# Creating a New C3D Pressure Pipe Catalog and Fittings (from manufacturer's 3D models)

C3D 2014 only has Catalogs for Ductile Iron pipe; either Flanged, Mechanical or PushOn (and these are not complete). To add other materials (or additional DI sizes) use the following directions. This assumes you have found some 3D models, either from a manufacturer or online. This does not cover creating a 3D part from scratch in AutoCAD.

For Pipes you will need the pipe data from a manufacturer's catalog (OD, thickness, class, etc.) and for fittings you will need a 3D model provided by a manufacturer (STEP, SAT, IGES, IPT, etc.). You will also need **both** AutoCAD standard (plain) and Civil 3D of the same version. You will need to use Content Catalog Editor provided with your version of Civil 3D to create the Part Family.

You should also take some time to consider your naming format and attached information for your pipes and fittings and how they will appear in Civil 3D as you are creating your Pressure Pipe system. Clear naming will avoid issues in the design process. For example: in Civil 3D 2014, the Description field **does not** automatically populate in the pipes and fitting created. If you use this field in your Label Styles, you may want to utilize the Nominal Diameter Description field in your Label instead.

## **Creating Fittings from a Manufacturer's 3D Model**

An example of 3D models of fittings can be found at the Weld Bend site. Steel fittings from *STEP* models found here: <a href="http://www.weldbend.com/">http://www.weldbend.com/</a>

Go to the "AutoCAD Files" menu and select the fittings needed.

AutoCAD can support a number of 3D model formats, I'm using STEP as an example.

- 1. Open AutoCAD standard. Go to the Insert tab and select Import. Select the *STEP* file of the fitting. It will take a couple of minutes to import. An Import File Process Complete popup will appear when it's done, click on the link. The 3D model should appear. I suggest you set your View to 2D Wireframe (on View tab).
- 2. Explode the block to expose the 3DSOLID object (a later step will not recognize the block). PURGE the block from the drawing. Save the drawing in the folder with the *STEP* files, with the same name as the *STEP* file.
- 3. Centerline. You will now need to draw a line through the center of the object, or two for Tees (if you need two lines, **make a Block** of them to bind them together). This line will be needed for two steps later. Use the ViewCube in the upper right corner to rotate the object. Hit the "Home" icon to angle the view. Hit the "Top" icon to return to plan view. You should be able to snap to the center of either end of your fitting to draw a line. You will not be able to see your line if you are not in Wireframe mode. You will need to add an arc for elbows or curved fittings.
- 4. AutodeskConnectionPoint. Enter this command for each end of a fitting (Elbows will have 2, Tees 3, Cap 1, etc.). Insert, then select 3DSOLID, pick the end of the line on the side you are choosing, for direction first pick the opposite end of the line then the end that you are choosing, finally select No for engineering data. Repeat for each open end of your fitting. For curved fittings (elbows) be sure that your ACP is perpendicular to the face (open end) that it is attached.
- 5. Steps 2-4 can be done in either AutoCAD or Civil 3D. The next command is only available in AutoCAD Civil 3D. Save and close AutoCAD and open the drawing in Civil 3D.

- 6. Enter the command PublishPartContent. The prompts will ask you to select the part, select the centerline of the part (main line for Tee), Inches for units, and then the part type (Cross, Elbow, Tee, etc.). Then save the .CONTENT file in the folder with the *STEP* and DWG files.
- 7. **Pro Tip:** Civil 3D will create a square icon of your part based on your drawing window, so resize your drawing window to approximately a square shape before publishing, or your icon image will be "squished". You can draw a circle, zoom extents, and then resize your window to just fit around the circle.
- 8. That's it. Now you can import your .CONTENT files into the Pressure Network Catalog you create with the instructions below.

## <u>Creating a New Pressure Network Catalog and adding Parts</u>

By default, all Civil 3D users Catalog files are on your C: drive. You may want to consider saving your new Catalogs on a network drive if you are in an office environment (see tip below on Network Issues). Also, browsing large data sets can be cumbersome when working in C3D, so you may want to create specific Catalogs for specific uses. Consider how many parts are possible if you add all sizes, tees, reducers in every Schedule, Class and pressure rating in one Catalog. Review the way parts are imported into C3D with the provided Catalogs and plan out how you want to organize your data and how you want to name your parts and utilize the provided fields. This will make creating Label Styles easier and cleaner. And as always, you should back up any files before you edit.

#### **Pro Tips:**

- You can only add one material type per Catalog. Plan accordingly.
- Do not use a full quotation mark in any field, use two single quotes. Everything will appear to work fine, until you try to add a pipe in C3D, where it will not create anything. A full quotation is reserved symbol and will create problems. Good rule of thumb for any AutoCAD data (ex. SheetSet fields).
- I recommend making separate Part Families for each size for large groups like Reducers and Tees. This will help keep them organized and keep the lists from getting too long. Ex. 12" STL RED, 10" STL RED and 8" STL RED, which will each have several sized steel reducers, both concentric and eccentric in each.
- If you want to use a field in your Label Style for the pipe or fitting (like I do), you may want to use the *Nominal Diameter Description* field. Pressure Pipes does not have the option to add the Description field to pipes or fittings, like the previous Pipe Networks (there is an option in Pipe Networks Default settings in Prospector). You will have to fill in the NDD field in the Content Catalog Editor to look the way you want your Label Style to read.
- Use the Parts Table and Connection Points table to check the data you've entered.
- Renaming Parts and Network Issues. Important! Even after you import the Catalog into a Parts List, the Pipes, Fittings and Appurtenances are still linked back to the source Catalog. If you change the name of a part in the Catalog, it will break the link to that part in the Parts List. You will not be able to edit or add that part to a Pressure Network. Make all your edits before starting your project, or you may have to delete your Parts List and reimport the parts. This also means that if you place your Catalog in a network folder for others to use, that it will need to stay in the same location for the data to be accessible, and have the same drive letter designation for all users.
- Test first! Create one pipe, elbow and tee in two sizes in a new Catalog, create a Parts List with the
  Catalog, then create a Pressure Pipe Network and add Labels. You will have errors so test your
  process out with just a few parts before you have developed a whole Catalog.

This guide assumes that you have created .CONTENT files as shown above and that you have all the necessary specifications (OD, thickness, class, etc.) available. Only some of that data is necessary to create a new Catalog, and you can go back and update you table with more information later.

- To create a new Catalog for your new pipes and fittings, use Content Catalog Editor. You can launch it from your Start menu > All Programs > Autodesk > Autodesk Civil 3D version > Content Catalog Editor.
- Create a New Catalog. Chose Imperial or Metric. SaveAs to an appropriate place, either the
  default folder or a network folder (see Renaming Parts and Network Issues above if you save to
  a network location). The default folder is (C3D2014): "C:\ProgramData\Autodesk\C3D
  2014\enu\Pressure Pipes Catalog\Imperial". Name it following your guidelines (ex.
  Imperial Steel Std.sqlite).
- 3. You will notice that your Catalog automatically lists your new file as "Water" industry. This is the only choice available by Autodesk at this time (2014), but it doesn't seem to matter, just use it. You can add parts either by using a .CONTENT file or creating one without. For this example, we will create pipes without a file and add fittings created with. Remember, single quotes only for inches.
- 4. Adding Pipe Sizes. Either right-click on Pipe on the left side, the Import Part icon or from the Edit pull down. For pipe, select Without .CONTENT file. Select Industry (Water), Part Type (pipe), and enter a Part Family Name (ex. Steel Std Pipe). Fill in the data you have for the pipe. ID Type should be Standard. The asterisk items are required. Enter the data on the second table as well and select Finish. If you need to add or change your data, you can edit either table on the right. Repeat for all your pipe sizes required for this material and specification. One part family should suffice for your Pipes.
- 5. Adding Fittings. Similar process, right-click on a type (ex. Tee), but Import from .CONTENT and browse to you folder with the files. Again, you have to select Water as the industry and create an appropriate Part Family. This is where you should consider creating multiple Part Families for each size, especially for Tees and Reducers. Fill in the data on the next two pages and hit Finish. Repeat for as many parts as you need.
- 6. You can go back and edit the tables to update or add information to keep everything uniform.
- 7. Save your Catalog.

# Creating a new Parts List with your new Pressure Pipe Catalog

To use the new Catalog, there are a couple of things to do in AutoCAD Civil 3D. Also, you may want to save it to a network location so that others can have access to the new data.

- 1. From the Home tab in Civil 3D, hit the pull down in the Create Design panel and select Set Pressure Network Catalog. You will need to reset this each time you want to access a Catalog and import parts. It will default to you C: drive. Browse and select the .SQLITE file you want.
- 2. Open ToolSpace and select the Settings tab. Open Pressure Network and right-click on Parts List. Select New.
- 3. On the Information tab, give the new List an appropriate name and fill in the Description field.
- 4. On the Pipes tab, right-click on the Parts List and Add Material. You should see your new material available. Right click on the material and add sizes. There will be a check box for All Sizes if you wish. Repeat for Fittings and Appurtenances as available. Add any part Styles, Materials or Pay Items as needed.

- 5. **Note:** The Description listed in the Parts List, is not available to use in the Description field in Label Styles, use *Nominal Diameter Description*. Also, see Renaming Parts and Network Issues above.
- 6. Your new Catalog of Parts should now be available for use.

# References

- PartPublishingWizardUsersGuide: C:\Program Files\Autodesk\Autodesk AutoCAD Civil 3D 2014\Sample\Civil 3D API\Part Publishing Wizard\
- Autodesk University, <u>CI 1472-L: No Part Builder Required, Creating Custom Parts for Pressure</u> Networks