



## BEST PRACTICES COURSE – WEEK 14 – PART 3

### Using the Grid for Sketching and Precise Placement

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Hello, this is Eric Bobrow. And in this lesson, we'll take a look at the use of the grid for sketching as well as precisely placing elements.

The grid is visible onscreen right now very faintly as a grid of lines, and when I activate it by clicking on the grid snap in the toolbar, it will force my cursor to jump to the nearest grid position. So you notice as I start to draw this wall, it's jumping to the nearest point. So if I wanted to make this a certain distance like 60 feet, it becomes easy to sketch. So I can actually draw this up to whatever distance might be appropriate. [0:00:41]

Now of course, it's constraining that to a distance. In this case, it was showing it every 4 feet. And you might want to adjust that from time to time. So how do you control the grid? You can turn it on and off using this button here, but going to the View menu, Grid Options, Grids and Backgrounds will give you lots of controls. Now the first thing I'm going to do is just make it a little bit darker, easier to see for our lesson, by double clicking on the grid line color here and changing its to a little darker shade of gray. You can see in the preview how it's now much easier to see. [0:01:16]

Now if I wanted to change the background, and some people prefer having let's say an off-white, like a yellow color here, you can see how that shows up. I actually prefer having it white so I can just go and click on one of these presets here or drag this around until I get it into the center, and then get it back to the white value. Now the spacing here, right now it's set to the 4 feet. In metric file it might be set to 1 meter. Let me just make this a column spacing. So for example, we might have a column 16 feet horizontally by 12 feet vertically, and you can see now we've got a rectangular grid here. And we can use that for snapping perhaps a larger building to the nearest column grid when we doing a little sketch here. [0:02:02]

So let me just get rid of the two walls that I've drawn and zoom out a little bit here. And let's just draw a box of walls say that fit that dimension. So you can see now it's going horizontally, 96, that would be six units of 16. And it's going up to 60, which would be five units of the 12. So that makes it very easy to place things on column divisions. Now if I go to the Column tool, and I just click, I can place columns right on these points just by clicking, it's going to snap to the nearest one. If I go to a corner here and click - and obviously what it's done is it's put the insertion point of the column, which in this case it is the

center, at that intersection, and that may or may not be what we want. We actually may want to have this column is setup where the corner of it is matching that wall. [0:03:00]

So we can of course when we are placing columns, change the insertion point like this. So let me get rid of the other one. Now sometimes it's a little bit hard to select things, but as long as they are on the grid point then it makes it easy. Let me go ahead and I'll place the new column here from its bottom left corner there. Now this brings up the whole idea of do we want to only be able to snap to the center line of the column or will we want to have lines and easy ways of snapping to one side or the other of the column? So let's take a look at that. I can go to the View, Grid Options, Grids and Background, and say you know what, these columns are 1 foot in each direction. And I will put them into the auxiliary grid, and I will make one step, basically there is going to be one column for every distance along the main grid. [0:03:55]

Now when I do that, you can see that it's created this grid that goes a certain distance, the 16 feet, then goes one more foot for the column. And we now have snaps along there. As I go to the Wall tool, and I start to draw a box of walls, you can see how it's snapping to either one point or the next of these grid lines that we see. Now it's offset, because it's actually gotten a little bit bigger in terms of the spacing. I didn't compensate for this. I would need to make this 15 feet and 11 feet clear space, and then have the auxiliary grid. Now separate from just having one space, what if we wanted to snap to the center of the column? Well then we might want to have the spacing two spaces that are half as big. So 6 inches would be half a foot. [0:04:55]

So let me make this two spaces, and the half a foot 6 inches. And I will say OK. And you can see now, we are getting the grid, and we can actually place the columns or the walls either on the center - actually I have the insertion set in the bottom left, so let me put it here. So I can click on any of these corners here. I can also go and when I'm drawing walls, I can snap the wall to either the center point here or the corner. So I can easily make this go up to a nice even division along here. You can see how I'm snapping to the outside of what would be the column grid there. [0:05:38]

So this is using the feature for the auxiliary grid. I'm going to turn that off, because for the rest of this lesson it won't be useful. But do remember that you can turn this on when you would find that useful for working with columns. I'll just change the grid steps for the auxiliary grid to zero, and that will put it back to not showing. And I'm going to put the main grid back to the 4 feet, sort of smaller general purpose visual display. And now let's take a look and what's called the snap grid. You can see that this is set to 4 inches. So this is a smaller value here. Right now we're snapping to the large construction grid, but I could tell it that I would like it to snap to the smaller snap grid. [0:06:24]

And when I do that, let's see what happens as I start to draw walls. So I will just draw a simple sketch, and I'm going to draw this along. You can see it's jumping to 7 feet 8 feet, 8'4", 8'8". It's jumping every 4 inches. And you could set that, in metric that would be every 10 cm. So it becomes easy to jump - say here say I wanted it exactly 18 feet. So I don't have to type in values as much because I can just sort of move it until it reaches the value that I want. So the snap grid gives us a finer gradation that we're not

seeing visually, and it does give us more fine control while still rounding it to a nice even number. [0:07:07]

Now, another option that we may want to use sometimes it is a rotated grid. Let me turn off the grid right now and let's just zoom out a little bit and place a box of walls, a rotated box along from the corner. So I'm going to click on a corner here and start this wall. Let's say that I wanted to make it 60 feet long, hit the tab key, and 20°, and so that's now going to be part of the building that's going to be on that angle, and I can snap this up into relationship with the rest of the building. I will hold down the Command key to get the scissors or CTRL key, and I can then trim here. That's the keyboard shortcut for trimming is Command or CTRL, when nothing is selected, will bring up the scissors and allow us to do that. [0:07:57]

Now as I'm working in this area, we can see that the grid is now not very relevant to this particular section of the building. I'd like to switch the grid to a rotated grid that matches that. So I'll use the popup from the grid and say Set Rotated Grid. And I will go and click on this corner, click on the edge of the wall, and that will then make the grid start at this corner and measure on this angle. So now if I go to the Wall tool and I'm just trying let's say a chain of walls, and I'm going along, as I press the Shift key down, it's going to lock onto that. It's aware of it. And if I were to type it in an X or something like that, you can see that I can type in a value. Now notice that the distance here says 18 feet something and the X says minus 18. So let me just type in minus 20, and you can see that went 20 feet along. [0:09:00]

And here I'm going up in the Y direction. And if I type in Y, you'll notice that it's a negative value. So negative 15. So that's rather confusing, because I'd rather make the measurements here going from left to right be positive, and going from the lower part of the screen to the upper be positive. So in order to do that, in this case, I'm going to set the rotated grid. But instead of going from this bottom left corner, I'm going to start at this upper corner and go back the other way. And what that will allow me to do is to measure. And so when I'm measuring now using the Measure tool, say from here to this point, you'll see that it's going to be a positive X, and going up this way it's going to be a positive Y. [0:09:42]

So just remember that you may want to set your rotated grid from a point up above going to the left. I'm not exactly sure why that's the case, but just know that you can play around with moving the rotated grid from one point to another this way. So now if I were to draw the Wall tool and simply say that I would like to go and press the Shift key and type X, and then type in 20, that's going to go in the direction that I would expect. And in this direction, snapping to the guideline, type in Y, and you can see the positive value will give me the result that I'm expecting. [0:10:21]

Now, we've rotated the grid and X and Y are matching that. But we're still working on an angle. And sometimes it's nice to be able to rotate this like you're turning a piece of paper. In ArchiCAD 13, Graphisoft introduced the option to rotate the orientation. It's this little icon here next to the Fit in Window. So if you have ArchiCAD 12, you won't have that. But in ArchiCAD 13 and later you will. I'll click on Rotate the Orientation and say click on Rotate This Corner. And then click along this edge, and you can see the ghost image moving along. And I can snap it along the axis here. It automatically has the normal X and Y axis as a guideline. [0:11:07]

And in this case, it's telling me that I'd be moving it 20° back. When I click again, now you'll see that this part of the building, and if I zoom out to fit in window, you'll see that this part of the building is in the orientation that will make it easier to work on. Now sometimes you may want to actually rotate this even further, in other words we may want to put a different part of the building up. So I say Set Rotated Grid. Let me just click on this corner and say that this edge is what I'd like to be horizontal, and I can bring it around. I'm sorry, I need to do the Rotate Orientation here and click here, click along this edge, and perhaps take this up. And now you can see that the building still has the same shape, but now I've got it another further orientation. [0:12:00]

Now I can go back to the previous zoom and rotation by using the Previous Zoom options here. And you can see how as I keep clicking, it keeps going back to the views that I was looking at. Or I can go forward to these orientations. Now Forward and Back allow us to jump to different zoom positions as well as orientations for the grid. But if I want to, I can just click on the Reset Orientation, which right now shows the 340. I can click on that, and that actually puts it back to the normal orientation for the view. [0:12:39]

Now the grid is set on the angle, and we might still want to use that for some cases. But if you do want to put it back to the original arrangement, you can pick Orthogonal Grid. Now let's take a look at another way that we can use the grid, which is for masonry construction. So I'm going to just zoom in say over here. And let's say that I wanted to create a wall that was a certain number of masonry units long, so a certain number of bricks or blocks. Well, let's set up the snap grid here to the size of a brick. So instead of being 4 inches, let's make it 8 inches which would be 20 cm. And then let's activate the snap grid here. We can choose to switch between the snap grid and the construction grid in this area as well, so these icons will allow you to switch. [0:13:38]

Now when I go and click to place this wall, and I have that activated, you can see that it's jumping to the nearest, in this case, 8 inches. So that would be a nice even masonry size. So it would be a whole number of bricks or blocks. Now what about when I want to place a window or door? So I will go into the Window tool. We want to place a window opening that fits in neatly into the construction or the masonry size. So what we will do is say well 2'6", that's 30 inches, and 8" bricks, then we would need to make it 32, so we would make it 2'8", and this would have to be, instead of 5 feet, it would have to be 5'4" or 64 inches. But the size that we're specifying right now would be the size of the window unit itself, and it generally would need a little extra space for installation. [0:14:32]

So we would actually have to cut it back until it fit into the right size there. So to simplify this, if we go in the custom settings here, we can switch to nominal sizes and tolerance. And there, we can choose to say set the nominal size, which is what we are entering here, as the rough opening. So what we're going to be specifying from this point forward is what the rough opening sizes. So we want to make these 2'8". So you'll notice that it got bigger here from what it was because there's a certain tolerance or shim space that is that you can setup. So this can be adjusted, and you could set this to be zero, but generally it's nice to be more realistic. At least that's an option that I often prefer, is to have the actual tolerance or shim space indicated. [0:15:23]

And now I'm able to set the rough opening and know that I need to order a window that will fit in that will be this much smaller. So having set that up, let's just say that we want to pop this window into by its corner. So we want to make the corner of the window let's say evenly on this space. Now I just sort of clicked arbitrarily, where did that window end up? Let's measure it from here. With the grid snap turned on, I can't measure precisely. So I'm going to turn that off, and then I can measure say from this corner here over to this point. And you can see it says 5'4", or go to the other side, 8'. So by using the construction grid or the snap grid set at the correct distance, I can make sure that the windows are placed in, as well as doors, in the right location. [0:16:17]

Now this works great as long as the wall was placed on the snap grid when I was constructing it. But for various reasons, the walls might not be on that construction grid. So let's say I have the grid turned off. And let's just put something slightly off from here. And how would we make sure that it's measuring from there? Well let's just zoom in on this and see how much that's off, and how we can correct that. So if I am going to the Window tool and I have the snap grid turned on, you'll see that this little dot is jumping around. It's not really on the wall itself. In fact, you can see that it's starting from this point in line with the other wall. [0:17:06]

So let me go with the grid turned off and use the Set User Origin command, which I discussed in an earlier lesson. And I say move the origin to here. You can see the little X shows up. And now when I turn the grid back on, the dots are, you can see here's one brick going up or sideways, and it's right in line. So now if I pop it in, this window is going to be that same offset, because it's going to be measuring - if I use the Measure tool and turn off the snap while I'm measuring - if I measure this, you can see that it's measuring 5'4" four and 8'. So by using the Set User Origin, I can reposition is anywhere I like. [0:17:51]

Now sometimes it is nice to be able to see these divisions, not just know that the snap grid is controlling it. So I may want to go to the View menu, Grids and Backgrounds - let's actually cancel out of the Measure tool. Go to the View, Grid Options, Grids and Backgrounds, and let's say that we set up the main grid to be the spacing. So when I do the main grid spacing, and let's make the nudge, the snap grid here let's say something smaller, like 2 inches here. Now you can see that we're getting the main grid every 8", every brick. But of course it's not starting here. It's starting in relationship to the original grid. So how can we reposition that? Well remember, with the rotated grid, we are able to do that very easily. We can put in at any corner and rotate it to any angle. [0:18:51]

So let's use this Set Rotated Grid to set it to this corner. And instead of rotating on an angle like this, I'm just going to take it horizontally. And you'll notice how it repositions the grid here. So now it's measuring, and we can see how the window is popping in. If I pop in the window again, and we can see that it's precisely fitting into the grid space, you can see how it relates to the grid. Well what if we were going to have a whole number, in this case, the wall was not drawn to an even masonry unit? What if we were going to start the whole bricks on the other side? Well, we can measure using this by saying Set Rotated Grid and start it from this point. [0:19:35]

We need to turn off the grid when we are doing it, and then we can set the rotated grid from the other orientation. So now it's measuring every 8 inches or every brick from this side. So you can reposition the grid using the rotated grid, even if it's not rotated. You can simply say that you want to place the origin point that way. So this is a great trick as well. Now let's take a look at one another option that we might want to use for the grid controls, which has to do with nudging something. [0:20:17]

So if we put in some text and it's really tightly spaced, let me just say I'm trying to put in some text right here where it's going to be hard to fit in. Now that text, if I'm trying to fit that in, and of course this is a little bit of a crazy example, but let's say I want to fit that in. I could drag it around, but sometimes it's hard to snap to things that are nearby. There is a command that was introduced I think into ArchiCAD 12 called Nudge. To move it up, I would use the up arrow with the Shift key. So I hold down the Shift key and hit the up arrow. And it moves it just a little bit; just a little bit more. Oh, perfect. But if I wanted to make it a little left, hold down the Shift key and type left. So you're using the Shift key and one of the up down left or right cursors. [0:21:09]

This is controlled by the snap grid spacing, so I'd set it to 2 inches which would be about 5 cm. So whatever that is set to is the size that it's going to jump. Now sometimes you want to jump things further, you want to just sort of use the keyboard to move a piece of furniture over or something else. So you can hold down the Shift and add the Option or Alt key. And then it can jump much bigger amounts. You can see it's jumping one whole grid space as I move left, right, up or down. So that's a Shift and Option or Shift and Alt with the cursor key, the left, right, up or down. [0:21:45]

Now to see what that shortcut is, you can write it down, of course while you are watching this lesson, but Options, Work Environment, Keyboard Shortcuts, let's just see where that's listed. So if I go to the Popup menu and change it to "All commands in alphabetical order", I can scroll down through here until I get to the letter N, but here's a shortcut. I can click anywhere in this list to activate that list as the primary focus, and then hit N, in this case the letter for Nudge. And it jumps me down. So now I'm very close to the ones that I need to find. So if I hit nudge up, you can see it says "Shift+up". And the command "Nudge up larger" use Option+Shift+up or Alt+Shift+up. So that's where you'll find these commands in the work environment, in the keyboard shortcuts there. [0:22:36]

Now one thing I don't think I showed you was the visibility of the grid in 2D is also used for 3D. So if I go to 3D here, and you'll see that the model comes up. There's actually a visual grid in ArchiCAD 15 that we can use in 3D. So when I go to the Wall tool, if I turn on the let's say the construction grid here, and just click, you can see I'm jumping. I'm creating a wall and it's snapping to that grid. So this grid visibility is something that we can control under the View menu. We can, for example, go to the View, 3D View Mode, and turn this on or off. It's called the Editing Plane. So I can turn off if you find that annoying, because it will actually move up or down in space if you're working on a different story or have a different base height set. You can also do some controls for the editing plane and placing it along a particular face or height. We'll get to that in a later lesson in the course on working in 3D. [0:23:52]

But the other thing that I want to look at is if we turn his back on here, we can control how it's displayed. And that is also under the Grids and Backgrounds. But now that we are in 3D, there are

some controls for the background and grid lines in 3D. For example I can make this a little bit more intense here, I could change the grid lines to another color, something like that. And when I say OK, we're going to see how that's changed visually. And if I go back in here and I wanted to make the plane disappear but still have the grid lines, I can pull this back to where the plane disappears and then we can see that effect. So you have different options, you can turn it off entirely or just simply change what color or level of opacity it is here in the 3D view. [0:24:46]

Now there are some gotchas, things that can get in your way when you have the grid turned on either intentionally or inadvertently it gets turned on. Let me switch back to the floor plan, and we will go and change the grid set up to let's say a more common one. Let's say the 4x4 and the 4 inch spacing here. So now if I go to the Arrow tool and I try to select when I have this set to the construction grid, you'll notice that when I go into this area and I click, it doesn't select it. Why? Because it's actually clicking on the nearest grid point. And so that I can make it hard to select or to stretch elements because it's not letting you click the point where you want. Turn off the grid, and you can easily just go ahead and click to select something and back to normal. [0:25:43]

Now, if we are in the layout book, we may see something a little bit similar, a little bit different, and that is the construction grid right now is set up and its jumping to this point here, the little dot where it's jumping. Now in earlier versions of ArchiCAD, that construction grid was set to be from the main grid. In other words, it was set 4 feet, which would be over a meter, which would be actually larger than the piece of paper. So it became impossible then to even select the drawing because we would be jumping there. In ArchiCAD 15, I'm not sure when this changed, but in ArchiCAD 15, if we go to the Grids and Background, we may see that the main spacing for the grid is set at a smaller value. In other words, in the layout mode, it's set here to 4 inches and half an inch. So this allows us to nudge drawings a little bit up or down using the same controls, or to line things up along some type of visual grid system. [0:26:47]

So Graphisoft has improved some of the defaults in this area giving you separate controls for the grid in the layout book as well as in 3D, it obviously had that control for the Editing Plane Display. So the keyboard shortcut for turning the grid on or off is displayed when I'm positioning myself over the grid button. And you see it's Shift+S. So if I hold down the Shift key and type in S you will see it turn on or off. And I will just do this a couple times so you can see that. In earlier versions of ArchiCAD that was simply the letter S. So it was easy to accidentally hit the letter S while you were in the middle of an operation or just when you were typing in something on the keyboard. If you weren't in the middle of entering actual text but you were drawing something and you hit the letter S, it would turn the grid on. [0:27:42]

So I would occasionally get calls from clients saying, "Hey, I can't select." Or "There's this problem with things," and after talking to them a little bit I realize that the grid was turned on. I told them how to turn it off and they would move on. But if you find that you can't select or snap to things properly, check whether the grid is on, and the keyboard shortcut now is less prone to accident, because you have to hold down the Shift key as well. So that's going to happen less frequently by accident. So this concludes our lesson on the use of grids for sketching and precise placement of elements. I look forward to getting your comments and questions on the page down below. This has been Eric Bobrow, thanks for watching.

[END OF AUDIO 0:28:28]