



## BEST PRACTICES COURSE – WEEK 22 Managing and Optimizing Live Sections and Elevations – Part 1 - Clean Modeling to Create Clean Drawings

Welcome everyone to the ArchiCAD Best Practices course training lesson. Today we'll be starting on week number 22. This is a section that I designated early on in the course for managing and optimizing live sections and elevations. So the overall topic here is how do you, first of all, model things well so you can create clean drawings? How do you put in extra detail or continue to add detail effectively and efficiently in 3D, and where necessary or appropriate in 2D? And how do you deal with update strategies in terms of these sections and elevations, because obviously updating can take time. And how can you minimize any time wasted or unnecessary time? [0:00:56]

So in this first section we're going to be looking at clean modeling to create clean drawings. I've certainly covered this area in a lot of different places in the course and in the coaching program, so some of this is definitely going to be a review of things that I've already covered. but we'll be focusing on this as a topic by itself as opposed to something that I'm cleaning up maybe in a coaching call. As you probably have seen in some of the coaching calls, people send in projects, perhaps you have as well, and have asked, "How do I clean this up?" Some of those fall into the category of poor modeling or mistakes in modeling that can be corrected easily. [0:01:45]

Some bring up questions or limitations in ArchiCAD that over time maybe ArchiCAD gets better at, but in general, there are some things that ArchiCAD can't quite handle perfectly. So we're going to be looking at some of the basics of how common mistakes are made that cause elevations and sections to have issues, how to clean those up, and then we'll be going into some of the more tricky topics of things that are harder to deal with and in fact need workarounds. So I invite you while I'm doing this to put in some comments and questions in the chat box. Unlike some of the other live lessons that I've been doing, this is an area where my presentation outline is not well thought through. [0:02:37]

I'm going to be improvising. If you remind me of some things or tell me some of your frustrations it will help me to remember and cover some of the things that are important. So let's start with some of the basics. and feel free to comment as we move along. Now here I have the sample project as you are familiar with. And if I go to an elevation of this project here, and the view of course - actually I'm in the project map, I need to be in the view map here. Let me just change my palette so I can see it better. So obviously if I bring up a viewpoint like this elevation from the project map it doesn't change the layers and right now it's not showing the roof. etc. [0:03:33]

So let me go to the Elevation clone folder where we have the right layers and style set up and we'll take the same view. And you can see instantly it cleans up. Now in this particular view we have walls that are on one story and walls that are on another story. They are not joining. Let's take a look at say maybe



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another elevation where we have some walls that are joining. So here you can see this wall up here and the wall below are two separate pieces, but when I deselect them there's no line in between. So the most basic principle in terms of clean modeling in ArchiCAD, at least that I think of right away, is do you have things aligned properly? Are they snapped into correct position? [0:04:28]

So let's look at what might cause an issue here and where you might have a line between elements that are supposed to be essentially a smooth surface. So when I go back to the floor plan by hitting F2 I have all the layers turned on that were in the elevation, so it's a little bit messy to look at. But that north elevation was north looking down from the top of the screen here. And let's just say that this wall, I will just do something really obvious. I will stretch this and make it off. Now right now these two walls are not joining, but let's say that I take these two walls and I use the "Intersect". [0:05:13]

So now on the plan this is clean. Now we can see, because I made it quite a bit off from horizontal, that it is not square. But the difference could be just a fraction of an inch or even just a tiny millimeter off and it would look just perfect. But if we look at that elevation now, we're going to see a line here. why? Because obviously this wall that I just adjusted is not in the same plane as the other wall. If I look in 3D we'll see that perhaps it will be clearer. I will rotate around to this side of the house and zoom in on this - actually, where is it? Here it is. [0:06:02]

Here's the issue. I've pulled this part of the house out, so there's a line here. If I undo back those two steps and we go to 3D, you can see how that wall jumps back in and it's all lined up and it's clean here. So that's the most basic thing is that you need to line them up. Now if I redo the change so we can see where they're not lined up, how do you make sure they're lined up? Well the most obvious thing is that Virtual Trace, or as it was in ArchiCAD 10 or earlier, Ghost Stories, allows us to see one story in relationship to another. [0:06:45]

So I'm on the first floor and in fact I'll just go back to the first floor plan where I am actually in the layers that are just showing the floor plan information. I'll go up to the second floor plan, just jump up, and we can see - actually, I guess it's over here. The issue is because this is a balcony. But if we look carefully at this as I jump back and forth, you can see how of course this wall is definitely off. But if we couldn't see those two in relationship to each other, we might not know it until we looked at the elevations and then we might wonder what was the problem. [0:07:23]

So let's go and right click on this view here and say "Show as trace reference". When I do that, we are seeing a bunch of line work show up here. It's a little bit hard to see what's going on because we have let's say equipment and furnishings and this is probably all equipment. This is a layer here. Let's go and turn off that layer. So I might want to go to the Quick Layers palette under the Window menu, Palettes. And then in Quick Layers, say that I'd like to hide the layer that has that selection. And perhaps I want to also hide the bathtub there. [0:08:05]



Now I can't really change that layer here directly because this is a view. I'm saying "Show the view of the other story," and that view has certain layers. But here's a nice - I was going to say trick, but it's just really a good strategy. In many cases you want, instead of saying I'd like to reference a view, I'd like to reference another story or just use the option for "Above current story" or "Below or previous story". So let's just say "Above current story", and you can see that it's now showing this. But when I rebuild this here - let's see. I'm saying "Rebuild". I want this to go away, and I believe that's probably on the same layer. But maybe it's not. [0:08:56]

Let me switch the two references with the active. Now as soon as I switch it here, I'm now looking at the upper story with itself as its own reference. So actually I switched this here because it is now switched to below, because I had it above. So when we switch back and forth it's smart enough to do that. But let's just now turn this layer here, this bathtub, and that's on the layer "Plumbing". I guess the other one was on a different layer. And let's hide that. The reason why I'm using the Quick Layers palette is because I can undo these to show each of these or redo them. It's very convenient there. [0:09:40]

So now it's a little bit easier to see. One of the things that I was going to show because it's not turned on, it can be an issue for tracing, is this option here in the Virtual Trace. So if I click on this you can see that we're now seeing the walls with opaque fills, and therefore it's harder to see what is going on below it. If we click on this button which says "Make fills" - waiting for the prompt to come up, why is it not coming up - "Make fills and zones transparent", and it's for display only so it doesn't affect printing or output - but if I click on that, now we can see through. Now we can start seeing in this case it's sort of looks like a mess. But let's just go to back to the first floor and let's go turn off the trace and reference and let's make this more a subtle difference. [0:10:38]

In other words, I am going to undo back these two steps and let's just take both of these walls and we'll take it up just a hair. So I will take it up here. By the way I have both walls selected. Actually there are five walls selected. But I think it will only affect the ones that I'm touching, these two that are there. I guess it has the objects; maybe there are some other things that were selected. Let me deselect them. So I will select this wall and this wall. So a nice little editing trick that certainly you should use if it's appropriate is to select two walls and go to the corner. And when I'm editing this, it's affecting the endpoints of the reference lines of both of them. [0:11:23]

So I'm only moving 1/2" and it's obviously going to keep it clean because both endpoints moved together. And this difference is now much more subtle. So now if I turn on the trace and reference we'll see that it's close. And in fact, as we get over here, you can see how close this is. Now it's still a little hard to see because our wall is up above here and this is the lower wall. But ultimately what you have to do is decide what is the main reference here? In other words, what is accurate and what is not? So in terms of cleaning things up - and this is something that I did recently in a coaching call for a user who sent in a file that had issues like this - the first thing I did when I realized that things were out of



alignment was I went to the end of a wall, pressed down to start to stretch it, and then looked at the angle. [0:12:21]

And you can see that the tracker came up with a 179.89. Obviously not a nice, even 180, but very close to it. So in conversation with him I said, "Which point should we rely on?" We determined that the lower left corner of the building was good and the left side was accurate but the right side had some issues. So we basically made sure that things lined up. In this case I know of course that this corner is off and the other corners of the building probably are okay. So I might want to just make this 180. So this would be a way to do it. [0:12:56]

If I press the Shift key down, it's not going to actually help me because it will lock in relationship to this point that I'm close to. So in other words, the Edit Origin, when I press the Shift key is determined by what endpoint I'm closest to. If I wanted to use the Shift key I'd have to go back a bit to the left side here. In other words, with this stretching, bring it down and make sure it was reading at the 180, press the Shift key. And now you can see the X over here is the Edit Origin and that's what it's locked to. So I can slide over and do this. [0:13:30]

A shortcut for that, just in this particular case, is remember I'm starting here. I can say I don't want to use the Shift key; I am just going to type in the angle. I can do the letter "A" to highlight Angle, and 180, and you can see how that moved down. Now we have an issue here. Let's turn off Virtual Trace so it's clearer. This wall is straight but the other wall is sticking up a little bit further. And because we have the Auto Intersection option turned on, it cleaned up in an odd way. So let's go and take this wall here. And you can see that this wall is actually sticking up beyond where it should meet. The intersection is a little bit funny. [0:14:19]

Let's see if this one is still the 180. Yes it is 180. So how would we clean that up? Because I know that this is correct and this one is maybe just a little too long here. I will use the Intersect option. That will clean it up. So sometimes it can be tricky with Virtual Trace, but I wanted to show you how Virtual Trace can at least make it clear. If I now turn on Virtual Trace, we can see how lines are cleanly aligning. In terms of seeing it, the windows and doors are getting a little bit in the way. One option we can do is turn off things like - can we turn off windows and doors here? We can turn off objects but we can't turn off windows and doors. That's interesting. [0:15:12]

So with Trace and Reference there's an option to turn off certain things so that you can simplify it. Maybe turn off for example text and labels and dimensions and things like that. So that would mean if I go and switch this, the reference and I turn off - so I guess this is the stair out here. Can we turn off stairs? Where are these? Interesting. Can we turn off objects? we can turn off objects. So this is an interesting thing to use in terms of aligning stuff and Virtual Trace is to turn off categories of elements just to make it simpler. [0:15:57]



Of course the other thing that you can do with Virtual Trace is you can reveal with this and then pull a slider and see how things are relating from top or side or bottom. And you can move this around. So Virtual Trace is going to be your ally here. It's obvious that these walls I pulled out of alignment then I had aligned. And it could've been just a very tiny amount, literally the tiniest fraction of a millimeter, and ArchiCAD would say that's not in line, so we'll put a line in the elevation. [0:16:33]

Now another reason that you might have a line show up in an elevation is because the materials are different. So if we go to the 3D window we can demonstrate that more easily. Let me switch my sun around or actually use that little shortcut I came up with that I put in a tutorial video, which is to go to the - I guess it's under View, 3D View Options, 3D Projection Settings. I can control where the sun is, and I can move this around so that it's bright here. But for simple modeling, I have found that another approach is to go to this and go into the "More sun" and make the sunlight zero. [0:17:26]

What will happen is then there's no directional light in the 3D window, so it's not coming from any direction or at least it won't pretend to be from one direction. And instead of it being dark like the preview, it actually compensates. And now you can see everything is sort of dull but it's easy to look at. No matter where we rotate around the building it will have even lighting. And there are some options to make the whole scene brighter too that you can use, but right now this is just going to mean that any side I can look at without it being in shadow. [0:18:02]

Now let's say I select this upper wall here. It's got an exterior surface. Remember in ArchiCAD 17 it's called "Surfaces" and in 16 and earlier it's called "Materials". In ArchiCAD 17, we can have the surface inherited from the built-in settings for the building material or we can override this. So now I'm going to override it, and let's just change it to a different color. Instead of the exterior color, let me make it the interior. Now these two colors might be identical in terms of a color chip. Right now they are actually a little different, but what will happen is if they are different, if they have a different name, then we will see a line. [0:18:52]

So it could be exactly the same tone, exactly the same appearance, but if they have a different name we'll see a line there. So that's another thing that can cause issues. Another one is that sometimes we have things that are stacked that are not aligned vertically. So if I select this, we can see that its top is at 9 feet. Occasionally you may be stacking walls. Let's say that we originally made the building at 10' for the first floor or ground floor and then we decided to move it down to 9'. So from 3 1/2 m to 3 1/4 or whatever that is; 3 m down to 2.8 here. [0:19:37]

Before ArchiCAD 17, things might just overlap. So here it's very obvious that we've got this overlap. But sometimes that overlap is just a hair or a fraction of an inch. So it may be less obvious why we are getting this line there. So for example, if I make this 9'1/2", then it's going to be very close here. I can't see that it's an overlap, all I can see is that there's a line. Now let me put this back to the surface being the exterior, and now it's going to be the same color. And we're still - actually that's interesting. Same



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color, I guess it didn't take - let's say 9' and 1/2". That's interesting. Let's try 9'1". Now it shows up. So I'm not quite sure why it wasn't accepting my input for the half an inch off, but certainly you could have a very small overlap and it could be an issue. [0:21:03]

Let's try it with the reverse which would be if it was a little bit short. Now it is 8'11", and now it's a little bit below the other one. And you can see obviously we're seeing the top of this wall, but this could be so close. It could be 8'11<sup>3</sup>/<sub>4</sub>", and you can see that's getting closer and closer. We could have something where we are looking at it and saying, "Well they look like they're right in line." In fact, if we look it that elevation - what is this? This is the north elevation. We can say, "Why are these missing?" Maybe if I take this really up to 8'11 15/16" or something like that. [0:21:57]

So we can have it so close that you cannot see the difference, but obviously it's the height there. So when you have that question I would always look at what is the top of this one, what is the bottom of that one. Make sure this #9 here is what we are using in the other one. And when I put that in, then you'll see the line gets resolved. So those are some of the basic things about elevations. And that is that if you have elements that are stacked, you need to make sure that they're aligned on plan, the same edge, and possibly corners as well vertically. In other words, the bottom of one exactly the same height as the other, and they have the same surface or material. [0:22:50]

So that's the real basics of why sometimes we see things have lines that we didn't expect or don't want. Now we can have lines where some things are showing through from the inside. And let me see if I can simulate that or cause that to be the case. Let me switch over to a fresh copy of ArchiCAD, and we'll do this here. Now obviously I made all of these walls at the same time with the same settings so they have the same types of wall construction. These interior ones clearly shouldn't be exterior; they should have a different one. Let me just switch this to an interior one here. [0:23:42]

So now it's showing this is a fire-rated wall so it has a line across there, etc. If I were to switch this to let's say a simple wall here and do it as interior, this interior matches that interior so it's cleaning up. Basically this composite has a skin that is interior; this is just a pure interior one with drywall, nothing on the outside. So it's cleaning up nicely. And if we went in 3D everything would look like you would expect here; no lines or anything. But let's go back here and select all the walls except for the interior ones and then change them to a generic wall type. And here is "Generic exterior". Now what's happened? You can see that the interior walls are poking through here. If we go to 3D, we're going to see the results. We're going to see some lines. [0:24:47]

And let's just change the sun settings again. I will put this to zero here. So now it will be evenly lit up and easier to revolve around the building. So obviously, we have an issue here. We are seeing it on the plan as well as in 3D. And in elevation of course it would show as well. So how do we resolve that? Well, in ArchiCAD 17 this is caused by the fact that the interior material called "Generic Interior" has a higher



priority than "Generic Exterior". This is an odd setting in the U.S. template. I'm not sure whether it affects the international version. [0:25:26]

This particular one would be controlled if we go to the Element Attributes, Building Materials. We can go and say that "Generic Exterior" is here, and "Generic Interior" is here at a higher level. Let's just move exterior down above this here. Now if I move it right next to it, I may have to keep trying until I get it right or we can put in a number that is just above that. You can see here it's 590 and here it's 595. Now having done that, it will clean up and the interior gives way to the exterior. And of course in 3D we have a clean result. So that's in ArchiCAD 17. [0:26:10]

I'm going to start up ArchiCAD 16 and let's go here and take a look at the similar settings that we have. In ArchiCAD 16, we'll start that up and take a look at a similar issue and how that is addressed in ArchiCAD 16. So this starts to look at the question of how do things join to each other beyond just stacking? How do they interact? So let's create a new project here and we'll open that up. so in 16 and earlier, we would rely on the skin priorities. And this could be set for each composite individually. It can also be set overall for certain walls. So we'll take a quick look at that. [0:27:23]

We'll do something similar here, and do this. And by the way, it has nothing to do with the layers. In other words, putting it on the interior or exterior layer does not matter. Let me select all the walls here minus this and we'll make these walls - if I go to floor plan and section and here if I go to cut fill we'll pick a composite. Let's say "Stucco" here. We'll take these and make them an interior wall. Actually I don't want it to be insulated. 2x4 here - no that's a two sided one. Where is just a simple interior wall? They actually don't have a simple interior wall without insulation in the standard template. Somehow I don't remember, but I guess that's how that was set up in the standard U.S. template. [0:28:31]

Okay, so we can see how one wall is stopping properly if we go to 3D. And we say Fit in Window here and rotate around we'll see everything looks good. But if we are working with the wall in 16 and earlier, there is a concept of the wall priority and enabling skin priorities. If I turn off enabling skin priorities and boost the wall priority up, you can see how I'm forcing it to have a problem. Conversely, I can force it to give way, as long as it's less than the skin priorities of the other wall or the overall wall priority if I turn off skin priority. So skin priorities can be individually adjusted and you can override the entire thing to say, "I want this wall to be less strong or not push through the other wall." [0:29:32]

So I don't want to spend a whole lot of time on the details here, but this would be a place where you would need to potentially look. Now one issue that can come up in 16 and earlier, I can't remember if the same thing happens in 17 - is sometimes you may want to make this room - and by the way by changing this one here it is no longer joining with that because it has a different priority. So let me undo back to where it was using the skin priorities. Now these are cleaning up normally. They should be. There we go. These are cleaning up normally and obviously this is stopping where it should in line with the exterior wall. [0:30:21]



But what if we wanted this room to be a different color? If I select these two walls and I want the interior or let's say that they're painted, I'll just pick all sides here and give them a color. So now they have a color here. Well as we rotate this around, maybe we want the color on these two sides of this wall, but we don't want it in this area. So how would we deal with that? We'd have to take this wall and split it using the Split option and go to the reference line of this wall here and then click below it. So by the way, I did this in 3D; you can also do it in 2D. Select the one that you want to change and go to the Split option and then go to a reference line if the wall is meeting it and click. [0:31:09]

That will determine where it's split, and you click on one side of it and that selects it. So now course I can, with this selected, go and say that I want the interior here to be set up - what color was that? It doesn't really matter that it matches but I think it was Paint 14. Yes, I did get it right. So this is now looking correct on the inside. Let's see what we've got on the outside. You can see that there is a line up here, there's no line there, because this wall is a separate piece from the other one. We don't see the line here. This is the north elevation; let's see if we have a line. No, we don't, we have two different pieces of wall but no line. [0:31:54]

So I know that in this case we didn't have a problem, but occasionally I've seen issues where when you do split a wall into two pieces because you need to override say the surface or the material, that it can make this wall actually have priority to stick through there. So the solution there in at least the case that I was looking at was to manually go and switch - in the floor plan to manually go and switch the priorities around. So remember it did cause an issue with this one joining, but if we had both of these coordinated, then it might not be a problem. So this is a known issue or challenge in some cases where you split it in order to be able to have a different material or surface in a room. You split the exterior wall along its length. [0:33:01]

And sometimes this can cause an issue where this pokes through and you see a line there. Another thing that can cause issues in terms of things poking through is sometimes you have multiple story walls. And maybe that's something that we can take a look first and 16 and then in 17 and see how that works. So I'm going to go and let's take these exterior walls. I will select all the walls except for the interior and make them two stories high. Now if I go up to the second floor we are not going to see them because they are set up - and I will just select again these four walls here - they're only showing up on the home story. But if I say I want to show on all relevant stories, that means that since they are high, when we go up to the second floor we will see them. [0:33:55]

So far so good. But let's say that we have a wall on the second floor. So I haven't put in a floor yet, but let's say we're on the second floor. I'm going to another room over here Will this clean up properly or what will happen to these walls? I'm not actually seeing an issue here, and it's OK that these walls are not connecting, but let's see if we can force it. Let me pick up the settings of this and force it into these two and make them the right heights for the walls for this building, so 10 to 20 here. Now if we look in 3D, we're going to see they are cleaning up nicely as well. [0:34:54]



Sometimes I'm not going to be able to force this in on the fly to misbehave. I've seen issues where people have modeled stuff that will look good in 3D in terms of having walls that are on different elevations. Obviously complex buildings sometimes have all sorts of geometry and elements at different heights. And the issue in terms of things cleaning up was whether they were being shown on the same story. That was in part of one of the issues. So I remember something where we're seeing a line on the outside of the building and it looked like the walls were touching each other cleanly and everything, and then I realized that the walls were on the lower story and they extended up to the upper story but they did not clean up. [0:35:48]

So let's select this wall and say for whatever reason I don't want it to be shown on the second floor I just want it to show on the home story here. So now you can see that we do have this cleanup issue. We are seeing this line. It's a little subtle, but if we go to the north elevation we're going to see that line. So I forced the issue because this wall I said should only be shown on the ground floor, even though it sticks up to the second floor. And therefore since it's not showing on the second floor it doesn't know that it should clean up with this wall that's up on the second floor. So if we go back to the floor plan, we're going to see that this wall is no longer there in terms of the plan. [0:36:35]

So obviously we wouldn't want this - this wall should show up here, so I was forcing the issue. But maybe there some things where you have parapet walls or short walls meeting walls that are extending up. I can't remember the context, but let's say we have perhaps a combination of issues that contribute to an elevation drawing that doesn't look correct. So the principle here is that if you want these two walls to intersect and meet each other properly, they both have to appear on the same story. For example, this one has to show up on all relevant stories in order to clean up with that one successfully. So I think that at least is something to keep in mind. [0:37:28]

Okay, let me show you something about the way that beams interact with walls and the change between 16 and earlier and 17, which can be confusing if you know how it worked in 16 and it doesn't work that way in 17. Or before, if you were in 16 or earlier, if you didn't know how it worked, you could have some challenges with getting the results you wanted. So I will put in a beam here. Right now the beam is set to be 8' high, so it's going to be just below the top of this wall. And let me stick this beam through the wall and we'll take a look in 3D. We have this beam here. When I select this, see how it stops and starts again at the other side. We can't really tell too easily until we select it, but you can see there's a nice line there. [0:38:26]

Now sometimes of course you want the beam to cut through the wall, so what you do in 16 and earlier is manually change the beam priority to be higher than the wall. So grab this and move it up, and you see now the beam passes through the wall. And if I were to select the wall we would see that it has a line around the beam. So there's a manual control in terms of priorities that will take effect. Let's look in 17 then at the same thing here. So I will go to the Beam tool and let's put a beam as a square here.



And let's look in 3D. Now when I select this beam, you can see it is passing through the wall. Let me change its height down. I will drag it vertically so that it's inside. [0:39:22]

And is it passing through the wall? We are seeing the green line go through; we're not seeing an outline here, so it has priority. Now if we look at this and wanted to change it, you'll notice there are no controls for priority here because the priorities are now taken care of by the material. This is structural concrete and it has a higher building material priority than whatever this wall is made of. If I were to instead say this is made of wood or something like that - not wood flooring, heavy timber. You can see heavy timber in this case has a lower priority than whatever this wall material is, so it's being cut short and started again. [0:40:09]

Obviously that would be an odd thing; ornamentally it might be nice to have certain things that continue a line on the outside of the building and on the inside. But probably if this is a single piece you wouldn't want it to stop and start, you would want to either pick a different material like precast concrete here that would go through and then color it here or just designate - even if it's wood, just designate that you have some elements made out of a building material of wood that you want to have a higher priority so they will then - so let's just show how that works. If I say if it's made out of the heavy timber, then that's a problem here. I do want it to be made out of timber or wood, but I want it to stick through the wall. How would we do that? [0:40:57]

I will go to the building materials and create a duplicate of the timber wood. Actually, here is a nice shortcut again. If I select this and go to the building materials it will highlight that one. So here you can see it's highlighted and that makes it much easier. Then I can say "New, Make a Duplicate". And make it high priority. You can call it whatever, "pass-through" or something like that. Now I can move this new one up. Let's be arbitrary and move it up near the top of the list so it has a very high priority. By the way, you can manually type in the number here or you can drag this bar or you can move it for any of these things. But now I have this available. It will look the same in terms of its appearance and cut through, but it will pass through. [0:41:58]

Now this didn't change because I need to tell it to use the new version. And now you can see its passing through and the wall is being cut out around it. So that's just an example of how the priorities of elements passing through each other are controlled differently with the building materials than in previous versions of ArchiCAD.

I see a comment from Steve Nichol, "This is an important issue since if that wall gets trimmed, the gap and the beam will remain. This is sometimes frustrating." Yes, this is definitely something you have to understand. And you have to understand that in ArchiCAD, before 17, beams would have some priority. Just whatever the default was or whatever you had it set at. And if you are trying to do some Solid Element Operations, the priority of the beam meeting the wall or slabs would be handled first. Then the Solid Element Operations would be available. So if the beam was giving way to a slab then it couldn't



cut the slab. On the other hand, if the beam was inside the slab and it had a higher priority, then it would cut a hole out for itself. So Solid Element Operations is done after the initial referencing of the priorities. [0:43:23]

Now it's the initial referencing of building material priorities that are looked at first before that is handled. So in fact, let's look at this. Sometimes you may want to have something that has a notch where it has a gap above. This wouldn't be a good example, but if I take this and go open up the Solid Element Operations palette and I select this as the operator and I select this wall as the target, then we would do subtraction with upward extrusion and execute, we can see it creates the groove that we would expect. On the other hand, if this is a lower priority - go put it back to the regular heavy timber - then you see it doesn't. Basically the piece stops short and then continues on the other side. [0:44:10]

But since it doesn't have priority in here it can't cut the element above. So I think this might be part of an answer for Sherri Weaver. You had a question about cleaning up the groove in the wall, a question sent in earlier today. And I don't want to take the time during the training lesson to open up your project file and troubleshoot it, that's really what we should do in a coaching call, but I will say this is the sort of thing that you should look at is the priorities of elements in terms of in terms of if you are in 17 the building material priorities, because you may find that that is the first thing ArchiCAD looks at and then Solid Element Operations are the second thing. And similarly the Connect command where you say you want to trim the walls to roof or connect walls to roof. [0:44:58]

Now you had a question about someone suggested that maybe you needed to clean up the relationship and undo the trims or whatever and you said, "I don't see anything." If you highlight something that has used the Solid Element Operations or the Connect command - remember that we have under the Design menu there is Connect. There are options to connect things to roofs and whatever. So if you have either Connect or Solid Element Operation in effect you'll see this little tiny palette when you select it. When I deselect it, it goes away. But when I select it, it will be somewhere in the vicinity of the object. You press down on that, and it will say what it is related to. It could be related to one element. You can see when I hover over it, the wall gets highlighted. [0:45:47]

When I move away the wall is not. When I move my mouse over, it highlights. So you can undo individual ones or if you had multiple ones you can undo all of the relationships to the other elements to start fresh. So I will say start fresh here. So now you can see there's no box because I said "Undo" to those operations. So hopefully that helps you Sherri in relationship to your question there. [0:46:15]

In terms of clean elevations, another thing that occurs to me that could be useful is to look at how textures and hatching are handled. And again, I have looked at this in various other calls and lessons, but maybe in this particular context it could be useful. So if I select these two walls, and let's put the exterior here instead of the building materials option, we will override it and make it out of a CMU block. Here's something interesting, why are these not cleaning up? Okay, so that's certainly not a clean



result. If we were to look in an elevation from the north elevation here, yes, you can see that this is not showing what it should. We should have the block wrapping around. [0:47:19]

Let's look at this wall here, it's the 0 to 10, this is 0 to 10. What did we do? I'm trying to remember what I did that would make it have a problem. You can see the reference line of this going here. The reference line of this one is here, but it's stopping short. You can see it's not mitering at the corner, it's stopping short. So something is different about these settings. Now the simplest way to fix this rather than trying to troubleshoot it might be to redraw it. But one way would be to eyedrop one. And I don't know which one to use, but I will eyedrop this one here and then I will inject it into the other. That didn't work. [0:48:04]

Let's select both of them and use the "Intersect". That didn't work. Okay, so this is a mystery. Why are they cleaning up on the top here and on plan but - OK, I know what it is. And this is a subtle thing. Right now I've got these two walls, both of them are set to have their exterior with the CMU. But the corner of them or any exposed edges you can see it is not CMU, it's set for the old one. So let me override this and put it in that CMU. You can see now this is connecting up. Of course, this was an exposed edge that I didn't expect to show up there but now it's cleaning up properly. Now when we are building things with large units like this, we probably don't want to have a little tiny piece at the corner. So we might go and select this wall and go to the Design menu and say that we want to do "Align 3D Texture, Set Origin". [0:49:24]

This allows us to click on an origin point. That moved this one over. Now if I select this one and we say the same thing, now they are nicely lined up. So basically I could've selected both at the same time and told them both to line up to this. Now you'll notice at the bottom of these, the blocks start right at the bottom which is good although maybe it's a tiny bit of an issue because it's actually starting with the cement or grout in between the blocks as opposed to starting with a clean block. But that may or may not be worth trying to clean up. [0:50:18]

Suppose we have these walls, and I'm just going to move these walls up in space. Of course I would want to move the other walls as well. But let me, for demonstration purposes; say they started at 5". Now you can see I've moved them up to 5" and the blocks now start here, which is perfect. But remember I moved the origin of these. Let's go and do the same thing with these two but not move the origin. So I'm going to take these two and repeat the same process of overriding both of these to be the same concrete block. They look good. And we haven't aligned the corners. So we have a partial block at the corner here, it's not quite right. [0:51:16]

But it's relatively close. What if I moved these up to the 5", just some offset here? Because I haven't aligned them, now it's starting at a partial block because ArchiCAD is saying, "We're going to put blocks out starting from zero just at the project zero probably is what the reference point is. And just wherever these walls happen to sit in space, that's where the block will be." So that's probably not good. here



then we would resolve both issues, in other words, the corner relationship as well as the base relationship, by going to the "Align 3D Textures, Set Origin." And you can see we actually did both of them at the same time. Now we have a good result. [0:52:04]

Now what's going to happen at the other corner? Obviously, right now I drew this building arbitrarily. I just sort of sketched it out, so it's not a nice even unit of masonry here. In general terms, you might make the building have a nice even number of masonry units; at least that is something that could be considered in terms of your design.

Steve Nichol is saying, "Voilà! I didn't know about that one." Okay. So I guess that would be the 3D things.

Dave Norman says, "Can we align block wall textures to meet at a corner but start the wall with a 5" block?" So in other words, have a shorter piece at the bottom, is that what you mean?

"Yes." [0:53:01]

Okay. So what we would want to do is instead of snapping it to the actual bottom is snap it to some other element that has a snap there. So let me go and - so we are at this corner here. Let me go to the floor plan and go to that corner. And let's say that I've put in just a square column right here and I'm going to move this here. Now this is sort of like a drafting guideline. I'm just putting in a thing there that I can then use to snap. So if I go to 3D you can see that this column was set to start at zero. So what I can do now is select these two walls and use the "Align 3D Textures, Set Origin" and click on the bottom of the column. You can see now it's starting the blocks here, giving us a short piece at the bottom. [0:54:08]

So you have to have something to snap to, even if it's something that you just delete afterward in order to be able to do that. In general, you can line up these textures to another element as opposed to themselves in some cases.

Dave says, "Great, thanks." Alright.

So we are at the hour mark just about. I'm wondering if there's anything that you can think of related to this that you'd like to have me consider. We can see that we have now a nice clean result at the top edge as well. I remember when we were looking earlier it was not as clean. Let's see what we have on the other side. We do have this issue. Remember I just changed the alignment of these to have a different offset. So let's just see if we can get this lined up, say both of these. [0:55:04]

You know what? I deleted the column. So let's put the column back and let's go select these two walls and align the texture of this point. And now they are nicely aligned at the same thing. All of them, even if they are remote, can be lined up to some reference. Because actually without doing that they are lined up to the project origin. So they just figure out how many blocks from the project origin to where



the wall starts, and that's where it starts with a partial block or whatever. And if you're starting at zero height or elevation then of course it would start with a whole block. But if you're at some other height it will start with another. [0:55:58]

Now let's just see what happens if I stack walls. Sometimes you might make this wall taller. So I'll take this up to 15 feet or something like that. But let's make a piece of wall - and what was that? That was this one. Let's just make a piece of wall up on the second floor and show the first floor as a trace reference. And I can eyedrop this one and make this go across. Just for convenience, I'll go down here and we'll go to 3D. And of course, when I eyedropped it, it picked up 5" as the offset off of the base. So of course I would want to make these come down. [0:56:48]

I can just say I'd like to change the bottom down here. So I can stretch that. And what do we have? Well, it doesn't quite work. We've got a little bit of a funny thing there. Let's see if we take these two that are on the remote story and again do "Set Origin" and let's go down to here. And now, yes, it looks perfect. So essentially, we're just putting a reference for where we want to start these blocks. That seems to work pretty well. Let's see if there are any other comments or questions on this topic. I will think about it between now and the next training session, because I believe that there are some other areas of creating elevations that are clean that would be useful to cover before we switch gears and move on to the next piece here which is adding detail. [0:57:53]

So right now we're talking about clean relationships between elements. In the lesson that would follow this section we'll be talking about how you add detail, which you can increasingly do in 3D and of course sometimes you're going to do purely in 2D. So let's see if there are any final questions or comments before we finish up today's lesson. And feel free to send me an e-mail with your suggestions on things that have been challenging for you for creating clean elevations. Things that have been tricky to clean up or you wondered what is the best way to make the elevations really look crisp. [0:58:39]

One thing I just realized that I should add into the section would be some strategies for presentation and clarity in elevations and sections. And that would include things like "Marked distant area". So as many of you know, there's an option in sections and elevations to say elements that are closer to the viewpoint can have more detail and elements that are further than a certain line or distance can have less so that they recede into the background to visually indicate what is foreground, or more important, in this drawing and what's in the background. [0:59:23]

So that will be something that I will spend some time on as well. Steve Nichol says, "Way more interesting than the myriad of work environment stuff." I know, I know. Work environment stuff took forever to cover and really only a few things here and there were revelations. But still I needed to create a reference so that anyone who needed to look at a particular section they would have all the explanation. We're now moving into some things that will be perhaps much more exciting. This whole week 22 should be pretty darn interesting. Thanks everybody. We'll finish up for today. Please add your



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comments and questions to the page down below this video. This has been Eric Bobrow, thanks for watching.

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