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QUICKSTART COURSE - MODULE 6 – PART 3

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Hello, this is Eric Bobrow. And in this lesson, we'll take a look at creating stairs. This is a rather complex topic, so we'll take a look at creating the basics of the stair and adjusting it to fit the context of the model. [0:15]

Here's the project as it stands from the end of the previous lesson. Let's just take a little Marquee view to see what it looks like if we cut away at part of it. So I'll activate the Marquee tool, and I'll draw a box just on the left side of the building here. Now the Marquee has two variations, the thick and thin one. So let me just show you, if I pick the thin version of it, you can see how it changes visually. Now, I'm going to use the option of right clicking in empty space and saying, "Show Selection or Marquee in 3D". It does have a keyboard shortcut. On my computer right now, it's set for F4. On yours it may be F5, particularly if you're on PC. And if you're on the Mac, you may have to hold down the Function key, the "Fn" key on the lower left of the keyboard, to make it accept the F keys. But you can always do it with a right-click. [1:11]

So I'll select that, and we'll take a look. So here, you can see part of the building. I'll just rotate this around. I'll use the Orbit tool here, and rotate this around. So you can see we've got the kitchen, and we've got this living room area with the entry door. But it's a little bit hard to tell what's going on, or say what we need to do for the stair without seeing the second story or the upper story. So let me go back to the floor plan. I'll click here on the icon that takes me back to the floor plan, or I can hit F2 or Function F2. Now I'll switch the marquee. The Marquee tool is still active, so I can just switch in the Info box to the heavy marquee, and then use the same command, to go to 3D with just what's in the marquee showing. [2:02]

And now we can see, if I zoom out a little bit and pan down by pressing on the center mouse button, we can see now what going on here. We do want to go up to the second floor, to the upper story, but we need to put a stair there, and then we will need to cut a hole for that stair. So let me start by putting in a stair. I'll hit the F2 or Function F2 and go back to the floor plan. And let's just see where this is going to fit. It is going to fit immediately next to this door here, and it will go up above this wall, and it will actually be ending above the kitchen in the room up above. Now it's a little hard to visualize that when we're only looking at one story. So let me go in the Project Map here, I'll right click on the next story up and say, "Show as Trace Reference". [3:01]

And you can see now the view of the upper story is shown. I'd like to measure between this door here on the current story and the door up above; because I need to fit the staircase in between those two.

And since I want to really zoom in tight but very carefully, I'll use the magnifying glass plus, and then I'll just draw a little box between these two points. And what it will do is it will expand the area that I'm outlining to fit the window, in this case from top to bottom. And it will show me whatever it's available left to right at that point. So now I can use the Measure tool here, I'll just click on the Measure tool, and I'll go to the corner of the casing here of the door and go to where I snap to the corner of the casing up above. That's not quite going straight up and down, because the casings are different thicknesses. But what I really care about is the vertical distance, at least vertical on the plan, that's the "Y" Coordinate. And it says that it's 9 foot 1/4 inch. So I figure I can make the stair 9 feet in length. [4:10]

If you're in the metric version, then you just take a look at what that number is, and make a note of some nominal size for the stair that would be less than that. And I'll hit the Esc key to cancel the measure. And let's take a look at creating the stair. So, when I go the Stair tool here in the toolbox, you'll see that it shows some Information about the last stair that was active, which in the template is set for the L shaped stair, at least that's what it is on mine. And I'll click on the icon for the stair in the Info box, and that will open up the Stair Default Settings. And you can see the 3D view here, perhaps you're seeing a plan view, but you're going to see a preview of it. And most likely you'll see "Stair" highlighted in this lower left area that's the active one. [5:07]

Now we want to make a straight stair, and there are a number of different straight stairs. You can see wooden ones here that are straight. But I'm going to pick the one that's generic that just says "Stair Straight 15". And in whatever version of ArchiCAD you have, pick one of the straight stairs, and you'll be able to follow along for most of the things that I'm doing. The stairs have evolved over time with ArchiCAD, so the one I'm working with may have a few more options or bells and whistles than what you have, but the basic ideas will still be the same of course. So let's take a look at this. Here's a Plan view, here's an Elevation view, and here's an Angled view and Shaded view. Let me take a look at the Elevation view, and we'll see if that we have a certain number of treads going up, we have a certain type of railing. And all of these things can be adjusted. Now there is a link here, so you can see this horizontal distance says 13 feet 9 inches. [6:10]

Now remember that I determined that it could only go 9 feet in length. So it's going to have to be a lot shorter. So I'll type in 9. And what we'll see is that all the sudden the stair becomes much, much steeper. Well, it may actually be too steep to be permissible, but let's see what we actually end up with, because we need to adjust some other things as well. Now the height of the stair, you might think it's going from the bottom of the stair to the top; that it needs to be the height from one story to the other. But actually, in this particular case, we're going to stop the stair at just below the upper story. In other words, it's going to stop one tread or one riser short of the floor slab. [6:59]

So in this case it will be a little bit lower. Let's just check. I'm going to say OK. And without putting in the stair, I'll go hold my place so to speak by clicking OK, and then I'll right click on any one of the plan representations in the Project Map or the View Map, and ask for the Story Settings Dialog to be brought up. And in the Story Settings Dialog, you'll see something similar to this. If you're in the international version, it may say ground floor and floor two or something like that. Or floor one here, and floor two up above. But basically, what we're interested in is what is the height between the stories. So in my

project here in the U.S., it's 10 feet. And metrically it's going to be 3 m or 3,200 mm or something like that. So I'll go back now, having determined that its ten feet, and I'll open up the Stair Settings again. Now, the stair will be less than 10 feet by the distance of one riser. [8:03]

So let me just guess that the risers are going to be about 8 inches. And I'll just make this 9 feet 4 inches here. And you'll see that it gets a little bit less steep. It still may be too steep to be permitted, but let's see what we can do with this. Now, I'm going to close up the Stair Settings, which shows some the graphic options for the symbol, and I will look at the parameters. And you may need to go and bounce around between parameters, the visual settings and the Floor Plan And Section to make adjustments. Follow along with me, or watch this and then try it on your own to see where these controls are. Many of the controls in the parameters are also in the Stair Settings, just in a different visual form. But we'll take a look at the tread and riser sizes which I believe are only available in the parameters here. [8:53]

So if we look here, it says there's a number of risers, 18. Well, from my experience, that may be more than we need going this particular height. So I'm going to put in 14. So you can calculate that for your own needs. But when I put it in, you'll see that the tread height changes. I'll put it back to 18 here, and you'll see the little gray thing, it updates. That was saying 6 7/32 inch, so that was very, very short. Let me take it to 14, and you'll see that this will update to 8 inches. Now that's still actually a pretty reasonable tread height. Now the tread depth, which would be the tread of the step that you're going to be stepping on, is 7 23/32 inch. So it's really very, very short. So that would be about 1/5 of a meter, so about 200 mm. So this may actually again be little bit tough to get permitted, but let's just see what happens when we build it into the space. [10:00]

So right now we've made a change to the height of the stair. We've made sure that the length will fit in based on the constraints we have with the doors on either story. The width of the stairs is something we haven't talked about. Let's just take a look on the plan representation. So the width of the staircase, I'm going to make it less. I'll make it 3 feet or 900 mm or something like that. And let's see what that does. Now the stair is facing to the right, and as I move this a little bit you'll see of course it needs to go up and down. So what I'll do is I'll just change the angle. I'll type in 90 here, and you can see that it rotates around into position. [10:45]

Now, all of these little X's that we're seeing here are going to be points that we can select or snap to, but also the one that I use right now, and I'll just click in this bottom left corner, that's going to be the one that will be used for insertion. So when I click on the plan, that is where that click is going to be related to this element. So I'll say OK, and I'll just click to see what happens. When I click OK, you can see it dropped in right where my cursor was. Now I'll go and move this into perhaps a better position. I'll select it here. And we'll zoom in a little bit. And pan. And let's say I want to put the side of the stair right against that wall. So I'll go and grab this and use the pet palette option to move the whole stair as opposed to stretching it. And I'll just make sure it has the Mercedes three line symbol to indicate that I've snapped to the surface of the wall. [11:47]

Now, what we're seeing here is the top of the tread, and underneath would be the riser. So there's a little bit of an overhang. And this can be adjusted, and sometimes of course you may not have an

overhang or nosing. But in this case, I like the nosing, that's just fine. So what I'm going to do is press down on this one, and say that I want to move the stair. It's so I'm using the pet palette option to move. And now, I'd like to line this up where horizontally it's going no further than the edge of the casing. Now, one way that we can do this is to move it vertically like I am and press the Shift key. When I press the Shift key down, when I'm in a drawing or editing operation, it will lock the angle. You'll notice that the angle stays at 90, even when I move my mouse way to one side or the other. So now I can actually go and find the snap point that would place it in line with the edge of the casing. With the Shift key still held down, I click on that checkmark, and you can see how beautifully that fits into position. [12:53]

Now I'll just go back to my previous view here and we'll take a look up at the top. That's pretty darn close; it looks like it's just barely cutting into this casing. And maybe we could adjust the width of the casing. I'm not going to worry about that right now, I'll just work with that. That's certainly close enough for our purposes. Now let's take a look in 3D. I'll just deselect this by clicking outside it, and then I'll right click and say "Show Selection or Marquee in 3D". And we'll see the stair now is fitting in between the doors of the lower story and the upper story. We do need to cut a hole here, and I do want to just get a sense of if this stair really is the right height. [13:40]

So if I select the stair right here in 3D, I'll take it out of Orbit mode in order to be able to select, and I'll use the Shift key or the arrow key to select perhaps the stair. Now it's a little bit hard to see, because it's buried, which is exactly what I wanted. But let's just see if I orbit this what happens. So you can see that the tread goes here, and there's another one going in to the floor slab. So that looks about right. So let me proceed then with cutting a hole. Now by the way, I just orbit using a shortcut. If you press down the center mouse button and you can pan, which you can do in almost any view, and then while you hold down you add the Shift key. It will immediately switch to Orbit mode, and then you can let go when you're done. So that actually is a great shortcut for orbiting. Hold down the center mouse button to pan, but add the Shift key using your other hand of course, and then you can drag around while orbiting. [14:49]

Now let's cut a hole for this and see how that starts to shape up. So I'll go back to the floor plan. And so I'm on the first floor, the ground floor, and I want to go up to the second floor. So I'll go up here to the second floor, and I can't see the lower story. So let me right click on the first floor and say Show as Trace Reference. So now I can see where that stair comes to. I'm going to go with the Arrow tool and select the slab. Now as I hover over the area of the slab, you can see that it's proposing that maybe I want to select the roof. But in the bottom left preview or pre-selection highlight, it says "Multiple Elements" and then the word "(Tab)" in parentheses. So all I have to do is hit the Tab key, and it will propose "Would you want to select the slab that's also in the area?" So then I can then click, and it will select whatever was the item that was last indicated. [15:50]

Now that I've selected it, I want to cut a hole in it. So I'll go to a corner or an edge, press down, and in the pet palette, I'll use the Boolean Subtraction, the one in the upper right corner that has a minus sign. And having selected that, it's waiting for me to click a series of points to define the hole that I'd like to subtract out. Now, the geometry method in the Info box is set for rectangular, which is perfect in this case, rather than polygon or rotated rectangle. Since it's rectangular, I can just click on the corner here

when I have a checkmark. Actually let me just cancel this, because I got the wrong point. I could see it was not quite on there. So let me go ahead and just again press down on a corner, get the Boolean minus, and then I'm going to zoom in a little bit and make sure that I get that point exactly. And you can see that it's perfect. [15:52]

And then I can zoom out right while I'm doing this, just rolling the mouse button and rolling it again until I am seeing the point that I need to snap to. And I'll click on the inside face of the wall. And you can see how the slightly colored shading of the slab indicates that a hole has been cut out in the right location. So I'll just deselect by clicking outside of everything and then go to 3D. So I'll just click on the 3D icon here, and look at that. That looks pretty darn good. You can see that the last tread is underneath the floor by what looks like a good amount, and everything has a space. [17:37]

Now I do notice one more thing that needs to be adjusted here, it's very subtle from this view. But if I Orbit a little bit we'll see that there is a little problem. And I'll zoom in on this. With the wall that is in the lower story, sticking up through the stair. Now it's a little hard to see here, but let me switch to the floor plan and perhaps we'll just place the marquee in a different location where we can see it better. So I'll use the Marquee tool, and I'll just draw the marquee, let's say cutting only part of the stair or showing just part of the stair. [18:22]

So now, when I go and say show that in 3D, we'll see there is a wall down from below that is sticking up. So in order to resolve this, we're going to use Solid Element Operations, which we've looked at in connection to trimming walls to roofs. But it's a very useful tool for things like this, as well when working with roofs. So I'll go to the Design menu. If you're in ArchiCAD 10 to 14, you'll see Solid Element Operations near the upper part of the Design menu. If you're in ArchiCAD 15, you'll see Solid Element Operations is as a sub-command under the Connect menu. In either case, it will bring up a dialog box like this, and we can then select. I'll just use the Arrow tool to select, for example, this wall and make it the target, so that it will be modified. Then I will just click on the stair, and make it the operator. [19:25]

Now the operation will be to subtract out where the stair is and everything above it. So basically, wherever they intersect will be cleared out and anything above it. That will remove where the stair passes through the wall and that little piece that goes up. And I'll click on Execute. And you can see beautifully what happens there. When I select the wall, you can see that its actual shape has been trimmed out underneath here. You can see the green lines there. So that will make a beautiful change, and make the model look good even when you're walking up the stairs for example. So we're now pretty done, except that perhaps I want to do some tweaking to the stair. It's got railings on both sides, and we probably don't need a railing against the wall, or at least not a whole built up one like this, maybe just a handrail as opposed to a whole balustrade. [20:26]

So I'll select this stair, and even right here in 3D, go and look at some of the options. So we can take a look in the preview and see that, yes there are the two stair rails with a balustrade. Now in the parameters, you can see it says "Rail" and it says "Both". Let me just press down on it, and it says perhaps you don't want both, maybe you just want it on the right side, or left, or none. I'll just choose

right, ah. That looks more like what I want. Now I don't really like the balustrade, I'd like to try something different. So I'll press down here and you can see that there's a lot of choices. Now I could pick another one like this, and look at it, but it's a little hard to see. [21:22]

So let's take a look in the Visual Stair Settings. So I'll click on this little triangle here to open that up, click on the triangle for the parameters to close that up, just because I have a limited amount of resolution for the recording. And let me press down at the top of the stair settings and say, "Is there one of these that's going to show me how this looks?" And I say, "Railing Type Right". Well, OK, I've got a railing on the right side; let's see if that gives me some choices. Yes, that gives me some choices. So I can flip through this and say, "Which one do I want?" and just move through this. And I'll pick the one that says "Wired". So, it's very easy to see the preview here, it's not so easy to see it in this little window. But I'll click OK, and you'll see now it's got a wired railing on just the one side. That looks pretty good, alright. So I'll accept that, and move onto the next part of this lesson which would be railings. [22:15]

So clearly we would have a hazardous situation if someone were to walk near the edge of the stairwell; we need to put a railing here. So let me go back to the floor plan, so I'll click on the floor plan icon. Now the other thing is the symbol. If I were to turn off the Virtual Trace by clicking on this icon, we'll see I don't even see that there's a stair there. And normally you would want to have a stair symbol. Now instead of drawing a 2D something or another, why not show the stair itself both on the lower story and the upper story? Okay, well let's take a look at that. I'll go down to the lower story and I'll select the stair. So I'll just, with the arrow, click on one of its handle points and look at some of its options. Now we just changed the settings in 3D. In other words, it would only have a railing on one side. But let's look at some of the things for the plan representations. So you can see there's something that - actually before we do that, I apologize, we'll need to look in the Floor Plan and Section. [23:27]

So it is a little bit tricky to remember where things are, but take some notes while you're watching this lesson and you'll be able to find some of these more easily. Now the basic control for how any element is going to be seen is often controlled under the Floor Plan and Section. And you can see Show on Stories, Home Story Only. And I'm going to change this to Home Story and One Story Up, because I've placed the stair of the lower story, or ground floor, and if I would like it to also be seen one story up. And there are some variations here, and you may temporarily say you want to show all things one story and then later restrict it. These are variations that will depend on what type of element of this, for example, stairs have some options; roofs have different options, and walls have yet other ones. They basically will give you enough controls to get what you need, but they will vary depending upon the element type. [24:23]

So let's take a look at this on the plan. I'll say OK. And I don't really see a change here, but if I do go up to the second floor, the upper story, we'll see there's that stair. Now, it's not looking quite what I want, because it is sticking out. Now I could put it underneath the wall. In other words, I could bring the wall as a display element in front. But still the stair is showing its lower part, which typically would be cut off with the break line. So what I'll do is I'll select the stair again, now I'm on the upper floor, and I can still control it, because now it's showing on both stories. So let's take a look at the next part of the control, which instead of being in the Floor Plan and Section General controls, are under the Stair Settings where

we have a control for Story Sensitivity and 2D Above Home Story. So, a little bit of a funny term for it, but basically is it going to be sensitive to what story you're looking at it from? [25:28]

So if I choose that, then it says, do you want to have a symbol, the 2D line work that's sensitive to which story it is? And if so, in the plan or 2D representation above the home story, should it show the 2D under the break mark? In this case, it's not going to show it, because this is unchecked. I'll say OK, and lo and behold, we now have a symbol that looks pretty good. Now, there are some other options. For example, this shows that the stair is coming up, and perhaps you may want to have this show a line going down. So I'm selecting the stair - a minute ago I selected the slab by accident, and then I click on one of the points that that is unique of the stair to select it instead of the slab. [26:19]

So I'll open up the slab settings, and let's take a look at another option that will be found in many of the stairs, but depends on which version of ArchiCAD and which library you have. So we'll look at up and down and the numbering. So when I select that, you can see it says Text, None. Well what is that referring to? Is it going to show the word "up" at the bottom? Is it going to show "down"? How is it going to show the direction? And I'll just choose and look at both story sensitive. Say OK, and we'll see now, all of the sudden on this story, we see the word "down", and the arrow has switched. And when I go to the lower story, when I double click on that, you'll see it has the word up here. [27:10]

So now it's looking pretty good. There are other variations. Do you want to see the handrails? You want to see at a certain scale the nosing, the double lines for where the overhang of the tread is? All of these are things that you can adjust, and there are some other options. I'll deselect this stair and just point out that in addition to the Objects which we've been working with; there is an option to create a stair here which uses a whole different interface called "Stair Maker". And if I click on Create a Stair, you'll see it brings up a whole different dialog box. And if I say OK here, we have this whole different world on how to create stairs and how to create treads and things like that. [27:59]

Now I'm not going to teach you that it is beginning course, but Stair Maker does give you even more flexibility than the Objects that we've been looking at. So I'll just cancel out of that, because I don't really want to create a new stair using that alternate method. So this completes our lesson on stairs. It certainly doesn't teach you everything about stairs. There'll be a lot you will need to experiment with, but it will help you to get started. This has been Eric Bobrow; please share your comments and questions on the page down below. Thanks for watching. [28:30]