

Basic LOD Guide

Digital Combat Simulator

Written by Zach/ Luckybob9

In Collaboration with The Fighter Collection and Eagle Dynamics

Mandatory Requirements:

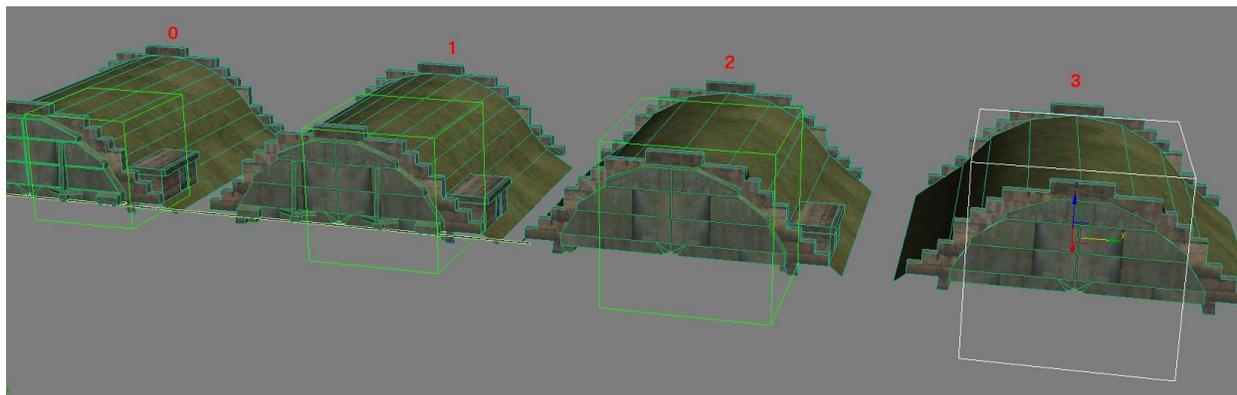
3D Studio Max 2008, 2010, 2011, or 2012 (64bit): <http://usa.autodesk.com/3ds-max/>

3D Studio Max Plugins from Eagle Dynamics: ftp://ftp1.files.eagle.ru/mods/edm_plugins/

Background Information:

What is a LOD? A LOD means 'Level of Detail' and is used in games to ease the stress off the system resources when an object is far away. Since there is no point to having a highly detailed model render in the distance when the detail cannot be seen, the best thing to do is to create a few version of your model with different polygon counts. Using this guide, the game will know when to automatically switch LOD's to achieve optimal performance.

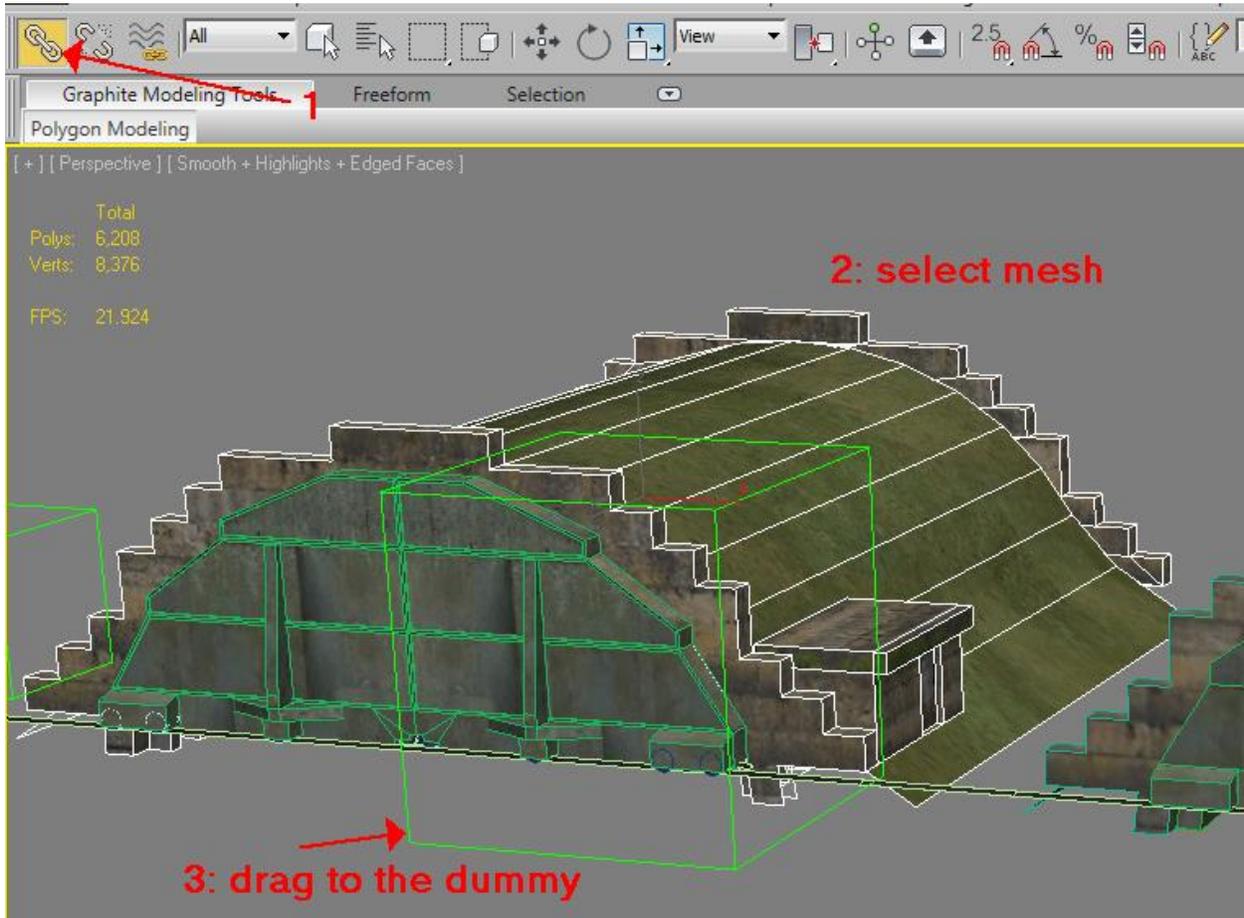
LOD's are all created within the same 3DS Max file and I find it easiest to link your LOD's to a dummy to make it easier to move and control. Below are my four LOD's for the Hardened Aircraft Shelter. I have labeled them 0-3, with 0 being the most detailed



The important part that makes this all work is the naming scheme of all the dummies and the link between them. I have my dummies named as “HAS_LOD0, HAS_LOD1, HAS_LOD2, and HAS_LOD3” and the corresponding LOD mesh is linked to it.

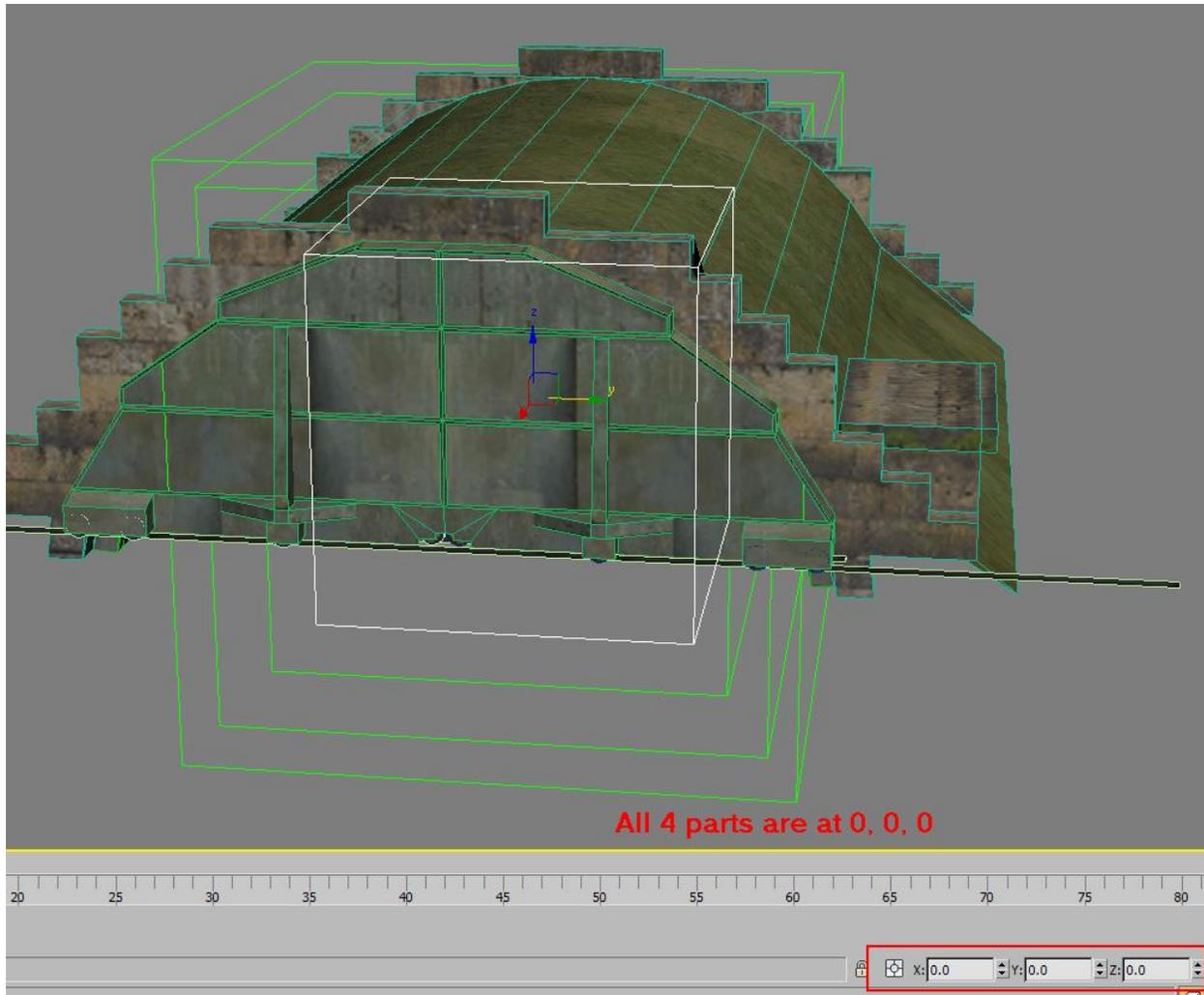
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In case you forgot how to link objects, click the link button in the top left. Then select all the mesh you want, and drag it to the dummy.



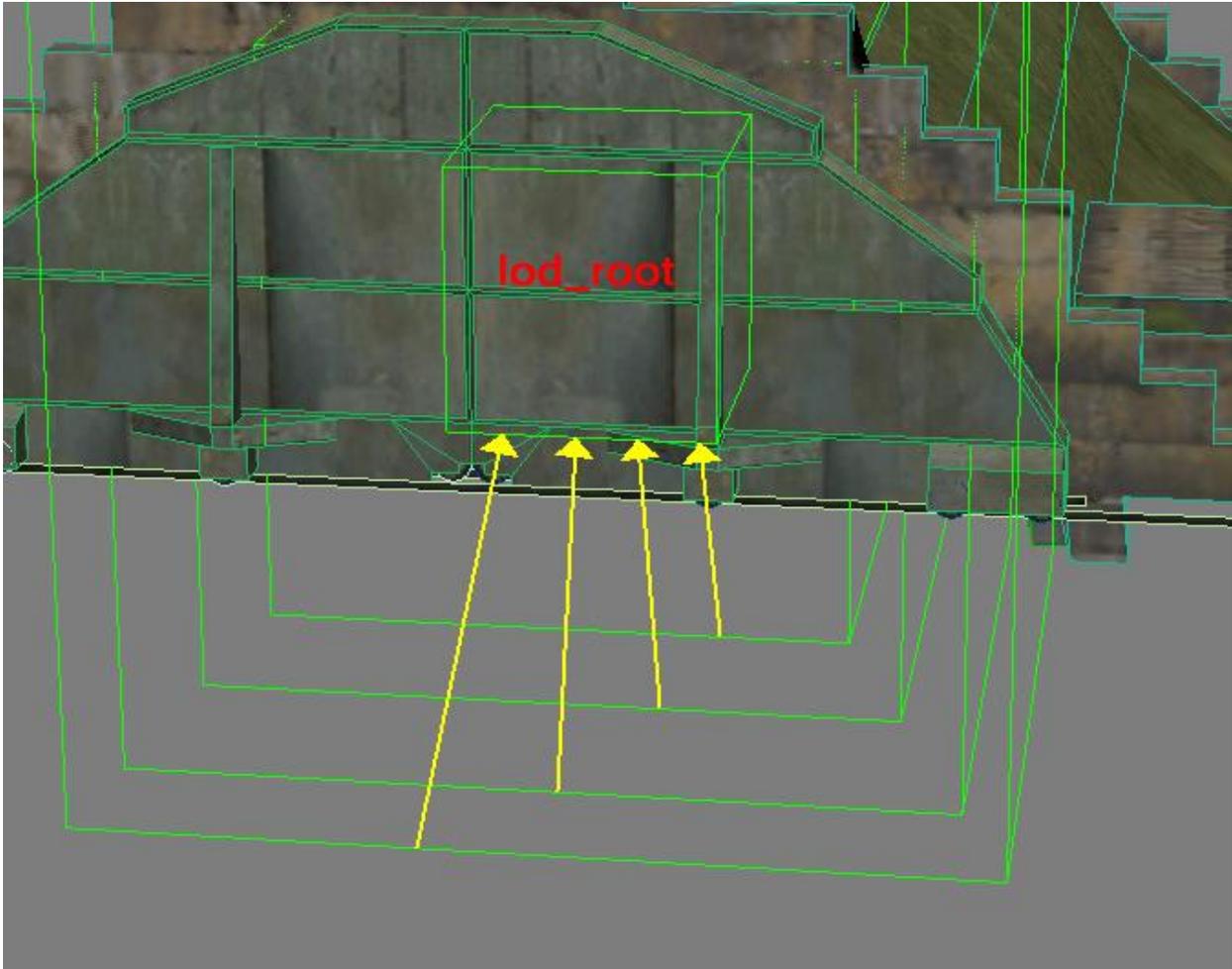
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Once you have all your LOD models linked to their corresponding dummy, move all the dummies to the 0,0,0 axis. They should be stacked on top of each other since this is where you want them to show up in the game.

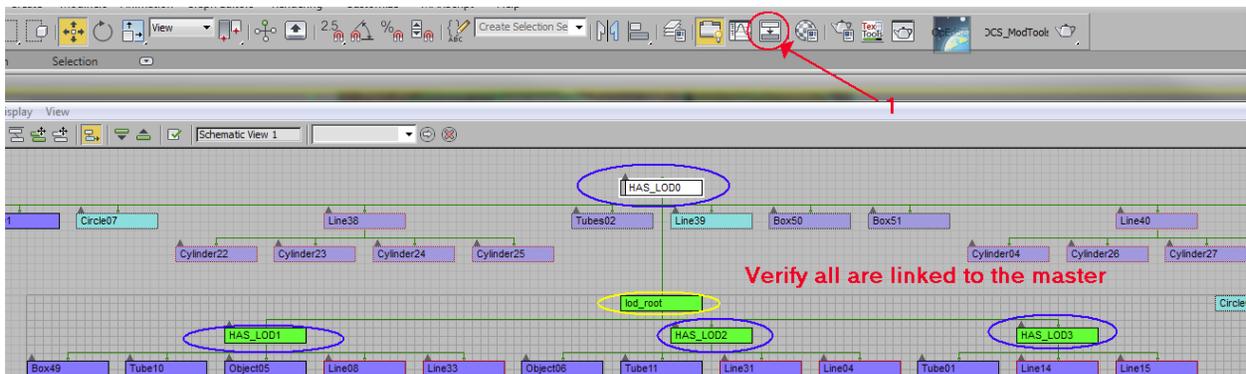


Then create a new dummy, and set it to the middle axis. Size does not matter, but I made it the smallest so I could easily recognize it. This last dummy is going to be the master that will have the parameters for the game engine to understand. Once you have the new master dummy created, link all your other dummies do it.

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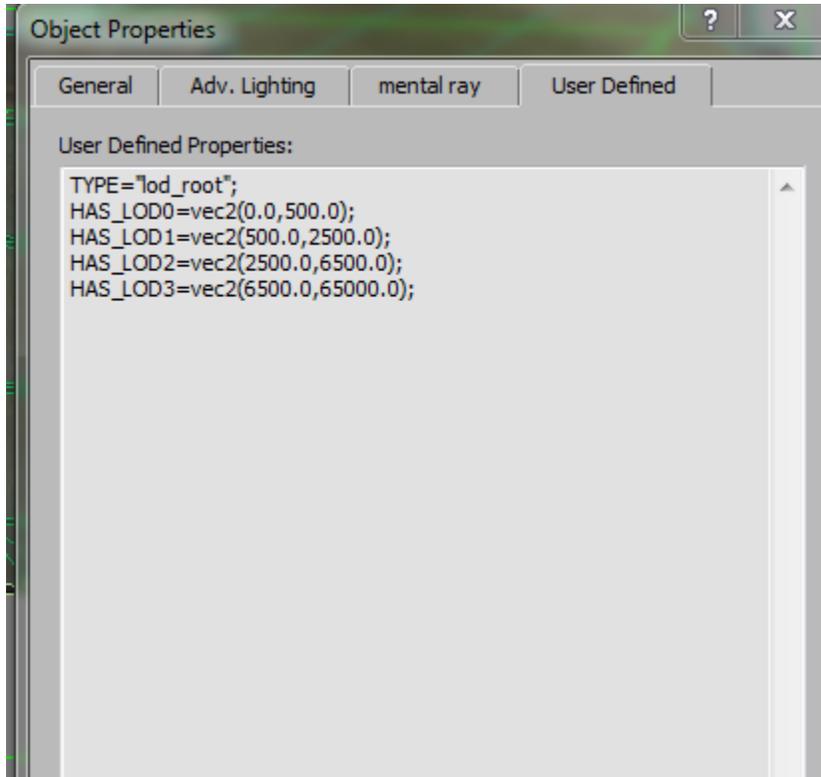
You can verify you did this properly by opening up the "Schematic View" and checking the link.



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Next, rename the master dummy to "lod_root". Then right click on the master dummy, and click "object properties". Click the "User Defined" tab, and enter the following information but change it to match your model:

```
TYPE="lod_root";  
HAS_LOD0=vec2(0.0,500.0);  
HAS_LOD1=vec2(500.0,2500.0);  
HAS_LOD2=vec2(2500.0,6500.0);  
HAS_LOD3=vec2(6500.0,65000.0);
```



These are the variables that the game engine will read. Each line begins with the level of LOD linked which is why the naming scheme is important. For your model, rename "HAS_LOD0" to what you used. The last part is the value at which it will be displayed in distance Meters. In this example, I have LOD0, (most detailed), displaying from 0 to 500 meters. Then it switches to LOD1, (second most detailed), which will be displayed from 500 to 2500 meters.

Once you have your desired values, export your model as normal and the LOD's should start shifting at the declared distance. You can test your setup to verify everything works before using your final values by using very small numbers and opening them in Model Viewer to observe the shift as you move the camera back.

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A commonly asked question is how much reduction should take place between each LOD. There is not a set amount nor can anyone really advise you without seeing your model since it will be different for every model. In this case, I broke my model down into two categories; overall shape and detail. Naturally the overall shape is the biggest concern but the detail pieces can be removed so let us dissect what I did.

The polygon count is as follows:

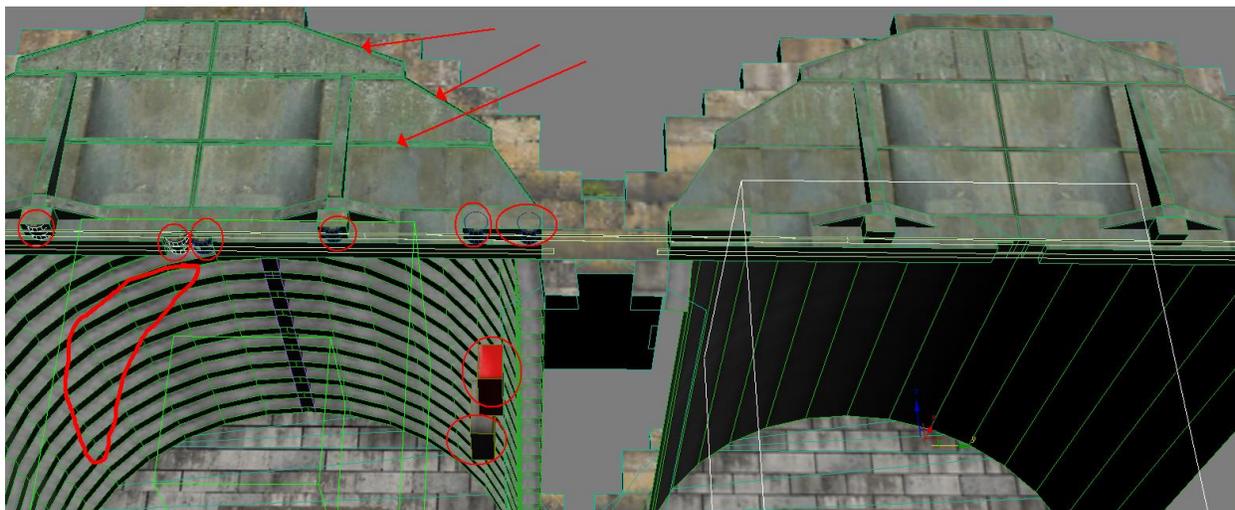
LOD0 – 1704

LOD1 – 780

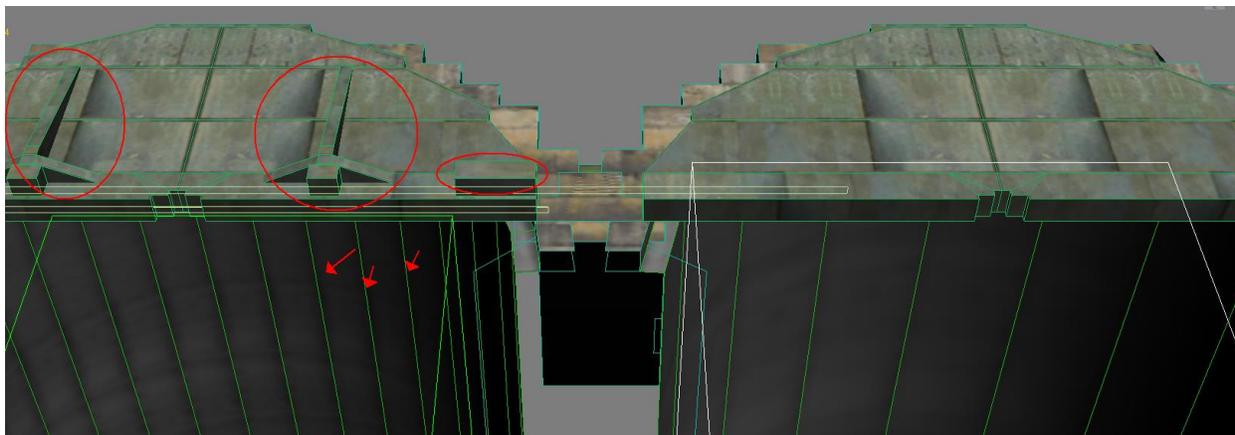
LOD2 – 568

LOD3 – 334

In my first reduction I chose to remove the inside ridges, the inside workbenches, the wheels, and the inset on the front doors. At 500 meters, this detail is not needed nor will you be able to see inside the model at 500 meters.



For the next LOD, I remove more of the front, and reduced the amount of segments of the shell.



For the final LOD, I removed even more of the door, the side door, and the back vent.

