QUICKSTART COURSE - MODULE 4 – PART 2

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This is Eric Bobrow, we're going to now look at roof construction in ArchiCAD 15. We have looked at it in ArchiCAD 10 through 14, and there are some real differences to simplify, for the most part, how we construct roofs and trim elements to them. [00:18]

So I'm looking at the file from the end of the previous work, where we put in doors and windows, and there's actually an upper story as well. And I'm going to go and say that I'd like to put in some walls. So I'll use the eyedropper to pick up the settings of one of the exterior walls. So I'll go say to the inside face of this wall. So it's picking up that settings rather than the setting of the slab that's underneath it that overlaps in on the outside. Now that puts my Wall tool active, and I'm going to go and use the scroll bar to move over to the side. And I can keep on going. You can see the elevation marker here. I'll just keep going. And by the way, if this palette sort of looks like you've reached the end, you can just use the little triangle to say, "No, keep going a little bit." [01:10]

Now, I want to draw a box of walls, so I'll just switch from single wall to rectangular construction. And I'll just click up above and start to draw this. And it looks like, although I'm drawing a box nicely, the heavy line, which is a rubber band line, is on the inside. I'd like to switch that. So I'll switch the construction method from right to left here. So now, you can see that the lines I'm drawing are the outside of the walls. And I'll set the height or the distance to be 20, hit the tab key, 30, if you're in metric, you can do 7 by 10 or 7,000 by 10,000 mm. Not too critical, as long as it's generally a realistic size for a small building. [01:56]

And now, I'll go to the Arrow tool and select by clicking in one corner, and going down to the other corner. I'll select all four walls, and right click in empty space to say I'd like to move them, but actually not just move one, I'd like to make multiple copies. So I select the Multiply command, or Command+U or CTRL+U, which is the second letter of the word multiply. Now, when I do that, it says, "What type of multiplication do you want to do?" I'll say I'd like to drag these in a row. I'm going to create six copies like I did before in the previous demonstration. And they are going to be incremental. I'm going to show ArchiCAD where the first distance is, and it will create the other one. So I'll say OK. [02:37]

Now, its saying, "What is the drag reference point for this drag or copy?" Or in this case, multiple copies. So I'm going to refer to this point in the bottom left, and then move. And you can see the ghost images as I go will show me what I'm going to get, at least a basic outline. I move it down horizontally, so I'm on the axis, and I'll type in a distance. I'll say 30 feet or 10 m, 10,000 mm. And you can see the very first copy is there, and if I scroll over a little bit further, we'll see the second copy. Now, I really want to start

on the first copy with a roof, so I will click to deselect the walls and proceed to create a roof. Now, with the Roof tool here in ArchiCAD 15, the geometry options are different. We have single plane roofs and multi plane roofs. [03:27]

Now we're going to start out with a single plane roof for a shed roof type situation, and this will be very similar to the previous versions of ArchiCAD. We click on, actually once we select that, then we have a choice of polygon shape, rectangle, or a rotated rectangle. I'm going to do a rectangle, because we have the building right on the axis. And then I'll click on the left hand option here, or left hand wall, click the bottom left to step the pivot line, and the upper right, or just click inside the body of the building to say I want to go up that way. And now it says, "Enter first node of rectangle roof". So I'll just click on one corner, go diagonally opposite to the other one, and click. [04:13]

And we've now created a roof. We're not seeing much, we just have the little tick mark that was up here, but let's draw a marquee around this to be able to see it in 3D. So the marquee is set to the heavy option here, which is what I want, because in case there are things on other stories, I want to be able to see them. So this will show me the whole building in this area. So I'll right click in empty space and use the option that says, "Show Selection or Marquee in 3D", which is either F4 on the Mac or F5. And if you have some problems on the Mac with getting that going to 3D, hold down the Function key, or the Fn key in the bottom left corner of your keyboard while you're hitting the F keys like F4, and it should work. [04:58]

So I select that, and I'll use the Fit in Window option here to be able to see it. And oh, that's really steep. Let's just orbit around this so we get an angle where we can see this a little better. So, similar to ArchiCAD 14 and earlier, we can select this roof by Arrow+clicking or Shift+clicking in the 3D window, and we can change its slope. Now here in ArchiCAD 15, we have the option of setting it in the info box for degrees, percent, or rise over run. I'll just change this to let's say, 4 and 12. I'll just hit 4 there, this would be in terms of degrees, 18.43, or percent, 33%, because that one 3rd - it's going up 1/3 as much as it's going across. So whatever I've set it too, I now need to make these walls extend and join to it. [05:57]

So we'll select all of these walls, go to the Wall tool, and use the shortcut to Select All Walls. This will again, select only the wall that are in the current 3D model viewing. In other words, when I went with the Marquee tool, only these four walls in this one roof were included. So, Select All Walls only affects those. Now I can change the height manually in the info box, so let's say I can make it 20 feet or 7 m, take it up taller. We'll review how you can set it visually using the pet palette in a minute. But right now, it up a little bit higher than the roof, and I'll use the Design menu. [06:40]

Now, the command that in previous versions was called Trim to Roof is now called Crop to Single Plane Roof. And it basically brings up a similar dialog box just with a different name and the word crop instead of trim. And I'll just click on that, and in the same way, it will cleanly make the walls be cropped or trimmed. Now if I select this roof by Shift+clicking on it, so that Shift+click only on the Shift key gives me the Arrow tool, I can change its slope. Let me change it down a little bit, and we'll see that again, we have the same issue with this Command, in that the walls are not adjusting automatically. What we can

do is we can Select All Walls again, and again use the command here which has a shortcut, Command+0 (zero) or CTRL+0 (zero), and just hit crop, and it works beautifully. [07:34]

But if I Shift+click on the roof and change this to a higher angle here, then these walls are not going to respond properly, because if I go Select All Walls, and hit Command+0 (zero) or CTRL+0 (zero) to get the crop, and do this, they're already trimmed too much. So in order to clear that up, I need open up the wall settings dialog, and under the model option, where this panel where would normally focus on the materials, there's "Undo all Crops", which would be like in previous versions "Undo Roof Trim". We say "Undo This", and then I'll click OK, and you can see now they work. [08:18]

And I can do Command+0 or CTRL+0 and crop them again. So, it's still quite usable, but let's look at the new option which is that we can trim this to the roof using ArchiCAD 15's "Connect" command. So with the walls still selected, and I've undone the trim, or the crop, I'll use the "Connect" command under the Design menu. Now we can use Solid Element Operations, it will work exactly the same as it did in ArchiCAD 14 and earlier, but there is a new option called "Trim Elements to Roof or Shell". The Shell tool is a new tool in ArchiCAD 15 that allows you to do complex forms. Maybe for use as roofs, but could be used for other things. [09:04]

But this Trim elements here gives us a little bit different sequence. Now, I asked for it to trim and it didn't do anything. If I look in the status bar the bottom left, it says "Click an element to use as a trimming element." So I'm going to go and hover my mouse over this roof. Now, you'll notice that the cursor has changed to - it still has a tiny little arrow, but it has a little tiny picture of a roof. If I go up higher, you'll notice that the roof looks empty. So I need to go somewhere where the roof becomes black. That's ArchiCAD visual queue to say, "Alright, I see this as an element, I could work with this." It will only allow you to select roofs or shelves. [09:49]

So I'll click on it, and you'll notice as soon as I click on it, it shows the roof as with a red outline. So it's indicating that that's the roof that I'm using. Now, the next thing, it says "Click to select which part to keep from the element. " Well if I did want to keep the walls above the roof, I'd click in that upper area, but if I wanted to keep only the lower ones I'd click below. You'll notice that as I move this up above or below, the blue lines, the heavy blue lines, switch to the area I'm indicating. So when I have the visual preview looking correct, I can click. And now, as you would expect, a nice, clean result. [10:30]

Now if I select the roof again by Shift+clicking here and change this slope oh, let's say, down a little bit, you can see that the roof has moved down. Now there's still a little bit of a preview as long as it's selected showing the original position. But when I click outside it, we can see that the walls have trimmed down below. Now this preview image is not going to get in the way when we're drawing. If I just rotate around, we'll see that the walls are cleanly connected here. And it seemed like that was just a little visual remnant of the operation. So it really doesn't get in the way. If I do select the roof again, we can see that actually, it's not showing those results, or not showing other line. So, we've got the same connection, or the Connect tool gives us the same result as the Solid Element Operations in the previous versions. [11:41]

It actually is more sophisticated, but for our purposes it will work just the same way. Let's go back to the floor plan and continue on with some of the other things that happened in ArchiCAD 15 that actually make it quite a bit easier to achieve some basic roof construction. So I'll use the Marquee tool, I'll put the marquee on the next section, and I'll draw the roof. Now in this case, I'll open up the Roof settings, and we'll take a look. In the Roof settings, we can just close some of these lower ones here. We can work with individual single plane roofs, or a poly roof or multi plane roof. And you notice when I change it, this multi plane geometry goes away. And when I change it back, it becomes available. [12:33]

So when I open up multi plane geometry, it says, "How many roof levels do I want?" Let's see, we can add roof levels using the "Add" button, so we can have multiple pieces, but for now we'll use just one. And it says, "What pitch do you want?" And it says, "Do you want to measure it in percent or do you want it in degrees, or rise over run?" So this would be 12 and 12. Let me make it 4 and 12, and you can see that the preview actually changes. And if we look at the percent here, it will be 33%. So it's very intuitive to work with. [13:11]

Now it will create multiple pieces of roof with an offset for eaves automatically. So I'll just leave it here at this 2 foot 7 1/2, and I'll click the OK button, which is actually off screen right now for your recording, but basically I'll just say that I'd like to do be at that slope, and leave it at the certainly the same height. And say OK. Now when I'm doing the Poly roof method, which you can see is activated in the info box, I can do an irregular or polygon shape, or a rectangular shape, or a rotated rectangle. Now if I'm doing a rectangular shape, there are two options. One will do hips immediately, and the other will do a gable. So let's start out with the simplest, which will be a gable. [13:57]

When we do a gable and I click on this corner, you see as I move horizontally, it's proposing that the ridge line move horizontally here. But as I get a little bit longer, so that it's actually taller rather than it is wide, then it switches. So it's smart enough to know that in most cases, that ridge line will be along the long distance parallel to the edges. And I'll click again. Now, it looks like nothing really happened, but if you look closely, there are some dotted lines. So the roofs are being shown with a very faint dotted line. Let's take a look in 3D. So I'll just choose that, and we'll see that they actually have automatically created the overhang and they look just fine. [14:45]

And we can do the trimming operations like we did before, but let's just go back to floor plan and get the look of these roofs to be a little bit more visible. So I'll hold down the Shift key to get the Arrow tool, and then click on the edge of the roof. And you can see that it selects when I select it, let me zoom out a little bit here. You can see that it's selected both sides of the roofs, so it's selected all of it as a single element. And I'm going to go and open up the settings of the roof. And instead of looking at the geology for the planes, I'll be looking at the floor plan information, meaning how is this going to be drawn on the floor plan. And if I scroll down in this area, you'll see something about outlines. [15:36]

These are the edge lines of the roof, the outside edges of the roof, and they're up above the current cutting plane. In other words, on this particular story, which is the ground floor, it's up above. And so it's called "Overhead Lines." And they are being drawn with a dotted line. Now I would prefer having it dashed, so I'll use the dashed option here, and say OK. And you can see now they are certainly much

more visible. I like that a little bit better. So that was much simpler to create, I didn't have to figure out the halfway mark, and the offsets for this were built into it. [16:16]

Now let's take a similar option off to the right, and the next one, and we'll draw the marquee to select what I expect will be the next one. And now I'm going to go back to the Roof tool. And in this case, I'll go ahead and let's see. Let me look at my plan here. So I will go ahead and draw the same type of a rectangle here. And you can see how of course it did the same thing, but it's actually got the dotted lines, and I would prefer the dashed. So I'm going to use the eyedropper. So eyedropper up here on the previous roof, to pick up the settings. And if I'd done that before I drew it, the new roof would have had that setting. But since I'm doing it after, I need to use the Syringe tool to inject. And I can go along the edge of this, or corner, and click on it. You can see how it's highlighting it, saying, "This is the one that you're going to be affecting." And now that roof has updated. Let me scroll over a little bit further to the right here. [17:25]

Now in addition to changing its appearance like this, and let me draw a marquee a little bit bigger so we make sure we're going to see it all. I would like to adjust the angle like we did in ArchiCAD 14's demonstration. So I'm going to go and with the Arrow tool, I'll select this roof, click anywhere on a corner or edge, and I'm going to go and point out some things in ArchiCAD 15, how of roofs are represented. We have the outline of the roofs, and only have the pivot line or the reference line. So we have the two pivot lines with the tick marks, but there actually is also a blue line going around completing the rectangle. [18:10]

Now we can go to any one of these edges and affect it, just that particular plane; or we can control a lot of different things. So I'm going to go to the edge of this pivot line, press down; and you'll notice in addition to some of the polygon editing options we're used to, there's one here on the far right of the pet palette that is brand new in ArchiCAD 15. When I select this one, it's indicating that it's going to be editing that particular plane. So this plane has a certain angle. Let's change it to 4 and 12. Let's change it down to 2 and 12, so it will be lower, and let's just say OK. So I'm only going to change this one thing to the one plane that I'm talking about, rather than all of the ones on this level. We only have one level to begin with, but we could affect all levels or all planes if we wanted to. And I say OK, and you can see that it has actually adjusted the position of the ridge line. So let's go back to 3D, and see this particular one. [19:19]

Now, I had just the roof selected, so when I use the shortcut to say "Show selection/marquee in 3D", it's only showing the roofs rather than the walls. That fine for right now, but just remember that if you want to show an area, you need to have nothing selected, rather than having something selected. Now let me go ahead and shift click on the roof here, and you'll see the preview is quite different in 15. It's got the reference lines in blue sort of floating at a constant height down below. And then you see the outlines in the green. Now let's say that I wanted to change the edge. So again, I can go to this edge, and again use the same option. And let's take it down even shallower, and you can see how it adjusts the shape automatically. [20:08]

Now, there is another option for adjusting where that ridge line is. I'll go back to the floor plan. So in ArchiCAD 15, when we get to the floor plan, we can adjust the ridge line manually. We can literally go and grab the ridge line, and use the pet palette or editing palette here, and move it around until we get it to look the way they want. But it doesn't seem to allow me to snap to precisely, so I wouldn't necessarily use that as a primary method of doing it. And you can also see how it suggested the overhangs in a way that isn't quite what I would expect. So I'll just say Undo that, and perhaps if I wanted to get the symmetrical again, I can I go to the outer edge here and choose the option to edit the pitch. And I think it was 4 and 12 is what I had. And I'll say OK, and now that's precisely even. [21:02]

So let's now go to the next option here, and we're going to be actually creating the shape with the hip. Now I'm actually going to skip this one, because we don't have to do it manually. We don't have to create a gable first and then a hip. So let me just draw a marquee around this next one. So we'll skip the one that we no longer need to work with, and I'll just go to the Roof tool. And this time I'm going to select the rectangular creation but what the hip. And I'll just click on one corner, click on the other corner, and you can see how instantly it's created the four roofs with a nice hip. If we take a look in 3D here, we'll see what you would expect on that. [21:54]

So now, let's go on to say, "What if you want to use the magic wand, can you do that?" Well let's just get the marquee prepared for this one. And we'll go to the Roof tool. Now, if you've already got the rectangle, you might as well just use the rectangle. But sometimes you might want to use the Poly roof or polygon method. And you can use the magic wand here to outline it. And it does the same result. But of course it can do a more complex shape. Now, what I want to show you is how you would possibly, if you had a complex shape, how you would take one end. Perhaps most of it is going to be hips, but in one or two places you want to have some gables. So what you are going to need to do, you don't delete this roof edge, you actually press down on the corner here of this node and tell it that you'd like to move just that node. [22:58]

And you can see that there's a new editing option in the pet palette here. So as I activate that, well here we have a little glitch in ArchiCAD where I've activated it, but it's ignoring it. I need to switch to a different mode, and then switch back, just in terms of the pet palette, and then now it's paying attention. So I've noticed that in different versions of ArchiCAD, that sometimes the pet palette doesn't seem to respond until you do it a second time. Now what you can see here is that it's moving the whole plane. If you look carefully at this bottom plane, it's actually showing a preview of it as it becomes more and more vertical. [23:35]

And when I bring it way out to the point where it's at the edge, then it's going to become so vertical that it will disappear. Now I'm going to click on it, and look carefully because it's going to actually snap back to the face of the wall. So you can see how it actually became a gable. We'll look in 3D and see what that did. You can see how it's a gable and. But let me deselect it. I'll go the back to the floor plan, deselect, and then go with the F4 or F5, and we can see that it's actually exactly in line with the face of the wall. So in order to adjust that, I can do that in 2D or 3D. I can select the roof system. So selecting any one of them will select the whole system, and then I can go to the blue edge line here, which is the

reference line for the roof, press down, and use the option in the pet palette that allows me to affect just this one edge. [24:37]

You can see this little icon and it has a little shaded area just for the one plane that I'm going to be affecting. And when I do that, it says, "Alright, we're affecting just this one plane." We had used this before when it was a pitched side, to change it from one slope to another, and make it asymmetrical. But now it's a gable, and now I'm just going to change the overhang. So let's put it back to 2 feet or perhaps 500 mm here. Whatever you'd like. And I say OK. And you can see how the blue line stayed the same, but the roof now comes over with an eve overhang as we had done before. Now again, if we want to make the wall connect to it, we need to select it. And we can go say to the top of the wall, and use the pet palette to stretch. [25:32]

So I'm using the pet palette to select, say I want to move it up or down visually, take it up to perhaps where it snaps to the top of the roof, and then use the Design, Connect, Trim Elements to Roof or Shell. Remember that it's - look at the status bar says, "Click an element to use as a trimming element". I'll select just this one roof. You notice that the cursor changes from an empty roof to a black roof indicating, "Oh, I see a roof there." And I click on that, it outlines the roof in red and shows also the area down below as what is called its "Connecting body". And it's saying, "Do you want the lower area of the wall in blue, or do you want the upper one?" So of course I want the lower area to remain, and it does a nice clean trim. [26:28]

So let's go back to the floor plan, and we'll do one more here, just to show the complex situation which is handled very, very easily and elegantly. So I will go with the Arrow tool and select this lower wall. Once I click on it, and it selects it and gets the handle, I can go to the end of its reference line, press down, and with the stretch indicated here, just move it a little bit to the right. Now it's on the guideline, and I can type in a distance. I'll say 28 feet or this would be let's say 9 m. And then I'm going to use the eyedropper to pick up the settings of this wall. So that the next wall, the next thing I'm going to draw will be a wall. I click on the outside of the wall to deselect it, and get ready to draw new walls. And instead of drawing a box of walls, I'll pick the Poly wall, and click on the bottom right to say I want to connect to the outside corner. [27:29]

Go up 12 feet, or that would be 4 m, and go to the left here until it gets either an intersection or a perpendicular snap, and we can see the angle and the distance are very nice, and click. And then just click one more time to say, "This is where I want to stop". With a distance of zero, it will take that as a starting point. Now I want to trim off this extra piece of wall, so I'll hold down the Command or CTRL key if you're on Windows, and if I get the scissors. When I go to the edge of this wall here, I get the scissors with a black appearance, indicating that it's ready to go. Holding down the Command or CTRL key, I click, and it disappears. And it's trimmed back. So now I'm going to go back to the Roof tool, and I'll make sure I'm in the multi plane method here. And in this case, I'll use the complex roof, meaning that it's going to allow me to create multiple points and it will calculate all of the intersections. [28:36]

And I'll use the magic wand. So again, I can use the magic wand by either pressing down the space bar, and can see it appear onscreen. Or I can go to the Design menu and say, Outline Polygon with Magic

Wand. And then, I get the magic wand, and I can click on the outside corner. Click, and there is our roof system. And if we need to take off one end to make it a gable, we would follow the process that we did a minute ago. So that concludes our basic introduction to working with roofs in ArchiCAD 15. In a little bit of a contrast and a follow-up to the methods that are used in ArchiCAD 14 and earlier. [29:17]