Architectural Desktop 4 - Development Guide

PART 1

AEC SETUP - DISPLAY

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AEC Setup Toolbar How do I get this toolbar? You can also acquire access to these commands form the Format pull-down menu - see illustration below. This toolbar is an optional tool and is not needed to use this guide but may help.	

AEC Setup Pull-down menus The **Display System** in ADT is one of the most difficult subjects to comprehend and master. It is also the most important tool and that is why I have chosen to make this subject the first one to be discussed in this guide. My suggestion is that you to read through Part 1, take in as much as you can and then refer back to this material as needed while learning about the Objects. Throughout this guide you will find links back to this material as it applies to object behavior and appearance. Generally speaking, once you understand the Layer and Display system for one object, you will understand it for all objects. Illustrated to the right I show the **Format pull-down menu** with red dots next to the main topics that will be discussed below. Though the **Display Manager** is the primary tool for Display Management, I have also included the topic of **Drawing Setup**, **Style Management**, **Material Definitions** and **Classification Definitions** since they all affect the organization and appearance of objects in your drawings. For users who are not familiar with the concept or technique of working with objects (not blocks but "smart" objects), there are two fundamental concepts that you will need to recognize to avoid getting overwhelmed and frustrated when you don't get the results you want. The first concept is that most of these block-like objects have built-in behavioral characteristics referred to as reactors and the second concept is that these objects are all controlled through a centralized display system. This means that if an object does not appear the way you expect or want, either the software cannot produce what you want or you will need to investigate the settings that affect the reaction or the display. In the case of a Wall meeting another Wall, for example, you will find that there are Properties that affect the way that wall joins with another wall and there are Properties that affect how the wall appears in general and even at the point of intersection.	

Templates Files and Display Configurations

Menu   **Format> Drawing Setup...**

Keyboard   **AecDwgSetup**

Links   Architectural Desktop 4 Deployment eGuide - for information on templates and how to configure them for your office

Generally, Architectural Desktop has a set of default configurations that will allow you to begin drawing immediately.   The problem with the default configurations is that they are the "defaults" and often produce results that are very distant from what you and your office wants. These default configurations reside within template files that you use when you start a new drawing file. If you don't use one of the template files that come with ADT or open older files that predate ADT, you will not get these configurations and that may end up causing you some frustration. The good news is that I will be discussing, throughout this guide, how you can import ADT data from other files so you can make any file perform like one of the template files.

One of the most important configurations that come in ADT template files are the ones that control the display of objects; these are refereed to as **Display Configurations** and are bound in a trio of configurations that include Display Representation Sets and Display Representations (by Object). These Display Configurations are used to change how objects look in a drawing when you want to see it, for example, as a typical Floor Plan vs. a typical Reflected Ceiling Plan. The control or switch for this Display Change resides on the Drawing Window Status Bar near the lower right corner of your ADT Application Window - look for the words: "Display Configuration:"

By picking on the black down arrow or the current display configuration name, you should find that you invoke a pop-up menu that displays one or more Display Configurations to choose from. (note: if you only find "Standard", then you are most likely in an older file that predates ADT).
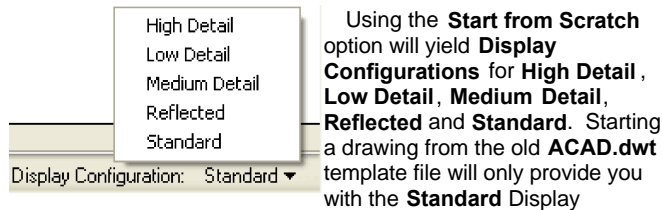
Using the **Start from Scratch** option will yield **Display Configurations** for **High Detail** , **Low Detail**, **Medium Detail**, **Reflected** and **Standard**. Starting a drawing from the old **ACAD.dwt** template file will only provide you with the **Standard** Display Configuration and that's it.
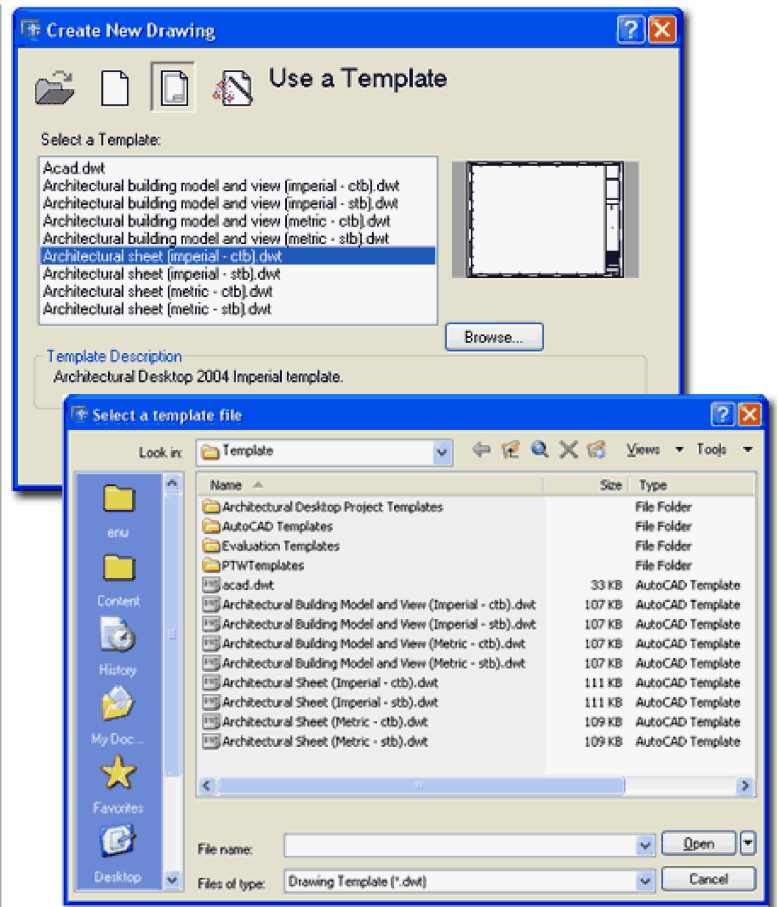
Architectural Desktop 2004 reduced the overall number of template files by a dramatic factor and basically now only offers two to choose from: "**Architectural Building Model and View .. .**" and " **Architectural Sheet ...**" The other template files are simply versions of the same configuration for such things as Pen Configuration and Metric. The " **acad.dwt**" that is listed under the default Template folder for ADT is not really the same old "acad.dwt" that you would use in AutoCAD so don't mix the two up. Despite the other folders within the default Template folder, only the "AutoCAD Templates" actually offers other .dwt files. You can use the AutoCAD template files if you don't want a template file with any ADT configuration data in it (this might be for a drawing that you won't be using ADT for at all

). The remaining folders contain actual drawing files that were meant as examples for project work (hence the listing under Templates). One of your first tasks with ADT should be to consider how you will format and configure your own Template File for use in your office but if you haven't already started that task in a previous release of ADT, the " **Architectural Building Model and View (...).dwt** " is a good place to start with and to follow along in this guide.

The "Architectural Building Model and View (...).dwt" template files offer the list of Display Configurations illustrated to the left.

2 **Drawing Setup Dialog Boxes**

Drawing Setup - Units Tab

Menu   **Format> Drawing Setup...**

Keyboard   **AecDwgSetup**

As with any AutoCAD file, Architectural Desktop files need to be **Set Up** in such a way that the Units, Scale and Layering are set to match what you need. Unlike AutoCAD, however, Architectural Desktop actually has a Scale that affects the objects in the file and objects being inserted so make sure to pay special attention to the Scale settings. Architectural Desktop also uses automatic layer keying so objects are placed on the right layers as you draw or insert them. Though the Scale and the Layer Keying settings can be changed later in a drawing, it is not a lot of fun to deal with so you should get these settings right before starting a drawing.

The Drawing Setup dialogue box is ADT's central control for configuring the current drawing's **Units** *of measure*, **Scale** *of Annotation*, **Layering** *Standard* and **Display** *of Objects' defaults* - see illustration to the right. AutoCAD has a similar dialog box, activated with the DDUNITS command and both dialog boxes affect the same variables but it is best to use the AecDwgSetup command.

Units Tab - on this tab you will be able to set the Primary Unit measure, the Unit display Type and the round off precision for the Type. Inches, for example, can be displayed as a Decimal Type with a round off Precision of 1/100 inch. Always set the Precision to something greater than you expect to worry about. For **Area** and **Volume** settings, use settings that you actually want to display in tags and tables. For **Angle** settings, the general rule of thumb in AutoCAD has been to measure this in Degrees where the counter clockwise direction is positive (don't check Clockwise to stay with the industry standard). For **Scale Objects Inserted From Other Drawings**, you will most likely want this feature checked on because it will automatically convert objects from files created in other Drawing Units. If you decided to do a drawing in Units of Feet, for example, and copied this object into another file setup for Units of Inches, the object will be scaled up appropriately. If you don't use this scale option, an object drawn based upon a Unit of Feet will be translated to Units of Inches without conversion and thus .5 feet would become .5 inches (not good).
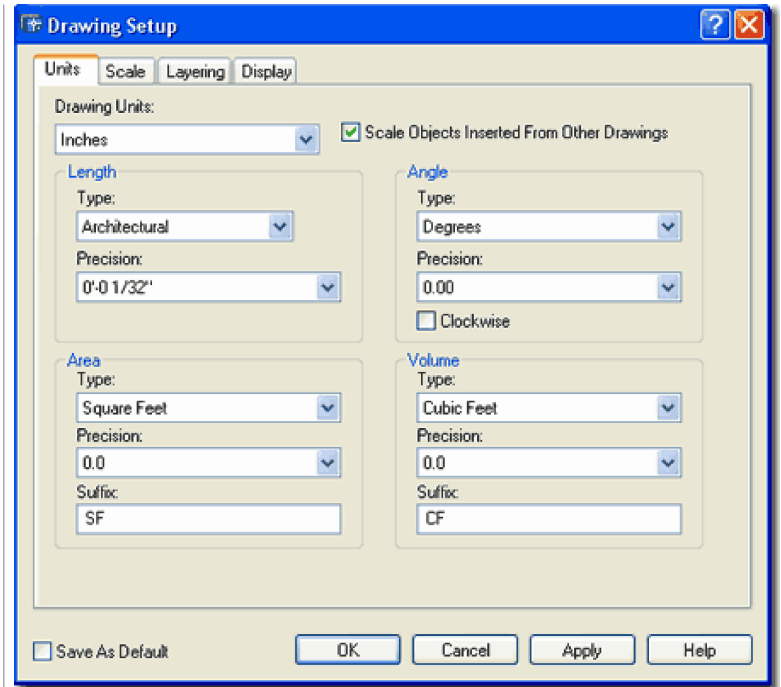
Drawing Setup - Scale Tab

Scale settings in ADT actually affect the objects you use in a

drawing, particularly objects that have annotation elements within them such as Section Bubbles, Object Tags and Schedules.

Drawing Scale - this value should be set correctly prior to doing any annotation work like inserting labels, tags, schedules or dimensions. Changing the Drawing Scale after objects, such as dimensions, have been placed does not change the objects so this is very similar to working in AutoCAD but it also allows you to annotate at different scales while in the same drawing. For **Other...** scales, think in terms of ratios such as 1:48 for 1/4" = 1'-0" and thus you can create a scale of something like 1:600 for 1"= 50'-0"; i.e., you select the Other... option and type 600 in the Custom Scales value field.

Automatically Create Dimscale Override - this checkbox option was never an option in any previous releases of ADT and it drove ADT users crazy because if the Dimscale did not match the Drawing Scale, ADT would automatically change the scale with an Override Dimension Style. If you are diligent about changing your Dimension Style **DimScale** Value then this option should not be necessary for you and it will allow you to be more creative. Note: this only affects AutoCAD Dimensions and not AecDimensions.

Annotation Plot Size - this value field allows you to control the size of text based objects such as bubbles and tags; i.e, because the text is bigger so is the object that contains it. This means that you can manage a drawing at one scale while placing annotation objects for larger or smaller scales. Traditionally, 1/8" has been a standard among Imperial Unit drafters but most of ADT's annotation based objects come out a bit large at that scale so many are now using the value of 3/32 inches.

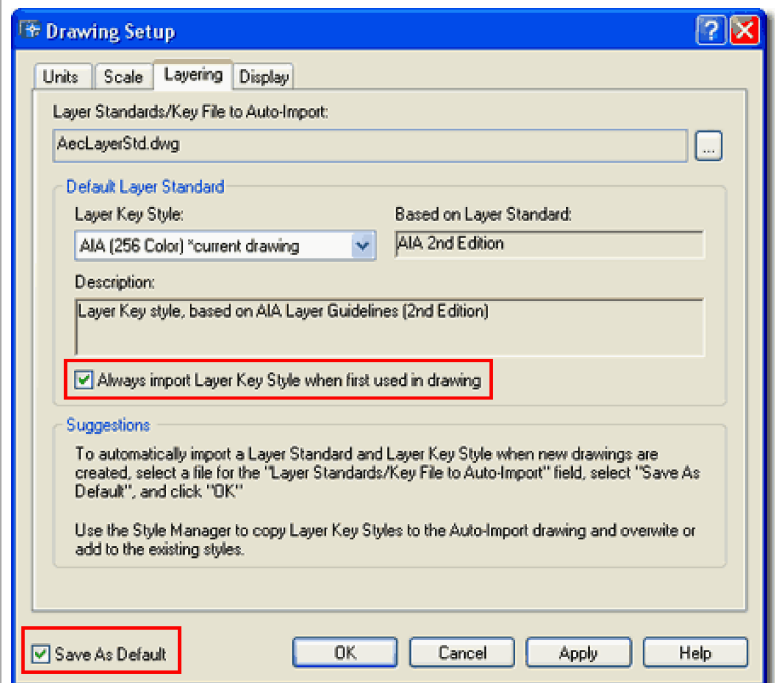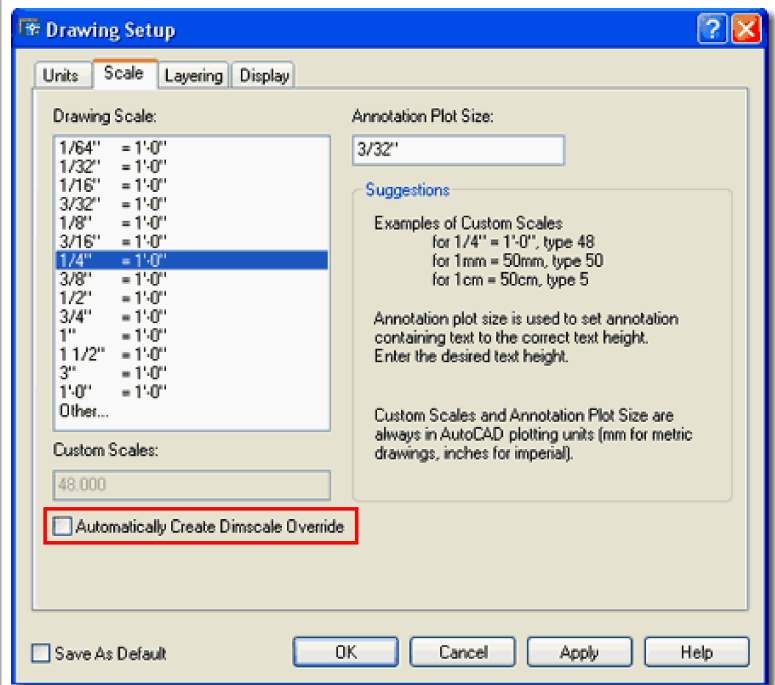
Drawing Setup - Layering Tab

Links — [Part 2 - Layer Management](#) - for more information on the automatic layering system in ADT.

Layering in ADT is a very powerful feature that can be customized to meet almost any office's standards; including naming, linetype, lineweight and coloring options. The only significant drawback to this system, in my opinion, is that it does not affect non-ADT objects so you cannot count on this feature for placing old AutoCAD blocks, AutoCAD Dimensions, AutoCAD Text or other AutoCAD based objects on the right layers. In other words, if you have to draw using AutoCAD based objects you have to do the layering yourself.

Layer Standards/Key File to Auto-Import - use the "**...**" button to access any drawing file that contains a Layer Standard and Layer Key Style that you want to make current. The default Layer Standards file resides within the Layers folder of the Autodesk Architectural Desktop 2004 Folder - see [Default Folder Structure](#) for more. The "**AecLayerStd.dwg**" file, for example, contains the Layer Key Styles that control such things as names of the layers, their lineweights, linetypes and so forth.

Layer Key Style - on this drop-down list you should find any and all of the Layer Key Styles residing within the Layer Standards drawing file set in the field above this drop-down list. I have yet to come across one office that is content with the default Layer Keys so you too will probably want your own settings for this feature and it is fairly easy to do - see **[Part 2 - Layer Management](#)**.

Always import Layer Key Style when first used in drawing - this checkbox option, introduced in ADT 4, provides CAD managers with the option to insure that a regularly changing Layer Key Style is always being imported into new drawings. This is a great option and only under unusual circumstances would you not want this feature; cases, for example, where you use different Layer Key Styles that have the same name or cases where you want the Layer Key Style in template files to control the keying.

Save As Default - this option is available for all of the Drawing Setup tabs but I have drawn a red rectangle around it here to remind you how important this setting is with respect the the Layer Standards.

Drawing Setup - Display Tab

The Display tab of the Drawing Setup dialog box offers a somewhat archaic option for accessing each of the object families in ADT and their corresponding default Display Representations. I call this "archaic" because the better option for accessing this information is through the Display Manager (discussed below).

Object Type - this list offers access to all of the unique objects that are specific to ADT and you can actually count them.

Display Representations - this list shows all of the various Representations that are available, by default, for each object selected under the Object Type list. Though the 2D Section/Elevation object, illustrated to the right, may only have one Display Representation by default, a Door object has fourteen. This topic will be discussed in greater detail below and throughout this guide but in short, Display Representations are exactly what the term connotes: appearance. If you think about how you might want a Door to look in a typical floor plan at 1:48, for example, think about how it should look at 1:196 or at 1:12; and think about how it should look in an Elevation or 3D Model and you get the idea.

Drawing Default Display Configuration - this drop-down list offers access to the same list of Display Configurations that you will find on the Drawing Status Bar and in the Display Manager Window. All users should know that these exist, how to set different ones and eventually how to alter them to produce custom results. Medium Detail is the default Display Configuration when ADT is installed.

When used as an Xref Overlay use Display Configurations from this drawing only - this checkbox option, when checked, allows this file to control its own Display Configuration independently in another other file where it is being Xref'd in. In other words, as a source Xref file, it will have control over its own Display Configuration regardless of the Display Configuration used in any target files. I do not recommend using this as a default option but it can be used to create some interesting results; e.g., a second floor in High Detail with an Xref of a 1st Floor in Screened Low Detail and an underlay. You see, what it achieves is the ability to have different Display Configurations active at the same time. This setting can be activated and deactivated at any time on a drawing in a project.
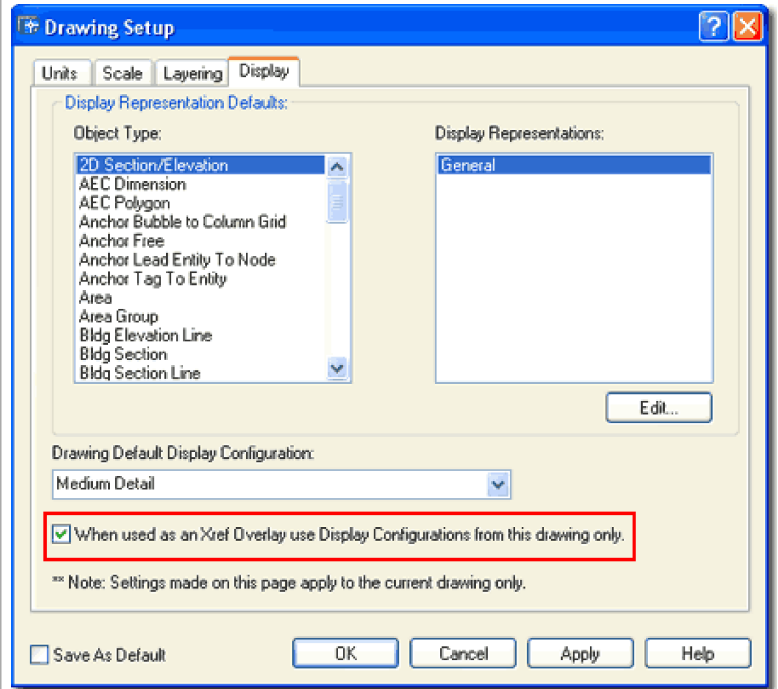
3
Setting Displays

3-1 AEC SETUP - DISPLAY

Set Current Display Configuration

Menu	**Format> Display Manager... Left-Click** over a **Configuration, Set to Current Viewport**
Status Bar	**Left-click over triangle**

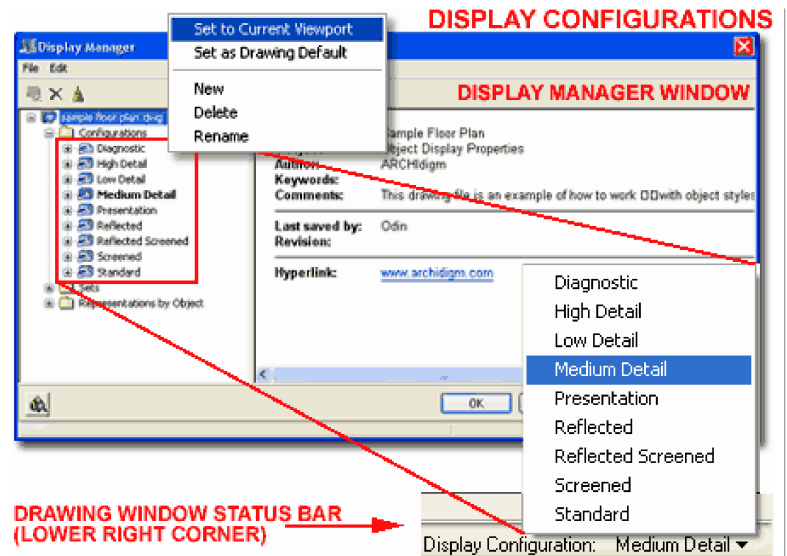|	
Keyboard	**AecDisplayManagerConfigsSelection**
Links	Templates Files and Display Configurations - for more on how to switch between these configurations.

ADT has the ability to change the display of numerous objects so you don't have to rely on Layer controls, Xref and Block swapping or any of the numerous other odd techniques AutoCAD users have developed over the years. This means, for example, that you can go from a High Detail Display Representation of a Wall or Door to a Low Detail Reflected Ceiling Display Representation at the click of a mouse button.

Illustrated to the right I show the primary **Display Configuration pop-menu** and how you access it (lower right corner of drawing window area on a new bar called the Drawing Window Status Bar). Also illustrated to the right, I show the source of that pop-up menu so you won't be confused about where it comes from and how you can Add or Delete Display Configurations (Display Manager Window activated by typing "AecDisplayManager").

There are two primary places where Display Controls are managed: one is via the Display Manager (illustrated upper right) and the other is through Object Styles (discussed later, below).

When you switch Display Configurations, you are are actually triggering a whole Display Representation Set of Object Representations; i.e., a change from High Detail to Low Detail actually goes through a list of all the objects and displays them as per how they are set with respect to those two Representations (in the default case, as defined by the manufacturer of this software).

Changing Current Display Configurations

Links	Automated Display System - for another discussion of this topic.

I   illustrated to the right are examples of how the **Display**

DOOR DISPLAY COMPONENTS FOR HIGH DETAIL VS. LOW DETAIL

Display Component	Visible
Door Panel	
Frame	
Stop	
Swing	
Direction	
Door Panel Above Cut Plane	
Frame Above Cut Plane	
Stop Above Cut Plane	
Swing Above Cut Plane	
Door Panel Below Cut Plane	
Frame Below Cut Plane	
Stop Below Cut Plane	
Swing Below Cut Plane	

HIGH DETAIL

Display Component	Visible
Panel	
Swing	
Direction	
Panel Above Cut Plane	
Swing Above Cut Plane	
Panel Below Cut Plane	
Swing Below Cut Plane	

LOW DETAIL

Configurations can be used to **change the appearance** of some basic ADT objects. Illustrated below, left, I show an example of the information that resides within an ADT object (a Door in this example) that controls how it appears or displays when you change the Display Configurations. At the heart of the display system are the object representations that control how object families (and sometimes individual objects of a family) appear when the Display Configurations are changed. In the illustration to the left I show some of the hard coded **Display Components** (think of these as internal layers) for the Door Family. The number and type of Display Components will vary depending on the object and representation

To bring a collection of **Object Display Representations** together, ADT uses a **Display Representation Set**. The Display Representation Set merely associates the various display representations (such as High Detail) of all the objects with a unique name. The primary purpose for this Set is so you can create custom combinations of your own choice; such as a Reflected Set that shows Doors and Windows in Low Detail, for example.

Because ADT uses 3D objects and because architects tend to display objects differently in Plan View than Elevation View, for example, ADT uses **Display Configurations** (this is what you use to switch displays). Display Configurations associate Display Representation Sets according to **Views** thus allowing for automatic Display Representation Set changes when a user switches from Top View to Front View, for example.


DIAGNOSTIC

HIGH DETAIL

LOW DETAIL

REFLECTED

Diagnostic
High Detail
Low Detail
Medium Detail
Presentation
Reflected
Reflected Screened
Screened
Standard

Display Configuration: Medium Detail
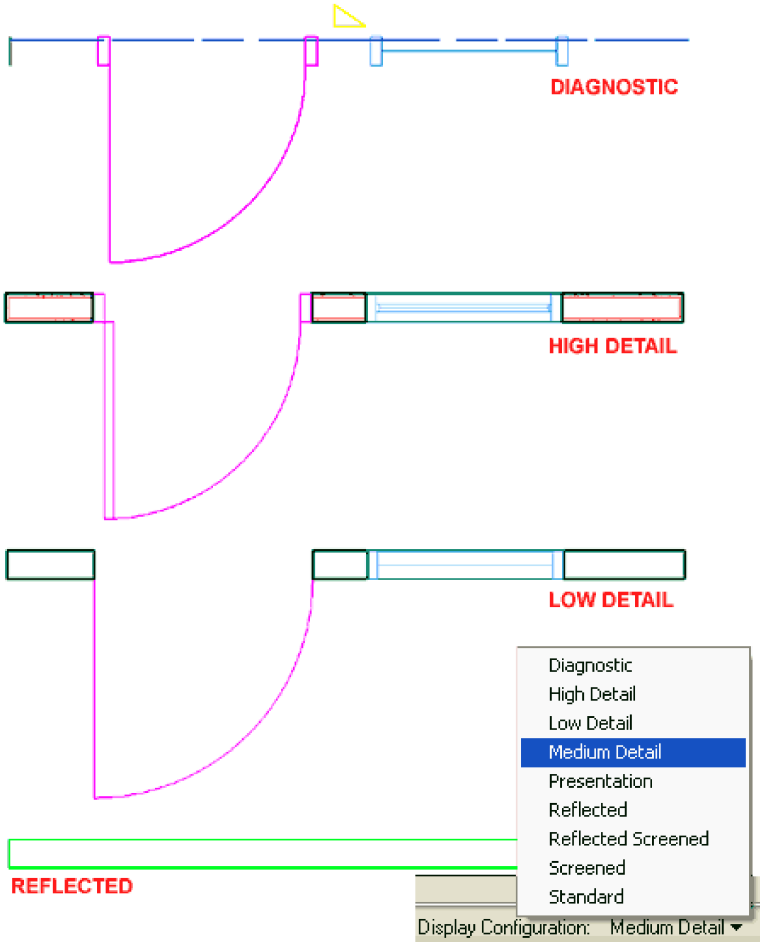
Changing Current Display Configurations in Viewports

When using **Layouts** and **Viewports** in ADT, you can either change the Display Configuration by choosing one while in a Viewport or by selecting a Viewport frame when not in any Viewports. If you are not in a Viewport and you attempt to change the Display Configuration, notice that a prompt will appear on the command line requesting that you select a Viewport Frame to apply this change to. If you do not select a Viewport Frame but hit the Enter Key instead, you can apply a Display Configuration to a Layout Space.

The use of different Display Configurations for different Viewports provides a fairly efficient way to create such plans as that illustrated to the right where I have a proposed remodel displayed as a typical Plan configuration next to the same proposed remodel displayed as a typical Reflected configuration

What I illustrate to the right exemplifies the ultimate goal of producing architectural designs as Single Building Models (SBM) but I have found that the practice of SBM tends to be the stuff more of myth than reality. It is true that in many cases this concept can and has been applied rather successfully but the cases tend to be rather unique. One case, for example, is that the job is small and another case is that the job is being managed and produced by one individual on one machine. The best answer to how far you go with the SBM concept is a matter of how drawings are managed
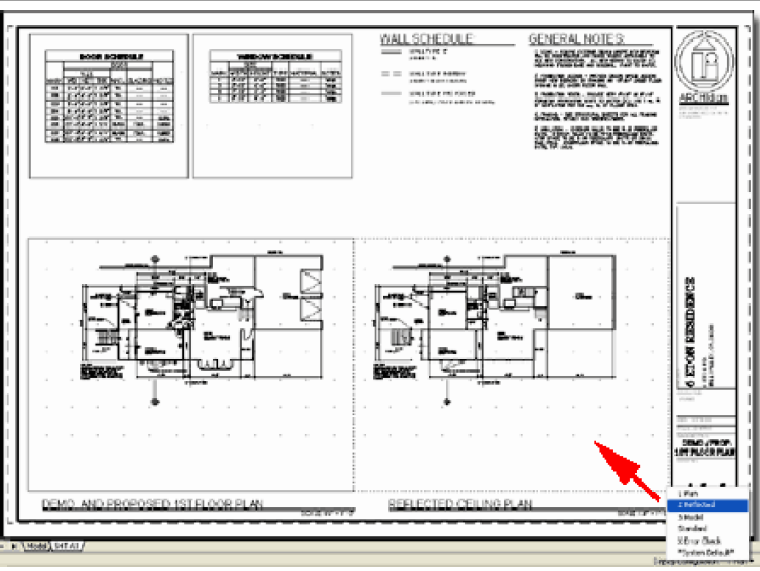
and processed in your office. I also like to remind AutoCAD users about the years they have spent perfecting organizational processes; there is no reason why most of them cannot continue to be applied to the use of ADT.

4 Display Management

Display Manager

Menu   **Format> Display Manager...**

Keyboard   **DisplayManager**

When you change the Display Configuration in a drawing, as discussed above, you are selecting a name off a pop-up menu that is actually stored within another tool called the **Display Manager.** The Display Manager Window, illustrated to the right, has three hierarchical folders that all store levels of display information about the ADT objects in your current drawing file.

Configurations folder - stores a list of display configurations that you can select from in a drawing file. These choices are available via the "AecDisplayManagerConfigsSelection" command or via the Display Configurations pop-up menu on the Drawing Window Status Bar. Technically, these configurations orient Display Representation Sets so a drawing may change automatically depending upon the viewing direction. Display Configurations also provide Global **Cut Plane** Settings for objects that extend beyond a typical single story.

Sets folder - stores a list of names that describe a whole set of object representations. The function, therefore, of a Display Representation Set is to combine or group individual display representations of object families; i.e., you could, for example, group Doors that display in Reflected mode, Windows that display at High Detail, Walls that display in Low Detail and so on for each object family. Display Representation Sets also provide **Classification Show/Hide** control and some interesting settings for Live Sections.

Representation by Object folder - stores a list of all the ADT object families and provides the deepest level of display control over individual object families. At this level, individual object families will have an internal list of display representations ranging from High Detail to Diagnostic and Reflected. Some objects have more display representations than others depending upon their function in drawings but most allow you to add your own should there be a need for custom representations. You cannot create unique representations but you can copy existing ones and modify their names and settings.

DISPLAY MANAGER WINDOW

*CONFIGURATIONS
*SETS
*REPRESENTATIONS BY OBJECT
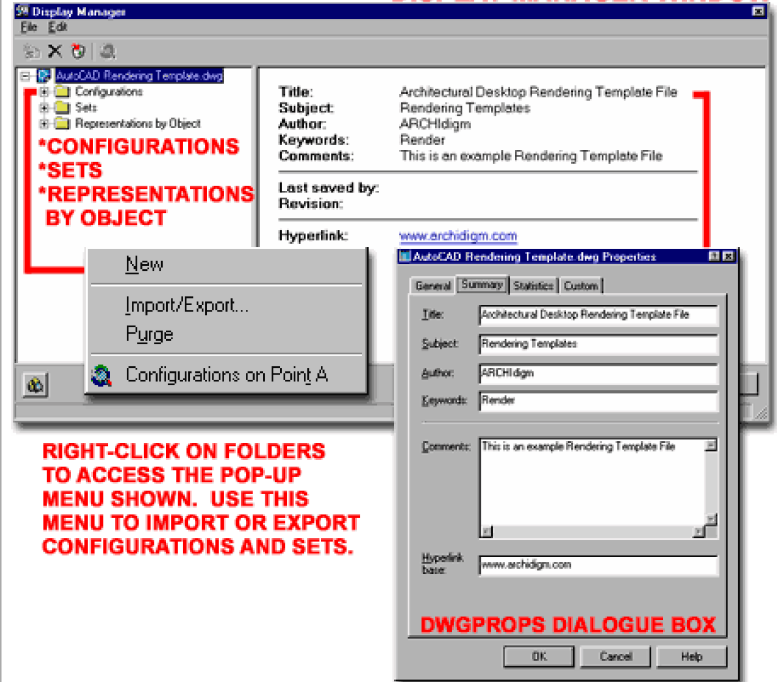
RIGHT-CLICK ON FOLDERS TO ACCESS THE POP-UP MENU SHOWN. USE THIS MENU TO IMPORT OR EXPORT CONFIGURATIONS AND SETS.

DWGPROPS DIALOGUE BOX

When you highlight a drawing file in the Display Manager Window, it will display the drawing's **Properties** - as illustrated above right. You can access the **Drawing Properties...** from the File pull-down menu or type "**DWGPROPS**"

Configurations	When Which "Object Hows" are Displayed

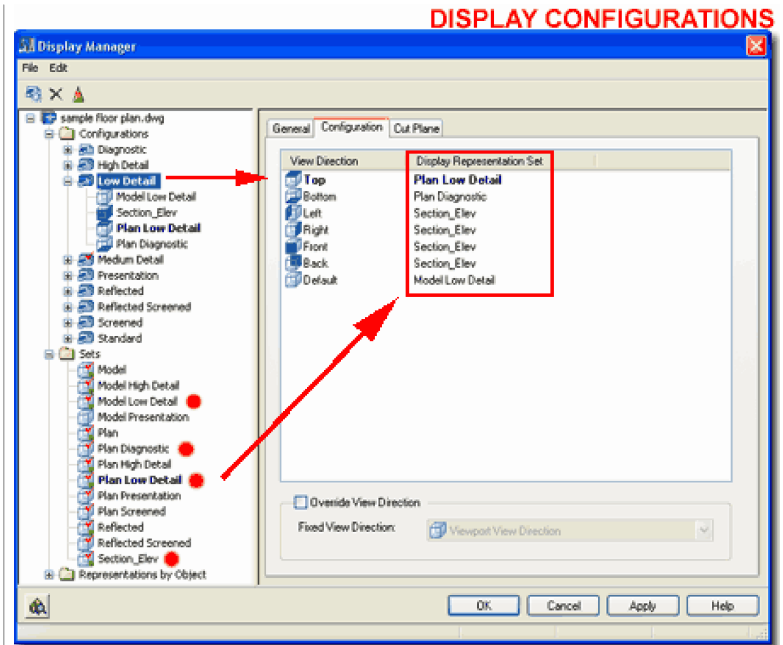## Display Configuration - Association with Display Representation Set

Display Configurations associate **Display Representation Sets** with **View Directions** so you may see one Display Representation Set when you view your drawing from the Top but a different Display Representation Set when you view your drawing from a Front View (elevation).   One might argue that this seems redundant and that the full Model Representation should be fine regardless of View Direction but the problem with the full Model Representation is that it carries too much graphical information. By using Display Configurations to automatically switch Sets of Object Representations, graphical detail can be adjusted for the purpose of the View Direction.

In the **Display Manager Window**, illustrated to the right, I show how the default **Low Detail** Configuration stores **four Display Representation Sets** from the Sets folder. Also illustrated to the right, you should be able to see that **View Directions** have been assigned to each of the four Display Representation Sets: Top = Plan Low Detail, Bottom = Plan Diagnostic, Left-Right-Front-Back = Section_Elev and Default (any other view direction) = Model Low Detail.
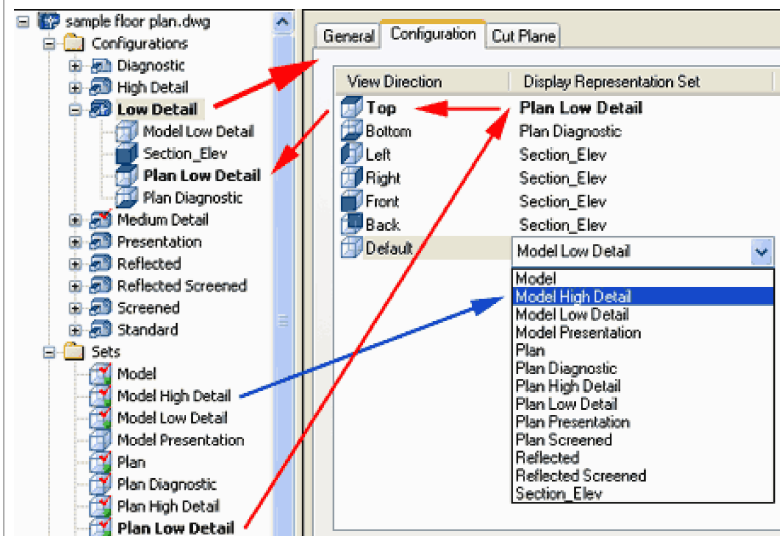
These View Direction associations change the Display Representation Set when you change the View Direction using the View buttons. Different Display Configurations can use different Display Representation Sets and different View Direction associations so the results of changing View Directions depend upon the current Display Configuration.

Display Configuration - View Direction

For each of the **six Views** listed under the Configuration tab, you can associate any one of the Display Representation Sets. This means that you could, for example, create unusual associations like Front = Plan; though this would not really make sense it demonstrates how powerful the system can be.

The seventh **View Direction**, titled **Default**, is typically used for non-orthogonal view directions and would thus include any of the Isometric Views and any 3D Views set with the 3D Orbit tool. With the exception of the Diagnostic Display Configuration, most of the default Display Configurations use Model or a permutation of the Model Display Representation Sets (like Model High Detail).   Be sure to keep this setting in mind the next time you have a desire to see your plan as a flat 2D image in Isometric View; i.e., associate the Default View Direction with something like the Plan Display Representation Set and you will not see a 3D building in any of the non-orthogonal views.

Display Configuration - Override View Direction

As an alternate solution for controlling the association between View Direction and one Display Representation Set, you can use the Override View Direction checkbox. When you check the **Override View Direction**, the **Display Representation Set** associated with the **Default View Direction** becomes the **only** Display Representation Set used no matter what direction the model is viewed from.

Note:
The Fixed View Direction is enigmatic to me at the time of this writing because I could not create one example where it actually changed anything and it is my belief that this override is really about using one Display Representation Set for all cases no matter what the View Direction is.
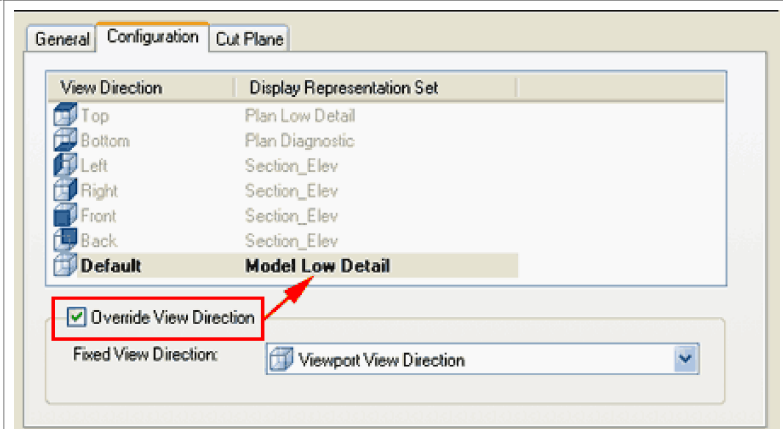
Display Configuration - Cut Plane

On the **Cut Plane tab** for a specific Display Configuration, you can manually set the **display cut range** for all of the objects in the current drawing or use the **Calculate button** to base the range on settings on the **Project Navigator**.

In ADT 4 most objects have been set, by default, to allow the new Cut Plane Display Configuration values to govern the cut plane height. Some Objects, such as those belonging to the Door and Window Object Families, are controlled by the objects they are Anchored to; this is referred to as the "Container Object" and is typically a Wall. Doors and Windows do not have their own Cut Plane values but some objects, like Stairs and Slabs do. These objects typically have an option for manual control of Cut Plane Height rather than using the more global cut plan height as set by the current Display Configuration. To access the object specific cut plane heights, see the object Display Representations.

Illustrated to the right I show the three basic range controls as offered on the Cut Plane tab of the current Display Configuration. In addition to the Display Above Range, Cut Height and Display Below Range, you can use the Calculate button to automatically generate the Cut Plane ranges according to the floor Levels settings on the Project Navigator for the Current Project. If you are not using the Project Management tools in ADT you will not be able to take advantage of this feature but by setting similar values manually, you will get the same results (so fear not).

Display Above Range - the height at which the lines of things Above will be cut off; i.e., items above this height will not be displayed even as dashed lines.

Cut Height - the height as which the Z-axis cut plane for plans is set. Typically, this value is right through all Doors and Windows in Floor Plans but above Doors and Windows for Reflected Ceiling Plans.

Display Below Range - the height at which the lines of things Below will be cut off; i.e., items below this height will not be displayed even as dashed lines.
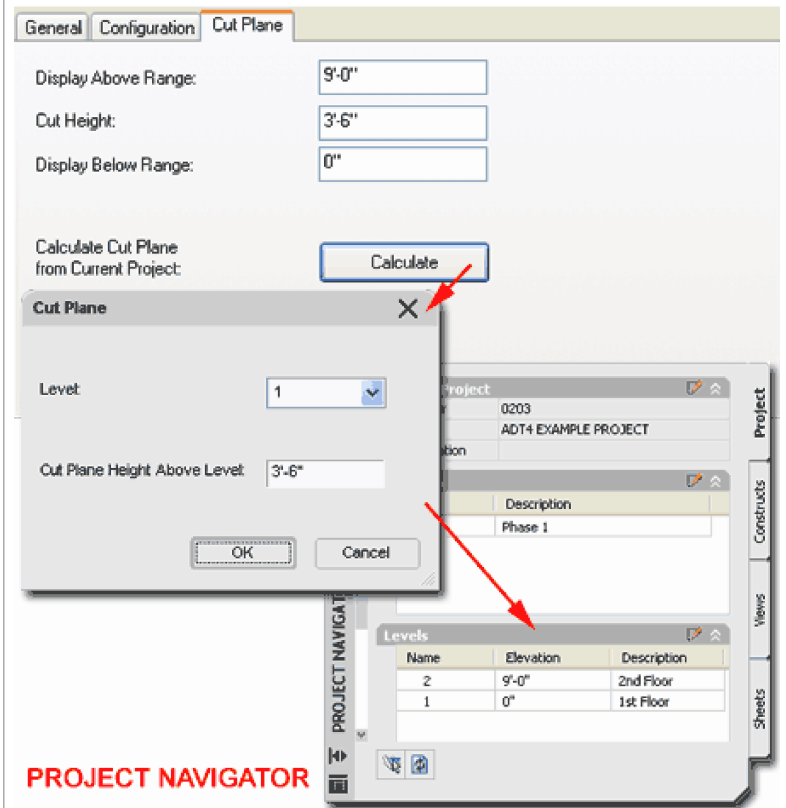
Sets	Which "Object Hows" are Displayed

Display Representation Sets

Next in the hierarchy below Display Configurations are the **Display Representation Sets**. These Sets can be accessed from the individual Configurations or by selecting individual Display Representation Set names under the Sets folder. To access the Sets from the Configurations, expand a Configuration by picking on the plus symbol in the left-pane of the Display Manager Window to reveal the various View Directions that have associations. Select one of these View Directions in the left-pane and you will see the very same Display Representation Control layout as that accessed directly through the Sets folder.

Display Representation Sets are actually just what the name implies: sets of display representations. Since ADT has numerous object families ranging from Grids to Doors, each object family has one or more display representations that can be grouped in a single Display Representation Set. Though you might think that every object should always be displayed in Plan for a Plan View, there are cases where you might want to show some objects in Plan View and others in Reflected View, for example - think of a lighting plan with furniture objects. Since ADT offers Display Representations for levels of detail, you can also create Display Representation Sets that show some objects in low detail while others are in High Detail.

DISPLAY REPRESENTATION SETS
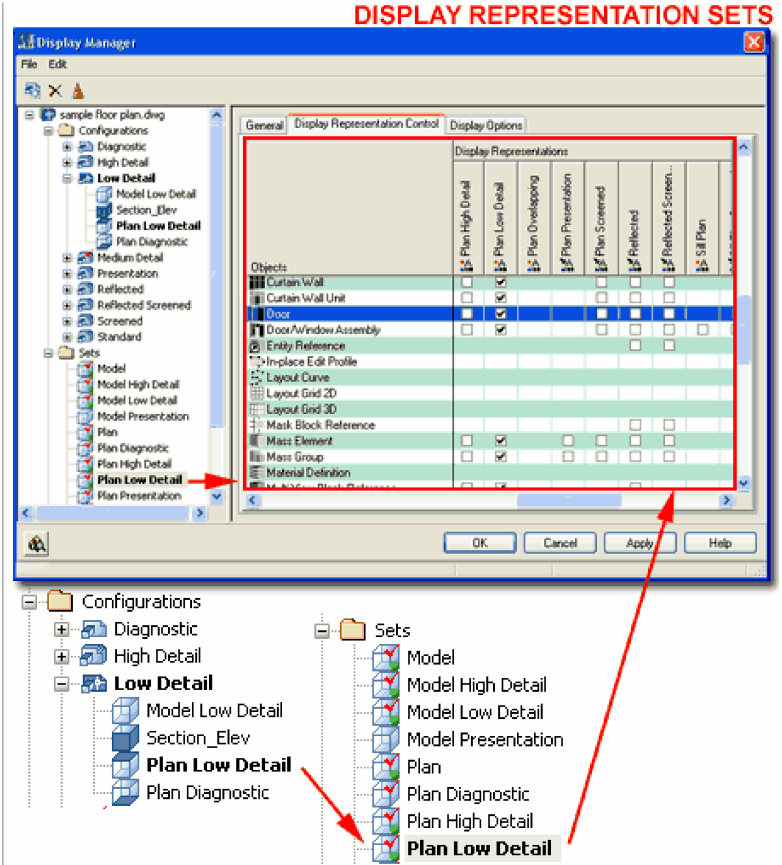
Display Representation Control tab

Illustrated to the right I show a portion of what the " **Plan Low Detail**" Display Representation Set looks like and how most Objects have and use the "Plan Low Detail" Display Representation for this set. Notice, however, that in this Display Representation Set (a default in ADT's template files), that the Window Object Family uses the "Nominal" Display Representation instead of the "Plan Low Detail".

If you change this setting, you will find that the "Plan Low Detail" Display Representation for Windows removes the glazing line that most prefer to show in typical construction documents and that is why the "Nominal" Display Representation is used instead. You can, of course, change any of this by going further down into the Display System and working at the object level (see below).
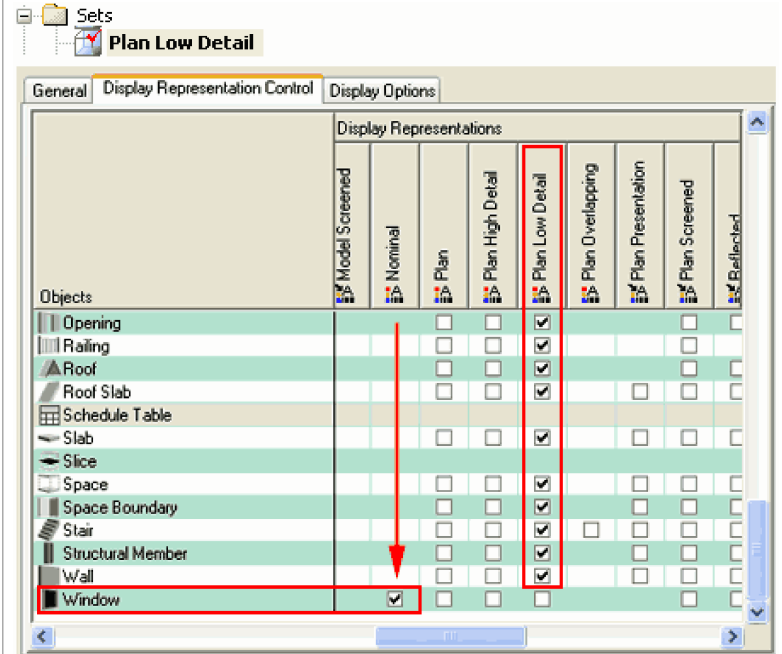
Display Representation Sets - Display Options

Links   **Live Sections -** for more information on the Live Sections and Materials topic.

On the **Display Options tab** for individual Display Representation Sets, you can control the visibility of objects by their **Classifications**. The visibility control is either on or off as set by the **Show** or **Hide** Filter setting.

Object Classifications occur at the Object Style Level and you must create a Classification Definition Style before applying any Classification categories to object styles.

When a Classification Filter is set to Hide, object Styles associated with this Classification Category will disappear as if turned off. Since this setting occurs at the Display Representation Set, the results of these settings will depend upon the Display Configuration that uses this Set.

Live Sections and Materials

Section AEC Objects by Display Range defined in Display Configuration - use this option to include the Display Configuration Cut Plane Range as part of the active Live Section. See the **Cut Plane tab** for the current Display Configuration. This means that you can cut horizontally even if your Live Section is only vertical.

Show Materials where Display Range Intersects AEC Objects - this option requires the option listed above to be checked. If on (checked) a section outline will be displayed at the point where the Cut Plane cuts horizontally. This is similar to what you see when cutting normal vertical sections.   The control for this Display feature can be found on the Object Style Properties dialog box, under Materials - Shrinkwrap. See the Sectioned Boundary Display Property to change the Color, Linetype, etc.

Hide Sectioned Body Component - use this option to turn on or off (hide) the objects that are outside of a live section.

Hide Surface Hatching - use this option to turn on or off surface Surface Hatches on Faces of objects. If you use Materials for Rendering this may not be something you will want on but if you want hatch patterns like those you see on your Elevations, this is the place to check them on for Live Sections.

Representations by Object	How Objects are Displayed

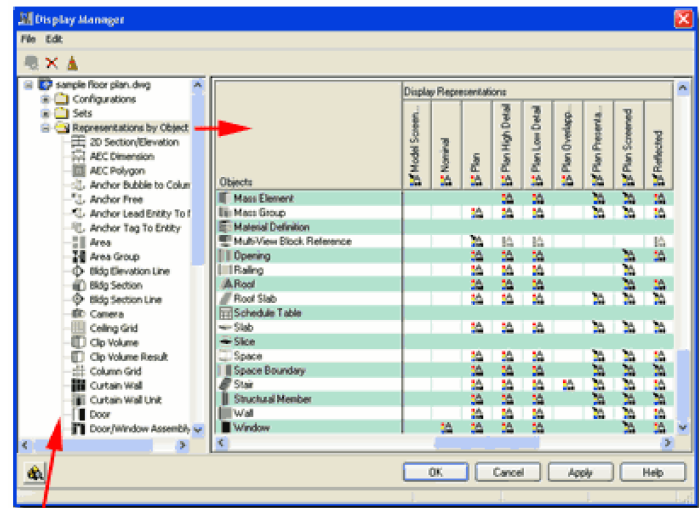## Display Representations by Object

At the lowest level in the Display Hierarchy, are the **Display Representations for individual Object Families**. Though these are at the lowest level in the Display Manager Hierarchy, they are the most important feature of the whole display system because this is where the actual display settings are managed. In other words, Display Configurations and Display Representation Sets generally don't affect the display of the objects but are more like organizing tools for all of the object display options.

Illustrated to the right I show, in the right pane of the **Display Manager Window**, how you can get a map that correlates all of the object families with the various Display Representations that may or may not apply to those objects. By double-picking on the **Properties icon** in a particular cell, you will be able to edit that display representation but I find that this type of work is a lot easier to manage by first selecting the object family name under the Representation by Object folder in the left pane (see discussion below).

DISPLAY REPRESENTATIONS BY OBJECT

ALL OF ADT'S OBJECT FAMILIES

ALL OF THE VARIOUS REPRESENTATIONS FOR EACH OBJECT FAMILY

NOTE: IT IS OFTEN EASIER TO READ AND MANAGE THIS INFORMATION AT THE INDIVIDUAL OBJECT FAMILY LEVEL
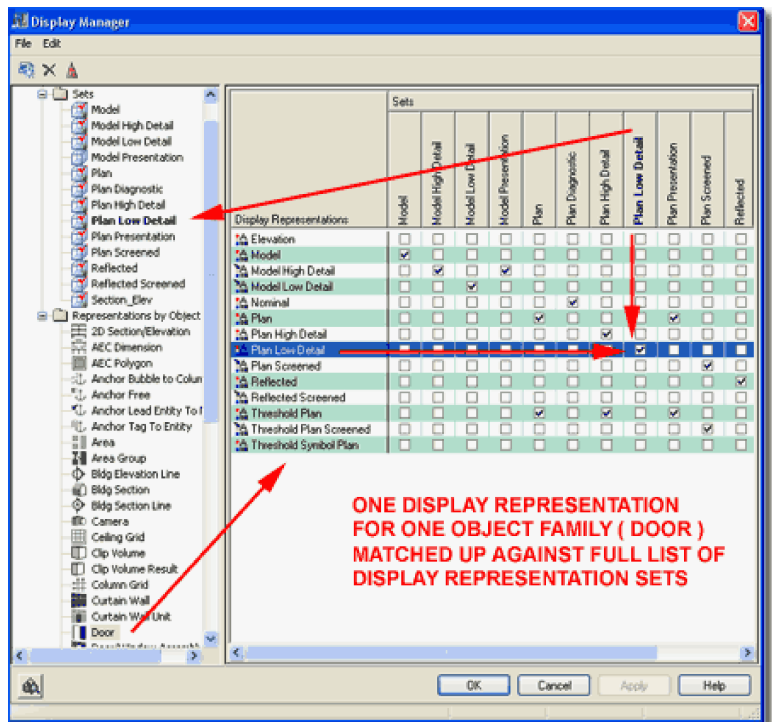
Display Representations by Object - Relationship to Sets

As discussed above under the topic of Display Representation Sets, each individual Object Family has a set of default Display Representations that are associated with one or more Display Representation Sets as one of many in a group for all other Object Families.

In the case of a Door Object Family, for example (see illustration, right), the default list of Display Representations holds about fourteen different representations. Some of these are actually just permutations or copies of the primary set and you can distinguish these by the little arrow on the properties icon. This arrow symbolizes that the representation is a pointer to a parent representation (if the name is not indicative of this then it is really difficult to figure out which one is the parent - keep this in mind when creating your own).

Depending upon the type of object and its general use in architectural design and presentation, the number of Display Representations will vary. One of the most common is the " **Plan**" **Display Representation** where you will find Properties that relate to all of the linework you might want to control for the "Plan" look of that Object Family. If you find the logic of this subject a little confusing, think in terms of AutoCAD-like Blocks and Layers. Now, imagine making a block of a Door with Layer Names for all of the parts that you think you might want to control for the look of that door in Plan View. Then, imagine adding another Block to the same Door Block but this one will be used for how the Door will look in Elevation; add all of the linework and Layers for how you might want to control that look. ADT objects are basically like sophisticated Blocks and all of the Layers are embedded within them as something called "Component Layers". These Display Representations are your controls for the different Views: Plan, Elevation, Reflected, etc.

ONE DISPLAY REPRESENTATION FOR ONE OBJECT FAMILY (DOOR) MATCHED UP AGAINST FULL LIST OF DISPLAY REPRESENTATION SETS

Illustrated to the right I show the correlation between one **Display Representation** (Plan Low Detail) of one Object Family (Door) and one **Display Representation Set** (Plan Low Detail) that this representation has been grouped under.

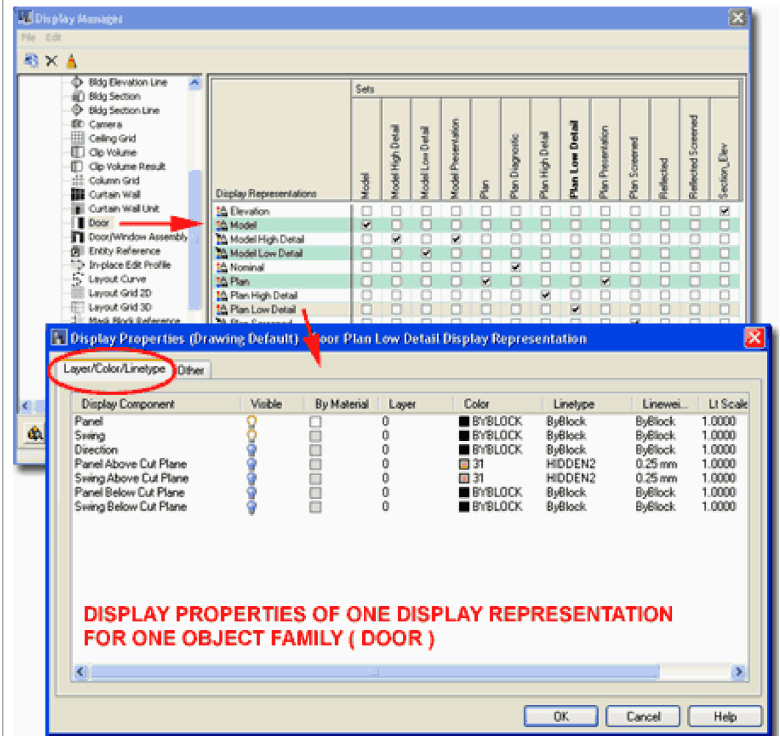## Display Representations by Object - Display Properties - Layer/ Color/ Linetype Tab

Object Style Display Properties - for the continuation of
Keyboard   this topic as discussed from the object point of view

rather than the Display Manager's point of view.

For each Display Representation of an Object Family, you can **double-pick** on the **Properties icon** to access the actual **Display Properties** of that Object Family for that particular representation (like Plan). Once you get this deep within the whole display system, you are actually affecting how and what to display. Notice that the list of "Display Components" on the Layer/Color/Linetype tab of the Display Properties dialog box is different for different Display Representations. The Display Components are also very different from Object Family to Object Family since different objects have different pieces (components) that explain how they are put together and what pieces you can control.

The **Layer/Color/Linetype tab** on the **Display Properties dialog box** contains what can essentially be described as internal object layers. By placing these "layers" inside the object display representations, you don't have to work with hundreds of physical layers but basically only one physical layer for each object family. Depending upon the Display Representation and the Object Family, you may find different tabs on the Display Properties dialog that provide additional display options ranging from the ability to Add Custom Blocks to Adding Parametric Muntins (usually the greatest offerings are under the Model Display Representations).

If you want to create your own Display Representation for an ADT Object, highlight a pre-defined one that offers the options you want and then pick on the New button. Notice that if you do not highlight a Display Representation, you will not be able to create a new one. Also, creating new Display Representations is really more like creating a shortcut or pointer to a pre-defined one; where you make unique settings.

Display Representations by Object - Display Properties - Other Tab

For most of the Object Families in ADT, the Display Properties dialog for various Display Representations offer a Tab called "**Other**" that has unique options and settings for custom controls.

Illustrated to the right I show the "Other" tab for the Plan Display Representation of the Door Family. On this tab, as with numerous others, you will find the option to **Add...** custom Blocks for such things as Door Knobs, Handles, decorative elements and so forth.

In addition to the ability to Add... custom blocks you should also find other options and settings that are unique to each object type and the current Display Representation Properties. There are far too many options to list here so you might look to the different parts of this guide or simply investigate on your own because even though this guide covers all of the object families it does not cover all of the possible options on every single "Other" tab.

Note:
Notice the Respect Cut Plane of Container Object when Anchored checkbox. This option, checked by default, defers the cutting plane height to the Wall that the Door is Anchored within. Consequentially, the Wall, by default, defers the Cut Plane height to the current Display Configuration which , in turn, may use the current Project Level Settings for this calculation.
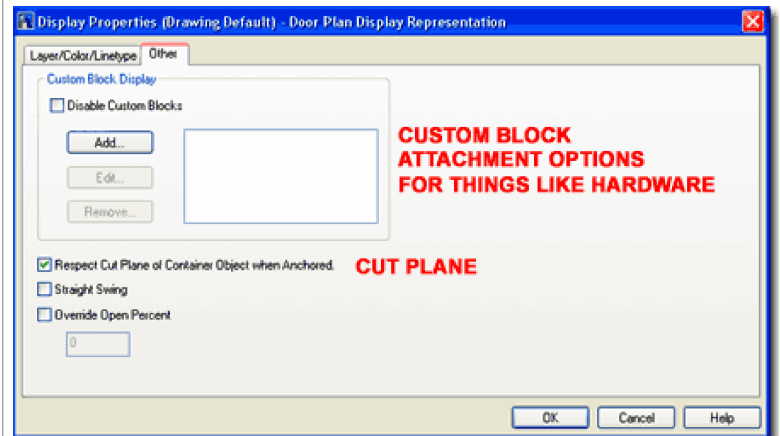
5 **Object Style Management Overview**

Style Manager

Menu   **Format> Style Manager...**

AEC Setup

Keyboard   **AecStyleManager**

The **Style Manager Window**, illustrated to the right, provides access and control over individual objects within an Object Family. This differs quite a bit from the Display Manager which manages the display of all objects while the **Style Manager manages the physical dimensions and display characteristics of individual objects within Families**. Where the Display Manager leaves off on basic component settings, the Style Manager picks up with options for physical dimensions, schedule data and unique display characteristics that may deviate from the default ones as set by the Display Manager.

Through the Style Manager, for example, you can Import, Create New, Modify or Purge individual objects such as Double Doors, Casement Windows, Floor Slabs, Wood Housed Stairs, Metal Railings and so forth.

Illustrated to the right I show the typical left and right panes displayed when the Style Manger Window is first opened. In the left pane you should always see the name of the current drawing file and any other drawing files that may currently be open. In addition to these drawing files, you should also see any files that you have opened previously within the Style Manager to access other object styles (notice I show the "Wall Styles - Stud (Imperial).dwg" as an example of this).
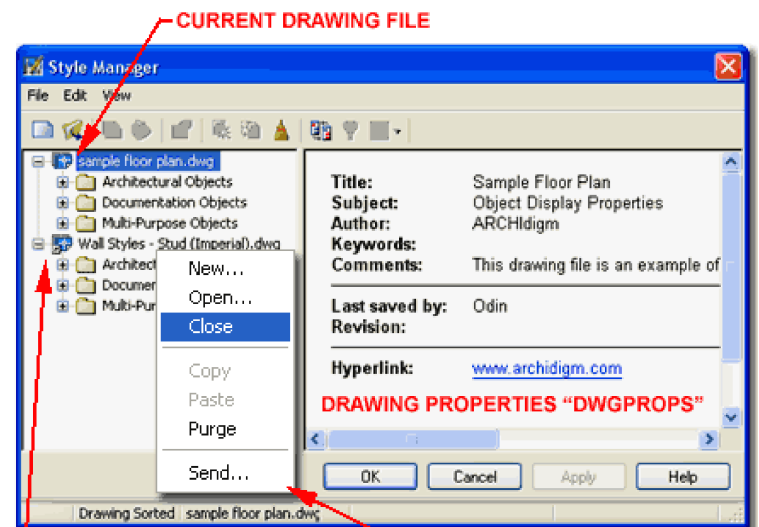
Every drawing file will display three object folders that are organized by function to help you go through the list more expediently. These three folder categories are "**Architectural Objects**", "**Documentation Objects**" and "**Multi-Purpose Objects**".

CURRENT DRAWING FILE

DRAWING PROPERTIES "DWGPROPS"

RIGHT-CLICK POP-UP MENU

OTHER DRAWING FILE OPENED EARLIER TO ACCESS OBJECT STYLES TO BE LOADED INTO A DRAWING
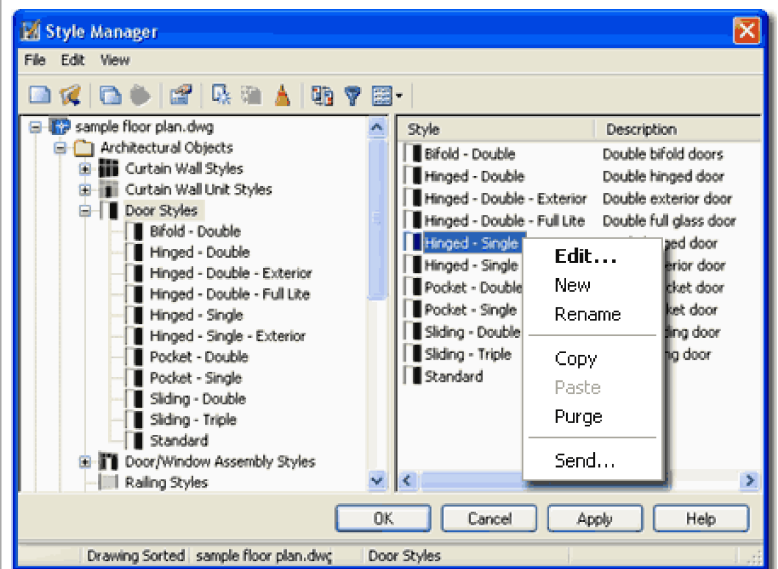

Style Manager - Objects

 Links   **Style Manager Objects** - to see the full list of all objects

Illustrated to the right I show the **expanded view** for the **Door Styles** under the **Architectural Objects folder** and how the right and left pane will display the same list of object styles. The only significant difference between accessing the objects in one pane over the other is that the right pane allows for multiple selections in Explorer-like fashion and this can be rather handy when dragging a bunch of styles from one file into another.

Within one object family, all of the Style Property options are always the same but how you adjust these properties will not only make them unique but in some cases will also limit or open other property options (Muntins in Doors, for example, are only available on Doors with openings in them). Many of the object Style Properties also offer an array of options that control how they look and function so the variation can be extremely broad; in some cases, unlimited possibilities.

Style Manager Toolbar

Remember that you also have right-click menus for tasks such as New, Copy and Paste but also Send... for sending a Style via e-mail to someone else.

New Drawing - actually Creates a New Drawing just like you would create a new drawing in ADT. The concept is based on the way Styles work in ADT: if you want a set of unique styles, they can be saved in a drawing file. In fact, that is how styles are managed; in drawing files.

Open Drawing - allows you to either open a Style drawing file or any drawing that contains styles that you might want access to. This is how you access and import Styles from one file to another.

Copy and Paste - work like any copy and past in that you find a style you want from one drawing and paste it another. As I understand it, the process actually uses AutoCAD's block process to transfer the data.

Edit - allows you to change the data within a style. Double-clicking on a style does the same thing.

Create a New Style - allows you to start with a blank of default settings for a particular Object Style; i.e., you can't create a completely original style nor a style for a non-existing object. Often it is far faster and easier to Copy, Paste and Edit.

Set From - allows you to define elements or components of a Style by selecting an object on the screen. A Wall Endcap Style, for example, can be defined by using Set From to select a polyline object as the shape. Not all Styles can use this option even though it seems available (this is a reported defect in the program).

Purge Style - allows you to remove **unused** styles in a drawing file.

Toggle View - sorts the Tree View (left column) by Drawing or by Style (see Status bar for which type you have). This actually has three features depending on what you have selected in the left pane. If you have a style selected and toggle, you will either see a list of styles or a list of drawings and the current style types - this is really useful if you want to go back and forth between drawings and work with the same Style types (like Doors). If you select a drawing file and toggle, you should see a table of drawing files in the right pane; now pick a Style type and the right pane should display a table of that particular Style type for all currently open drawings. This is really useful when doing comparisons between files.

Style Manager - Other Styles
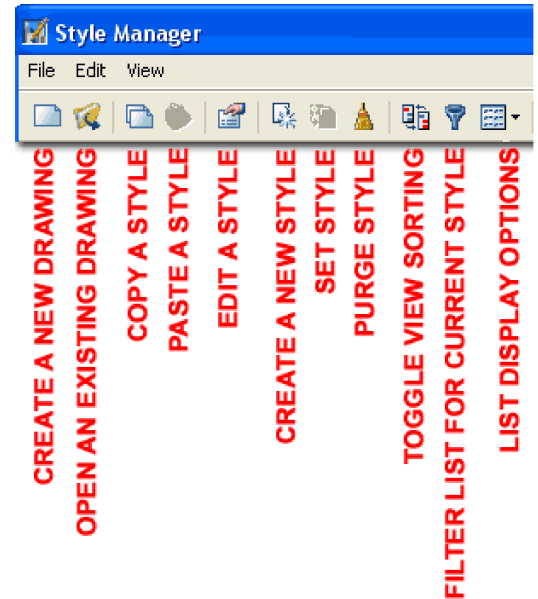
Filter - is what happens automatically when you use the Style button on any object toolbar: it's filtered for that object style only, leaving the other object styles closed and un-viewable until you turn off the filter.

List - this is just like the list options for Explorer. Large icons and Details are probably the best options - too bad the large icons don't actually show an image of what the object style looks like, that would be really cool.

- for the path to the Imperial and Metric Object Styles Folders.

In the world of ADT, every drawing is basically a source of data for every other drawing so you can actually use the Open Drawing option from the **Style Manager Window** to **Open any drawing file** and poke around inside its Style Library to Import them.

In the illustration to the right I show that I have located the **Imperial Folder** for all of the Object Styles in ADT and Opened the "**Door Styles (Imperial).dwg**" file. On the Style Manager Window I show what this file looks like when Opened and how I have expanded the Door Styles category to reveal all of the Door Styles in the right pane. In addition, I show that I have **selected several Door Styles** by using the **Ctrl key** and am **Dragging** them into the Door Styles category of the current drawing file that I am working in.

By using this technique, you can not only access all of the Imperial or Metric Object Styles that come with ADT but you can also create and access your own custom Library Files for objects. You should also know that when you use the Tool Palettes, this is exactly what they are doing for you: accessing one of these files and importing a specific object style.
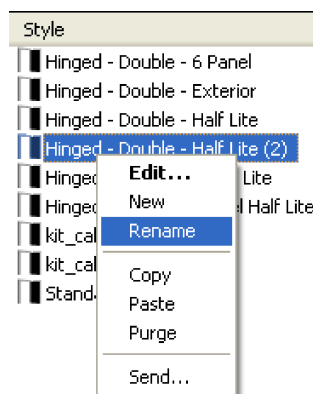
Illustrate to the left I show a procedure that I recommend for the process of creating your own Object Styles: Copy and Existing one, Rename it and then Edit... it. By using this technique as opposed to creating one from Scratch, you save time by not having to change every single Style Property unless you really need to.

Note:
Though I show these two methods for adding styles, there are many other methods including the old Cut-n-Paste technique (from one drawing to another).
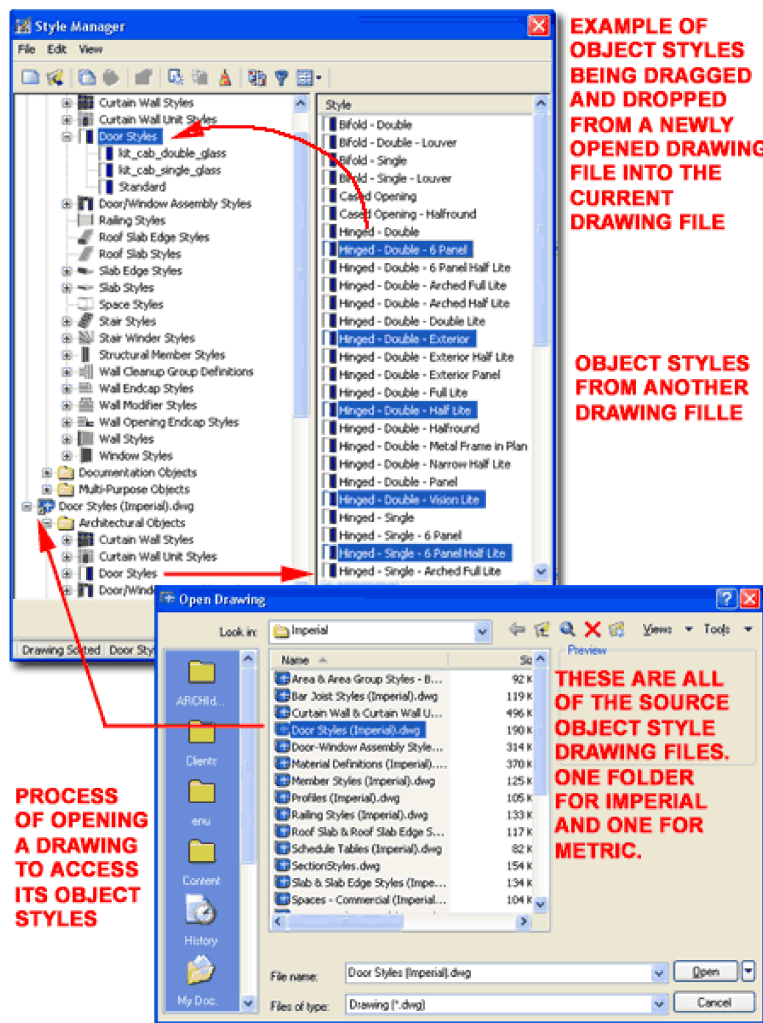
EXAMPLE OF OBJECT STYLES BEING DRAGGED AND DROPPED FROM A NEWLY OPENED DRAWING FILE INTO THE CURRENT DRAWING FILE

OBJECT STYLES FROM ANOTHER DRAWING FILLE

THESE ARE ALL OF THE SOURCE OBJECT STYLE DRAWING FILES. ONE FOLDER FOR IMPERIAL AND ONE FOR METRIC.

PROCESS OF OPENING A DRAWING TO ACCESS ITS OBJECT STYLES

## Style Manager - Style Viewer and List

If you **select** an **Object Style** in the **left pane**, as illustrated to the right, you should see an **Object Viewer** in the right pane. You should also find a **List** tab where you can see a quick overview of the Object Style's specifications.

These two options are not for making changes but rather to help you go through a huge list to find the best Style for use in your project. This becomes more useful when there are numerous Styles with similar names.

Since the Object Viewer uses the **3D Orbit** commands, remember that you can use the right-click on your mouse to activate a pop-up menu to get the same list of options provided on the Viewer toolbar.

Note:
For best results, I highly recommend that you see the left pane as a navigation tool much like Explorer's left pane and the right pane as the place to actually interact with the styles. Working with this concept should provide more consistent results.
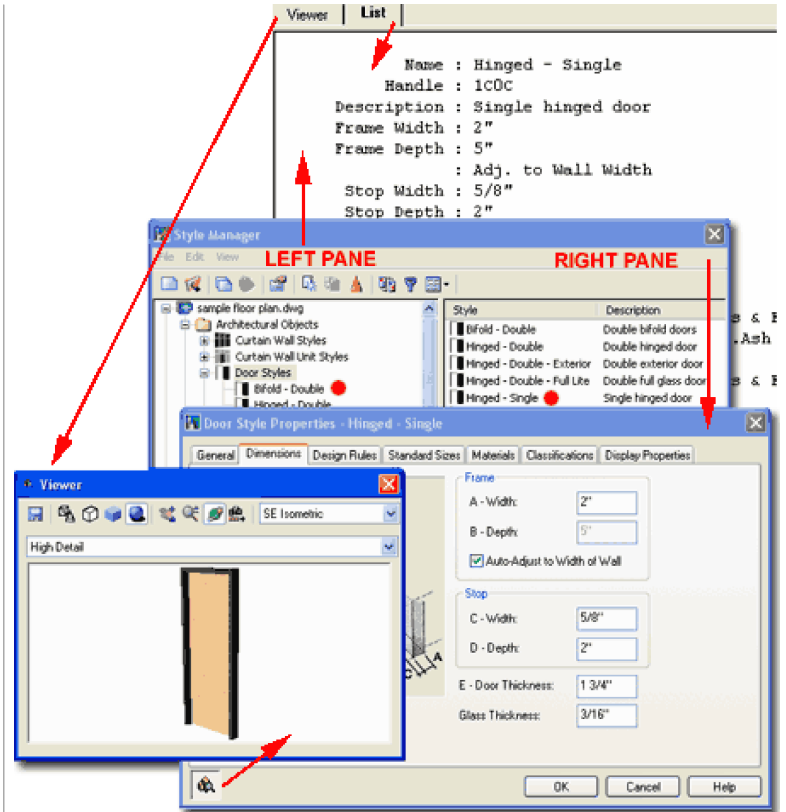
Style Manager - Style Properties - Unique

Most Objects have a variety of tabs following the General tab on the Object Style Properties dialog (see image above, right). For Door and Widow Styles, you will find the **Dimensions tab**, **Design Rules tab** and **Standard Sizes tab** as common options but the set of tabs will vary from Object Style to Object Style. Generally, however, this is where you will find the options to set sizes, shapes and some behavioral options.

Read the Parts related the the Object Style for more in-depth information about these tabs.

Style Manager - Style Properties - Common

 Links   Materials - for the full story on this topic.

Among the numerous objects in Architectural Desktop, some of the common Style Properties include **Materials**, **Classifications** and **Display Properties** and these can be accessed by the tabs illustrated to the right. For information relating to other properties or for greater detailed explanations about the properties of a particular object, see the Parts and Sections that discuss these objects in detail.

For those who have upgraded from Architectural Desktop 3 - 3.3, the Materials and Classifications Properties are new to ADT 4 and offer even more options for controlling the display of objects.

Materials - this tab provides access to a new way to control and manage some of the display properties of Object Styles (and individual objects via style overrides). The primary purpose for this new property is to allow for material mapping to the objects so the process of rendering becomes less time consuming. In the past, since there was no direct way of associating materials with objects, mapping of materials had to be done as a separate task through direct attachment or via color index numbers.

Classifications - this tab provides access to a new way of adding categorization to objects. The primary purpose of this new property is to allow for object grouping regardless of the style or object family thus providing a means to classify objects as being part of a construction phase or construction type. Classification can play an important role in schedule data but can also be used as an **On/Off display switch**.

Display Properties - this tab provides access to the Display Representations for a particular Object Family and offers the option to Override the default Display Representation Properties. Though this property is not new to ADT 4 but has been reorganized for better clarity.

For a more complete discussion of these three tabs, see the three sections below.
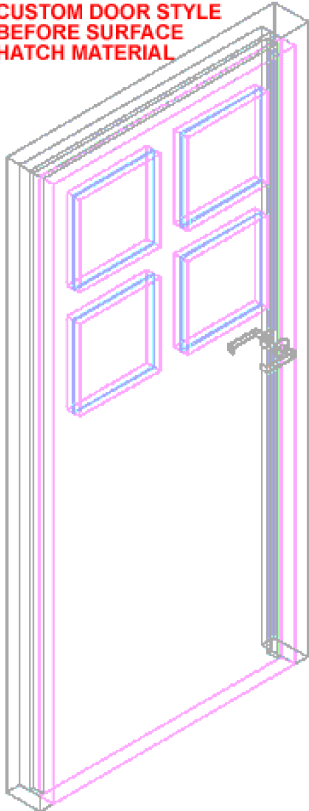

COMMON DISPLAY CONTROLS FOR ARCHITECTURAL OBJECTS

6-1 AEC SETUP - DISPLAY
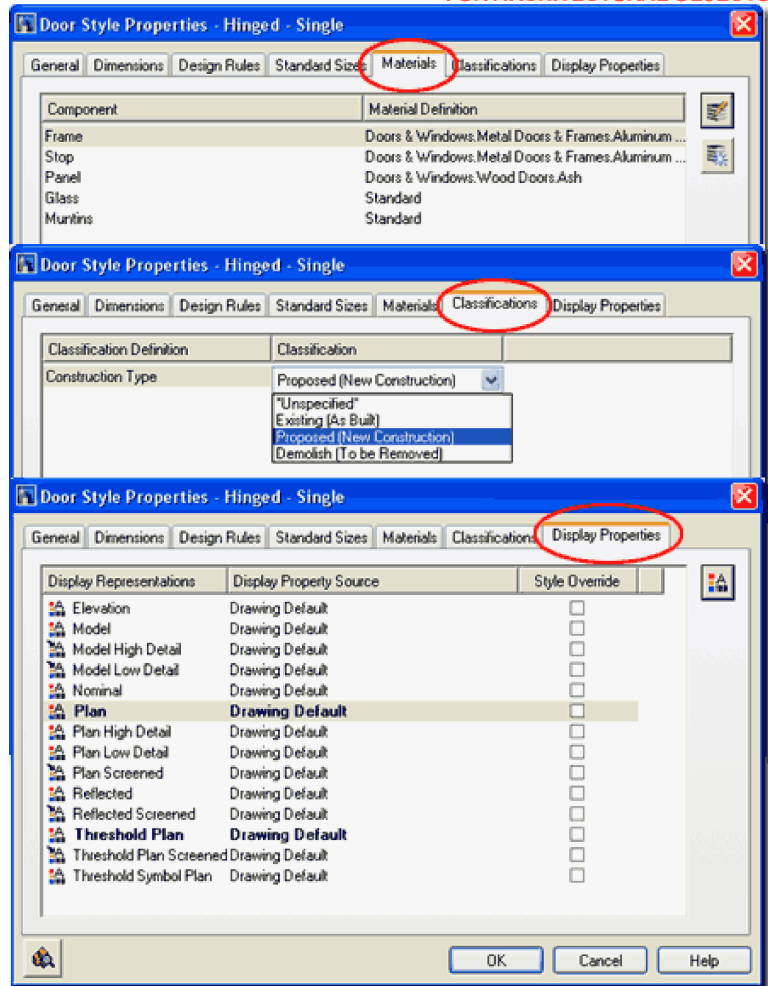
6 Object Style Properties - Materials Overview

Object Style Properties - Material Tab

Links   Material Styles

CUSTOM DOOR STYLE BEFORE SURFACE HATCH MATERIAL

The **Materials tab** can be found on the **Style Properties dialog box** for most of the objects in Architectural Desktop. You can access this dialog box by activating the Style Manager or by using the **Edit [Object Name] Style...** menu option on the object specific pop-up menu.

In short, a Material is basically how an object looks or "displays" on the surface in Plan, Elevation, Section, 3D, when Rendered and so on. Materials are stored under the Style Manager as **Material Definition Objects** and they have their own Display Representations stored under the Display Manager.

To best explain the use of and options for Materials, I have chosen to use a custom Door Style but this concept applies to most of the objects in ADT.

Illustrated to the left is a custom door style that I created using a Pline that was turned into a custom Profile Definition and then applied to a unique Door Style Name. Since my example object is a Door Style, the **Component list** under the **Materials tab** of the **Door Style Properties dialog box** shows the Components that apply to Doors. If this were a Wall or Window object style, the Components would reflect either of those objects.

A unique **Material Definition** can be applied to each of the Components listed on the Materials tab. Depending upon the drawing file you are working in, there may already be some default Material Definitions to choose from (such as "Doors & Windows.Wood Doors.Ash") or you can use the **Add New Material** button to create a new Material Definition Style - illustrated to the right as "Custom Material".

To **Modify a Material Definition Style**, you can double-pick on a Component name. When you create a new Material Definition Style from the Material tab, you are automatically taken to the **Material Definition Properties dialog box** - as illustrated to the right.

Since a Material Definition is actually an Object Style, you will find that the Display Properties tab offers Display Representations just like those for most objects. Again, the number of Display Representations will vary depending upon the current file you are working in or the ADT Template file you started with. Generally, you would probably want one Display Representation for each of the Display Configurations that you use in a drawing so you can create individual object style Overrides for each of these Display Configurations. This logic may not make sense yet so read on and it may start to make sense. Also, keep in mind that this is the first attempt at adding surface materials in ADT and some programmers have admitted that it is not a fully refined process.
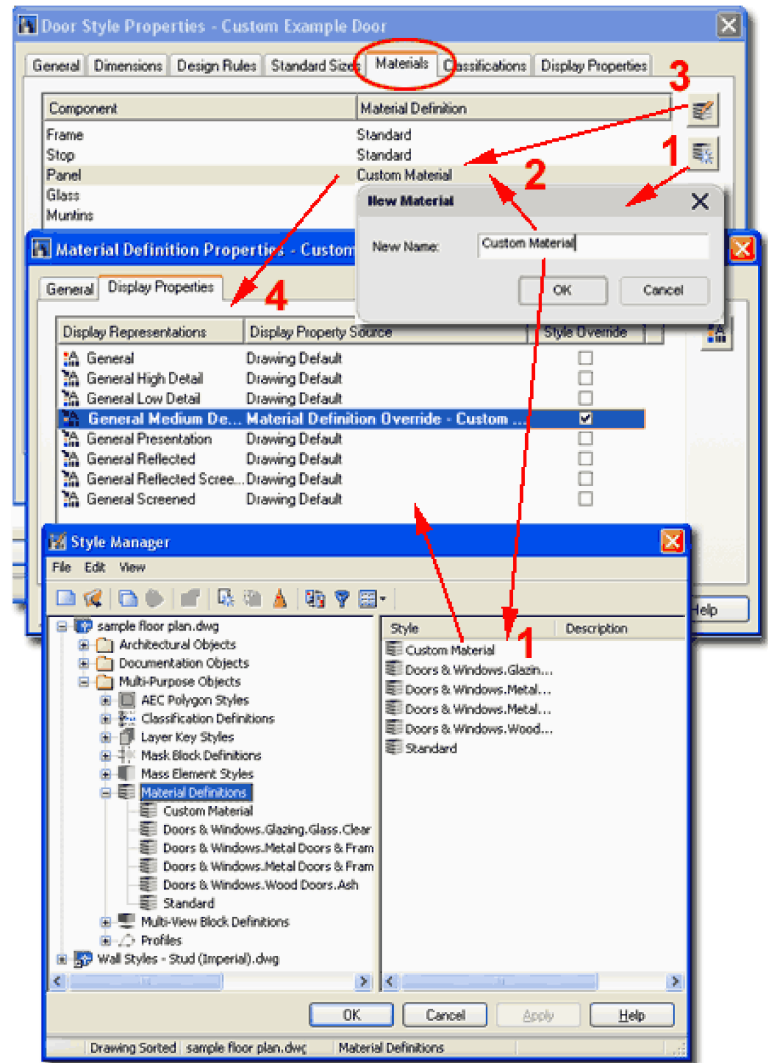
Why Overrides?

The reason overrides are necessary in most cases is because of the nature of the solution; a very poor one in my opinion. To offer users more flexibility on Materials (mostly for rendering purposes) the developers of this software created a new object type and allowed it to be embedded within other object styles as a unique display property. The problem with this solution is that you are working with one object style and one object style can only have one display representation at a time so when you want to assign a Material Definition Style, you have to Override its Display Representation in order to get anything other than the default. What this means is that you are always using Overrides on Material Definitions which, in turn, means that there is really no reason to have more than one Material Definition Style except that you will need them to keep track of your Overrides. In other words, you create a Material Definition Style just so you have something to Override.
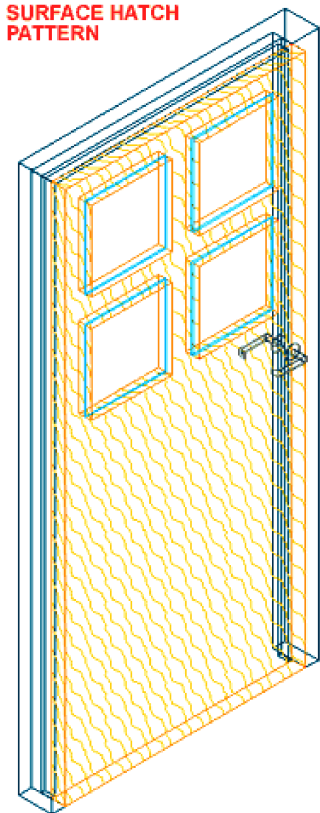

Material Definition Properties

Menu   **Format> Material Definitions...**

Keyboard **AecMaterialDefine** or **MaterialDefine**

Illustrated to the right I show that I have accessed the Material Definition Properties dialog for the new custom material definition style that I created in the previous step. Since Material Definition Styles belong to one family of objects, the list of Display Representations will be the same for all of the Material Definition Styles in this drawing file. And because one object family cannot have independent Display Representations (but must share the same set), these are thus the

SURFACE HATCH PATTERN

same for all of the material assignments you might want to make in one drawing file. This means that you only have one Display Representation to work with for all of the possible material assignments you might want to create and use for any Object Style Family (like Doors). To work around this amazing limitation, you employ a **Style Override** on the **Display Representation of the current Material** Definition to provide the means for having a unique material. If you don't employ a Style Override, you will be changing the material for all objects using this Material Definition Style (those that don't have overrides, that is).

On the **Display Properties tab** of the **Material Definition Properties dialog**, illustrated upper right, I have checked the Style Override box for the "General Medium Detail" Display Representation because that is the Display Representation I created a new material for in the previous step. Once you place a checkmark in a Style Override box, the Display Properties dialog box will pop up allowing you to set the overrides.

Once on the Display Properties dialog for a Display Representation of a Material Definition, you can see a list of **Display Components** that are relatively universal in application for all objects. Among the list you should see the " **Surface Hatch**" which is the Display Component I have chosen to demonstrate here.

Illustrated to the right I show that I have turned the Surface Hatch Display Component On, Set a unique Color and by picking on the **Hatching tab**, set a unique **Hatch Pattern f**or the **Surface Hatch Component.**

Illustrated to the left I show the results of going through all of this work. Because a Style Override was used, only this Door Style will express the Surface Hatch selected in this last step. If neither of the two Style Overrides had been used, all objects would now express this Surface Hatch whenever the "General Medium Detail" Display Representation for this Material Definition Style is part of the current Display Configuration for objects.
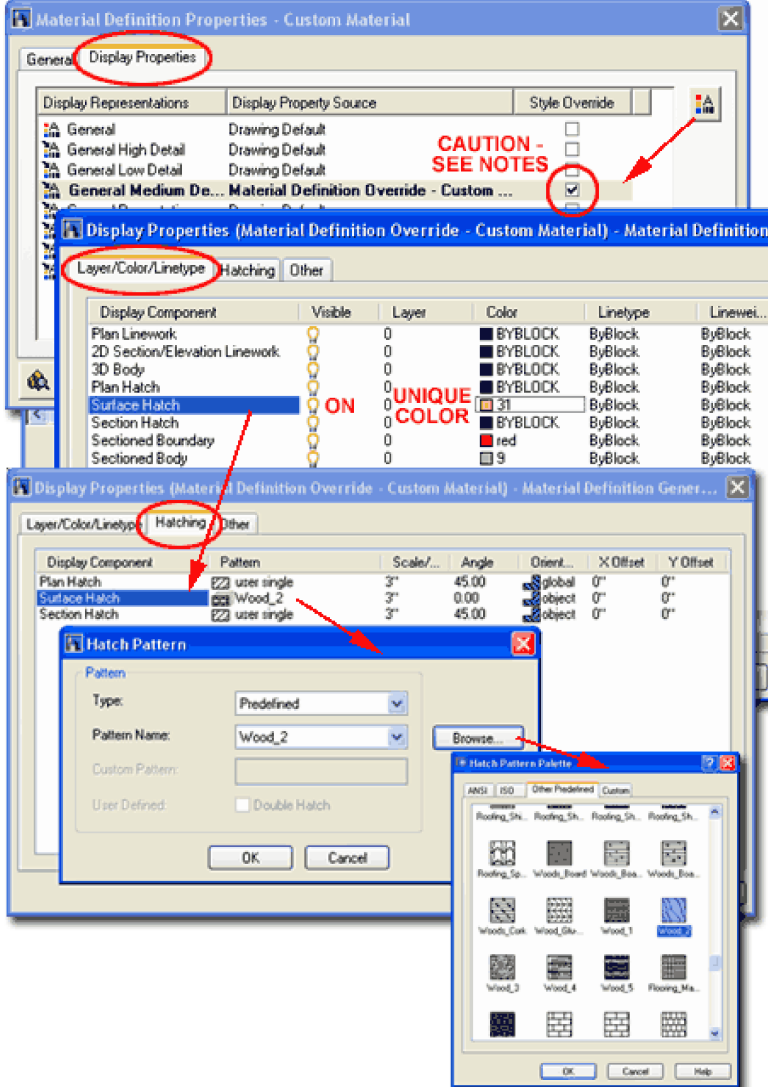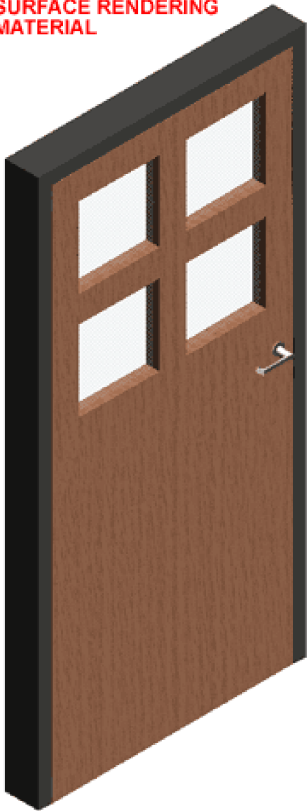
Material Definition Properties - Surface Rendering Materials

Links   <u>Options - System tab - 3D Graphics System Configuration</u> - for information on how to control the display of rendering materials while in shademode.

xxx Presentation eGuide - for how to create, load and use custom materials
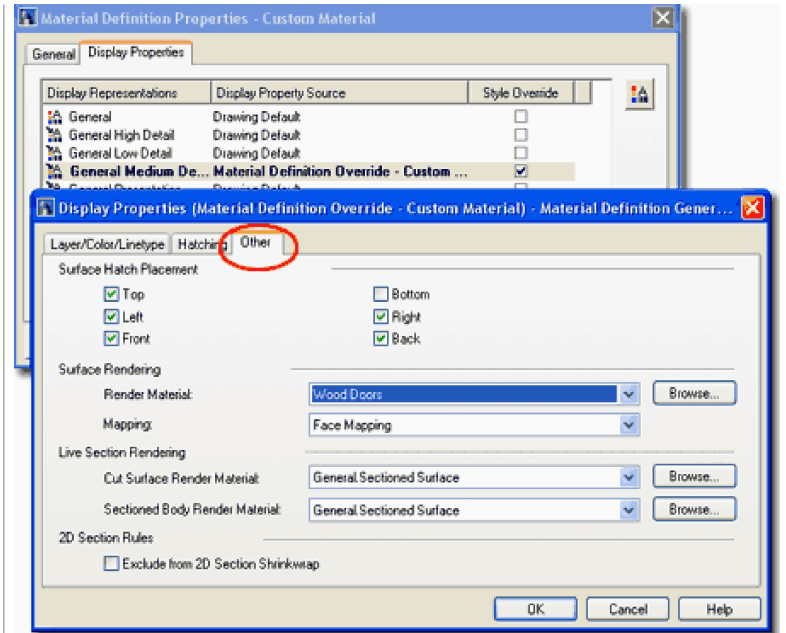
SURFACE RENDERING MATERIAL

By continuing from the discussion above, you will find more options for material control on the "**Other**" **tab** of the **Display Properties dialog box** , illustrated to the right. For the Surface Hatch, as discussed above, you will find the **Surface Hatch Placement** checkboxes that control the planar direction for the surface hatch patterns: **Top**, **Left**, **Front**, **Bottom**, **Right** and **Back**. By selecting one or more of these directions, you control how the surface hatch is mapped along the surface of the object(s) it is applied to. To reduce the drain on your graphics card, for example, you probably don't need to have surface hatches on the Top or Bottom of Doors.

Surface Rendering is similar to the concept of Surface Hatch but uses a raster image instead of a hatch pattern. This is where you assign the photo-realistic materials that Viz Render will use to create high quality presentation images.

Render Material - use this drop-down list to select any of the materials available in the current drawing or use the Browse... button to search for any raster material available on your entire office network.

Mapping - use this drop-down list to select one of three mapping options that control how the material is placed or mapped to the surface of objects. **Face Mapping** is most likely your best choice since it places the material on all faces. The **Same as Surface Hatch** option will apply the material on those faces checked under Surface Hatch Placement and may be a good choice if you don't want the material on both sides of an object. **Default Mapping** is most likely your least desirable option because it tends to map a material across the top surface only while bleeding it along the edges.

Live Section Rendering
Cut Surface Render Material - use this drop-down list to select any of the materials available in the current drawing or use the Browse... button to search for any raster image that you wish to use across the surface of a 3D or "Live" Sectioned Surface. In the case of a Brick Wall, for example, you can have a brick image running across a sectioned surface of the brick wall or, as the default, a simple gray color.

Sectioned Body Render Material - use this drop-down list and Browse... button as per the Cut Surface Render Material. Sectioned Body Render Material is for a unique option to show objects or bodies outside the cutting plane. The default material, as per screen capture to the right, uses a translucent blue material which is very appropriate to help see what it included and excluded from the Live Section. To see this effect, make sure to **Toggle Sectioned Body Display** - select section object, right-click to see pop-up menu with this option. Comment: add link to section part when ready
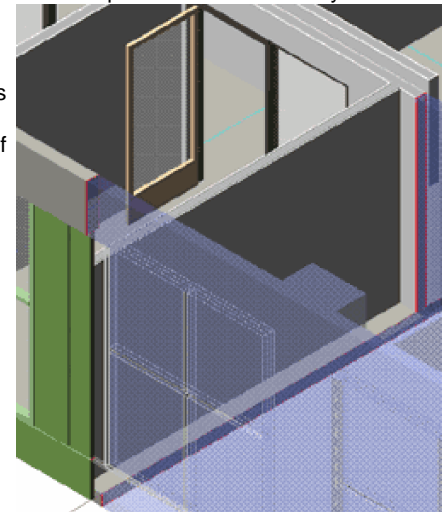
2D Section Rules
Exclude from 2D Section Shrinkwrap - use this checkbox to declare this material excluded from automatic 2D Section Shrinkwrapping. In other words, if you are assigning this material to a component of an object but don't want the component this material is being assigned to to appear as one homogenous material in a 2D Section, then use this checkbox. The typical example of this scenario is the glass in Doors and Windows where you may want the glass as a simple set of lines, no hatch, but want frames, jambs and other components to appear as one solid shade of gray. Comment: link to part for sections when done.

Comment: Expand in the future

7 Object Style Properties - Classifications Overview

Object Classification Definitions

| Menu	**Format> Classification Definitions...**

AEC Setup

Keyboard **AecClassificationDefinition** or **ClassificationDefine**

Links

Object Style Classifications are really more about tracking and coordinating data related to the objects (schedules, for example) than a matter of Display options but I have included this topic here because they can be used to affect the display characteristics of objects.

Illustrated to the right I show the two primary dialog interfaces you will need to use in order to create and manage Object Style Classifications. Though you will see the option to "Classify" any object on the **Classifications tab** of most **Object Style Properties** dialog boxes, you cannot classify the object style if there are no **Classification Definitions** for that particular object.

To create a Classification Definition, you will need to use the   **Style Manager** (AecStyleManager) to create a **New Style Definition Name** and then **Add the Classifications** it. On the **Style Manager dialog**, illustrated middle right, I show that I have created a   **New Classification Definition Name** by selecting the **Classification Definitions category** under the **Multi-Purpose Objects folder** . By editing the new Classification Definition that I named "Construction Type", I show that I used the   **Add button** on the Classifications tab of the Classifications Definition Properties dialog to Add three classification names: "Existing", "Proposed" and "Demolish". After adding these names that I just made up on-the-fly, I show that I used the **Applies To tab** of the same dialog box to **Check** those **Object Styles** that I want my new Classifications to be available for. Though I show that I have only Applied my new Classifications to the Door Styles, it would seem far more logical to Apply to All Styles. Applying to the Classifications to all object styles does not mean that they are active but simply available if desired.

Once you have created one or more Classification Definitions within the Style Manager Window and used the Applies To tab for the object styles you want to use them for, you will now find them available on the Classification tab of the Object Style Properties dialog (for those objects that you have applied them to, that is) - see upper right illustration.
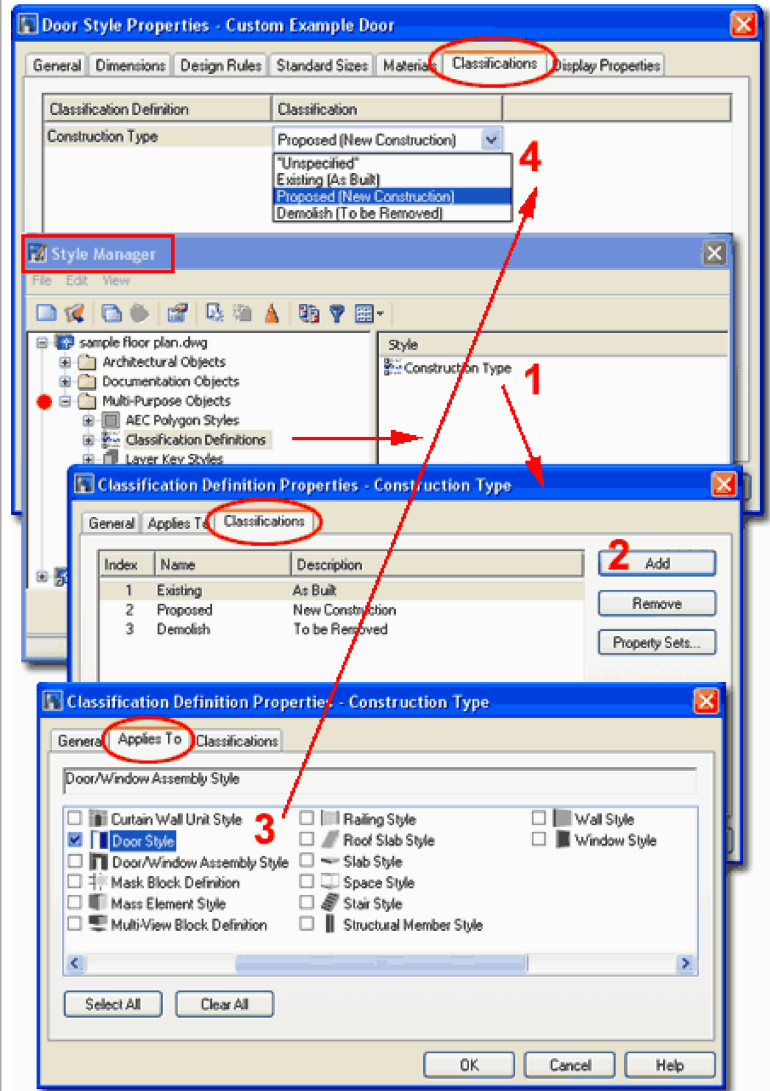
Object Classification as a Display Control

As stated above, the reason Object Style Classifications have been presented under the Display portion of this guide is that they can be used to control object display.   Illustrated to the right I show the

Display Manager Window where I have selected the **Plan Display Representation Set** in the left pane in order to access the **Display Options tab** in the right pane. On the Display Options tab, you should see the Classification Definitions you have created and for each Definition you should find that you can use the **Filter** cell to set the display to either **Show** or **Hide**.

The consequences of this option is that you could, for example, create a plan of a proposed remodel where all objects have been classified as either Existing, Proposed or Demolish and set to Show or Hide depending upon the Display Representation Set and Display Configuration used in the drawing. In other words, you can use this option to have a very fast solution for what we have been using Layer Filters for: Hide all objects to be Demolished, for example.
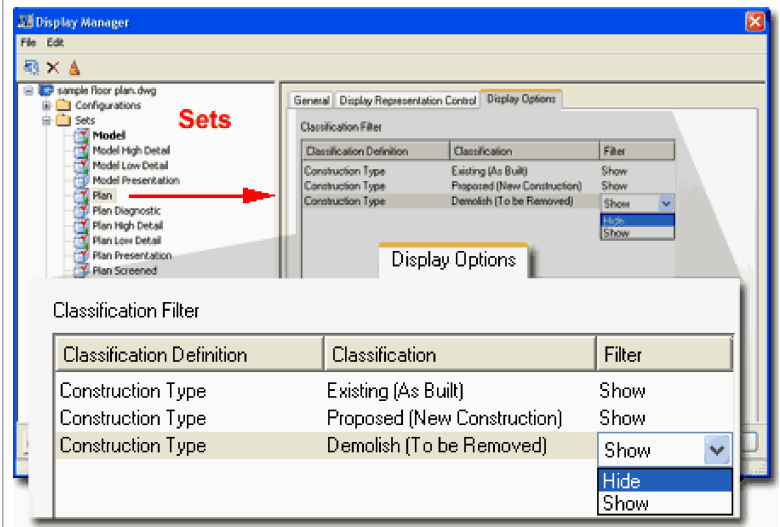
Okay, before you get too excited about this feature in ADT, keep in mind that none of this has been built in so you will have to do all of the work in your template file including classifying all of your objects and creating unique Display Representation Sets and Configurations that take advantage of the Show/Hide Filter for your new Classifications. I state this not to discourage you but only to warn you about the work involved. Also, to fully take advantage of this feature you will need a lot of redundant object styles because you cannot classify objects individually; i.e., a simple single hinged door will need to have three styles - one for each classification (now multiply that by all your objects).

Classification Definitions are not limited to the scenario I proposed here so you may find other opportunities to use them; especially as they apply to schedules rather than display.

Classification Definitions will be discussed further under Schedules and anywhere else they may affect your work.

Comment: Expand in the future

Something to think about:
Since Classifications are currently bound to Object Styles, you may want to create a generic set of object styles for work to be demolished. After putting together good as-builts, change objects to be demolished to these generic styles and thereby acquire not only the proper display characteristics but also the classification .

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8 **Object Style Display Properties Overview**

Accessing Object Display Controls

Menu   **Format> Style Manager...**

            Format> Display Manager...

Keyboard **AecStyleManager**

Mouse   Select Object, right-click, select **Edit Object Display...**

Links   Openings - for more information on Doors

One of the more difficult concepts to master in ADT has to do with how objects change their appearance when viewed from various directions and at various levels of detail. One of the best ways to begin the process of mastering this topic is to start with one simple object and break the display system down step by step.

If you recall from an earlier discussion about Display Management, you will remember that eventually you get down to the display of individual object families under the **Representations by Object** folder in the **Display Manager Window** (Illustrated upper right). This is where you will find all of the Display Representations that control how object families appear from different views and at different levels of detail; most objects, for example, have a Plan Display Representation for how they will look in Plan View. Since architects often desire more or less detail in Plan Views, many objects have Display Representations for such needs and you can even create your own Plan Display Representations. Because ADT uses 3D objects, most have Display Representations for Model, Elevation and so forth where their appearance may be quite different than in other Display Representations.

Illustrated to the right I show three different ways that a you can access the Display Representations for one particular object family; a Door. The steps are the same for most other ADT objects.

1) If you open the **Display Manager Window**, you can access the Display Representations for various object families under the **Representation by Object folder**.

2) If you open the **Style Manager Window**, you can access the primary object families under the **Architectural Objects** folder where you can Edit a single Object Style to gain access to the Display Properties. These object style Display Properties, found on the Display Properties tab of the Object Style Properties dialog are the very same Display Representations found within the Display Manager Window.

3) The last way that you can access the Display Representations for objects in ADT is to work with one or more objects that reside in your drawing file. Illustrated to the right I show the object-specific pop-up menu for a single door object and the two options that will take you directly to the Display Representations for that Object Style: **Edit Object Display...** and **Edit *[Object Name]* Style...** (in this example the [Object Name] is Door.

MANY PATHS TO THE SAME CONTROLS

DISPLAY MANAGER - MASTER CONTROL

OBJECT STYLE PROPERTIES

STYLE MANAGER
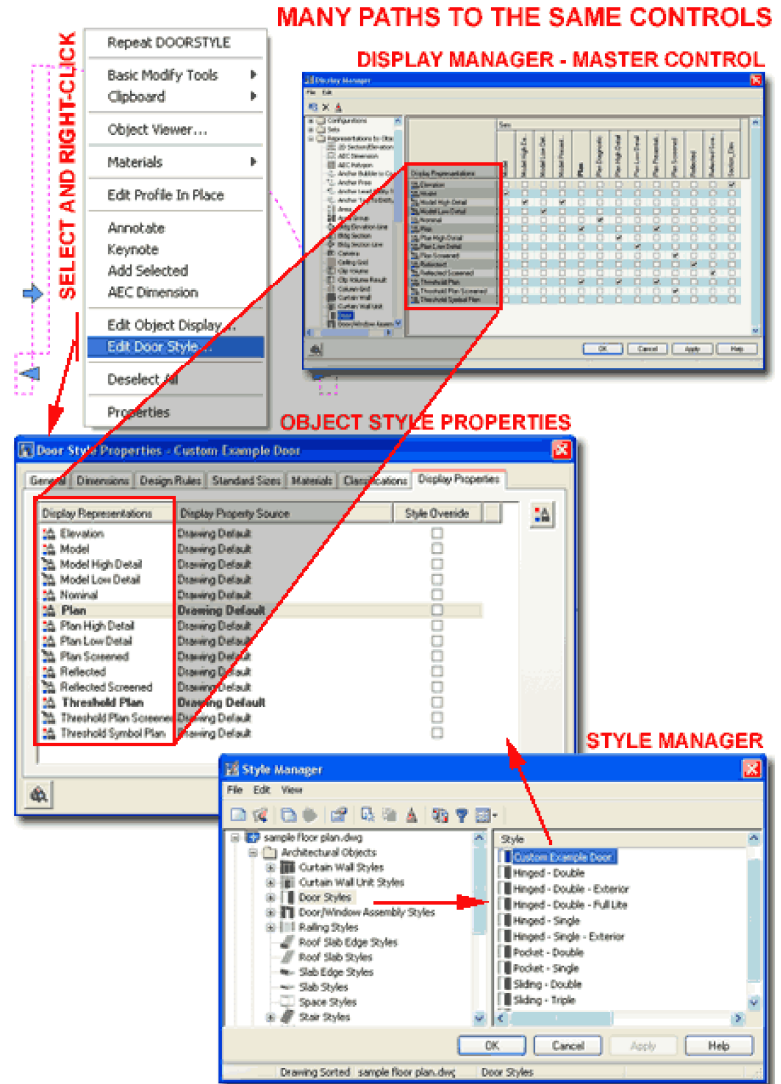
The path you choose to get to the Display Representations is not as important as how you work with those Display Representation Settings. If you decide, for example, that you want that custom exterior door with thresholds in Plan View you will need to use a Display Representation Override. Since the Display Manager handles the default settings for all objects and not the individual Styles, you cannot use this tool to set Overrides; instead, you will need to use the other two paths discussed above (2 or 3). And, once you have placed a Display Representation Override on an individual object or object style, it will no longer be controlled by the default settings as governed by the Display Manager (hence the term "override").

Object Display Representations and their Display Properties

Once you have isolated an **Object Family** under the
Representation by Object folder in the **Display Manager
Window**, you should find a list of **Display Representations**. Each
Display Representation has its own **Display Properties** that always
include a list of **Display Components**. Therefore, for each Display
Representation you can adjust the Display Components to produce
different results as they relate to the following properties: **On**, **Off**,
By Material, **Layer**, **Color**, **Linetype**, **Lineweight**, **Lt Scale** and
Plot Style.

Usually the Display Properties dialog will also offer Other options
and settings on tabs labeled Hatching, Cut Plane, Other and so on.

You can access the Display Representations for Object Families
through the Display Manager Window as illustrated to the right or
through individual Object Styles, also illustrated to the right. As
long as there are no Style Overrides for the Display Properties of an
Object Style, the settings found via the Style Manager Window will
be the same as those found through the Object Style Properties.
However, Object Styles often have Style Overrides on the Display
Properties because that is how they differ in your drawings; e.g. this
is often how an Exterior Door Style shows a Threshold while an
Interior Door Style does not - without an override both would have to
show a threshold or neither would show one since there is only one
Plan Display Representation to share.
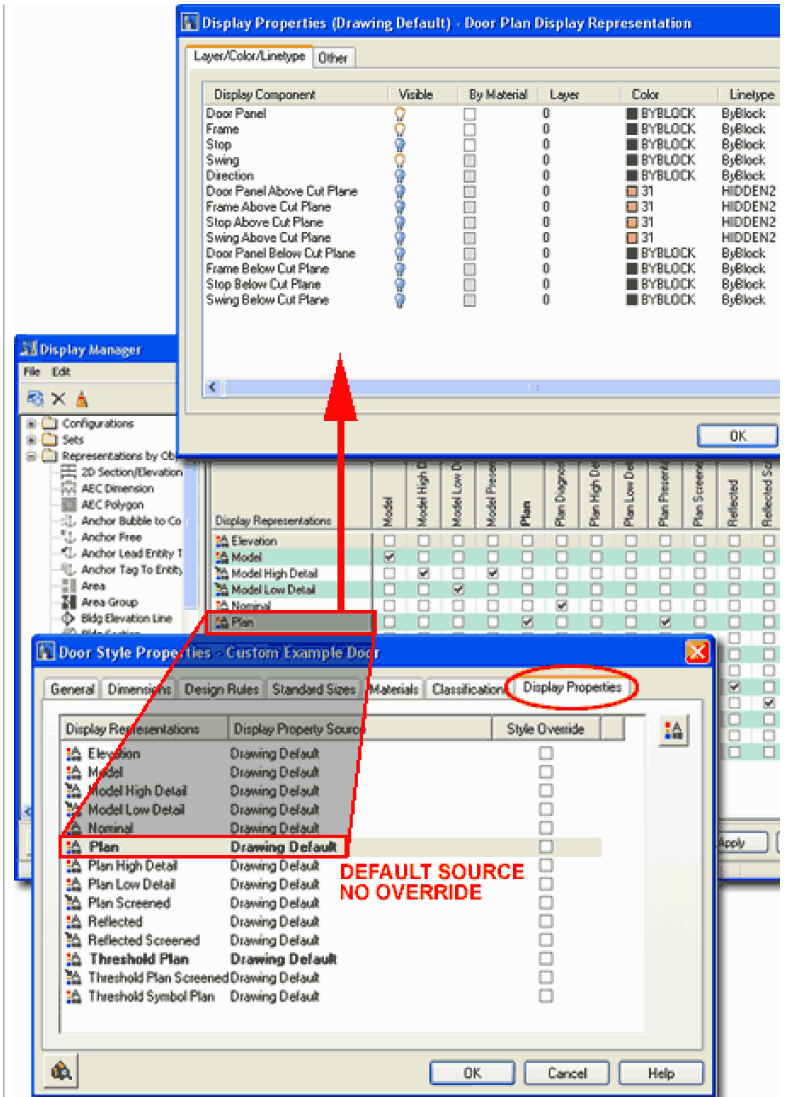
Tracing Object Display Properties back to the Display Configurations

Illustrated to the right I show a road map of the relationship between one Object Family's Plan Display Representation, the Display Representation Sets that use it and the Display Configurations that use the Sets so you can toggle this information by a simple pick on you screen.

Starting from the example object, a Door, it has a predefined **Display** Representation called "**Plan**" that you cannot rename or delete. This "Plan" Display Representation is used in the **Display Representation Set** called "**Plan**" - yes, they created a set that uses the exact same name as a Display Representation just to confuse you. Think of this as the Plan Set to keep it clear. The Plan Display Representation Set includes other the Plan Display Representations for other objects; hence the term Set. The Plan Display Representation Set is used by at least one **Display Configuration**; I show one called "**Medium Detail**" and another one called "**Standard**". For both of these Display Configurations, the Plan Display Representation Set has been assigned to the **Top View** so they appear when you view your drawing from the Top and not from the Bottom, Side or 3D.

"PLAN" IS USED, BY DEFAULT, TO DESCRIBE TWO DIFFERENT FUNCTIONS: A DISPLAY REPRESENTATION AND A SET

Tracing Object Display Property Overrides back to the Display Configurations

Object Style Display Overrides offer you the opportunity to change the way objects appear within a family for the same Display

Representation; like "Plan". One example of where this is particularly useful is with Interior and Exterior Doors as stated above; for thresholds. Another example of where this is rather useful is with Walls that need to appear different with respect to Color, Material, Lineweight and/or Linetype.
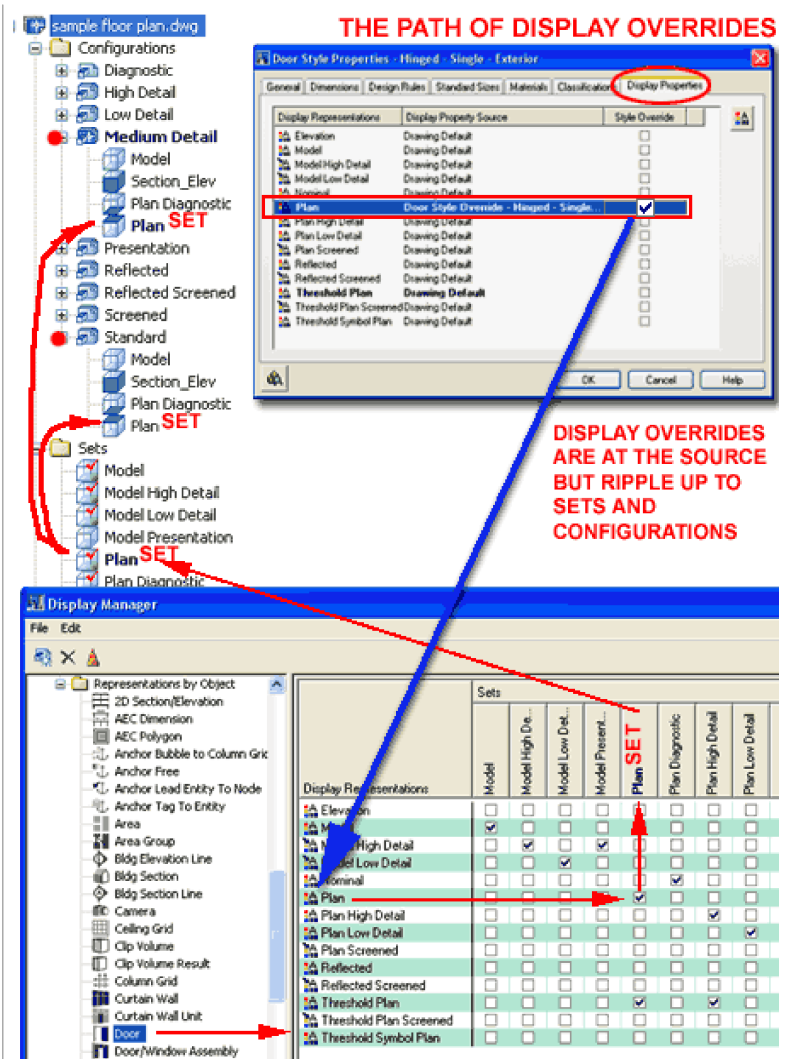
Since Objects like Doors and Walls belong to Object Families and each Family can only use one Display Representation at at time (multiples can be turned on but that tends to create a mess), unique characteristics are created through overrides on the primary Family Display Representations.

Illustrated to the right I show the connections between an Object Display Override and the rest of the Display System. It is important to recognize what you are actually overriding so you don't get unexpected results. As illustrated by the blue arrow to the right, these overrides are always at the object level and never at the Display Representation Set or Configuration level since neither of these two categories actually work on the objects. In the case of the Door Style, for example, when you Override its Plan Display Representation you are overriding it at the object level found under the Representations by Object folder in the Display Manager (lower right).

Object Display Overrides, like the parent Representations, follow a linear path to one or more Display Representation Sets which in turn may be used within one or more Display Configurations. If you set an Override and don't see the results, make sure that your override is on a Display Representation that is actually used as part of a Display Representation Set within the current Display Configuration you may have set on your screen.

Overrides tend to have a negative connotation and that is actually for a good reason so you should do your best to fully understand the whole override process and the ramifications down the road in a project cycle. A good rule of thumb is to limit the use of overrides without limiting yourself. The reason overrides can be a problem is that they isolate object styles or even single objects from a central point of control thus turning the task of making broad changes into very time consuming jobs. Suppose, for example, that I create several Door Styles and override each one so the Door Panel Component has a unique color in Plan View. Later, on the same project, imagine that I now need to screen back all of the Door Styles so they simply appear as a light background. Since each Door Style has overrides for the Plan Display Representation, they can now only be changed on a style-by-style basis.

Object Display Property Overrides - Object and Style Based

THE PATH OF DISPLAY OVERRIDES

DISPLAY OVERRIDES ARE AT THE SOURCE BUT RIPPLE UP TO SETS AND CONFIGURATIONS

Object Style Display Overrides offer solutions for altering the way objects within a single Family appear but sometimes you may find that you want to alter how one object within a Style appears. To continue the Interior and Exterior Door analogy from above, suppose you now have thresholds on the Exterior Doors via a Door Style Display Representation Override for "Plan" but discover that there is one Exterior door that needs one of the threshold lines removed. For cases like this, or in cases where a Door needs to have a different angle in plan view, you can use a Display Override at the individual object level.

In the illustration to the right I show how you can access the Display Properties of objects via the object specific pop-up menu. When you select one or more objects of the same Style within the same object family, you can use the **Edit [Object Name] Style...** menu option on the object specific pop-up menu to access the Display Properties for the Style. When you **select one** (only one) **object**, you can use the **Edit Object Display...** menu option on the object specific pop-up menu to change the current Display Representation or Attach an Override for just this one object.

When you use the Edit Object Display... object-specific pop-up menu option, you will access the Object Display dialog box as illustrated to the right (middle). The Display Properties tab on the Object Display dialog will appear identical to the tab of the same name on the Object Style Properties dialog (see comparison, right). If you look at the Display Property Source column and the name preceding Override for the Override column (Object vs. Style), you will quickly see that there is a difference. If you attach or activate an Override on the Display Properties tab on the Object Display dialog, you are setting changes for that single object alone.

Objects with this level of Display Overrides cannot be controlled from a central point so be careful how far you take this option. By now it should be clear that you have two levels of Object Style Display Representation Overrides: one that overrides the default object style display representation called a " **Style Override**" and one that overrides both the default and any Style Overrides that might already have been applied, called an "**Object Override**".
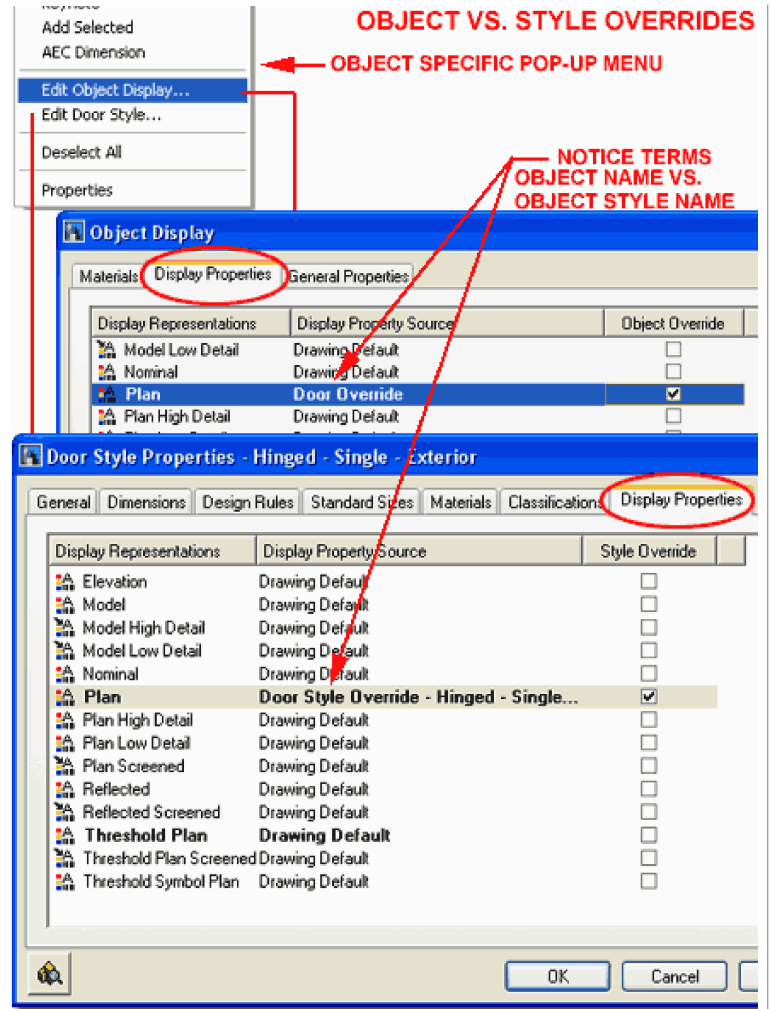
9 Display Properties Dialog

Different Display Properties for different Display Representations

For each unique **Display Representation of an Object** , you are

likely to find unique **Display Properties** as they apply to that Representation. For those Display Representations that are merely copies or pointers to a parent Display Representation (like **Model High Detail** and **Model Low Detail**), the Display Properties will be the same as those for the Parent (Model).

The Display Properties available for each Display Representation are designed to provide options for Component Properties that apply to how that Display Representation is expected to be used. In the case of a Model Display Representation, for example, the number of Display Components might actually be less than the number of Display Components found for a Plan Display Representation. More Components do not necessarily mean more parts but may just mean more specific separations in those parts to allow for more sophisticated control over the presentation of the object.

In the illustration to the right I show the **Model** and **Plan Display Representation Properties** for a simple **Single Hinged Door** . As you can see, the Plan Display Representation Properties outnumber the Model Display Representation Properties by almost three-fold. Architects tend to have more display requirements for how a Door Object might look in Plans than in 3D Presentation drawings so that is why the list is greater for Plan than Model.

Notice that the Display Properties dialog boxes offer different tabs for different Display Representations as well. In the Door example, right, the Model Display Representation offers a Muntins tab for glazed inserts. This tab is not available for the Plan Display Representation because muntins are not presented in Plan. You could easily argue that mutins should be shown in a Plan view of a highly detailed Door but if you expected to achieve this with ADT, you currently would not be able to do this very easily (it could, of course be done with the attachment of a Block or other work-around solutions).
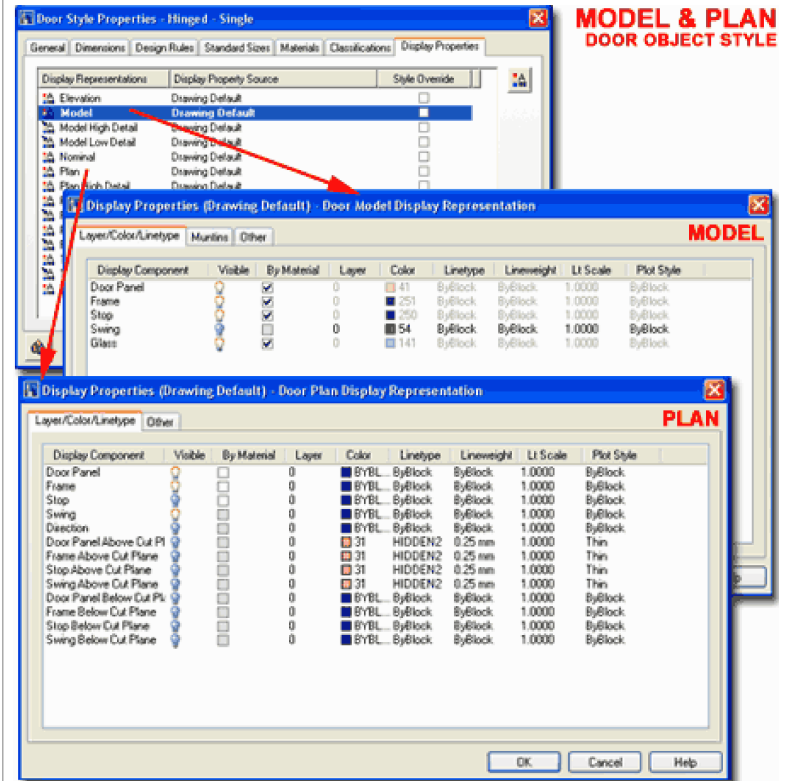
Layer/Color/Linetype tab

When you examine the **Display Components** on the **Layer/ Color/ Linetype tab** of the **Display Representation Properties dialog box**, you should find some familiar terms like "Layer", "Color" and "Linetype". This breakdown of linework within an object is very similar to how AutoCAD users have used Layers inside Blocks for many many years. Generally, the number of Display Components is fixed but if you add your own Blocks via the "Other" tab, you can actually introduce new Display Components.

Visible - this is just like turning a Layer On or Off.

By Material - this option defers the remaining properties over to a Material Definition as set by the Material tab of an Object Style Properties dialog. Gray boxes cannot use Materials and tend to be things that do not display in 3D or are just lines instead of 3D objects.

Layer - this option allows you to assign a reference layer to a Display Component but it is not an insertion layer so don't confuse this with the idea that the component will actually reside on another layer. When objects are inserted, they are keyed to one layer just like Blocks but you can use this option to emulate component layers. This means that you can control almost everything about the component via a layer but if you Freeze the object's insertion layer, the component will disappear as well - see discussion below for more.

Color, Linetype and **Lineweight** - these options can be set to specific values, ByBlock or ByLayer. Using the ByBlock setting offers users the greatest flexibility for changing these properties at a later date. This is what allows you to change an object's Color, Linetype or Lineweight in a drawing without having to work with the Display Component Properties. If you set a Color, for example, this becomes a static or fixed property that can only be changed
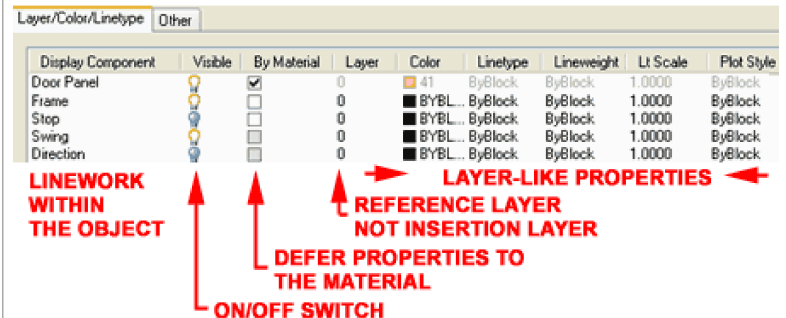
here.

Lt Scale - this option is only significant if the display components use linetypes. In AutoCAD and ADT, there are two primary linetype scale settings that also have an impact on this setting: Ltscale and PsLtscale.   If you change this value to other than "1" then whatever the Ltscale value is, you will get a product of the two; e.g., setting this to .5 and having your Ltscale set to .25 will produce a linetype that is 1/2 of what it looks like at .25 - which would be like setting it to .125.

Plot Style - see comments for Color, Linetype and Lineweight. ByBlock is usually the best setting here.

Display Properties - Deferring Properties to a Layer

At times you may find that you want to change the default Display Component Properties to work in a way that is either more flexible for you or just produces different results. One technique for externalizing the Display Component Properties is to set a component's Layer assignment to a physical layer and then deferring the remaining properties to "ByLayer". The end results of this effort is that you will be able to control the internal Display Component Properties through the Layer Manager.

Illustrated to the right I show that I created a layer named "A-Door-Swng" before going to the Component Display Properties. For the Layer Property of the Swing Display Component (for a Door Object), I set the new Layer. For Color, Linetyp and Lineweight, I set the property values to "ByLayer" which will then allow me to change any of these properties on the Layer Manager dialog under the "A-Door-Swing" Layer. For the last two properties, I kept them as Static or Fixed settings just to demonstrate that combinations are possible.

EXAMPLE OF DEFERING COMPONENT DISPLAY CONTROL TO A LAYER

REFERENCE LAYER CREATED EARLIER

PROPERTIES SET TO "BYLAYER"

FIXED SETTINGS

SWING COMPONENT IS NOW CONTROLLED BY THE A-DOOR-SWNG LAYER

For more in-depth information on Object Style Properties, see the specific Object(s) you are working with.

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10 Customizing and Tricks

10-1 AEC SETUP - DISPLAY

Creating a Model Display Configuration for All View Directions

You may have noticed that the 3D Model Display Representations of all objects tend to appear only when you view your drawings from Isometric or other 3D Views. At times I have found that for various reasons, including resolving weird problems with objects, that I need to see all of the objects in Model from the Top or from other direct views like Front. Since none of the example ADT Template files come with a Display Configuration that provides this option, you can quickly create your own.
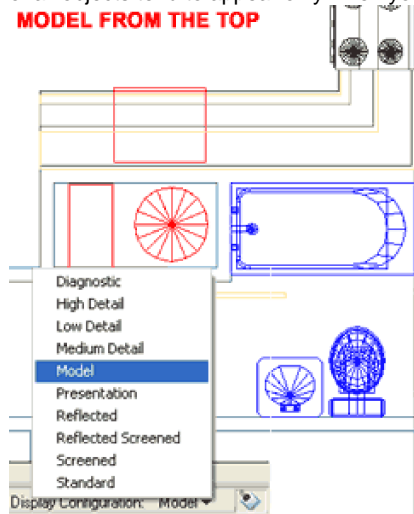
MODEL FROM THE TOP

On the **Display Manager Window**, **high-light the Display Configuration** that you would like to make a Copy of, **right-click on your mouse** and select the **New** option on the pop-up menu. When you have your copied Display Configuration, **Rename** it to something like "**Model**" and change all of the **Display** Representations for the **View Directions** to "**Model**". That's it, you will now have a new Display Configuration to select and it will always show your objects in 3D form.

Note:
You can also use other Display Representations like Model High Detail or mix them up for different View Directions.

If you are in a hurry, you can also just set the Override View Direction and have the Default set to "Model".

Illustrated to the left I show what a Plan or Top View of a floor plan might look like with this new Model Display Configuration. Because it displays everything in 3D, you can use it to check for linework that might otherwise be hidden by such settings as Cut Planes and so forth.

HIGHLIGHT CONFIGURATION TO COPY, RIGHT-CLICK AND USE THE NEW OPTION TO CREATE A COPY
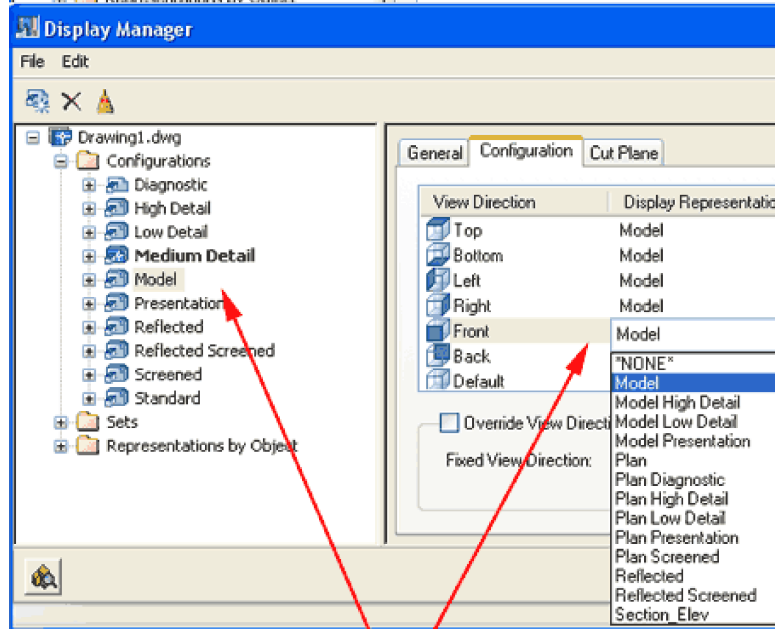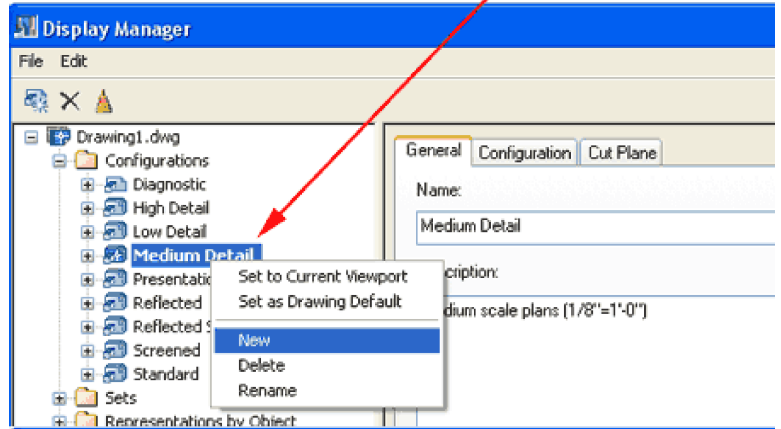
RENAME NEW CONFIGURATION TO "MODEL"

SET ALL VIEW DIRECTIONS TO YOUR CHOICE OF THE MODEL DISPLAY REP'S.