



BEST PRACTICES COURSE – WEEK 20 Managing Attributes, Project Preferences, Work Environment – Part 1-F – Element Attributes: Pen Colors and Pen Sets

Welcome everyone to the ArchiCAD Best Practices Course lesson. Today we'll be focusing on Options, Element Attributes. We'll be finishing out the basic Element Attributes. Previous lessons covered line types and fills, and we went on to surfaces or the old word was materials. We looked at building materials and composites. Today we are going to be looking at pens and colors or pen sets, and we'll be looking I guess also at zone categories, which is brief because there's not a whole lot in terms of attribute management that you can do. And we'll look briefly at operation profiles. These are the remaining ones that are part of the attribute manager that you can define for any particular project and move from project to project using attribute manager. [0:00:59]

As with all of the other attributes, these are not things like 3D elements; like walls and roofs. And they're not 2D elements like annotation, text, dimension and labels. They are the definitions of how these things look or appear or work when you're doing your project. So we're going to be focusing on pens and colors at first. So if I open up the Pens and Colors dialog box, we'll see that in the standard U.S. version there are a number of pen sets. In the international version there are some different ones, and in fact I will open up the international version of ArchiCAD, the international English one, because I'd like to point out that some of the systems that they have built in there. [0:01:52]

Of course the basic concept is going to be the same regardless of where you are in the world, and that is that you have at any given time an active pen set that determines how things appear. So if we have this current one here, 'U.S. ArchiCAD 10 default' active, then depending upon what pen things are drawn with, they will have a certain color and a certain line weight. So what's common between all of these is the grid, which it looks like it just has the first half filled in, but actually as we switch between it, you'll see that it goes up to 255 pens. So there are 255 pens from 1 to 255, and in some dialog boxes you'll see an extra pen or two at the end. One being transparent and another one being opaque or screened background. [0:02:47]

The U.S. ArchiCAD 10 default was established of course with ArchiCAD 10, and it was noticeably different than previous versions with ArchiCAD 9. Unless you are migrating an old project in the U.S. from ArchiCAD 9 or earlier, you wouldn't want to use this. This is available simply to provide compatibility for older projects that had different standards. The ArchiCAD 10 default has not been changed in the last few years. Here we are in ArchiCAD 17 and we still have that default. And I don't know if there are any current plans to change that for the U.S. people. [0:03:29]

Now if you're in the U.S. there is a CAD standard which some firms will either prefer or be required to submit drawings in. It's called the 'National CAD Standard' or 'NCS'. It has a rather different set here and



you can see it's extremely different with no color gradations, just simple rows of colors. It is based on let's say standards that were appropriate for 2D CAD and not nearly ideal for working with BIM or Building Information Modeling or virtual building projects. And certainly don't provide a range of color choices for graphic controls, at least not as subtle ones. [0:04:18]

And you will see some other ones here in the U.S. defaults such as 'Electrical Plans'. And what this is intended to be is a variation where the first row of pens or first elements that are placed, such as walls and objects and beams etc, in general are going to become gray. but this "Pen 10" here is going to stand out, and it's intended that you might put your electrical elements using that particular pen, so that your electrical plan on the plans fade away or fade into the background and electrical elements stand out. Now if you are bringing in AutoCAD drawings, then you may want to use this. This is based on the standard DWG pen settings. [0:05:09]

AutoDesk, with AutoCAD over the years, I guess has maintained a consistent pen definition. So basically all of these colors here are their standard colors. What will be different, depending on whether you bring in drawings, is that different firms will have different pen weights. So actually the pen weights here you'll notice are all the same. And as I click on then you can see the weight not changing. So we'll be looking at that a little bit more in terms of the definitions there. But this is a variation, and it's specifically the same as the AutoCAD pen set except for pen 7. Pen 7 being the one that in AutoCAD is commonly white against the black background that AutoCAD users generally use. So this variation makes this one black. [0:06:05]

And here you can see another variation of 'Arch pens black', which actually closely resembles the standard U.S. default but has the first row all black. So this is intended to be a quick way of making your drawings look different, where most of the structural elements, the actual building geometry itself, gets made a crisp, black color. This is an overview of the standard setup in ArchiCAD in the U.S. I'm going to go and open up the ArchiCAD - I'm going to get the international version of ArchiCAD if I can here. And we'll start it up. So I have a version of ArchiCAD 17 international, and I will start up that one. That will come up as a separate application on my screen. [0:07:07]

In the international version, there is a much more complex organization of - ArchiCAD 17; I think this probably will be alright. I'll go here. Let's just go in to our library manager here and go find where that international library is. Because I have renamed it here for clarity, it's going to use that and take away the original reference there. That will bring up the ArchiCAD 17 international version. Now all of this stuff with the pens is sort of hard to understand. This is a little hard to understand when we're not looking at any drawings. So we will spend a little time looking at the project file and seeing the effects of it. [0:08:22]

So right now I just wanted to go through the basics theoretical overview. If we go to Options, Element Attributes, Pen and Colors, here in the international version we'll see that they have a rather different



set of concepts. So the standard architectural one is intended for 1:100 scale - which for those of you who are in the U.S. that would be roughly 1/8 inch scale - you can see the colors are organized in a different way than the U.S. version. I'm going to point out something that I didn't indicate earlier and that is that whenever you click on one of these, you'll see some information, a description here. So as I click on it, you can see that it tells me 2D elements general or 2D elements cut structural, 2D elements cut non structural. So you can see that these related colors, they grays in this case, are all 2D elements as opposed to the orange, which are for openings like door and window openings. [0:09:27]

Or these green ones for objects. So basically if you're looking at a drawing using this pen set using the ArchiCAD standards for the international version, then you will end up with being able to quickly see that green elements are objects, whereas gray elements are 2D. Blue elements are for text or annotation, etc. So each one of these has a general purpose. This provides an organizational structure. There is also a little bit of logic here that with the pens, the first row is thicker and then as it goes down it will tend to get a little less saturated in color. So a little bit lighter looking on screen, and a little bit thinner to ultimately the thinnest one that they work with here. [0:10:29]

And if we look at "Building Plans 50" it looks very similar, however I believe that the pen weights have been adjusted in some cases. I'm not an expert on this, so these all say 0.35. And the same - this is 0.25 here for the 1:100. So in terms of the pen weights, you can switch if you wish or look at the pen weights in either millimeters or points. So the standard in the international version is millimeters whereas in the U.S. version - if I go back to this - we'll see that the standard with the default is in points. I personally prefer thinking about it in millimeters. It's up to you how you do it, but obviously when you switch this it doesn't change the weight of pen, it just gives you a different readout, so you can understand it conceptually better. [0:11:31]

So you'll see in the U.S. that there are these descriptions here that give you some idea of what they are intended for, like "Pen 3" is for slate or for door and window. Here "Pen 4" for brown is used for objects. "Pen 5" is a thin line here and "Pen 6" in very thin line for door swings. You can use it for anything you like, but this description helps you decide if you're trying to decide what to use. In some cases you'll be able to choose that based on the description. These are just names here, medium and a color like magenta or teal. Here is uncut line, or gray overhead. So you can see this is intended to be a thin line that is not too prominent for things that are over the floor plan cut plane. [0:12:26]

These descriptions are definitely useful. Now in order to understand the references for this, I'm going to open up or switch to the MasterTemplate sample project. I have a little problem with the library right now, so we're getting some duplications with the zone stamp. But aside from that, this should give us a good example for viewing the pens and the effect of the pens. Right now, if I zoom in on let's say this area here, we are seeing this in a hairline. So no matter how close I zoom in, all these lines will remain a thin hairline onscreen. [0:13:15]



If I go to the View menu, I can switch at any time to turn on the Onscreen View Options and True Line Weight. When I do that, you can see that we're starting to see quite heavy line for the walls, sort of moderate lines for these objects and the outlines of the windows and then thinner lines for the edges of the wall here below the window for some annotation and for the door swing. Now if I want to switch the pen set to see the differences, I can switch it right on the fly. In other words, I can go to the Document menu, Pen Sets, and switch for example to the "Electrical Plan". And you'll see how everything becomes gray at this point. [0:14:06]

This particular layer combination does not have an electrical element showing, so it's not popping out. In general, you're going to want to coordinate the pen set with the layers so that you can take advantage of these things. Now I went to the Document menu, Pen Sets and manually changed it. I can also use the Quick Options here. I like having this stuff below the navigator in the corner. The Quick Options can be turned on or off using this little button here in the bottom, third from the left. Any drafting window will have this Quick Options here. You can move these around if you want. You'll see that in the Quick Options there is the pen set here, "Electrical Plan", so I will switch this around. [0:14:58]

And we'll see, for example, here's where we started with the ArchiCAD 10 default. And here's another one where the first 20 pens are made of all black. This is similar to the one that is in the standard ArchiCAD that is the first 20 black here. So you can see everything is nice and crisp black, but it has retained the same thickness. So in other words, the objects are sort of strong but not as strong as the walls. And the hatch dots in this case are thin; they are certainly less prominent. If I go to another one here like all gray, you can see how this really is a light gray. So these are ones in the MasterTemplate. There are some additional ones. Why would you want to make everything light gray? [0:15:52]

Perhaps you want to put this drawing on a sheet as a background and put some other things on top of it. By switching the pen set for entire drawing to all gray, you can end up making it fade into the background. Or you can see sometimes you might want to have a simple background in just a simple color like blue. So these are some pen sets that are available in MasterTemplate. If I go to the Document, Pen Sets, Pens and Colors, you'll see that there are more choices here in MasterTemplate. Let's just take a look at how you would create a new pen set. [0:16:39]

Here's our standard ArchiCAD U.S. version and we'll go to the pens and colors. and in order to create a new one and all I have to do is make any change here. If I take this black and I edit the color and make it gray, something like that, you'll see how it changes the gray here, and all the sudden it says "Custom". So as soon as I make any change it becomes custom. And of course I can change many of them. For example I can select multiple pens like this and edit the color and make them some particular color. That will affect all of them at once. Now each one of them has a distinct weight, and I put it into millimeters. As soon as I click on that, you can see that even though they are all now made into this particular shade they've retained their individual weights. [0:17:36]



That's how we have the one for - say there's "Arch pens black", that was done at the first row, was made of black but retained the fact that this "Pen 1" in the U.S. version is a heavy outline whereas "Pen 2" is a thin line. So essentially by taking this and selecting the whole row and making this black, that created a custom set and it was renamed to "Arch pens black". So after you have done some work on it we can see the results. We can work with a custom one to see that. And if you decide this is what you would like to use again and again, you can store a give it a name. And initially it will copy the name that it came from, but you can also overwrite a pen set if you want to update it here. [0:18:34]

So the basics of manipulating pen sets are that you can switch between them at anytime. You can modify the settings and create a custom pen set. And then you can store and give a name to whatever changes you've made in that pen set. Now the use of this, when I was showing the sample project here, let me go back to the one that is the standard here. When you have it in the standard pens, it gives you some visual clarity in terms of seeing the color. In this case in the U.S. version, the browns are the objects. And we have blue for text and things like that. So it just makes it a little easier to read. And of course in the international version there are different standards, but the idea is that you have columns in one color and objects in another; lamps in different ones. [0:19:37]

Now when we place this onto a sheet, if I go to a plan sheet here to the first level plan, we're going to see that same drawing that we were just looking at here. But you'll notice that everything is black - well not everything. Most of the stuff is black except some things stand out, because in this case it's indicating the new elements with a particular poché color. How is that done? Basically, this is the same drawing. If I say 'Open Source View', we're going to see that this is the view we were just looking at with all of these colors. but here on the sheet it's got a different pen set. So drawings, when we open up the drawing settings, each drawing has the option of either using the original pen set that was in the view or overwriting it. In this case you can see the first row of pens were all made black so this is a variation. [0:20:45]

They still have thick and thin pens, but it will plot a little bit more cleanly. If you're plotting on a plotter or printer that allows you to easily switch everything to black then you can use that without this. But the advantage of this one is that we can selectively make most things black. And then if we want perhaps print in color and have only certain things get in color. So all these different colors that we're seeing that we saw on the plan while we were working really aren't necessarily helpful for the printout. But we may want colors for certain types of annotation or graphic effect. And then if we're printing in color we can have the best of both worlds. Simple, clear representation of most of the drawing, and then colors and shades for some of the other things. [0:21:42]

So that's why we might set that up in terms of having the drawing with a different pen set. Now this drawing, as you saw when I opened this up, has a setting for the pen set that is different than the view. This reminds me that I should clarify that each view - if I go back to the view here - each view has settings associated with it including what pen set. So in other words, whenever you switch views, you



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can not only change the layers, which would be very common, so either were you doing a furniture plan or doing a site plan that's going to have very different objects and different elements showing based on the layers, but you can if you want to switch the pen sets. For example, if I go to say a fire separation plan here, this one actually still uses the U.S. ArchiCAD 10. [0:22:41]

Here's a simple background plan. This view setting changes of bunch of things. It changes the layers to make it a background and not have all the furniture and fixtures and things like that. But it can change other things. And in this case it's actually still using the same pen set but it has a different model view option so that the walls are showing pochéd. I'm not sure in MasterTemplate whether we have something. Oh, here's the electrical plan, it probably has that. No, that's interesting. The electrical plan - OK. This is something that I think might be good. Let's go to MEP for Mechanical Electrical Plumbing. And this one, no, all of these are using the same pen sets. So that's interesting that that is not - let's go to Reflected Ceiling here. These all are using the same pen set. So in the sample project we're not taking advantage of that. [0:23:48]

But what we might want to do here in the electrical plan one is we might want to switch this settings to let's say the electrical plan. And now you can see how the settings for the building are gray, but the electrical elements are standing out. So that actually would be a common thing to do is to change for a particular view. If you want to do that of course it's very simple to go to the view settings and either in this case get the current window settings or just manually change the pen set to say, "I want to use the electrical plan pen set". So then every time you go - I'll just go back and forth between the first floor plan where you can see different pens and colors and electrical plan, and we'll see how it switches the appearance. [0:24:43]

So you could also potentially make the walls thinner, the line work thinner if you wanted to. You could change settings to show the wall composition differently, more like in a site plan. We have a site plan here. you can see how in the site plan we are changing a lot of things about that. We can manipulate the pen set as part of creating a more legible drawing or output. So let's see, in the international version here, just returning to some of the settings that are in the international version. Graphisoft has set up - of course you can see slightly different versions for plans at medium scale and a slightly smaller scale here. And when we go to site plan, you can see how that changes as well. In general, they have some thinner weights here. [0:25:50]

If we go to this one, let's look at "Walls General", it's .35 here. This is 0.35. What I'm noticing here - this is cut structure here - is that when we're at a slightly larger scale, they have some tweaks to make the walls stand out a little more here. When we are at a smaller scale it actually gets much thinner. So you can see this is .2, this is 0.35 and this is 0.5. So there is some tweaking. It looks like they have common color scheme, but generally they are adjusting certain pens to get the result that they want. If we go to mechanical, we'll see that they are simplifying some of the colors or electrical, so the same idea as what



I was showing here. This color one clearly would be intended for construction documents. It might be the type of pen set that you use for creating a graphic presentation. [0:27:03]

Here you have a whole rainbow of colors that makes it easy to make something that might be a diagram read properly. And a different type for shades of gray scale. And some legacy compatibility for previous versions of ArchiCAD. So these different pen sets - I don't have a detailed understanding of their use, but it's clear that there are some nice things that Graphisoft has put in for specific purposes that you could use for those special drawings that you might create. So again the basic idea with all of these is that each view in the view map, when you go to a particular view, it's going to switch potentially to a - let's go to our quick views here - it's going to switch to perhaps a different model view option, perhaps a different pen set. [0:28:14]

If we go to the structural plan here, we can see it has a structural pen set. So each view will have its own options. And then of course when you're placing drawings on the sheet you can override that. Generally you want to coordinate that. You don't want to have something totally different. You'll want to either use the same as the view you are working with or a variation that maybe simplifies some of the colors and makes them black. [0:28:39]

So let's see if there are some questions about this. Dorothy Howard asked an off-topic question about room finished legends that I would be happy to help you with offline rather than doing that in the middle of this lesson.

Iain Dykes asked about the Australian pen sets. That brings up how the pen sets coordinate with objects. Iain, in reference to your particular question, I have not gone into that in detail, but I'm going to go over the concept for everyone's benefit here.

Dave Norman, "Kindly clarify how to plot with all lines in black but some select annotations or fills in color." I will explain that Dave, and then go into the relationship with pen sets and library parts which is very important to understand. [0:29:47]

So if I go back to MasterTemplate here - let me go back to our first floor plan. You can see that there is blue in certain places and brown for these objects. And when I go to the particular sheet here, everything is black. However, it's not all black because some things have a color. How is that done? Again, this particular view had certain settings. It was the view that was using the ArchiCAD 10 default which had many colors. Here is the variation of the pen set that makes all of the first row of 20 black. So again, if I go to the Document, Pen Sets, Pens and Colors, we will see that the - and let's made this wider so we can read it better. Unfortunately, it still didn't show the name completely in this dialog box but you can see the name down here. The standard one that this was drawn with was this one. And here is the variation here. [0:31:13]



I believe in the standard one, if we go back to the standard U.S. one here and go to the pen sets, you will see that they have one that is identical concept that we did in MasterTemplate, they just call it "Arch Pens Black". So essentially if I draw something - and let's just draw a wall - we'll pick a more complex one here and pop in a window and a door. And we'll put in an object here and we zoom in on it. Let's make sure that we are set to do true line weight. You can see the different weights. We can see blues and browns and gray tones here. If I look at the sheet for the plans and we now update, look at it. You can see that this is all looking black, because again, the standard default or the standard in the ArchiCAD template in the U.S. is that drawings are placed with a different pen set. [0:32:33]

"Arch pens black" remember only changed the first 20 pens. So if I go back to the floor plan here and I go and say create a fill, and let's give this a simple poché pattern. Then choose, instead of this first row of 20 pens, pick something else. Maybe just a nice tone like that. Now if I go back to the sheet we're going to see that is in color. So these have all been swapped out. This is in color because it's using a pen above the first 20, which is left in the same style as the working view. Now again, this is a drawing on a sheet. When you place drawings, the settings that are in the drawing tool are going to be used. So whenever you drag a view onto a sheet it uses the settings that are the default. That's the same for anything. When you draw a new wall or put in a new object or anything, when you start to click, it starts putting it in based on whatever is the default. [0:33:47]

Of course you can change it later. So the drawing default settings in this template are - well actually, here it says "Pen set is missing", so that's interesting. This is a brand new file from the ArchiCAD default in the U.S. and it actually says "missing" here. So the default could be that whenever you put a new view on as a drawing, it uses the original pen set. And that would be fine. Then you can manually change it. But it's common to say that the default for whenever you are putting in a new drawing on should use this variation where some of the pens have been swapped out to be black. Then every time you drag a view, it will automatically do that. Then we can say OK. [0:34:37]

Now that I have changed the default, the next time I drag a drawing on it will have this setting. Hopefully that clarifies that for Dave Norman and for everyone else.

Dorothy Howard asks, "Why would you use a different color for various types of things? Walls are obviously walls, columns are columns. Why not link colors to layers so you can tell if something is on a wrong layer?" [0:34:57]

That's an interesting philosophical question. We could also just call it a workflow question. In AutoCAD I know it is very common for layers to be a designated with colors. So the electrical layer or the object layer or the wall layer, each one of these will have a certain color. So that makes it a little easier for if you're zoomed in on things to see what's going on. That's somewhat limiting, I would say, because objects often will have multiple things. So if I go to this, you can see that this as a wall that has different parts of it. It has different cutlines; some of them are thicker or thinner. It has some hatches. So if we



were to color this wall based simply on the fact that it's on a particular layer, then all the pens might be the same. So this gives us flexibility. And in addition, I don't know about this object, but if we were to take certain objects, we will find that -I'm not sure what would be a good example here. [0:36:15]

We could do something more complicated. I don't have anything really that I can remember offhand. Let's take some equipment here. Does this have some parameters for the 2D representation? There's a contour pen, there's a fill pen, etc. I'm not quite sure where exactly we would see this in these elements. But certainly there's the possibility that any of these could have a different pen weight for different components. In the standard ArchiCAD library in the U.S. there's the detailer library which has 2D symbols. I know we've got wood moldings here. You can see that it is a 2D symbol and it has different colors in here and there are different controls. If I place this and look at it, the view is intended at a different scale. [0:37:48]

If we were to temporarily switch this to a detail scale like this, you can see that the different colors allow for different thicknesses. So just categorically I would say that making everything have the same weight or pen color based on the layer is very limiting. ArchiCAD gives much more flexibility there. Now in terms of why do you need colors to identify whether it's a wall or something else? Walls are very clear. Sometimes when you are zoomed in on things it's a little bit harder to tell what's going on. So let's just put it back to its normal scale here. Sometimes just being able to see the colors here can give you a clue on things. And also if you turn off true line weight then you may be used to the fact that, oh, that's a light blue, that's going to be a thin line. And you just know visually that different colors have different thicknesses. [0:39:06]

So overall I would say that not everybody agrees with the use of pens and the differentiation. Certainly there are many different styles and I've seen there. Some people even would wager that making everything hairline is not a bad idea. Just making it all very clean and crisp is sometimes simpler to manage; and printing in hairline is an option you can do. But I think to provide more legibility, having differences in weight will make it possible depending on when you're looking at things just to have things jump out that these are structural elements etc. [0:39:55]

So let's see other questions. Steve asked, "What is so 'true' about true line weight?" Good question. And let's talk about how pens coordinate with the ArchiCAD library because that's something I haven't touched on. So in terms of true, well, when I'm going to be printing at a certain scale, 1/4" to 1', or roughly 1 to 50, this is approximately the size that it would print out on paper. It depends on the resolution I have on the screen. Right now I'm at a certain resolution on my screen, but it's roughly 100%. And if we put in some text here, this text has a certain relationship to the building. Now I'm 1/4" scale. That means this is what size that it would print. If I reduce this to let's say 1/8" scale, what's going to happen is that the building will get half as large. [0:40:59]



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But annotation, like the size of the text, will still remain the same size because annotation is defined by its paper size. So in the U.S. that is in points and in international versions it would be millimeters. But it's how big it will print out. And you'll get used to the fact that the text at 9 points is quite readable, at 7 points it's still good, but if you get it down to 2 or 3 points it's going to be very hard to make out. So you get used to those sizes and it becomes relatively easy to just pick a size based on what you know it's going to look like. If I switch this to a smaller scale like this, the text will still be legible. But of course the building has gotten smaller or tighter on the page. [0:41:46]

And if I go back to that 1/4 inch we'll see how it's spread out. In the same way, if I zoom in on this at 1/4 inch, when we're at a larger scale these pens separate. We can see some differentiation. If I go to a smaller scale like 1/8 inch then you can see how things are starting to bleed together. In fact if I go to something like what we might do, a site plan in 1/16, that would be roughly 1 to 200, then we're seeing how the thicknesses are looking very different. Why? Because if I go to 100% percent, you can see that everything on the site plan is going to be really pushed together. There's not much differentiation. [0:42:31]

So true line weight means that ArchiCAD is doing its best to represent the relative thickness of things and the relative size of annotations like text. And we of course have dimensions. Let's just do a dimension here, not that I have much to dimension. Each of the dimensions has a certain thickness for the tick marks and the lines here. As I switch between the small scale to slightly bigger scale, you can see that these weights, at 100%, there's a certain weight. This may be a little hard to tell, but there's a little more weight on the tick mark than on the line that shows along the axis. If I go to 1/4", it's going to be very similar. There's still just a little bit more weight on that tick mark than here. Why? Because the cross line here is Pen 7 which is 0.3 mm. [0:43:43]

And the axis line here is Pen 6, which is 0.18 mm. So in other words this is definitely thicker. So that thickness is intended to represent onscreen as close as possible how this would print. So true representation of how it would print. Now when you zoom in on things, at certain scales everything will look good, but at other scales in might not look as clean. This gives you an idea of what you're going to end up with and how these lines, are they separated or not? Certainly if we go to an even larger scale like this, we're going to see more differentiation because the pen weight is not - these two lines are not joining together. [0:44:32]

There is a little gap there because that particular space now can be seen, whereas if I go to the smaller scale here, you can see how they essentially bleed together because pen pens are touching each other there.

So let's see, Dave Norman writes, "It's great the way international pen sets allow for different line weights for different drawing scales." I agree there is some sophistication there. I would say overall if I was Graphisoft and starting from scratch, I would say the international pen sets are probably better



thought out than the U.S. ones. But I believe that the U.S. customization of ArchiCAD, they have decided that the difference is relatively small in terms of how many controls you have. Users who are sophisticated can create their own pen sets and get the same controls. The bulk of the users are happy enough, and if they made a big change like this, they would get so many people requiring tech support and confused about it that it just isn't worth it. [0:45:44]

So it's not a perfect world. Every time they come out with a new version of ArchiCAD perhaps they consider *should we change this over?* And they decide, *no let's not do it now.* I am going to be talking about how it coordinates with the library now, because that is just another reason why compatibility from version to version and compatibility between pen sets and library parts makes this a little bit more complicated as well. [0:46:16]

Dave Norman goes on, "I assume we could do the same with the U.S. version, I am making some custom pen sets for these different scales and putting them into the appropriate view settings." Absolutely. If you have ever felt like a site plan, your walls, the lines were too thick because you are going down to a really small scale, you can just create a different pen set with thinner lines for those walls. And of course when it's reduced you're probably not putting in much of the interior structure or fit out for the building. So you are using fewer pens in any event. But you may just want to use a pen set that allows you to have the same walls show up thinner to read better in a small-scale site plan. [0:47:05]

Conversely for a detail drawing, when you are at an enlarged scale, you may possibly want to create some variations.

Rick Skorick says, "Can line weights be controlled in 3D using pens and colors?" Good question. I don't believe that we have much control in 3D. If I look in 3D, it's just this little building here. First of all, we are looking at this in Open GL. You can see some colors for this. Let's change the door. The door has pen settings here and you can see "wall contour pen", "plan symbol". This is the plan symbol. Let's go to door frame. You can see here is the contour. So "Pen in 3D", here is a control separately. If we were to change this to black which would be thicker and stronger and then look at it, there we have it. [0:48:15]

So there are some controls for some elements. In this case I changed this in 3D. And if I go back to the floor plan it still has the original teal color there. So you can do that. It did have a line weight? I don't think it's really a line weights, it's just a color here, at least in the Open GL version. If I look at the elevation here you can see here are thick black lines there. Let me undo the change and go back to that elevation. And you can see yes, in an elevation some elements like the doors have controls for their edge contours and that changes the color and the weight. Whereas in the 3D view in Open GL, it just changes the color I guess. [0:49:11]

Now let's look at the door and see how it's set up in the library. Right now we're in the U.S. version and were looking at the door. If we look at the settings for pens will see that the plan symbol uses Pen 3.



However if we go down to the door frame, go down to door panel, I know there's a Pen 6 in the opening here. Here is 2D and 3D line pen, that's gray, that isn't allowing us to control that. Let's see - "Override model view options". Okay, somewhere around ArchiCAD 13 Graphisoft introduced the idea that you could potentially in the model view options change certain attributes of elements like doors globally. Doors or windows or objects. so was the concept of model view options controlling it. If I manually say I'd like to control this, you can see that the line pen for the opening, which would be the swing line here, is set at Pen 6. [0:50:44]

Now Pen 6 you will notice is this light aqua color which is 0.18 mm. So it's a fairly thin line, not the thinnest that we see. The thinnest we might see is 0.10 or .12 mm, but this is certainly thin. And this is the default. And of course as we look back here at the general settings, the plan symbol is Pen 3. The reason why point this out is that if I were to use a different pen set where Pen 3 was really thin or super thick, then when I place the door - let's just switch to a door here - you'll see that they all use a certain default. So if I use the pen set that was radically different than I probably, before I even put in a door or when I'm cleaning up my drawing, I would have to go and change the settings. And this is true for virtually all elements in the library. [0:51:50]

So if I go to the Object tool and we look at this, the default for the appearance has a certain pen, Pen 4. So what that means is that the pen four was not just a different color but perhaps a very different thickness. All the objects would look bad, and we would have to correct or change the objects in order for it to look good. So the idea here is that there are some pens that are built into objects and doors and windows as the default. And that is set in the library. So the ArchiCAD library for your particular version of ArchiCAD. In the U.S. obviously it's one and in international use there's another standard. And I guess in Australia there are some differences in the Australian library compared to other English speaking countries. [0:52:55]

What this means is that the pen sets need to be coordinated with this. At least some of the pens. There are not a lot of pens that are used. In other words, each door or window or object only uses a handful of pens. It might be two or three or as many as five or six pens. But those pens, if they were radically different, would mean that every time you placed an element you would have to go and tweak it. You would have to have different settings and change the defaults. So for speed, I would wager that you don't want to mess around with your pen sets for those particular pens. And I don't have a summary of all the pens that are in use, but they generally tend to be in the first 10, at least in the U.S. version. [0:53:47]

In other words, Pen 1 is used for wall outlines and Pen 2 is used for thin fills. You can see the name next to it that pops up. Pen 3 is used for door and window symbols, Pen 4 for objects. So these ones that are in the first 10 here generally have a certain weight that I wouldn't mess around with, at least not for your general drawings because it's going to affect anything you place. And you're going to have to do a lot of extra work to make sure things look good if you change these. So if you create your own pen sets, I



would be very wary about changing the weights of the first 10 pens. And in fact the first 20 probably there are some things that might use this. [0:54:38]

So I would leave those alone or tweak them very carefully and look at what happens when you place objects and place doors and windows; and if you don't change the defaults does it look good? So Iain's question related to this, because we supply MasterTemplate and international versions that is set up in metric of course. It's set up using the international pen sets, but it relies on the local library. So in other words in Australia their loading the library provided by the Australian division or subsidiary of Graphisoft. And the question has come up that perhaps the pen sets that we distribute with MasterTemplate don't match the Australian libraries well enough. So this is something that I have been meaning over the last several years to look at and study, but have not actually dug into it. [0:55:41]

I will say that only a handful of people like Iain have actually brought this up, so a few people have said, "Hey this doesn't look good with MasterTemplate," or "I'm not sure this looks as good as it should." We have dozens of Australian users of MasterTemplate and others have not mentioned it. I don't know whether that's because they are just okay with the changes or not, but that is something that I still intend to look at and at least come up with a good response I apologize for Iain and anyone else from Australia who maybe has asked me up to this point. I intend to look it that. [0:56:24]

Let's see. We are at the hour mark, and we've focused on pen sets here, pens and colors. I have one other part that I just realized I haven't talked about and that is the fact that pens and colors are set separately for the model views and the layout book. Actually, I'm sorry; this is the Element Attributes, Pens and Colors that defines this, which we've looked at. But if we were to look at the Document menu, Pen Sets, basically if I change this either in a view or just manually, it affects what we're looking at onscreen in the model. Right now if I were to switch this to AutoCAD pens, we'll see how everything looks totally different. [0:57:25]

Let me go to the layout book here. And of course this doesn't look different. Why? Because the drawing is set to use a particular pen set. And in fact I think we can scroll over here and do we have that? I think there here is - you can actually change it quickly here. The same thing, I went into the dialog box you can change. So this ignores the fact that I temporarily had switched it to the AutoCAD pens, it's still looking the way it did. But also notice that the layout master and the titles didn't change. If I were to do a fill here and select this and go in here, you'll see that these are the standard. Actually this is the one with the first 20 are black and then we have the other color. [0:58:30]

So this element that I'm drawing now is put manually on the layout book. and if I go into the masters - so I guess let's go into this one here - you can see that when I select any line and go to the pens, you can see that this is a certain pen set that it's using. So which pen set is it using? It's in the Document menu, Pen Sets, and it's the Layout Book. You'll notice that it says "Layout Book" here. If you changed the layout book settings for pens and colors, it affects all layouts. You may say, *Wait a second; didn't I*



change the pens for a particular drawing? Don't I have some flexibility there for the drawing? And the answer is yes. Individual drawings can have their own pen set. But the elements on the master, basically the title block and background and anything that you place manually in the layout book just on the sheets, will use whatever is the active pens and colors in the layout book. [0:59:46]

So that's independent of whatever you have in the views in your model. So just to prove this, if I go to let's say the AutoCAD pens, you'll see how this looks. It's all green, etc. Let me go back to that sheet, and you can see this now has changed, the little fill that I did, because it's using this AutoCAD pen set, the one that I just changed. So in the Document menu, Pen Sets, we can change the layout book setting once or any time we want, but it will affect all sheets and all masters in terms of the way they are interpreted. So just be aware that. Each view that you have in the view map in the model can be different if you like and each drawing can have its own choice. But that the layout book as a whole will have a single choice, whatever is the active pen set. [1:00:48]

One last thing relative to placing drawings on here and the AutoCAD pen set. We're generally placing views of the model onto sheets or views of detail drawings or worksheets, things that we create from within ArchiCAD. Sometimes you'll place detail drawings from a manufacturer or a site plan or a consultant's drawings that were created in another cad program, perhaps AutoCAD. When you place that site plan or that detail from the manufacturer, if you place it onto a layout directly, you can of course choose that drawing and say, *you know what? I want this particular drawing to use the AutoCAD pens.* [1:01:46]

You can always override it to specify that a particular drawing should have a different pen set. Essentially if it was created by someone not using ArchiCAD, and using AutoCAD or any other pen set that you like. One other thing about the AutoCAD pen set as I mentioned, if I go to the pen sets here, if I go into the definition for the AutoCAD pens, the colors are fixed in AutoCAD. But the pen weights will be different depending upon what company or individual is working with it. So you can see how these all say 0.18 so they're all thin. Essentially this is the safest thing to do is just to say, we are going to make all of these lines thin so that everything is readable. But of course some of them would benefit by being thicker. [1:02:36]

So you can easily go and modify this. I can say that I'd like to make the pen 7, which is their main default pen. I want to make this 0.35 or something like that. And that of course will create a custom pen set. We can go through and tweak this based on the pen table from an AutoCAD user, if you're getting a drawing from structural consultants and you want to be able to place it in onto a layout sheet. You can find out what pens they are using. They typically will be using a small number, like 5 or 10 or 15 pens actively. And you just have to go through those pens and set up the weights to match. And then of course you can store it and instead of calling it "AutoCAD pens", you can call it "Consultant 1.dwg Pen Set" or whatever you want to name it. And now this is in the list. [1:03:34]



And for any particular drawing you can set that up. So we're going to be talking in a later lesson about how to move pen sets as well as other things from one project to another. So if you do create a pen set for a particular consultant then you can of course leverage that or use it in multiple different project files, just like you can pick different materials or composites or other things from one project to another. Let's see if there are any final questions for pen sets before we finish up for today. [1:04:09]

Steve Nichol says, "It sounds good. See you next time." Alright. Let me know if there are any other questions. Did you guys learn anything? Were there any surprising things or any things that you found will be useful to handle some of the challenges that you have for creating good documentation?

Dave Norman says, "Thanks, good lesson."

Rick Skorick, "Always learning something new." Alright.

Joe Archibald writes, "Nothing surprising. It is a challenge to set up pens if you don't like standard set." That is true.

Tom downer says, "Sounded pretty familiar." Okay. And a bunch of thank yous from a few others.

I think if you have been using ArchiCAD for a while you probably understand pen sets fairly well, but I know that this does come up both sometimes from beginning users not understanding how it all works and then sometimes from more advanced users saying, *Well I want to tweak it, and how do I manage this?* So if you're in between the beginning and the more advanced ones with a very particular sense of graphics then you probably work pretty well with the pen sets that exist. And just knowing you can switch the pen set for the drawings on the sheet I think is probably the key thing that I would remember. And you can also have pen sets for electrical or backgrounds that might help. [1:05:51]

Dave Norman, "One clarification if we create custom pen sets changing the first line of pens, as long as we change the weights to thinner lines, this will not mess up the objects, windows, etc.?" Yeah, I think you'll just want to see how a project looks when you switch that pen set. Certainly getting things thinner generally doesn't make things look messy; it just makes them look less differentiated. In other words, less punch for certain elements. That's probably a good, safe thing to do, particularly if you're printing things at smaller scale than having it thinner is a good safe thing to do.

Alright, so we'll finish up for now. And please and any follow-up questions or comments on the page down below. This has been Eric Bobrow, thanks for watching.

[END OF AUDIO 1:06:51]