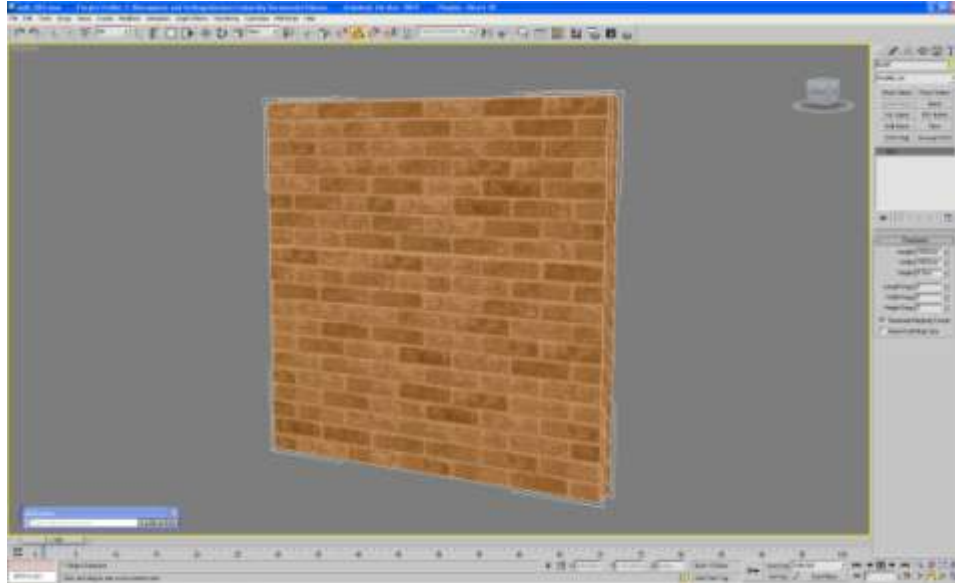


Breakable Wall Tutorial by Andrew Gahan

From 3D-For-Games.com

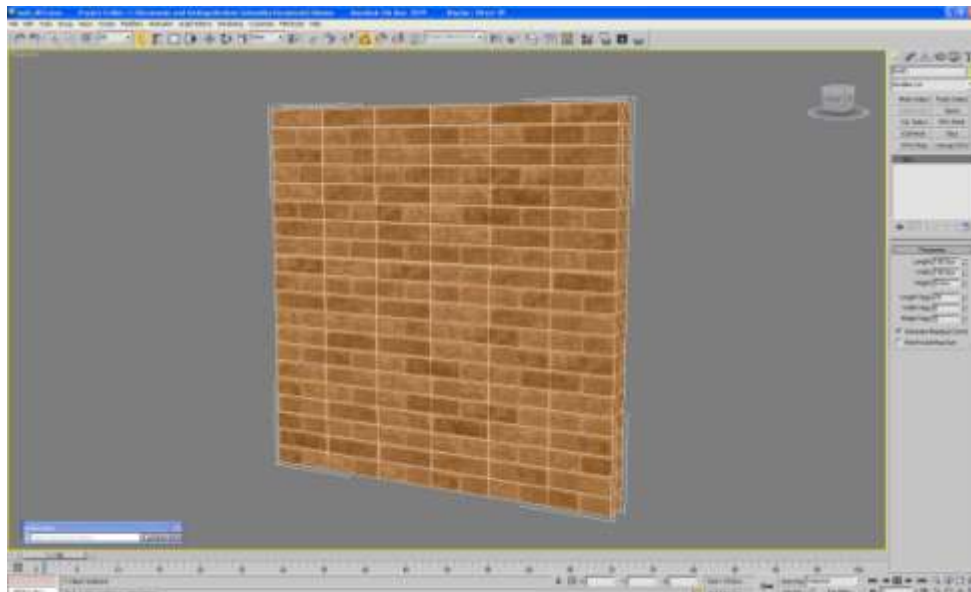
A request was sent in by Craig Marks on how to create a breakable wall for use in a game like COD4 or Battlefield2.

To begin with we will create a box and make it square. Next apply your square tiling brick texture map, with some simple box mapping.



Once you have the map applied to the box we need to set a rough polygon subdivision to match the bricks – In this my case it is Length Segs: 20 and Width Segs: 6 as shown.

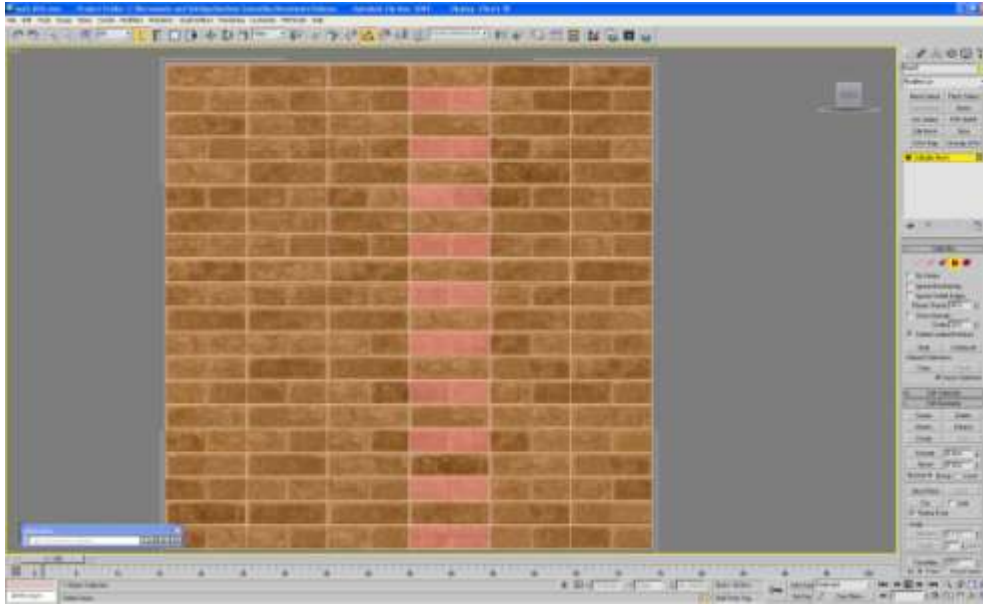
Don't worry about matching the wall pattern exactly, as the bricks overlap, you will only be able to match alternative rows at this point.



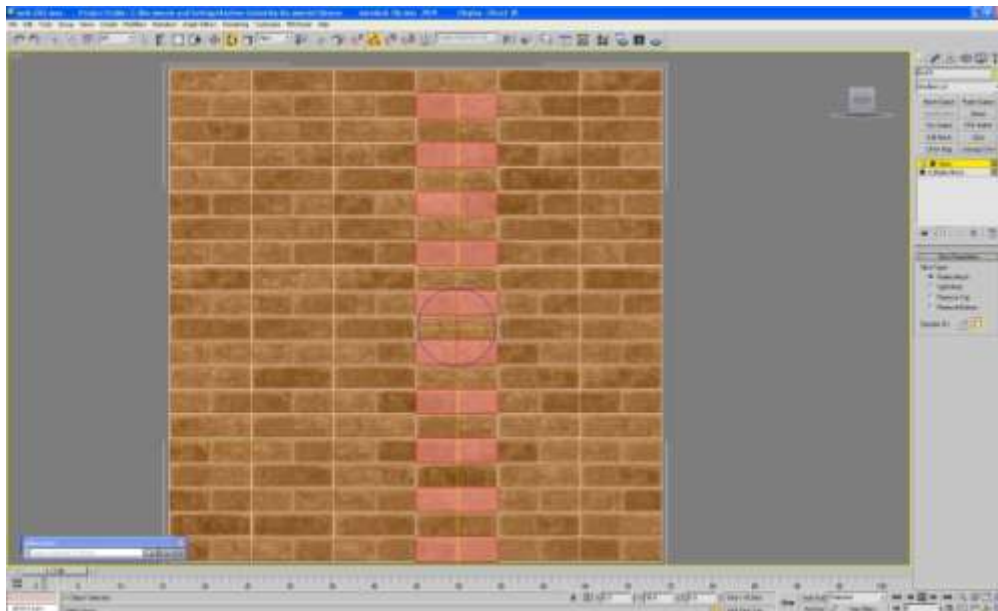
Next we need to convert the box into an Editable Mesh, or Editable Poly – either is fine.

If you're not already go to the Front Viewport (F) and click 4 – to Edit > Polygon.

Next we are going to choose a column of bricks where our sub-divisions do not line up and apply a Slice modifier to them. First, select the polygons to slice. Use the Select Object tool to select them and ensure that Ignore Backfacing is turned off as we want to select the polygons on the back of our wall object as well. Drag and select each alternative brick in turn until you have something like this.

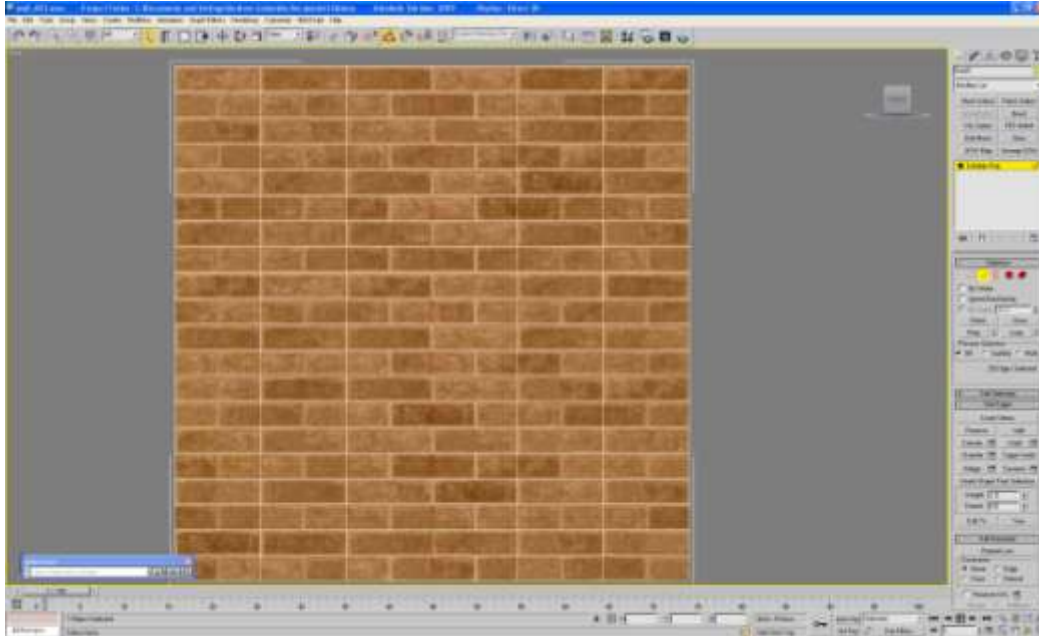


Next we need to add a Slice modifier. Go to Modify > Slice (from the Modifier List) or from your configured button set if you've followed the book, and apply the Slice modifier to your selected polygons. Now Click on the Slice modifier in the stack (to select it, turning to yellow) and use Select and Rotate from the top menu to rotate the Slice 90 degrees, slicing the selected polygons in half.

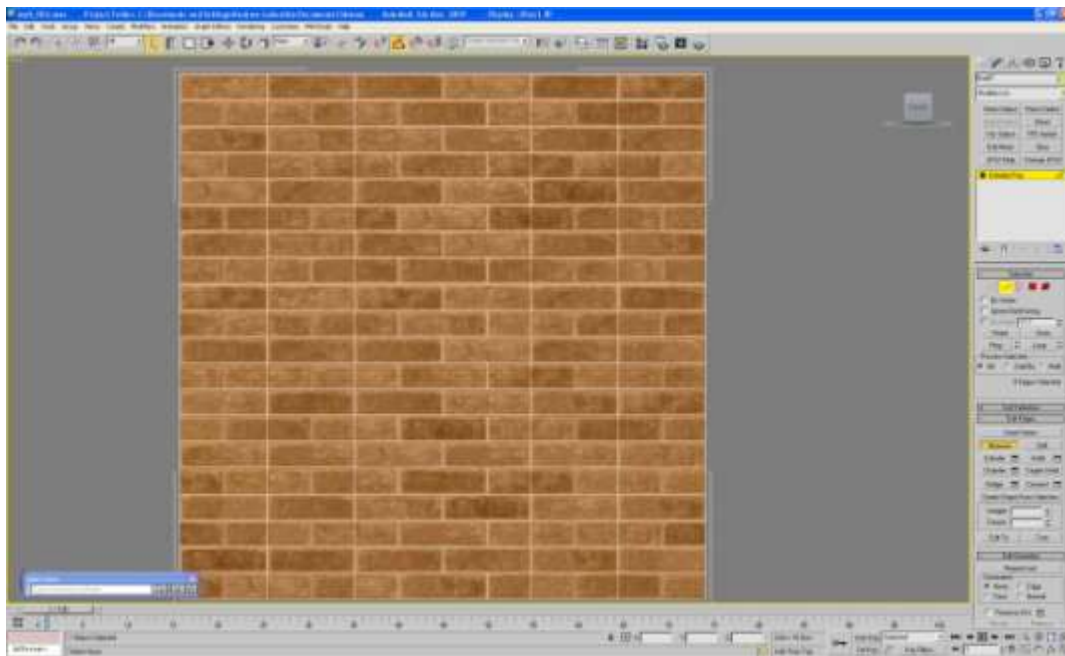


Now collapse the stack turning it to an Editable Polygon. Repeat this process to the next column of faces to be split.

Now, looking at the wall we have some excess edges where some bricks are being cut in half where they shouldn't be. These edges are very easy to remove in an Editable Polygon. We simply click 2, to Select Edge, and we drag and select the edges we want to remove. Remember to press and hold down the Ctrl key to select multiple selections.



Now that we have all the edges on both sides of the wall selected, simply go to Edit Edges > Remove, and the edges will be removed.



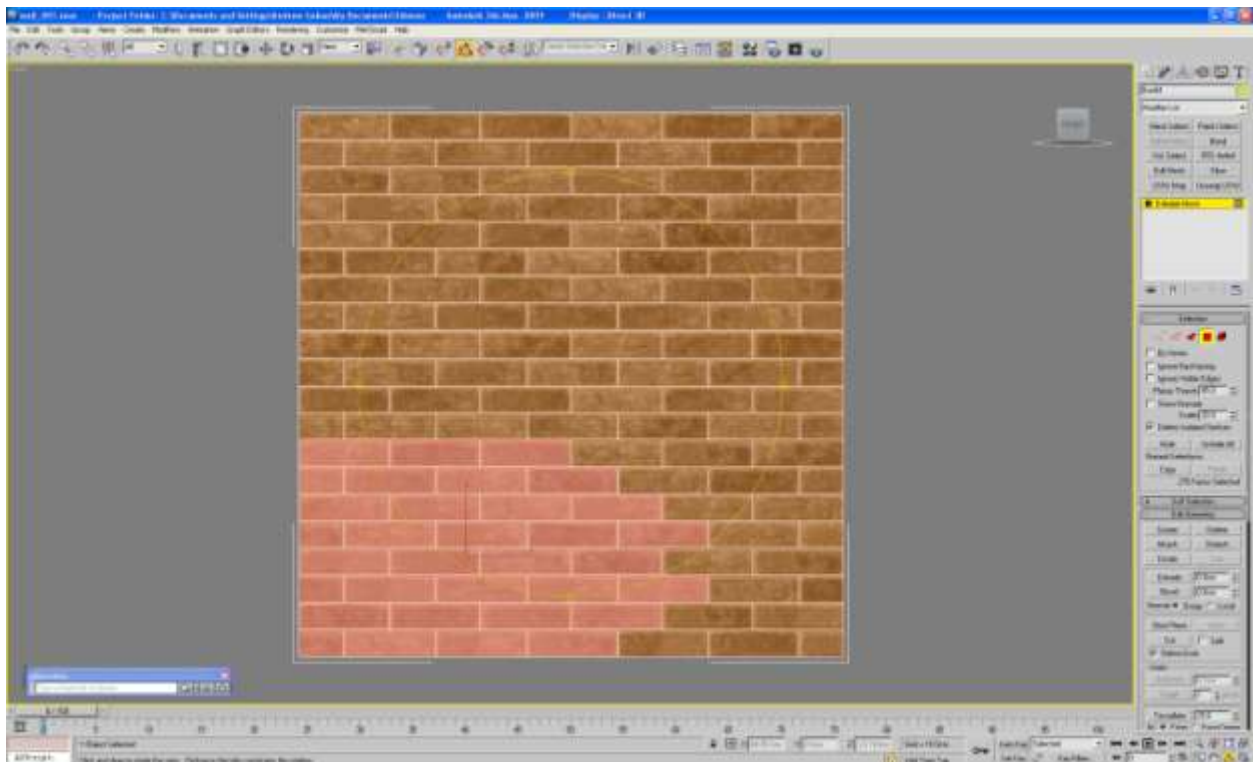
Now you just need to repeat this process, until you have sliced up the wall to have as much detail as you like. Don't worry about the complexity of the wall at this point, you will choose how detailed you want it to be in the next step.

OK, so we have a wall, with the surface carved up into bricks, but it's still not breakable. There are various plugins and scripts that can help with this sort of modelling such as Shatter(for 3dsMax) and Blastcode Kiloton (for Maya) – have a look for them online to see just how powerful they are.

Next we need to decide how many pieces we're going to break the wall up into. As the tutorial request was for current tech games such as COD4, we'll keep the number of pieces to around 10. If you want a lot more detail, this is not the best way of doing things. For lost of detail use scripts, plugin's or physics based engines, where you'll have procedural, single bricks all stacked up. Havok have some good demos for this technology, check them at www.havok.com

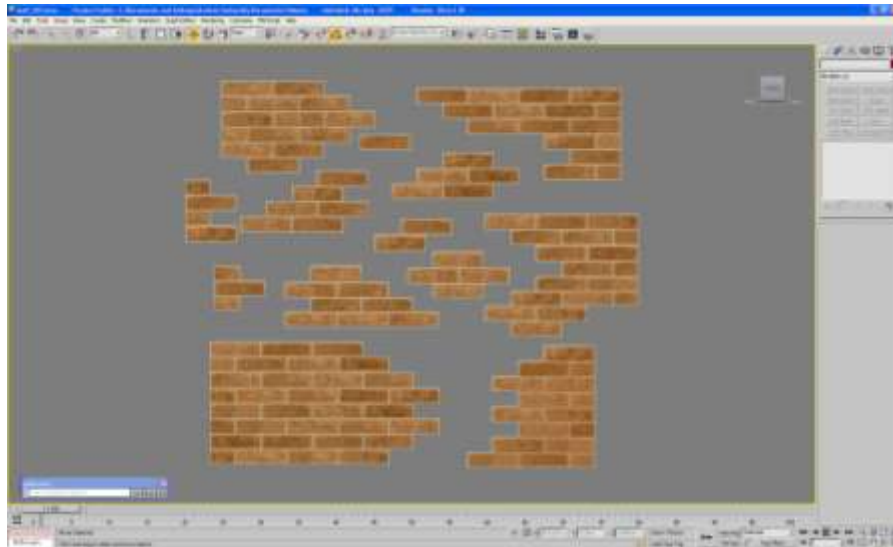
OK, back to the build. We next need to decide how to break up the wall, feel free to print out a quick render of your wall and sketch on the separate pieces you're going to break it into. Have a search online for wall + crash for some reference – walls all tend to break up in a similar way. Remember to create some interesting forms as well as the odd single brick for authenticity. You can break bricks in half as well, but I've chosen not to do so in this case.

Once you have an idea of what you want to do, select a group of bricks by selecting their polygons. Remember to drag select so that you select the polygons on the back of the wall too.



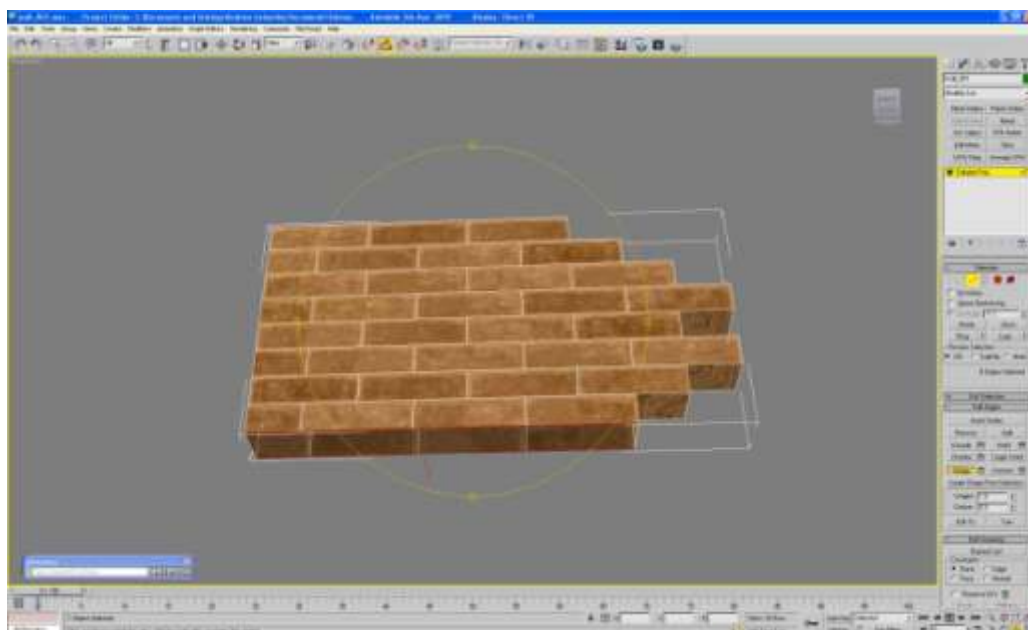
Next we need to go to Edit Geometry > Detach and type in something like Wall_001 to name your new object. Continue to do this process of Selecting, Detaching and naming until you have your wall chopped up.

Here's how I have decided to chop up my wall (I have moved the objects apart so that you can see them separately, you should keep yours together).

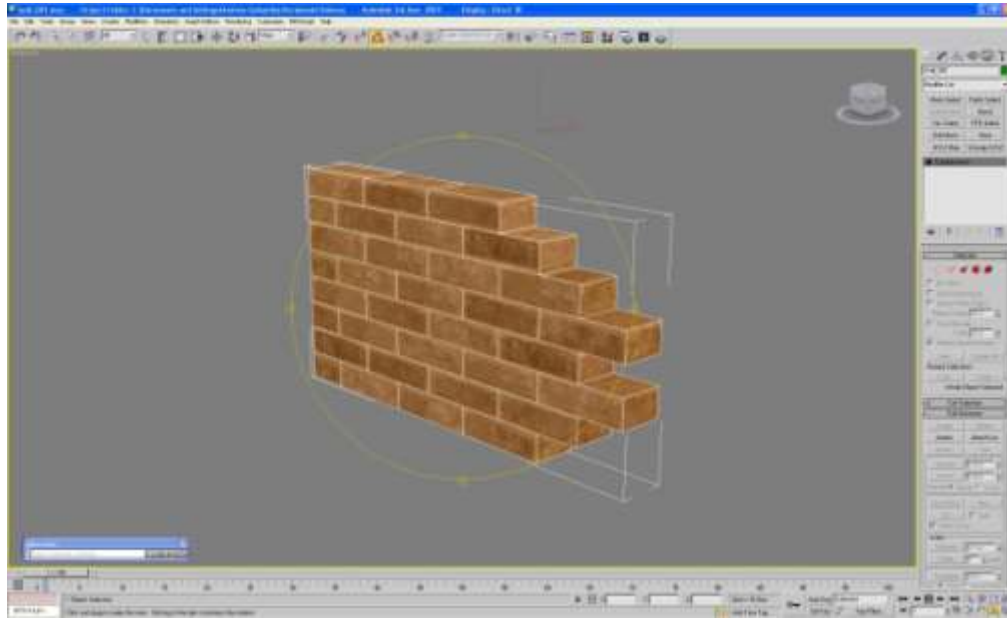


OK, with the 1st wall piece selected, right click on it and choose Hide Unselected from the pop up list.

Now in the Front or Perspective view select a group of edges next to the holes in your chunk of wall (like the top 3 bricks for example – make sure that your object is an Editable Poly). Now go to Edit Edges > Bridge, and you'll fill in the missing polygons. Continue round the object filling in all the holes.



With all the holes filled in, you just need to select the new polygons in groups and apply mapping to them.



We now need to collapse the stack, then right click in the viewport and select Unhide All from the pop-up menu.

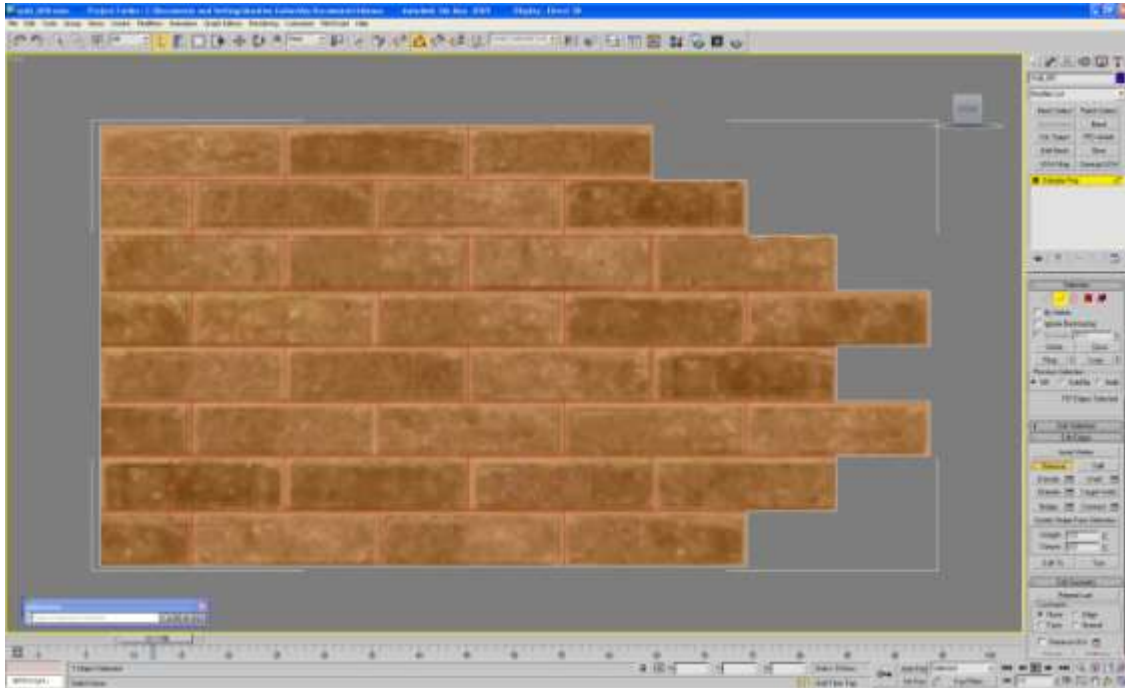
Now we need to go through all of the objects in turn and repeat the process until we have filled in all of the gaps in our wall pieces. It's probably at this point you'll be regretting chopping the wall up into a thousand pieces. If you have gone a bit mad chopping up the wall, start again at this point, unless you REALLY want all those pieces.

For any extra vertices on the pieces from before they were split up, just go to Vertex (or click1) > Edit Vertices > Remove to get rid of them. Remember always remove unwanted Edges before Vertices, and always check both sides of your model when after removing something, just to make sure you've not made any mistakes on the back of the model, or removed anything that you actually need.

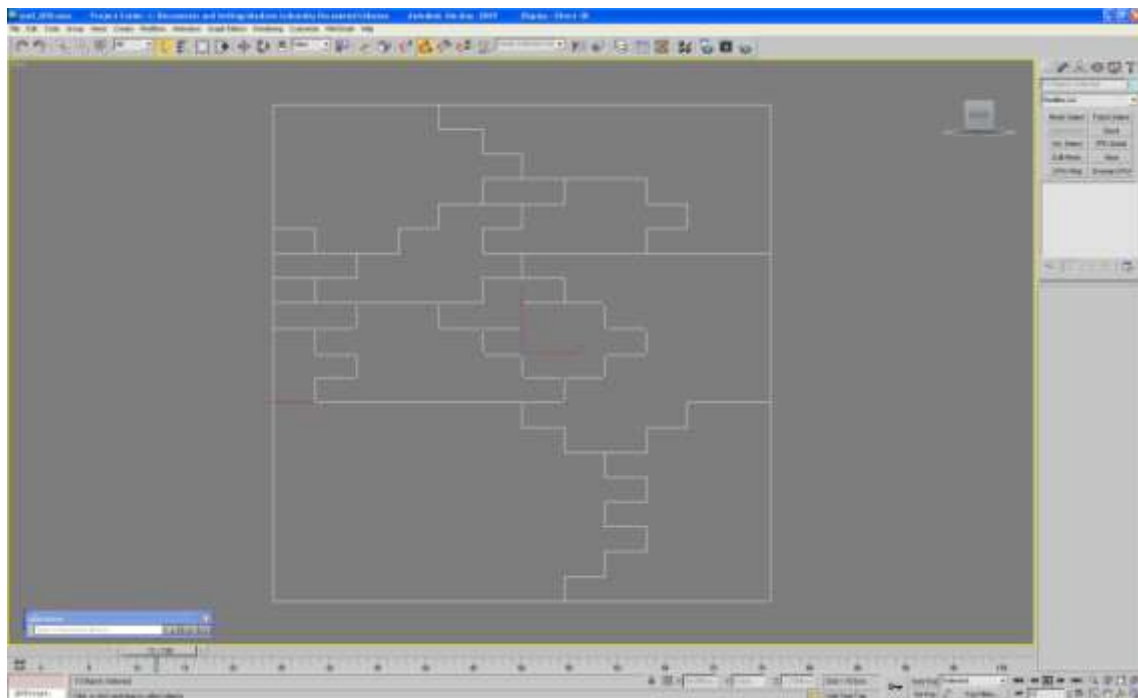
It is often quite difficult to line the mapping up on all these extra polygons when selecting them in groups and using box mapping, so try Face Mapping instead. Just select all the 'half' bricks to map in one group and Map by Face, then go through and select a few at a time and use Edit in Unwrap UVW to move them around to different parts of the texture page so that they all don't look the same. Then go through and map all the 'whole' bricks, repeating the Edit process.

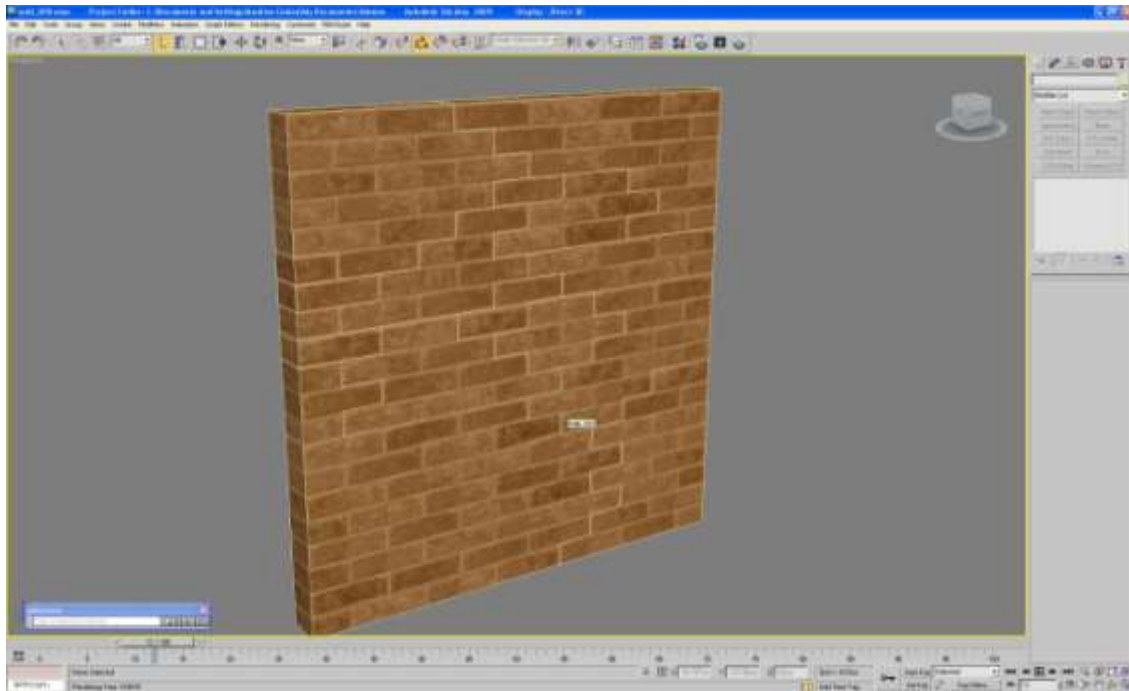
Finally, we just need to delete all the extra poly and vertex detail that we don't need for an in game model.

If your object isn't already, convert it to an Editable Poly. Select all the inner edges and delete them using Edit Edges > Remove.



Then just do the same for the outer edges and vertices, and you should be left with a fairly simple interlocking wall, ready to be knocked down.





Finally, here's a shot of it being blown apart, quickly set up with a camera and a spotlight on it.



And that's it.

Good luck with your modelling projects, and don't forget to send your renders to info@3d-for-games.com

Bye for now

Andrew Gahan