Using TracPipe Specifier 2
by Nicholas Pisarro, Jr. for Omega Flex, Inc.
TracPipe Specifier 2 version 4.1.1101 - Rev. March 9, 2019

I. Introduction

Designing a natural gas or propane system for installation into a home or commercial building is not a trivial project. You must *design your system* with an allowable pressure drop to deliver the required gas pressure at the appliance based on a given supply pressure. If too low or too high the appliance may not operate properly.

In addition, building codes and manufacturer specifications require that you size pipes properly using standard industry methods to assure these requirements are met. If an error is made using one of these methods, you may undersize your piping causing equipment issues, or oversize your piping costing you money.

TracPipe Specifier 2 solves these problems for you. After you lay out a system, it checks your system for errors and calculates the minimum required pipes sizes using the Branch Length Method *(BLM)*. Optionally, you may optimize the design using the Sum of Pressure Loss *(SOPL)* engineering method.

II. The Design Process

TracPipe Specifier 2 is a Computer Aided Design (CAD) system. You draw your system design schematically on a virtual piece of paper, first specifying the gas source, then adding pipes, fittings, regulators (in elevated pressure systems), and appliances in a drawing and connecting them together. Then *TracPipe Specifier 2* checks your design for errors and calculates the sizes of pipes in your system. When regulators are specified for elevated pressure systems (above ½ psi), it will assign regulator part numbers. You may print your design as an engineering drawing, and/or export the calculated data. The program will create a *Bill Of Materials* (BOM) and sum up the different types and sizes of piping. Lastly, you may change various attributes of your design to further optimize it.

To start, you are presented with a virtual piece of paper, to place your design. You can pan the paper up, down and sideways, as well as zoom it in and out. On the paper, you place the gas source, pipes, pipe fittings, regulators and appliances on the drawing, connect them together using the tools provided, and then print them out.

III. Features

- Virtual piece of paper. You may pan and zoom the paper in the drawing window. The virtual paper is scaled to fit the paper size you specify for printing.
- Unlimited undo/redo stack of all changes to a design. This allows easy correction of mistakes as well as experimentation.
- You may specify initial system parameters (supply pressure and pressure drop), which creates a gas source. You then place appliances, pipe fittings, such as manifolds, and

regulators in a design and connect them with pipes. Several drawing methods allow you to use the one that works best for you.

- Design natural gas and propane gas systems for low, medium and elevated pressure systems.
- Specify TracPipe (yellow jacket), Counterstrike (black jacket), TracPipe PS-II (underground gas piping) and rigid SCH 40 steel pipe (Black Iron or Galvanized).
- Extensive drawing flexibility. You may freely move around objects, scale appliances, rotate fittings, and reconnect pipes to your heart's content. Object properties can be adjusted. All objects have optional labels with font attributes.
- Be able to save as a `.tracPipe2` file and reopen and revise it at any time.
- Very fast. You can specify simple to complex designs.
- Pipe sizing uses the *Branch Length Method,* after doing extensive error checking. You may use the *Sum of Pressure Loss* (SOPL) method for more precise calculations and further optimize your design.
- Continually performs pipe sizing calculations as you work. It highlights incomplete areas of your design and fills in sizes when you design is complete.
- Suggests part numbers for regulators if available.
- Easy to install application.
- Reads and converts legacy TracPipe Specifier `.tps` files to allow working on old designs.
- Design can be turned into an Engineering drawing by specifying an engineering template, and include Bills of Materials, Sum of Pressure Loss reports and notes right on the drawing.
- Version planned for Macintosh® computers. Designs can be opened on either Microsoft Windows® or Apple Macintosh® platforms.

## Advantages over *TracPipe Specifier for Windows*

- Updated to a more modern application design. Menu bar has been added with additional commands available and keyboard equivalents.
- Multiple drawing methods are possible.
- Design may be zoomed and panned. Appliances may be scaled and fittings rotated or flipped. A design can be turned into an engineering drawing.
- Infinite undo/redo.
- There are many different pipe types, pipe fittings, and many more appliance types to choose from. Additional objects will be added over time.
- Pipes are separate from other objects. Extensive reconfiguration is possible without have to go back and recreate things. For example, you can add a tee into the middle of a system without deleting all the components downstream of the tee.
- Uses *Branch Length* and *Sum of Pressure Loss* sizing methods for more optimum designs.

IV. Quick Start

- If *TracPipe Specifier 2* has not been previously installed on your Windows computer, download the `Install TracPipe Specifier 2.msi` file from the *Omega Flex* website or http://www.tracpipe.com. Double click on the file to initiate the install or update process

and agree to the EULA before continuing. To uninstall, you may double click on the installer file again or use the *Programs and Features* control panel in Windows.

- Launch *TracPipe Specifier 2*. It is listed in the *Start* button under *Omega Flex, Inc,*

- If *TracPipe Specifier 2* had been used previously, the last design used will open. Click on the "New" icon to start a new design.
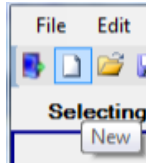

- Otherwise, *TracPipe Specifier 2* will start a new drawing automatically.

  If you want to open a previous `.tracPipe2` document, double-click on the file in a File Explorer window or use the Open (Ctrl O) command. If the *Gas Source Properties* dialog is showing, cancel it first.

- You will be presented with a dialog to specify the *gas source* of the system. Select *Natural Gas* or *Propane*. Select the *pressure supply range* (low, medium, or elevated) of your system. Select the actual combination of *Gas Pressure* and *Pressure Drop* of your system from the dropdown list. You may have to adjust the supply system pressure range to find the appropriate entry.

  Systems with *Elevated* gas pressure utilize inline regulators to drop the pressure to a value appliances can handle. You may specify the output pressure for such regulators on an elevated system.
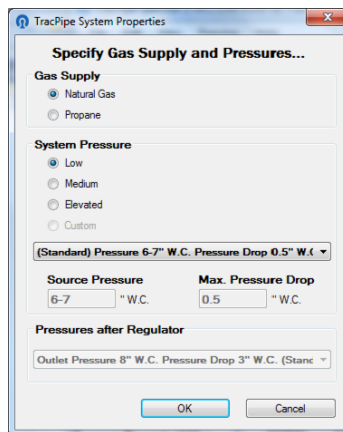

- The drawing window will open showing either a *gas meter* or the *propane supply pressure regulator* for the gas source.

- On the gas source and other unconnected objects you will see dots that are *connection points* where you can connect pipes, appliances, pipe fittings like manifolds, and regulators on elevated pressure systems. You only connect appliances, fittings, and regulators to pipes, not to each other directly.
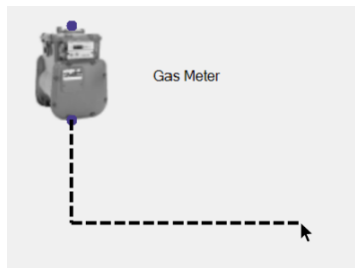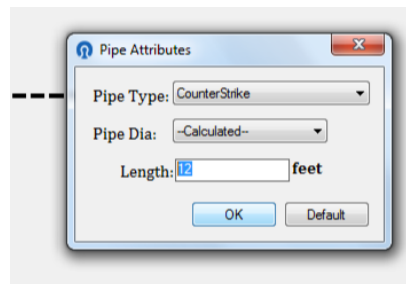
Right Click Method

- Right click on a connection point on the initial gas source. Select "Pipes".
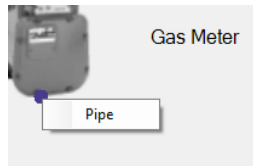
- Move the mouse to the right and down to where you want the pipe to end and click.


You will be presented with a little dialog that will ask you what attributes you want for a pipe.

Select the pipe type, usually *CounterStrike,* and specify the length of the pipe in feet. The pipe type will be remembered for next time. Click *OK. Pipe Dia.* is for existing pipes in legacy systems or for forcing explicit sizes.

- Now, right click on the end of the pipe and select an appliance.
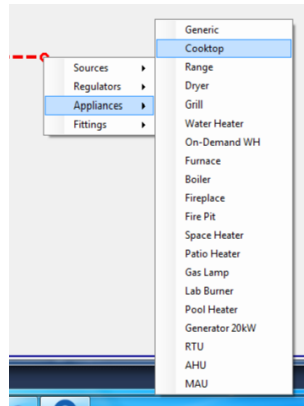
- You'll get an *Appliance Specifier* Specify its load in MBTU (thousands of BTU) energy units and click *OK* and you'll now have a small, but complete gas system. The objects in the system will be labeled.
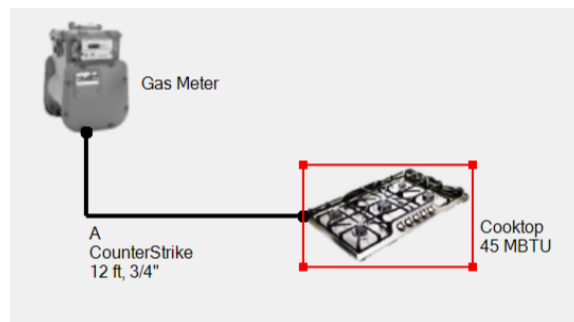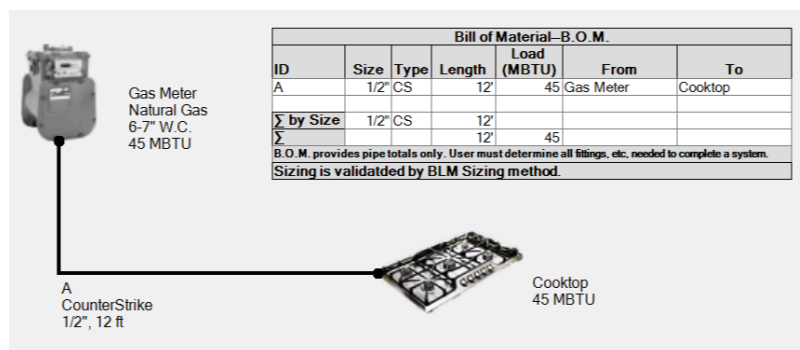

- To complete the initial design we'll want to add a *Bill of Materials* and the *Size* the system. Next click on the Text Block button, and select *BOM Chart*. (We'll discuss the Title Block later.)
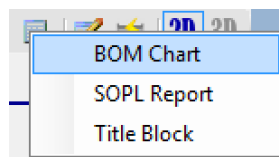

Then click in the drawing where you'd like to place it.

Because of automatic sizing, the pipe diameter will be calculated and the *Bill of Material List* will be filled in.

				Bill of Material–B.O.M.		
ID	Size	Type	Length	Load (MBTU)	From	To
A	1/2"	CS	12'	45	Gas Meter	Cooktop
Σ by Size	1/2"	CS	12'			
Σ			12'	45		
B.O.M. provides pipe totals only. User must determine all fittings, etc, needed to complete a system.						
Sizing is validatded by BLM Sizing method.						

- Optionally, click on the *Calculate Pipe Sizing* button. If everything is connected it will alert you that no errors were found. If there is a problem, it will present an error message.
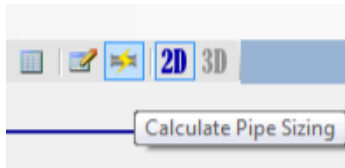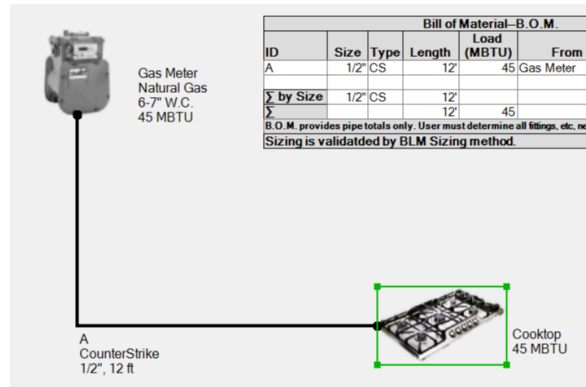
- Finally click on the *Save* icon, or select File->Save and save your design so you don't lose your work.

Expanding the Design

Let's add a manifold and a couple of additional appliances to show how easy it is to modify a design.

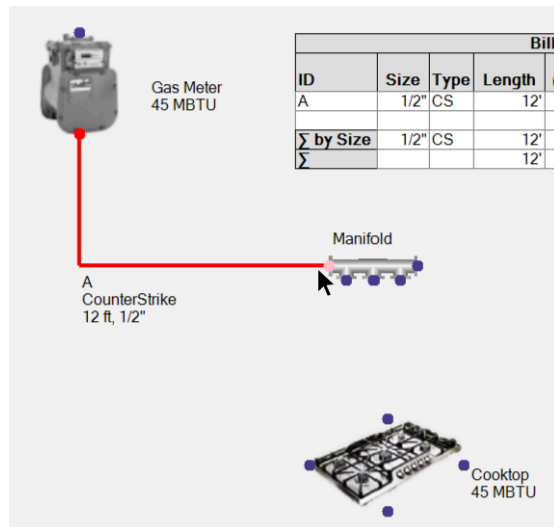- Click on the *Cooktop* and drag it down to make room for additional appliances.

You'll notice that the *Cooktop* becomes selected. *Resize handles* appear so you can resize the size of the appliances in the drawing, if you desire. Double click on the cooktop to get a *Properties Panel* to show properties of the cooktop so you can alter them.

- Right click in the space above the cooktop and select *Fittings->Manifold*. A manifold will appear where you clicked the mouse. A popup dialog will let you select the number of ports and the orientation of the manifold— down, up, right, or left, based on the direction of the outlet ports.
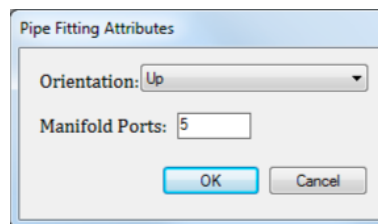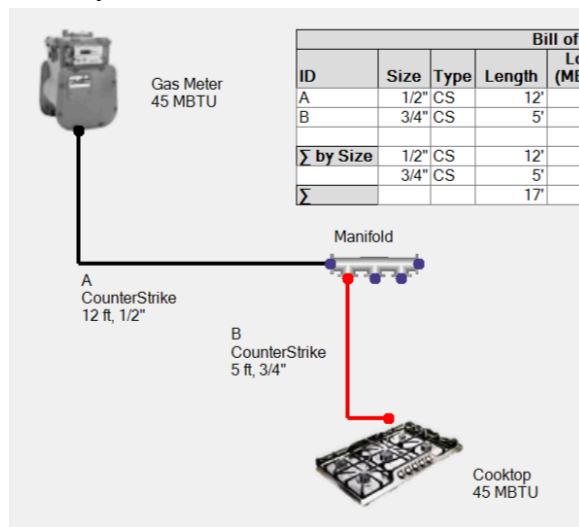

- Now you can move the *pipe* that connects to the cooktop and connect it to the manifold. Then you can add a new pipe from the manifold to cooktop.
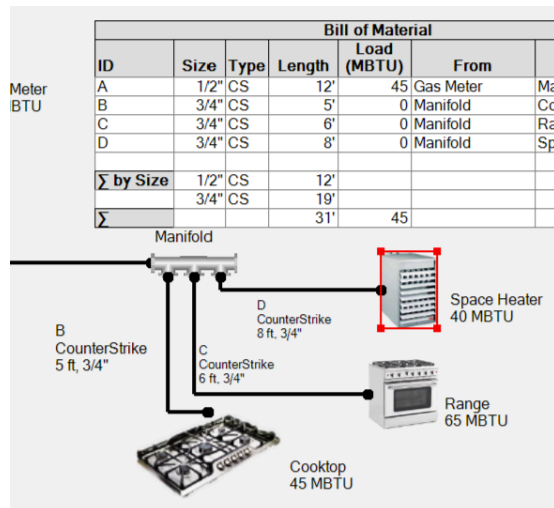
Click on the end of the pipe that connects to the appliance and drag it to the manifold input until its connection point turns red, indicating the pipe has snapped to it.

The first figure shows a Gas Meter (45 MBTU), a Manifold, a Cooktop (45 MBTU), and a CounterStrike pipe "A, 12 ft, 1/2"". Alongside is a partial Bill of Materials table:

ID	Size	Type	Length	(l
A	1/2"	CS	12'	
Σ by Size	1/2"	CS	12'	
Σ			12'	

- Now right click on the left hand manifold output and select *pipe*. Drag the pipe to the cooktop reconnect it to the system. You'll notice that the B.O.M. now has the added pipe.

ID	Size	Type	Length	Load (MB
A	1/2"	CS	12'	
B	3/4"	CS	5'	
Σ by Size	1/2"	CS	12'	
	3/4"	CS	5'	
Σ			17'	

Gas Meter 45 MBTU, Manifold, A CounterStrike 12 ft, 1/2", B CounterStrike 5 ft, 3/4", Cooktop 45 MBTU

- Now we will add another couple of appliances, By right clicking on connection points or using the appropriate drawing tools in the menus or menu bar. More pipes are added to the B.O.M.


Bill of Material

ID	Size	Type	Length	Load (MBTU)	From	
A	1/2"	CS	12'	45	Gas Meter	Ma
B	3/4"	CS	5'	0	Manifold	Co
C	3/4"	CS	6'	0	Manifold	Ra
D	3/4"	CS	8'	0	Manifold	Spa
Σ by Size	1/2"	CS	12'			
	3/4"	CS	19'			
Σ			31'	45		

Meter, BTU, Manifold, B CounterStrike 5 ft, 3/4", C CounterStrike 6 ft, 3/4", D CounterStrike 8 ft, 3/4", Space Heater 40 MBTU, Range 65 MBTU, Cooktop 45 MBTU

- Automatic resizing will update the calculations.

Gas Meter
150 MBTU

					Bill of Material		
ID	Size	Type	Length	Load (MBTU)		From	To
A	3/4"	CS	12'	150		Gas Meter	Manifold
B	1/2"	CS	5'	45		Manifold	Cooktop
C	1/2"	CS	6'	65		Manifold	Range
D	1/2"	CS	8'	40		Manifold	Space Heater
∑ by Size	1/2"	CS	19'				
	3/4"	CS	12'				
∑			31'	150			

- If something is not connected correctly, you'll see a dashed pipe, or an object shown in red. This shows that something is wrong. Click on the *resize* button to see an error message describing the specific problem.
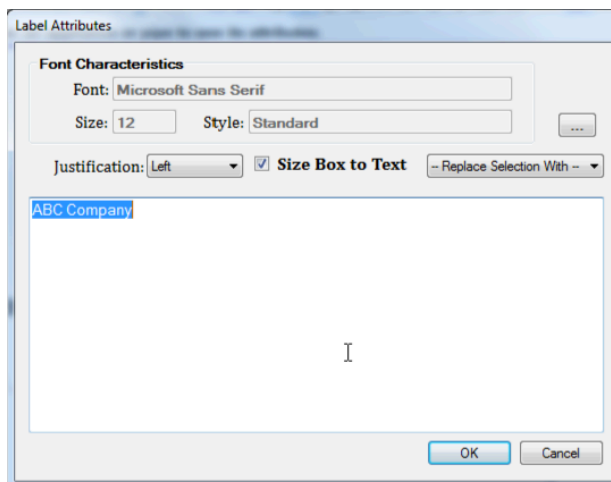
Adding some Additional Text to the Design

We can add additional free-standing text and other information to the design.

- To add a line or two of text, Click on the "T" icon, **T**. As you move the mouse over the design, you'll see some floating text.

Click or Click & Drag to draw a label.

Click *once!* A *Text Properties* dialog will come up. Specify one to a few lines of short text.

Label Attributes

Font Characteristics

Font: Microsoft Sans Serif

Size: 12   Style: Standard   ...

Justification: Left   ☑ **Size Box to Text**   -- Replace Selection With -- ▾

ABC Company

OK   Cancel

When you Click OK, you'll see your lines of text with a resize handle on each side of the text, like so...

ABC Company

Drag a resize handle to expand or shrink the text, like so:

Double-click on a piece of text in a drawing to bring up its properties.
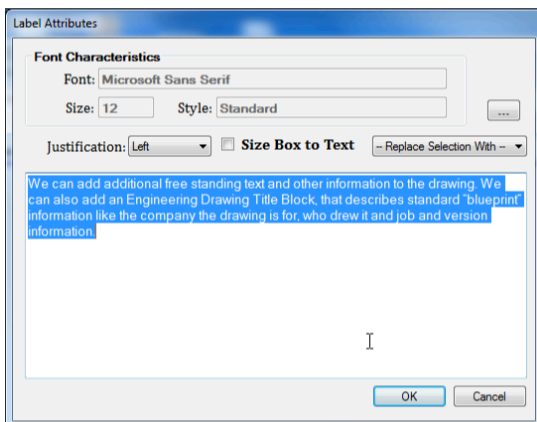
- You can add whole paragraphs or lists as text. Again, click on the "T" icon, **T**. As you move the mouse over the design, you'll see the floating text.
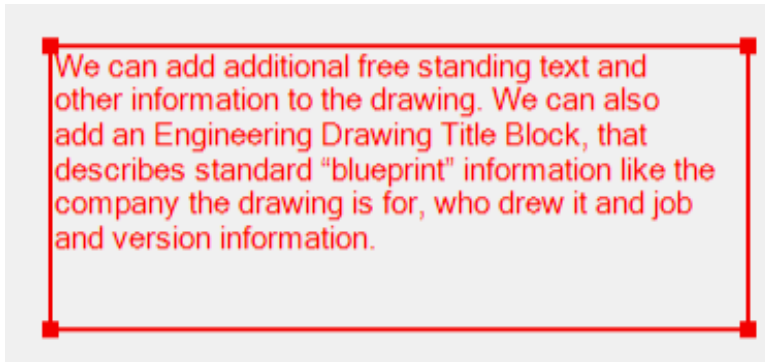

Click or Click & Drag to draw a label.

Now, *click and drag* a rectangle, instead of just a single click. A rectangle will drag out, like so:
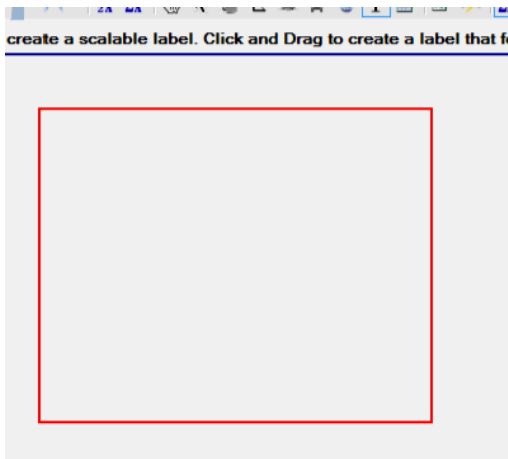
Paste in a paragraph or list in the *Text Properties* dialog and click OK.

And you'll see the text with handles, but the text will now be confined to the box you created, with the lines folded.

If you resize the text using the handles, the text font size will not change, but the lines will be readjusted to fit the text box.

Double click on the text to get its *properties*. Click on the "…" button to change the font characteristics of the text.
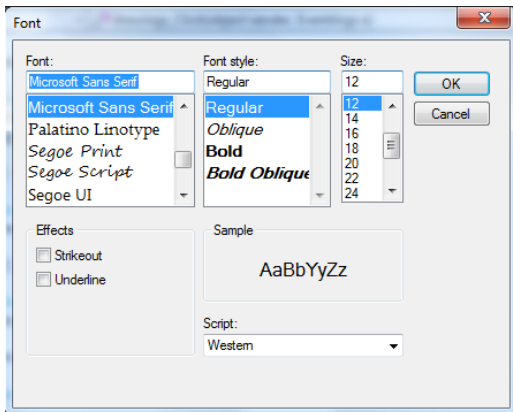
You may switch between the two types of text by checking "**Size Box to Text**" to get resizable text, or uncheck it to get text confined to a rectangle.
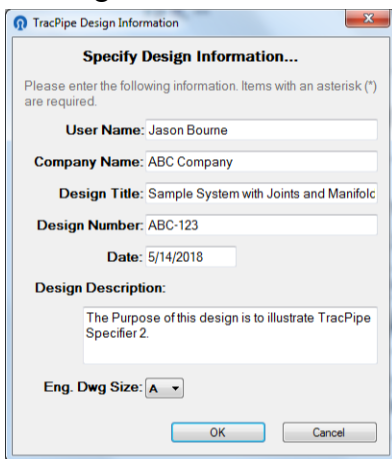
Adding an Engineering Drawing *Title Block* to a the Design

- You can specify the *Title Block* the one that appears on a standard engineering drawing. This appears like so, anywhere you place it.

To create an *Engineering Drawing Title Block*, you first have to specify the information that goes in it. Select *Design Information…* under the *File* menu or by clicking on the icon on the file tool bar.

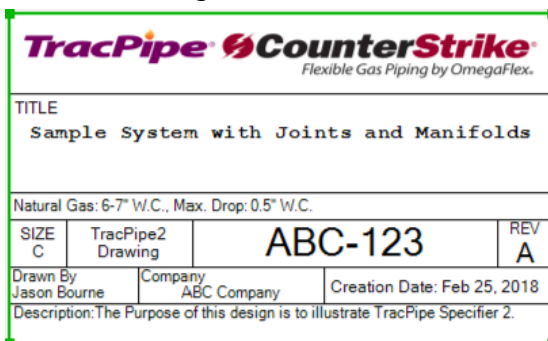A dialog will appear that will let you specify the information that can be displayed with the drawing.

A description of the properties is defined under *Dialogs,* below.

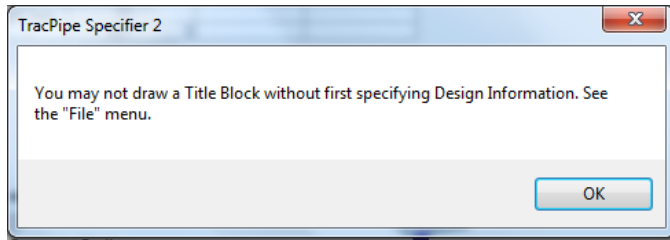Now you can select *Title Block* under the Block Text icon :

A rectangle will appear as you move the mouse over the design. Click to place it, Drag it to move it, or drag a resize handle to resize it.

Note: If you try to drop a *Title Block* on the drawing before using the *Design Information…* dialog, you will get a message:
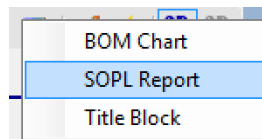

Using *Sum of Pressure Loss* in the design

Calculated pipe diameters are calculated using the *Branch Length Method.* This performs a fairly conservative calculation to assign pipe diameters. The *Sum of Pressure Loss* method is more sophisticated, by calculating the pressure loss across each section of pipe. These losses are then summed between each source (gas meter or regulator) and each end point (appliance or regulator) to assure the user defined system pressure drop(s) have not been exceeded. When you incorporate SOPL in a design you may manually specify smaller diameters for pipes than the automatic values. SOPL will determine whether a smaller diameter will work. **Note: "Approved engineering methods" such as the SOPL method are allowed per the gas codes (IFGC, NFPA 54, UPC, etc.), however, it is recommended the user confirm there are no restrictions on the use of specific sizing methods in their jurisdiction.**

To incorporate SOPL, you must place a *SOPL Report* on the drawing. This will trigger SOPL calculations.

- Select *SOPL Report* under the Block Text icon :

- A rectangle will appear as you move the mouse over the design. Click to place it, Drag it to move it, or drag a resize handle to resize it.

ID	Type	Length	Load (MBTU)	Size	Drop/ft. W.C.	Section Drop W.C.	Start W.C.	End W.C.	Source
A	CS	12'	150	3/4"	0.0182	0.218	6.000	5.782	Gas Source
B	CS	5'	45	1/2"	0.0098	0.049	5.782	5.733	A
C	CS	6'	65	1/2"	0.0209	0.125	5.782	5.657	A
D	CS	8'	40	1/2"	0.0077	0.061	5.782	5.721	A

Sum of Pressure Loss Calculations

Sizing validated by BLM & SOPL methods.

For each piece of pipe, you will see calculated data about it; the energy load on the pipe (in MBTU), the size, the pressure drop/foot, the total drop for the pipe section, and the starting and ending pressures.

If you see the ending pressure on a pipe segment that is much higher than you think is needed, you may manually reduce its size and the table will be recalculated. The easiest way to do that is to right click on the particular row in the table, and select a size, like so:
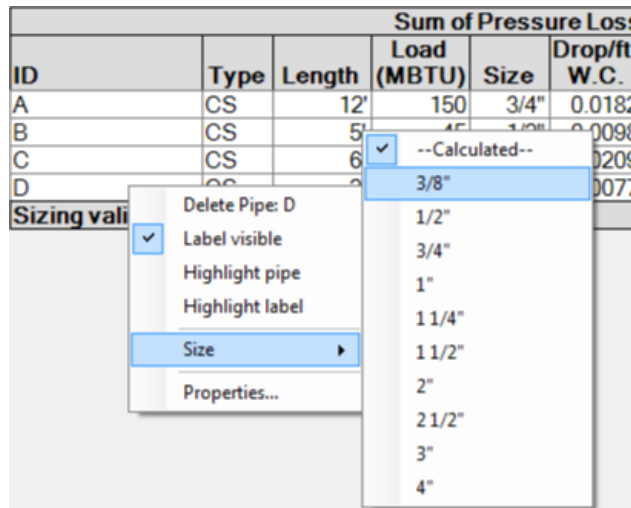
You may also right click on the pipe itself, or use the *Properties* panel.

If the sizing is appropriate, you'll see the table updated with the new diameter and updated data throughout the report. Notice that the pipe size is shown in **bold** for the pipe, indicating that it is manually (explicitly) specified.

			Load		Drop/ft.	Section	Start	End	
ID	Type	Length	(MBTU)	Size	W.C.	Drop W.C.	W.C.	W.C.	Source
A	CS	12'	150	3/4"	0.0182	0.218	6.000	5.782	Gas Source
B	CS	5'	45	1/2"	0.0098	0.049	5.782	5.733	A
C	CS	6'	65	1/2"	0.0209	0.125	5.782	5.657	A
D	CS	2'	40	**3/8"**	0.0377	0.075	5.782	5.706	A

Sum of Pressure Loss Calculations

*Pipe sizes in bold are explicitly specified.
Sizing validated by SOPL method but not the BLM method.

If the resizing resulted in too small a pipe, the pipe or pipes that are too small will be shown in red:

			Load		Drop/ft.	Section	Start	End	
ID	Type	Length	(MBTU)	Size	W.C.	Drop W.C.	W.C.	W.C.	Source
A	CS	12'	150	3/4"	0.0182	0.218	6.000	5.782	Gas Source
B	CS	5'	45	1/2"	0.0098	0.049	5.782	5.733	A
C	CS	6'	65	**3/8"**	0.1069	0.641	5.782	5.141	A
D	CS	2'	40	1/2"	0.0077	0.015	5.782	5.767	A

Sum of Pressure Loss Calculations

*Pipe sizes in bold are explicitly specified.
Sizing Error found. Click the "Calculate Pipe Sizing" button for more details.

- To understand the particular problem. click on the *resize* button to see the error. Use *undo* to undo your change, it may take two, or right-click on the pipe and change its size back to "−Calculated−".

Removing the SOPL report will cause future resizes to just use BLM calculations.

This illustrates the basic procedure for optimizing your design with the help of SOPL.

Additional Tips

- Make a mistake? Cntl-Z will undo operations including sizing. Cntl-Y puts them back.
- Right click on anything to see a handy shortcut menu for seeing things you can do with that object. This includes labels.
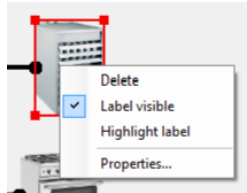
- Double click on anything to see its properties in the Properties Panel or in a special dialog for that object. You may use the properties panel to fix things up. If the Properties Panel is already showing, you just need to select a single object to see its properties.
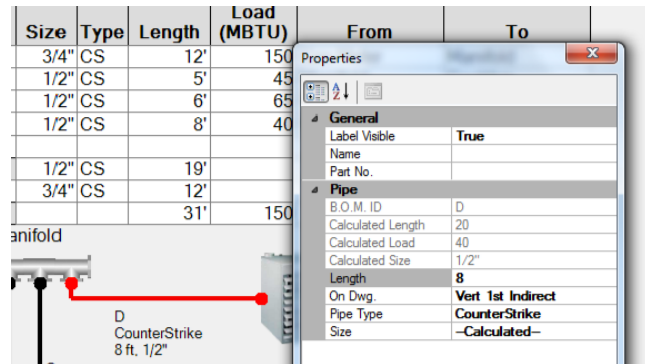
- Object Labels may be moved around or deleted. They may be brought back by right clicking on the object the label went with and selecting "label visible"

- Select an object and you can use the resize handles to resize it.

- Manifolds and other pipe fittings may be reoriented by changing the Orientation property.
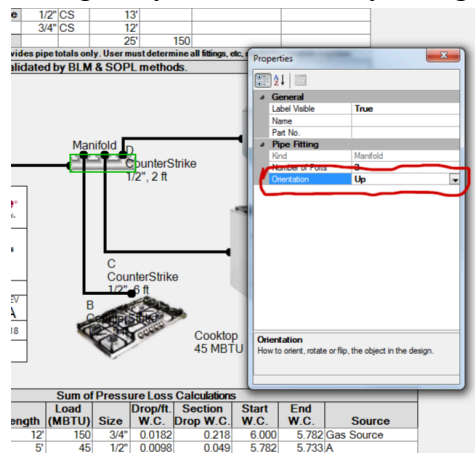
- Confused? Hit escape a few times to cancel whatever you're doing and go to the *Select* tool. It lets you select objects, move them around, delete them etc.

Drawing by clicking on icons and selecting from menus.

Another way of working is to use the Buttons in the tool bar and commands in the menu bar to select objects to draw or modify. Then use the mouse to place the objects where you want. You can add a pipe to connect a new appliance or fitting as you work, or connect them all at once at the end.

Read the section on *Tools* below, to understand the various buttons available to help you move around the drawing, draw, print, and save your work. For example: Hold the shift key down when selecting the Pipe tool to draw multiple pipes more conveniently.

V. Printing a Design

Before printing a design, you often need to do some special configuration so the design will appear as you would like it on the paper. This is especially true if you want to use a "plotter" or large format printer. Because of quirks in some versions MS Windows, this may be a little complicated.

To specify the page size and margins, you need to use the *Page* Setup command, Cntl-shift-P. If you are not using "Letter" size, you'll want to see the page sizes available for the printer you want to print on. In some versions of Windows, *Page setup* only lets you select sizes from the default printer. Other versions, let you select the printer right in Page Setup, that you want to use. In either case, it is always wise to see how your document will appear before you print.

Some plotter drivers are not good about obeying the specifications of the *Size* in the *Page Size* dialog. You may have to specify the plot size in the specific attributes of that plotter.

Follow this procedure to print a design:

- On Windows systems that don't let you select the printer, open Windows **Control Panel->Devices and Printers** panel and set the default printer. How you do this may vary, based on the particular version of MS Windows you are running on.

  You may also have to specify attributes (using printer preferences) such as the page size you want to print for the specific plotter at this time.

- In *TracPipe Specifier 2,* use the *Page Setup* command (cntl. shift P) to bring up the *Page Setup* dialog.

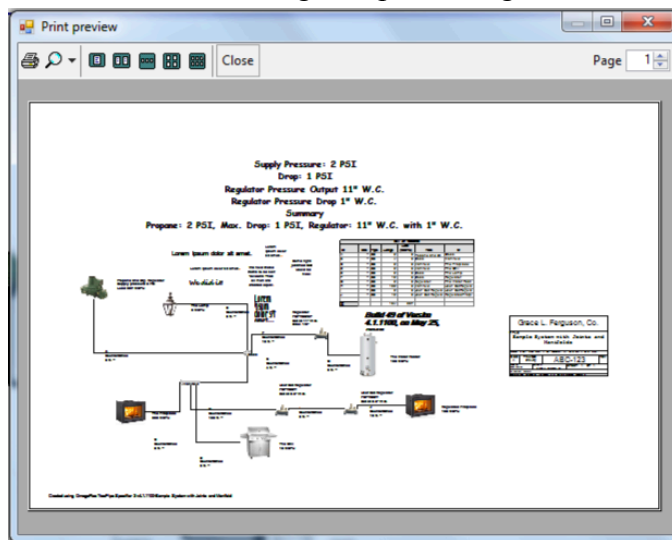- Use the **Size** pulldown to select the particular size of paper you want to use…
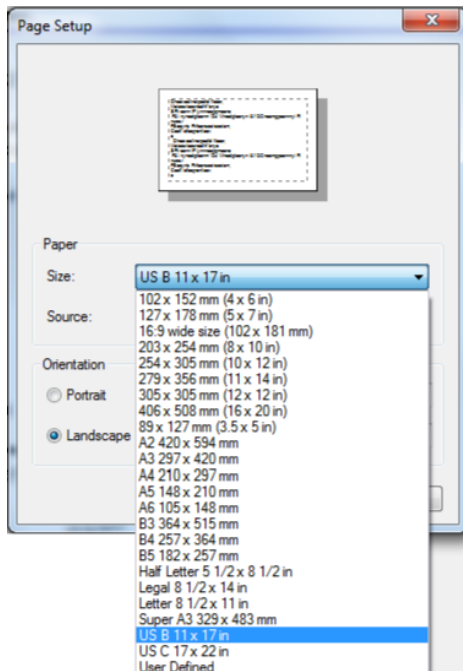
- The default *margins* at 0.5 inch are small for large pieces of paper so you may want to change them to maximize the design on the paper, like so…
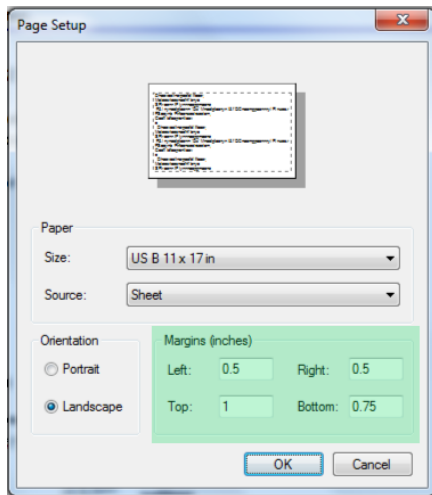
Warning! If you flip between *Landscape* and *Portrait,* the margins will flip too!

- Now *OK* the dialog.

- Check how the drawing will print using *Print Preview…*

The magnifying glass will let you expand the preview.

- If you approve of how it looks, it is safe to print the drawing. Use the *Print* (Cntl. P) command. **Make sure the printer you want to use is selected. Make sure any special printer options are how you want them.**

If you open a new design, or if you relaunch *TracPipe Specifier 2,* make sure your printer settings are still the same.

Printing in *TracPipe Specifier 2* is still being refined.

VI. Elements in the Design

Here is an illustrative design showing various features of *TracPipe Specifier 2*:
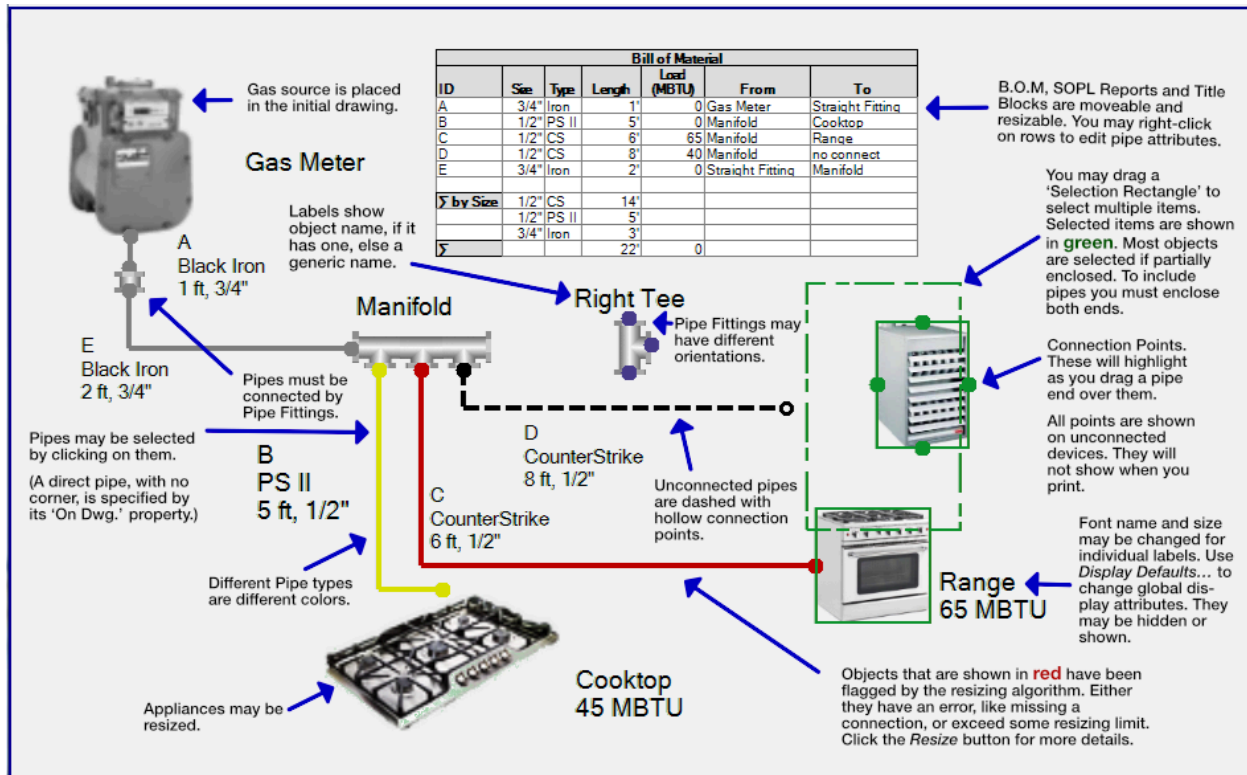
There are two highlight colors you should be aware of: Green is the color of selected items. Items flagged by the resize algorithm (errors) are show in red. Items that are both selected and highlighted are shown is some combination of colors.

VII. The Tools

At the top of the *TracPipe Specifier 2* window, are menus and buttons for accessing all the commands for manipulating your design. This section describes these commands.
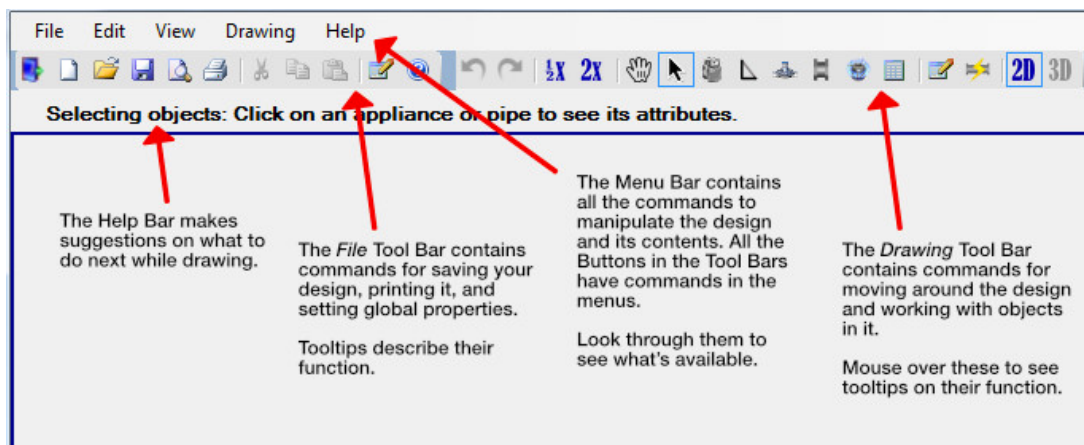
The *File* Tool Bar

See the Menu Bar Menus section, below, for fuller descriptions of these commands. More details on these may be found in the *Menu Bar* section, below.

Exit (Ctrl. W)

New Design (Ctrl. N)

Open Existing Design (Ctrl. O)

Page Setup (Ctrl. Shift P). Allows the user set the page size and margins for printing. Note: before using Page Setup, the user must set the printer they desire to use as the Windows *default printer*, in order to pick an available page sizes for that Printer. Use Windows **Control Panel->Devices and Printers** panel to set the default printer. See *Printing a Design* above.

Print Preview. Shows a preview in a popup dialog.

Print Design (Ctrl. P). See *Printing a Design* above.

Cut/Copy/Paste are not implemented in this version.

System Properties/Design Information/Display Defaults. Specify the gas supply to the system, specify information to display in an *Engineering Title Block* or set various display defaults. **Note:** If you change the gas source for an existing system, you must manually delete the meter or initial regulator in the design and replace with the proper new gas source.

Help. Shows application disclaimer.

The *Drawing* Tool Bar

See the Menu Bar Menus section, below, for fuller descriptions of these commands.

Undo (Ctrl Z)/Redo (Ctrl Y)

Zoom Out (Ctrl -)/Zoom In (Ctrl +) the design

Pan (move up, down, left, right) the design. If the drawing window is active, hold down the space bar to temporary bring up the *pan* tool.

Select/Move/Delete tool. (Escape Key)

Gas source. Presents a pulldown of sources. These are disabled if one is in the design already.

Draw Pipes. Hold down the shift key when you select this if you want to draw several pipes in a row. When drawing, hold down the shift key to draw a *direct* pipe, that has no corner.

⬚ Draw Inline Regulators. Presents a pulldown of Inline regulators—not a propane source regulator. These are disabled unless you specify an *Elevated* gas pressure.

⬚ Draw Pipe Fittings. Presents a pulldown of Pipe Fittings.

⬚ Draw Appliances. Presents a pulldown of Appliance choices.

⬚ Draws free-standing text on the design. See the section on *Adding some Additional Text...* in *Quick Start.*

⬚ Draw a block of text—a pipe Bill of Materials, a SOPL Report, or an Engineering Drawing Title Block.

⬚ Shows (double-click) the Properties Panel. If a single object is selected in the design, its properties will show in the panel. Selecting a single object will present its properties.

⬚ Perform Pipe Sizing operations with diagnostics. A dialog pops up when it completes. If it found a problem with the design, it presents an error message, and highlights the offending object in the drawing so you may correct it.

⬚ 2D/3D drawing modes. 3D mode, which includes drawing in 3 dimensions, and rotating the design, is not implemented in this version.

Menu Bar menus

1. File Menu

The file menu contains commands for creating new designs, filing and printing them.
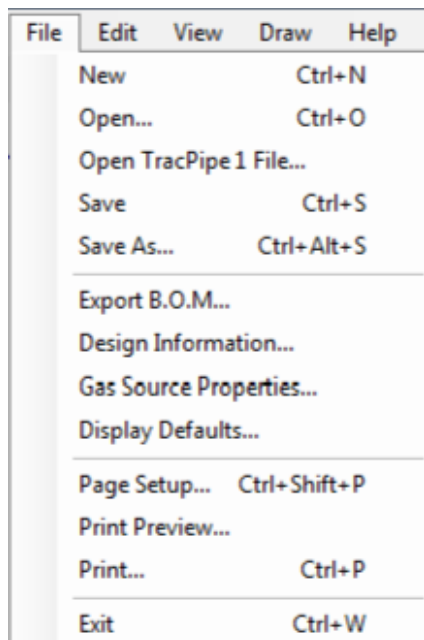
New (Ctrl N)

Creates a new document. A *System Properties* document is presented asking for the gas supply pressure and permitted pressure drop. If there is an open document, it is closed after asking if you want it saved.

Open… (Ctrl O)

Presents and *Open File Dialog* for you to select and existing `.tracPipe2` document. . If there is an open document, it is closed after asking if you want it saved.

Open TracPipe1 File…

Like above, but this allows you to open a legacy `.tps` file created with the original *TracPipe Specifier for Windows*. The file is converted to the latest document type.

Save (Ctrl S)

Saves your work. If you've never saved your design before, it presents you with a *File save* dialog.

Save As… (Ctrl Alt S)

Saves your existing design under as a new file. You'll be presented with a *File Save* dialog. Further saves will with the new file name.

Export B.O.M…

Creates a `.csv` export of the pipe *Bill of Materials*. A `.csv` file is a Microsoft Excel compatible ASCII file where each line is a row of the spreadsheet. Columns on each line are separated by commas. It has the same layout as the visible B.O.M. when placed on a drawing. If you have Microsoft Excel installed on your computer, you should be able to just double-click on the `.csv` file to open it in Excel.

Design Information…

Presents a dialog asking for textual information about the design. This information will be used as part of a *Engineering Drawing Title Block* that you can place on your design.

See more information on *Adding an Engineering Drawing Title Block…,* above, and under *Dialogs* below.

Gas Source Properties…

Presents the *System Properties* dialog for specifying supply gas pressure and pressure drop. **Note:** Changing these properties on an existing design does not automatically change the pressure source in the drawing or regulators or not. If the gas type changes, you must manually change the pressure source in the drawing. Regulators and their kind may need to be replaced or deleted depending on the system pressure. Only some of these consistencies are flagged.

Display Defaults…

Presents the *Display Defaults* dialog. This allows you set various global defaults for displaying labels and objects. See more information in *Dialogs* below.

Page Setup… (Cntl Shift P)

Lets you specify the paper size and orientation you want to print the design on.

Print Preview…

Lets you see a preview of the page as it will be printed.

Print… (Cntl P)

Prints the design using the default or manually selected printer. The design is scaled to the maximum size to fit on the paper with the orientation you specified.

`Exit (Ctrl W)`

Quits *TracPipe Specifier 2*. You will be asked to save the drawing if there are outstanding changes. This is indicated if the file name in the title has a asterisk at end of the name.

2. Edit Menu

Contains do/undo and some miscellaneous global commands that affect the whole design.
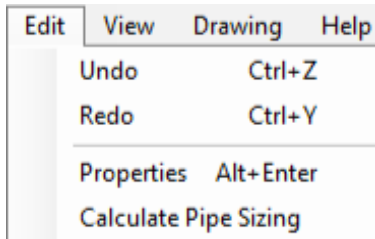
`Undo (Ctrl Z)`

Undoes the last command. Executing it repeated moves back in time in the undo stack. You can completely undo all changes you made since creating or last opening a drawing.

`Redo (Ctrl Y)`

Moves forward in the undo stack, re-executing commands you undid.

`Properties (Alt Enter)`

Presents the Properties Panel. If a single object is selected in the design, its properties will show in the panel. Selecting a single object will present its properties.

`Calculate Pipe Sizing`

Perform Pipe Sizing operations with diagnostics. Dialog pops up when it completes. If it found a problem with the design, it presents an error message, and highlights offending objects in the drawing so they may be corrected.

3. View Menu

Presents commands the let you change your view of the design.
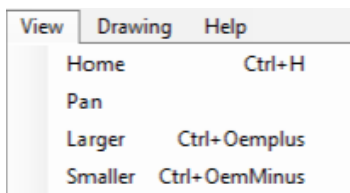
`Home (Ctrl H)`

Zooms and pans the design so the whole design just fills the main window. If you change the window size by dragging its sides, issue a *Home* to re-center the drawing.

`Pan (space bar)`

Brings up the *Pan tool,* so you can re-center the design. If the drawing window is active, hold down the space bar to temporary bring up the *pan* tool.
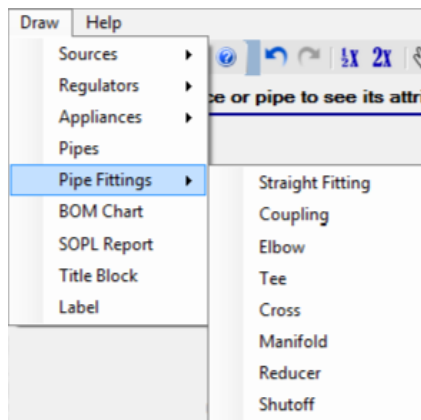
```
Larger (Ctrl +)
```
Makes the design larger in the main window about the center of the window. Do this to make smaller objects easier to work with.

```
Smaller (Ctrl −)
```
Makes more of the design fit in the main window about the center of the window. Do this to see more of the overall design.

4. Draw Menu

Lets you select an object to draw.

There are submenus for *Sources, Regulators, Appliances, Pipe Fittings* and various text blocks. When you select an item to draw, as you move the mouse over the main window, you drag an image or an outline of the object over the drawing. Click the mouse to place it.

After you drop an object *TracPipe Specifier 2* will flip to the *Select tool.*

Some items may not be placed in the drawing because you may have only one of them or they are not allowed, based on the system pressure. Those items will be disabled and can't be selected.

Pipes work a little differently. After you select a pipe, put the mouse over the point where you want to start the pipe and click to place the first point. You can either drag the mouse to the new point and release, or release it immediately and re-click the mouse where you want the line to end. If you click on a connection point, make sure the point highlights red to make sure you make a valid connection.

If you hold down the *shift key* while selecting *Pipes,* the pipe tool will become *sticky* and will stay in the tool until you select another tool or hit *escape.*

5. Help Menu

Information about *TracPipe Specifier 2.*
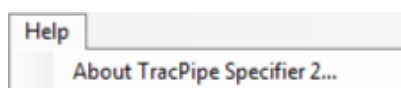
```
About TracPipe Specifier 2…
```
> Presents a dialog with the application version and terms and conditions about using *TracPipe Specifier 2*.

VIII. Opening an Existing Drawing

Open an existing `.tracPipe2` document by double clicking on it or use the *Open* command. **Note:** Double clicking on a file only works if you properly installed *TracPipe Specifier 2* using an installer file.

IX. Drawing a Design

(See the **Quick Start** guide.)

X. Using the Sizing Tool

The Sizing tool is the most important operation in *TracPipe Specifier 2*. It performs three important functions:

- It checks your design for errors.
- It sizes all your pipes first by using the *Branch Length Method* and optionally, performing *Sum of Pressure Loss* calculations.
- It assigns Omega Flex regulator part numbers for regulators on elevated pressure systems.

When the Sizing tool completes successfully it puts up a popup dialog saying that it completed. If an error was found, it presents the most important error it encountered and it highlights the object(s) that had the error. Errors may be informational or warnings. Sizing continues when these errors are encountered. Stronger errors, such as an incomplete design, cause resizing to stop when it encounters the error.

During BLM calculations, the Sizing tool resizes pipes whose default size is marked as '*Calculated*', the default. If you are adding to an existing design, you may want to specify the actual diameter of existing pipes, so the Sizing tool does not attempt to resize them. If you are using SOPL, you may force pipes to be smaller than BLM calculates, but still large enough to pass SOPL calculations.

The Sizing tool *will* check that these pipes are large enough to handle any additional load in the updated design and flag any pipes that don't, but if using SOPL, it will allow to continue. Pipes that fail BLM may pass SOPL.

If SOPL is being used, pipes that do not provide enough pressure or are out-of-spec are flagged.

The Sizing tool does check for most errors but may miss a few. New tests are being added with new releases of *TracPipe Specifier 2*. See the *Dialogs* section below, to see a list of errors that it flags.
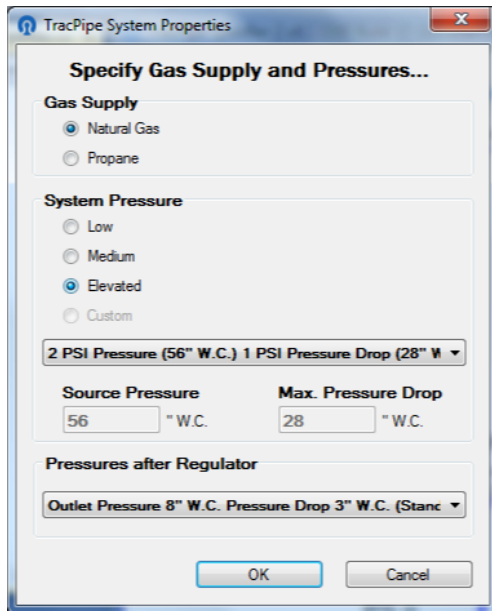
XI. Outputting your Results

The two main ways you can output your design are to print the design with the piping Bill of Materials on the drawing, and export the Pipe Bill of Materials for import into a spreadsheet.

XII.   Dialogs etc.

- *Gas Source Properties*

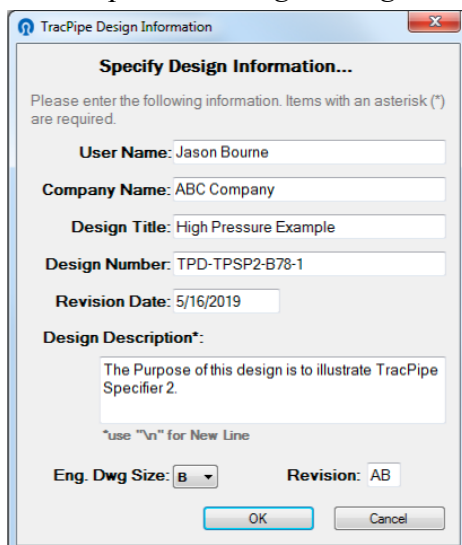   Lets you show various attributes of the gas supplying the design.

   [Details]

- *Design Information*

   Presents a dialog asking for textual information about the design. This information will be used as part of an *Engineering Drawing Title Block* that you can place on your design.

   Fields:

   User Name

   > The name of the person responsible for this design

`Company Name`

 The name of the company the design is for.

`Design Title`

 The title of the design. This is not the same as the design filename.

`Design Number`

 A number for the design.

`Revision Date`

 The last revision date of the design.
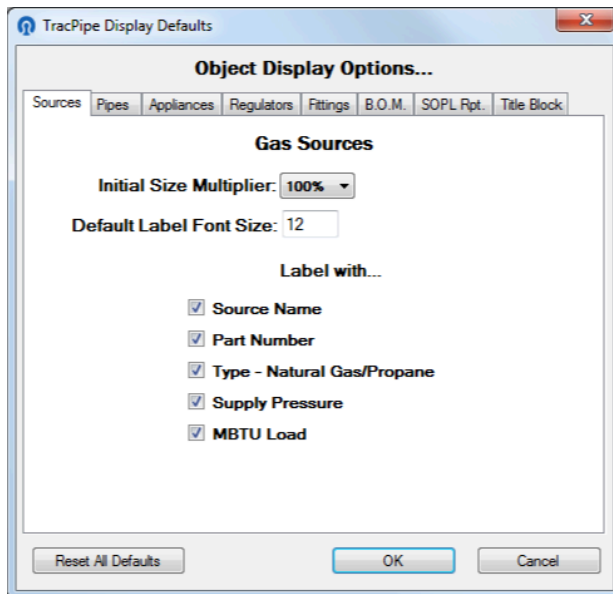
`Design Description`

 A one line descripton of the project.

`Eng. Dwg Size`

 Standard engineering drawing sizes: A, B, C, D, E. (For information only. This field does not affect the actual page size.)

- *Display Defaults*

 Is a dialog that lets you specify how various objects and their labels are displayed in the design window and when printed. There is a tab for each object kind.

 Most tabs have common sections:

`Initial Size Multiplier`

 This expands or contracts the image used to display the object being laid down in the design. So it makes the object appear larger of smaller in the design. *It only applies to when the object is placed. It does not affect images that are already placed.*

`Thickness`

 For Pipes, you specify *Thickness,* the width that pipes are shown in the drawing window and when printed. If you are printing to a small piece of paper, what looks fine on the monitor may not look great when printed. Use *Thickness* to make pipes thinner.

Default Label Font Size

This specifies the size to display labels for this kind of object. *It affects all new and existing labels that use the default font size.*

Label with…

These are attributes that are to be displayed in all labels for this kind of object. They are displayed in the order of this section. Different kinds of objects have different options, taken from the list below:

Source/Appliance/Regulator/Fitting Name

If an explicit name is specified in the object's *properties,* that is used. Otherwise the name of the particular kind of source/appliance/regulator/pipe fitting is used.

Part Number

display part number if specified or calculated for the part.

Type — Natural Gas/Propane

Source gas.

Supply Pressure

Supply pressure provided by a gas source.

MBTU Load

This is either the load an appliance places on the system, or the load the source/fitting/pipe must supply.

Marker or Pipe Name

If a pipe has an explicit name supplied in *properties,* that is used, else it is the pipe letter (A, B, C…) assigned to a pipe by *TracPipe Specifier 2*

Part Number

Calculated regulator part number or optional part number supplied by the user.

Diameter

Pipe size.

Length

The length of the section of pipe.

Material

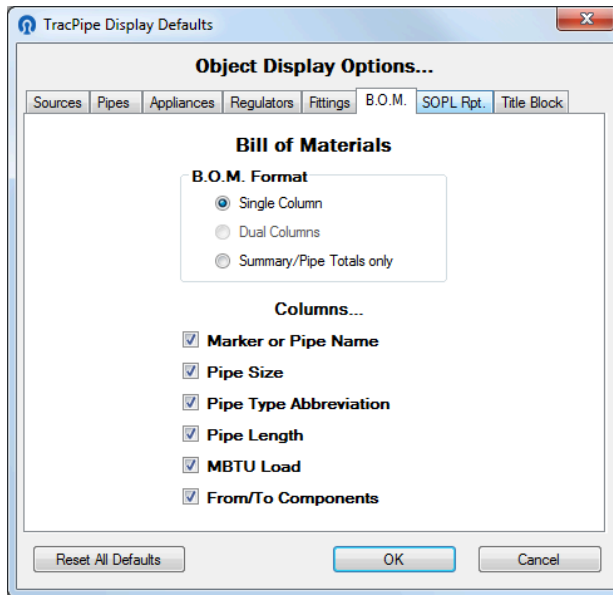How to display the type of pipe. The options are `Full name`, or `Abbrev…`

Port Size

For a regulator, this is the diameter of the inlet and outlet ports.

Outlet Pressure

The outlet pressure a regulator supplies.

B.O.M, SOPL Reports, and Engineering Title Block have their own special options.

For B.O.M. you may specify a single column full B.O.M. or just present the summary section which provides pipe totals by pipe type.

Two column reports are not yet implemented.

You may specify which columns you want to be visible:

Marker or Pipe Name
:   If a pipe has an explicit name supplied in *properties,* that is used, else it is the pipe letter (A, B, C…) assigned to a pipe by *TracPipe Specifier 2*

Pipe Size
:   Its diameter

Pipe Type Abbreviation
:   The kind of pipe it is.
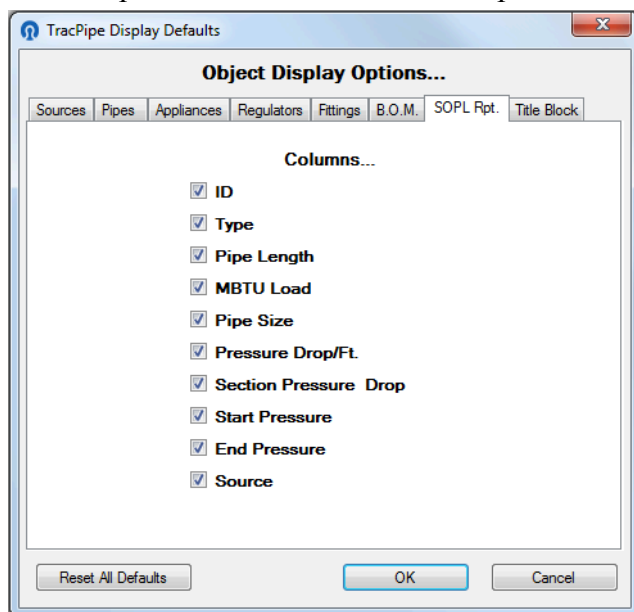
Pipe Length
:   Pipe length

MBTU Load
:   The gas load the pipe must supply.

From/To Components
:   The source to the pipe, from, and the name of the object it supplies—to.

SOPL report have their own column options:

ID
> If a pipe has an explicit name supplied in *properties,* that is used, else it is the pipe letter (A, B, C…) assigned to a pipe by *TracPipe Specifier 2*

Type
> The kind of pipe it is.

Pipe Length
> Pipe length

MBTU Load
> The gas load the pipe must supply.

Pipe Size
> Diameter or the pipe.

Pressure Drop/Ft.
> The calculated pressure drop/ft. for this section of pipe, based on its diameter, length and MBTU load.

Section Pressure Drop
> Pressure drop/ft * length

Start Pressure
> The calculated pressure at the source end of the pipe.

End Pressure
> The pressure at the end of the pipe, *start pressure – section pressure.*

Source
> The ultimate gas source, either the system source, upstream pipe outlet, or a regulator output.

The Engineering Title Block has only one display option. Eventually different format templates will be available, but only one exists now.
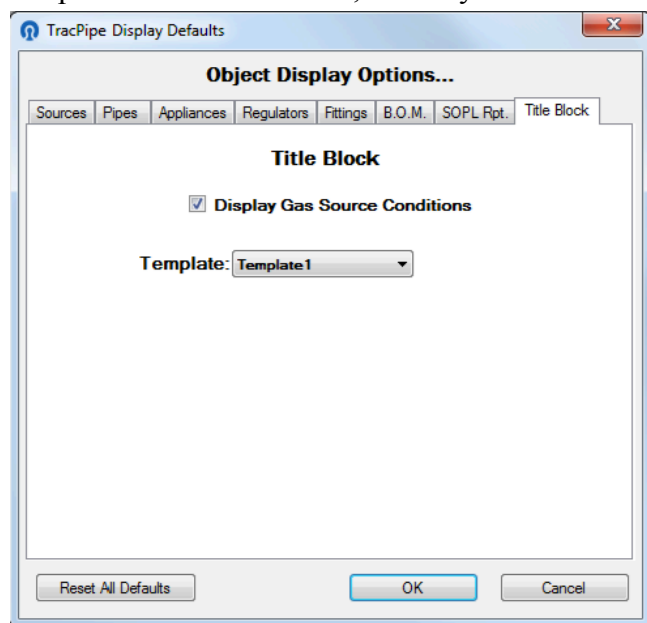

Display Gas Source Conditions

Normally there is a line in the Title Block that describes the source pressure, pressure drop, etc. This may not be desired for certain designs. If not checked the space for this field in the block will be left blank.
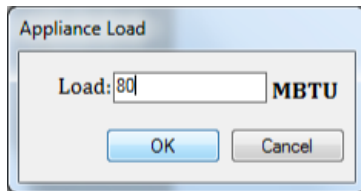
- *About*

Tells you what version of *TracPipe Specifier 2* you are using and presents a disclaimer of the risks and responsibilities of using the product.
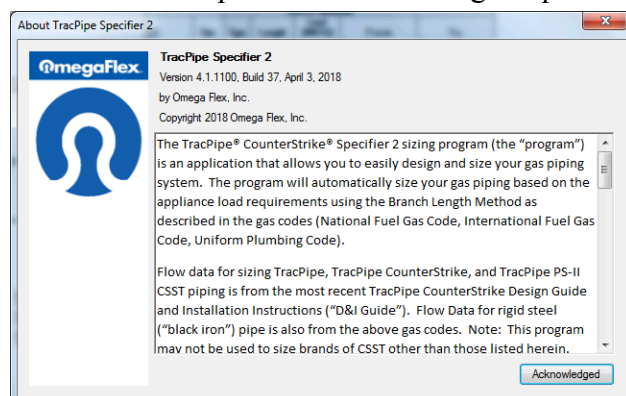
- *Appliance Load*

When placing an appliance, this dialog lets you specify the energy consumption in *MBTU*s.
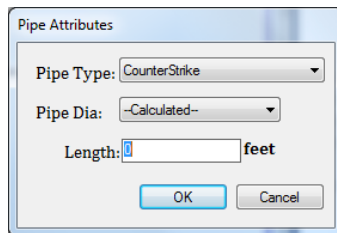
Load

> Remember to specify the appliance load in MBTUs (thousands of BTU) of energy consumption, not in BTUs or cubic feet/minute of gas or other energy units.

- *Pipe Attributes*

  When completing a pipe, this dialog lets you specify the kind of pipe, its length and it sizing properties.

Pipe Type

> This is the kind of pipe. *CounterStrike* (black jacket) is OmegaFlex's standard flexible pipe, or CSST- Corrugated Stainless Steel Tubing. *TracPipe* (yellow jacket) and *TracPipe PS-II* (underground piping) are OmegaFlex's other CSST products. *Black Iron* is the classic straight rigid gas pipe.
>
> This option is *sticky.* It remembers the last pipe kind you specified as the default.

Pipe Dia.

> Specifies how you want the pipe sized. The default is to have the *Pipe Sizing* tool calculate the pipe size. If this is an existing pipe, you may want to specify the exact size of the existing pipe.
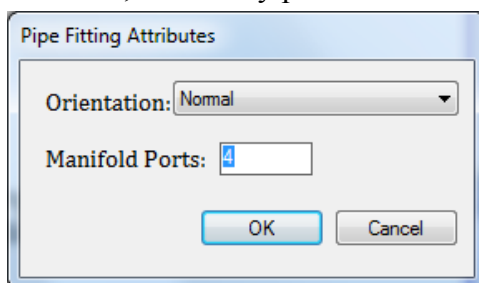>
> If you specify an explicit size, the *Pipe Sizing* tool will warn you if the pipe size is too small.

Length
> Specify the length of the pipe in feet.

- *Pipe Fitting Attributes*

  After placing a pipe fitting, this dialog lets you specify the fitting orientation and if a manifold, how many ports it should have.

`Orientation`

Fittings may be oriented on the design in different directions, based on the fitting kind. The exception is *cross* fittings, which are symmetrical, so this dialog is not presented.

`Manifold Ports`

When placing a manifold, this lets you specify the number ports the on the manifold. This field is disabled, if you are not placing a manifold.

- *Text Attributes*

Presented when you double-click on a piece of free-standing text—not object labels, or when defining a new piece of text. It lets you define the actual text to display in the design, font characteristics, etc.
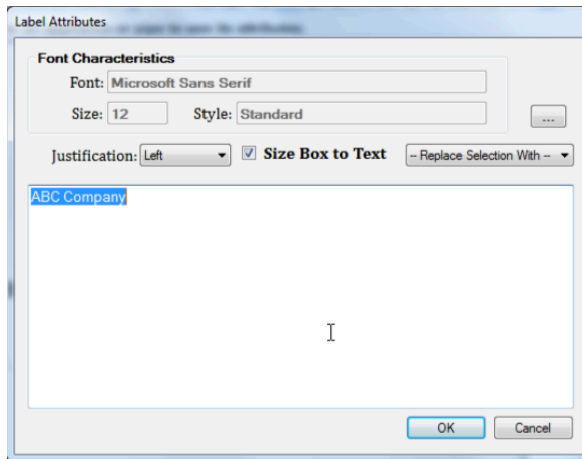
`Font Characteristics`

These are the *Font Name, Size,* and *Style.* These are not modifiable in this dialog, click on the "…" button to bring up the standard Windows font characteristics dialog;
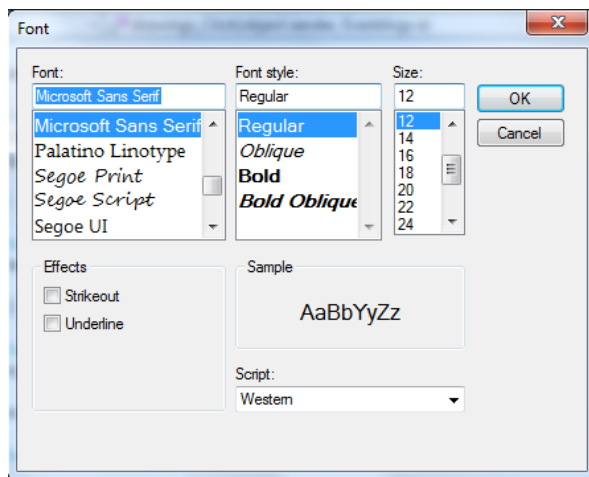
After completing or canceling this dialog, *TracPipe Specified* 2 will switch back to the *Text Attributes* dialog.

`Justification`

Specifies whether you want to the text, left justified, right justified, or centered.

"Size Box to Text" checkbox

You may switch between the two types of text; text that resizes by dragging its bounds, and text that fills a rectangle by folding its lines. Check "**Size Box to Text**" to get resizable text. Uncheck it to get text confined to a rectangle.

"-- Replace Selection With --" pulldown

You may bring in certain values into a piece of text by specifying special keywords. Examples are the *drawing filename, the current date,* and values specified in the *Design Information* Dialog. These keywords always start with an '&' character and most are hard to remember. Selecting an item in this pulldown, inserts or replaces text in the text box with the correct keyword. The value the keyword represents, replaces the keyword when the text is displayed. Values are:

Company name

&Company—The *Company Name* field of *Design Information…*

Current date

&Date—The current date from *Windows* as *Tuesday, May 15, 2018.*

Current time

&Time—The current time from *Windows* as *8:24:09 AM.*

Design number

&Number—The *Design Number* field of *Design Information…*

Design title

&Title—The *Design Title* field of *Design Information…*

Engineering drawing size

&EngSize—The *Eng. Dwg Size* field of *Design Information…* as *A, B…E.* This value is strictly informational. It does not affect how the design is actually printed.

Design Revision

&Revision—The *Revision* field of *Design Information…* Usually one or two letters or numbers.

Design revision date

&RevisionDate—The Revision *Date* field of *Design Information…*

File name

&Dwg—The name of the saved design file or *untitled* if it is new.

Gas kind

&Gas—Either "Natural Gas" or "Propane" — the kind of gas supplying the system.

Gas pressure

&Supply—Gas pressure, in *W.C.* or *PSI,* supplying the system.

Gas pressure drop

&Drop—The maximum gas pressure drop, in W.C. or *PSI,* allowed in the system.

Design description

&Description—The *Design Description* field of *Design Information…*

Regulator pressure
> `&RegPress`—The output pressure of standard extra regulators installed in the system.

Regulator pressure drop
> `&RegDrop`—The maximum allowed pressure drop in the output of extra standard regulators.

User name
> `&User`—The *User Name* field of *Design Information…*

Version build number
> `&BuildNumber`—The *Build Number* of the running *TracPipe Specifier 2,* like *44.*

Version date
> `&VersionDate`— The date the running *TracPipe Specifier 2* was built, like *May 12, 2018.*

Version number
> `&VersionNumber`— The *Version Number* of the running *TracPipe Specifier 2,* like *4.1.1101.*

Note: Use a period after a keyword, if the text that follows it is an alphabetic character or a period you want to show. Like *&Dwg.abcdef,* or *&Dwg..tracPipe2.*

- *Sizing Completed*

Presented when the *Pipe Sizing* tool completes. If no error was detected a popup dialog is shown and disappears after a few seconds.
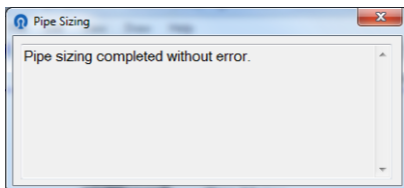

Otherwise there are three kinds of errors. *Informational* errors note about your design that you should be aware of. An example of this if a regulator needs a part number. *Warnings* are for limits that are exceeded such as the maximum pressure drop allowed in a system, or a pipe diameter could not be calculated. These do not stop calculations. *Errors* are serious errors that stop all calculations, such as a pipe that is not connected to anything or an appliance that is not connected. Calculations stop on the first error that occurs.

When an error occurs the offending object(s) are usually highlighted in the drawing in red. Lines in B.O.M. and/or SOPL reports are show with a red background.
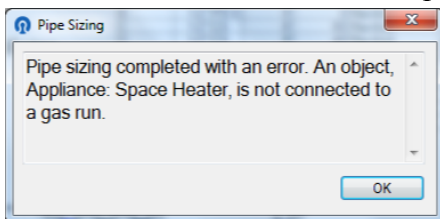
Certain errors that occur during the BLM calculations give the user the option to continue to the SOPL phase or to stop.
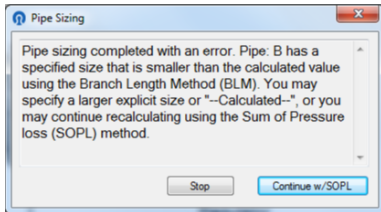
These are the errors that can occur and expanded descriptions:

A supplier is not connected to anything.

The supply gas meter or regulator is not connected to a pipe.

If you seem to have a pipe connected but it is dashed, you need to drag the end of the pipe until it actually highlights a connection dot on the gas source.

A supplier has more than one connection

One connection only, please.

An object needs to be connected to a pipe.

An appliance or pipe fitting needs to be connected to the system.

If you seem to have a pipe connected but it is dashed, you need to drag the end of the pipe until it actually highlights a connection dot on the appliance or fitting.

A pipe end on object is not connected to anything.
The object needs to be connected to something.
An appliance is connected to more than one pipe.
A gas source is not connected properly.
A Regulator needs two connections.
Can't come up with a Part Number for the regulator,
An object is not connected to a gas run.
Internal error, could not determine the supply pressure from object.
Regulator is not appropriate for this gas pressure.
Could not determine which ends of a regulator is the feed or the supplier.
Possibly an error in connecting the regulator.
There is a loop of pipes in a gas run. Stopped at object.
Pipe has a specified size that is smaller than the calculated value.
Specify a larger explicit size or turn on "--Calculated--".
A pipe could not be sized because no sizing table or capacity entry in one
could be found.
An error occurred while calculating a Sum of Pressure Loss pressure. An
appropriate entry in the pressure tabled could not be found,
An error occurred while calculating a Sum of Pressure Loss pressure. The
calculated end pressure went negative,
An error occurred while calculating a Sum of Pressure Loss pressure. The
maximum allowable pressure drop was exceeded,
Pipe size is not a valid explicit size for the particular material
selected.
Warning: Pipes must be of decreasing size by type, along a run.
A pipe has no calculated or explicit diameter to use for SOPL
calculations.
A pipe could not be sized because the pipe length exceeds the maximum BLM
table entry for this kind of pipe.
Warning: The pressure drop/foot of pipe must not exceed 10"/ft. W.C.
Warning: The gas pressure supply to an appliance exceeds ½ PSI or 14\"
W.C.
Unknown Error.