BEST PRACTICES COURSE – WEEK 10 – PART 3
Record Your Design Intent Using Proper Referencing and Anchoring

Hello, this is Eric Bobrow. And in this lesson, we'll look at ways that you can anchor your design intent. By that I mean, helping ArchiCAD to understand what's important about your design choices as you go along, by using proper referencing and anchoring. [0:00:18]

Here we have a blank document to get started. I'm going to draw some walls. I'll make them a certain length. I'll just type in some distances here. And when I'm doing this, of course I'm telling ArchiCAD that these distances are important to me and ultimately these distances are connected to the walls that I'm drawing on the reference lines. So if I zoom in on this a little bit and we dimension for example from here to here, I told it to be 25 feet. And guess what, its 25 feet. So what was important to me in this case was the distance from this point to that point. And that is currently on the outside surface of the wall. [0:01:18]

Now if I were to change these walls - for example, if I go to the Wall tool and select all the walls and say that instead of being 6 inches or what would that be, 15 cm. Perhaps if I double it, let me just make it a foot; you'll see that the walls get bigger. But of course the critical distance that I entered, 25 feet - which is by the way for those of you international users that would be about 8 meters. So that critical distance is maintained as I change that. Now let me undo the change there and let's look at changing the wall in a little different way. And I'll zoom in a little bit so we can see it better on screen. [0:02:04]

Now suppose that I take this wall and I change what type of wall assembly they are. So instead of using just air space here, I pick something like a siding, something like this here. Now when I did that, it still maintained the 25 feet, but let's just zoom in on this and you'll see that this distance right now is measured from the outside surface of the wall. Now if that's what important to me, great. But perhaps what I really care about is the distance for the framing, in other words, from the face of framing I want it to be a certain size. So having changed these walls to be a particular composite, I will need to offset the reference line if I want it to match that. [0:03:00]

So let me go and use the Measure tool. I'll click once in the Measure tool and click on this corner and click there. And you can see that in the X and Y coordinates, it is 1 1/4 inches. So that is the thickness of the sheathing and the siding and the plywood that is on there. Now what I'll do is with these wall selected I will open up the settings, and I'll go ahead and insect the reference line, that appropriate 1 1/4 inches. And you can see now the handle that's highlighted is at the reference line. And if I zoom out it's still showing 25 feet. So now what I've done is in two steps, I've changed the wall composition and then I've also changed the reference line inset to be at the face of framing. [0:03:52]

Now I can do this in a single step, and this is a tool that a lot of ArchiCAD users don't really know is there. So let me go back and I'll undo the two changes here. And with all these walls still selected, I'll go to the Design menu and go to Modify Wall Structure. So now the wall is currently just an air space or two parallel lines with no fill of a certain thickness. And I'm going to change this to say the siding one that I was just using, and it says, "Alright, well there's a core of a certain thickness." In other words, the 2x6 framing, the lumber, is 5 1/2 inches, because that's how it's defined. And I'm going to tell it that I'd like to thicken the wall, actually change the wall structure but keep the core at the same location. [0:04:49]

Now the current core is basically on the surface of the wall since I don't have it inset. And I'm saying that I want to maintain that core and use the definition of the core for the new wall. So I say OK and it does that in a single step. So you can see that it automatically in that single step. I'll just undo and redo, and you can see the change going back and forth. So that's a great tool to use is the Modified Wall Structure command to maintain what's important to you, if the face of framing, the distances that you set out are what's important, then you'll want to use that. So let me just undo this back and we'll put it back to a simple condition here. [0:05:38]

Now, sometimes you're going to be working on existing buildings and doing work on them by measuring the inside distances. So you take your measuring device, your laser pointer and get that information. Now at that point, you might be able to guess or you might be measuring the outside. But let's just assume for the moment that you're measuring the inside surfaces and distances. So in that case, you'll probably want to have the walls on the other side. In other words I just flipped the construction method so that the points that I was entering are on the inside. That way of course if these walls do change, and I'll just again make it thicker, you'll see that the thickness goes out. So depending upon what your situation is, you may have the reference line on either the outside or the inside or of course as I demonstrated earlier, the face of framing. [0:06:40]

Now let's talk about interior walls. So I will go to the Wall tool and I will switch to a different layer, Interior Wall layer. And let me make this say 3 5/8 inches Perry so this is a very precise measurement of the framing thickness of the core in the United States for what is called a 2x4. So I'm going to be drawing this wall. I want to make a room that is say ten foot across here, about 3 m, 8 feet going that way. Now I used to all the time use the special snaps to change the distance to the 10 feet that I want, and I would continually have to open up the special snap values and change it here. And while that still is eminently usable, I've actually come to prefer using the Create Guideline Segment. [0:07:38]

And I will go and click on this corner, and I'm actually now drawing a guideline. So if I type in 10 feet, I've drawn a guideline. You can see the orange dashed line just barely on the wall. And you can see the little checkmark that indicates that I'm at the end or corner of something. Now having drawn the guideline, I can simply hit the Enter key or Return key to start my wall. So I'm now drawing a wall. And since I want the room to be 10 feet in clear space, then I'm going to switch the construction method so that the reference line is on the left, allowing the room to have the full 10 foot distance. And then I'll

type in the 8 feet and go across to finish out the room. So again, I've got a distance in here. This is what was important to me; I wanted the room to be 10 feet or about 3 m in distance along there. [0:08:38]

Now let me go and dimension that, and we'll just take a look at some things that may happen. So if I dimension from here to here, and place this dimension into position, we can see the 10 foot distance. Now suppose that I take these walls, and let's just zoom in a little bit so we can see it more clearly. And suppose I change them from simple walls like this to - perhaps I'll just go and change it to a different type of wall. For example, one that is a composite for interior, it's a 1 hour fire rated wall. And you can see that it still stayed 10 feet but it actually got a little thicker. I'll just undo and redo, and you can see because it now has the sheathing, the drywall or gypsum board on both sides. [0:09:31]

Now if I wanted the framing to be in the same place, of course I could do the same type thing of selecting those walls and going to the Design, Modify Wall Structure. And then here I would switch it to that same wall type, saying that I would like to keep the core in the same position. And you can see that the wall stayed in the same position in the core, and it got some extra, the drywall went to the sides. Now you'll notice that the dimension actually changed, because it was locked into the surface. So of course that also tells me that the clear space in the room has changed. Now if I undo this and you look carefully, you'll see how the dimension is still tight to the surface and moves, whereas the core of the wall stayed in the same position. [0:10:21]

So there are some things that you need to be aware of, particularly that dimensioning before you make changes to the wall structure may be prone to some issues. In other words, you have to decide perhaps if you're just going to redo the dimensions after or wait to dimension it until after you have firmed up the wall construction. Now we can - and I'll just undo this back again - we can draw the wall on either side. Sometimes we may have a situation where when we have multiple walls intersecting each other they don't clean up quite properly with the walls laid out the way you originally have done it. And you may want to actually change which side the reference line is on. [0:11:11]

So if you do that just simply by changing the construction method, you'll see of course the wall has moved in position and I can then move it back. I can actually drag it over whatever it's thickness it is. So that can work. But there is another command worth knowing about under the Design menu, Modify Wall, Reference Line. So we were working with the structure, now we're looking at reference line. And one of the options is to invert all sides. What that does is for one or more walls, I'm going to put the reference line on the other side. And I say OK. And you can see how the walls stayed in the same position. Now the dimension was tied to the end of the reference line here. So it adjusted, but the wall was still in the same position. [0:11:56]

And just for your information, this other wall also got longer. it actually stretched over to the new position of the reference line. If I undo it, you'll see that the walls look similar but this wall is actually shorter, it's stopping here. Now let's talk about dimensioning to the center line, because people often ask, "How can I dimension to the center line of a wall?" Now there is no snap point in the center line. There will be a snap point at the end of the reference line, but not to the center line, unless that wall is

drawn as a axial wall where its midpoint or midline is the reference line. So when I do this, of course now there is a snap point here. And I can also dimension to the faces of the wall just as easily. [0:12:51]

So if you do need to calculate or dimension to the center line, perhaps in commercial spaces, you may be working out the spaces with the center line between adjoining rental or tenant spaces. So then you would want to draw the wall with that axial line option. Now if you've changed your mind, in other words, you realized that you need to move that over, again we have the option in the Design, Modify Wall, Reference Line to actually keep the wall perhaps the same type instead of changing its structure. But we might move the reference line to the center of the core. And when we do that, we'll see how the reference line has moved over. Now the dimension stayed constant because the wall didn't move and the dimension in this case stayed attached to the surface. [0:13:48]

So it's a little bit inconsistent. It didn't move when we offset the reference line here. And just for your information, if I select this wall, you'll notice it is not an axial line wall. It doesn't have a center geometry. Instead it has an offset that was calculated by ArchiCAD to put it at the center of, in this case, the core. And that would be the center of a symmetrical wall, but of course some walls may have a core that is offset from the center. And it calculated exactly where that needed to be. So these are all options that you should be aware of. The Design menu, Modify Wall, Structure and Reference Line are very powerful commands. [0:14:29]

The final one called Invert Direction I almost never have used. When you're drawing a wall, you're drawing it from one point to another, from left to right or top to bottom. Sometimes that direction is critical for certain things ArchiCAD does. I can even quite remember now the last time that made a difference for me. But it would actually internally move the start and end points to the opposite direction without changing which way the wall body is facing. So in any event, those are important commands to understand. [0:15:05]

Now when clear space is critical, for example if this room being a certain size is very important to fit in furniture, cabinets, tile work etc. then it probably is a good idea to place the wall with the reference line on that side, so that it's easy to calculate and maintain that clear space. For many walls in many contexts it won't be as critical where it is because the wall looks symmetrical on screen, and so it doesn't really matter as much which side you draw that wall. But generally we would recommend drawing the exterior of the building as a reference line or the exterior face of framing when you're doing new construction; using the inside face of the exterior walls when you're measuring for an as-built or existing project and you're measuring on the inside. And then for interior walls, whatever is most convenient. And do keep in mind that if you do want to dimension to the center line of a wall, then you probably want to draw with the center line construction method. [0:16:16]

Now let's look at putting in some windows and how we can tell ArchiCAD what's important about their placement. So if I go to the Window tool, and let's say that I wanted to put it in the middle of this room, it's evenly spaced. Well I can go and tell it that I'm going to put it in by its center point. That means that I can just put the center in halfway along there. And then I can use this - perhaps the halfway snap. I'll need to make sure that I have it set to between intersection points, so that will measure between one

wall and the next wall as opposed to along the entire length of it. And having done that, if I just position my mouse over here, you can see the little tick mark, click, and say I'd like to face that window out. [0:17:02]

Now the reason why this is important and why you should pay attention to this is that if this relationship is important, then by anchoring it with that center point, you are free at a later time to change the window type or its size. For example, if I change it from this 2'6" to 5', you'll see that the window got bigger and it went in both directions evenly. Now on the other hand, let's put in some doors. Doors frequently are being put in right next to the corner of walls. So let me go ahead and select this wall and I'll adjust it to extend it to the other wall here. And let's say that I wanted to put in a door on either side of this vertical wall here. So I'll go to the Door tool. And in this case I'd like to put in let's say a single door. So let me switch it to a single door. And I'll put it in by corner, because I'd like to make the corner of the door a certain distance from this intersection. [0:18:06]

Now here's where I would use the distance value. So I say snap to the distance, and of course I may need to check the snap values and say what is the distance that it's snapping to, 4 inches is just fine for this purpose right now. So when I move my mouse over here, you can see all these little tick marks. And I can click to say I'm going to put the corner of the door there, click again to place the door, and do the same thing along here. And of course this snap of a certain distance makes it very convenient to put in a number of interior doors very quickly. Now let's suppose that I selected these doors, and I wanted to make them a different size. So right now, they are 2'6". Let me make them somewhat bigger, I'll make them 3'. And you'll see that they get wider, but they kept that 4 inch distance. [0:18:59]

So in other words, the anchor that I've placed that I used the insertion method, was recorded by ArchiCAD so that when I changed the door size it kept that distance because that's what was important. I'll just undo that change there. Now of course there might be conditions where you want to put the door centered, for example in a corridor. Let's go in and I'll just put in some walls here to create a corridor. Now I'm going to be just very quick and not measure this particularly. Let me just change snap here so that I'm not getting all of those extra snaps every 4 inches. And let me just draw an arbitrary wall to indicate that we are in a corridor. And we're going to be putting in a door between this part of the corridor and the other. [0:20:01]

We'll say that that we're going to have a double door. So let's go in here and I'll select then a simple double door. And this time I will want to put it in center. And again I'll want to make sure that my snap is set to the halfway between intersection points, so that way when I go in I get tick mark and I can easily snap this into position. So now if the door changes size, for example I will make it a little bit bigger, it will keep that center point anchored. Now this particular door in the ArchiCAD library has an odd feature. I'll just make it 6' and you'll see how it's gotten bigger and the center point stayed constant. But the leaves are not symmetrical. [0:20:49]

Now certainly it's nice that you can make them asymmetrical, that you can make one door bigger than the other. But probably the large majority of the time you'll want to have them split the overall width. In order to make that happen, you need to go into the settings for the door, either before you place it or

afterwards, and you can go into the parameters area. And under door panel, where you'll see define panel sizes. And it says choose the main door panel. That means that it's going to pick the main door panel at 2'6", which actually is the smaller one because I've made it bigger so that the alternate panel, the non-main one has gotten bigger. [0:21:34]

But what I'll do is change it, instead of main door panel, I will say proportion. And that allows it to just type in a proportion. Obviously 50, 50 would be symmetrical. So having made those two changes and then clicking OK, this door might look like what we expect or want it to be. So that is a rather odd default in the standard library, at least in the U.S. version. I'm not sure about the international version. But just beware that when you're doing double doors and you resize them, you need to go in and make sure that the leaves are proportioned properly. [0:22:11]

So let's take a look at some options that may be important for columns and beams. To demonstrate this, I'm going to take advantage of a feature within the Design menu called Grid System. Now with the Grid System, it automates the placement of grid lines. This is available since ArchiCAD 12 I believe. I think in ArchiCAD 11, the grid system was offered as an optional goody and then in ArchiCAD 12, they finished up work on it and they put into the standard menus. But basically the grid system allows you to put in the grid lines, but also can optionally put in columns or some object perhaps similar to a column, but done with the Object tool at the grid line intersections, can put in beams, dimension lines, etc. [0:23:10]

And it does have a really useful option to keep the columns and/or beams within the perimeter. This means that although the outer lines will then be considered the outside boundary as opposed to the center line of those columns or beams. Now there are all sorts of options here. I don't want to explain. I'm just going to put in a number of these elements based on the grid that I set out. And I will say OK, and we'll take a look at the way that these things are anchored. So let me just slide over here and I'll pop this in. And we could rotate it, but of course in this case I'll just simply want to demonstrate the basic case. And if we look here, will see that the columns, in this case, the column of course the bottom left corner, is on the intersection of the grid lines. [0:24:05]

And with the column selected, we'll see that it is anchored at the bottom left, whereas if I select this column, will see that it is anchored at the center center. In this column, as you might expect, is anchored at the center bottom. So basically by anchoring them in this way, they're placed properly. But more so, if I just say let's go and I'll select all columns. And again just say that these were put in with a certain size. Right now that would be 1 foot by 1 foot so that would be 300 millimeters approximately. Let's just say that they needed to be twice as big. When I change them, you'll see that they kept the alignment. In other words, this one is at the corner, this one is at the left edge, this one is at the bottom and this one is centered on the grid lines. [0:25:01]

So the anchoring allows us to change size or style easily. In the same way the Beam tool, if I select the beam, or actually select this beam, you can see that it's got a reference line anchored in the center, whereas the one on the side here has that reference line anchor on the edge. So in very much the same way as we looked at for walls, and of course similar in some ways to windows and doors, the anchoring

will allow us the flexibility to place general, generic elements down and then later come back and modify them to suit the requirements of the design. [0:25:44]

Now let's take a look at one final thing, which might be to put in some text. And so when we're putting in text, let's say that we have text that we are going to put in as a room name. Now if you leave the text say left aligned, which I think is the default in the template, and I think if we just say I want to put in a room name. Let's say that I click, and I click a couple of points here. So let's look at what happens as I work with this. So I clicked, and I sort of had to guess how it was going to be centering in the room. Now I can always move this around to get it centered, but perhaps I want to look at how to anchor it, how to place it in a way that would be the simplest way to do that. So first of all, if we do have multiple lines, I would want to most likely want to center these on top of each other. [0:26:50]

But even more so, what I want to do is look at the anchoring and say anchor it center center. Now we didn't actually see it change here, but let me just use the eyedropper to pick up the settings and then delete this. Let's say that now with the settings set that way, I'll just click twice in the same location. And now as I type that text, it just expands around it. So you can see how it did that. If I zoom in on this and I select and edit it perhaps. And let's just say "longer room name". So what happened is that the center point here stayed constant. If I undo this, you can see how that stayed anchored. [0:27:44]

So particularly when you have a tight space but generally any time you're doing a room name, I like doing the center center, because you can place it where it's going to have the least conflict with the surrounding elements very easily. And if you do change the scale of your drawing but leave that text to be visible on the different view or drawing that you're working on, then having it centered or maintaining its center will make it a little bit easier to fit say perhaps two different scales. Now on the other hand, sometimes you have longer text. For example, I may want to put in some text off to the side. So then I may want to have it lined up, let's say left aligned would make the left side multiple line text nice and neat next to the building on here. [0:28:34]

And I might want to make the anchoring perhaps centered on the left side or possibly top or bottom. But now if I go and say draw this box, and say here is a longer note that automatically wraps. You can see that the point that it's stayed constant on is the center left point. If I take out one of the lines of text, you can see that it stayed constant there. So at choosing whether I want to have it anchored or anchored on the left or the right side, possible top or bottom, then it'll make it easier to work with that text. Now by clicking two points, I've created text that has a boundary and will automatically wrap. If I just click twice in the same location then it will be text that will not automatically wrap and you can then just manually use the Enter or Return key to create a line break. [0:29:39]

Labels would be exactly the same sort of thing. So if I go to the Label tool and I say that I'm going to be labeling this, if I click twice in the same point, then it's going to go whatever length until I hit the Return key. But if I click on two points, then it will have a boundary and it will wrap automatically. And certainly when we're doing it from this side then having the label be left aligned like this would be good; whereas if we're doing it from the other side then we might want right aligned. So text and labels are very similar in that way. [0:30:21]

So this concludes our lesson on anchoring your design intent. Working with the tools in ArchiCAD in such a way that ArchiCAD can maintain the important placement. What is important to you when you place these elements? Whether they are structural elements or in some cases annotation elements that have a similar capability in terms of anchoring. So this has been Eric Bobrow. I look forward to reading your comments and questions on the page down below, thanks for watching.

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