



BEST PRACTICES COURSE – WEEK 17 – Complex Modeling PART 4- Non-Vertical Walls

Hello, this is Eric Bobrow. In this lesson, we will take a look at in on non-vertical walls. As you know with the Wall tool, there are different geometry methods; creating straight single walls, multiple walls, boxes, curved walls and things like that. We are going to focus over in this area here where we have a choice of making walls that go straight up, slant, possibly have a double slant, and complex profiles I have dealt with in other lessons. So we won't be looking at that. [0:00:34]

If I have a wall that I am drawing straight, I can do this. If I switch to a tilted wall or a slanted wall, it looks much the same on the plan. And we'll do the double slanted afterward. Now you'll notice that this wall here says 90° and this one as well, but the 90° is gray, because this one is designated as going straight up whereas this one potentially could be at a different angle. Now let's look in 3D and see what we have. [0:01:11]

So if I rotate around here and select the straight wall and press down on the top, you can see I have the option of making it taller or possibly changing its tilt. If I go to the one that is already designated as a slanted wall, then you will see it has different options here. So what happens if I go ahead and tilt this here? You can see that the angle interactively changes and of course I can type in an angle here and get it to adjust. If I go to the wall that is straight up and use the option to tilt it, it works much the same way and in fact instantly changes to be a slanted wall and then this becomes available. [0:02:09]

If I undo, then you can see how it goes back to being vertical and this becomes locked in at the 90°. So there are different ways that you can switch from a straight wall to a slanted wall, but let's see now that I've got it slanted what options we have with this pet palette. We've already seen how we can interactively change the slant. This second option in the pet palette will extend it. So you can see how it's going to keep the angle the same but possibly make it taller or shorter. Let me undo that. [0:02:44]

On the other hand let's just zoom out a little bit. If I use the option here, this one will make it taller or shorter but keep the offset the same. So you see how it's staying in line vertically, and of course that means it's going to change the slant while staying the same on plan. So actually let's look at this on plan before we make the change. See you can see on plan that this wall occupies a certain space here. It starts the base at this point and extends to there. Let's go and actually we'll make a copy of it. [0:03:36]

I will drag a copy next to itself here, and now we'll go back to 3D and take this copy and perhaps stretch it down a little bit. Now you can see how it no longer has the same slant, it has a different slant here. When I go back to the floor plan though, it will have a similar edge. You can see that it maintained the far extent of it, even though the line in the middle, which is the cutting plane, changed. Now let's explore that a little bit further. [0:04:04]



So this, if I were to stretch this up using that option back to here, of course it's going to line up again. Or if I take it further, then it's going to still have the same offset on the plan but now has a different relationship. Now what are we seeing here? We are seeing the wall in a method where we are seeing the cut plane, which is defined by the Document menu, Floor Plan Cut Plane. In the U.S. the default is 4 feet. In international usage it may be 1 meter or something similar. This is where we are seeing the cut. [0:04:48]

Now the actual description, the visual display of it can be changed on the floor plan to show just what's projected and what's below but leave out the overhead. You can see here - let me just move this down - how it's now removed the overhead line; or we could say just show the cut. And you can see now it's showing just what's at that 4 foot or whatever height the cutting plane is. So those are two options there. We can also switch it to outlines only and now it's going to show, if we deselect this, it's going to show just the top. Basically we're looking straight down on this wall in more like a 3D type of view. [0:05:36]

And we also could go and make it overhead all. It will still be a top down view but the lines will be thinner generally following whatever settings are used for the overhead lines. You can see the overhead lines are often put into a different pen color and a different weight, so you can see how this is now looking lighter. So if I back up through this, this is the option for outlines only and the outlines are being drawn with this pen 11. Whereas if I switch this to projected with overhead, then we are going to see the cutlines which are drawn with a different pen; in this case, pen one is a thicker line. You can see it there. [0:06:29]

These are all different options that you may find useful at different times. Let's see what happens when we pop in a window here. If a pop in a window, it looks much like a normal situation of the wall going up. Let's take a look in 3D, and we'll see that this window by default - at least in this version of ArchiCAD and the template for ArchiCAD 16 U.S. - the default for the windows it for them to be associated with the wall plane. So that means that they are going to tilt just the same way as the wall. On the other hand, we could say I'd really like the window to be vertical. [0:07:10]

If we do that, we're going to see that looks rather odd, it's sticking out of the wall. The reason it's sticking out of the wall, in addition to the fact that it's vertical and the wall is straight, is that the wall is not thick enough to contain it. Let's just change the wall thickness. I will select this wall and we'll change the thickness from 9 inches to twice that, so 18 inches. So you can see now we've got a thicker wall and of course the window probably could fit inside of it very nicely. But I need to make this window recess in a different way. [0:07:48]

Commonly in residential construction in the U.S., we have the height of the windows set, to a common height for the header of the window so that all the windows line up at the top, at least many of them do. Now I can switch it if I'd like to measure it to the sill. So let me just switch it this way. And what



you'll notice is that then the window is flush with the face of the wall at the sill. So in fact when we change that reference here, it automatically kept the window at the same height, it just changed the number here. But it also changed the reference in terms of the inset. [0:08:36]

The other possibility that we could do is go to the geometry for the window and say that we'd like to inset it. Now you'll notice to reveal depth here is an option or the reveal this area is something that we can type in. But if I type in something like 6 inches which would be what 15 cm, it goes back to zero which can be frustrating if you don't know why this is happening. The reason why this is happening is that this window currently is set to be put into a certain type of wall construction. If you're having a tilted wall, you may need to switch it to a solid wall here or use a custom closure. [0:09:19]

The simplest thing right now for training is to switch it to a solid wall. You can see now the reveal depth becomes available for editing here. And if I switch it let's say to 6 inches, this will also show up here. And in fact, I can modify it to whatever number I like. So let me just leave it at 8 inches and say OK and you can see how this is recessed in or has a reveal. We do have a rather odd situation with the sill here, and we didn't actually have that when we said that we wanted it to be lined up at the bottom. So that would be one simpler way to do it. And the other possibility is that we really maybe don't want to have a sill on this or a stool. [0:10:09]

I turn this off then we end up with just a simple window context here. So there are different variations that you can try. Let's look at the door options. If I pop in a door here, you'll notice that the door also - at least in this version of ArchiCAD - the default is to associate with the wall. Now that might actually not be able to open very well because it is tilted. So we probably want to switch it to vertical. Let's take a look at a section through this and then see the controls displayed when we have it in a section. [0:10:45]

So I'll just open up the section here, and we're cutting through the door. Let's just select that door here and we'll go into the options here for changing the opening plane to vertical. We'll see that okay, now it's going straight up and down. However we do have some odd extension here. It turns out that that has to do with the casing. And so while you might want to adjust some of the parameters to change the size of the casing, the simplest thing in this case is to turn the casing off. So you may find that by changing the wall type here and changing the casing that you get a nice, clean result for the door modeling. [0:11:38]

We go back to 3D and we will see something that at least is a little bit more functional. So those are some of the options there. If I were to switch the tilt of this wall, make it let's say change its tilt to make it a little bit more, we will still see that these potentially of course have to be adjusted or change it back here. And of course we can change the tilt of the wall numerically. So if I know that I wanted a particular number, then I can do that. So you can see how straightforward it is to control a tilt, but there are some complications or some options you need to be aware of for windows and doors. [0:12:22]



Now let's take a look at the option for a double slanted wall. So I'll go to the Wall tool and switch to the double slanted and draw a piece here. So now we go back to 3D and you can see now I have an option for both sides of this. So if I wanted to make this let's say a common battered wall, then I might want to make it thicker at the bottom. So let's just make the thickness quite a bit wider here and then change the tilt of this to - now if I make it 85, what's going to happen is it's going to tilt out. [0:13:11]

So really if I wanted to tilt in I need to make it more than 90. So 95 perhaps might work. If I wanted it to be on the other side, let me make this one 90 and perhaps this one here 95. So that gives us a basic battered wall type of shape. Now if I wanted to make the top here a certain width - down here, I made it 2 feet across, which would be a little over ½ meter - to make this a specific width I can go to the top and you can see that the pet palette has some other options that we hadn't seen before. [0:13:50]

This first one will basically change the one side only. So I can make it narrower, or I can make it potentially wider. By doing that, I can do this interactively. If I wanted to be a specific distance away from this point here what I could do is position my cursor over that point as a snap, hit the D key to highlight the distance. You can also type R, which would highlight the same value, and now we can say instead of moving it whatever distance it's showing, in this case 2 3/8 feet, I'm going to want to back it up a certain amount. Let's say I wanted the top to be 6 inches. So I would type in 6 inches and then a minus. [0:14:40]

If you're in the metric system then a minus will work immediately, but I can go and in the U.S. if we don't have feet and inches, then I need to type minus a second time. I will type it a second time, and you can see how it backs up the appropriate 6 inches. Then I hit enter. So it would just be for the U.S. and only if you are backing up a distance that doesn't already have a dash or a separator in there. If we want to verify that distance is correct, we can use the measure tool and click on one point and click on the other or hover over it and you can see that it's exactly the 6 inches. [0:15:18]

It can maintain the 6 inches here, but I possibly could move the offset. So I can move this anywhere I like. Now if I wanted it to be straight on the left side, then I can snap to this. See now it's going to go straight up but have the 6 inches or that appropriate distance on the other side. And the other changes that we have, the other options here, would be this option to make it taller or shorter while keeping the same angle. So if I make it shorter now of course it's no longer going to be 6 inches, but you can see how it's maintaining that angle. [0:15:59]

And if I go up higher, you can see how it gets thinner and thinner until it reaches a maximum, and it's not going to go any higher than that. You can see how it stops because it maintains whatever angles were there. On the other hand, if I wanted to use this final pet palette option, this will maintain the 6 inches or whatever I've specified while making the wall taller or shorter. Of course the angle will adjust as needed. So that's how the double slanted wall works. When you insert a door or window it will follow the same sort of rules as in the tilted one. [0:16:41]



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It will do the best it can in terms of cleaning things up. In fact, let's take a look at when we draw a box of walls. And let's get rid of this here. We will draw just simple box of four walls. And before I do that I will put it back into the straight, normal walls like this. So let's take a look now in 3D. If I were to take one of these walls and tilt it, use this tilt option and type in a value for the slant - by the way if we hit A here, you can see how that highlights the slant angle. [0:17:26]

And I can type in 95 or something like that - you can see how it's cleaned up very nicely. In fact we can pretty much take it whatever angle we want, either in or out, and ArchiCAD will keep that box connected. The reason why it knows that these walls should stay connected and the side walls in this case should extend is that their reference lines meet at the same level. In other words, this wall has a reference line. You can see the blue line here, and these walls, these two, are meeting. And the same thing is happening on the plan. [0:18:03]

You can see that they are showing the wall at the cut line, the 4 foot or the 1 meter line, going around. Here's the base of this wall here, and here's where it extends. So ArchiCAD is doing a good job of measuring that. And you can see here is the actual original line. If I undo back a few steps here and go back to the floor plan, you can see how that's where the blue line was. So let me just redo this here. If I wanted to go and tilt other walls, I can do that, and ArchiCAD in general will be able to accomplish that. [0:18:48]

Now if I had more than one wall selected, you'll notice the pet palette did not give me the option of tilting. I can make these taller or shorter, and we will see what happens. You can see how it's attempting to do the best job it can at meeting my requirements here. So you may get some odd results there. If I wanted to tilt this particular wall I just need to select only that wall and then I can tilt it one way or the other. And you can see how ArchiCAD is cleaning that up nicely. And we can even curve these walls by using the standard option for curving it. And ArchiCAD will generally create a clean result as best it can. [0:19:36]

So this is probably a good place to finish up. You can see some of the options for controlling the tilts on one side or both. One other little warning that I've discovered at least with the standard ArchiCAD 16 template is that if I have a straight wall - you remember how I was able to tilt it and immediately switch it to the tilted mode, the slanted mode here? If I don't actually tilt it here but just click, you'll notice that it just all the sudden changes radically. Well look at the angle here that I have put in: 1°. Let me make this 88° or something like that which is a more reasonable number. [0:20:24]

You can see that the default, when I switched it from straight to tilted, was really wildly off. So don't be surprised with that. The simplest thing to do is either switch it before you draw, declare that you want it to be slanted, or grab it and change the tilt in 3D rather than switching the mode first. The same thing will happen if we switch the single slanted one, you can see with the 86° to a double slant. You can see all the sudden how it has a totally weird number here. I can manually fix that by making some number



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that's normal. Although now, I have to change the thickness. The thickness got immensely big. Let me just change it to 1 foot here and we'll have a normal value. [0:21:20]

So again the solution here is before - let me just undo back these three steps here - if you want to draw double slanted wall then it's simplest, if you switch before you draw, switch to the mode before you draw it. The default then becomes a very simple 90 on both sides. You can draw this on the plan or in 3D and you can see how each of these walls in this case has the double slant option there. That is just a little warning about a little odd thing I saw at least in this template. And it may be different if you have a different ArchiCAD version or template file. So this has been Eric Bobrow. I look forward to getting your comments and questions on the page down below, thanks for watching.

[END OF AUDIO 0:22:14]