Contents:

1 Sections - Access

.1-15 SECTIONS

Sections Toolbar
How do I get this toolbar?
You can also acquire access to these commands from the Alternate **Document** pull-down menu. From the **Document** pull-down menu, pick **Sections and Elevations >** and cascade to their respective command options - see image below, right.
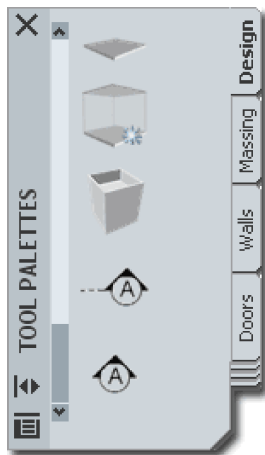
Live Sections Toolbar
You can also acquire access to these commands from the **Desktop** pull-down menu. From the **Desktop** pull-down menu, pick **Live Section Display >** and cascade to their respective command options - see image two below, right.

Sections pull-down menu and Tool Palette

In ADT Elevations and **Sections** are broken up into two separate tasks though they are basically identical objects using nearly all of the same tools. This means that you can actually use the Elevation Line Object to create Sections and the Section Line Object to create Elevations. It's a bit silly, isn't it and we should really just think of this type of work as creating Projections because you can use either object to do Interior Elevations as well. In fact, you can also use the Documentation Symbols to produce the same results.
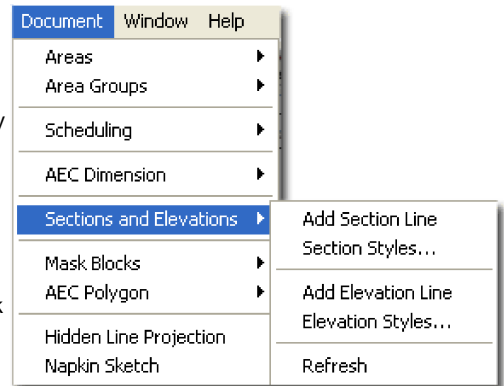
When you get ready to use the **Elevation** or Section Line **Objects**, think about what you want as the product of this "projection" and where you want it. For example, on a single story residential building you might have all of the information you want in one file but do you want the Elevations or Sections in the same file? On a larger commercial project, as another example, you will have all of the floors in separate files so in order to generate an Elevation or Section, you will need to create a composite file.

For both scenarios described above, I typically Xref everything I want for my Elevations and Sections into a Composite File where I add the Elevation and Section Line Objects and Generate the work need. Once this work has been Generated, I use Layout Tabs to set up the Sheets.

Most designers are familiar with the concept of a 2D Elevation or Section so that part of this process is relatively self-explanatory but ADT offers a new twist on this concept: 3D Elevations and Sections.

For Elevations, I prefer to use the 2D option because I typically break the live-link to the model at some point in order to finish off the work with linework that I just don't bother to add in Models. The 3D Elevation Object is basically a copy of the Model with Subdivision Controls for Color/Lineweights.

Sections - Overview Discussion

When you get ready to use the **Generate Sections** (not Live Sections) dialog box, you will have 2 choices for how you want to take the next step.

XREF'S

1 FLOOR AT A TIME
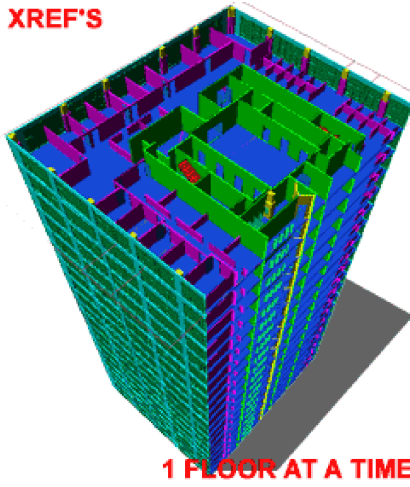
Unfortunately, Sections are not as easy to generate as Elevations. For quick on-the-fly Elevations, you can simply use the various View buttons but there are no default views that Slice through buildings. If you are determined to find a fast solution, try using the 3D Orbit Clipping Plane (I don't like it much for a Section substitute but it's fast and it gets you into a building space) or use Xref Clipping (Xclip).

Once you are ready to create a real Section, there are 3 types to choose from: **3D Sections**, **2D Sections** and **Live Sections**. In the early Pre-design and Development phase of a project you may want to use the 3D Section or Live Section because of the presentation opportunities but for the traditional 2D Linework Construction Document Sections, you will need to use the 2D Sections much like their equivalent for Elevations.

3D Sections, like their Elevation counterparts, were arguable more useful in previous releases of ADT but now that the Live Section works on Xref'd files, this option provides the most impressive presentation offerings.

The final step might likely be that your Sections are 2-Dimensional non-associated Lines, Plines, Hatches, Text and so forth - the way Sections have been done in AutoCAD for about 20 years now. You may be one of few fortunate people who won't end up at this stage but will actually be able to keep your Sections linked to your model all the way through construction and even into archiving.

The first choice allows you to create a Section that is still 3-Dimensional but with the power to control lineweights relative to depth of field. The second choice allows you to create a 2-Dimensional Section with lineweight control.

Single Building Model vs. Composite Building Model

Assembling a body of work in order to create a Section is another subject that can be discussed and debated greatly. There does seem to be a majority vote on the **Xref** approach rather than attempting to build one model in one file that solves all documentation needs. ADT's **Project Browser** emphasizes this approach and finally advocates the concept that buildings are made of pieces brought together rather than a whole broken apart. Though I believe one individual could probably make the one-model-does-all scenario work rather well, I would never advocate such a solution. Even on a small project, like a one-room remodel, I rely on Xref's.

By separating as much as possible into unique files, you not only provide others with the opportunity to work on a project simultaneously, but you provide yourself with another form of Layering. Though I completely comprehend the idea that if more is in one file, you can more easily edit it, I have found that I am actually more likely to lose information in the clutter. Instead, I simply run many files open at the same time and refer back and forth when necessary or rely on Edit-in-Place functionality.

By the time you are ready to Generate Sections, you should also have one or more Composite files ready since most of your working drawings probably have everything else Xref'd in. I usually create a Model file where I Xref everything in and add other things that I want for Perspectives, Renderings, Sections and/or Elevations; like 3D topographic contour work, street and curb information, adjacent and background information and decorative elements such as cars, trees and people.

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2 **Adding Section Lines**

.2-15 SECTIONS

Adding Section Line Objects

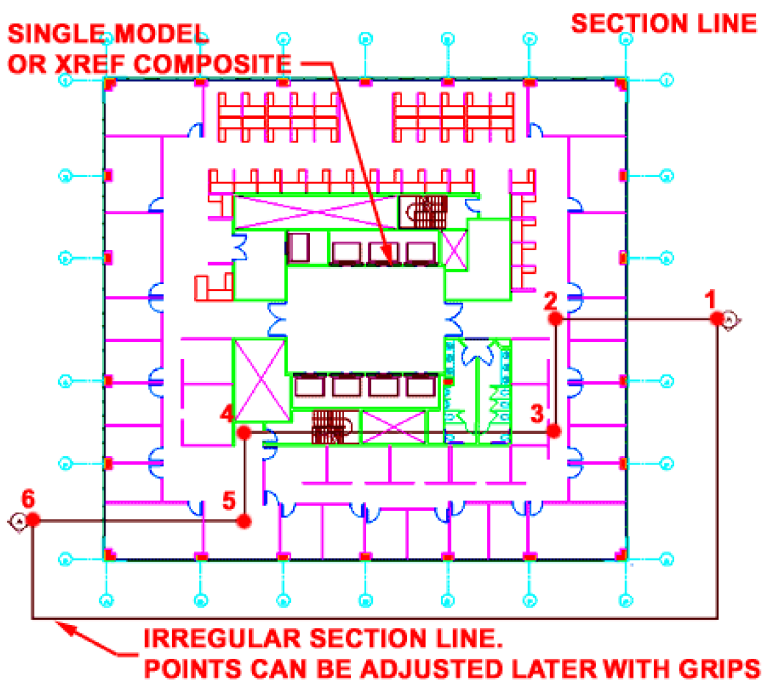|	
Palette	**Design**
Alt. Menu	**Document> Sections and Elevations> Add Section Line**
	[Sections toolbar]
Keyboard	**BldgSectionLineAdd**

Links   [Section Line - Display Props](#) - if you don't see a Section Line object as illustrated to the right in blue.

[Section Bubble Letter](#) - for how to change the letter/number

[Interior Elevations](#) - for how to use the Elevation Mark as a Section tool.

[Section Marks](#) - for how to use the Section Mark from the Documentation folders as a better annotation object

Adding a **Section Line** is a far easier task than figuring out how to put a project together to take advantage of this tool. It's also based on all of the same principals used to create an Elevation.

Illustrated to the right, I show the plan view of a highrise with the six two points that were used to create an irregular **Section Line** (see red numbered dots). Once you have finished picking two or more points to establish where you want your section line to cut through, hit the <Enter> key to establish the Length of the bounding box. Whatever values you set at this stage can always be changed later so it is not required that you be exact about these points.

The **Section Bubble** is more of a tracking tool for you than for proper annotation; though you can certainly use it as a proper annotation symbol. There are better Section Marks in ADT that you can access from the **Annotation tab** of the **Tool Palette** or go to the Elevation Marks folder under the Documentation folder in the Design Center (type "**_AecDcSetImpSectionMarks**" or "**_AecDcSetMetSectionMarks**" for Metric).

For multiple Sections, you can draw a Section Line for each side or **Copy** one **Section Line** object, **Rotate** it and position it as you like.

SINGLE MODEL OR XREF COMPOSITE

SECTION LINE

IRREGULAR SECTION LINE. POINTS CAN BE ADJUSTED LATER WITH GRIPS

3 Modifying Section Lines

Section Line Properties - Dimensions tab

Menu	**N.A.**

Sections

Keyboard	**BldgSectionLineProps**
Mouse	**Double Pick on Frame - Properties** Palette
Links	

On the **Properties Palette** for the **Elevation Line Object**, illustrated to the right, you will find an assortment of options that control the proportions and segments.
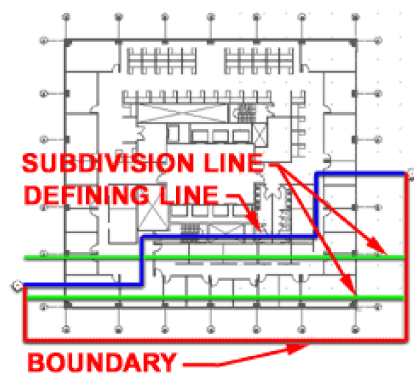
Dimensions
Use Model Extents for Height - this drop-down list has a **Yes** or **No** option and applies to the overall size, in 3D Space, of the object selected when using this Elevation Line Object as a tool. In most cases you will probably want to Use Model Extents (Yes), but for Interior Elevations you would not want to this option on.

Subdivisions - when you pick on this cell, you will activate the Subdivisions dialog box where you can Add, Edit or Remove Subdivisions Lines. Subdivisions are measured from the Elevation Defining Line in and represent sectional divisions where you want the lineweight/color to vary. In other words, adding a Subdivision half way along your Elevation Boundary box will allow you to change the colors, linetypes and lineweight of all the lines/objects that lie beyond the subdivision line.

Lower Extension - (**Use Model Extents for Height** must be set to **No**) - an amount of space extended below the default ground plane for an Section Line. The default will capture information that lies 12 inches (308 mm) below the World Coordinate System or Ground Plane. Illustrated to the right, this option is used to capture the slab below the finished floor in a high-rise building.

Component Dimensions
A Side 1 - use this value field to specify the length of the boundary from the 1st point used to create the Section Line Object. Grips can be used to modify this value as well.

B Side 2 - similar to A Side 1.
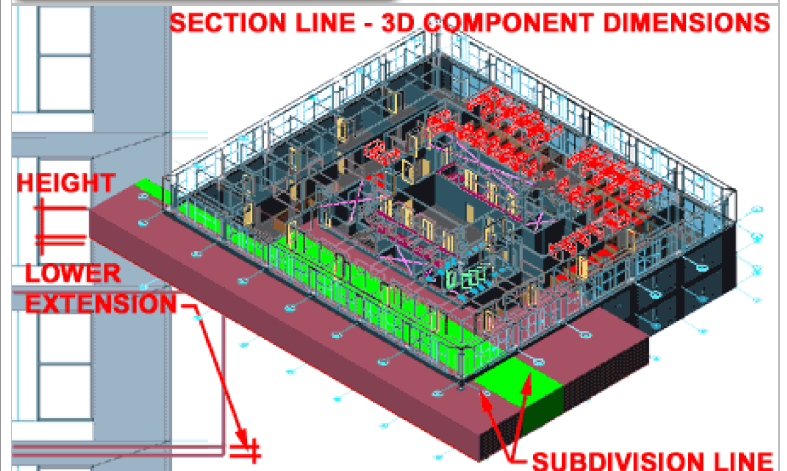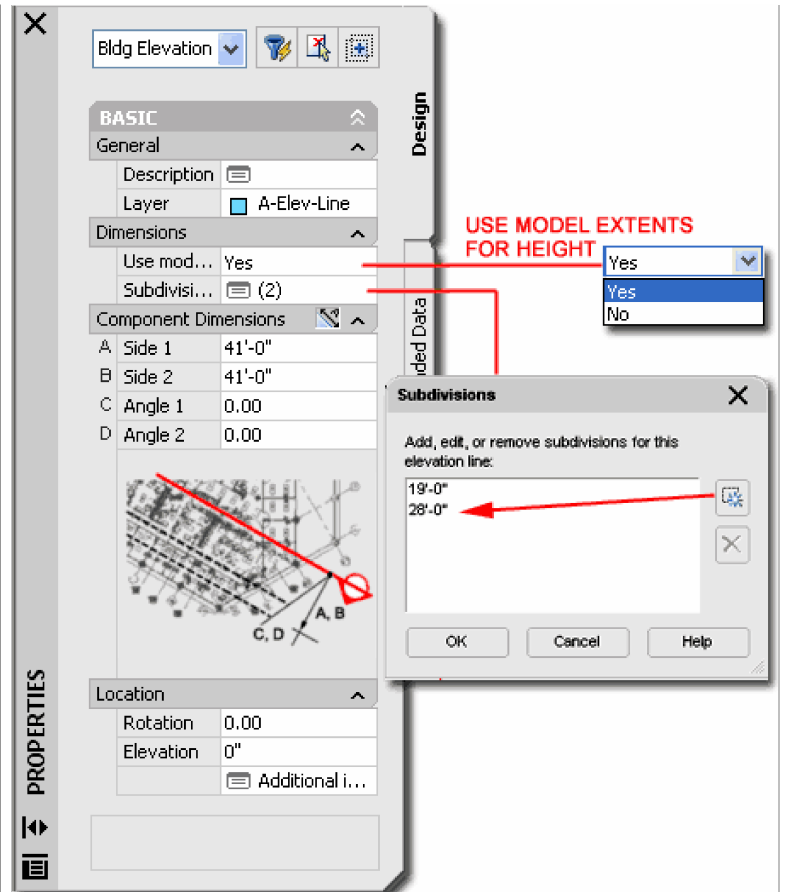
C Angle 1 - use this value field to specify the taper angle of the boundary from the 1st point used to create the Section Line Object. Grips can be used to modify this value as well. Negative Angles are allowed. This can be useful when trying to clip objects in or out of a Section that are not parallel or perpendicular to the Section Line Object.

D Angle 2 - similar to C Angle 1.

Location
Rotation - based on the global angle similar to all objects.

Elevation - if **Use Model Extents for Height** is set to **No**, this can be used to move the Section Line Object up or down relative to the Model and can thus be used to control the bottom of the section projection; e.g., for a portion of a multi-story building, like a single floor of a high-rise.

Modifying a Section Line with Grips

When you **Select** an **Section Line Object**, you should see several **Grip** points activate that you can use to edit with. These Grip points correspond to the values that you set on the Properties Palette for an Section Line Object.

Grip Stretching Subdivision Lines is as easy as it gets because you only have one Grip to work with. Grip Stretching any of the four corners of a Section Line Object may pose more of a problem. Since the Section Line Object supports irregular shaped tetragons, you can stretch any corner uniquely. If you don't want an irregular shape, simply use the **Shift key** while making your Grip spots HOT. This will allow you to work with two Grips at the same time and thus you can Grip Stretch one side evenly to exclude or include more of your project.

GRIP STRETCHING

SUBDIVISION LINES

USE SHIFT KEY TO MAKE MULTIPLE GRIPS HOT
FOR STRETCHTING FRONT AND BACK LINES

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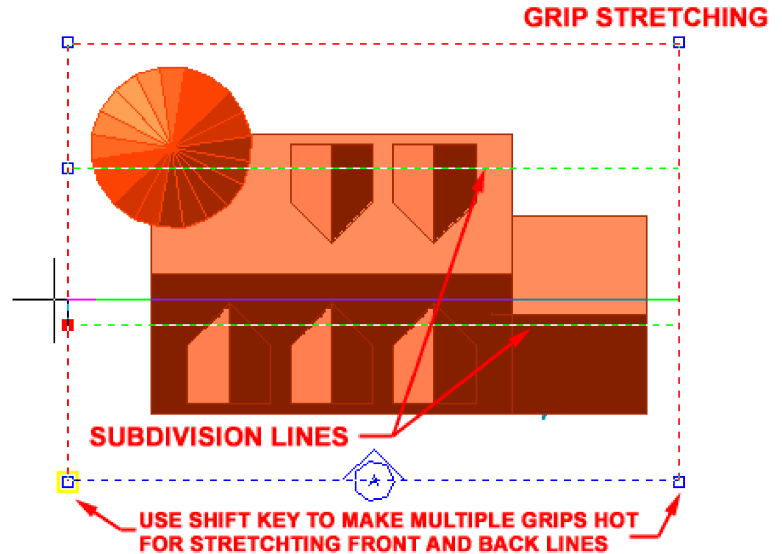
4 Section Line - Display Props

Object Display... -   Section Line
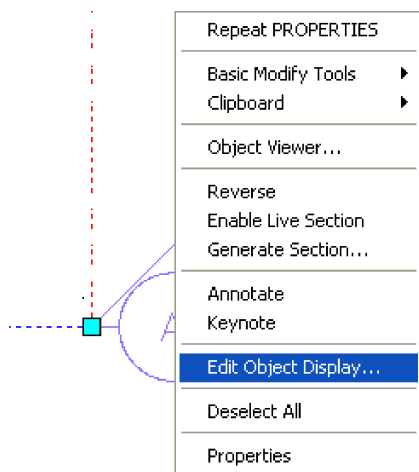
The Section Line object in ADT does not have a Style but you can use **Edit Object Display...** to access its display controls. On the **Object Specific pop-up menu**, illustrated left, select Edit Object Display... On the Object Display dialog box choose a Display Representation, like **Plan** and double pick on it or pick the **Edit Display Props...** button.

The only Display Props you can edit for a Section Line Object are on the **Layer / Color / Linetype** tab. On this tab you should find three **Components**: **Defining Line**, **Subdivision Lines** and **Boundary**.
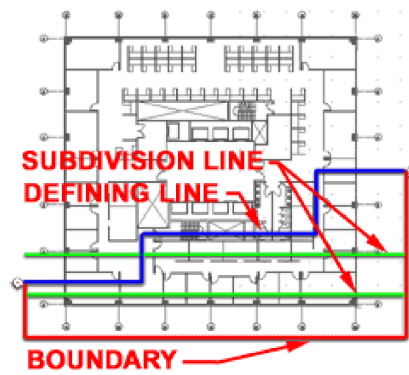
Tip:
If you color code these components, they are a lot easier to read when looking at them on your screen - see discussion below for how.

Entity Properties - Section Line - Component Layers
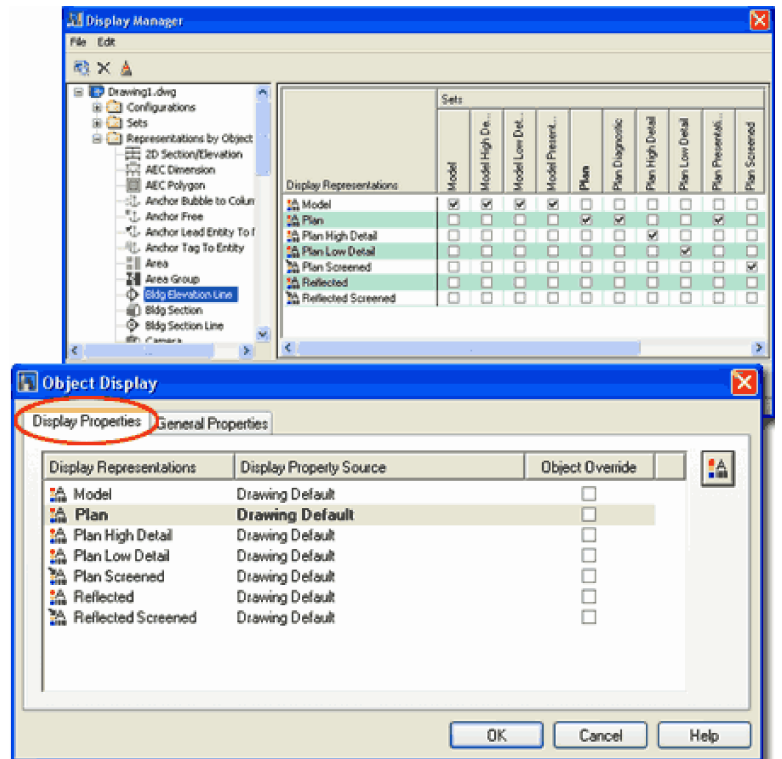
From the **Display Props** tab, in **Plan** view or other **Representation Sets**, you can use the **Edit Display Props...** button to access the component's **Layer/ Color/ Linetype tab.**


Notice on the Section Line's **Display Properties** dialog box, right, that you have three components that you can work with: **Defining Line** , **Subdivision Line** s and **Boundary**.

The **Defining Line** represents the side, direction and Width of the Section you intend to create.

The **Subdivision Lines** are internal Lines that you can set under the Dimensions category on the **Properties Palette**. These Lines can be used to control Color and Lineweight changes within the Section you generate with this Section Line. Typically, you will use this technique to imitate the way we have traditionally shown lines as lighter when farther back.

The **Boundary** represents the area that surrounds your building or project.
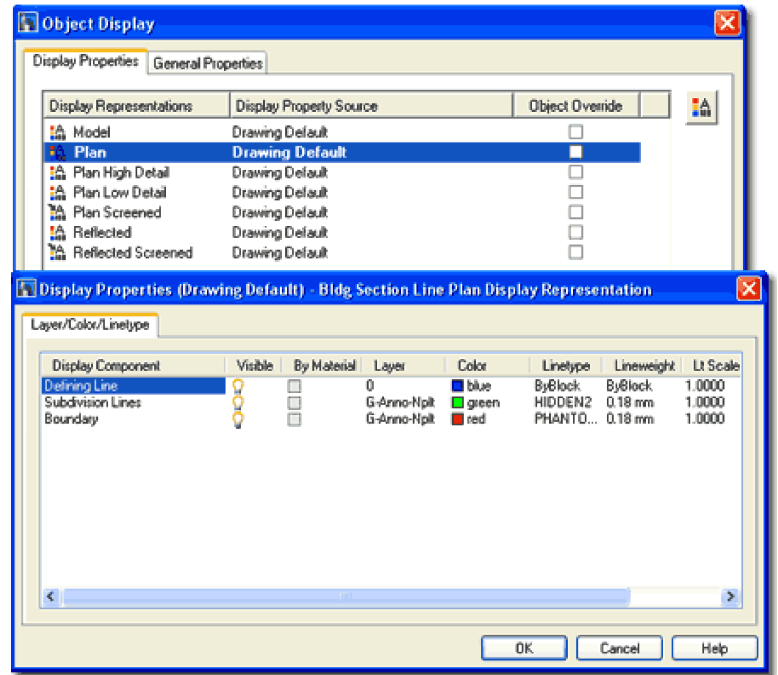
5 Creating Sections

Generate Section/Elevation dialogue box

Menu	**N.A.**
Keyboard	**BldgSectionLineGenerate**
Mouse	**Select Section Line Object, right-click, Select Generate Section...** on object specific pop-up menu
Links	

When you are ready to actually create a Section, you will use the **Generate Section/Elevation** dialog box, illustrated to the right, to define the type of Section you want; what you want in it, what it should be displayed like and where you want it placed. To Generate a Section, you can type " **BldgSectionLineGenerate** " or simply Select your Section Line Object, right-click to invoke the object specific pop-up menu illustrated to the left and select **Generate Section...**
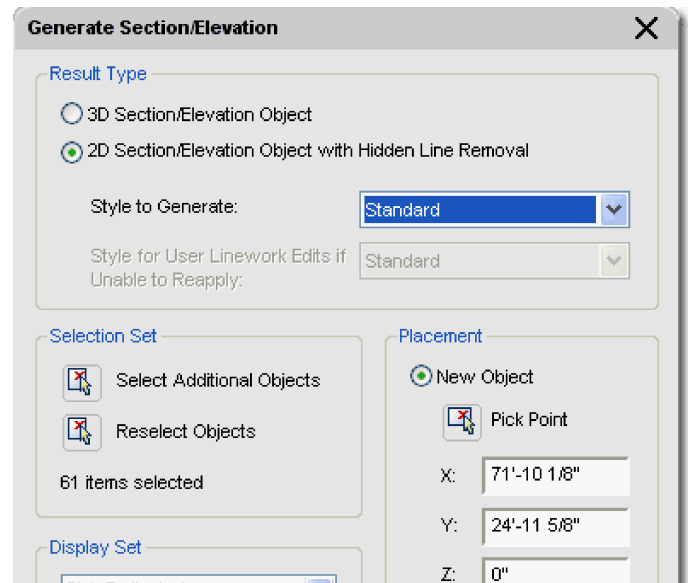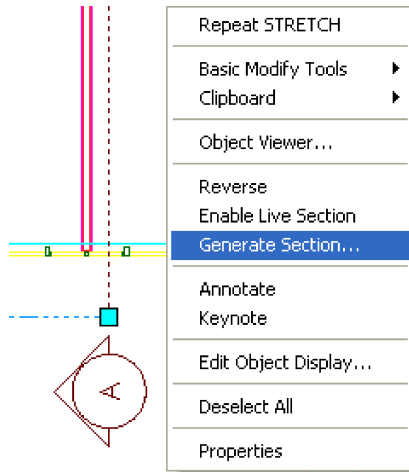
Both types are linked to the original drawing and thus can be updated to reflect your design changes at any given time. This will be discussed below.

Result Type
3D Section/Elevation Object - a copy of your drawing presented as a Section object where subdivisions and other Section Line settings are displayed. This is a weird option and may prove to be of little use when you can use the Live Section option instead - see example below and **Live Sections**.

2D Section/Elevation Object with Hidden Line Removal - a projection on to a plane of your drawing where subdivisions and other Section Line settings are displayed. You can think of this as being much like a block or Xref associated with the Section Line and your original drawing. If exploded two times, you will get 2D line work.

Style to Generate - the default "**Standard**" is all that you will find anywhere in ADT until you create your own. A custom Style will allow you to refine line colors and weights for objects within your 2D Section.
Style for User Linework Edits if Unable to Reapply - this option is only available when Updating a Section or Elevation that has had Linework Editing. You can use it to save the Editing to a new Style Name so the edits can be reapplied upon future update/refreshes.

Selection Set
Select Additional Objects - this button is active only after a Section Line has been associated with objects. It can be used to select more new objects to be associated. This may be useful when you want to create a set of Sections from the same Section Line where each one contains different or more information.

Select Objects (Reselect Objects) - this button changes once a Section Line has been associated with objects. This button allows you to reset what you want associated with your Section Line and thus, using the Shift key, you can also deselect objects.
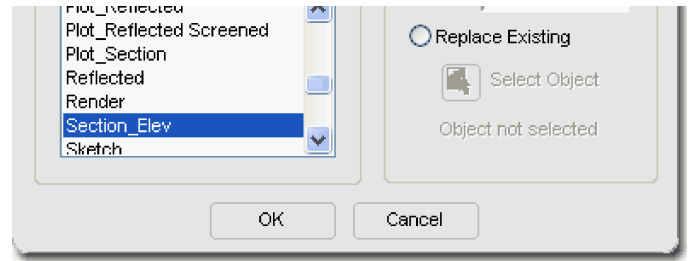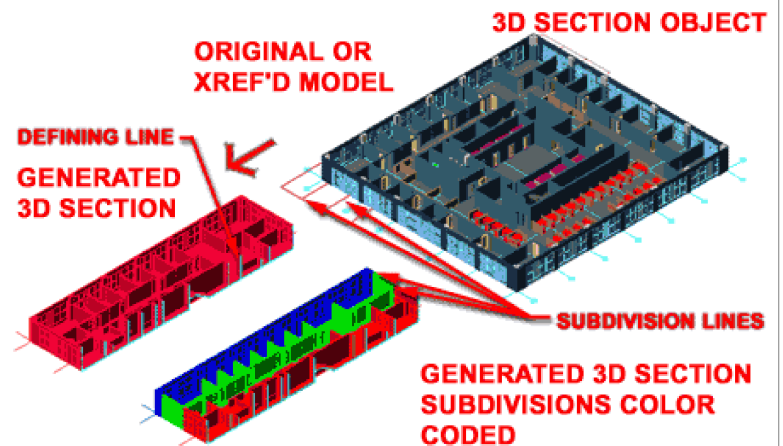
Display Set - this should be an obvious option for you at this stage of a project but if there's still some uncertainty, you should read up on Display Representation Sets . Basically this is just how you want objects to look in "Elevation View". One example is how Doors have the swing indicated by centerlines.

Placement
New Object - this radio button tells this dialog box that you want to create a new Section object. Leaving this radio button checked while trying to adjust an existing Section will result in duplicate Section objects right on top of each other, so be careful about this option. A good way to avoid making a mistake is to select the Section object itself, right-click, and then select the Refresh option on the object-specific pop-up menu.

Pick - this button with X, Y and Z corresponding values simply allows you to locate the lower left insertion point of your elevation object. Since you can move it at any time after creation, it isn't a big deal where you put it.

Replace Existing - this radio button should be used when you are in this dialog box without having used the Update route. In other words, if you simply used the Generate Section command or button to work on an existing Section object. By checking Replace Existing, you will be asked to Select Object. This object has to be the existing elevation object that you intend to modify or update. After doing this selection, you can then proceed to Reselect Objects, deselect objects or select Additional Objects. Once again, it's a lot easier to simply pick the Section object, right-click, and use the Refresh option.

3D Section Object Example

Links   3D Section - Display Props - for how to change the resultant colors

Display Properties - 3D Section - Component Layers - Example - for an example of how the lineweights can look on a print.

Illustrated to the right, I show the default **3D Section** object and how the same 3D Section object can be adjusted to reflect the **Color** changes (lineweights) for the Subdivision lines on the Section Line object.

To change the **Colors**, as illustrated, select the **3D Section** object, right-click and use Edit Object Display... as outlined below.

2D Section Object Example

Links   [2D Section/Elevation Styles - Display Props tab](#) - for how to change the resultant colors

[2D Section/Elevation Styles - Display Components - Relationship Map](#) - for an example of how the lineweights can look on a print.

Illustrated to the right, I show the default **2D Section** object and how the same 2D Section object can be adjusted to reflect the **Color** changes (lineweights) for the Subdivision line on the Section Line object.

To change the **Colors**, as illustrated, select the **2D Section** object, right-click and use [Edit Object Display...](#) as outlined below.
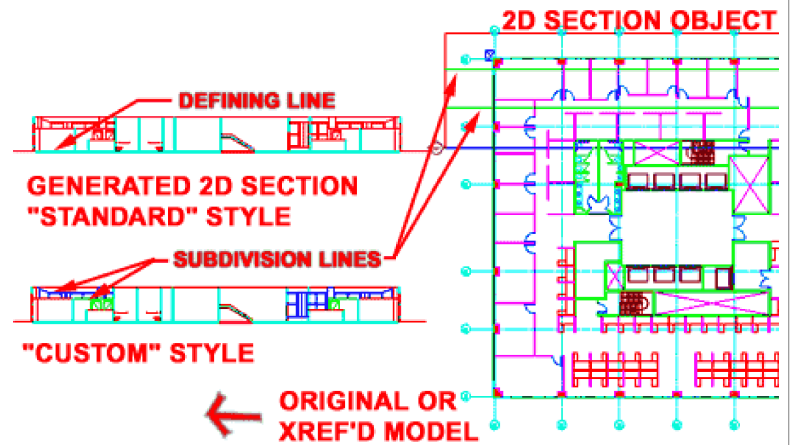
Comments on Display Representation Sets for Elevations and Sections

If you don't choose the right **Display Representation Set** when you generate an elevation or **Section**, the objects generated in the automatic elevation or Section may not come out right. For example, you might only see a single horizontal line in a Section view if you chose the PLAN Display Representation Set.

These Display Representation Sets tell ADT how to represent your Doors, Windows and other objects in an elevation or section as opposed to a plan view. A door, for example, will have a frame with a swing triangle in an elevation but not in a plan. If you recall, Display Representation Sets are actually groups of all the Display Representations; one for each Object Family.

When you select the Section_Elev Display Representation Set, you will be prompted to provide how far you want your new elevation object away from the actual model. Think of this as the Move command in AutoCAD.

When you have placed the new elevation object, it should look something like the illustration above. This new copy is actually linked to the original via the Elevation line.

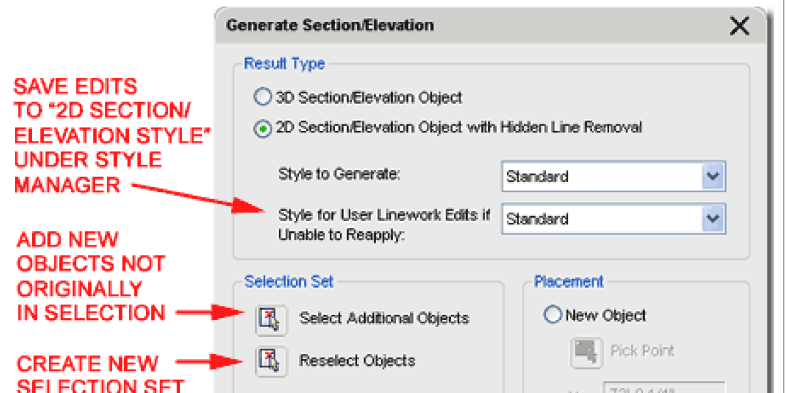# 6 Modifying Sections

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Regenerate Section

Menu   **N.A.**

Keyboard   **BldgSectionUpdate**

Mouse   **Select Section Object, right-click, Select Regenerate** on object specific pop-up menu
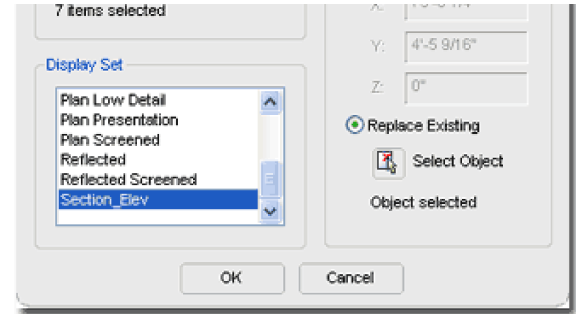
Links   [Generate Section/Elevation dialogue box](#) - for information on all of the other features not discussed here for Regenerating.

Once 2D or 3D Sections have been created, you can **Regenerate** them to update for changes made in the model, change the original selection set or make other changes offered on the **Generate Section/Elevation dialog** - illustrated right. For 3D Sections, the option to use Styles is not available and for 2D Sections, the option to save Edits to another Style is only available if "in-place" editing has been done and if another Style exists.

Though this command can be activated by typing or creating a custom tool, the easiest way to Regenerate is to **Select** an **Section Object** (not the Section Line Object), **right-click** on the mouse and select **Regenerate...** off of the object-specific pop-up menu - illustrated left. You can only Regenerate one Section Object at a time but you can Refresh as many as you wish to Select.

When Regenerating, the **Generate Section/Elevation dialog** is used and just about all of the options, conditions and results are the same. You can even create a New Section by Regenerating an existing one (just use the New Object and Pick Point buttons). This means that you really only need to use this tool when working with 3D Sections (which I never do) and when you need to Save 2D Linework Edits to a New Style and/or change the Selection Set. For most other forms of updating, use the **Refresh** option discussed below.

Note:
Though you can easily change the 2D Section/Elevation Style by changing the Style to Generate option when Regenerating, you can also just use the **Properties Palette** to **change the Style**.

Style for User Linework Edits if Unable to Reapply - a drop-down list that offers any 2D Section/Elevation Styles to save the Edited linework to. In plain English, this option is for when you Regenerate a Section knowing fully that some or all of the Edited Linework from a previous editing session will not translate correctly (match up or fit), but you would like to save it as a separate block to compare with. This new block can be set to display differently, like with all red lines, so you can more clearly see the edited linework that is no longer embedded. Read the Summation, below, for more information.

Refresh Sections

Alt. Menu	**Document> Sections and Elevations> Refresh**
	N.A.
Keyboard	**2dSectionResultRefresh**
Mouse	**Select Section Object(s), right-click, Select Refresh**
Links	

This tool allows you to **Regenerate one or more Section objects** without having to use the Generate Section/Elevation dialogue box and thus acts more like a Refresh tool.

By **selecting** one or more **Section objects** and right-clicking, you can use the **Refresh** option on the **object specific pop-up menu** to achieve the same results

Section - Properties Palette

Menu	N.A.

Keyboard	**BldgSectionProps**
Mouse	**Double Pick on Section Object**
Links	

Since Section Objects are fairly simple with respect to options, the Properties Palette will reflect this fact. For 2D Elevations and Sections, you can **change the Style** and for 3D Elevations and Sections, you can only change position based items in the Location Field since 3D Elevations and Sections have no Styles.

You may want to use this button to provide a Description, Attach notes and Property Sources.
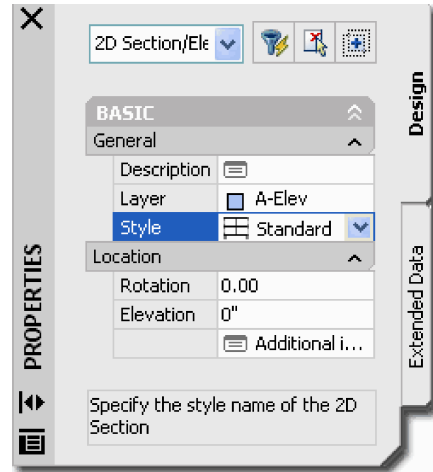
Section - Edit Linework

Menu	N.A.

Keyboard	**2dSectionResultEdit**
Mouse	**Select Section Object, right-click, select Linework >, cascade to Edit...**
Links	Entity Properties - 2D Section/Elevation Styles - Component Layers - for information on how to access the Component Index Properties for color, lineweight, linetype and other changes.

For 2D Sections you can use an editing process somewhat similar to "Edit In Place" for Xref's that allows for some fairly limited linework modifications. These "Edits" might be for things like changing the Color or Linetype of certain lines or Removing lines that you don't want to show in the Section Object. To activate, **Select** the **Section Object**, **right-click**, **Select Linework** and cascade over to the **Edit** option on the object-specific pop-up menu (see illustration to the left).

Once you have activated the Linework Edit session, the Section Object will behave much like regular linework so it is rather easy to work on it as if the lines are free for normal editing and it is also rather easy to forget to "**Save Changes**" (see below).

You cannot edit the lines as you would for a normal AutoCAD file because these lines actually reside within the Section Object and its Style. To make linework changes that are saved back into the Section Object Style, you must use the "**Modify Component...**" option from the object-specific pop-up menu.

When you **Edit Linework**, the lines must be assigned to Components within the Section Object's Style for proper Display Property results. This way, when Saved, the Edited or reassigned
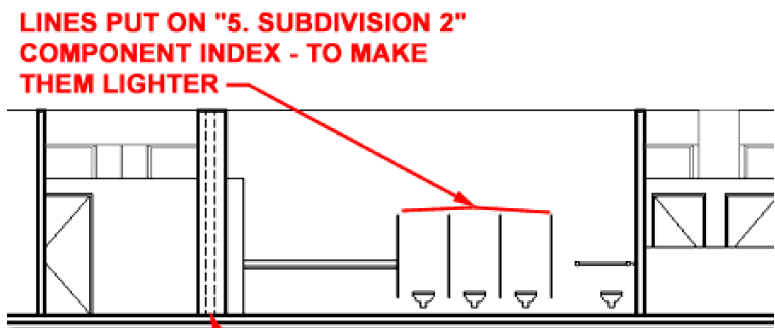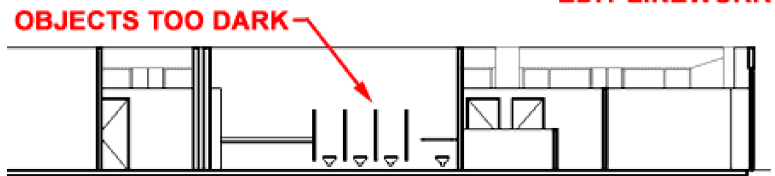
When you **Merge Linework**, which are new lines that you want to add to an existing Section Object, you must assign them to Components within the Section Object's Style just as for Edited Linework.

To **Delete Merged Linework**, use the Edit option, Delete the objects and Save Changes.

To Delete Object Linework generated by the model, use the Edit option, Modify Component... option and change the linework to the Erased Vectors Linework Component.

Note:
Edited Linework will "drop out" of the Section Object after a Refresh or Regenerate action if the objects changed in the source model after the editing was saved. The resultant linework will reside as new objects on top of the Elevation Objects that can be Erased.

linework will be recalculated according to the Component assignment and display representation.

Section - Modify Component

Keyboard **2dSectionEditComponent**

Links 2D Section/Elevation Styles - Components tab - for more information on where the Component Names come from and how you can add your own.
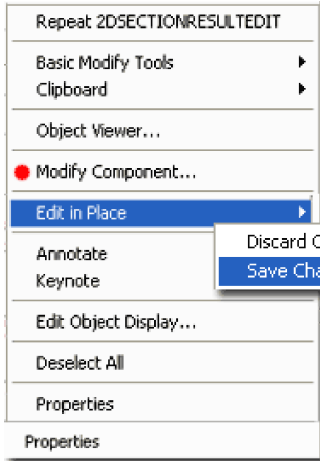
Once you have activated the **Edit in Place** function for a 2D Section, you can Select any part of that Section Object, right-click to see new options on the object-specific pop-up menu: **Modify Component** and **Edit in Place** with **Discard Changes and Save Changes.**

The **Modify Component...** option activates another dialog box, illustrated right, that provides an unusual way to edit linework that is embedded within the Section Object. Because the Section Object is "live-linked" to the source model, edited linework must be saved in a unique way in order for that edited work to be regenerated in the future. Unfortunately this aspect of editing linework for Section Objects is thus tedious and time-consuming so you may want to solve editing needs another way (see comments below under Summation).

The **Match existing linework** option on the Select Linework Component dialog box allows you to use a tool like Property Painter to capture the Component of other linework in the current Section Object and apply it to object(s) being edited.

The **Linework Component drop-down list** provides access to the **Component Names** of the current Section Object's **Style** (the list illustrated to the right is the default list but you can add your own component names). When you select a Component Name, the linework being edited will be associated with the Display Properties for that Component as set within the current 2D Elevation / Section Object Style. Some of the default Component Names have some very practical Display Properties that you can easily take advantage of; such as Hidden Vectors (dashed lines) and Erased Vectors (deleted lines).
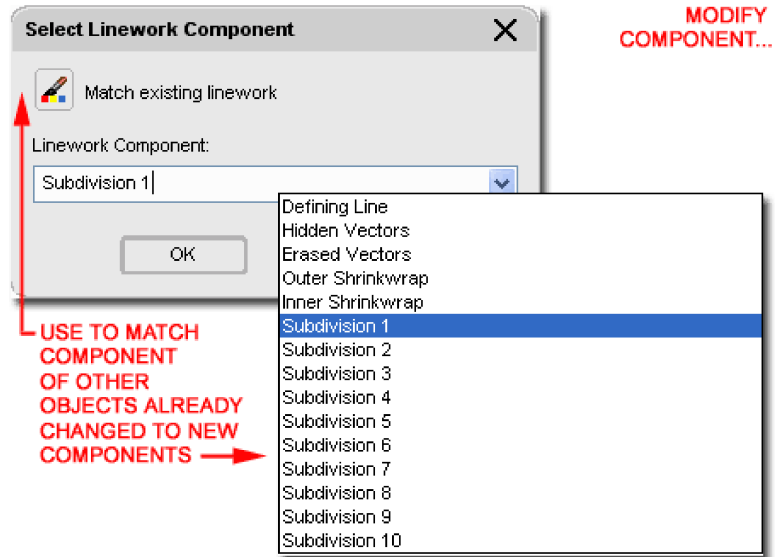
When you are done editing your Section Object, you must end the "Edit in Place" session much as you would for Xref's and this is done by selecting the **Save Changes** option via the object specific pop-up menu.   Any changes that have been made to the current Section Object via the Select Linework Component dialog box will be saved using the current Section Object Style.
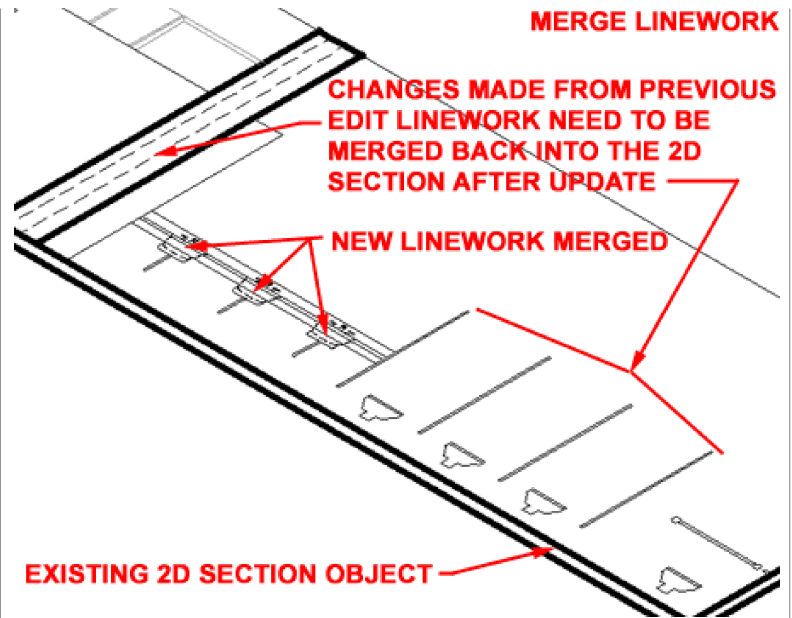
Section - Merge Linework

Menu **N.A.**

Keyboard **2dSectionResultMerge**

Links

New Linework can be Merged into a 2D Section Object by using the Merge option from the object-specific pop-up menu; acquired by selecting an Section Object and right-clicking.

When you Select one or more objects to Merge, the **Select Linework Component dialog box** will appear requesting that you assign the Merged Linework to a Component Name (as discussed above).

MERGE LINEWORK

CHANGES MADE FROM PREVIOUS EDIT LINEWORK NEED TO BE MERGED BACK INTO THE 2D SECTION AFTER UPDATE

NEW LINEWORK MERGED

EXISTING 2D SECTION OBJECT

## Modify 2D Sections/Elevations Summation:

Working with 2D Sections is fairly easy and rather efficient up until the point where you need to make specific refinements that have to be done right on the Section Object rather than in the Model from which it has been derived. The use of Edit in Place and Merge for Linework can be useful in a pinch where you do not wish to Explode the Section Object and lose the live-link. Be aware that Edited Linework cannot be saved in such a way that it is truly tied to the objects that the lines have been derived from. In other words, if you change the lines for a garage door to a dashed Component (like Index 9), for example, those lines will not move with the garage door if it has been moved in the Model file. Instead, by default, the linework is placed on top of the Regenerated 2D Section as a separate 2D Section Object. To assist in managing this, you will find that option to change such Edits (that cannot be reapplied) to another 2D Section/Elevation Style. If you create another 2D Section/Elevation Style for this type of linework and use only Red Line, for example, then you can use this Style to see when linework has been disassociated from the Section Object.

Generally, I find that Editing and Merging Linework is not worth the trouble it takes to worry about components and associations so we, at ARCHdigm, have developed a technique where we copy a live-linked Section Object to the side and Explode it two times. We edit the exploded Section as we would in the old days of regular AutoCAD drafting but use the original live-linked Section Object to update any changes made to the Model file. When changes have occurred, we copy the live-linked Section Object once again to another location, Explode it two times and copy out only those lines that need to be added to the first Exploded Section. In other words, we have a simple 2D line drawing for a Section that was originally created from the Model but now gets updates from another copied and exploded Section. The trick to using this technique is to pick the right time to start developing the Exploded Section. Comment: add new image showing exploded elevation work

SAVING EDITED LINEWORK AT UPDATES IS NOT WHAT YOU MIGHT HOPE FOR

DOOR WAS MOVED

ONCE SAVED, EDITED LINEWORK HAS NO ASSOCIATION WITH THE 3D MODEL

---
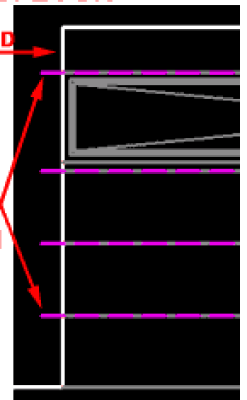
7 **3D Section - Display Props**
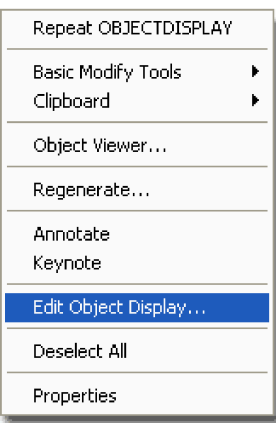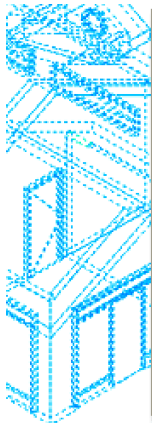

Object Display... - 3D Section

Menu **N.A.**

Keyboard **ObjectDisplay**

Mouse	**Select Section Object, right-click, select Edit Object Display...**
Links	Object Style Display Properties - for more information on working with the Display Manager

The 3D Section object in ADT does not have a Style but you can use the **Edit Object Display...** menu option to access and manage unique display controls. On the **Object Specific pop-up menu**, illustrated left, select Edit Object Display... On the Object Display dialog, illustrated to the right, choose a Display Representation to modify or Override.

Use the Override if you don't want your modifications to apply to all 3D Section Objects in the current drawing.

By default, there is really only one Display Representation that you can Modify or Override for 3D Section Objects and that is the Sub-divisions Display Representation. This Display Representation controls how you want the "Defining Line" and Subdivisions to appear in your 3D Section Object. Illustrated below I show how this can be used to color code the subdivisions.

Note:
Be aware that the Sub-divisions Display Representation for 3D Sections actually comes from the Bldg. Section Object as illustrated above right on the Display Manager Window. This means that any changes you make to the Sub-divisions (without overrides) can affect Section Objects as well.
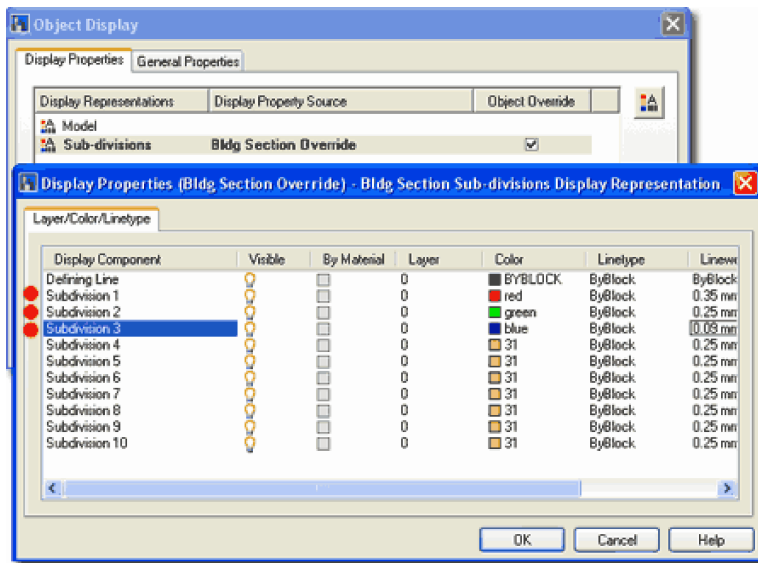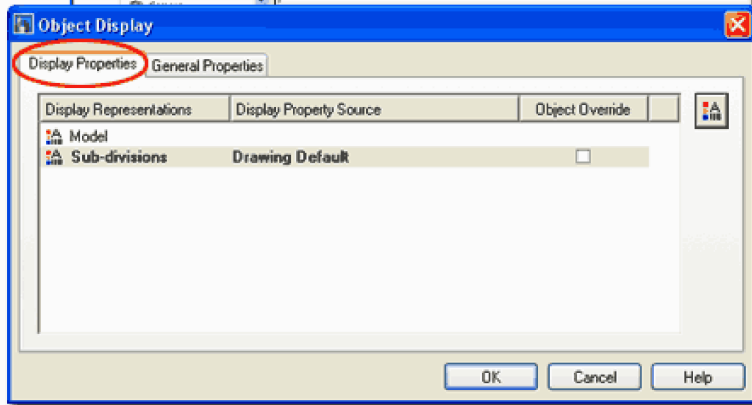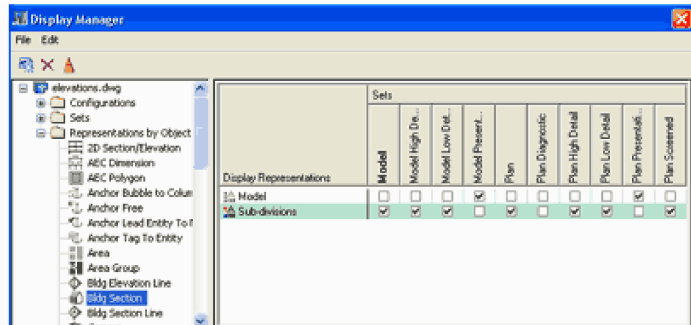

Display Properties - 3D Section - Component Layers

On the **Layer /Color /Linetype** tab of the **Display Properties** dialog box, illustrated to the right, you will find the power to control the Color (and consequently Lineweight for Color Dependant Plot Tables or .CTB files), Layers, Linetypes, Lineweights, Lt Scale, Plot Style (for .STB Plot files) and Visibility. The By Material option is not available for this Display Representation.

Illustrated to the right I show that I have Attached an Override for the 3D Section/Elevation Entity Property Source since I want these changes to be reflected on this 3D Section object only and not all 3D Section and Section objects in my drawing.

Defining Line - is the default color of your 2D Section but is primarily designed for the outline of a Sectional Cut right at the defining point of the cut. If you have and use the Subdivisions, this Component Color will not matter.

Subdivision 1 - 10 - a default set of subdivisions that are automatically associated with physical subdivision lines on your Section or Section Line object.

Display Properties - 3D Section - Component Layers - Example

Illustrated to the right I show the default **3D Section** Object and how the same 3D Section object can be adjusted to reflect the **Color** changes for the Subdivision lines on the Section Line object.

To change the **Colors**, as illustrated, select the **3D Section** object, right-click and use Edit Object Display... as outlined below.

Notice that for a background, I show what the multicolored 3D Section object might look like when plotted in black and white. If find these particularly useful, even more so in perspective as shown, to help communicate internal design features that don't show up well in full isometric or perspective views. In a way, you get quick interior Sections this way.
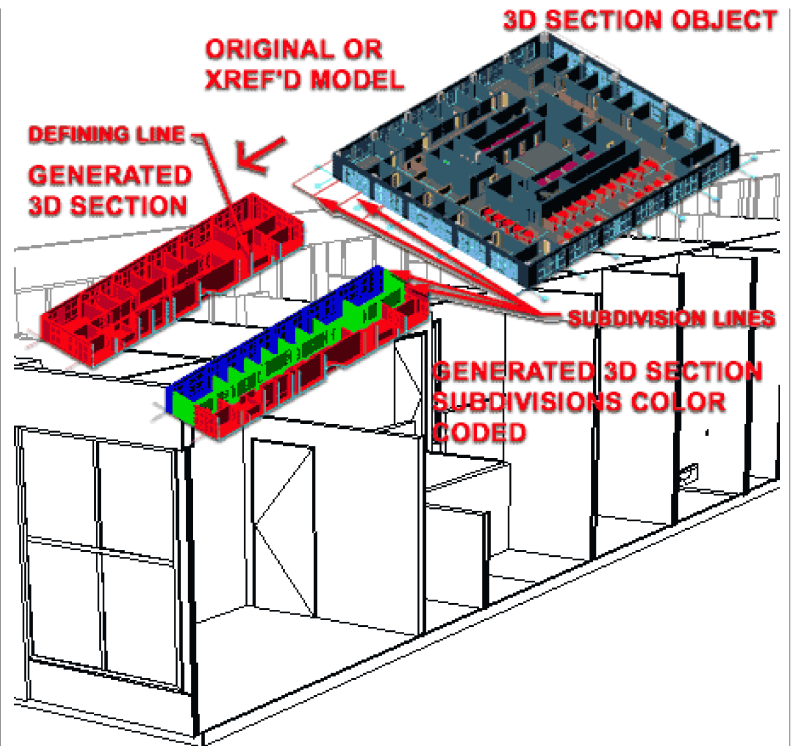
8 2D Section Styles

Style Manager - 2D Section/Elevation

Menu   **Documentation> Sections> Section Styles...**


Keyboard   **2dSectionStyle**

Links   2D Section/Elevation Styles - Display Components - Relationship Map

Object Style Management Overview - for an explanation of what Object Styles are.

For 2D Section objects, you can use the **Style Manager** to load, modify, delete and create new 2D Section Styles.

Illustrated to the right, I show the process of creating a **New** 2D Section Style that I have Named " **Custom Elevation Style** ". By **double-click**ing on this new style, you will invoke the **2D Section/Elevation Styles** dialog box - as illustrated.

The **General** tab provides access to the **Name** and **Description** fields for a Style; plus access to the attachment of Notes and Property Sets.
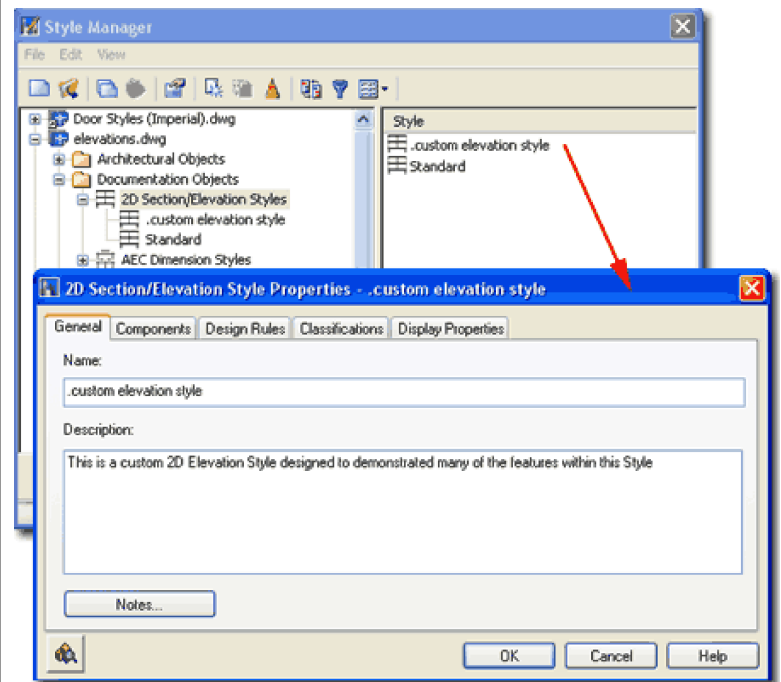
2D Section/Elevation Styles - Components tab
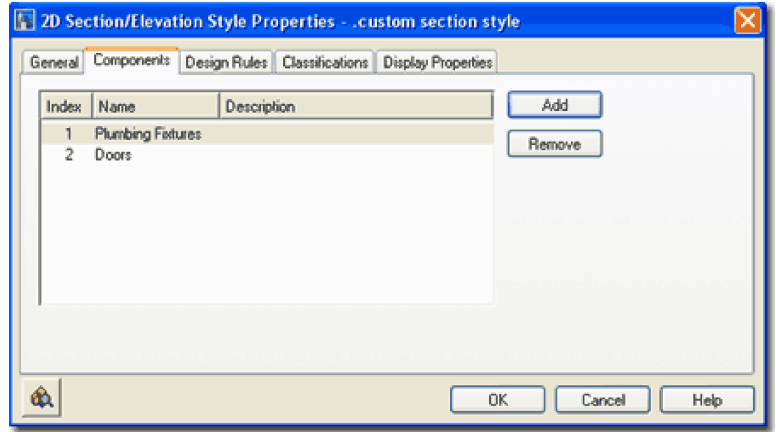
Links   Unique Component Layers

On the **Components** tab of the **2D Section/Elevation Styles** dialogue box you can use the **Add** button to create custom **Component** names for use on the **Design Rules** tab and on the **Layer/ Color/ Linetype** tab of the **Entity Properties** dialogue box.

The basic concept behind this option is to allow you to define **Layer/ Color/ Linetype Component** Names that you can use to assign custom Layers, Colors and/or Linetypes for objects within your Section.

Illustrated to the right, I show that I have Added two unique Components named for what I intend to used them for: Plumbing Fixtures and Doors. Follow the discussion below and you can see how I use these Components to change the line colors and weights of objects within a Section object.

2D Section/Elevation Styles - Design Rules tab

Links

- see this for a different screen capture

On the **Components** tab of the **2D Section/Elevation Style Properties** dialog box you can use the **Add** button to create custom **Component** names for use on the **Design Rules** tab and on the **Layer/Color/Linetype** tab of the **Display Properties** dialog box.

The basic concept behind this option is to create a " **filter**" that finds objects within your **Section Line** that match your specifications for **Color** and **Context**. Using this "filter" you can have the Design Rules look for objects that have the Color 150, for example, and lie in the closest front portion of your Subdivided Section Line, change to one of your custom Component Names (these are created on the Components tab).

Illustrated to the right, I show that I have **Add**ed two unique **Design Rules**. **Rule 1** finds objects in my example Model whose **Layer** is set to a **Color** of **140** and lie Anywhere (Any Visible) within my Section Line and assigns them to the custom **Component** Name "**Plumbing Fixtures**" that I created on the Components tab.

Rule 2 finds objects in my example Model whose **Layer** is set to a **Color** of **150** and lie **Within Subdivision 1** of my Section Line and assigns them to the **Component** Name "**Subdivision 3**" that I intend to set to a specific color later on the Component Layers.

Note:
You don't actually need to create unique Component Names for the Design Rules to work correctly. You can simply assign objects to a Subdivision that hasn't already been used. The nice thing about using Named Components is that you can easily track them.

Rule - an index number automatically generated to assist in tracking.

Color - use the Select Color dialogue box to set the color of the objects you are **filter for** (not against) If you want to change your Walls and you know they are set to Color 50, then you set Color to 50.
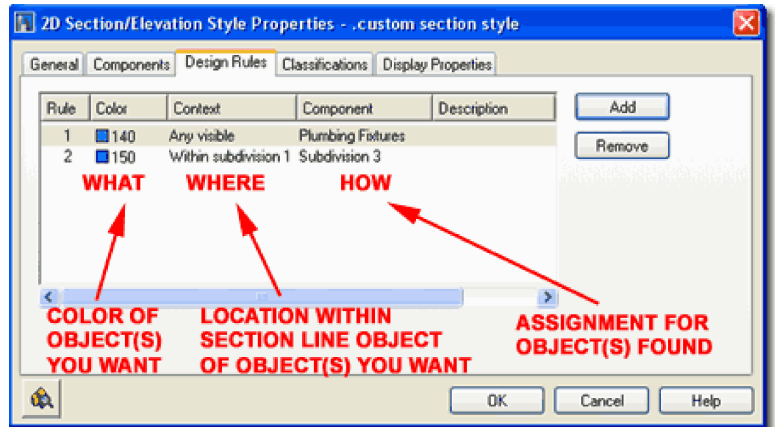
Context - use the drop-down list to help filter for objects you set by Color. You can use Any visible or Any visible or hidden to work with your Color selection to find all instances of objects with that Color. You can also refine your filter by specifying that you only want objects within a particular subdivision (as illustrated). This is how you can make Walls closer in an Elevation or Section darker than those beyond - even if they are in the same Subdivision.

Component - use the drop-down list to specify what to do with the objects that have been filtered for by the Color and Context options. Component **Display**, if you realize by now, is controlled on the **Layer / Color / Linetyp**e tab of the Entity Properties dialogue box for a particular object or object Style. Using the pre-defined "SubDiv #" choices is okay as long as you pick numbers out of your range for the physical subdivisions that you may have on your Section or Section Line object. You can also use unique Components , as illustrated with "Plumbing Fixtures", by first creating them on the Components tab of this dialogue box - see below for how to change their colors.

2D Section/Elevation Styles - Display Props tab

The **Display Properties** tab on the **2D Section/Elevation Styles** dialog box provides access to the display characteristics of the components of your 2D Section objects; such as what **Subdivision** components are turned on or off, linetypes, layers and colors.
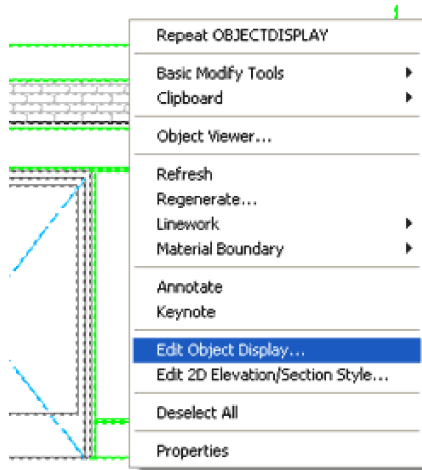
Illustrated to the left, is another way to access the **Display Props** tab; **select** the specific **object**, **right click** on your mouse to invoke the object-specific pop-up menu and select **Edit Object Display...** See discussion directly below.
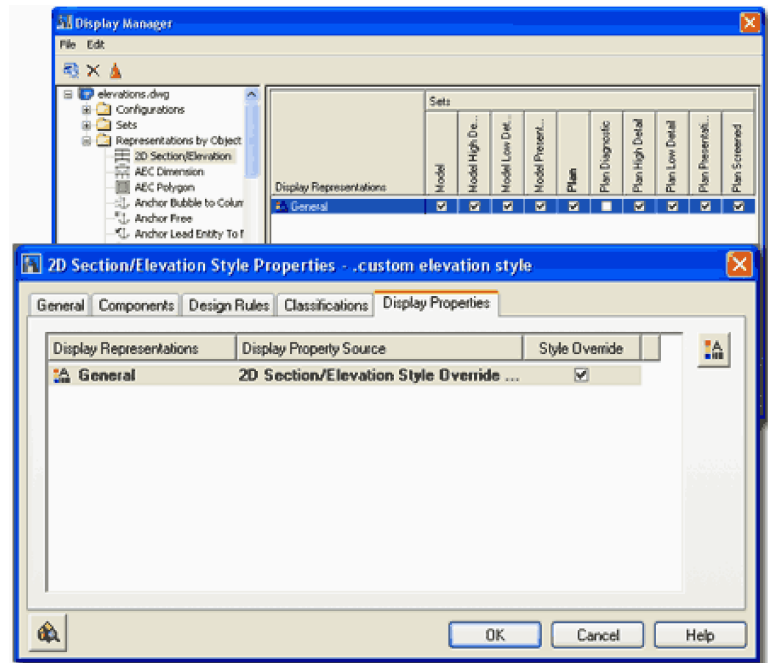
Display Properties - 2D Section/Elevation Styles - Component Layers

On the **Layer /Color /Linetype** tab of the **Display Properties** dialog box, illustrated to the right, you will find the power to control the Color (and consequently Lineweight for Color Dependant Plot Tables or .CTB files), Lineweight (for Named Plot Style Tables .STB files), Linetype, By Material, Visibility and more.

Illustrated to the right, I show that, by default, there is only one **Display Representation** option "**General**" on the Display Properties tab of the **2D Section/Elevation Styles Properties** dialog box. I also show that I have **Attached** an **Override** for the 2D Section/Elevation Style Property Source since this is a custom Section Style that has properties I don't want placed upon other Elevations or Sections in this example.

Defining Line - This Component controls the appearance of the linework right at the cutting point across objects like Walls. In general theory, this controls what the lines look like that are being cut throught or sectioned. However, because of the Shrinkwrap component on Walls, for example, you may have to focus on the Shrinkwrap Component to modify the appearance of objects that are cut. In addition to this extra control, some objects like Walls, may defer the Shrinkwrap Display to a Material Component and Definition. What this means is that if you use default ADT objects, the likelihood of actually seeing the Defining Line may be slim. On Wall Objects, you may notice this Component on Internal Component Lines for things like Gyp. Board, Plywood or similar Components that are not affected by the Shrinkwrap.

Outer Shrinkwrap [By Materail not available] **-** This Component controls the appearance of outlines for objects being cut through. As with Walls, the Shrinkwrap Component is an outer wrapper that can be used to emphasize the primary shape. Though this component cannot be set to By Material, some Objects may be using the By Material option to determine their appearance when Cut in 2D Sections.

Inner Shrinkwrap [By Materail not available] **-** This Component controls internal outlines as the name suggests but it is not available for all objects. It appears that this Component was designed for simple primitive objects such as Mass Elements, Slabs, Roof Slabs, Spaces, Boundaries and so forth. You will see this Component only when an object, like a Mass Element, has a
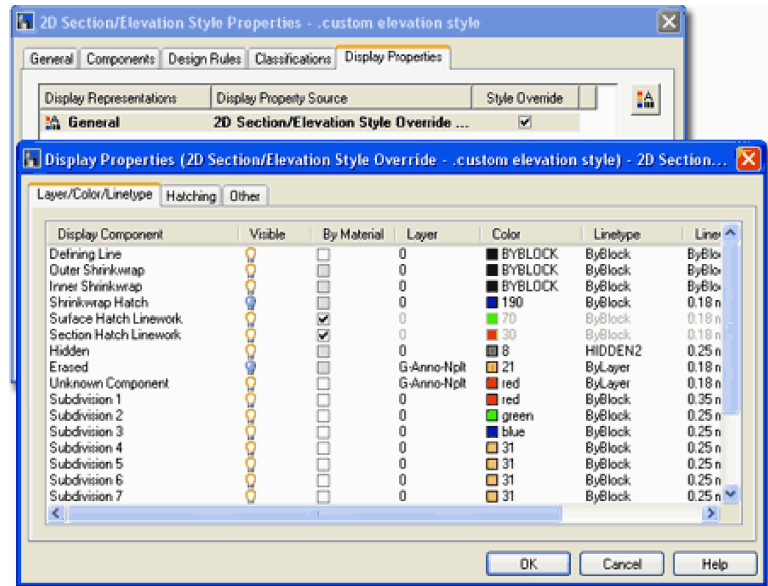
Surface Hatch Linework - This Display Component applies to Hatch Patterns across the surfaces of Walls, Doors, Windows or any other object that has Material assignments as part of its Style. A Brick Wall, for example, will display as an Elevation Object with Bricks if this component is turned on here, a Brick Material has been assigned as a Style Property and the Display Property of that Brick Material has its Surface Hatch Component turned on. This is very convoluted and fortunately most of the Wall Styles included with ADT have the proper settings.

Section Hatch Linework - 2D Sections

Hidden [By Materail not available] - turned off by default. You can use this Component when you use the Edit Linework tool to assign lines within your 2D Elevation or Section a Hidden line appearance. Just make sure it's turned on here.

Erased [By Materail not available] - turned off by default. As with the Hidden Component, you can use this Component when you use the Edit Linework tool to assign lines within your 2D Elevation or Section an Erased appearance. To achieve this effect, leave the Component turned off.

how subtracted out and the Section Line cuts through the object.

Shrinkwrap Hatch [By Materail not available] **-** This Component controls the Hatch Pattern for the Shrinkwrap Component and thus will fill from outer edge to outer edge of sectioned bodies. Turned off by default in ADT, this may be a very useful option for Presentation Sections where you simply want a solid poche at all cut bodies. If Section Hatch Linework is also turned On, both Hatches will appear and you could thus have a ligth screened poche under a diagonal line Hatch Pattern, for example.

Unknown Component - I am not sure about this one but I believe it's like a wildcard Component that you can use creatively - especially with Edit Linework, but it may be used automatically during such work, I don't actually know - hey, it's unknown.

Subdivision 1 - 10 - a default set of subdivisions that are automatically associated with physical subdivision lines on your Elevation or Section Line object.

Unique Component Names [By Materail not available] **-** these come automatically when you create a custom Component on the **Components tab** of the **2D Section/Elevation Styles** dialog box.

Unique Component Layers

 Links   2D Section/Elevation Styles - Components tab

On the bottom of the **Layer /Color / Linetype** Component list, you should now find any custom **Component Names** that you created and used on the **Components** and **Design Rules tabs** of the **2D Section/Elevation Styles** dialogue box. By creating unique components, you can color them for lineweight control, as illustrated to the right.

From the examples and discussion above, the plumbing fixtures will now be assigned Color 6 - Magenta.


Display Properties - 2D Section/Elevation Styles - Custom Display Component

 Links   2D Section/Elevation Styles - Components tab

Though you should be able to create Custom Display Components here on the Entity Properties dialogue box, I have not been able to do it unless I had extra rules on the Design Rules tab of the **2D Section/Elevation Styles** dialogue box. When you create Components on the Components tab of the **2D Section/Elevation Styles** dialogue box, they show up here automatically and can be removed here as well. If you attempt to Add one here, make sure it works by exiting all dialogue boxes and then return to this tab.

For better results, use the **Components tab** of the **2D Section/Elevation Styles** dialogue box.

2D Section/Elevation Styles - Display Components - Relationship Map
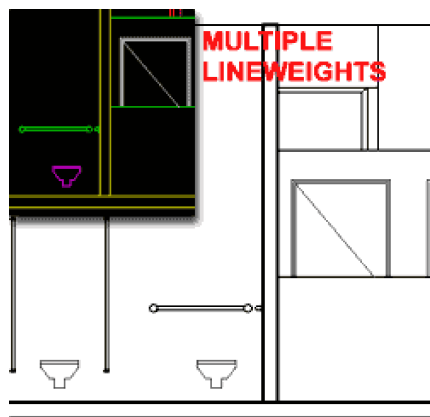
Illustrated to the right, is an overall map of how all the pieces come together for unique and custom **Components**.

Illustrated to the left, is an example of how you can use these unique Components to adjust the Colors and Lineweights of 2D Sections to match you want them to look by traditional means.
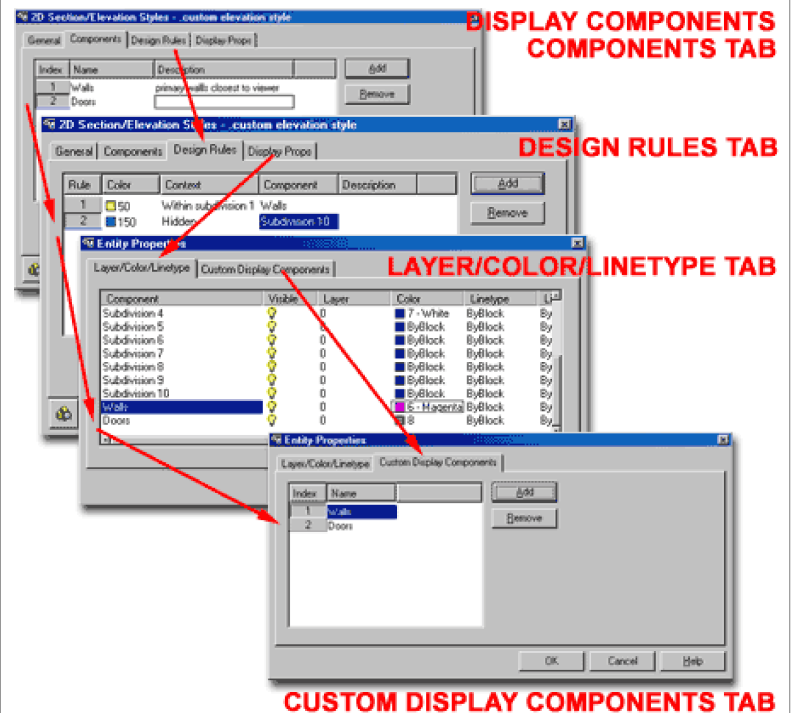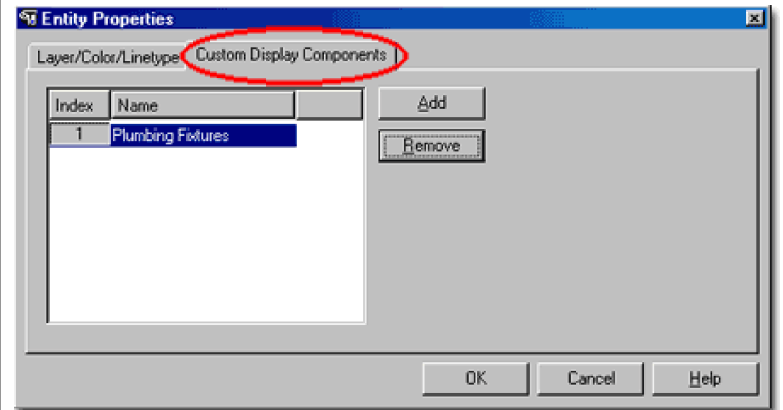
By using the examples illustrated above, I was able to make the Cut Line very heavy and I was able to make unique adjustments to internal components like the Doors and Plumbing Fixtures so they would be a bit lighter than other objects within the same Subdivision Line.

Objects beyond Subdivision 1 can be controlled in a similar fashion or simply be allowed to be lighter and monotone - an easy and effective solution.

Enable Live Section

Alt. Menu	**Document> Sections and Elevations> Add Section Line**
	Live 9
Keyboard	**LiveSectionEnable**
Mouse	**Select** Section Object (**Defining Line**), **Right-clic**k and select " **Enable Live Section** "
Links	

In order to create a **Live Section**, you need to be in the native drawing file (no Xref's) and you need a **Section Line Object** or Elevation Line Object like the ones used to create 2D and 3D Sections/Elevations - see **Add Section Lines.** .

Once you have a Section Line Object placed where you want to cut a Live Section, simply **Select** the **Section Line Object's Defining Edge**, **right-click** to Select " **Enable Live Section** ". You can also type "**LiveSectionEnable**" on the command line to be queried to "**Select section or elevatoin lines:** "

When a Section or Elevation Line Object has been "Enabled" for Live Section, the result should be obvious emediately. If you do not see anything different, make sure to view your drawing file in an Isometric View or other 3D View and confirm that the Definining Edge actually passes through your ADT objects.

CREATING A LIVE SECTION

USE REGULAR SECTION OBJECT

SELECT SECTION OBJECT, RIGHT-CLICK AND SELECT ENABLE LIVE SECTION

- Repeat LIVESECTIONDISABLE
- Basic Modify Tools ▶
- Clipboard ▶
- Object Viewer...
- Reverse
- Enable Live Section
- Generate Section...
- Annotate
- Keynote
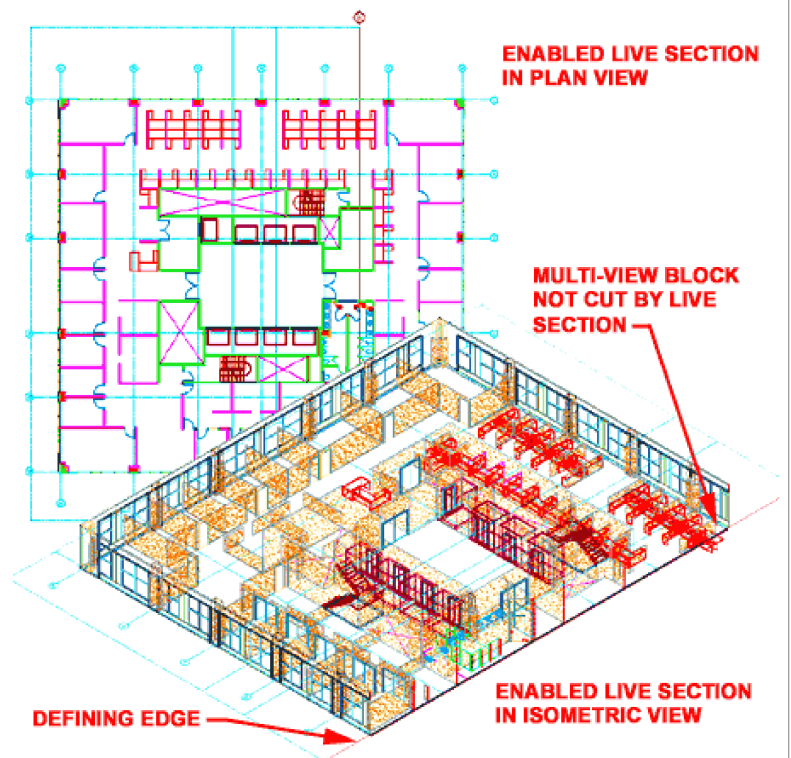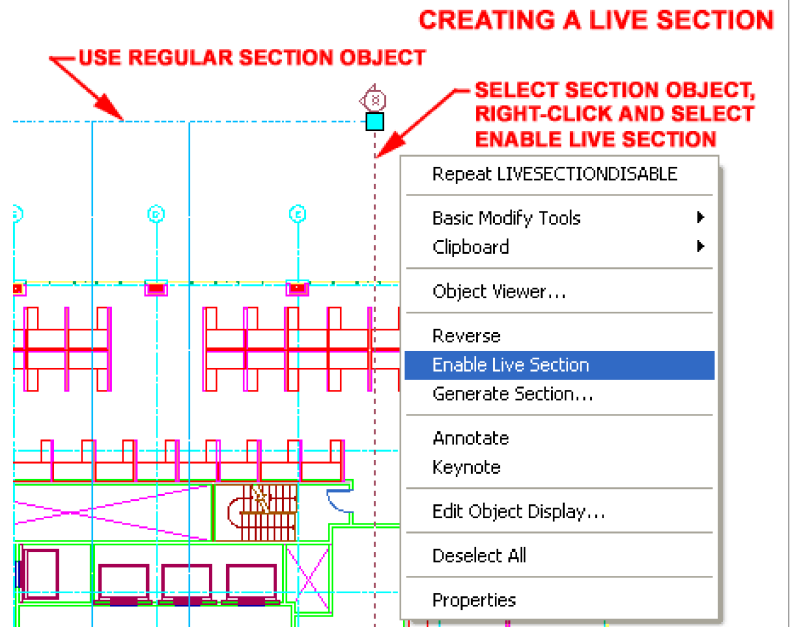- Edit Object Display...
- Deselect All
- Properties

Live Section Configuration - Examples

Illustrated to the right I show an example of an active Live Section where the objects outside of the Section Object Boundary have been clipped and appear erased. As noted in the illustration to the right, not all objects behave equally in Live Section mode so you may have to work with them in create ways; particularly Multi-View Blocks.

Once active, the Live Section can be adjusted simply by moving the Defining Edge

Tip:
If your Multi-View Block's 3D Representation is make out of native ADT objects, like Slabs, Doors and Mass Elements, they will cut as desired in Live Sections. For other Multi-View Blocks, try to cut through around them on one side or the other instead of right through them.

ENABLED LIVE SECTION IN PLAN VIEW

MULTI-VIEW BLOCK NOT CUT BY LIVE SECTION

DEFINING EDGE

ENABLED LIVE SECTION IN ISOMETRIC VIEW

Live Section Toggle Body Display

|	
Keyboard	**ToggleSectionedBody**
Mouse	**Select** Section Object (**Defining Line**), **Right-clic**k and select " **Toggle Sectioned Body Display** "

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

Right-click menu:
- Repeat LINE
- Basic Modify Tools ▸
- Clipboard ▸
- Object Viewer...
- Reverse
- Disable Live Section
- Toggle Sectioned Body Display
- Generate Section...
- Annotate
- Keynote
- Edit Object Display...
- Deselect All
- Properties
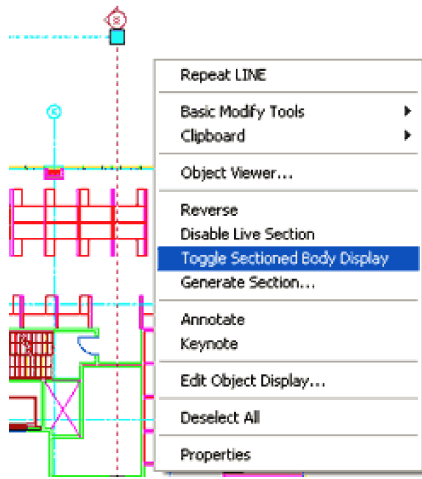
For enhanced presentations, Live Sections have a **Body toggle** that will display objects outside the Section Boundary. You can acess this toggle by Selecting the Defining Line of the Section Object and right-clicking to Select "**Toggle Sectioned Body Display** ", or simply type "ToggleSectionedBody" on the command line.

The purpose of this display option is primarily as a Shaded mode or Rendered presentation and thus you will find that it has the greatest impact when using the Solid Shademodes with **Enable Materials** active under the 3D Graphics System Configuration settings on the Options dialog. The homogenous semi-transparent effect comes from the "**General.Sectioned.Body** " **Material Definition** that has been assigned as a default Rendering Material for most default objects in ADT.

2D WIREFRAME MODE

SHADED MODE

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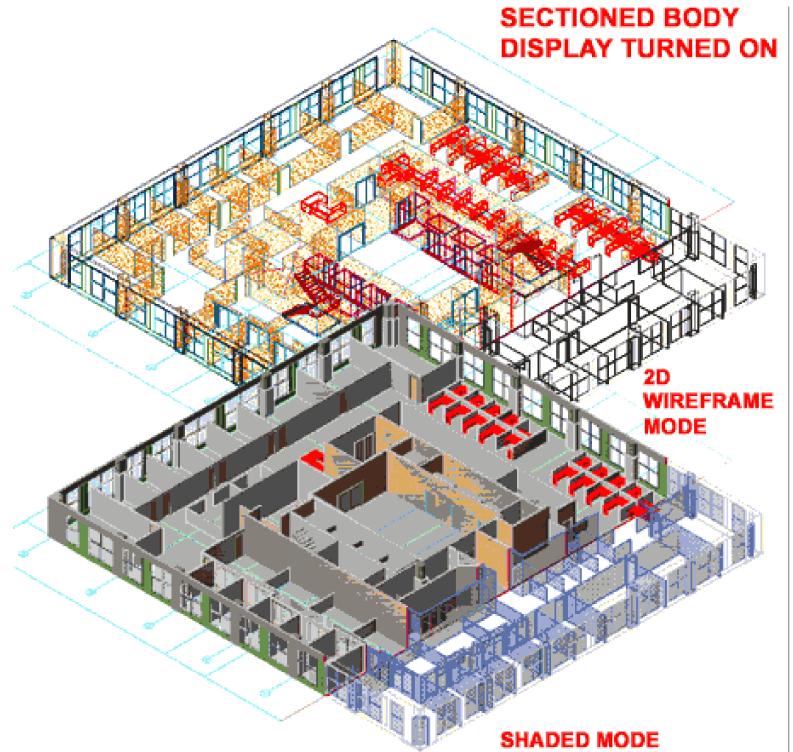
10 Modifying Live Sections

Modify Live Section Configuration

Links | Material Definition Properties - Surface Rendering Materials - for an overview of where to control the Live Section Rendering Materials at the Object Style Display Property level.

Live Sections are as the name implies so in order to modify the appearance of the objects in a Live Section, you must modify the objects themselves. Before tackling the job of making modifications to objects in a Live Section, consider whether you are attempting to modify the Rendering Materials or the Linework. For both of these considerations, you will usually find that display results are controlled by the Materials assigned to the various Components within the object styles.

For the **Linework** along the cutting plane of objects in a Live Section, including **Hatch Patterns**, the settings are typically found on the Dispaly Properties dialog for the Material Definition assigned to a specific component within an object style. For Live Sections in the default ADT Template Files, the **Material Definition Property Display Representation** is typically " **General Medium Detail**". The primary Display Components for Live Sections are Sectioned Boundary and Section Hatch. By changing these two Display Components and possibly the Section Hatch Pattern, you can create unique linework results on Live Sections.

For the **Rendering Material** applied to objects across the cutting plane and outside the section boundary in a Live Section, the settings are typically found on the same Display Properties dialog box for a **Material Defintion**. For the Materails, however, you will need to use the "**Other**" **tab** and look under the **Live Section Rendering category** where two options are avaialble: **Cut Surface**

Render Material and **Sectioned Body Render Matieral** .	
11 **Sections - Customizing and Tricks**	**11-15 SECTIONS**