



BEST PRACTICES COURSE – WEEK 16 – Roof Modeling & Documentation PART 5 - Simple Hip and Gable Roof Systems

Hello, this is Eric Bobrow. In this lesson, we'll look at simple hip and gable roof systems, those with a single plate height. We'll start out working in ArchiCAD 14 with techniques that apply for ArchiCAD 10 through 14, and then we'll switch over to ArchiCAD 16 and look at some of the options that have been introduced starting with ArchiCAD 15, which dramatically changed the way roof can be worked with. [00:29]

So here in ArchiCAD 14, we've got a simple building. I'm going to activate the Roof tool and go to the Hip Roof Creation mechanism, the poly roof. And then I will use the magic wand by holding down the space bar and clicking on the corner of the building. It will then trace this and create a poly roof, which will be a series of roofs with the same roof slope, thickness and an overhang of whatever I set originally. Other settings of course can be adjusted as well. Now when I do that it creates a coherent system, and I can then work with it and make modifications as needed. Now if I select a roof plane, I can modify it, but if I want to change the attributes of all of them, then I might want to do Command+A or Ctrl+A with the Roof tool active because that will select all roofs. [01:25]

And then I can, for example, raise this up a little bit because it's a little low. Now it's going to be more appropriately situated for the building. I can go into the settings for these six roofs here and perhaps change them to be a different color so that they read a little bit better for our presentation. I can even change the slope say to 6 and 12 here. So you can see I've made a number of changes very quickly. However, if I wanted to change the overhang, one of the problems is that I can only do this at one plane at a time. So for example, if I select all of these roofs and I go to the edge here and I use this offset, it will only affect the one plane at a time. There is no option here, I will just undo this, there is no option for going to the outline and affecting all of them. [02:18]

You can see how it would affect only the one plane that I've got. So I'd have to do this one by one here. I could perhaps type in the distance 1'. If I want to make instead of 1' across, I want to make it 2'. And just to verify, if I measure here on the floor plan, this is now exactly 2'. So I can do this in 2D or 3D. To change the overhang for all of them, I can select all of the roofs with Command+A or Ctrl+A, and then just go around and grab each one. It will still remember the offset command as I'm doing this, and just snap back into position. You can see that although it's multiple steps, it can be pretty quick because I can snap each one to the other adjacent ones. Now they're all done. [03:08]

Now one of the things that I want to do here is show what happens when you have a more complex shape than just the L shape. So having changed the slope and other settings, the color, I'm going to use the eyedropper. Use the Option or Alt key to use the eyedropper to pick up the settings of the roofs, so that way when I delete them and start over, they will have those settings. Now I'm going to go and add a little bump out here. I will go and draw with the box of multi-walls and make it 12' x 4', typing that into the tracker. Now this is a shortcut I've realized is quite nice because I can simply select that extra piece of wall that was created and delete it, and then hold down the Command or Ctrl key to get scissors and trim out the extra part that bridges that area. [04:02]

So that's what I found to be a very quick way to add an extra piece to a building. Now I'm going to go back to the Roof tool and I need to reactivate the hip roof. It tends to go back to the other method when I switch tools. And I will go and click on this and again do this perhaps with the 2' overhang. But notice that it's created a bump out with the roof hip extension. And it will certainly work well if that's what I want. But if I wanted to have this perhaps a single plane and then extend it just with that one plane over this overhang, then I would have to delete these pieces. And I can delete them actually here



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if I rotate up. I can delete them here and in 3D or in 2D. And perhaps if I wanted to simplify this then go and use the pet palette to combine nodes on top of each other and end up with a nice clean result. [05:06]

But there is another way to do this. I will just undo back all of those steps. And now instead of using the eyedropper with the poly roof method, I'm going to actually manually click on the points that I want. So I can skip over this area and just define what the main lines are that I'd like to follow for this construction. And when I do that, it creates the simple arrangement. Now if I want to change the slope of the end, and certainly sometimes you want to make the end a different angle, different slopes, I can go change that setting. For example, from 4 and 12 to 8 and 12. And we will see no change on the floor plan. But if I go to 3D we will see that it's now steeper. Of course that means that we have to adjust the adjoining pieces. [06:01]

Now I could try to manually calculate that, but ArchiCAD has a very simple way of adjusting things. I can select the roof, for example like this one, and tell this other roof's edge to adjust by holding down the Command or Ctrl key and clicking on that edge. And you can see how it filled the gap and actually now has found the point where it needs to meet the other roof here. And I can go and for example take this point and snap it there. These edges are not actually fully meeting. This corner is meeting and this edge is correct, but I need to correct the other one. And to do that, I could reverse the operation. So I can actually go and select this roof as the controlling one and then Command or Ctrl click the edge of the other one and you can see how it neatly snugs up. [06:55]

Sometimes it's easier to do it on the floor plan. So I select this roof and Command or Ctrl the other one and then zoom in and perhaps and do the inverse, which means that I will deselect, select this roof as the controlling one, and Command or Ctrl click this edge. So now we have a clean boundary, but I would need to manually modify the overhang because the overhang here actually is going to be a little bit shorter because it's a steeper roof. So you can see now how it's getting a fairly clean result. We're going to have a little bit of an extra piece there which we'll deal with in a later session, just talking about some of the details that might be necessary. [07:38]

Now if you want to turn this into a gable, we can select this piece and get rid of it, and then we can adjust the others. Sometimes I would prefer to do this on the floor plan where I can go and use the Shift key or the guidelines and snap these points together like this and of course get a nice result that if I look at it in 3D. But sometimes I may prefer to do this right here in 3D. So I'll just go back to 3D and show you how I like to do it. I will select this, press down on this node point, make sure I'm in the option to move the node, and then go approximately in the right direction, press the Shift key to lock it, and you can see how it's locked going straight, and then snap it for example to the other point. Take this one and again move the node right on top. And I can do this directly right here in 3D. [08:30]

So let's make this end wall trim to these two roofs. So I'm going to go and select this wall here and use the option to raise it up right here in 3D. We have a few ways that we can do this. Under the Design menu there is a command that says Trim to Roof, which seems like the most natural one to use. It will ask you if you want to trim off the top or the bottom, and we will just use the default, and that will trim very neatly and instantly. So it's a very quick command to work with. However the problem is, if I select these roofs and make them a different slope like this, you can see that the wall did not adjust. So what I want to do is undo these steps and use a different command. I will select this wall and go to the Design menu, Solid Element Operations. [09:21]

And in the Solid Element Operations palette I will then, with the wall selected, make it a target for change. And select these two pieces of roofs and make them operators so that they will modify and take control over the operation. Then



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choose Subtraction with Upward Extrusion which will subtract out where these roofs intersect plus everything upward or above that and execute. Now if I select the roofs here and I make them shallower, then we will see that the wall stays trimmed and remembers its relationship. If I undo this here and go and change the slope to be something higher, then we may have a little bit of a gap. Let's take it even higher to see it more obviously. You can see that this wall has not grown as it needed to, but simply by stretching it up either to the top height here or to any arbitrary height, it will trim underneath that roof, because it remembers the Solid Element relationship between them. [10:27]

And so what I'll do here is just put this back to the relationship that I wanted. Now let's say that we wanted to add a little overhang for this roof plane. We can do that by using one of the standard editing operations that are available for all polygons. I can go to the edge with the pet palette, add a node, place it approximately where I want, do the same thing and actually just simply click twice because it will remember the last operation that I did when I was on an edge. Then go to this edge and change it to the overhang modification. And I've now created a little overhang for the roof. And if I go back to 3D, we can see the result. [11:11]

Now, the trim here can be done by selecting the three walls here in 3D, making them the target, and then we can go and select the roof, make it the operator and execute. And we can very quickly get the results we need. Now if I wanted to make this more precise in terms of the relationship here or the placement of it, then I could measure the distances to clean that up. So let me just go and clean up the extra pieces here. So I will sort of start it over essentially. I am merging these nodes on top of each other. And now let's look at how we would create them exactly in the right location. I will zoom in a little bit and then use the Create Guideline Segment and click and put in a guideline 2', because that's the overhang that I want. [12:08]

Now I can go in and use the pet palette and snap to that point. So that has now added a node point there. I will do another guideline off to this side here and then simply click twice. And that added a node point exactly on top of it. So I don't even have to move around from it as long as I've got that roof selected. And then of course I can go and offset this here, but if I wanted to measure this - let me just undo that and we'll put in the Create Guideline Segment. Now Create Guideline Segment does have a keyboard shortcut, although in some versions of ArchiCAD, the keyboard shortcut is a little bit awkward. For example, this symbol here is not possible to be done on the Mac. You can actually create your own keyboard shortcut for it if you want. [13:01]

In later versions of ArchiCAD, Graphisoft actually changed the shortcut so that it became easier to do. And we will see that in ArchiCAD 16 in a few minutes. So I'll just tell it that I'd like to create another guideline here, say 2' down this way, and then go ahead and snap this into position. So that's one way to do it, but I can also go and undo back and do it a little bit quicker. So I will take this Create Guideline Segment say 2' over. And I will create another guideline segment. This time I will go from the corner and go 2' over and 2' down. So I will type in X and indicate that I want to go -2 and Y -2 because I want to go left and down and hit Enter. [13:55]

And you can see the guideline that's been created in the snap point. Now I can go to the edge of this roof, and instead of doing the node points I can say that I'd like to use the Boolean Addition. This allows me to add a shape, and I can simply click on the snap point here, make sure that I'm in the rectangular creation mode. Now I'm adding a rectangular piece, and then snap it to the other one. So now this is exactly spaced the way it should be here. So that is a little bit quicker operation. And if we go to 3D we'll see that it's come out just exactly the way that we had it before. [14:36]



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Now when we want to create a simple gable roof in ArchiCAD 10 through 14, it's actually a little bit awkward. What we need to do is create the roof in two pieces. So I will indicate that I'd like to create a rectangular roof, click to put the pivot line and then create the first piece up half way. Then select the roof and perhaps do the overhangs. So we will do 2' on each side. Or, that was three steps. Let me undo that and I will show you two steps. I can go to the corner and use the option to offset it in all directions 2' and then in the second operation move it back 2' just on the ridge line. So that was two steps instead of three. [15:34]

In either event, I can go and say Mirror a Copy here, and that will be the quickest way that I can generate this gable situation. So when I go to 3D, you can see what we've got. Now in order to turn this into a hip, if we had a gable and we wanted to turn it into a hip, I can select the roofs and then just select all of them by doing Command or Ctrl+A and then go and use the Move Node part of the pet palette. And it will move just one of the roof pieces and I can move the other one. And then I will create a piece that is triangular. And having done that, I will select it, hold down the Command or Ctrl key, and then click on these two adjoining edges to reposition them. [16:29]

Then select one of them, Command or Ctrl click the corresponding edge, and then repeat for the other one. At this point, it's almost done; I just need to change the offset or the overhang to match. So I've very quickly created that from a gable situation. Now in fact, we can build up an entire hip roof system piece by piece very quickly once you understand these principles. So to demonstrate that, I will go and use the Marquee tool, activate the Wall tool, select all walls in marquee by hitting Command+A or Ctrl+A or using that menu command; and then drag, press and release the Option or Ctrl key to make it a copy, and now I have a copy of all of the walls without the roofs. [17:22]

I will go to the Roof tool, and I will start creating this bit by bit, one at a time. So I will then choose to create his upper piece. And I am just going to do it very quickly, because I don't have to worry about the exact placement. I'm going to have ArchiCAD help me put the exact placement in. So I'm sketching out the basic shape here. We will use ArchiCAD's built in tools for aligning things. The main thing is that I want to have the right number of points. In other words, is it four or three sides? It will help if I get that right. And I'm going to select say one of the roofs and Command or Ctrl+click on the two adjoining edges to reposition them; then deselect it and go on to the next one, go to the two adjoining edges. [18:30]

Then select the next one, go to the two adjoining edges. Go to the next one, and so on. And here I realize that there's going to be a ridge line, so I'm going to take this one that will meet - it's not adjoining to it but it will meet in a ridge - and Command or Ctrl+click that. And do the inverse. And I've now got something almost working, almost complete. If we look in 3D, we will see that we have a couple of problems. One is that this wall was raised up and will need to be I guess trimmed by the gable. So let me just take it up a little bit higher here and then make it the target. And again select these two and make them operators and execute, and that's done. And then here we have an issue where I made four sides but actually this one has to go up five sides. [19:38]

And the same with this lower one here. Instead of it being four sides it has to have a little extra corner. Now I can do this in either 2D or 3D. I can select this and say add a node point using this option here right on top of this point, and move this up into position. If I know what I'm doing, I can actually do it here in 2D very quickly. Move the points, and then perhaps add a node and have it clean all the corners up and when I go to 3D we will see that it works perfectly. But sometimes I like doing it in 3D. So I'll just undo back those changes and we will look in 3D and see how we can do that. I simply select this and I can reposition nodes right here in 3D. Sometimes the pet palette requires an extra click to take effect. I will add an extra node here, and reposition it. [20:34]



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So I'm telling ArchiCAD to move it somewhere in space and then afterward I will clean it up. Again, I will add an extra node somewhere here. So you can see that now could break. Having done that with this roof selected, I will Command+click on the edge of this roof and that will reposition it. And take this roof and Command+click on the edge and that will reposition that one. And this one is going to control the edge here, which has to jump up. So you get used to this a little bit. It can be a lot of fun to just sort of snap these into position. Of course at the end of the day, when you want to get the overhangs right, we will have to select all of the roofs and one by one go and use the overhang here the appropriate distance and snap these around. Fortunately, we can actually snap them to each other so we don't have to type in things except at the gable end here where I have to type it in one extra time. So now we've got the basic shape here and of course I could add the bump out. [21:43]

So that was in ArchiCAD 14 and it applies to ArchiCAD 10 through 14, but still actually will be useful to understand for people in ArchiCAD 15 and later. Although the commands for roofs are more sophisticated, there are times when you do need to work with roofs in exactly the same way. These are called Single Plane Roofs. So let me switch now to ArchiCAD 16. So in ArchiCAD 16, we have different roof controls. We will switch to the Multi Plane Roof option. And for now, it doesn't matter which one of these I pick because I'm going to use the magic wand and tell it to trace it. And you can see how quickly he has created that shape. [22:29]

Now when I Shift+click, instead of selecting one plane, it selects the whole roof system. And I can go change the plate height here to make it go up higher. I can go in and change the materials and this will affect all sides as well. Now you'll also see that there's a Multi Plane Geometry that allows me to control the offset. So right now it's set to 2 feet. I could actually change that to anything I'd like. So let me see that I can do that actually in 3D as well. I can change the overhang, and this will affect the entire roof system. So if I type in say, 2', then it's going to make it a total of 4 feet. Let's go back down to the floor plan, and we will measure this from here to there. [23:16]

And you can see it's precisely 4'. An in fact if I select the roof system and we look in here it says 4', and I can type in whatever I want as well. So it can work either in visual or in the Dialog box. Now what I've noticed is that there are some bugs here when we are doing this in the floor plan. If I press down and use the offset, unlike in 3D - and let me type in that I want to make this just 1 foot longer. And you can see right now it says 5'7". If I type in 1 and hit Enter, you can see how it actually did not do that. It still was huge. And if I do even on a single edge here like this, sometimes I've noticed that I will type in 1 and it ignored that. So there's something going on, I think that's a bug in ArchiCAD 16 and I'm not sure whether it affected ArchiCAD 15 or not. [24:08]

Now this roof, you'll notice this as I zoom in on it is a little bit hard to see because it's drawn in dots. That's because of the setting that is the default in ArchiCAD 15 and 16 for the floor plan display. And I can change this if I like to make the overhead lines instead of dots; I will make them dashed so that we can see them better. This is a personal preference, and certainly you can do whatever you wish. This has to do with the lines that are above the current story, do you want them to be dotted, dashed or solid; make them whatever you like. Now I'm going to redo it with that little bump out like we had before. Before I do that, I will use the eyedropper option or Alt+click the roof so that when I start over, the next roof will be drawn with those settings. I will add a box of four walls here and delete the extra little piece of wall and delete the bridging piece with the Command or Ctrl+click creating the scissors. [25:09]

Then go back to the Roof tool and use the magic wand with the poly roof method or the multi plane roof method as it's called. So you can see that it's created the same sort of shape here, but if I wanted to get rid of this little bump out so I could do an overhang, what I would need to do is I cannot select this and delete it because I'm selecting the entire roof



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system. However, what I will point out is that this roof system, when I select it, it has not only an outline but it has a series of pivot lines. These are the places where the roof is resting at a certain defined height. [25:47]

Now, these could be on the outside of the building or inside or on the face of framing, and I will be dealing with that in a later training lesson on roofs. But for now, let me just point out that if I press down on the edge of this pivot line and use the option for a adjusting it perhaps bigger or smaller, you can see how the pivot line moved and the overhang moved with it, it just basically kept constant. Of course, I could take this in the other way or even take it all the way in to where this line is now in the same line as the rest of it. And we now have a simple building shape. Let me show you how we can do this from the beginning if we wanted. [26:31]

Let me just get rid of this roof and we can do the same thing we did in ArchiCAD 14 where I have the poly roof method, and I'm telling it that I would like it to do a polygon rather than a rectangular shape. And I'm manually tracing this shape skipping over the bump out that perhaps I don't want to have a detail hip extension. And you can see how instantly the result comes up. Now suppose I wanted to change the slope of this hip end on the right. If I select the roof system, I can go to the corner of this and there is a new option in the pet palette that allows me to reposition or extend the ridge line. And you'll see that it actually allows me to move it a defined distance, and I can also type in the pitch that I'd like if I knew I wanted a certain pitch. [27:25]

But let me just do it by eye here, and we'll take a look at what that did. So when I go to 3D, we will see that it's become much steeper here. In fact, I can adjust this right here in 3D with the same command and take this out. Now sometimes I've seen it sort of stop where it won't let you go beyond a straight up and down, and other times you can actually take it further. You can see that this is pulling it out. But let's just stop it at the straight up and down point. You can see it's now made it into a gable. However, I will point out that at least sometimes when I do this, it removes the overhang. So it was a 2' overhang, and now there isn't. But there is a way to correct it. I can simply go and select the roof system, go to the edge of the pivot line. And the pivot line now, if I press down on it there is a special option in the pet palette that is for adjusting the plane. [28:23]

Right now, it's the second from the end. It looks similar to the one at the end. This one is Custom Plane settings, the other one at the end is Custom Edge settings. So let's look at the Custom Plane settings right now, and we will see that it says, "Oh, you are in a gable, but let's make the 2' overhang." So I can actually adjust the overhang for each side individually by going to an individual edge. Let me just undo back these changes and show how I can go to that same edge and use this option here on the floor plan. And the floor plan right now, I'm on the edge of the pivot line and the contour line, the edge of the roof itself, I'm not on top of that. So it's actually only giving me the option for adjusting the custom plane, custom plane settings. [29:17]

So that's why there's only one option here rather than two, because they were not in line with each other. But here, you can see how I can just switch it to gable, and either maintain or change the overhang offset. So in fact, let me just undo this again simply by clicking on here, using the option, and then saying gable is the quickest way to switch that. Very nice improvement in terms of the methodology for Graphisoft. Now I would like to add a little bump out here, and I'm going to use the polygon editing methods that we have that are common, including with the roof I will go and add again a node point here and another node point there and then use the option for pulling this over. So you can see how very quickly it's exactly like what we had in ArchiCAD 10 through 14. [30:11]



To do it precisely, let me just undo back. Again I can go to the guidelines and perhaps add a custom guideline here. Add another one, add another one. Go to the create another guideline along here, say the X -2 Y -2. As soon as I type the letter X or Y it pops up the rest of the tracker so I can input that. And now I can select this and use the perhaps the Boolean Addition and snap it to this. Now sometimes I've noticed this guideline won't snap. Let me go ahead and add another guideline right in the middle of my operation here. And now we should be able to snap this. Let's go back and say I want to add this operation. Here is the snap, and we will make it a rectangular piece and create that. So using the guidelines and the Boolean, I can do it even a little bit quicker. [31:18]

Now let's look in 3D and talk about the ways that these walls can trim to the roofs, because there are some differences. If I select this wall, and I go maybe make it taller here under the Design menu, there is no command that says Trim to Roof directly. The command is now called Connect which allow you to do a different type of trimming. And then there's the Solid Element Operations. Now let me use the new sort of standard method of connecting the walls to the roof which is the Connect command, Trim Elements to Roof or Shell. When I activate that command, it says "Click an element to use as a trimming element." I then click on the roof. You can see how the cursor changes from an empty roof to a black hatched roof, one that has a black fill. That indicates that I'm on a roof or shell which is able to trim this wall. [32:17]

That makes the roof turn red. Then I can choose whether I want to keep the upper part of the wall or the lower part of the wall. You can see how the blue changes as I move up or down. When I click, I've completed the operation. That works very nicely. We can do a similar operation for these walls here, but it's actually going to have a little bit of a complication, which I will explain in a minute. If I select these walls - actually let me back up a moment. Another way that we can do this command here, the trim, is to select the wall and the roof system together and go to the Design menu, Connect, Trim Elements to Roof or Shell. And it assumes then that you probably want to use the selection, those elements, to trim to each other as opposed to picking a different one. [33:11]

And I can say Trim and very quickly it's done. So in fact, that's quicker to select the wall, select the roof, right click, Connect, Trim Elements to Roof Shell, and Trim and done. Now let's look at where it gets a little more complicated. I will select say the roof and these three walls here and we'll do the Connect command. And what happened? The walls disappeared. Let me undo it and we will look at the settings for the roof to see what subtle change we need to make. In Roof Settings here under Model, there is the Trimming Body. And the Trimming Body allows ArchiCAD to decide or allows you to decide whether you want to trim only within the pivot lines, which is where the roof plane is defined or the roof height, or if you wanted to extend out to the contours. [34:14]

Now sometimes you want one, sometimes you want the other. The default is the pivot lines. But I'm going to change it to Contours Down and now it will trim out to the edge of wherever the roof is. This is of course what I want because these walls are outside of the pivot line. Having made that change, I can then select these walls and do the Connect, and it works very nicely. So just remember that sometimes you do have to go into the roof and look at or adjust the settings for the Trimming Body from pivot lines down to contours down. Now let's look at how we create a gable situation. It's actually much easier in ArchiCAD 15 and later versions. If I draw this set of walls and then go to the Roof tool, I can use the multi plane roof option here, but instead of doing a polygon shape or a hip, I can do a gable directly. And I will simply select that, click on the two corners and we are done instantly. [35:29]

Now when I want to change this to a hip, the simplest thing to do is just select it and go to the edge of the pivot line. And on the edge of the pivot line, if I press down on it either in 2D or 3D and go to the custom plane settings, this option at the end of the pet palette, I can switch it perhaps to the pitched angle whenever I want and say OK. If I say change it for the



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clicked plane, it will do just this one side. If I do it for all planes then it will do it on all sides. So for example I can say all planes here and say OK, and you will see it's now made this whole system a hip. If I undo that and instead do it with the option here for just the clicked plane to make it pitched, then you can see I can do just one at a time. I have total control. [36:26]

Now there are times when we do need to create and work with roofs individually. We will be spending some more time going through some examples where this is important. But first I want to show you how you can achieve that. There are two ways you can do it. One is if I just drag a copy of this over here and I select the roof as a whole. Then right click on it. There's an option to split it into single plane roofs. What this will do is it will get rid of the multi plane roof and make new single plane roofs that look very similar. If it was the dimensioned, those dimensions would disappear. So it gives you a tiny bit of warning. Now you can see these are single plane roofs and they will work virtually the same as the roofs that we were used to for ArchiCAD 10 through 14. [37:19]

Now if you wanted to actually build them up one at a time - and there are times when you need to create individual roof planes rather than create a compound situation and then split it - what we would do is get rid of it. I will turn off the Quick Select here by pressing down the space bar and then click to draw a little selection area and get all of these little roofs selected and delete them. Now I can go and start over. And instead of using the multi plane roof, I'll use the single plane roof in a polygon fashion. I can also of course do rectangle pieces when I need to. But I can simply go and create a series of roof pieces very much like what I did in ArchiCAD 14 demonstration. And I'll just do a few of them and then demonstrate that the editing operations are exactly the same. [38:18]

And the last one, I will just select this one and Command or Ctrl+click the adjoining edges. Move to the next one, Command or Ctrl+click the two adjoining edges. Move to the next one, Command or Ctrl+click. Then we get the ridge line and do the other ridge line and now we are back in exactly the same place as we were in ArchiCAD 14. And just add these node points here. Now here is an interesting difference. In ArchiCAD 15 and later, if the edge is not vertical, there is an option whether you should show the edge in a top down projection both the top and bottom thing. So if I look in 3D here I've got this almost working, almost looking correct. But notice this particular edge here is tilted. And so what I would want to do is actually have this roof and Command+click on the edge of that one and it's going to make it vertical. [39:53]

But let's also look - let me just undo that and show you that when this is the case, there is another option. You can't do it for individual roofs, but if you prefer not seeing the underside when it's sticking out for some reason, then you can go into the Options, Project Preferences, Construction Elements and say that you'd like to have the floor plan display of single plane roofs and their skylights shown symbolically like in ArchiCAD 14 and before, rather than a true 3D projection. And you can see now that instead of being dashed lines and a top down view, it's just showing the symbolic representation. So that is an option that you can change if you wish, but in general the true 3D projection is more sophisticated, so this actually indicates that there is a little bit of a problem or something that I might want to adjust. [40:43]

So I can go here and use the option to edit the angle and make it vertical or I can use the option as I did before and only just add a node point. If I select this roof and Command or Ctrl+click this little piece, it will adjust it. And when it is using the automatic adjustment it will neatly fit into place. So this concludes our lesson on simple hip and gable roof systems, those with a single plate height. And we worked in ArchiCAD 14 and did things with individual planes of roofs like this, and worked through all of these different shapes and forms and trimming. And then we worked in ArchiCAD 16 and did the same with multi plane roof systems that have a lot of sophistication and speed, but sometimes need to be broken up into



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single planes or manually create single plane roofs. This has been Eric Bobrow; I look forward to reading your comments and questions on the page down below. Thanks for watching.