4.1 Definitions

The **Design and Computation Manager** (D&C Manager) is a tool that allows MoDOT to standardize graphics elements for drafting and pay item quantities.

4.2 Accessing the D&C Manager

The D&C Manager can be accessed from one of three locations. It is available in the menu path **Applications > GEOPAK Road > Design & Computation Manager**. It can also be selected from the Road toolbox as shown to the right.

The third way that the D&C Manager can be accessed is from the **Road Project** dialog by clicking on **Plan View Design**, shown below on the left. This will bring up the Plan View Design tool pallet shown below on the right. The D&C Manager is the first one in that tool pallet, as outlined below.

4.3 Database

A hierarchical database is used with the **Design and Computation Manager**. For MoDOT the default database is **MoDOT_English.ddb**. The database stores information concerning functional classification and display preferences for each feature and item used in a Microstation file.

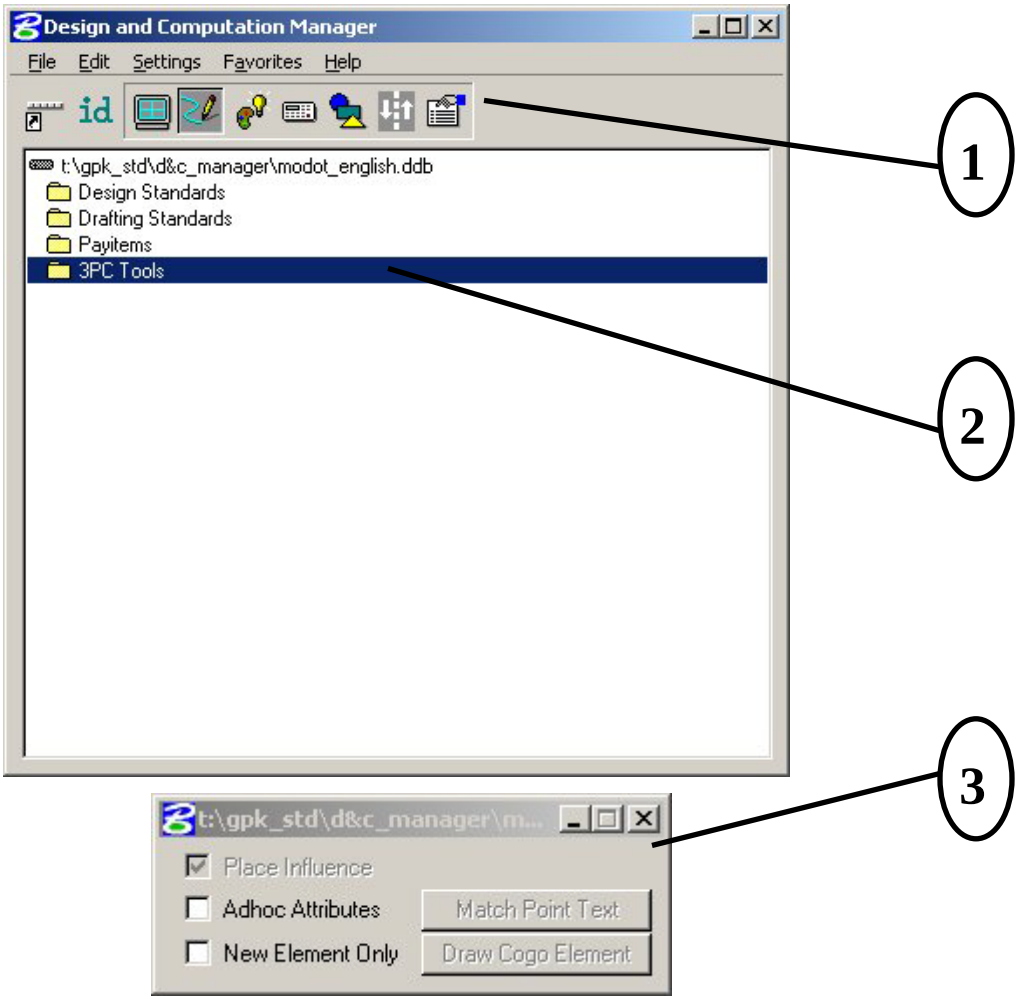
Categories are used to group and classify the features and items used in creating construction drawings. The content the MoDOT databases are divided into four overall categories – **Design Standards/, Drafting Standards**/, **Pay Items**/, and **3PC Tools**. The first three categories each contain sub-categories. The sub-categories break down each classification into more specific sections. (See dialog box next page). **3PC Tools** has a list of the various tools available.

For example, **Pay Items**/ is broken into several additional categories like **Pipes/** and **Lighting and Signals/**. **Pipes/** is broken into many different categories representing various types of pipes and pipe features that may be used in the design of your project like **Flared End Sections/**. Within the category **Flared End Sections/** the different pay items for flared end sections are listed.

CADD Support personnel maintain this database. You will find commands within the D&C menu that require a password before execution. This is a security measure to protect the integrity of the database file and ensure its consistent application on a statewide basis.

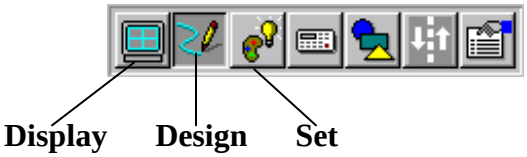
4.4 Basic Dialog

Once you enter the D&C Manager, the following dialogs will appear.



The D&C Manager dialog box is composed of three distinct areas:

1) The D&C Manager may be configured to operate in seven different modes. A single click on an icon will change operational modes. For the R/W class, we will be only covering three modes and they are: **Display Design Set**

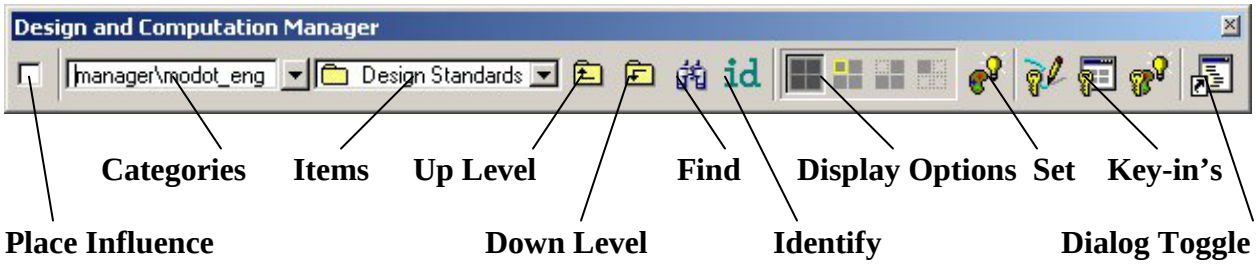


2) The **Content box** lists the sub-categories or items available at your current position within the database structure.

3) The **Operations box** will appear differently depending on the set mode of operation.

The D&C Manager dialog box can be used in two different modes. The dialog mode as shown on the previous page, allows the user to access items in from a “directory tree” structure. The icons at the top of the dialog allow the user to access the different operational modes of D&C Manager.

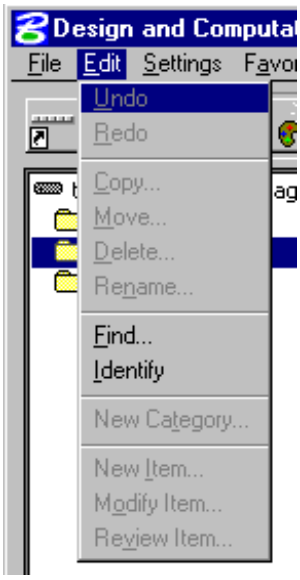
The toolbox mode as shown below, allows the D&C Manager dialog to be docked on the Microstation toolbars. With this format, the user accesses items from the pull-down menus, and can toggle the various tools from the tool bar.



The dialog box can be toggled using the appropriate icons.

Switch to toolbox mode

Switch to dialog mode

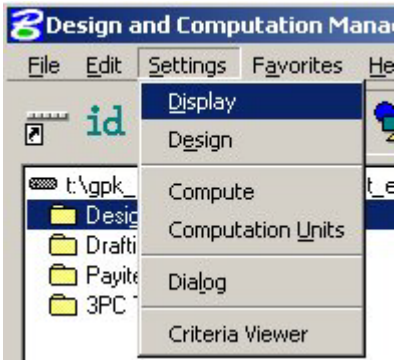


4.4.1 Edit Commands

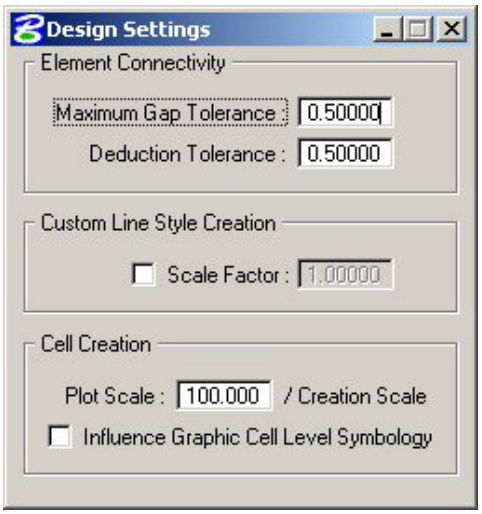
Find - will search the database (from your current location) for an item or category. The display in the D&C Manager dialog box will change to each item/category as it is found.

Identify – will show the item name and description attached to an element in the design file.

4.4.2 User Commands



Display Settings - temporarily changes the display of elements on the screen to one common color, then the user may specify additional elements to be viewed in their original colors. This tool enhances visualization when working on a complex project.



Design Settings - sets the *maximum gap* tolerance and *deduction tolerance* used in computations and the drawing scale for placing cells. **Do not use the Custom Line Style Creation option.** The **Project** in the Microstation Manager handles the line style scaling in the MoDOT Microstation configuration. This dialog also sets the cell scale to adjust the cell size appropriate to the drawing scale.

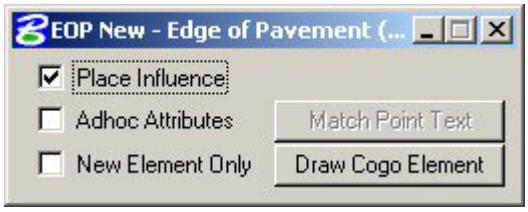
4.4.3 Recall Commands

Add to Favorites - saves current D&C Manager path for easy recall in the future.

Organize Favorites – allows the user to edit and save the Favorites list.

4.5 Operational Modes

4.5.1 Design

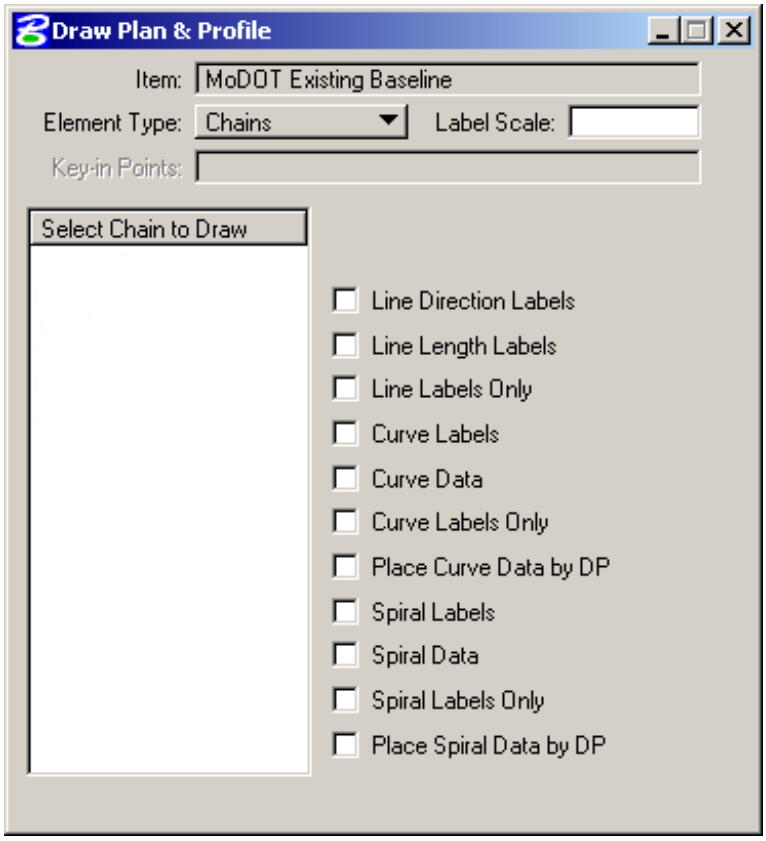


The Design mode allows the user to tag each roadway element as it is placed in the design file based on item parameters and/or write COGO elements to the file.

Place Influence will set the level, symbology and attribute tags of elements drawn or copied using Microstation commands. When **Place Influence** is **On**, elements are drawn using the level, symbology and attributes as defined in the Geopak database file. When **Place Influence** is **Off**, elements are drawn using the active level, symbology and attributes of Microstation.

The **Draw Cogo Element** button is for drawing Cogo elements to a design file. A single click to this button prompts the user for a job number then opens a dialog box that allows the user to choose a COGO item to draw.

If a drafting item is chosen, the **Draw Cogo Element** button changes to **Draw Plan and Profile**. A single click to this button prompts the user for a job number, and then opens the **Geopak Plan and Profile Draw** box shown to the right.



There are nine possible COGO elements that may be recalled from the .gpk file: points, lines, curves, spirals, chains, stationing, parcels, profiles, and parallel chain. Each of these options changes the dialog box to offer relevant draw and label features used when placing an element in a graphics file. When using **Plan and Profile Draw**, be sure to turn off **Place Influence**.

The points and lines dialog boxes have a key-in field that allows the user to specify the names of the COGO elements to be drawn. To use the line operation, the user must use point numbers to specify the ends of the line. The points/lines are drawn immediately after you enter their respective names and press the enter key. To draw more than one point or line, place a dash in-between the point numbers. To draw a line without using consecutive point numbers, use a forward slash.

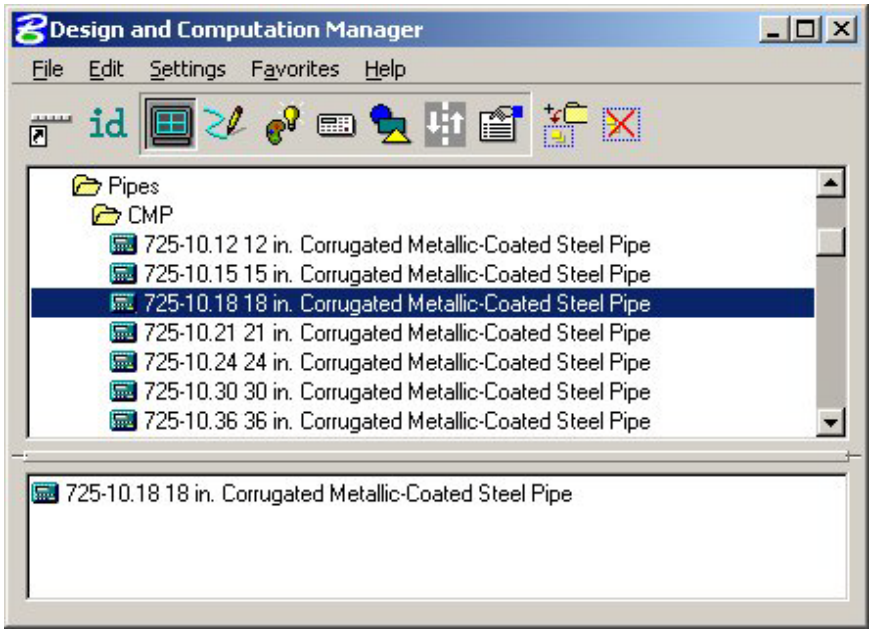
The dialog boxes for curves, spirals, chains, stationing, parcels, and profiles have a list box that display the names of all stored curves and chains. Highlighting one of the available elements causes it to be drawn into the file. Each type of item has a list of options that can be plotted.

**Note that Geopak can draw elements to levels not turned on. After elements are drawn, it may be necessary to turn on appropriate levels and fit screen.

Remember that **Place Influence is for drawing Microstation elements. **Draw Plan & Profile** is for drawing **Cogo** elements. **Do Not** have **Place Influence** on when using **Draw Plan & Profile**.

4.5.2 Display

Display mode is used to enhance on screen visualization.



The pay item to be visualized is added to the **Collection** box. Three display options are available for the display of the items in the **Collection** box.

Highlight - will change those items stored in the collection area to the Microstation highlight color.

Not - simply turns off the display of the collection items leaving everything else on.

Only - will turn off everything but the collection items.

4.5.3 Set

The **Set** mode allows you to assign attributes from the D&C Manager database to existing graphical elements in the file. With the Use **Complex Chain** option turned off, the **Set** mode is the same as MicroStation *Element Select*. The user may tag several elements by

depressing the Ctrl key while data pointing each element or by using the MicroStation *Power Selector*. This allows you to affect multiple elements with one Set command.

The **Complex Chain** option automatically creates a chain from graphic elements and applies the attributes of the highlighted item in the content box.

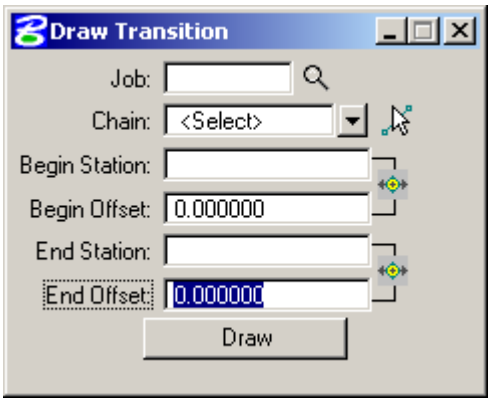
4.6 DP Station/Offset

The **DP Station/Offset** command works in conjunction with Microstation commands and the D&C Manager. It can be used as the *data point* for any Microstation command. **DP Station/Offset** provides precision placement of elements based on a station and offset of a stored chain. Uses for this command include precision placement of elements and window functions.

4.7 Draw Transition

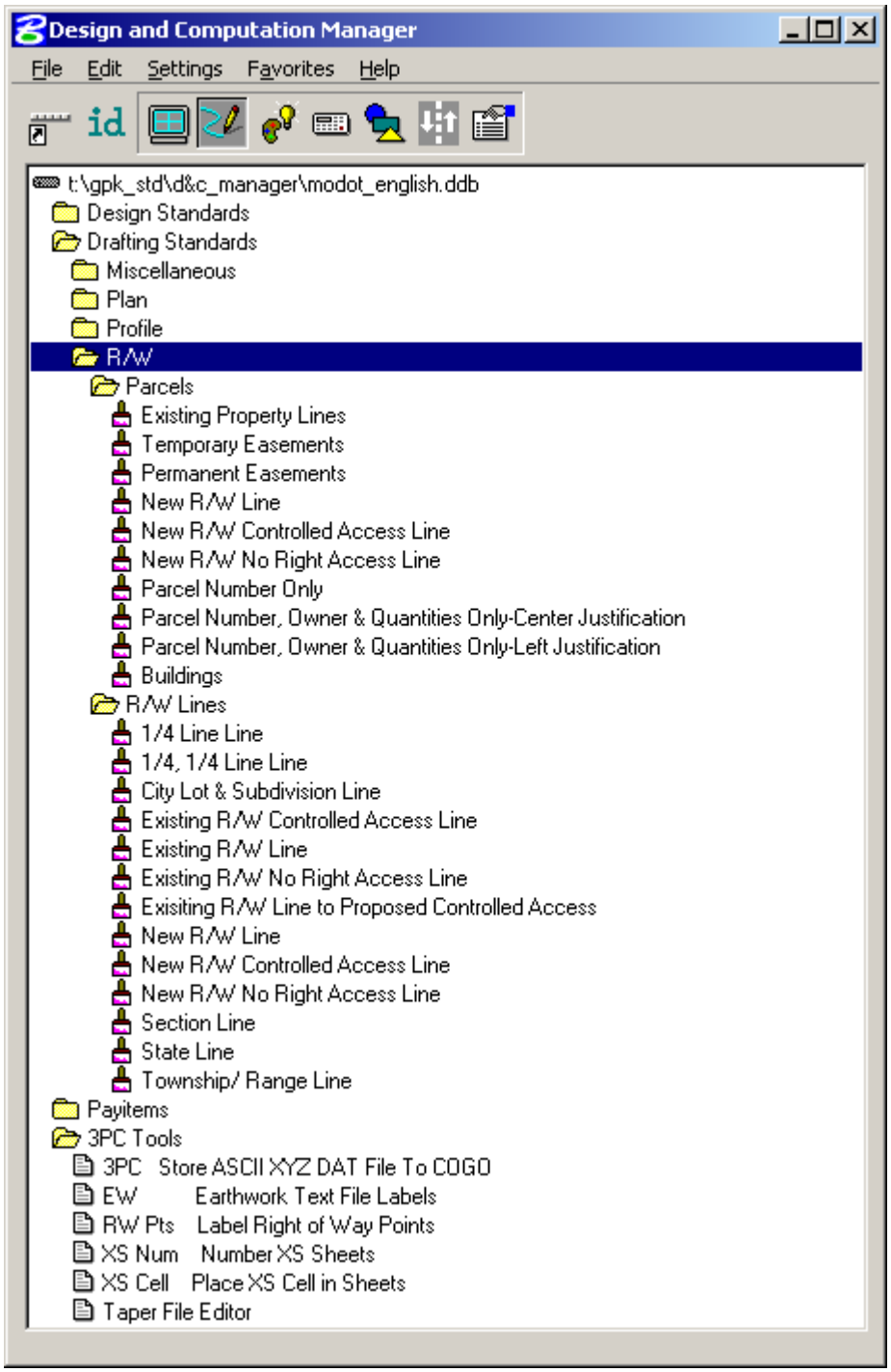
Draw Transition will draw a line/curve based on a beginning station/offset and an ending station/offset relative to a selected chain. Use of this command includes turn lanes, mail box widening and lane transitions.

Note: Elements placed with **Draw Transition** will have Microstation element type **curve** when the beginning and ending offsets are different and will have Microstation element type **line** and/or **arc** when the beginning and ending offsets are the same.



4.8 Main R/W Items

To plot Right of Way lines go to **Drafting Standards \ R/W** in the Design and Computation Manager, as depicted in the figure to the right. Right of way labels can be plotted using a Three Port Criteria (3PC) tool. It is **3PC Tools \ RW Pts Label Right of Way Points**, as shown near the bottom of the figure.



4.9 Parcels

There are ten drafting standards for plotting parcel information. The purpose for each is indicated in the following list.

- **Existing Property Lines Only** plots the parcel boundary as an Existing Property Line. The MicroStation Cell Tools (MicroStation pull down menu **Add-Ons > Cell Tools**) provides an easy way to add the property line symbol.

- **Temporary Easements Only** plots easement boundaries using the Temporary Easement standard. This option will plot all the easements using this standard. Therefore if the parcel contains both temporary and permanent easements, the line style for one of the types will need to be modified using the D & C Manager **Set** tool.

- **Permanent Easements Only** plots easement boundaries using the Permanent Easement standard. This option will plot all the easements using this standard. Therefore if the parcel contains both temporary and permanent easements, the line style for one of the types will need to be modified using the D & C Manager **Set** tool.

- **New R/W Line Only** plots taking boundaries using the New R/W Line standard.

- **New R/W Limited Access Line Only** plots taking boundaries using the New R/W Limited Access Line standard.

- **New R/W No Right Access Line Only** plots taking boundaries using the New R/W No Right Access Line standard.

- **Parcel Number Only** plots the parcel number inside of a circle as shown on plan sheets when the parcel information is not included on the plan sheet.

- **Parcel Number, Owner & Quantities Only-Center Justification** plots the parcel number inside of a circle along with the parcel information as shown when the parcel information is plotted on the plan sheet.

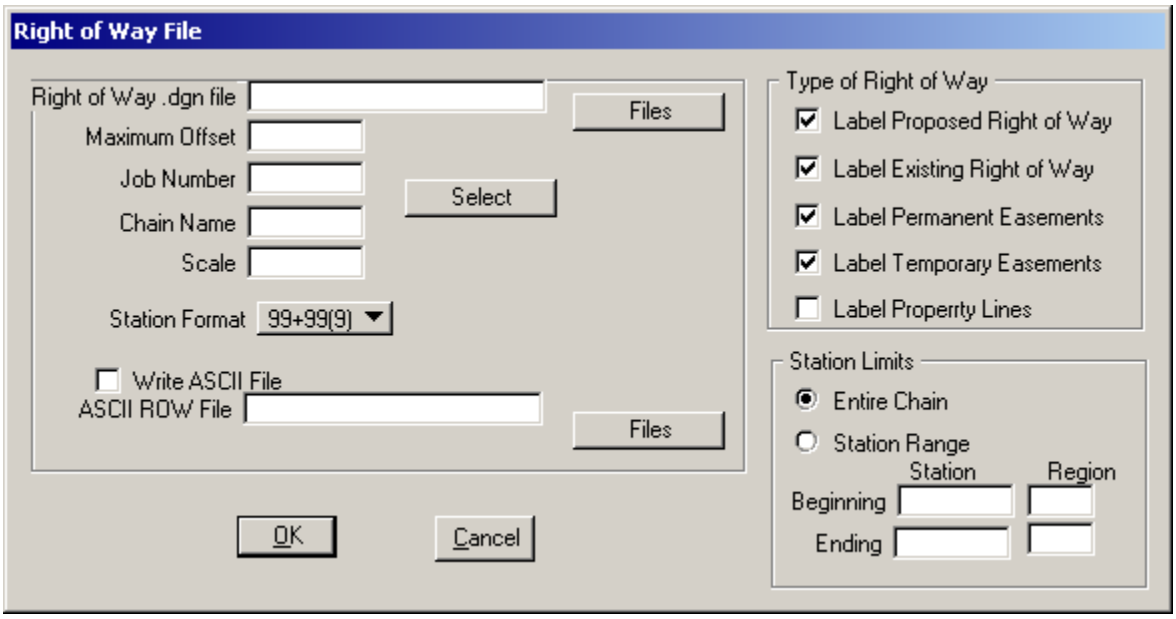
- **Parcel Number, Owner & Quantities Only-Left Justification** plots the parcel number inside of a circle along with the parcel information as shown when the parcel information is plotted on a separate sheet. Once this information is plotted, it can be lined up in rows and columns.

- **Buildings Only** plots the buildings stored with the parcel.

Each of the individual items listed above opens the **Plan & Profile Draw** dialog with the toggle activated for that item. The user can activate additional items to plot more than one item at a time.

4.10 3PC Tools \ RW Points

To start a 3PC tool, double click on the desired item in the list under **3PC Tools** in D & C Manager. The **RW Pts** tool searches a MicroStation file for R/W lines and plots the station and offset labels in the current MicroStation file. Due to this flexibility, the labels can be plotted in one file based on the R/W lines in the same or a different file. Activating the RW Pts tool brings up the following dialog, which allows the user to control the tools settings.



The dialog options are described below:

- **Right of Way.dgn file** is the name of the file containing the right of lines. It can either be typed into the field, or it can be selected from a list of files by clicking on the **Files** button to the right of the field.

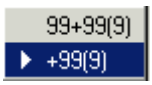
- **Maximum Offset** controls the search distance for the R/W elements from a specified chain. Any vertices with an offset greater than the Maximum Offset are ignored.

- **Job Number** specifies the COGO Job number. It can be typed into the field or selected from a list of GPK files by clicking on the **Select** button to the right of the field.

- **Chain Name** is the name of the reference chain. It must be typed in.

- **Scale** controls the size of the text in the labels.

- **Station Format** determines whether a full or partial station value is plotted, as indicated by the two options shown to the right. The number of decimal places displayed in the label is controlled by the current decimal settings in the GEOPAK User Preferences dialog. The **Station Decimal** setting determines the



number of decimal places for station if the full station option is selected. The **Distance Decimal** setting controls the number of decimal places for the offset. It also controls decimal places for the station value if the partial station option is chosen.

- The **Write ASCII File** toggle determines whether a comma separated text output file is generated containing the stations and corresponding offsets. **ASCII ROW File** is used to give the name of the file. It can be typed into the field or it can be selected from a list of files by clicking on the **Files** button to the right of the field.

- The **Type of Right of Way** toggles on the right side of the dialog controls which types of labels are plotted.

- **Station Limits** controls how much of the chain is labeled. R/W labels can be placed for the **Entire Chain** by selecting that option or for a **Station Range** by toggling on that option and typing in the beginning and ending stations for the range.