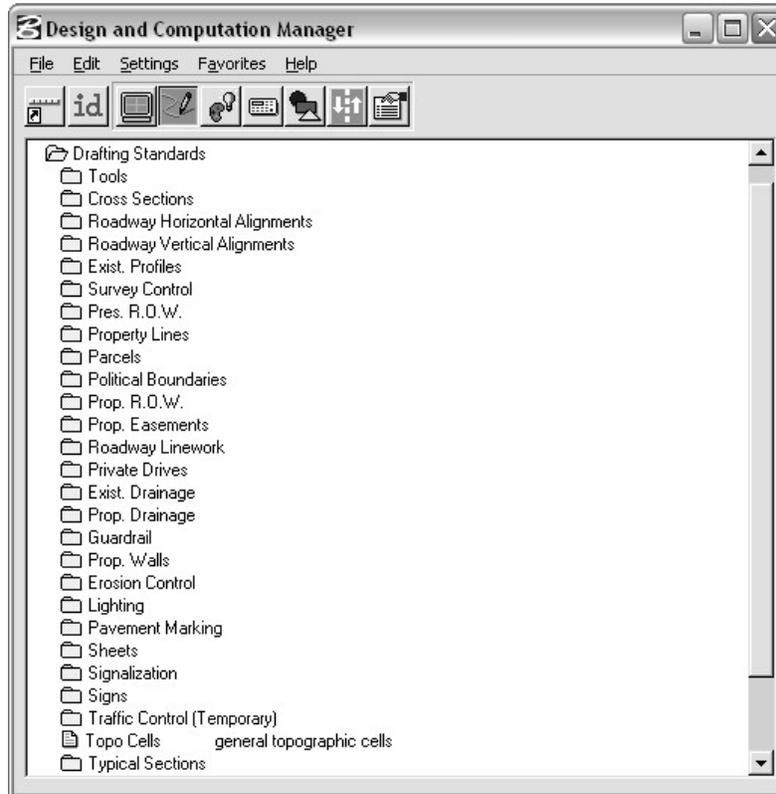
After saving, Place PI Alignment dialog is updated with chain name and station values.



When the Place PI Alignment dialog is closed, the temporary display in graphics is removed. Use D&C Manager to display permanent graphics.

Design & Computation Manager

The database for D&C Manager has been expanded with several new categories.



Symbology control for graphics drawn with MicroStation tools are now only available from D&C Manager.

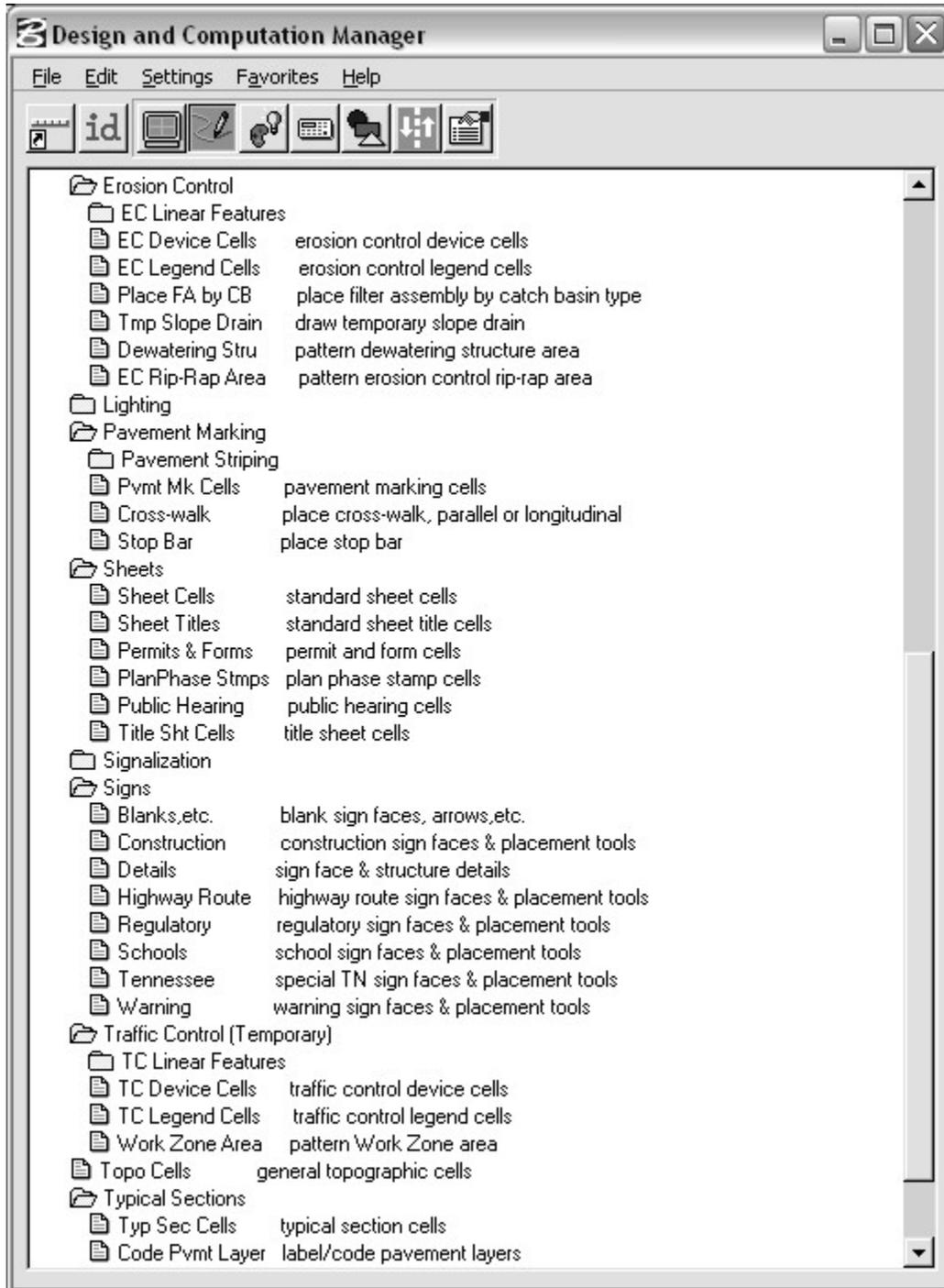
Place Influence



Place Influence now includes option to apply symbology to **New Element Only**. This will prevent accidental changing of graphics already in place.

T.D.O.T. Design Division Special Functions

All MicroStation visual basic applications and MicroStation Basic programs developed for T.D.O.T. Design Division personnel are now available from D&C Manager.



VA Labeler

This program was designed to label pertinent vertical alignment information on the profile. The user has the ability to choose the options they would like to label by selecting the check box corresponding to the label. Chain, reference datum, and scale information is attained when the user selects the Geopak profile cell.

Only profiles applicable to the identified Geopak profile cell are offered for labeling.

Type option allows for application for roadways, private drives or special ditches. The type controls text sizes, orientation and symbology.

Grade labels are placed on sub-tangents and tangents as well when vertical curves are separated by sufficient distance to warrant additional text placements.

A Maximum Speed Label keyin field is provided. When set, all curves exceeding the given speed are labeled with the speed and a "+". Any vertical curves where the speed is less than this value will also display a warning message as well.

Program is set up for use on English or Metric projects

Label Vertical Alignment

Profile Settings

Job: 101
Chain: SR95
Station: 285+00.00
Elevation: 700.00
Scale: 10:1
X: 2490000.00
Y: 581000.00

Identify Profile Cell

Type: Roadway
Profile: SR95
Label Scale: 50

VPI Labels
 VPC/VPT Labels
 Grade Labels
 V.C. Length Labels
 K Value RD01 RD
 Label Crest High Points
 Label Sag Low Points
 Label Speed

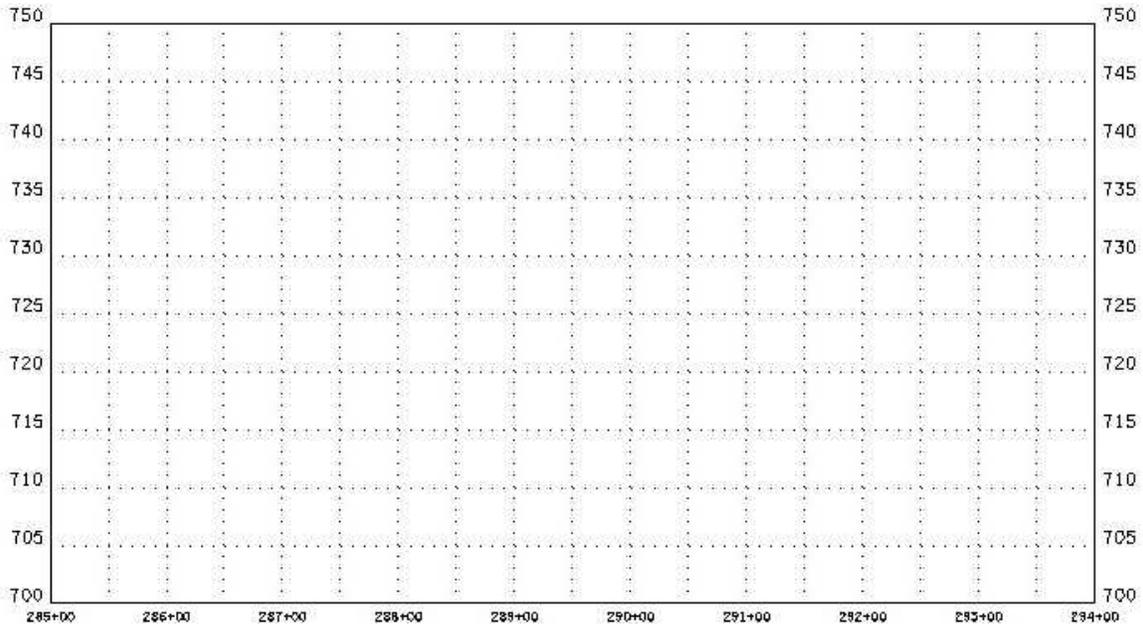
Maximum Speed Label (Optional): 60 mph

PLACE LABELS

All D&C Manager items which display proposed vertical alignments/profiles, such as VA Roadway, now place linework only. All annotation is placed by the VA Labeler tool.

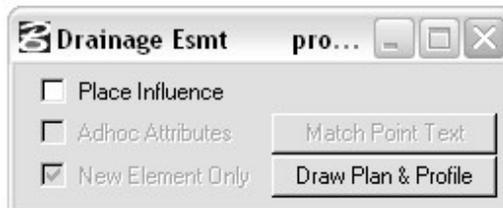
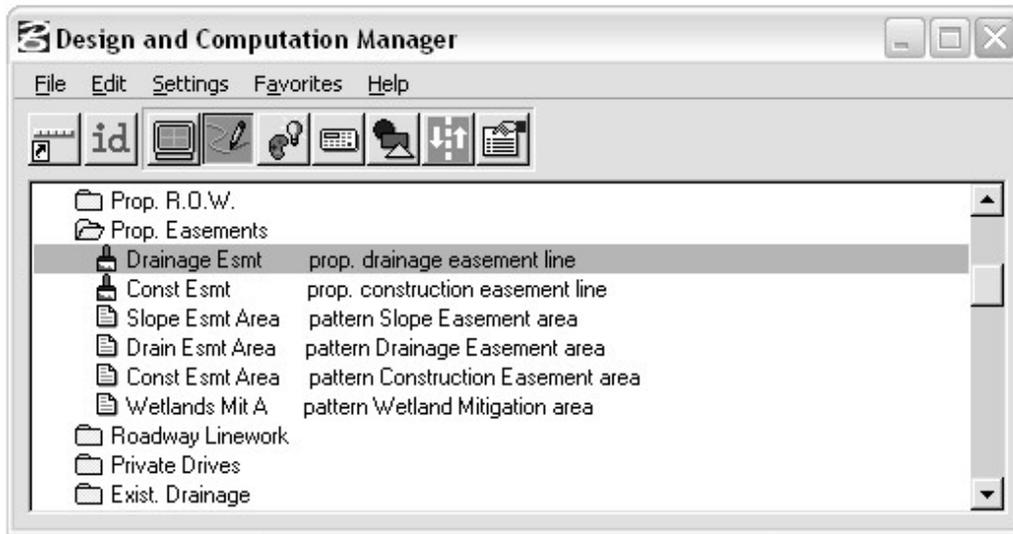
Draw Profile Grid

This 3PC program has been expanded to place station & elevation labels. The Exist. Ground item no longer places those labels.



Easement Items

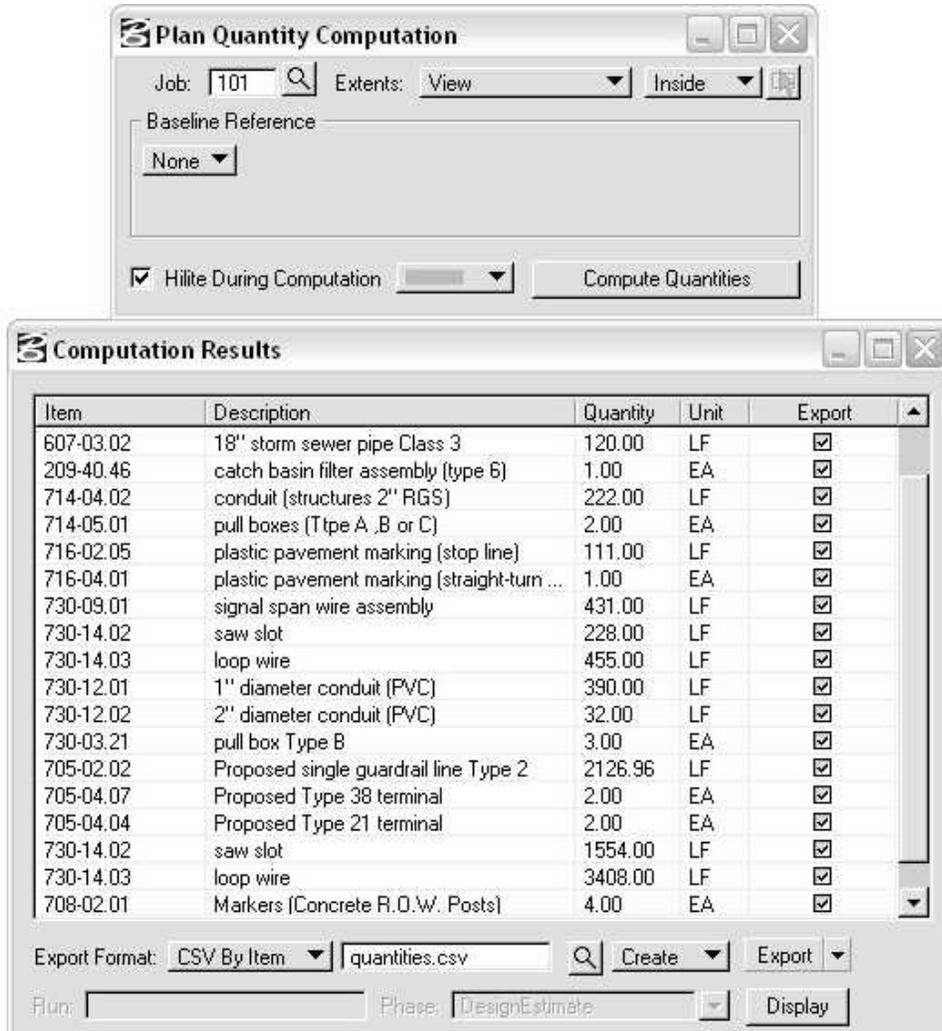
The **Drainage Esmt** & **Const Esmt** items have been upgraded to Draw Plan & Profile type items so that they can be labeled automatically with distance and bearing when stored in the project GPK file.



Pay Items & Compute Mode

Several new groups of pay items have been added. The ROW Markers item now can be used in Compute mode to calculate total quantities as well as its previous function in Design mode to compute quantities per sheet area.

After quantities are calculated, results are now shown in the **Computation Results** dialog. From there output files can be created. Our standard Estimated Roadway Quantities Excel file now includes a macro to import item quantities saved to CSV by Item.



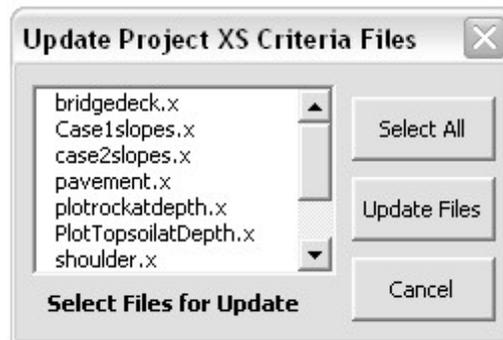
Cross Sections

The generation of existing and proposed cross sections have not really changed for the user. One thing to note though, is that proposed cross sections now run much faster than on previous versions!

Update Project Criteria Files

This new program is for use when new versions of cross section criteria files are downloaded from the web and project criteria files need to be updated. After downloading the new files to the standard criteria folder this program is used to copy the new versions to your project folder to replace/update individual criteria files or all as needed.

In conjunction with the conversion of V7 project data to V8, this tool will be used to update all project criteria files to the new V8 versions.



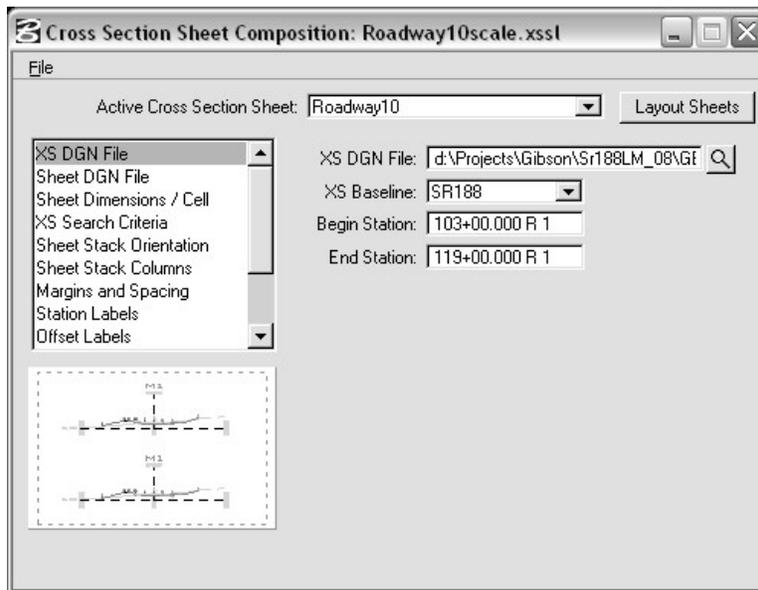
This tool is available from the MicroStation menu bar at **TDOT > Cross Sections > Update Project XS Criteria Files**

or from Geopak's D&C Manager at **Drafting Standards > Cross Sections > Update Criteria**

Cross Section Sheets

Geopak's Cross Section Sheet layout tool has been completely re-built. The tool now attaches each cross section as a reference file. As long as no major changes in the proposed profile are made, any updates done to the original working cross sections will be automatically reflected on the sheets.

Before setting up cross section sheets open up the working cross section DGN file and use the level filter **Sheets – Roadway Cross Sections** or **Sheets – Culvert Cross Sections** to set the levels in view 1. Save Settings for the DGN file. This will ensure the correct levels are showing in the cross section reference attachments.



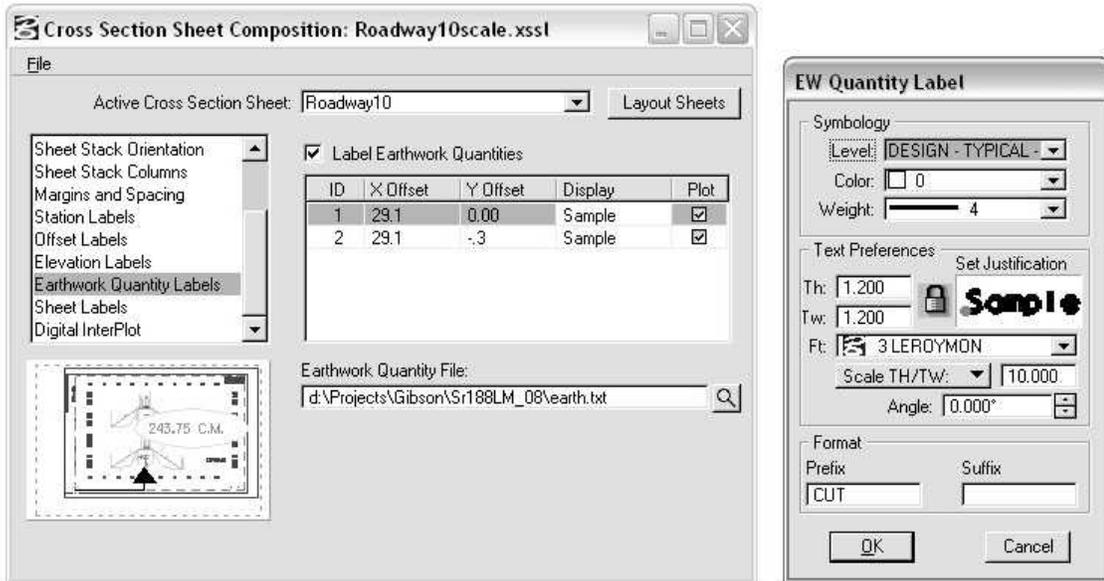
We now have 4 cross section sheet libraries available for cross section sheet production. **These files make all non-project specific set ups.**

Attach any of these by using the drop down option **File > Sheet Library > Attach** and navigating to the Design Division GeopakStandards folder, **C:\Program Files\GeopakStandards**.

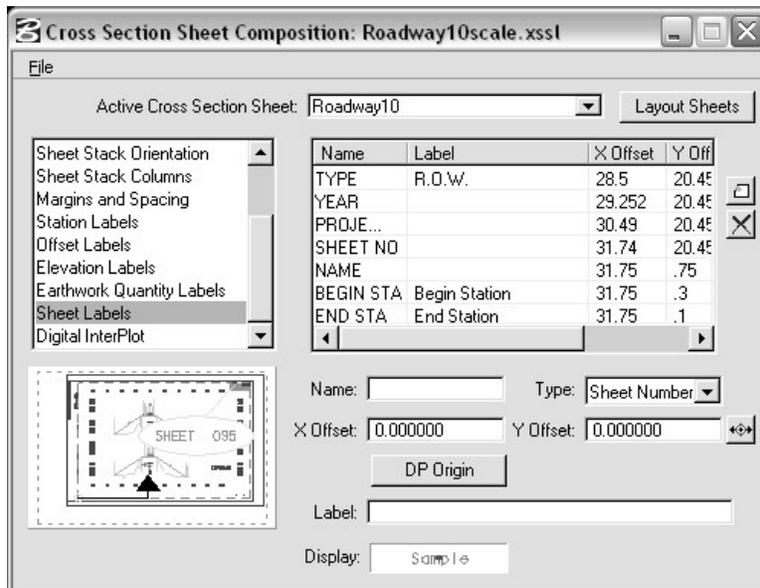
- | | |
|----------------------------|---|
| Roadway10scale.xssl | Cross section sheet library with settings to produce 10 scale roadway cross section sheets. |
| Roadway20scale.xssl | Cross section sheet library with settings to produce 20 scale roadway cross section sheets. |
| Culvert10scale.xssl | Cross section sheet library with settings to produce 10 scale culvert cross section sheets. |
| Culvert20scale.xssl | Cross section sheet library with settings to produce 20 scale culvert cross section sheets. |

After making all project specific set ups, you can save this as a new cross section sheet library in your project folder for later recall.

We now have the ability to add a prefix and suffix to earthwork end areas.



An option is also available to place additional sheet labels. The standard cross section sheet libraries set up basic project data labels for the upper right of the sheets as well as station limits and a name label for the lower right corner. On culvert cross section sheets the standard corner title block is set up at the lower right corner.



This tool now places cross section sheet cells as well. They are set up by default to place as shared cells in order to limit the file space required for large numbers of cross section sheets. Due to this fact, plot borders will need to be placed using the **Place and Annotate Cross Section Sheets** tool described on the next page.

Refer to chapter 16 in **TDOT GEOPAK Road Course Guide.pdf** for the new cross section sheet generation workflow and more specific details of its use.

Design Division Cross Section Sheet Tool

This program places shared cross section sheet cells, plot borders and annotation as requested by the user on cross sections sheets set up by Geopak. All graphics are optional. The main use of this tool is to place plot borders and additional project data annotation after setting up the sheets with Geopak.

Graphics and annotation can be placed for either roadway or culvert cross section sheets. Individual parts of Project Data annotation are optional as well as placement on either line 1 or 2 in the project data block.

Separate graphic groups are set up for sheets, plot borders, project data annotation & title annotation to allow easy deletion and replacement as needed.

Place and Annotate Cross Section Sheets

Roadway Cross Sections Culvert Cross Sections

Note: Sheets Placed in stacks of 5, cross section grids spaced 60' vertically & 60' horizontally at 10 scale

Placement Control

Shared Sheet Cell Plot Border Annotation

Total # of Shts: 1 X Start Point DP: 1000

Sheet Plot Scale: 10 Y: 1000

Annotation

Type Year Project No. Sheet No.

R.O.W.: 2005 [] 1

Project Data Location: Line #1 Line #2

Roadway XS Name []

Culvert XS Sheet Title []

Place Graphics Cancel

This tool is available from the MicroStation menu bar at **TDOT > Cross Sections > Place and Annotate XS Sheets**

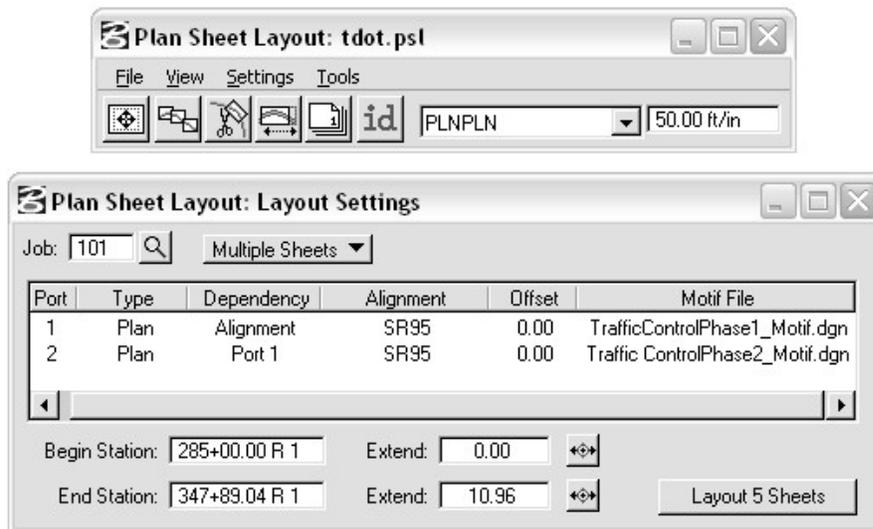
or from Geopak's D&C Manager at **Drafting Standards > Cross Sections > XS Sheets**

Plan/Profile Sheets

Split Plan Sheets

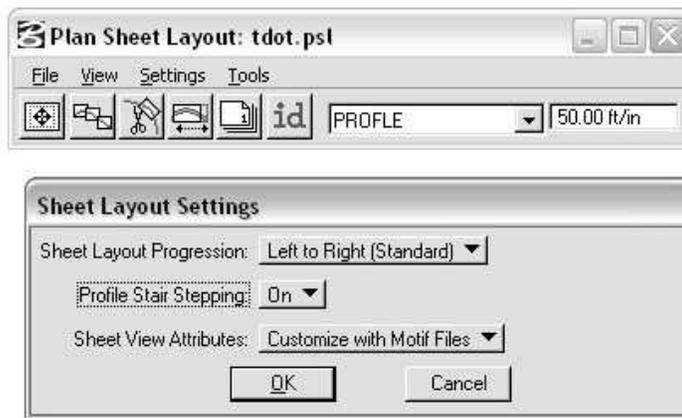
In the previous version of the software, the Plan Sheet Layout tool would only set up split plan sheets with consecutive stationing, such as top: 10+00 to 23+00 & bottom: 23+00 to 36+00.

That has changed with the new software so in our standard plan sheet library, **tdot.psl**, the split plan sheet set up, **PLNPLN**, has been revised to reflect the same stationing on top and bottom. This sheet set up can now be used when creating plan sheets for erosion control and traffic control which show different phases on top and bottom.



Profile Stair Stepping

The Plan Sheet Layout tool now supports profile stair stepping which is needed on roadways with extreme elevation changes across a given sheet. To apply this functionality, go to the drop down option **Settings > Sheet Layout** to turn it on.



New Plan Sheet Naming Convention

With this software implementation, we are changing the naming convention for all sheet design files except cross section sheets to be the sheet number only, with “0” prefix as needed to sort alphabetically, without the project info prefix used on other DGN files.

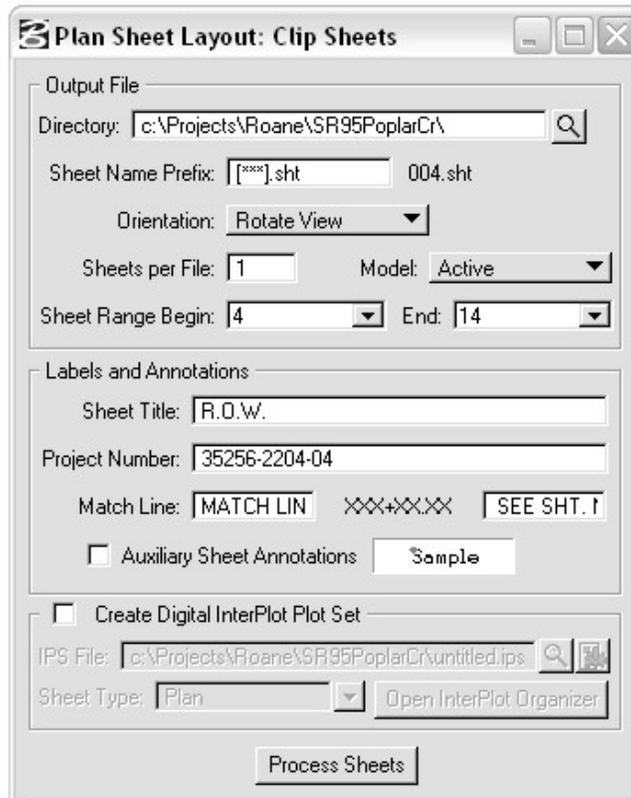
This has been done for several reasons including: the project will be very easy to plot in order when using batch plotting functions, so the project plan sheets can be published to Digital Interplot correctly and so other divisions, such as Right-of-Way and Construction, can use our files more efficiently.

Examples:

Sheet 4	>	004.SHT	,
Sheet 4A	>	004A.SHT	
Sheet 24	>	024.SHT	
Sheet 24A	>	024A.SHT	

The Plan Sheet Layout tool now has the capability to do this automatically when generating plan sheets. On the **Clip Sheets** dialog enter square brackets with 3 asterisks for the sheet number , [***] , followed by a suffix letter if needed and **.sht** for the filename extension into the **Sheet Name Prefix** keyin field.

The example dialog below shows the set up when creating present layout sheets. For proposed layout sheets the format would be [***]A.sht.



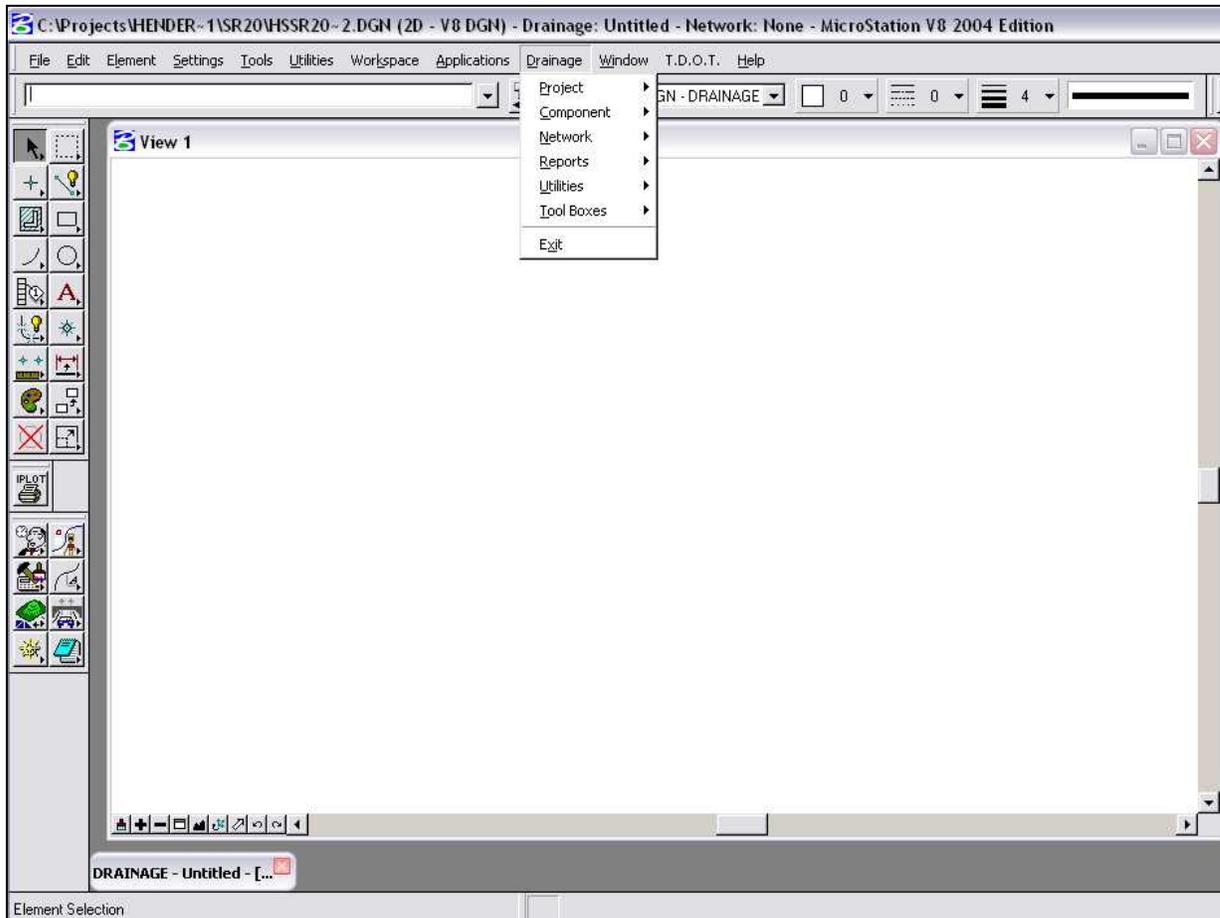
Refer to chapter 19 in **TDOT GEOPAK Road Course Guide.pdf** for the plan sheet layout workflow and more specific details of its use.

Geopak Drainage

Several of the various dialogs within Geopak drainage have been rearranged but still contain the same data, etc. The **TDOT GEOPAK Drainage Course Guide** is currently under revision to reflect these changes. The information on the next 2 pages reflect the more significant changes in the way it functions.

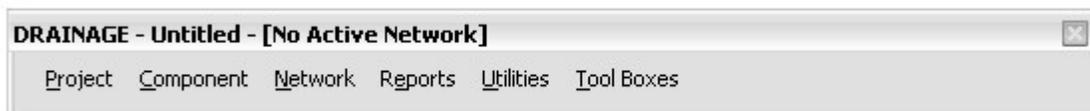
New Drop Down Menu

When Geopak Drainage is first activated, the Drainage drop down menu is added on the MicroStation menu bar.



To use the floating menu bar as we did with Geopak 2001 (V7) ...

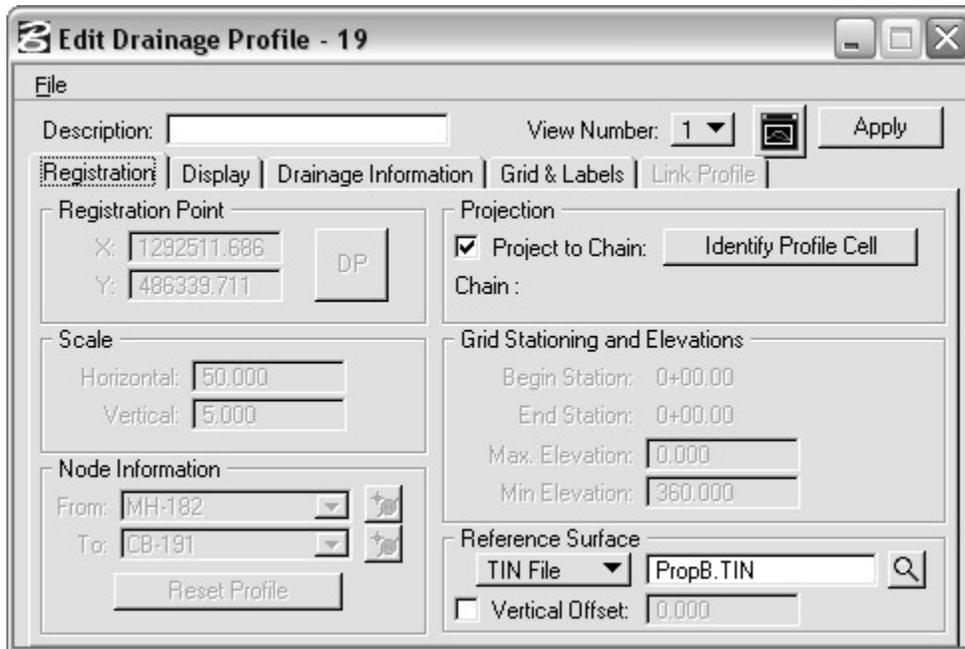
The floating menu bar is minimized by default when Geopak Drainage is started. Move the view window so that you can see it minimized at the lower left and double click on it to open up.



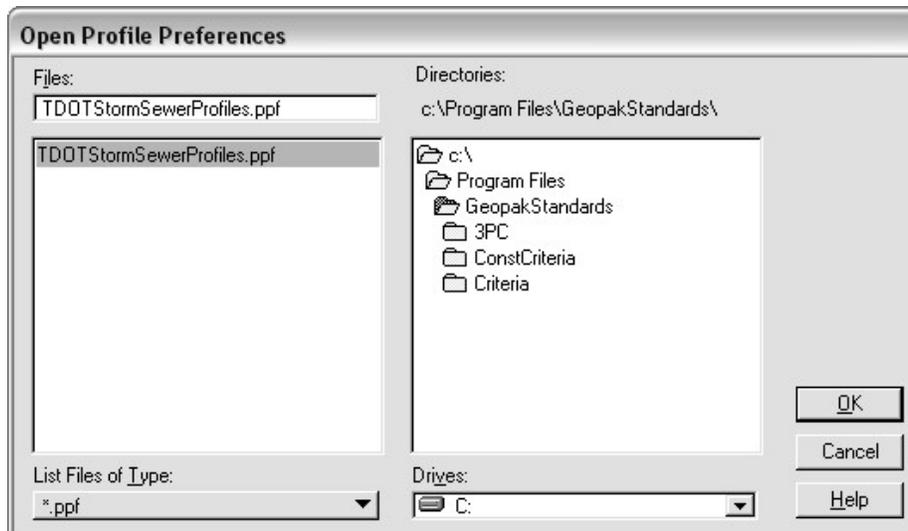
Profile Displays

In the previous version of Geopak Drainage profiles were called Reaches. In V8 they are now called Profiles! Along with this change, the dialog has been revised.

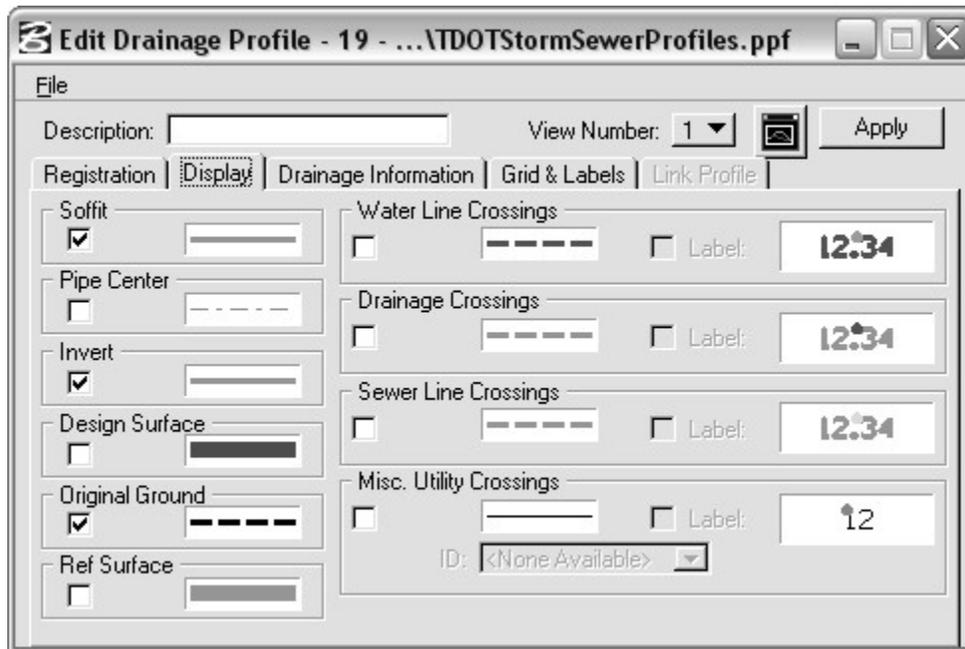
The most significant change is the control of profile displays. Those are now controlled in the Profile dialog instead of Preferences as it was previously. You can also save these profile preferences to use later as needed. A standard profile preference file has been developed named **TDOTStormSewerProfiles.ppf**.



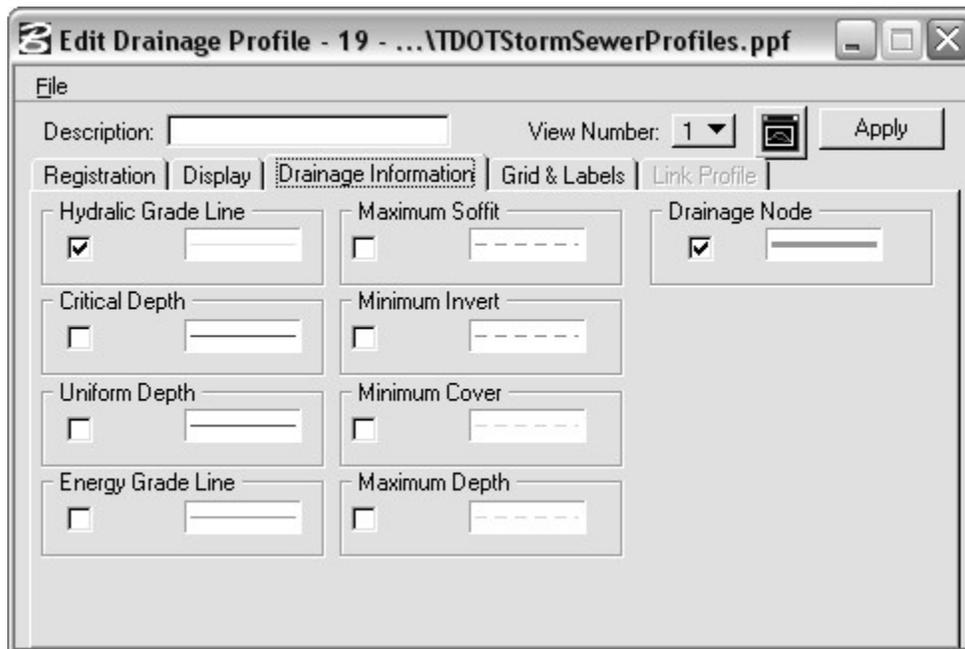
To load a profile preference file go to the drop down option **File >Open**.



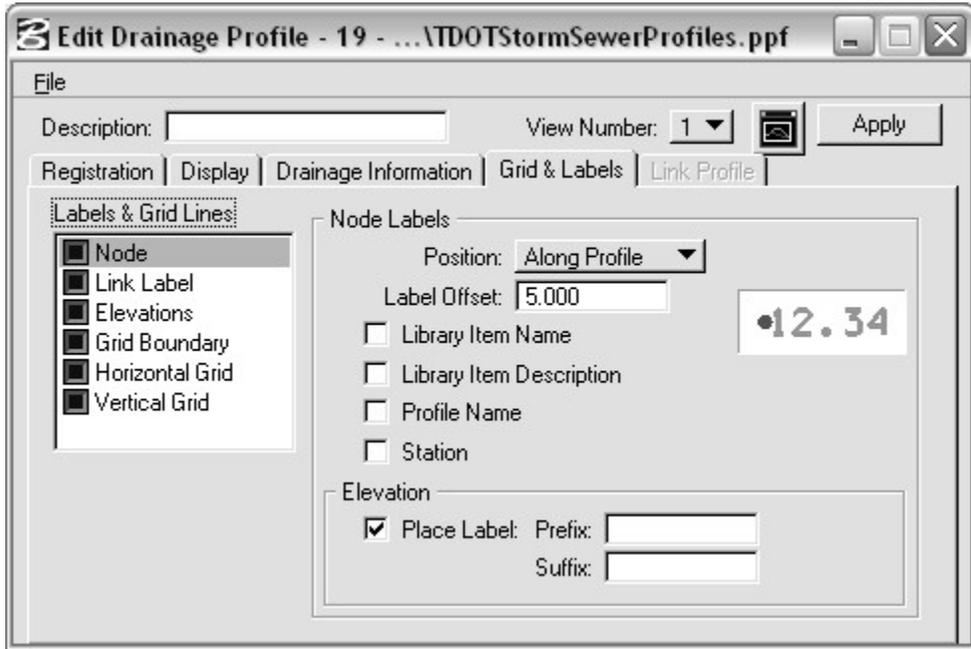
Profile structure display controls.



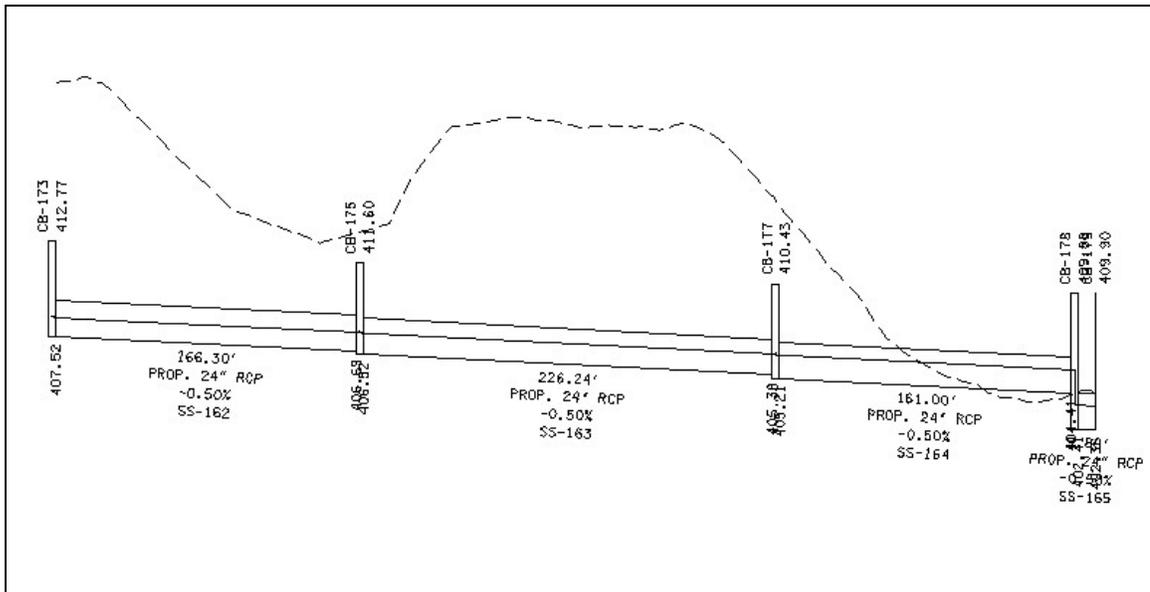
Drainage design control element displays.



Grids and Labels display control. When you pick each data type option in the list to the left, its control settings are shown.



The screen capture below shows the default display from standard profile preference file **TDOTStormSewerProfiles.ppf**. During the design process you may wish to turn other options on. For the final displays for the plans you may wish to turn some text options off.



7. Office 2003 to MicroStation V8

For the users there aren't significant changes in the way Office files are linked to MicroStation but the way it works has changed. In the past MicroStation graphics were generated to represent the text and lines from those files. Now it is truly what you see in Office is what you get in MicroStation.

Wide Excel blocks, such as R.O.W. acquisition tables, no longer have to be linked in more than one piece.

Linking values for Excel and methods for attaching Word documents have changed. For complete documentation on workflows, etc. refer to **2ndSheetsV8.pdf** and **ROWAcqTables.pdf**.

The screenshot shows the MicroStation V8 2004 Edition interface. The main window displays a drawing view titled 'View 1' containing an embedded Excel table. The table is titled 'ESTIMATED ROADWAY QUANTITIES' and has four columns: ITEM NO., DESCRIPTION, UNIT, and QUANTITY. The table contains 20 rows of data, including items like 'CONSTRUCTION STAKES, LINES AND GRADES', 'CLEARING AND GRUBBING', 'REMOVAL OF RIGID PAVEMENT', 'ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)', 'PLACING AND SPREADING TOPSOIL', 'WATER', 'CHECK DAMS', '12" TEMPORARY SLOPE DRAIN', 'SEDIMENT REMOVAL', 'TEMPORARY SILT FENCE (WITHOUT BACKING)', 'TEMPORARY SEDIMENT FILTER BAG (148" X 20" X 133")', 'TEMPORARY SEDIMENT TRAP', 'POLYETHYLENE SHEETING (6 MIL. MINIMUM)', 'MINERAL AGGREGATE, TYPE A BASE, GRADING D', 'MINERAL AGGREGATE (SIZE 57)', 'ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING A', and 'BITUMINOUS MATERIAL FOR PRIME COAT (PC)'. The table is surrounded by a standard Excel border, and the MicroStation interface elements like the menu bar and toolbars are visible around it.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
105-01	CONSTRUCTION STAKES, LINES AND GRADES	LS	1
201-01	CLEARING AND GRUBBING	LS	1
202-03.02	REMOVAL OF RIGID PAVEMENT	C.Y.	400
203-01	ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)	C.Y.	30610
203-04	PLACING AND SPREADING TOPSOIL	C.Y.	2800
203-06	WATER	M.G.	60
209-03	CHECK DAMS	S.F.	263
(1) 209-02.05	12" TEMPORARY SLOPE DRAIN	L.F.	202
(1) 209-05	SEDIMENT REMOVAL	C.Y.	440
(1)(2) 209-08.03	TEMPORARY SILT FENCE (WITHOUT BACKING)	L.F.	2140
(1)(2) 209-09.02	TEMPORARY SEDIMENT FILTER BAG (148" X 20" X 133")	BAG	6
(1) 209-10.20	TEMPORARY SEDIMENT TRAP	C.Y.	270
(1)(2) 209-20.03	POLYETHYLENE SHEETING (6 MIL. MINIMUM)	S.Y.	420
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	6769
(2) 303-10.01	MINERAL AGGREGATE (SIZE 57)	TON	140
307-01.01	ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING A	TON	1307
(6) 307-01.08	M2	TON	879
402-01	BITUMINOUS MATERIAL FOR PRIME COAT (PC)	TON	16

New Formatting

Due the changes in the way this process functions, it is no longer necessary for us to use the fonts and other settings as done previously with MicroStation J (V7). Arial is used in most cases which makes the Office files much easier to read and work with.

Office Links

When Office files are linked to MicroStation they appear with a white background and are bounded by a shape which they are defined in. The shape can be moved and copied. The link shape is created on the level active at the time the Office file is linked to MicroStation.

SIDE DRAIN TABULATION													
STATION	LOCATION		DESCRIPTION	SURFACE WIDTH (L.F.)	RCP CLASS III OR CMP 16 GA. OR HDPE (L.F.)			TYPE	DRAWING NO.	END TREATMENT			REMARKS
	LT	RT			FILL HEIGHT - 4 OR = 10 FT.					CLASS A CONC. (C.Y.)	RBNF STEEL (LB)	STRUC STEEL (LB)	
					18"	24"	30"						
13+47	X		PVT. DR.	10	14			*60"	D&B-W-6A-88	3.56	444	554	
18+61		X	PVT. DR.	30	34			*60"	D&B-W-6A-88	3.56	444	554	
22+00	X		FIELD ENT.	16	54			*60"	D&B-W-6A-88	1.78	222	277	
30+39		X	PVT. DR.	14	18			*60"	D&B-W-6A-88	3.56	222	277	
30+91	X		PVT. DR.	12	16			*60"	D&B-W-6A-88	3.56	222	277	
35+16		X	8 US. ENT.	40	48			*60"	D&B-W-6A-88	3.56	222	277	
TOTALS					184	0	0			19.58	1776	2216	

Linking in Rotated Views

There is no longer any limitation to linking Word or Excel files into rotated views. When they are linked they always come in horizontal to the view. This eliminates the previous need to link and then reference to get notes or R.O.W. acquisition tables to show up on property map sheets.

(TRACT 4) - CHANGED AREA ACQUIRED & AREA REMAINING ON (TRACTS) . ADD BOOK AND PAGE NUMBER TO (TRACT 6) . CHANGED TOTAL AREA TO 1,000 AC. , ALSO CHANGED AREA ACQUIRED & AREA REMAINING ON (TRACT 1) .

END PROJECT NO. BR-STP-188(6) R.O.W.
STA. 118+26.38

RIGHT - OF - WAY NOTES

- (1) IT IS INTENDED THAT ALL BUILDINGS AND/OR PORTIONS OF BUILDINGS THAT ARE WITHIN THE PROPOSED RIGHT-OF-WAY AND/OR EASEMENT LINES FOR THE PROJECT BE REMOVED THEREFROM IN THE PROCESS OF RIGHT-OF-WAY ACQUISITION. IF ANY SUCH BUILDINGS OR IMPROVEMENTS ARE NOT REMOVED IN THE COURSE OF RIGHT-OF-WAY ACQUISITION, THE CIVIL ENGINEERING MANAGER 2, DESIGN DIVISION IS TO BE NOTIFIED IN SUFFICIENT TIME TO PERMIT HAVING SUCH REMOVALS DESIGNATED AS A PART OF THE CONSTRUCTION CONTRACT.
- (2) ALL RAMPS MUST CONFORM TO THE DEPARTMENT'S "POLICY ON FINANCING CONSTRUCTION OF PUBLIC ROAD INTERSECTIONS AND DRIVEWAYS ON HIGHWAY RESURFACING, RECONSTRUCTION AND CONSTRUCTION PROJECTS ON NEW LOCATIONS", THE MANUAL ON RULES AND REGULATIONS FOR CONSTRUCTING DRIVEWAYS ON STATE HIGHWAY RIGHT-OF-WAY, STANDARD DRAWING RP-R-1, AND OTHER ACCEPTED DESIGN AND SAFETY STANDARDS.
- (3) EXISTING PAVED DRIVEWAY PER TRACT REMAINDER WILL BE REPLACED IN KIND TO A TOUCHDOWN POINT.
- (4) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY EXCEEDS 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED TO A TOUCHDOWN POINT OR UNTIL THE GRADE IS LESS THAN 7 PERCENT.
- (5) WHERE THE EXISTING DRIVEWAY IS UNPAVED AND THE PROPOSED DRIVEWAY IS LESS THAN 7 PERCENT IN GRADE, EACH DRIVEWAY WILL BE PAVED A SHOULDER WIDTH FROM THE EDGE OF PAVEMENT AND THE REMAINDER OF THAT DRIVEWAY REPLACED IN KIND TO A TOUCHDOWN POINT.
- (6) ANY NECESSARY PAVING OF DRIVEWAYS WILL BE DONE DURING PAVING OPERATIONS ON THE MAIN ROADWAY.
- (7) NEW DRIVEWAYS PROVIDED IN THE PLANS WILL BE PAVED BASED ON THE 7 PERCENT CRITERIA. THOSE 7 PERCENT OR STEEPER IN GRADE WILL BE PAVED AND THOSE FLATTER THAN 7 PERCENT WILL BE COVERED WITH BASE STONE.
- (8) ON PROJECTS WITHOUT CURB AND GUTTER THAT ARE ON STATE ROUTES, IT WILL BE THE RESPONSIBILITY OF THE OWNER TO SECURE A PERMIT AND TO CONSTRUCT ADDITIONAL DRIVEWAYS AND FIELD ENTRANCES OTHER THAN THOSE PROVIDED IN THE PLANS.

