Fabrication: An Administration Guide for New Customers

Darren Young – Systems Integration Manager, Southland Industries

FB6189   Fabrication software can seem overwhelming to new customers due to the number of files and interdependencies between settings. Fabrication software is probably unlike any other system you've managed before, and there are many things you may want to know. This session will walk you through from a new customer's point of view. You'll learn how to install, how to configure for a larger enterprise deployment, and how to keep all your users on the same page. You'll also discover a variety of other housekeeping items that will enable you to focus on learning the tools. We'll go over the database folder configuration and structure, and we'll explain all those dependencies between the various database entries. Finally, you'll learn some key practices that will keep you from creating problems down the road. In short, this is a new customers' how-to course for Fabrication software management.

Learning Objectives

At the end of this class, you will be able to:

- Install Fabrication software products

- How to convert your install to an enterprise deployment

- How all those files and folders work together (or don't)

- Discover how the various database settings relate to one another

About the Speaker

A Midwestern transplant now based in Southern California, veteran Autodesk University speaker Darren Young has held a variety of positions over the last 20 years, including CAD and CAM engineer, CAD administrator, and CAD/CAM systems developer. Currently Darren is the systems integration manager for Southland Industries, one of the largest mechanical engineering and construction companies in the United States. Darren manages one of the largest installations of Fabrication software licenses in the world. While Darren's true interest is the automation of manufacturing systems, his experience ranges from lean manufacturing to architecture, and this has led him to projects varying in scope from dress patterns to gas turbine piping. He has founded a consulting and development business, and he has been a technical editor and publication author.

dyoung@southlandind.com *(work)*
dyoung@mcwi.com *(personal)*

Intro

This session is not intended to be an all-encompassing guide to Fabrication administration. The goal is to provide a general overview of Fabrication software from an administrator's perspective. If you are an existing seasoned administrator, the knowledge to be gained in this session may be limited.

We'll attempt to give you a good overview, provide some rules of thumb, and provide a little insight as to "How" things work and why, preventing new administrators from doing things that may have negative future implications which they are unaware.

This handout isn't a training guide, rather a reference document to a variety of things. There is no "one size fits all" approach to Fabrication administration. Fabrication software isn't "Installed", it's implemented and each implementation can be and is as unique as the companies and individuals implementing it. As with most software, there's a variety of ways to accomplish any task successfully, depending on the desired outcome.

At the end of the session, you very well may have more questions than answers. If that is the case, then this session has met its objectives. We can't give you a step by step approach, only raise issues so they you can make more informed decisions when implementing Fabrication in your organization so you understand the inherent conflicts that arise between implementing a CAM system from a Detailing system from an Estimating system.

The Software

Starting in 2015, there's 3 main Autodesk Fabrication products. Below lists the various software components of each.

CADmep	CAMduct	ESTmep
Autodesk Fabrication Migration Tool	Autodesk Fabrication Migration Tool	Autodesk Fabrication Migration Tool
	Burny Downloader	
	CAMComponents[1]	
Configure Users	Configure Users	Configure Users
	D6 Downloader	
Dictionary Editor	Dictionary Editor	Dictionary Editor
Edit Configuration	Edit Configuration	Edit Configuration
License Transfer Utility	License Transfer Utility	License Transfer Utility
Product Information Editor	Product Information Editor	Product Information Editor
Product Information Viewer	Product Information Viewer	Product Information Viewer
	Remote Entry[1]	
Review	Review	Review
	Tracker[1]	

[1] 2013/2014 versions of Autodesk Fabrication these were separate products

Autodesk Fabrication Migration Tool
Used to migrate older installations to newer versions. There is nothing this tool does that can't be accomplished manually if you know where to look.

Burny Downloader
One of several RS232 serial communications programs designed to send NC files creating in CAMduct, to a CNC machine. Many are available, this is just one of the more common versions used.

CAMcomponents
Used by very few. Allows you to open an MAJ file created in CAMduct and export to change some settings and export to a few different formats. Likely the best use is to bulk export the flat patterns to a DXF file for use elsewhere. (not needed by most users)

Configure Users
This is where you'll setup user accounts and assign permissions and passwords for the Fabrication software. Only 1 user account should ever be allowed at one time (enforce single login) with administrative permissions, hence a dedicated "Administration" account is recommended.

End users (limited to no permissions) can be setup individually or share a single account. No password is required.

D6 Downloader
One of several RS232 serial communications programs designed to send NC files creating in CAMduct, to a CNC machine. Many are available, this is just one of the more common versions used.

Dictionary Editor
Used for language translation. You can define a whole new language, or change the verbiage of an existing language. 99% of users should never need to use this utility.

Edit Configuration
Allows some configuration changes to your installation. Be careful, not all changes are global, some are on a "per user/per computer" setting. Others affect only that computer while others affect the entire configuration for all users on any computer using the same configuration.

Note, this utility is special. Each product calls the same utility with most of the same information however calling this utility from the different products will provide you with a special tab for only that product. In short, running the utility from ESTmep provides you with EST options, running from CAMduct provides you with CAM options and running it from CADmep provides you with CAD options.

License Transfer Utility
Used to transfer a standalone license from one computer to another without requiring reactivation of the product. (most stand-alone Autodesk products require this)

Product Information Editor
Used to edit additional product metadata database. Things like manufacturer, specification, material, description, UPC code, manufacturer code, Harrison code, etc.

Product Information Viewer
Same as the Product Information Editor but allows read-only viewing of the data.

Remote Entry
Was a separate product offering prior to 2015. Not included in CAMduct. A specialized version of CAMduct intended for limited (fewer) input options by other staff (field personnel).

Review
A stand-alone viewer for ESJ/MAJ files and others. Does offer some nice reporting features. Can also be downloaded from Autodesk web site without needing a purchased license.

Tracker
Was a separate product offering prior to 2015. Used to facilitate barcode tracking and status of Autodesk Fabrication data.

The Configurations

Autodesk fabrication software comes with 2 default configurations. One for Imperial and 1 for Metric. Each release comes with an updated version of the configuration.

If you are using one of the default configurations, it is NOT required that you use the newest configuration when updating to a new version of software. Doing so only gives you access to additional content Autodesk may have provided.

If you have created your own items (piping, sheetmetal, electrical, structural) it is NOT recommended you use the new configuration(s) unless you take measures to copy your work into the new configuration.

You essentially have 2 of 3 choices….

1) Keep your configuration and copy the additional Autodesk items from the new configuration into yours.
2) Use the new configuration and copy your additional items to the new configuration.
3) Use the new configuration and create your items over. (you're not going to do this…I hope)

Note that most of the additional items Autodesk provides in their updated configuration will be available for easy download (http://building3dcontent.com/) into your existing configuration.

Note that there are 3rd party content solutions (http://building-data.net/) that offer a more robust library of managed content for you to choose.

Default Configuration Location
Autodesk default configuration location is stored locally here…

`C:\Users\Public\Documents\Autodesk\Fabrication ####\`

Configuration Folders

`.\`	Root of configuration
`.\Backup\`	Backup files created in CAMduct and ESTmep get saved here.
`.\Blocks\`	Examples of annotation blocks and drawing templates
`.\Common\`	Rarely used. Allows you to move Product Info database to an alternate location.
`.\Database\`	Most Fabrication database files are here.
`.\Database\*.mch\`	Configured CAMduct machines. One folder per machine Config.
`.\Database\Decoiler\`	Configured CAMduct Decoiler machine
`.\Database\Users\`	Location of User account data
`.\Download\`	Default location for content downloads
`.\DXFs\`	Default location for DXF exports
`.\Images\`	Location for shared images used by services
`.\Items\`	Location for *.ITM's (content / components)
`.\MIS\`	Root location for reports organized by software
`.\Projects\`	Default location for project data files
`.\Scripts\`	Default location for Fabrication scripts (*.cod)

Loading Configurations
Loading Autodesk Fabrication configurations is simple. Each configuration will have 1 (or more in select situations) files named MAP.INI. When the dialog for selecting a configuration is displayed, you can add a different configuration to the list by browsing to the MAP.INI for that configuration.

Within the MAP.INI file, you can edit the folder locations using notepad or a better recommendation is to use the EDIT CONFIGURATION utility which provides a friendlier interface.

Convert Stand Alone Configuration to Network
Perhaps you didn't realize it but you already have the knowledge to convert a standalone configuration to a network based configuration. The "Users" folder above ships named "1Users" so the software can't find it. Rename it to "Users" and you're ready to have use accounts to limit administrative access.

The next step is to copy (or move) it to a network location accessible by everybody. Simply update the configured paths in the MAP.INI file to point to the configuration. And you already know which utility allows you to do this easily.

User Accounts

Earlier we explained how to activate user accounts. Autodesk Fabrication ships with several pre-configured user account, one of which is the Administrative account. What's not known, is what the user name and passwords are for those accounts.

When you rename the `.\Database\1Users` folder to `.\Database\Users`, here's the user accounts you have access to…(remember to use the "Configure Users" utility).

Admin Account	User Name	Password
Yes	mapadmin	map
No	mapcad	map
No	mapcam	map
No	Mapest	map
No	Mapconstruct	map

While the initial structure is good, a single administrative account and different common user accounts based on roll (CAD, CAM, EST), the names aren't the best and you'll likely want a little different take on permissions. You can rename and reset all the accounts but there's another way.

If you rename the "1Users" folder to "Users", then delete ALL the contents of the folder, when you launch the "Configure Users" utility, it will automatically create a new administrative account with the user name "Administrator" and password "admin". Once created, you can rename it to anything you like and create any additional accounts you like.

Here's an example of what I recommend….

User Name	Description
UserAdmin	Enforce Single Logon, Password Protect and assign only permissions to edit users. Give password only to highly trusted managers.
DatabaseAdmin	Enforce Single Logon, Password protect, and assign all permissions except user editing permissions. Give password to all configuration administrators.
CADuser	Allow multiple logons, no password, no permissions unless needed.
ESTuser	Allow multiple logons, no password, no permissions unless needed.
CAMuser	Allow multiple logons, no password, no permissions unless needed.

You may want to create an additional user ("PowerUser" perhaps) with a little more permissions with limited likelihood of conflict like editing reports or folders.

As a Database Administrator, if multiple users are logged in with administrative permissions at the same time, their settings will overwrite each other when they exit corrupting your configuration.

A "User" type account doesn't write back to the database configuration so multiple people can be concurrently logged in at the same time. To draw or take off pipe/duct, requires no permissions.

The reason an account like "Power User" can work, is that you should restrict it to things that multiple users wouldn't write to at the same time. Reports, ITM's in folders, are acted upon as a single file, not a large database so the likelihood of another user editing the same ITM or Report at the same time is very slim.

Database Configuration

At the heart of any fabrication database configuration is the content. You'll often hear content referred to as ITM's or "Items" because of their file extension. We'll cover ITM's in a bit but for now, think of an ITM as something similar to an AutoCAD Block or Revit Family. They're the primary vehicle for creating what you're estimating, drawing or fabricating.

Each ITM references many properties. Some have inter relationships, others don't. All these properties are stored in files in the "Database" folder documented earlier. Some of the primary properties you'll be concerned with are below. Also shown are how some of the major properties relate to one another.

Common ITM/Item properties are below…

Working with...		(Description)		References this...
	>>-->		>>-->	SEAM
	>>-->		>>-->	CONNECOR
	>>-->		>>-->	STIFFENER
	>>-->		>>-->	SUPPORT (Obsolete)
	>>-->		>>-->	MATERIAL
	>>-->		>>-->	PRESSURE CLASS
ITEM	>>-->	A file containing all the properties required to draw or takeoff a particular piece of content.	>>-->	INSULATION SPEC
	>>-->		>>-->	INSULATION
	>>-->		>>-->	VANES
	>>-->		>>-->	SPLITTERS
	>>-->		>>-->	SEALANT
	>>-->		>>-->	FACING
	>>-->		>>-->	(Ancillary via Properties)

Working with...		(Description)		References this...
PRESSURE CLASS	>>-->	Primarily used for ductwork, a special configuration grouping together specific combinations of other ITM properties to be applied automatically. None ductwork must have a pressure class as well, generally speaking, a single "Pipework" entry is all that's needed.	>>-->	MATERIAL
	>>-->		>>-->	CONNECTORS
	>>-->		>>-->	SEAMS
	>>-->		>>-->	STIFFENERS
	>>-->		>>-->	SUPPORTS (Obsolete)
	>>-->		>>-->	SEALANT
	>>-->		>>-->	SPLITTERS
	>>-->		>>-->	VANES
	>>-->		>>-->	DAMPERS
SERVICE	>>-->	A defined set to fittings as well as related information such as layering, insulation, size constraints. Example: Piping = Chilled Water Return, Chilled Water Supply Example: Ductwork = -2" Return Air, +2 Supply Air	>>-->	PRESSURE CLASS
	>>-->		>>-->	SERVICE TEMPLATE
	>>-->		>>-->	INSULATION SPEC
SERVICE TEMPLATE	>>-->	A defined set of fittings to be used for a particular purpose. Example: Piping - Domestic Water, Hydronic, Condensate Example: Ductwork = General HVAC, Vapor Duct, Grease Duct	>>-->	HANGER SPECIFICATION
	>>-->		>>-->	ITEM
	>>-->		>>-->	PRESSURE CLASS
MATERIAL	>>-->	Material the physical items is made from	>>-->	
FACING	>>-->	Treatment applied to a physical item (e.g. Paint, finish, etc.)	>>-->	FACING
SEAMS	>>-->	Primarily Ductwork (Pitts, Snaplok, Lap, etc.) How the longitudinal edges of duct connect and the material used to form the material connection.	>>-->	SEAM MATERIALS
	>>-->		>>-->	SEALANT
CONNECTORS	>>-->	Defines the logic behind "What" connects together as well as the size/look of the geometry.	>>-->	NOTCHES
	>>-->		>>-->	ANCILLARY MATERIALS
	>>-->		>>-->	CLIPS
	>>-->		>>-->	GASKET
	>>-->		>>-->	CORNERS
	>>-->		>>-->	FIXINGS
STIFFENERS	>>-->	Configuration details about how ductwork is reinforced.	>>-->	ANCILLARY MATERIALS
	>>-->		>>-->	TIE RODS
	>>-->		>>-->	CORNERS
	>>-->		>>-->	FIXINGS
SPLITTERS	>>-->	Defines size, location, material, conditions of splitters used in ductwork fabrication	>>-->	FIXINGS
VANES	>>-->	Defines size, location, material, conditions of turning vanes used in ductwork fabrication	>>-->	VANE VANES
	>>-->		>>-->	VANE TRACKS
	>>-->		>>-->	FIXINGS

Working with...		(Description)		References this...
SUPPORTS	>>-->	Obsolete method for virtually quantifying supports (hangers) before Fabrication was able to draw them.	>>-->	BEARER
	>>-->		>>-->	SUPPORT RODS
	>>-->		>>-->	SUPPORT ISOLATORS
	>>-->		>>-->	FIXINGS
DAMPERS	>>-->	Defines materials and configuration of dampers for ductwork fittings	>>-->	
ANCILLARYS	>>-->	Generic category for the various other miscellaneous items used for fabrications purposes.	>>-->	ANCILLARY MATERIALS
	>>-->		>>-->	CLIPS
	>>-->		>>-->	CORNERS
	>>-->		>>-->	FIXINGS
	>>-->		>>-->	GASKET
	>>-->		>>-->	SEALANT
	>>-->		>>-->	SEAM MATERIAL
	>>-->		>>-->	SUPPORT ISOLATORS
	>>-->		>>-->	SUPPORT RODS
	>>-->		>>-->	TIE RODS
	>>-->		>>-->	VANE TRACKS
	>>-->		>>-->	VANE VANES
	>>-->		>>-->	ANCILLARY KIT
ANCILLARY KITS	>>-->	A defined group of ancillary materials	>>-->	ANCILLARYS
INSULATION SPEC	>>-->	Defined set of insulation conditions and materials.	>>-->	MATERIAL
	>>-->		>>-->	SEAMS
	>>-->		>>-->	CONNECTORS
MACHINE(Plasma)	>>-->	Configuration of control, machine, material and tooling parameters associated with a particular fabrication machine.	>>-->	POST
	>>-->		>>-->	TOOL
DECOIL	>>-->	Configuration of control, machine, material, seam, connector or other information associated with a decoiler machine.	>>-->	POST
	>>-->		>>-->	CONNECTOR
	>>-->		>>-->	SEAM
TOOL	>>-->	Definition of tooling type (plasma, torch, marker, router, laser, waterjet) and associated parameters used by a machine.	>>-->	MATERIAL
OVERSIZE OPTIONS	>>-->	Same as "Seams" but specific for seams used to join 2 or more pieces of duct together to form one large piece.	>>-->	SEAMS (oversize)

ITM's (Items)

So what is an ITM? We're all familiar with a Windows Shortcut. It's a small container file that specifies a number of properties like which program to run, the starting directory, icon to use, etc.

Background: Within Fabrication, internally there's hundreds of predefined parametric patterns programmed in each taking various parameters. Patterns are referenced by number and each number represents a different type of physical item with different properties, options and dimensions.

Pattern numbers are often referred to as "CID" numbers and for all practical purposes, they should be the same. However there are rare situations where a CID number (which can be user defined) and a Pattern Number are different.

The ITM file, is a "Shortcut" or container file that identifies several pre-defined properties like which pattern number (CID) it represents, the connectors, materials, dimensions and options. It's what defines the sets of parameters for a particular pattern and make it represent a defined physical item.

You can find a list of the various patterns/CID's here…

http://enceptia.com/wp-content/uploads/2014/09/Fabrication-CID-Catalog-2014.pdf

Services and Service Templates

A Service Template is a master container that has buttons pointing to the ITM's for content. Each service template can be shared with multiple Services. The Service is where you'd assign layers, colors, and other conditions specific to that service. Below is an example of the structure of Service Templates and the Services they control.

| Service Template	Service
Domestic Water	Domestic Cold Water
	Domestic Hot Water
	Domestic Hot Water Return
Hydronic	Chilled Water Supply
	Chilled Water Return
	Heating Hot Water Supply
	Heating Hot Water Return
	Condenser Water Supply
	Condenser Water Return
Supply Duct	Supply Air +1/2 WG
	Supply Air +1 WG
	Supply Air +2 WG
	Supply Air +3 WG
	Outside Air +1/2 WG
	Outside Air +1 WG
	Outside Air +2 WG
	Outside Air +3 WG
	Transfer Air +1/2 WG
	Transfer Air +1 WG
	Transfer Air +2 WG

Materials

Recommended structure for materials has recently changed. Historically for Sheetmetal, you'd have a more generic entry such as "Galvanized" and under that entry, you'd create multiple gauges. Piping on the other hand had an entry for each material. This led to poor performance in systems with a lot of materials as required in piping. Today, the software has been enhanced to allow a more generic material for piping items, with the creation of multiple entries within that main material for other materials. Below is an example…

Old Structure…
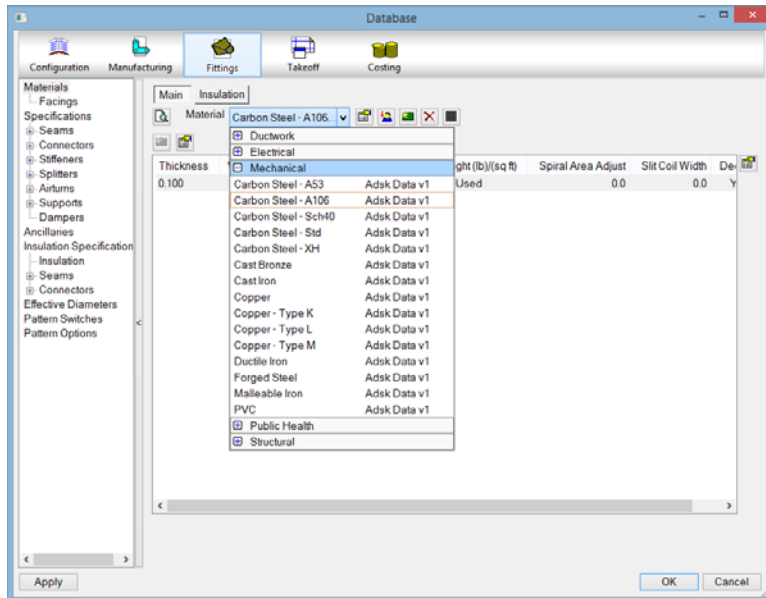
New Structure…
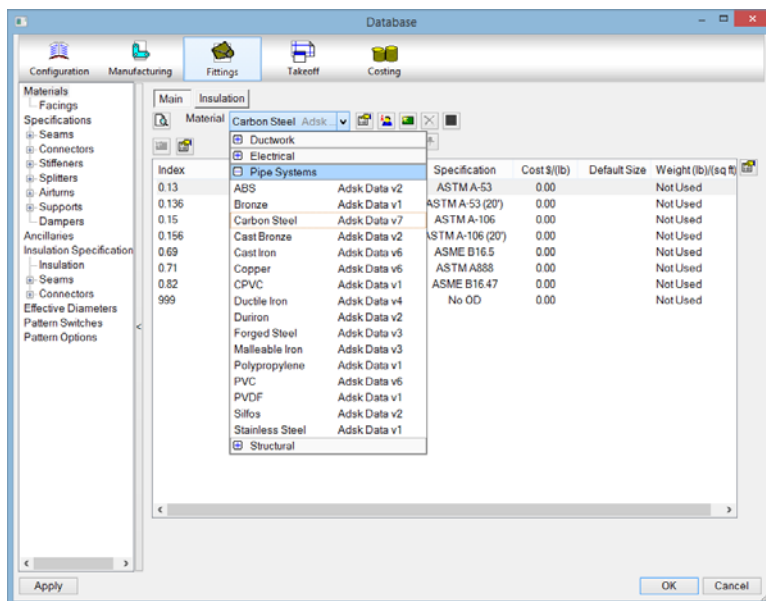
Piping OD

Another change that happened a few years ago is where Piping OD (Outside Diameter) is stored. This was (and still can) be specified in the Piping Specifications (by specifying a material under the specification). However the new recommended best practice is to have the Piping OD specified directly in the Materials section of the database.

Piping Length

If Outside Diameter is specified in the Materials, it stands to reason that Length would be too right? Wrong! The length specified under materials has NO impact on the length of pipe you draw or takeoff. This length is used for Linear Nest Reports. It would allow you to setup 2 different materials (same material actually) with 2 different lengths so you could nest your pipe on the length of stock you're actually purchasing.

To specify the maximum length of "drawn" pipe for a particular type of piping, specify the length in the ITM's length property.
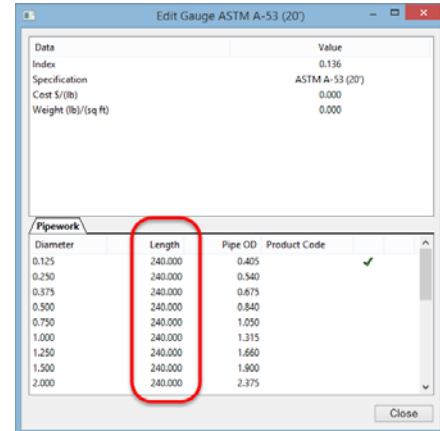
Connectors

Connectors are an animal in itself. Sheetmetal connectors are fairly well documented, piping are not although the parameters are the same, just using different terminology.

The Connector Name and Connector Group shown below have zero impact on what connects together or how it looks. They are simply names and groups for organizational purposes. Name them and organize them according to what makes sense to you.

The key to connectors (especially in piping) is the "Connectivity". ITM's are configured to connector names (green). When 2 ITM's attempt to connect, their connectors look at the "Connectivity" (blue) and the gender (male/female/none – not shown below). If the "Connectivity" name matches and it's the opposite gender (in cases of M/F), it will be allowed to connect otherwise you'll get a connectivity mismatch dialog.
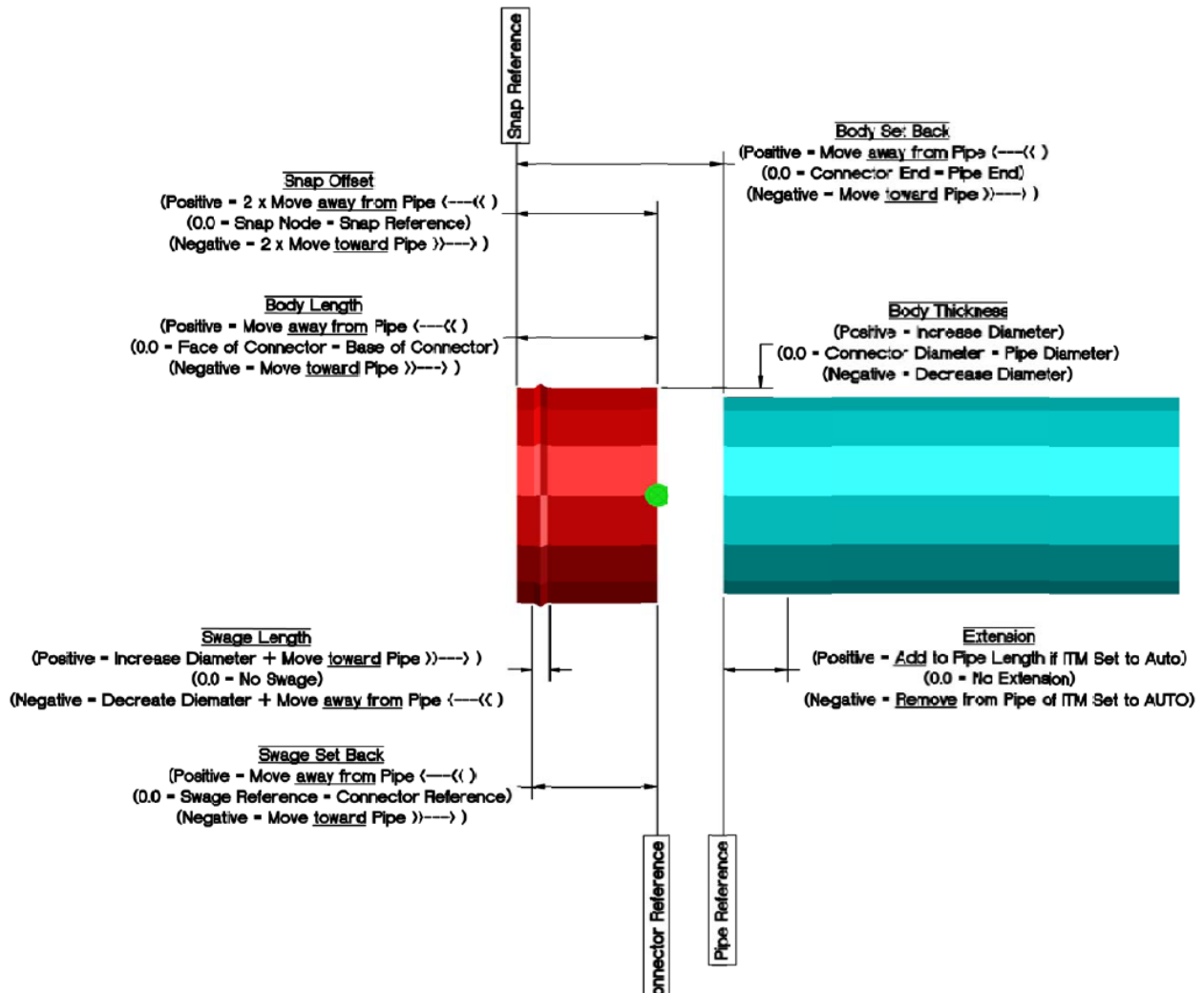
Building a Connector

Building a connector is complicated. There's a lot of obscure settings and it's not clear where they all are coming from or controlling. The below diagram is an attempt to help you understand what the settings do. Remember, there's 2 aspects of a connector definition…where the connection point is, and the geometry.

Admin in a Nutshell (What Every Admin should know)

These are some basic rules of thumb that are not taught well in most training but that are absolutely critical in administering a Fabrication configuration. It's not an all-inclusive list which would likely be thousands of points to note. However this is a good starting point in terms of the philosophy that a new Admin should keep in mind.

Services and Service Templates
- Keep track of your service templates and the services they control. It's easy to have service templates that are not used anywhere. It's recommended to document these things as you build your configuration.
- All Services referencing the same Service Template will have the same ITM's. If you want different ITM's between services, you'll need a new template.
- Consider "Generic" Service Templates that you copy and modify to make "Job Specific" Service Templates to handle items specific items related to a specific job.
- If you don't want to use Job Specific Services/Templates (it'll grow to be a long list), consider looking into Fabrication's "Profiles" functionality which makes a "configuration within a configuration" allowing you to make job specific changes without changing your master templates.

Connectors
- Connectors control 2 things
  - What "Connects" together
  - What the geometry looks like
- You will have multiple "connector" entries for something that seems like it should be the same, for no other reason than to control the geometry. Name, organize and DOCUMENT this well. Failure to do this will result in additional connectors being created because you don't know what the existing ones do.

Materials
- Use generic material entries with specific variants (spec, length, gauge) within that entry.
- Piping OD is controlled via Materials (don't use materials under Spec).

Specifications
- Specifications are used for ductwork, however all piping or electrical items should have at least a single generic spec set for them (i.e. "Pipework").
- Specifications control which seams, and connectors apply to ductwork. Connectors on piping/electrical items are NOT controlled this way.

ITM's
- Leave Connectors and Seams "unlocked" for most ductwork items (those you fabricate) as the Specification controls these values autromatically.
- Leave Connectors and Seams "locked" for all pipe fittings. As it's an off the shelf bought item, it is what it is and shouldn't change.
- Product Information (ProdInfo) is the proper way to report on things like Manufacturer, Description". Avoid using ITM names for this purpose.
- Name ITM's and Folders how you need to manage your configuration from a "technical" perspective, use Product Information to "report" on those items the way your staff wants to see the information.

- All ITM's representing bought items should have a unique ID associated with them (Product Listed ITMs' will have an ID field). This ID is what links the particular component to Installation and Fabrication Labor, Pricing and Product Information databases. Often overlooked by company's not using ESTmep, but should still be used by everyone.

General Admin
- You can "Create" anything in the various databases in Fabrication without problems. However don't take creation lightly, consider very closely the name, function and organization of what you're building.
- Changing or removing data is a bear. This is the cause of a lot of bracketed items and the single biggest cause for most configurations being a mess. If you rename/remove it, consider where it may have been previously used. Manually (or via script) fix existing drawings or jobs that use the legacy entries if needed. Or consider drawing a line in the sand, making a "New" entry (connector, material, seam, service) for NEW work, leaving the old until the work processes through completion.
- Use Scripts provided with this class allow you to determine which ITM's are using connectors, seams, materials, etc. This will help you understand your configuration so you can change it to what you want it to be.
- Consider backing up your configuration prior to any large change. Backup regularly as a matter of standard practice. Configurations can become corrupt or change may happen that you don't discover issues until later.
- When renaming, reorganizing ITM's and their folders, use the VIPS command (Validate ITM Paths) to "fix" the pathing in existing drawings or jobs. Similar tools exist to "fix" broken service templates.
- Don't use commas (,) or inch marks (") in names of files, folder or database entries. There's a variety of tools that export information about your database into a CSV file for easy viewing and processing. Those characters will significantly diminish the usefulness of those tools.
- User demands will EXCEED your technical ability for some time. Don't worry about it. Do your best and document what you do and why.
- Integrated systems often lead to conflicting ideas about how to setup a configuration. Take your and do your research and make an informed decision. Which user base are you prepared to "Manage" the expectations of?
    - Estimators want to see "glue" and "solder" for easy quantification. Detailers have them. Which way are you going to set it up?
    - Detailers want to draw with generic Cast Iron, Estimators need copies of ITM's representing each manufacturer to track pricing. Are you prepared to increase detailing time for the sake of estimating?
- Everyone you hire will claim to know how to manage Fabrication and claim your configuration is messed up. It's a lie. They know how to manage Fabrication as it was implemented in their last company. Carefully consider who you allow to manage your configuration or you'll end up with several "mixed" methodologies.

- Don't be afraid to "Manage" your database. Keep backups before major changes. Backup regularly. Make a copy of your configuration and test there.
- Just because you can, doesn't mean you "should". There's a lot this software will do but it can have drastic consequences for the amount of time it will take to admin. Consider a "Minimalist" approach to start. There will be no shortage of opportunities to complicate things later.

Resources
- Independent User community (http://www.XtraCAD.com)
- Autodesk Support (http://www.autodesk.com/subscription)
- Autodesk Community forums (http://forums.autodesk.com/t5/fabrication/ct-p/1221)
- LinkedIn (https://www.linkedin.com/groups/Fabrication-CADmep-4684510)
- Vendor Support
  - Advance Cutting (http://www.advancecutting.com/)
  - Enceptia (http://enceptia.com/)
  - Technical Sales International /TSI (http://www.technicalsalesinternational.com/)