

Creating 3D Environments



AUTHOR:

Rob Tuytel

Blenderpedia ©.
All Rights Reserved
Based on Blender
version 2.69.4

Content

Getting started

| | |
|--------------|----------|
| About myself | <u>2</u> |
| Introduction | <u>3</u> |

The methods of the environment masters 5

| | |
|---|-----------|
| Jan van der Heyden (17 th century) | <u>5</u> |
| Isaac Ouwater (18 th century) | <u>8</u> |
| Cornelis Springer (19 th century) | <u>10</u> |

Analyzing environment paintings 12

| | |
|---------------------|------------|
| The fundament | <u>12</u> |
| Buildings | <u>51</u> |
| Street furniture | <u>115</u> |
| Vegetation | <u>144</u> |
| Atmosphere/lighting | <u>201</u> |

Creating our own environment 221

| | |
|------------------------------|------------|
| Notes before we start | <u>221</u> |
| Looking for some inspiration | <u>222</u> |
| Visiting locations | <u>223</u> |
| Creating the scene | <u>225</u> |
| Reviewing the scene | <u>248</u> |
| Extras | <u>250</u> |
| Index | <u>254</u> |
| Image Credits | <u>257</u> |

About myself

My name is Rob Tuytel and a fanatic Blender user for the last 8 years. I have always loved using my imagination to create 3D art and Blender has been the right tool to help me with this.

Even before I started using Blender I always loved environments. When I started to create them I studied art books and tried to understand how to design these kinds of scenes in Blender.

Soon I started designing huge environment scenes. It was a hard process, but after a couple of years I learned some techniques that were very useful in 3D design.



My 3D artwork is now used in art books, museums, and even appears on nationwide television. I was honored to be asked to create environment scenes for the open movie Tears of Steel. This was a fantastic learning opportunity that allowed me to work with other environment artists. Learning new skills in such a project is one of the best ways artists can bring themselves to a higher level.

I have enjoyed writing this e-book and sharing some of my knowledge with new 3D users. Although I personally use Blender, the knowledge I share in this e-book can also be used in all other 3D programs. This e-book discuss how 3D works and how to use the techniques to develop artwork.

I hope that this book helps you in your own progress and that it will answer some of the questions you may have. There are three parts to this e-book. In the first part I explain why I use old environment paintings and not photos to study new techniques. In the other parts I develop a scene to demonstrate step by step what to do and how you can create your own art style.

Good luck and have fun!

Rob Tuytel

Introduction

Working with 3D content is a fascinating endeavor. I have always wished that I could travel to the past to visit my own hometown, Enkhuizen, in the 17th century. At that time it was a powerful city with beautiful architecture. Because there was a good economic climate people from all over the world traveled to this town. Not only was Amsterdam booming, Enkhuizen was growing and becoming one of the more important towns in the country.

Enkhuizen had a lot of different cultures and thus there were also various types of architecture. A nice example is the Dutch Italian mix known as the Dutch Renaissance style.



One of the last remains of Dutch Renaissance architecture (Fig 1) Cornelis Springer's depiction of this building (Fig 1.1)

When I was growing up I was very inspired by these old buildings. The creators of the buildings had such an eye for small details that they are like artwork on a street. Even 400 years later they are the icons of cities.

When I became familiar with the artwork of old masters like Jan van der Heyden and Cornelis Springer I understood that these artists faced the same issues that I had when I was creating 3D environment scenes. They were also recreating the reality but they did not have render engines that beamed the light on the canvas.

These masters were truly magicians and deserve to be much respected artists. Unfortunately, they didn't write an e-book to explain how they developed their techniques. Therefore I

decided to study their beautiful paintings and adapt their techniques to make 3D environments with 3D software.

The big difference between studying a photograph and a painted artwork involves the reality. A photograph is the perfect result but it does not show how you can create a realistic environment. A painting, however, is an illusion of the reality. The artist tried to create something that looks realistic, but made his own version of the reality in paint. A painter creates his own style of depicting reality, which can be recognized in his paintings.



Sketch from Cornelis Springer



(Fig 1.2) After the painting process the result is charming (Fig 1.3)

My conclusion is that the best way to learn to create environments is to look at the works of old masters. Studying a photograph will not help because if you start from scratch and try to create perfectly realistic objects, you will probably fail. However, if you understand how the painter faked this environment and how he tried to make his depiction realistic, you can learn from this and develop your own technique.

Do not reinvent the wheel. Save time by studying as many environment artists as you can. Of course you can have your favorite artist, but developing your own style is the most important way to grow as an artist.

Keep in mind that the work must be fun and inspiring. Creating environments is time-consuming work. If you don't spend enough time on it, or if you just want to make something quickly to have a result, you will fail and you will never grow. Accept that the process is slow and that it will take some time for you to grow in your work. Be open to critiques or feedback. I have a brother who is always very negative about the work, but he always describes what about the work doesn't satisfy him. He tells me very useful information and motivates me to improve. Critics help you grow; the people who always say your work looks good don't. Of course kind words are nice, but it is important to be objective and try to understand the critiques.

In the following section I'm going to analyze some paintings. I hope this will help you to understand why some techniques are used, and why they are so important to make the work

look nice. I hope you will use the advice in this book as a tool, and not feel that this is how you must do the work. I am merely sharing my interpretation of how things can be done. There are, of course, many other ways to do this work. By trying new techniques and exploring different options one becomes a better artist.

The methods of the environment masters

Jan van der Heyden

I have chosen to discuss van der Heyden because his style inspired me the most. I love the realistic mood of his work. There are many artists from the 17th century that produced fantastic work. One of the most famous is Johannes Vermeer, but his style focuses more on interiors and portraits.

Van der Heyden painted the Dutch culture in a fascinating way, capturing how Dutch cities look and feel. When you carefully observe one of his paintings you can discover so many secrets and small details that it is hard to imagine that this was created by hand.



Jan van der Heyden - View on a canal in Amsterdam

(Fig1.4)

The work in picture 1.4 is a great example of how van der Heyden created an environment scene. There is a lot of stuff going on. First of all there is some activity and people are working in the scene, which tells me it is early in the morning or evening. There is a lot of architecture in the background, including small and large buildings. There is also a canal with an arch bridge and you can see a lot of street furniture like boats, buckets, a dead pig, and other little props.

It is very important to notice the blue sky and the trees in the scene. All of these parts together make a wonderful composition. It looks like random parts in a scene, but they are so perfectly designed that the final result is charming and romantic. You can see it is not a photograph, but on the other hand it is accepted by the mind as a realistic image of how people lived at that time.

But there is more going on in the work of van der Heyden. He chooses to paint a canal in the scene. It takes up about a fourth of the whole scene, and it has a very important function. There is a nice reflection in the water that fills the scene. He uses the water to display the beautiful architecture. It is an often used method, and it works very well.

He also chooses to include the arch bridge. Of course this has a function for boat transport and for pedestrians, but in this painting it is used to add more depth to the scene. The light casts sun beams in the bows, which is a strong way of generating depth. Without the bridge, the scene feels a bit empty. The trees, of course, cast shadows on the buildings, but they also show a nice light transition on the bark, which also generates depth. Van der Heyden used these kinds of methods to avoid creating a flat image. It all looks so normal, but when you look at it from another angle you see interesting things that teach us as digital artists how we can create the same effect.

Maybe one of the most striking aspects of the scene is the artist's use of colors. Although they are not very vivid and the scene is a bit saturated, the sky is extremely blue. Strangely enough, this works for the composition, and also creates more depth.

Interestingly, a blue sky is typical for Dutch art. Some people say there was more blue in the sky in the 17th century and that is also why the landscapes look so beautiful. One of the explanations was that the country was surrounded by water. In the 20th century the Dutch drained most of this water away, so the color changed. It is a funny explanation, and I don't know if it's true. What is true is that the blue color is recognizable in a lot of paintings. For that reason artists identified this as a style for Dutch art.



There is a [video](#) on Blenderpedia about some interesting environments books

It is important to note that van der Heyden, like other artists from his generation, didn't paint the people and animals in the scene. Although they were very talented at creating environments, creating characters requires a totally different way of working. Therefore they asked other artists to paint the characters in the artwork.

Van der Heyden was also an artist who was proud of how the city looked. He lived in the Golden Age and most of the buildings were new and had a romantic design. This inspired many of the artists of that time to start creating cityscape paintings.



Jan Van Der Heyden- Dam square in Amsterdam

(Fig 1.5)

Isaac Ouwater

Another artist, who painted a century after van der Heyden, also caught my attention. Isaac Ouwater had the same fascination for environments and was captivated by the work of van der Heyden. It is clear to see that he has a different style, but in my opinion it is not better or worse than the masters from the 17th century.



Isaac Ouwater r- View of the city of Hoorn (Nieuwstraat) (Fig 1.6)

It is interesting to note that Ouwater was an artist who lived in a city that was no longer economically powerful. There had been a downturn in the economy and the buildings were started to decay. Ouwater painted the beautiful side of the city as well as its rougher, poorer side. (picture 1.7)

My favorite work by Ouwater is the one displayed in picture 1.6 His works are known for the bright sun beams on the walls. It makes the scene look very shiny and colorful. Environment artists can learn a lot from Ouwater. His painting technique may not be very special compared to van der Heyden, we can still learn interesting techniques from this painter.

This sounds a bit strange but when you find the same techniques are used by two excellent artists you can conclude that these working methods are effective, so when you copy this you can usually expect good results.



Isaac Ouwater- City of Hoorn 18th century

(Fig 1.7)

Cornelis Springer

The artist that inspires me the most is Cornelis Springer. There are many reasons this artist is in my eyes one of the most talented Dutch environment painter of all times.

Springer was one of the last generations of artists that created cityscapes. In my opinion, the best explanation for the disappearance of this style is that it was made redundant by the arrival of the photograph. After Springer there were a few more cityscape artists, but in my opinion they never had the originality or skills that made the old masters so good.

But why is Springer so exceptional and what can we learn as digital artists from this painter? To start, it is important to know that he also copied the style of the 17th century masters. When you analyze the work of Springer you can see he uses similar techniques. I think my fascination with this artist begun with the fact that he painted my hometown and that he was in love with that city. He explains that the city has some wonderful architecture and that he wanted to paint it before the people removed all of the buildings from the Golden Age.



Cornelis Springer - Cityscape in Enkhuizen

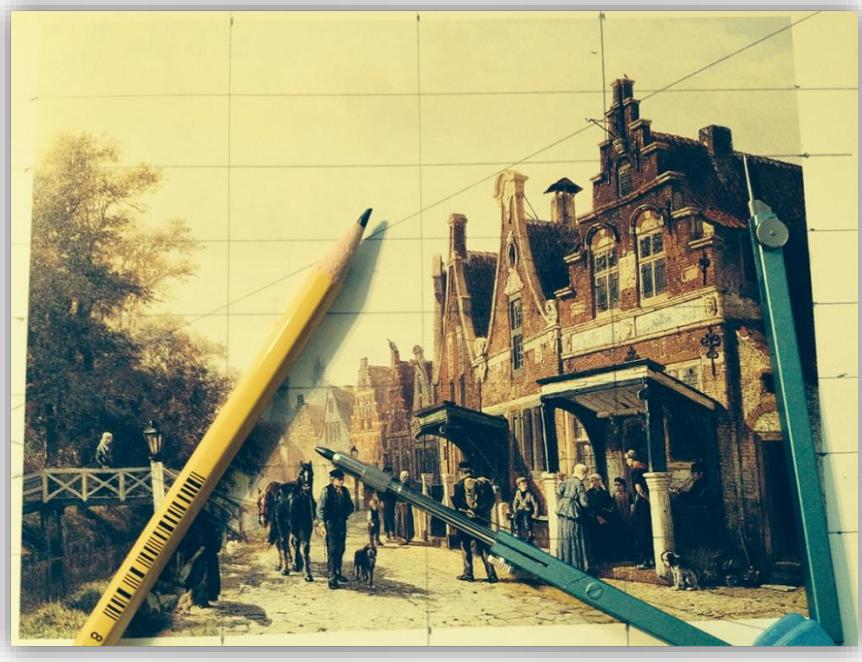
(picture Fig1.8)

Springer painted from 1839 to 1890. During this period the city was changing every year and that motivated Springer to paint.

But what does this all have to do with environments? In my eyes, Springer wanted to create a perfectly realistic image of the city. His perspective was not always correct, but he faked it to create a more charming image. When you look at his working style and his techniques, you can

discover so many little details that you sometimes become discouraged when you start working on your own work.

I also like his work the most because the objects he paints are not blurred by paint, but look very sharp so you can see what kind of shapes they have.



Look at a random painting and find out why the composition works (Fig 1.9)

There is so much more to tell about this painter, but I think that this art book should be about exploring the technique and not my fascination with the artists. In the following section I'm going to analyze some paintings and explain how we can create the environments in Blender. If you work with another software program like Maya or Studio Max, this lecture should still be interesting for you. I'm not going to tell how you need to work to get a good result, but I will explain how certain environments could be created.

I am not trying to motivate you to depict medieval buildings; the working techniques can be used for every kind of environment. I hope that as an artist you can turn this into something that works even better, but I also think that watching how someone else works is always interesting.



There is a [video](#) explaining some interesting details from old environment paintings

Analyzing environment paintings

The fundament

Environment scenes created in 3D or on an oil canvas can be separated into different parts, namely:

| |
|--|
| - The fundament (floor, road, bridge, water) |
| - Buildings (house, barn) |
| - Street furniture (street sign, lantern, bin) |
| - Vegetation (tree, plants, flowers, grass) |
| - Weather (cloudy, sunny, misty) |
| - Atmosphere (dark or shiny) |

Don't make the mistake of thinking that weather and atmosphere are the same. It can be rainy but the sun can break through the clouds and cast nice beams on the wall. The atmosphere sets the mood of the image.

In the following samples I'm going to analyze a painting but I'm not going to recreate it. I want to show what kind of parts the painting has and how you can create these in Blender.

This part is about the fundament. I will use picture 1.10 to discuss parts of the fundament.



Fundament details (Fig 1.10)

As you can see, there are 7 different numbered sections. They all have their own function in the scene, as is explained below.

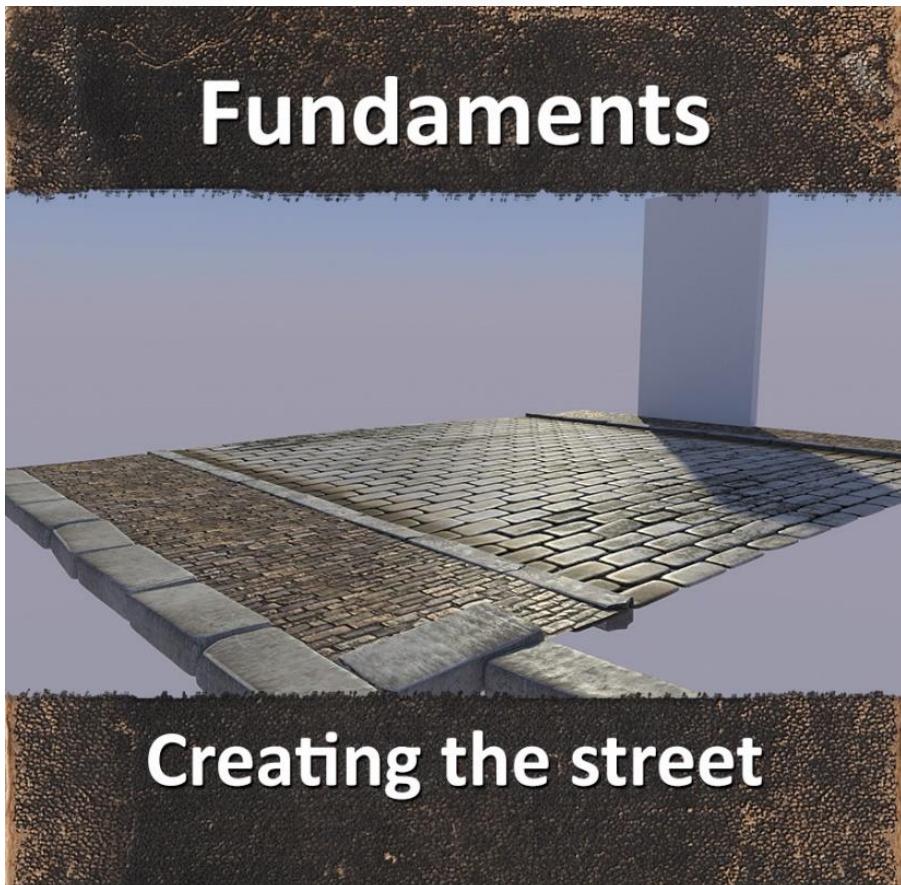
- 1- This is the main road, which takes up a lot of space in the scene.
- 2- This is a transition brick between the brown street on the left. If you don't spend time on this detail, the road will look strange.
- 3- This is the brown/yellow-looking street. The color is important. If you choose the same color as 1 or 2, it will look like a huge grey space and this does not make a good composition.
- 4- This brick functions as the end of the street to the canal. It is a rounded brick and looks pretty rough, so keep this in mind and don't make it a sharp-edged object.
- 5- This is the bridge with an arch in the middle. As it belongs to the fundament of the scene you have to make this object before you start on the buildings, etc. I can imagine it's hard to see what kind of textures we need to use for this object, so let's take a closer look.



There are about four different textures in this bridge. Keep this in mind and spend time on it. (Fig 1.11)

- 6- On the right is another transition brick. You can use the same brick you used number 2, or you can choose another texture and design something for this pattern.
- 7- This texture is hard to see, but it's not really an important point. It would look nice if you used the same texture you used in number 3, but of course you are free to use something else.

I have to say it again, colors are very important in this scene. In my opinion there are two colors: grey and yellow/brown. If you choose to use a red color for the brick, it can ruin the composition because your eye will be distorted. The colors in this scene are soft; just what you want in a scene like this.

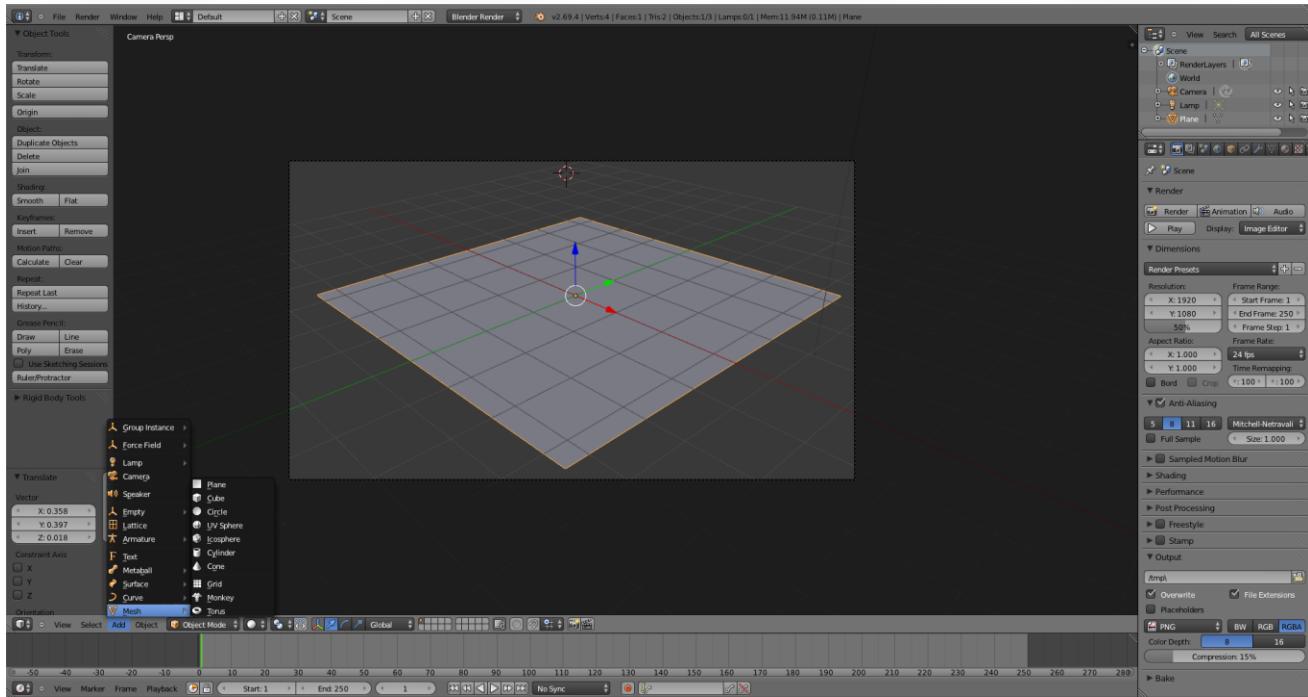


Creating the street

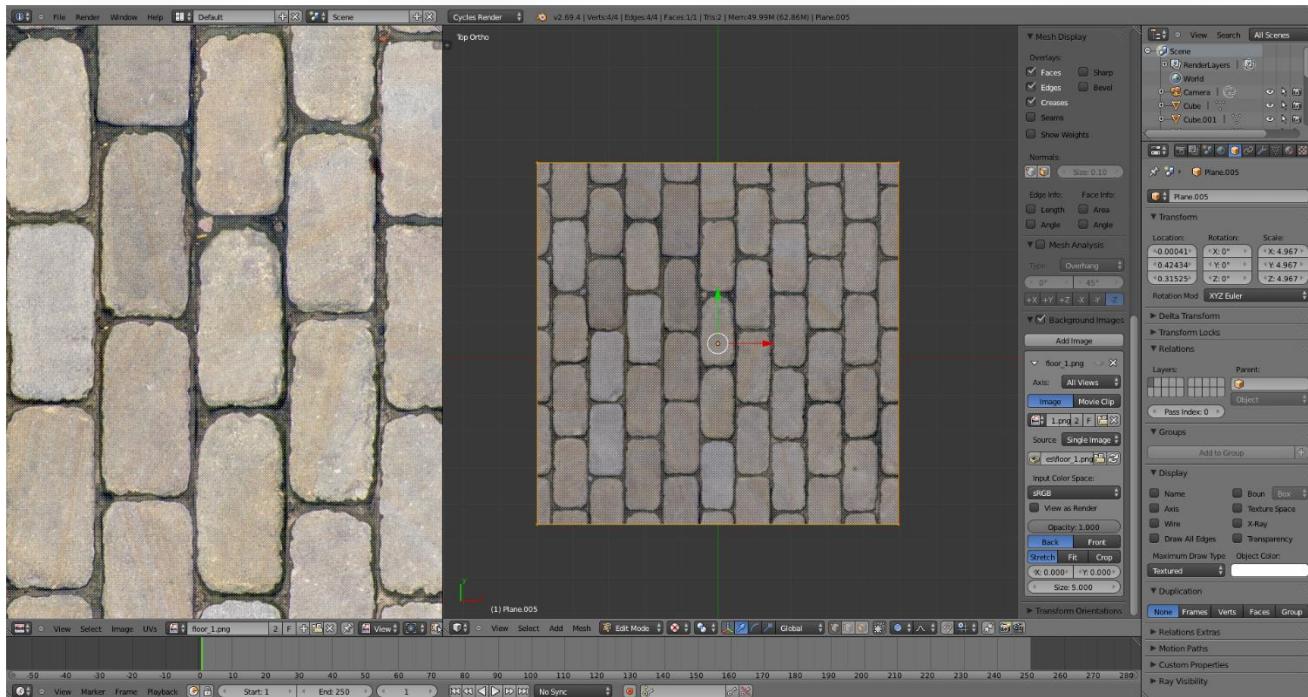
Creating the fundament

I created a scene and I'm going to explain how I worked. Keep in mind that it is a sample file, not a copy of the image. It is also merely a part of the fundament.

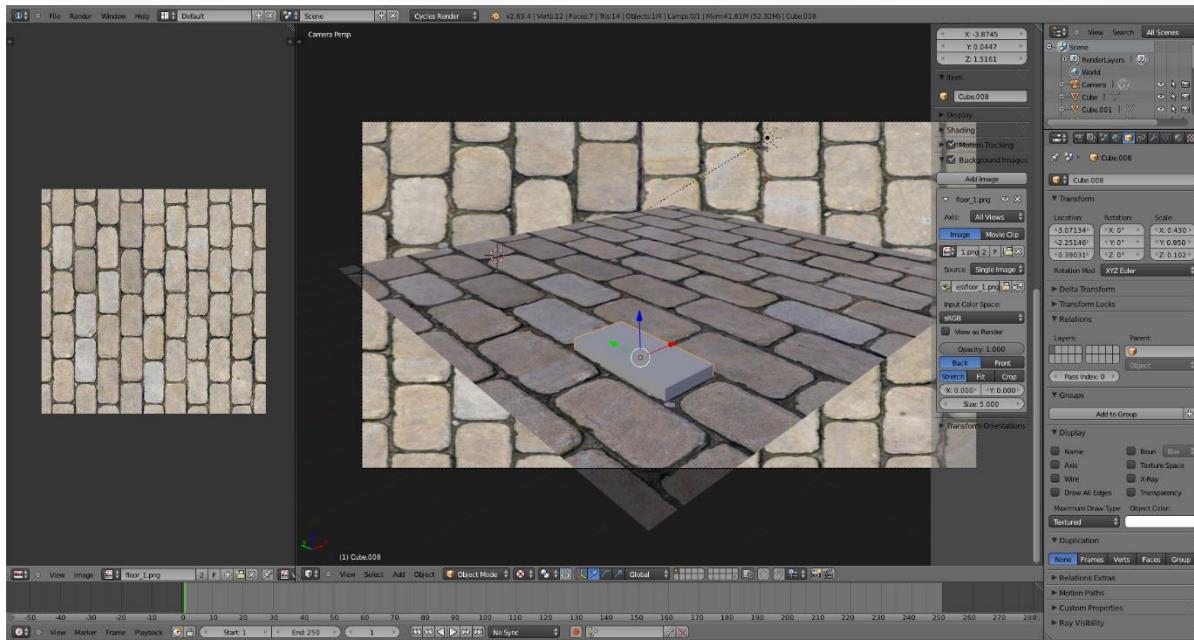
Later in this book we discuss how to put vegetation in the scene and add more dirt. Now we focus on the objects and the materials.



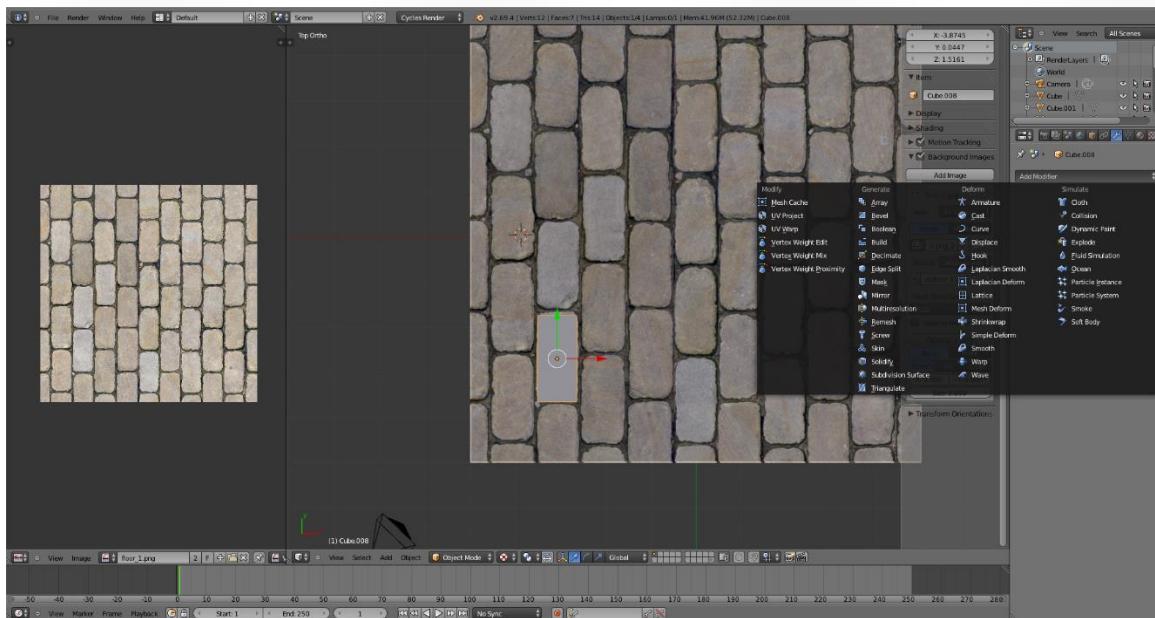
- 1. Start with a plane and bring the camera into position.



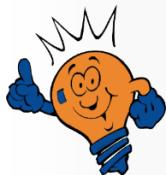
- 2. Open the texture you like, UV Map this on the plane and bring it also into the background.



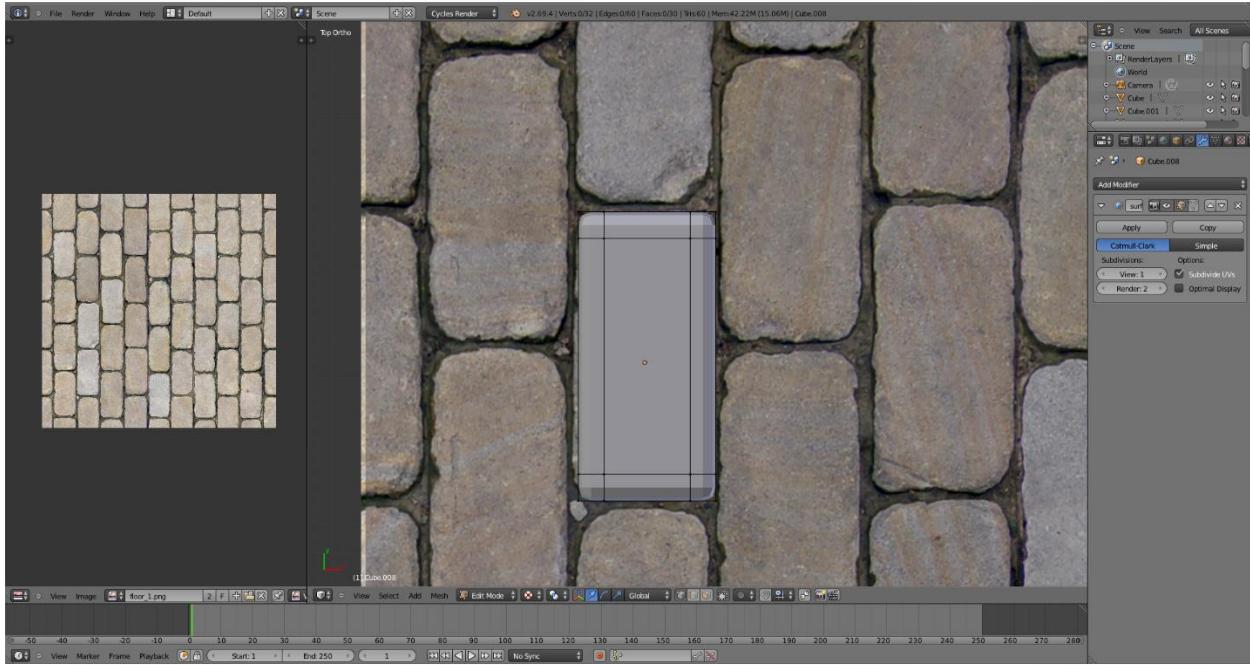
- 3. Create a cube and make it the size of a random brick on the plane.



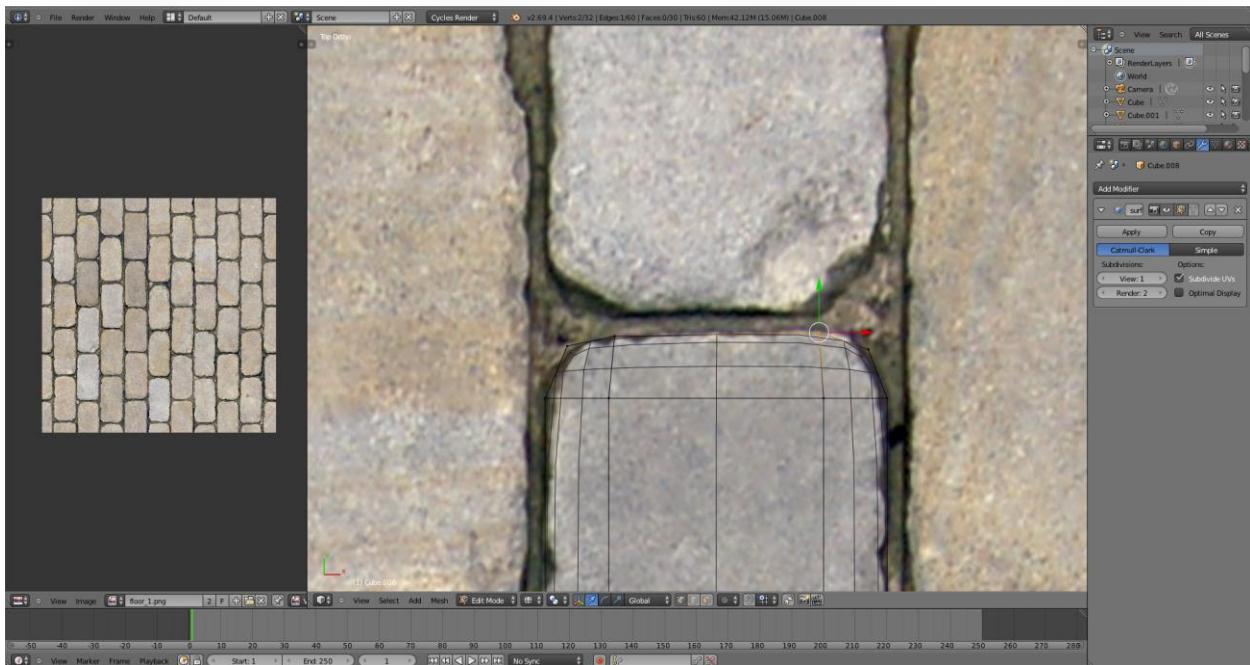
- 4. Go to the top view (Num7) and select the modifier (Subdivision surface).



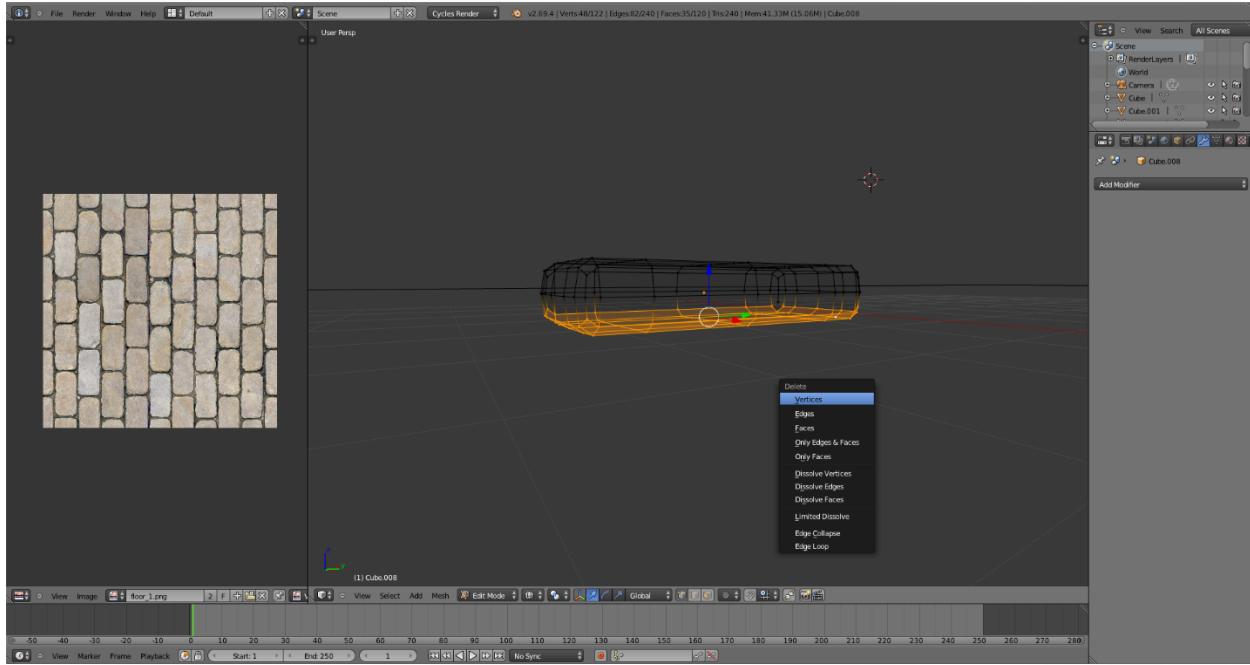
Try to work accurately; your work will look so much better when you spend time on details.



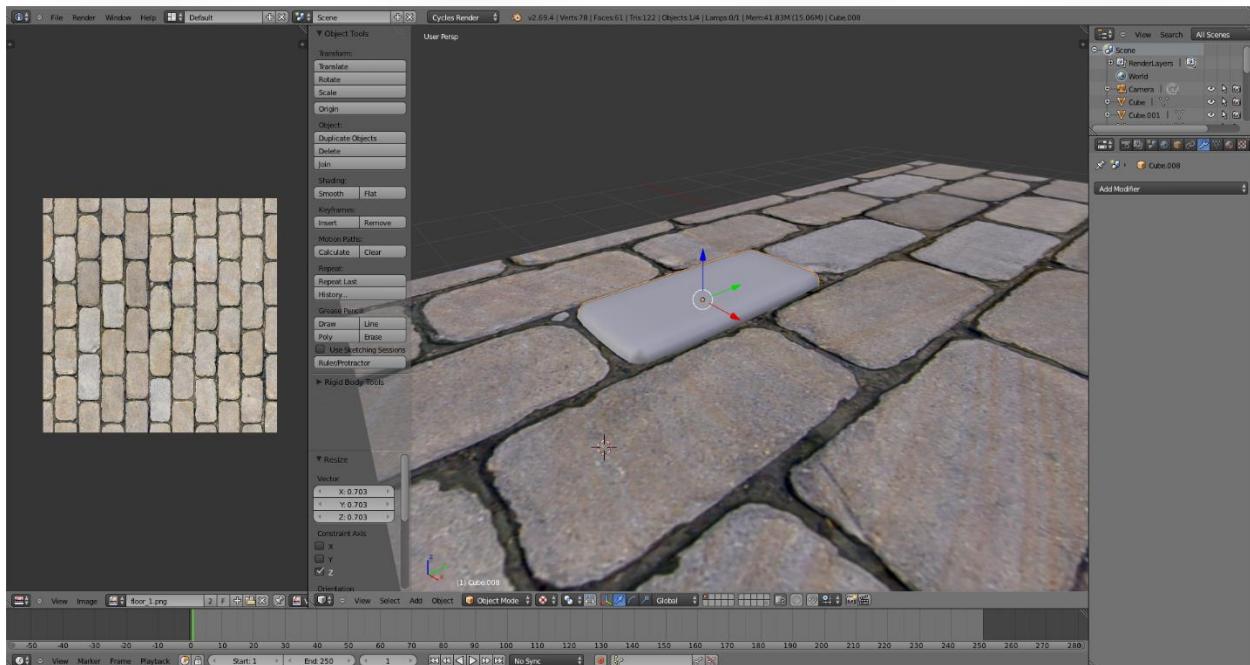
- 5. Create some extra lines (**CTRL+R**) to get the right shape of the brick. Try to do everything in the edit mode. You can toggle between the object and edit mode (**TAB**) to see what is happening



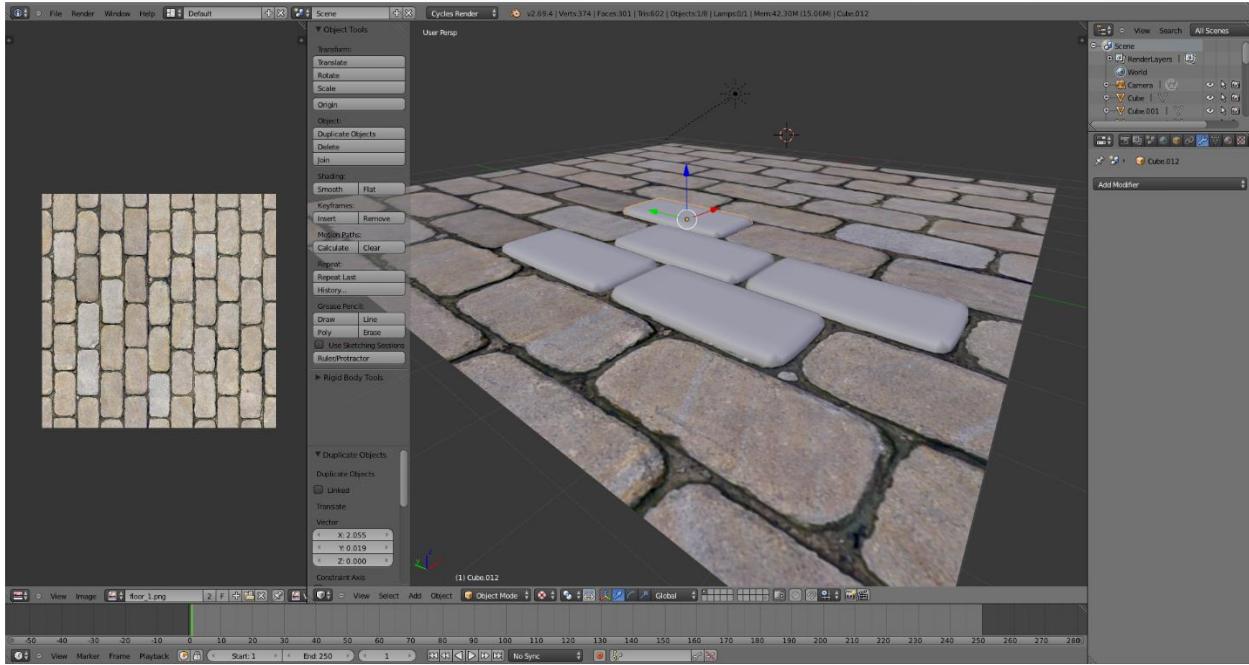
- 6. Take your time on this process. It can take 30 minutes or an hour. Remember, this is the fundament so it needs to be solid.



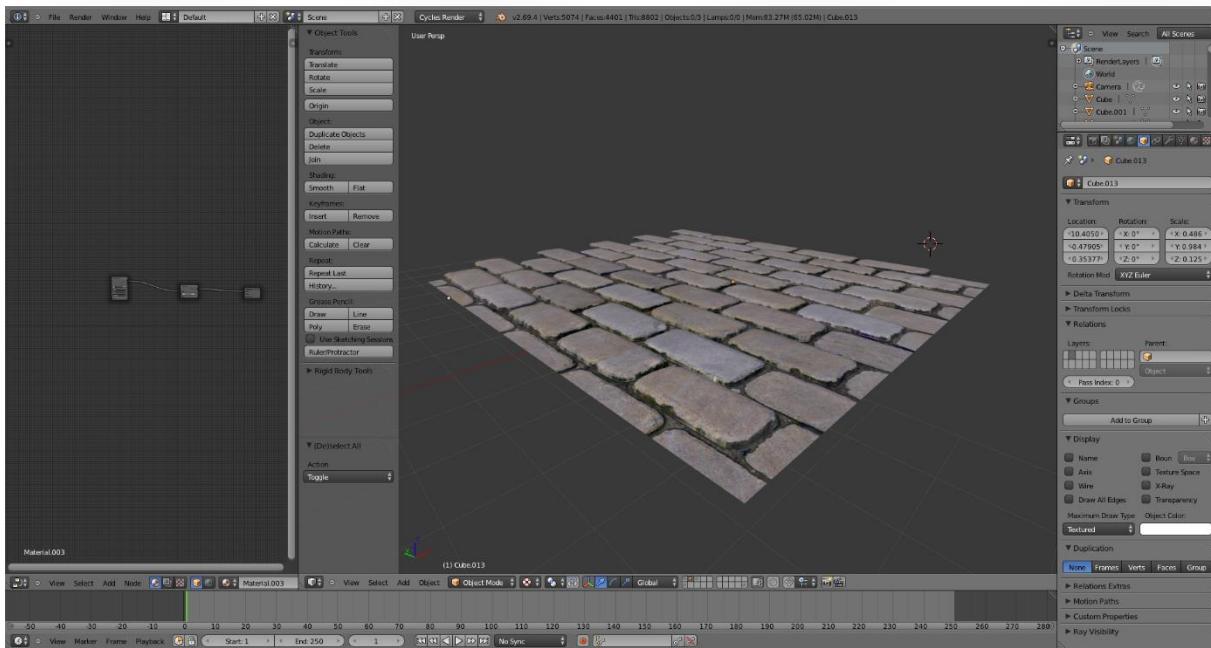
- 7. When the brick is finished, remove the bottom of it. You won't see it in the end and this will save render time.



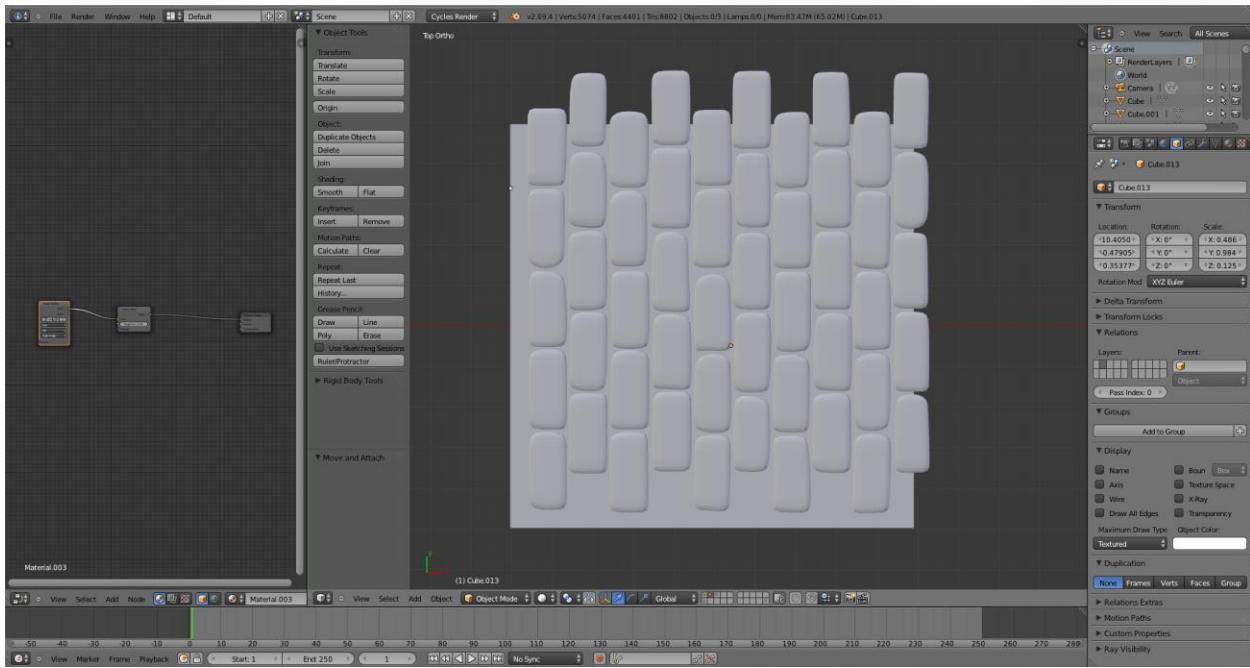
- 8. Try to flatten the brick a bit if it is too thick, and of course, don't make it too flat.



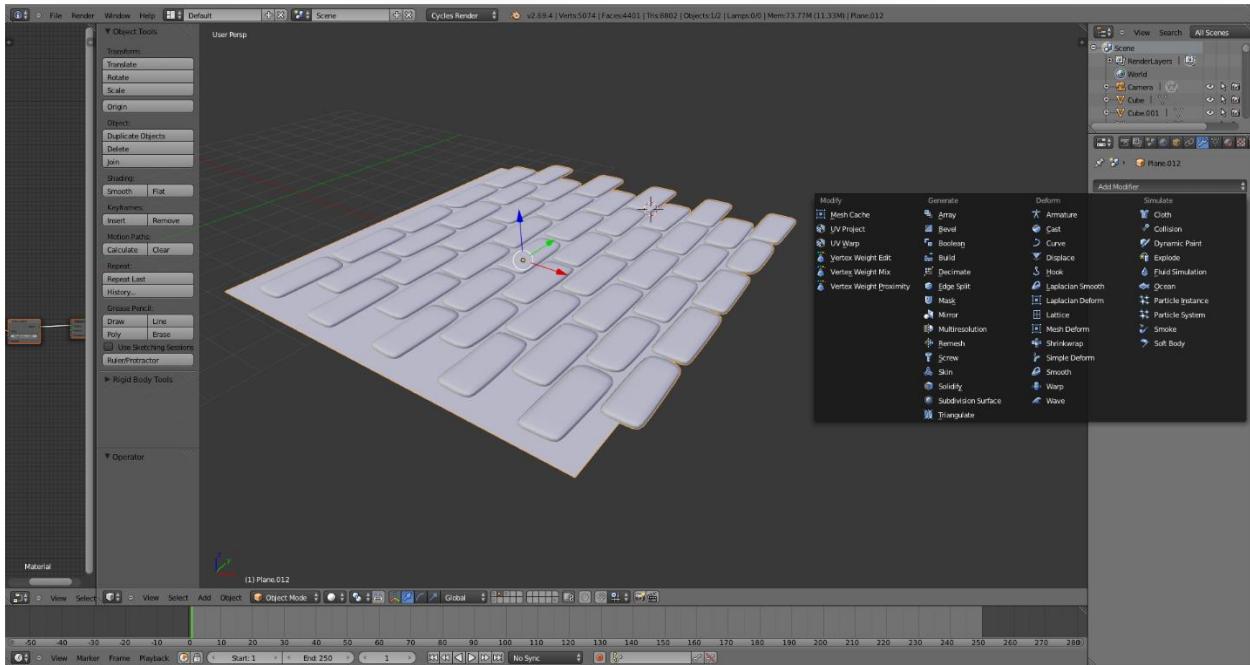
- 9. Continue this process. Copy the first brick and change the shape till it fits. duplicate the brick using (ALT +D)



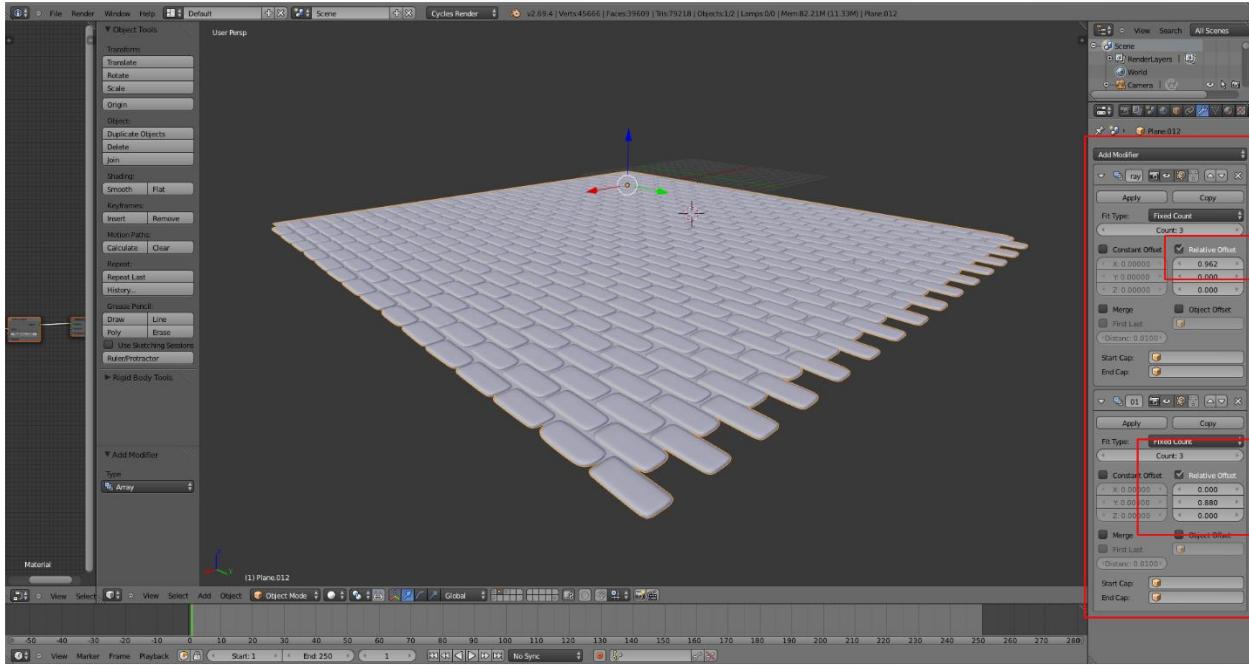
- 10. When you are done, copy all the bricks and join them (CTRL+J). Then project the image on the bricks till it fits.



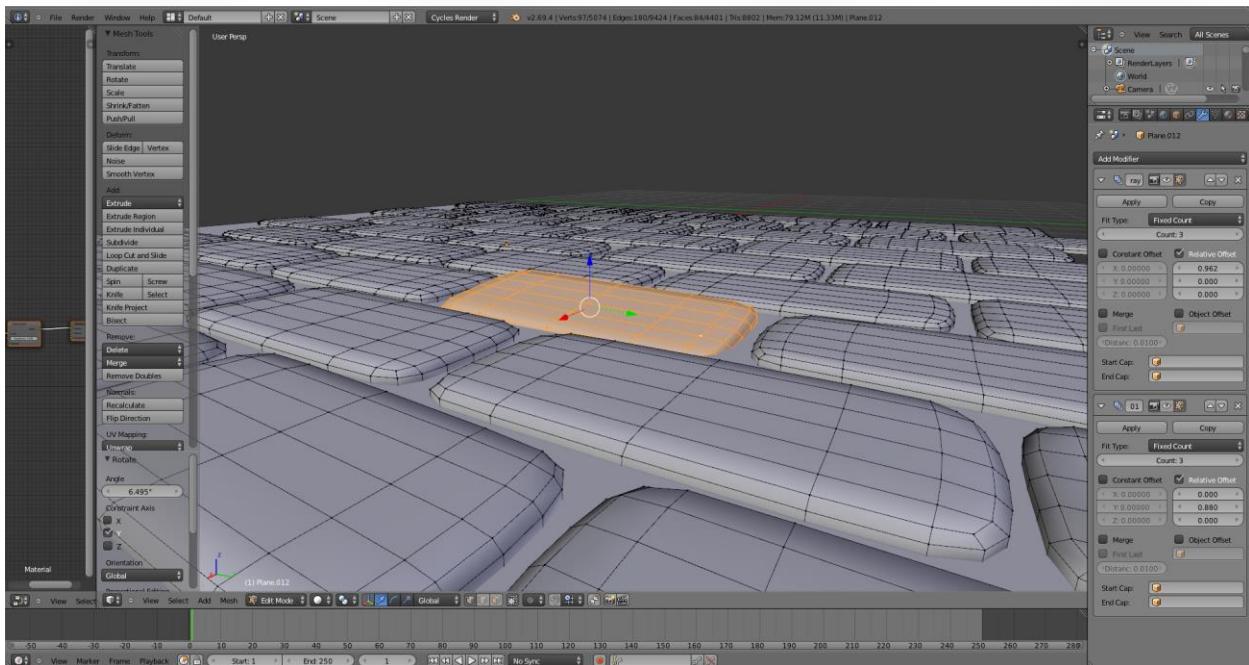
- 11. This is how it looks from the top view.



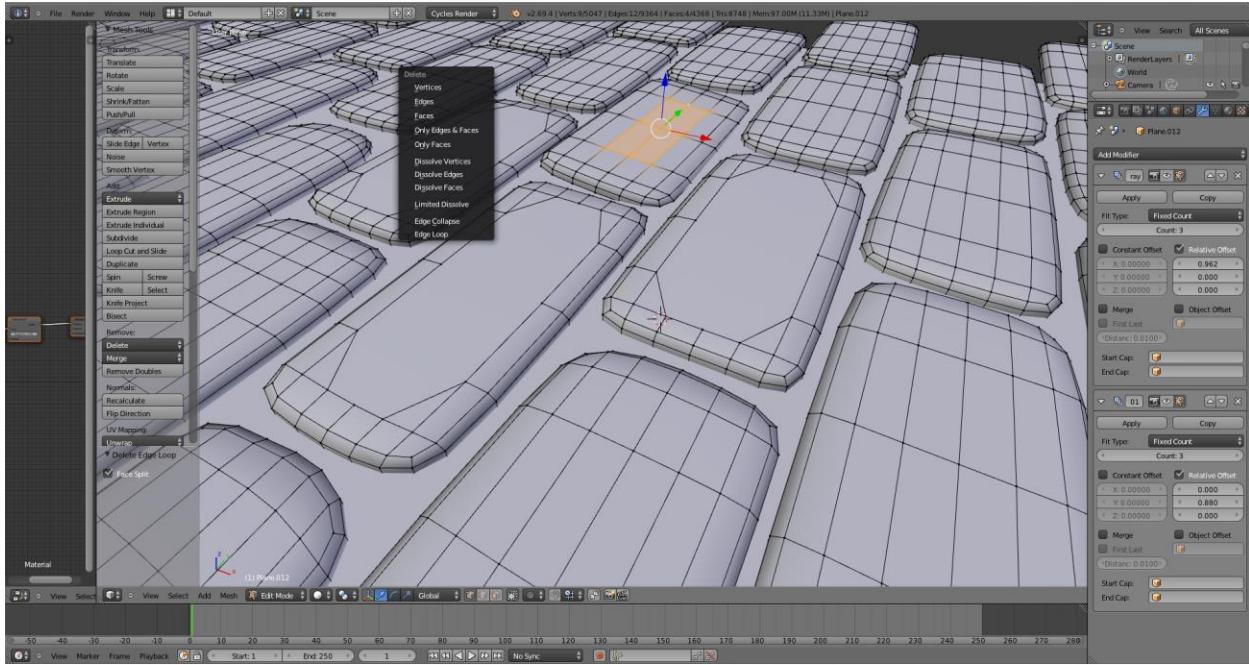
- 12. Now we are going to make an array of the brick pattern. Go to modifier and select array. You can do this two times, one for top bottom and the other left and right.



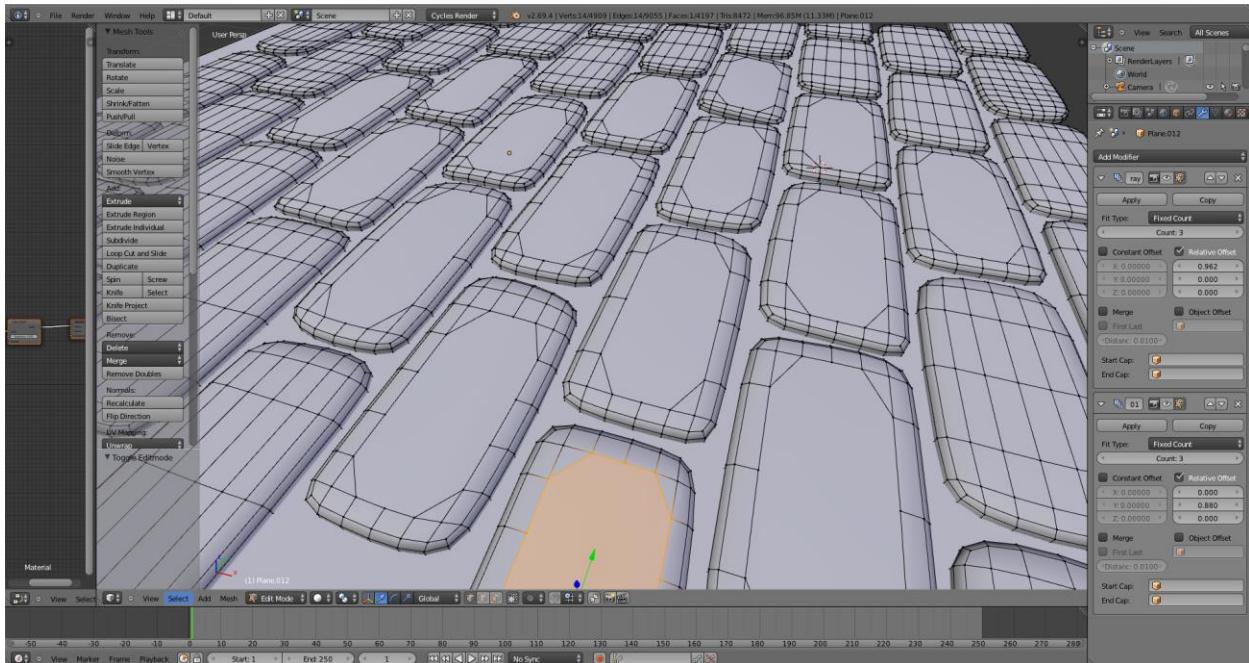
- 13. In the array panel you can type in the right values. This is not always the same, so try this out.



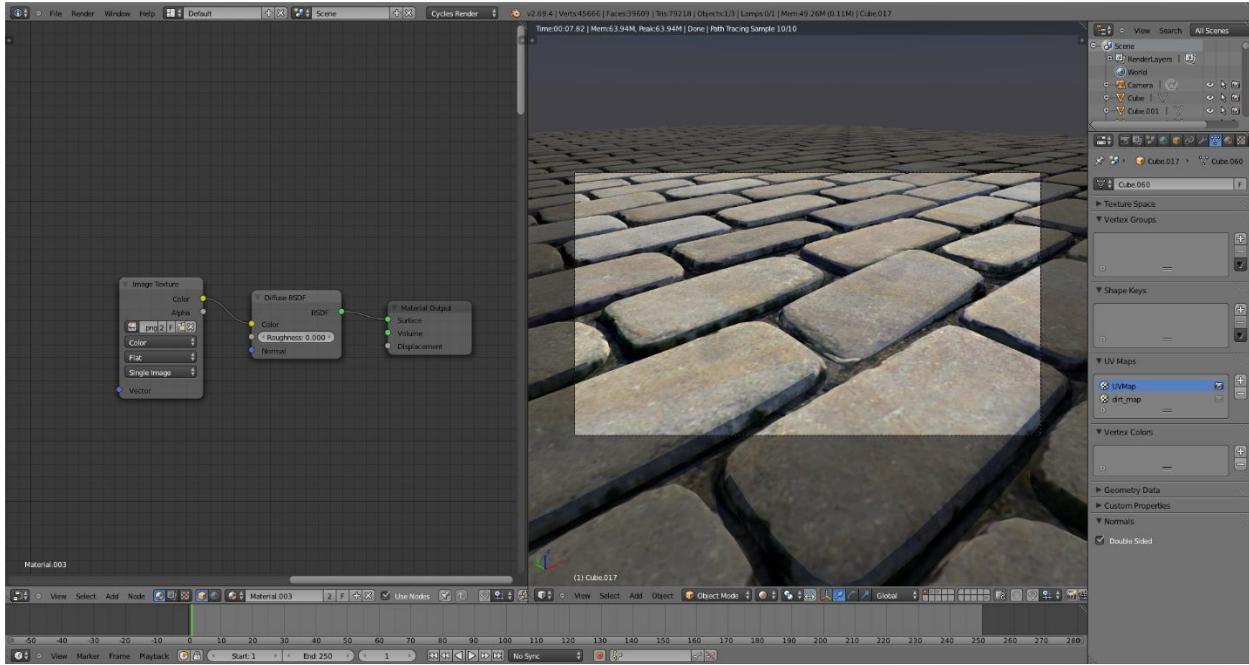
- 14. When the array is set, go back to the main brick panel and try to make some little variations. Do this gently or else it will look fake.



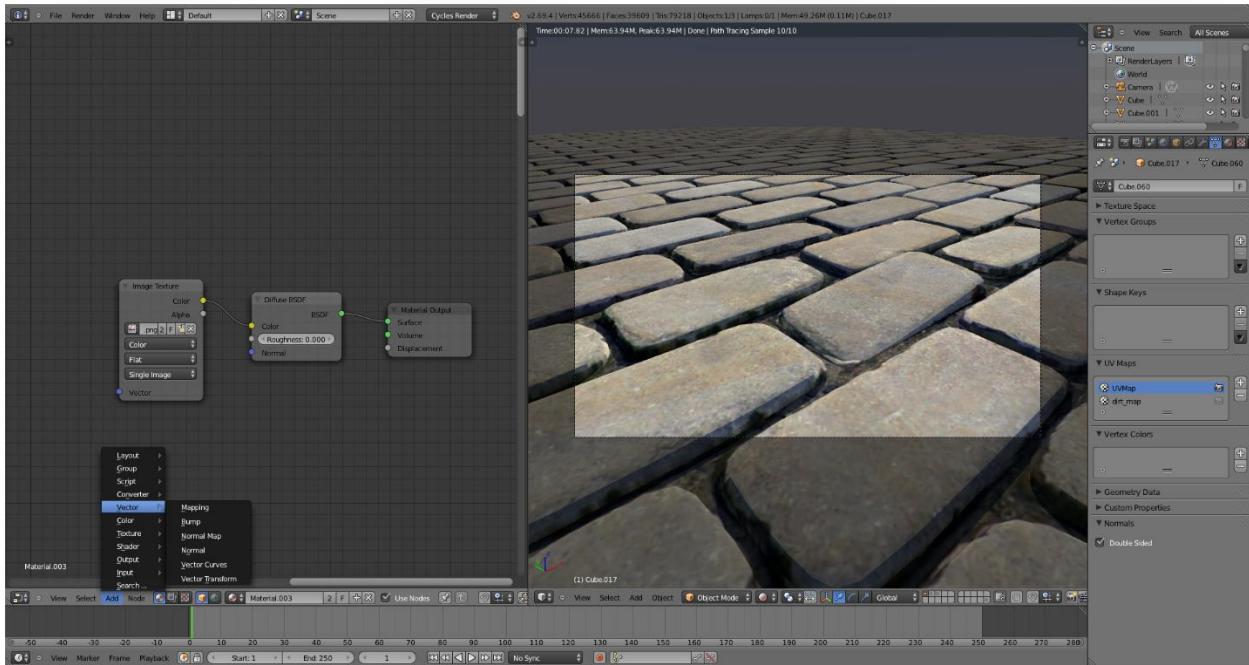
- 15. You can optimize the scene by removing vertices. Select the group in the middle, press X and select edge loop.



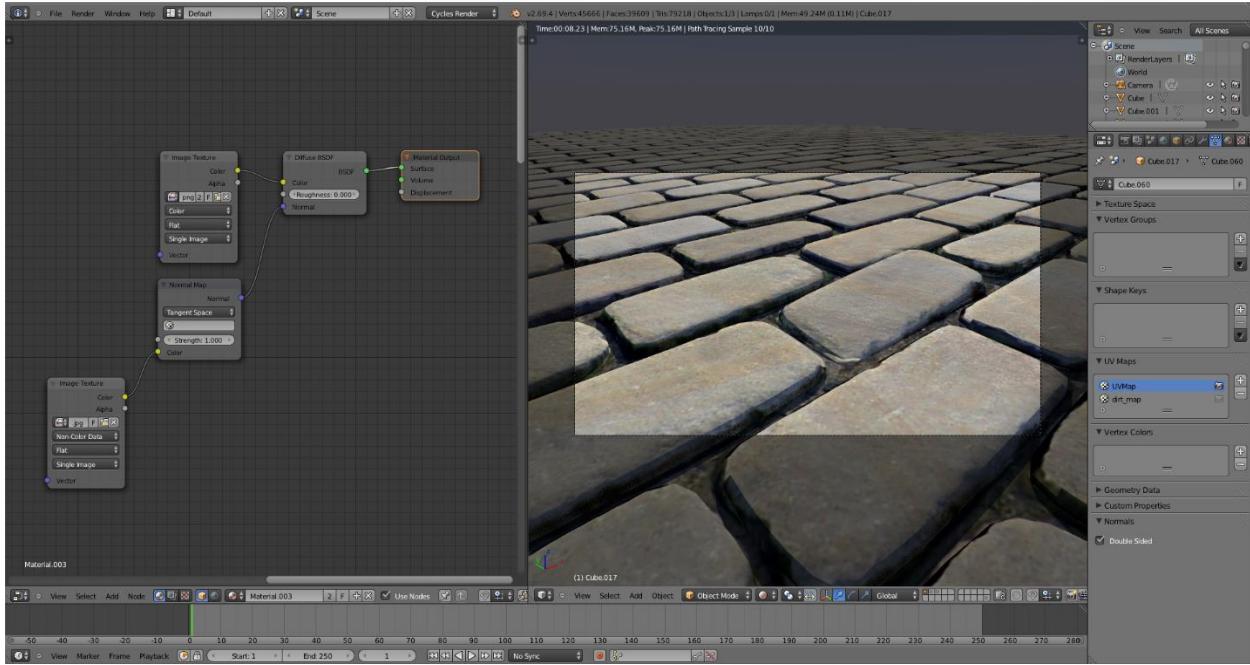
- 16. It takes some time, but in the end the rendering process is much faster.



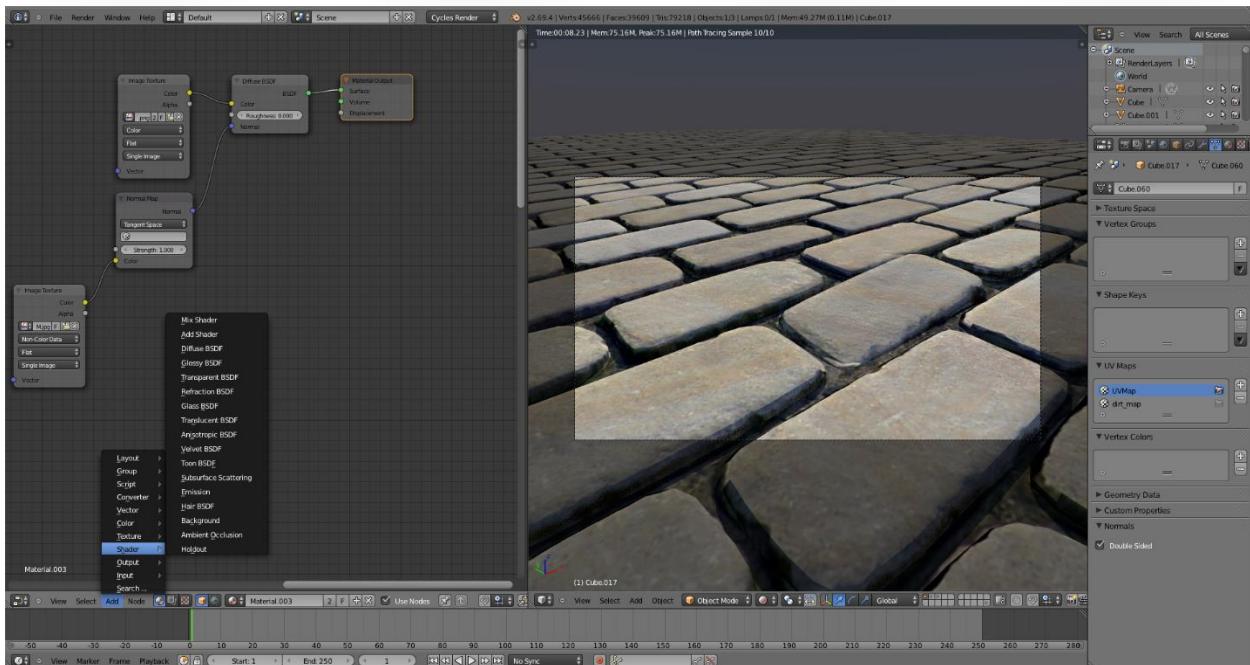
- 17. In the end the result is nice-looking bricks with an optimal 3D effect.



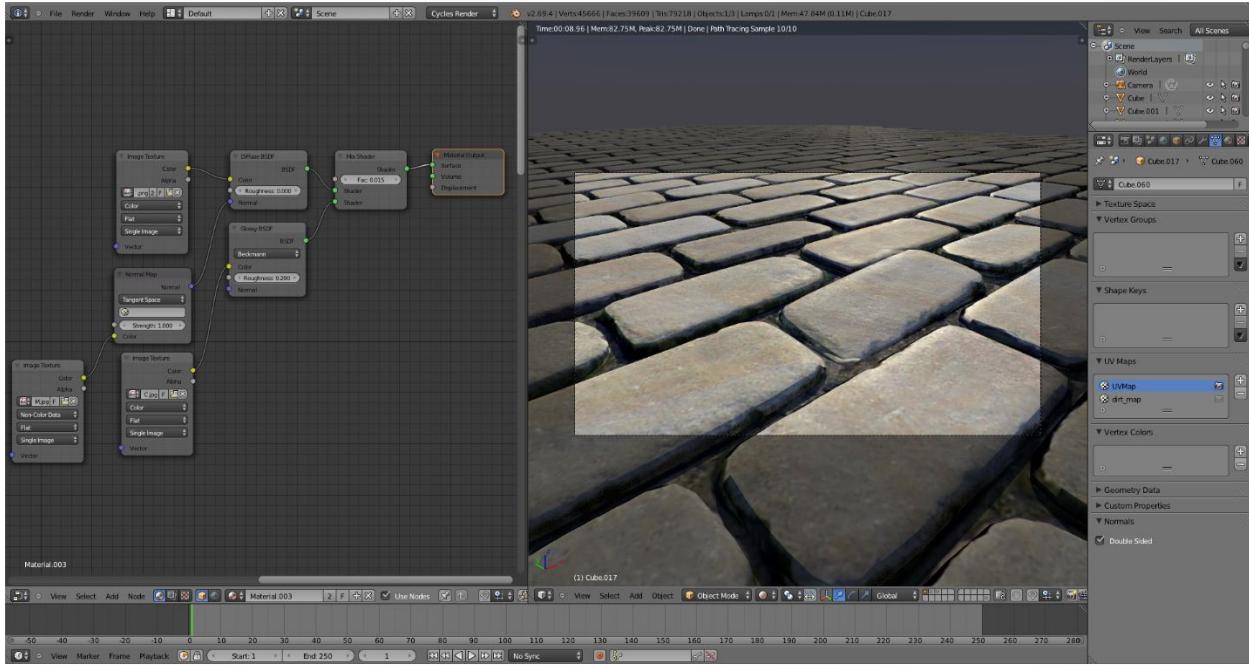
- 18. You can improve the texture by adding a normal and specular map. Go to [Add](#) → [Vector](#) → [Normal map](#).



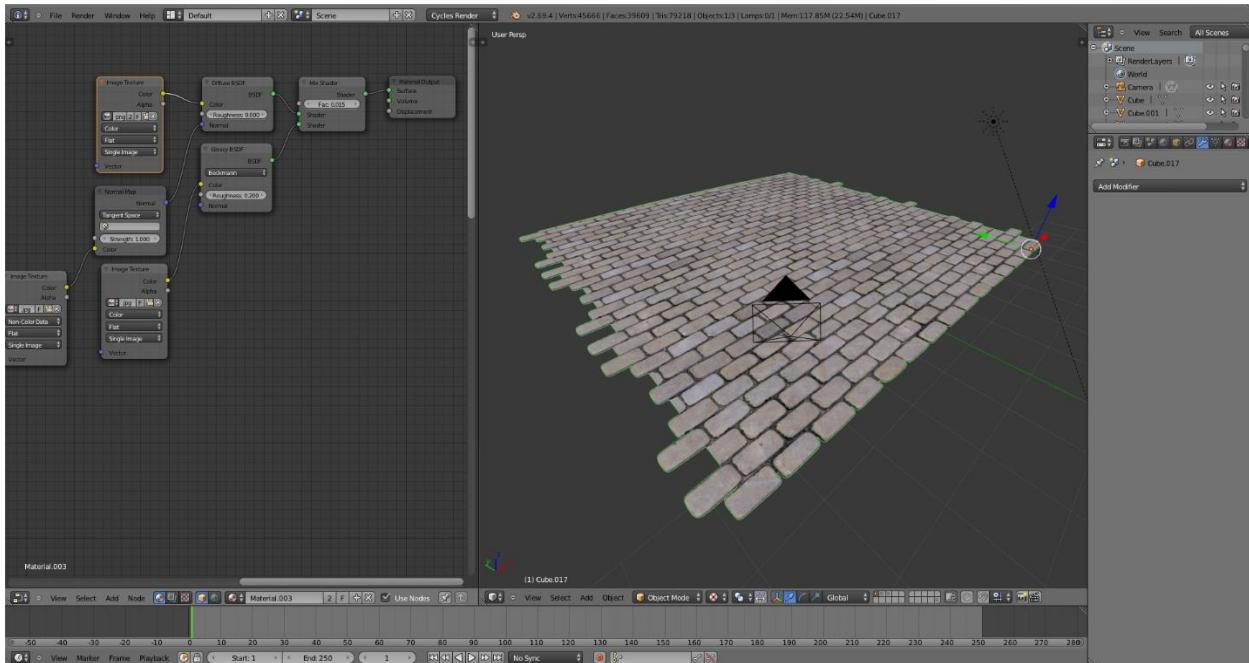
- 19. Open your normal image and combine this one with the normal node. Go to the image and set the image to Non color data.



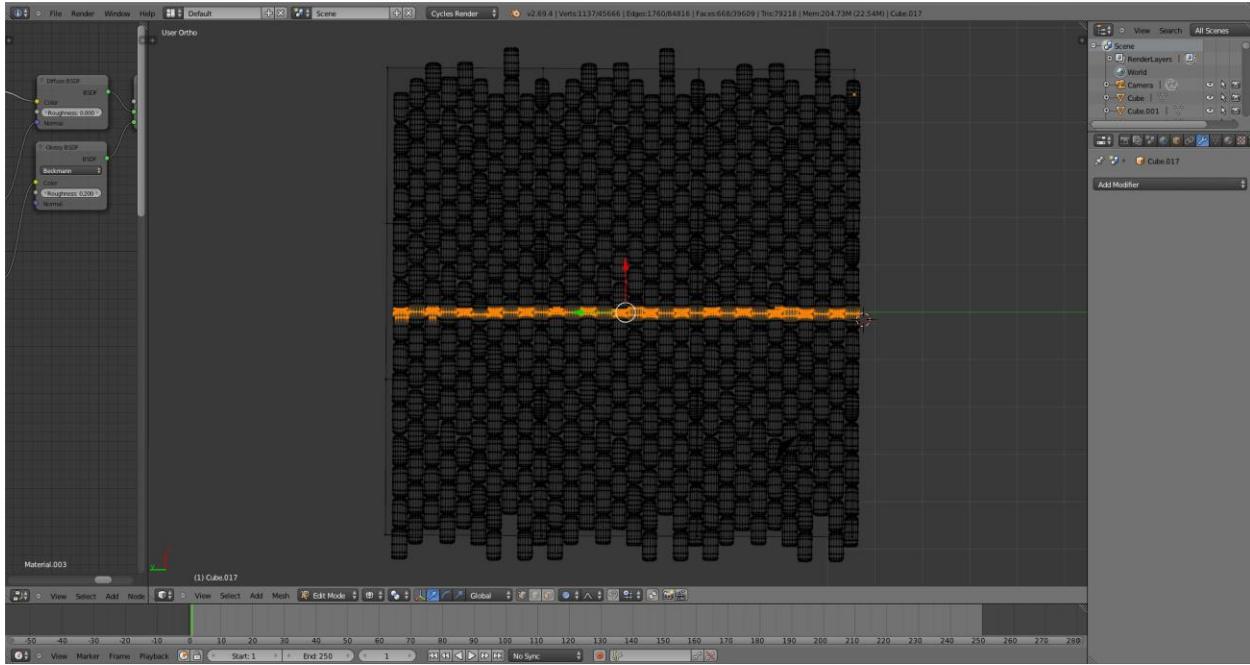
- 20. When we add the specular map we go to **Add → Shader → Mix shader** and put this node between the diffuse node and material output node.



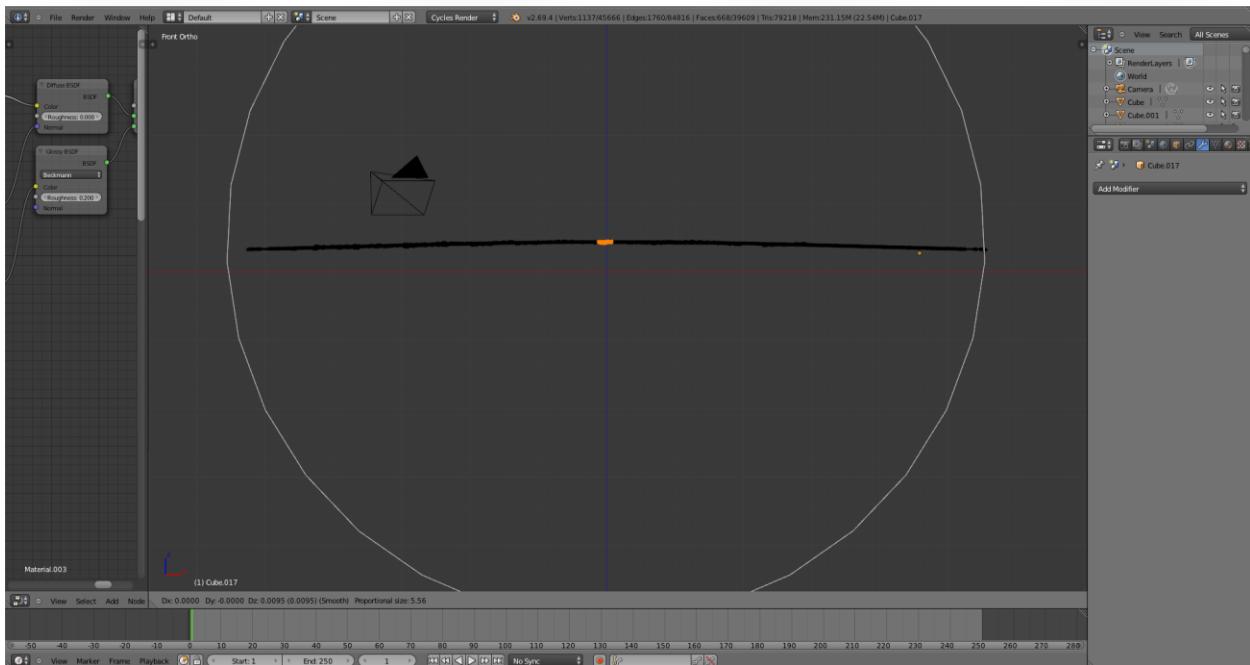
- 21. To add a glossy shader go to **Add** → **shader** → **glossy** and put the output in the bottom of the mix shader. Now open an image shader and combine this with the glossy node. Don't forget to change the value of the specular in the mix node. A value of 0.15 works well for me.



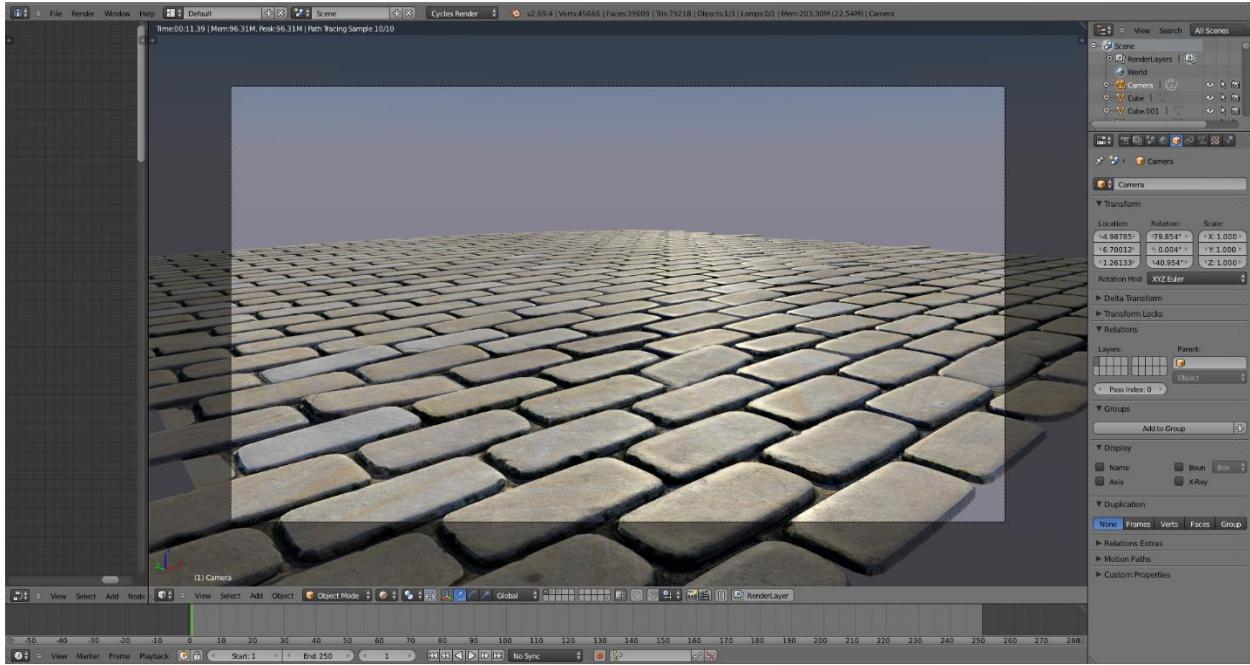
- 22. When everything is done, apply the array modifiers and join all the objects.



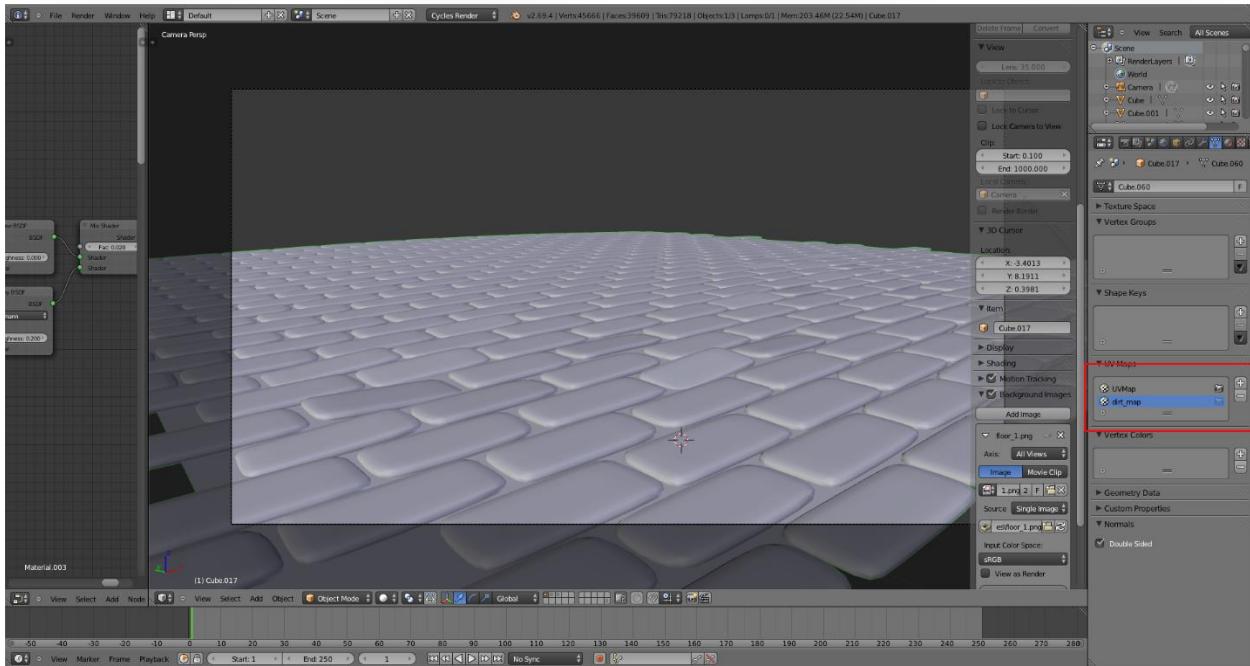
- **23.** Now we are going to make it curvier. To do that we select all the vertices in the middle. Don't forget to switch to the edit mode.



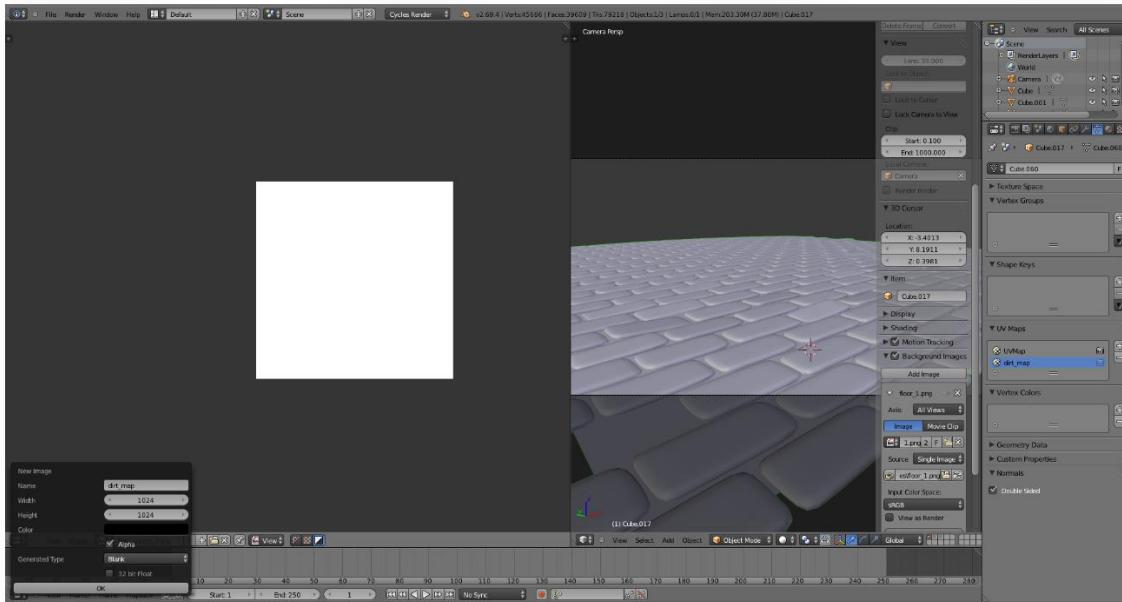
- **24.** Switch to the side mode (**Num 3**) and press O. Now you scroll the mouse wheel till you get a result like in the image above. Now gently hover it above upwards till you get a nice curve.



- 25. When we put the camera at a good angle you can see some nice reflection and the slight curve is visible.



- 26. The street is too clean so we want to add some dirt on it. Go to the Object data and add a new UV map. You can give it a name, something like 'dirt map'.



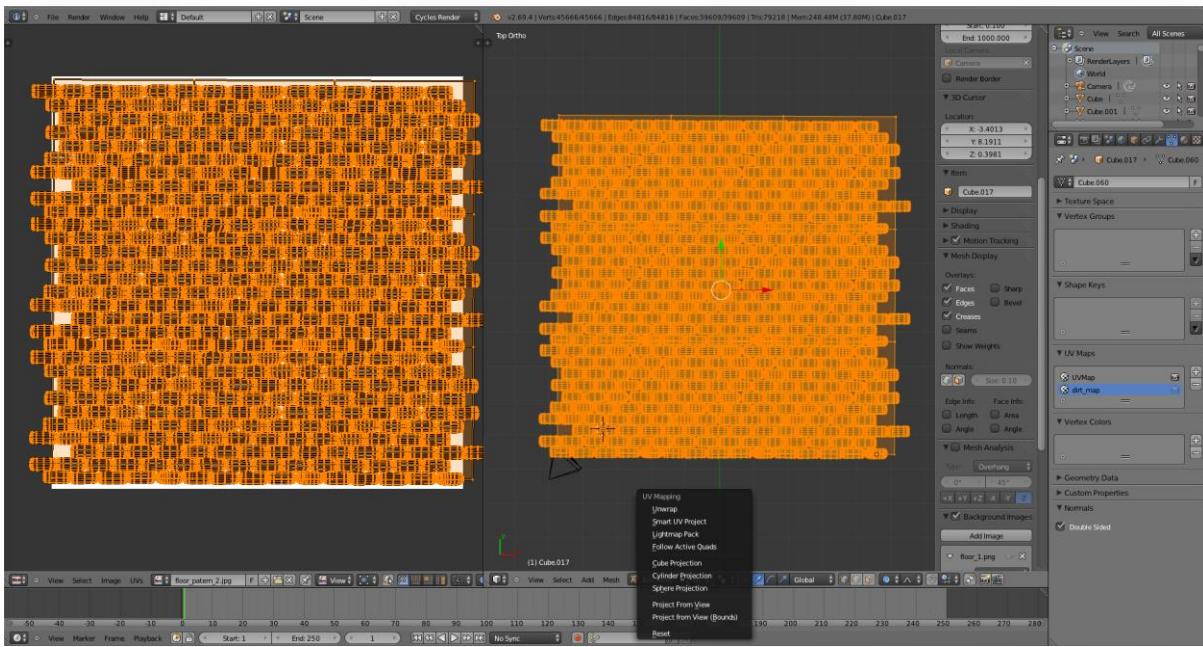
- 27. In the UV_Map editor you can create a new image. I used a size of 1024 X 1024. It must be a transparent image. You can remove the color in the color tab.



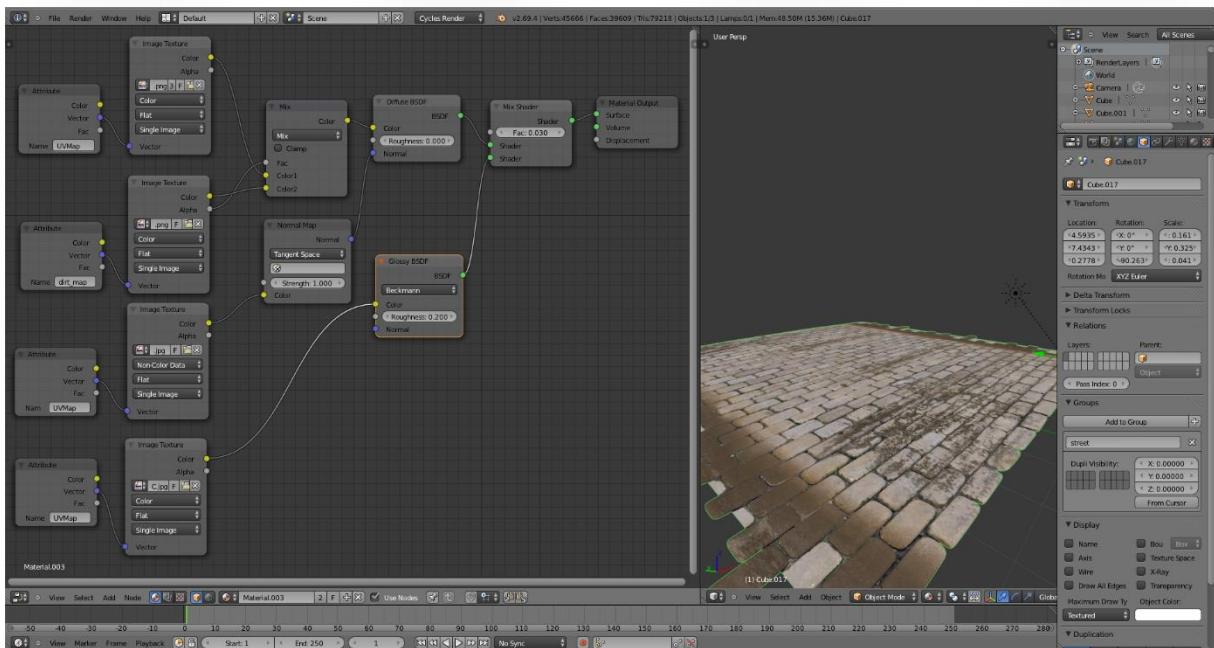
- 28. In GIMP I painted some dirt on the transparent map. Save it as a .PNG and leave the empty spaces transparent.



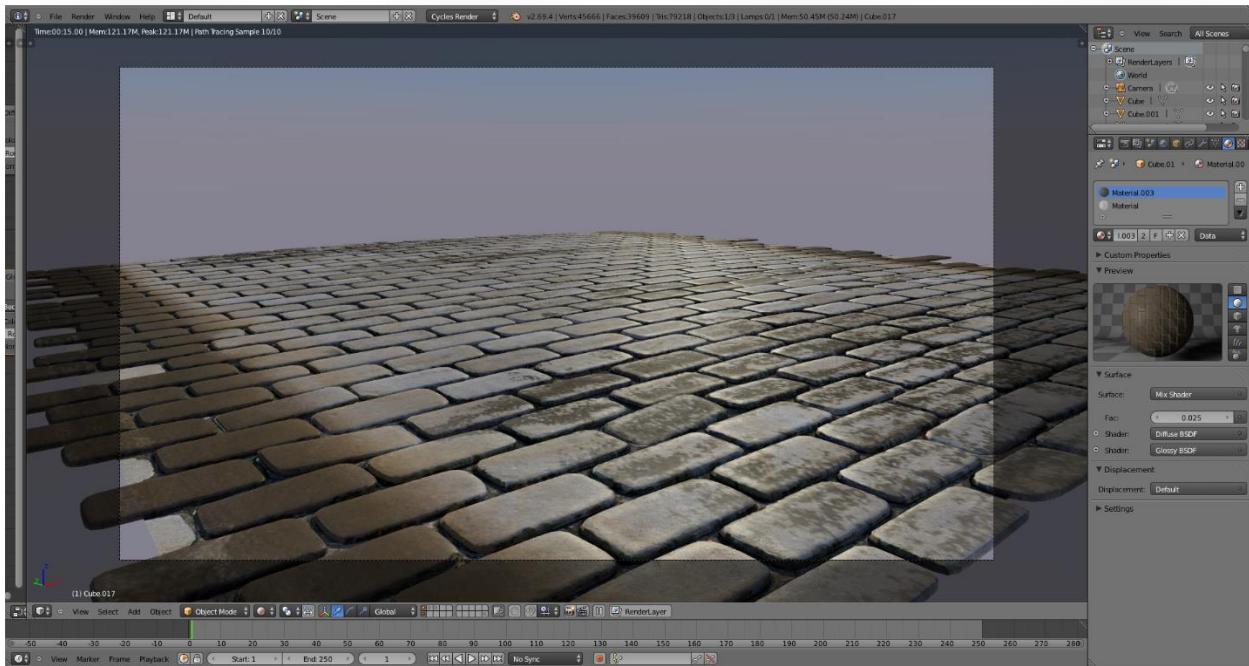
Is this all going a bit too fast ? There is a [video](#) on Blenderpedia showing this street process



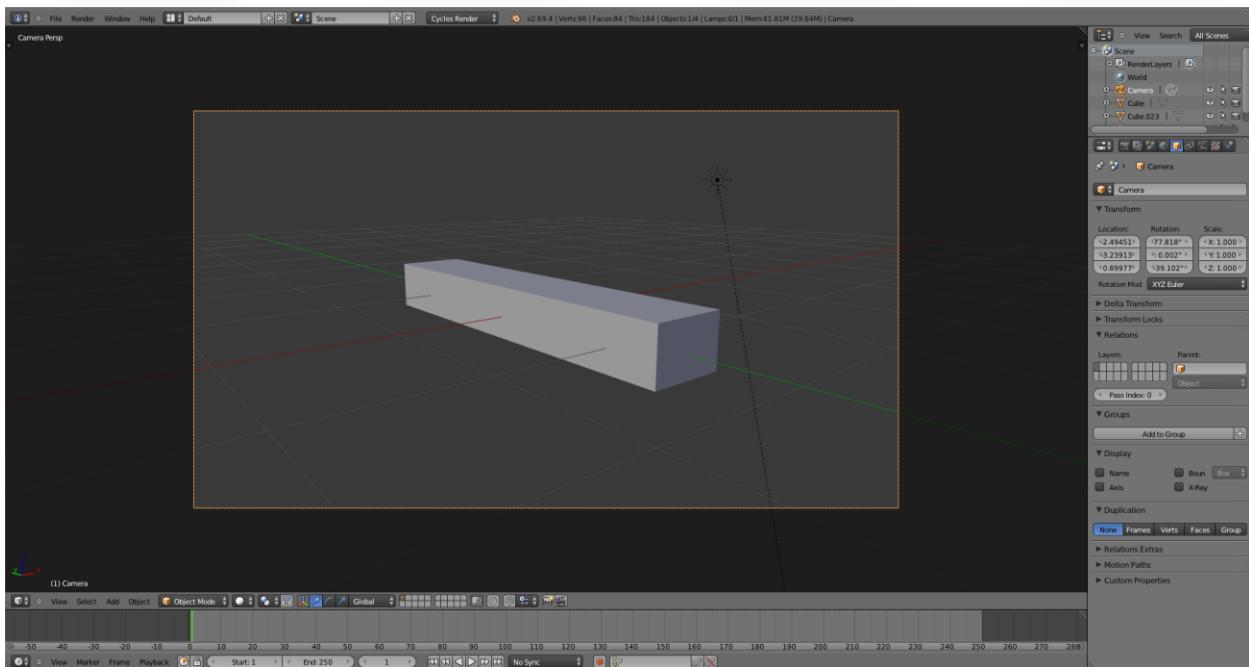
- 29. Now go back to the object data and select the dirt map UV. Go to the top view (num7) and press the U button. Select ‘project from view’. Now the texture will act weird but when you press the UV_map coordinates everything will be normal.



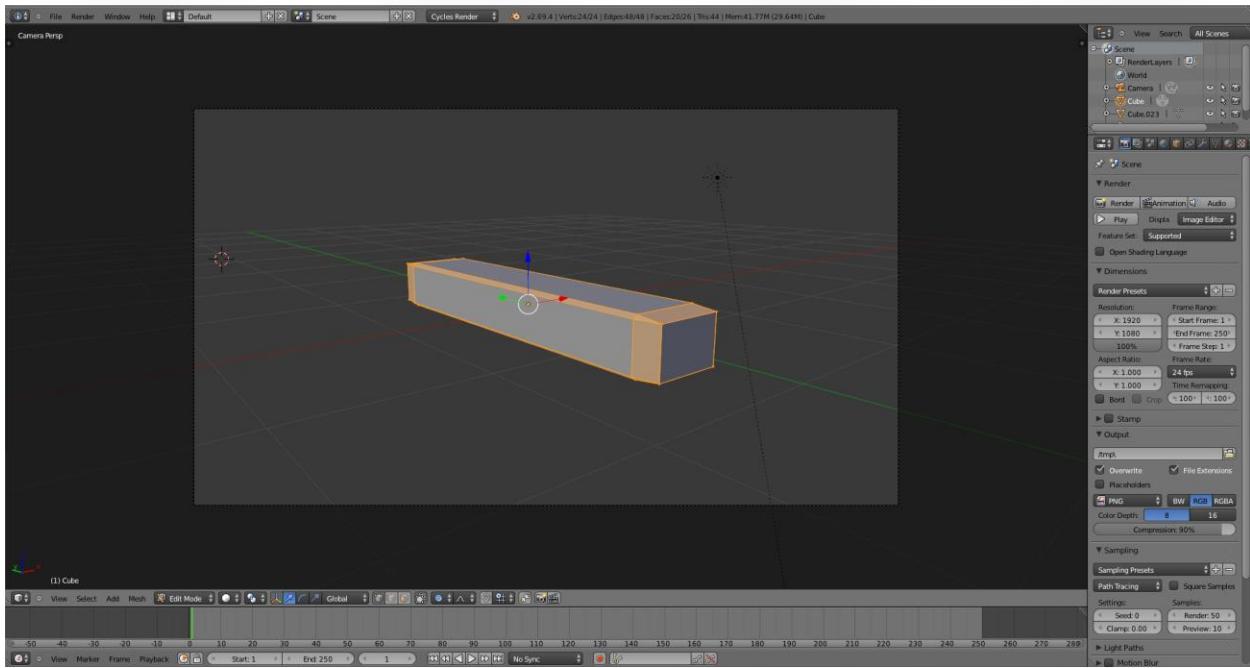
- 30. To activate the dirt map go to the node object editor. Create a new image node and put it under your texture image (open your dirt image). Now go to [Add](#)→[Input](#)→[attribute](#). Write down the name of the dirt map in the attribute node and put the vector into the vector of the image. To combine these two images open a color mix node, ([add](#) → [color](#)→ [mixRGB](#)) also put the alpha into the FAC of the color mix node. Now the two textures are mixed.



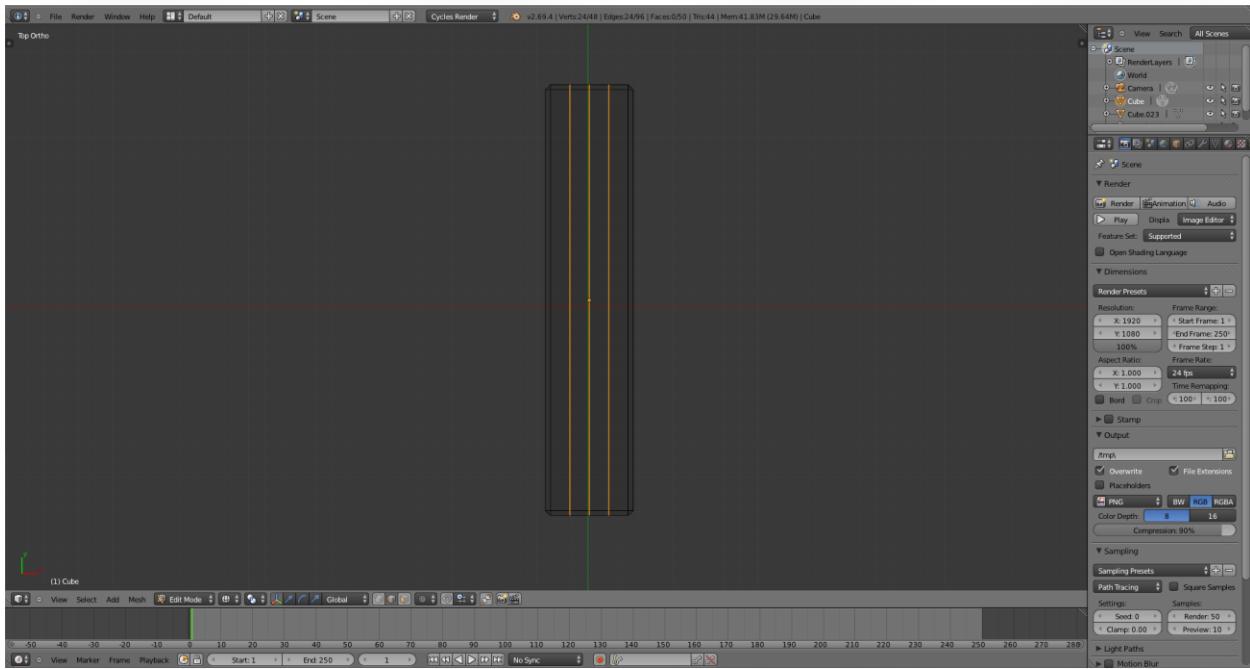
- 31. The quality of the dirt all depends on the paint map. Try to put as much variation in it as you can.



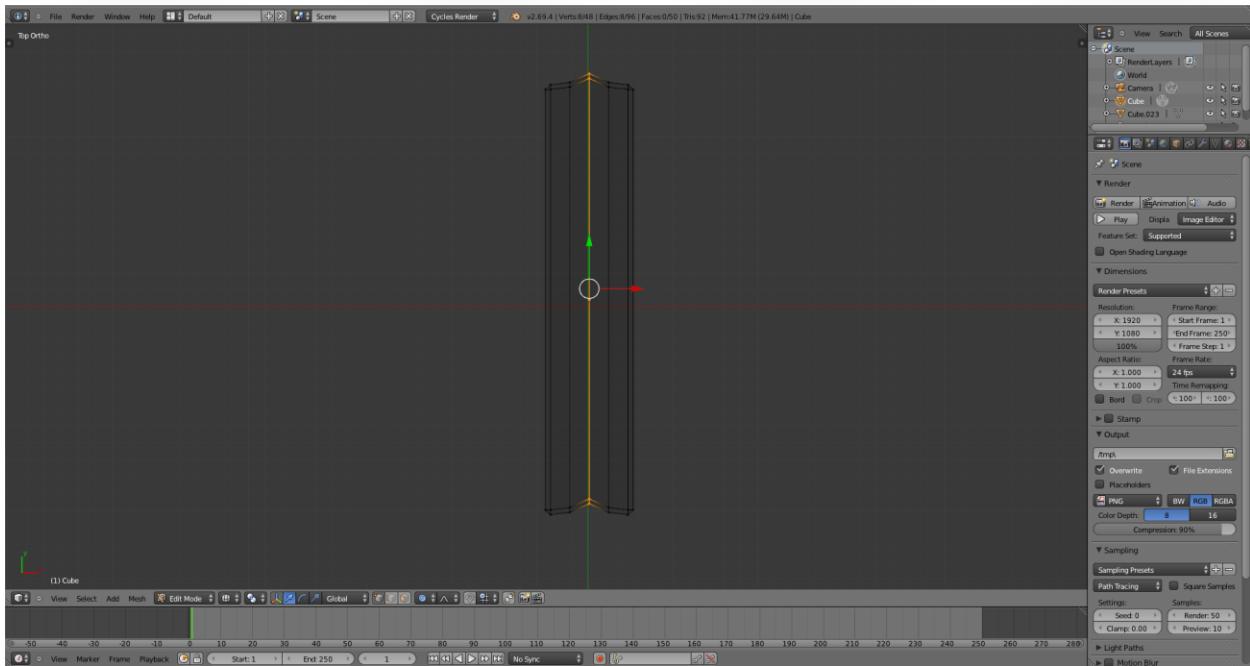
- 32. The next object we're making is a sidewalk for a nice transition. Add a cube and make it a rectangle shape like in the image.



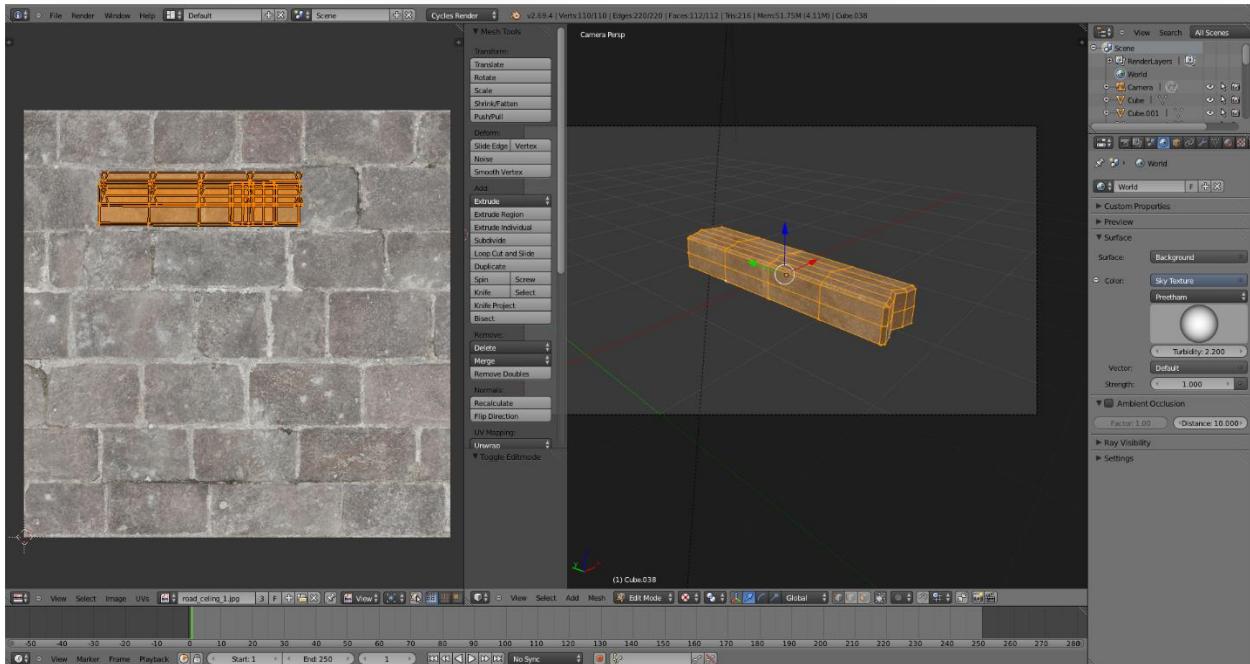
- 33. To add a bevel shape press (CTRL+B). Now you can stretch the object till you have a nice bevel. Sometimes you have to bring the ends back to the other vertices. Just select the ends and move them back.



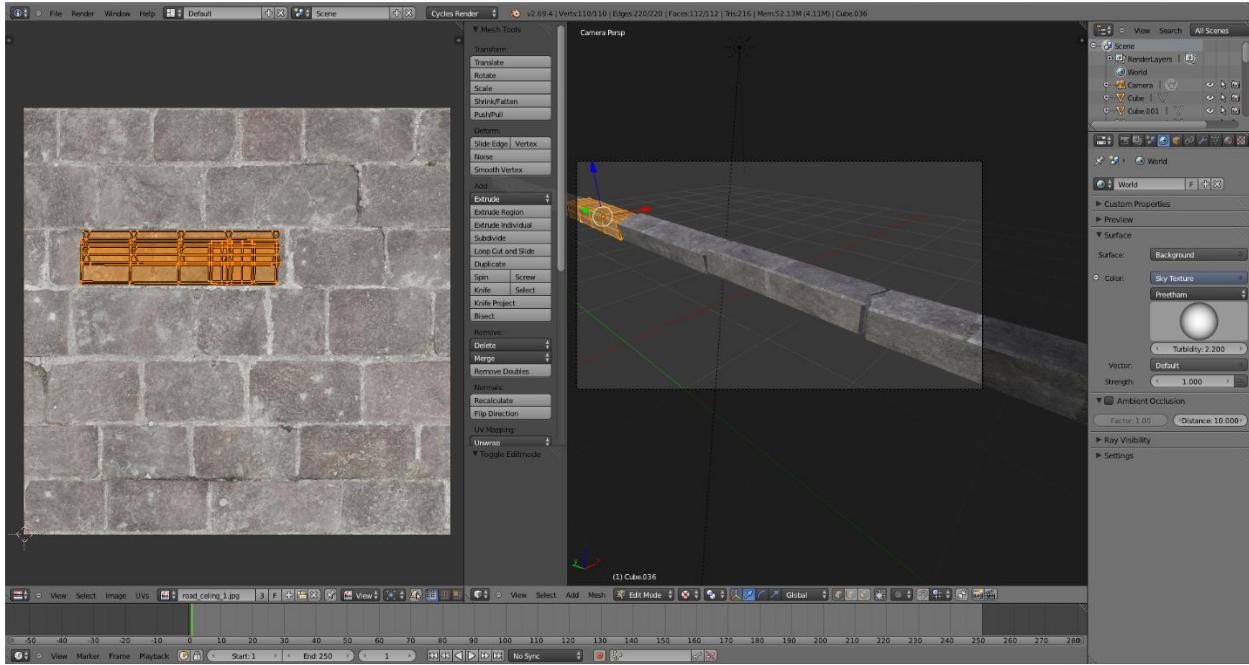
- 34. To add more detail in the object press (CTRL+R) and make 3 lines.



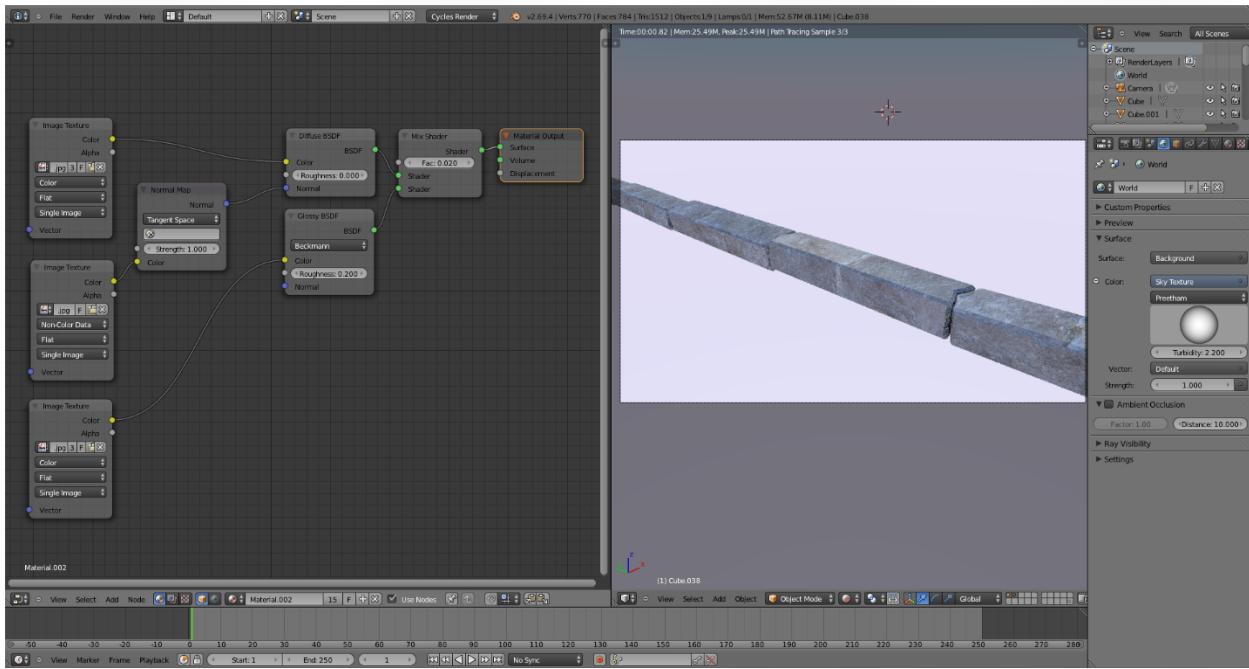
- 35. In the edit mode select the vertices in the middle and press O. Now make a small circle and move it a bit upwards so the other vertices move with it.



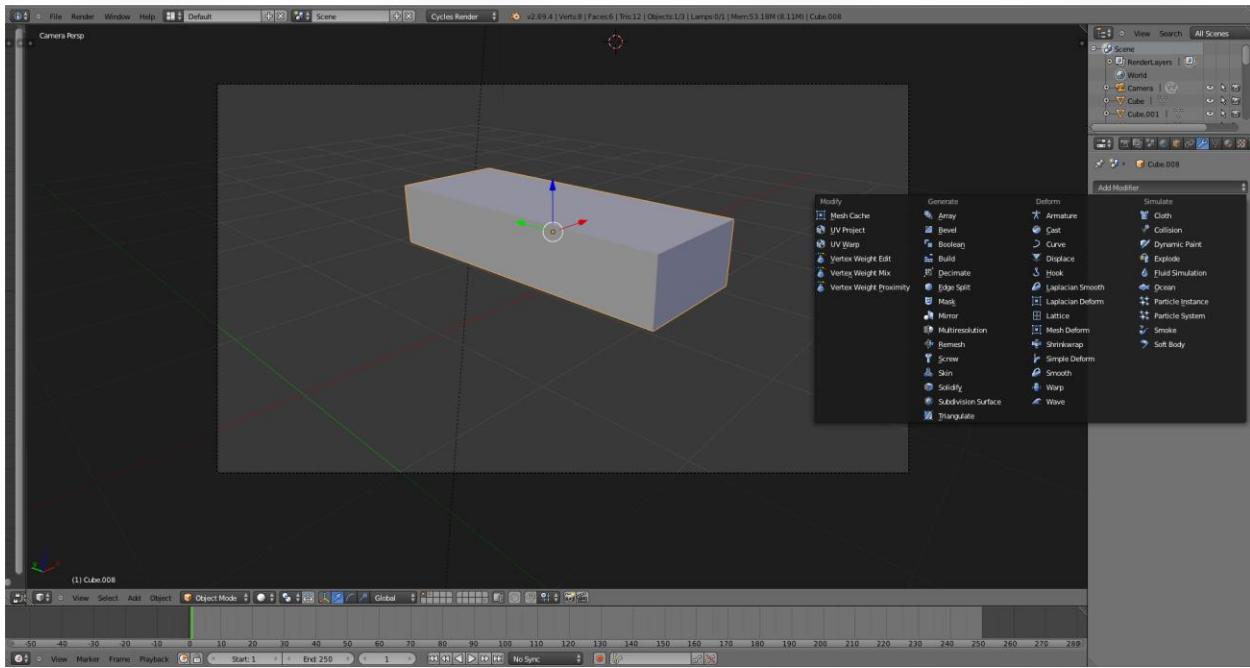
- 36. To texture this object press U → smart UV project. When you open the UV image editor, you will usually get the same shapes, so you have to find out what UV side belongs to the object.



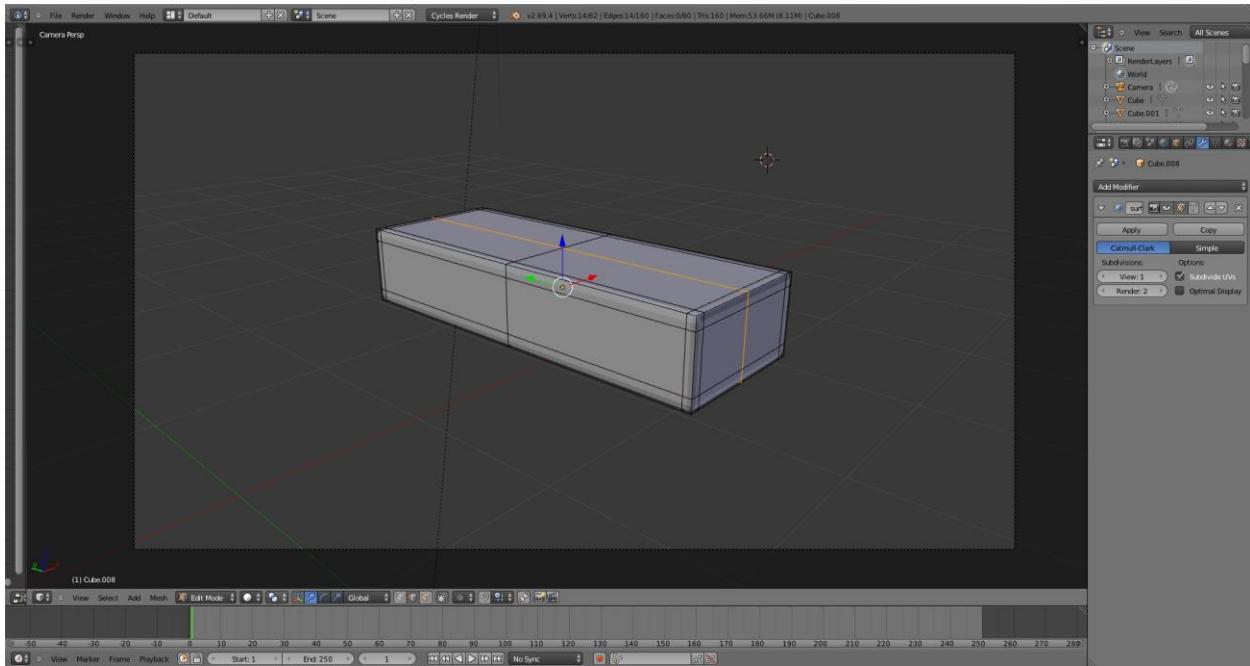
- 37. When the texture is applied (if smart projection won't work, use 'project from view') duplicate the object and change it a little bit. You can rotate the object, or change some vertices.



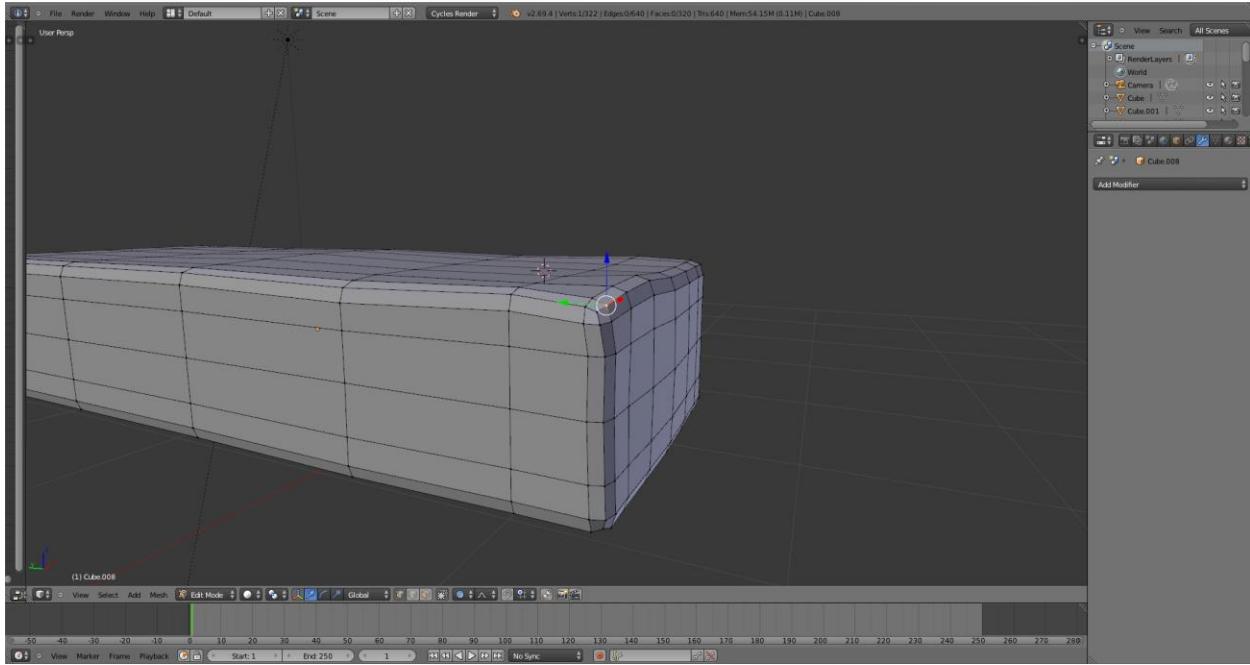
- 38. When you are done, don't forget to apply a normal and specular map. You can repeat the same process as I used for the street.



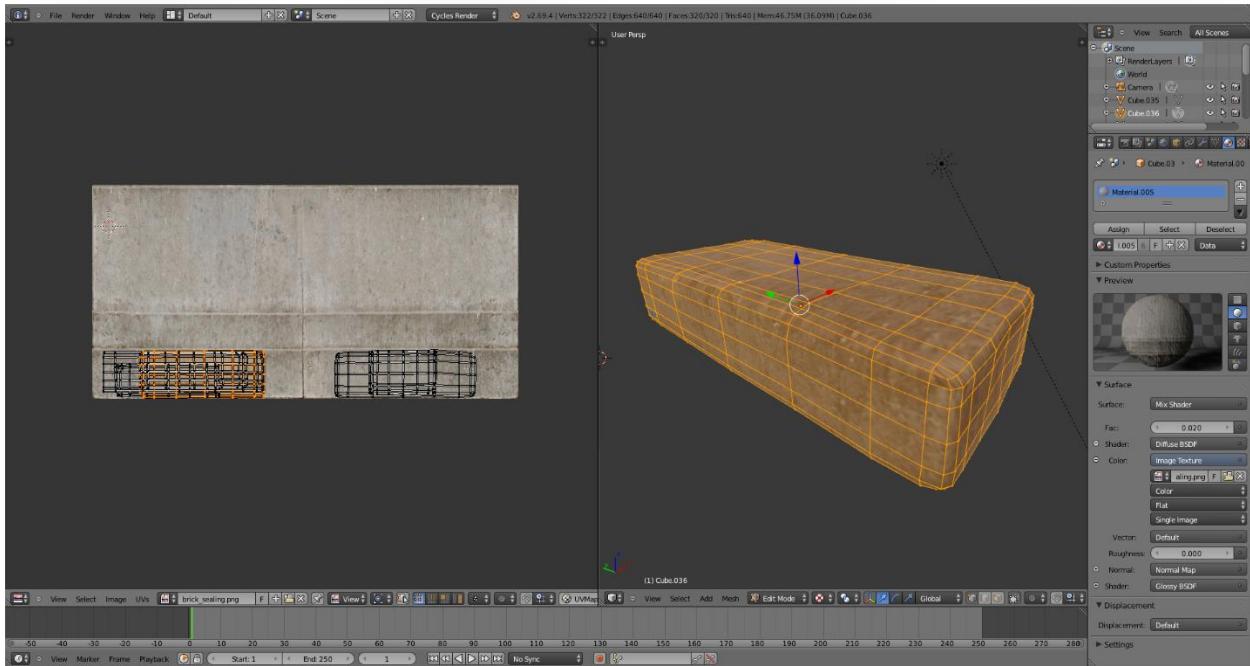
- 39. For the wall brick create another rectangle shape and add a subdivision surface.



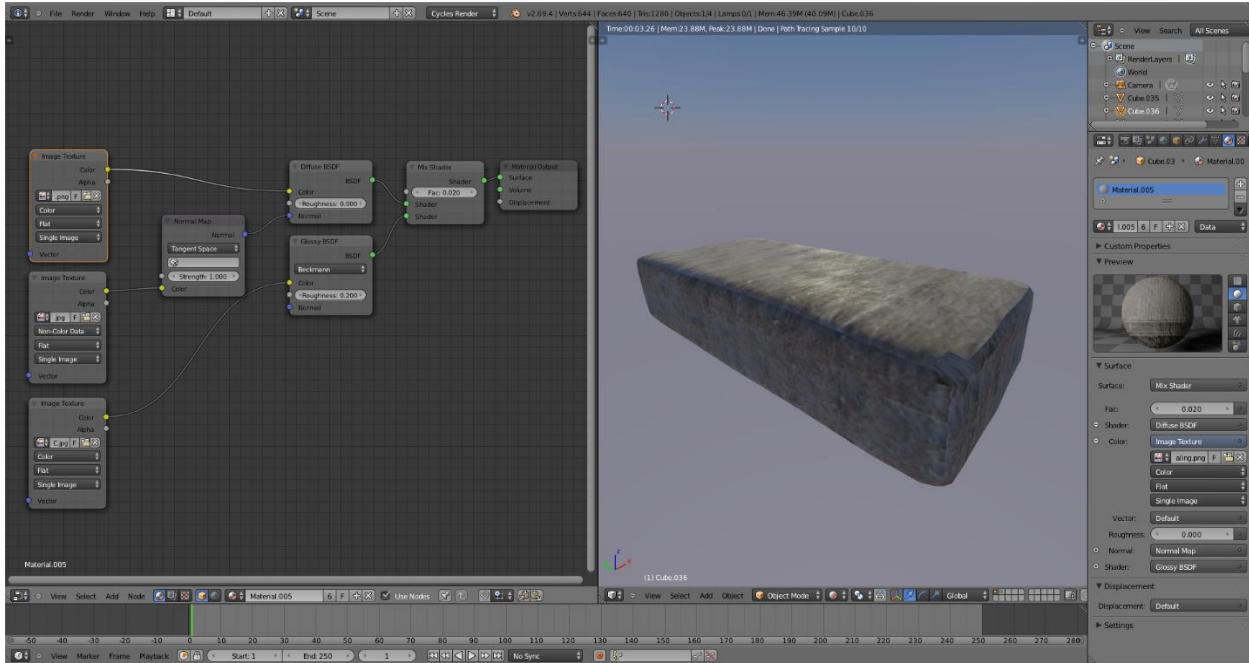
- 40. Put some extra lines on the object to get a smooth-looking brick.



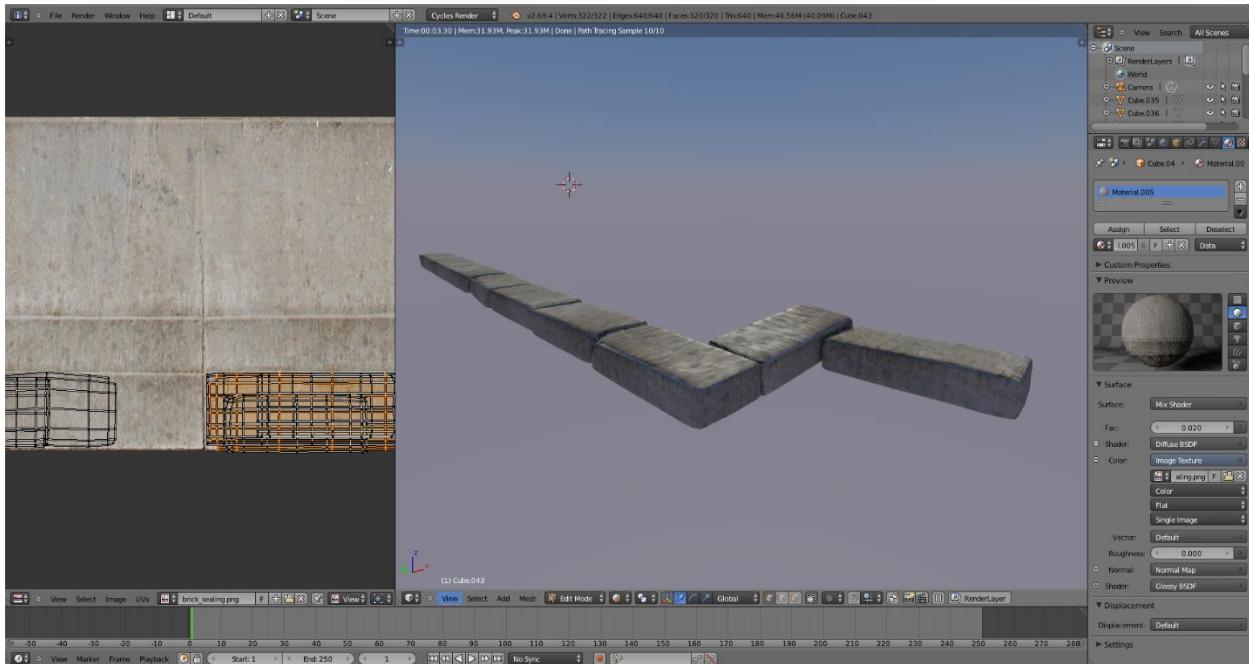
- **41.** Apply the modifier and start making rough shapes on the object. Don't get too wild. Just make it like it's handmade and not a factory brick.



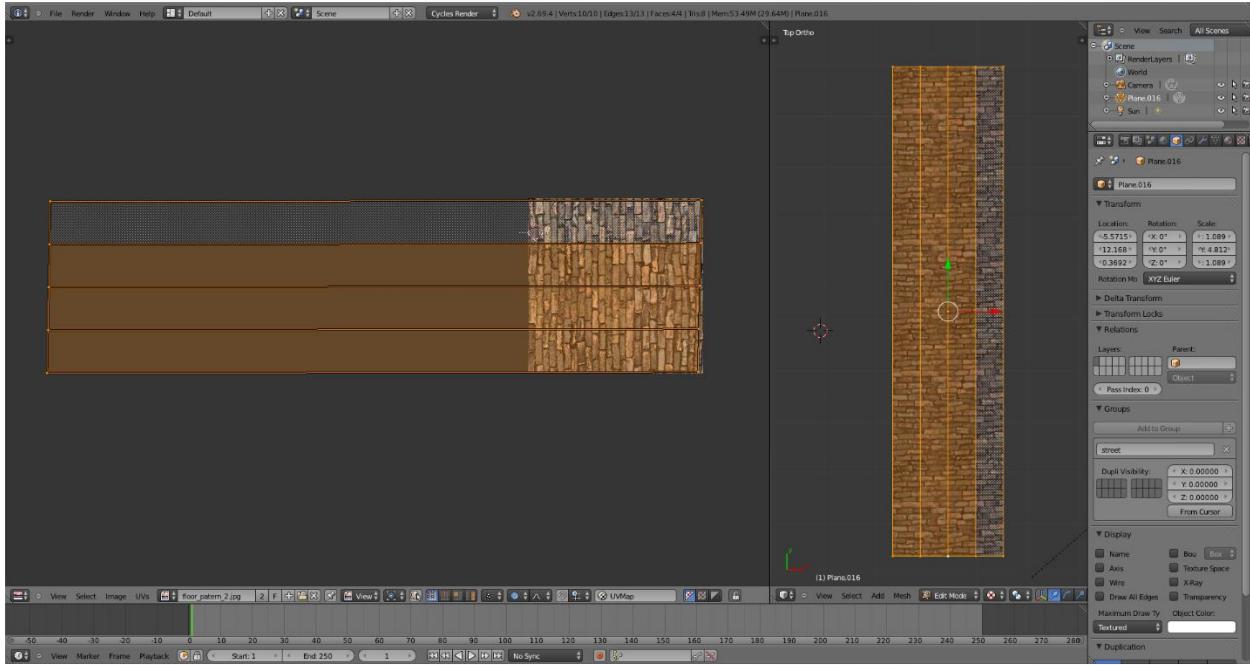
- **42.** For this object also try to Smart UV project the texture. If this doesn't work, project each side of the object.



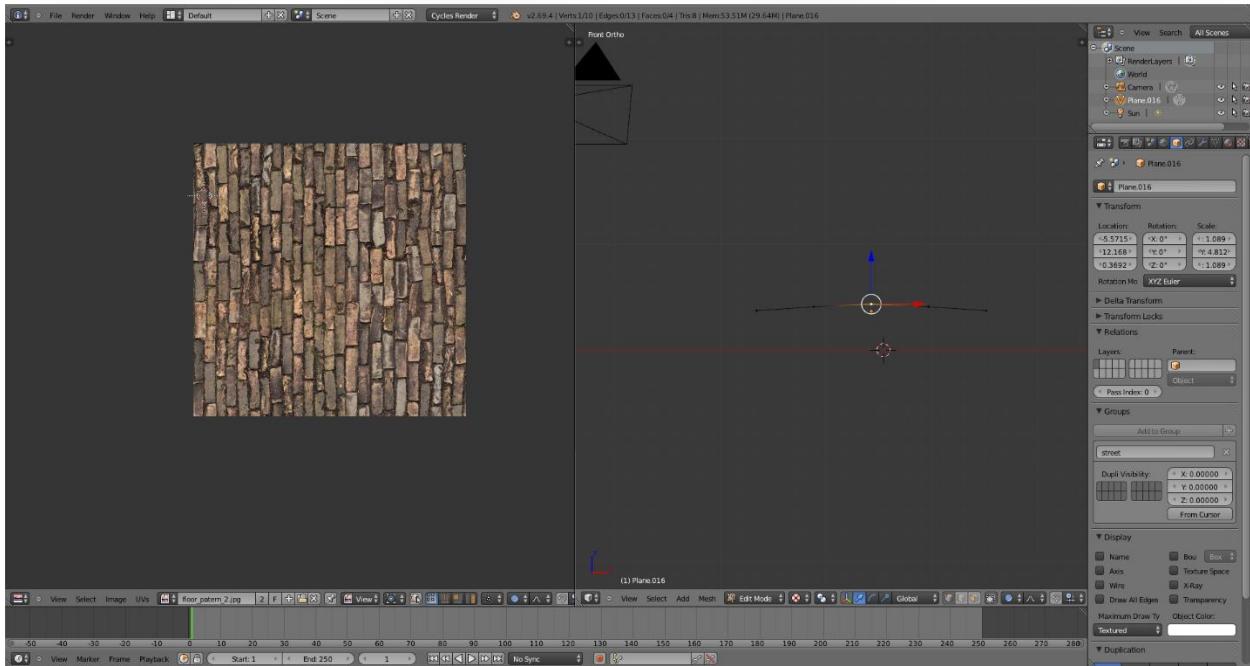
- **43.** Use the same process as with the other objects, and then add some normal and glossy nodes.



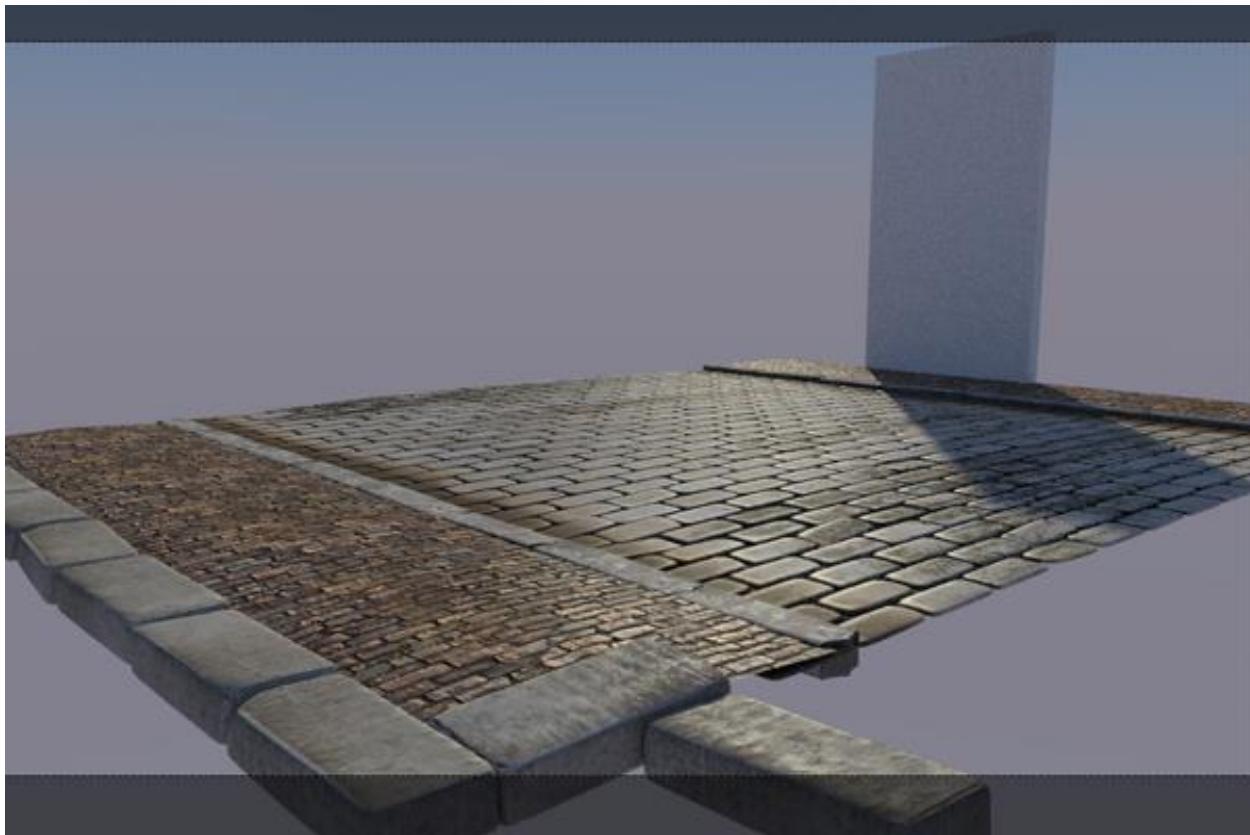
- **44.** Duplicate and change the objects to get this pattern.



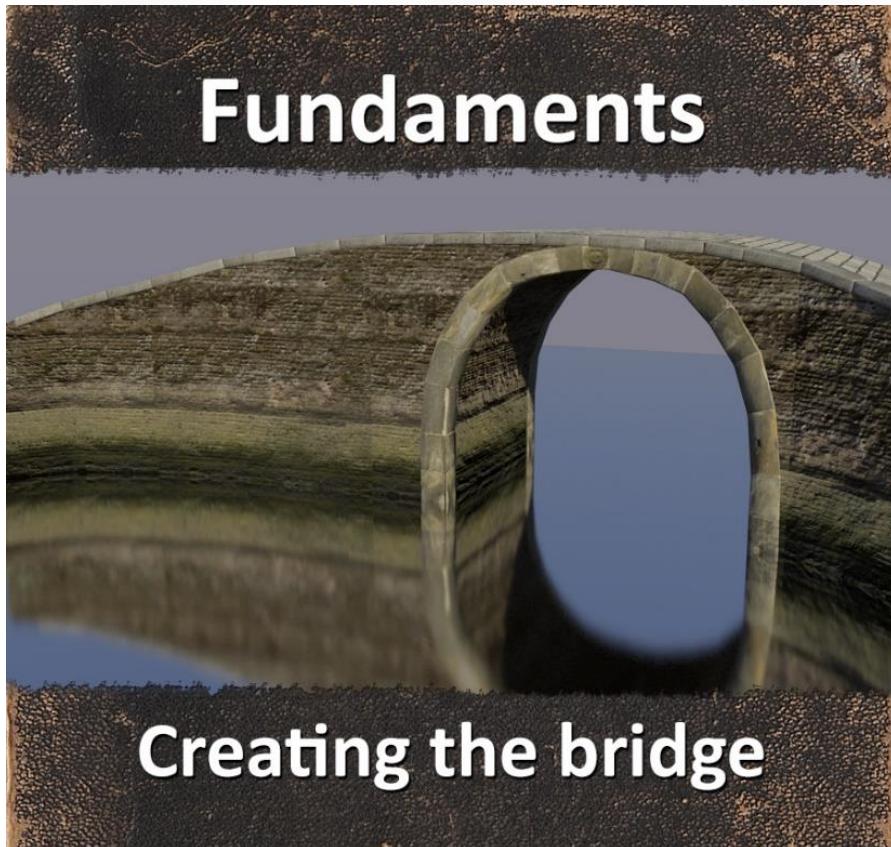
- 45. The last object is the brown street. Add a plane and stretch it like the shape in the image above. Then create some lines so we can make it a bit curvy.



- 46. Use the same method we used with the street. Don't forget to apply the texture on it and put the normal and specular on the texture.



- **47.** And this is the final result. Later in the book we add vegetation (moss, grass, little plants) but this part is about the core base. The next part is about making the bridge.

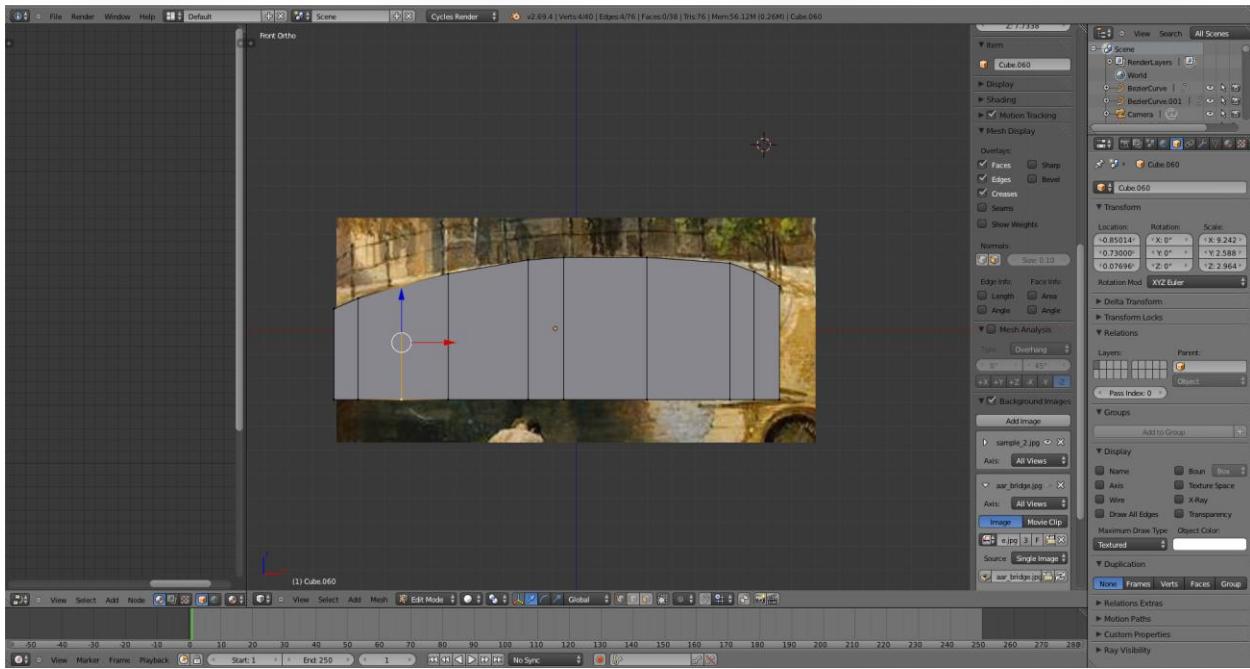


Creating the bridge

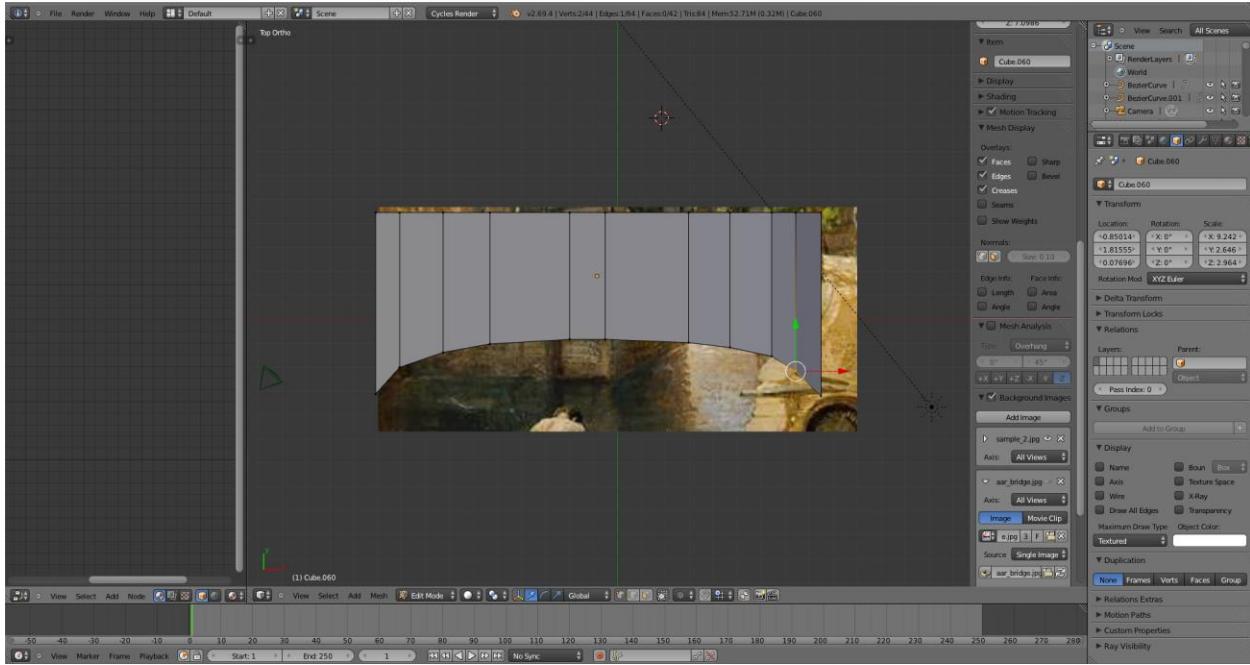
Now we take a closer look on how to model the bridge.



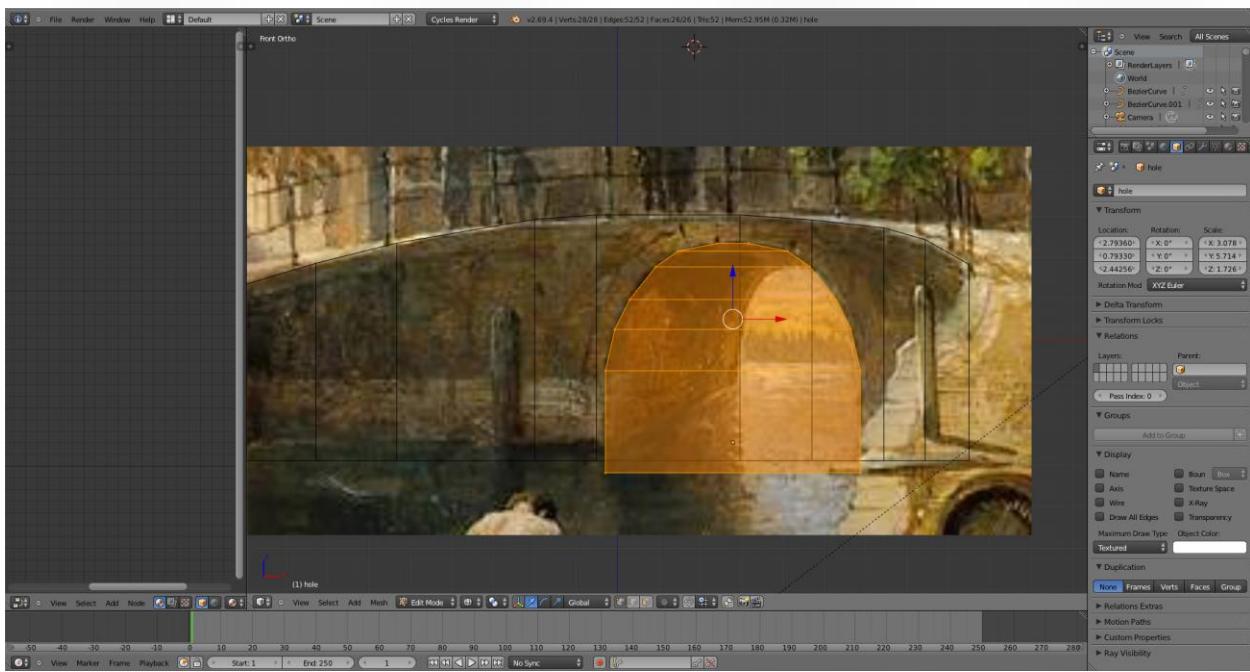
- 1. Put the bridge as a background image in the viewport. You can do that by pressing N, enabling background images and choosing the image you want. After that you create a cube and scale it to the bridge shape.



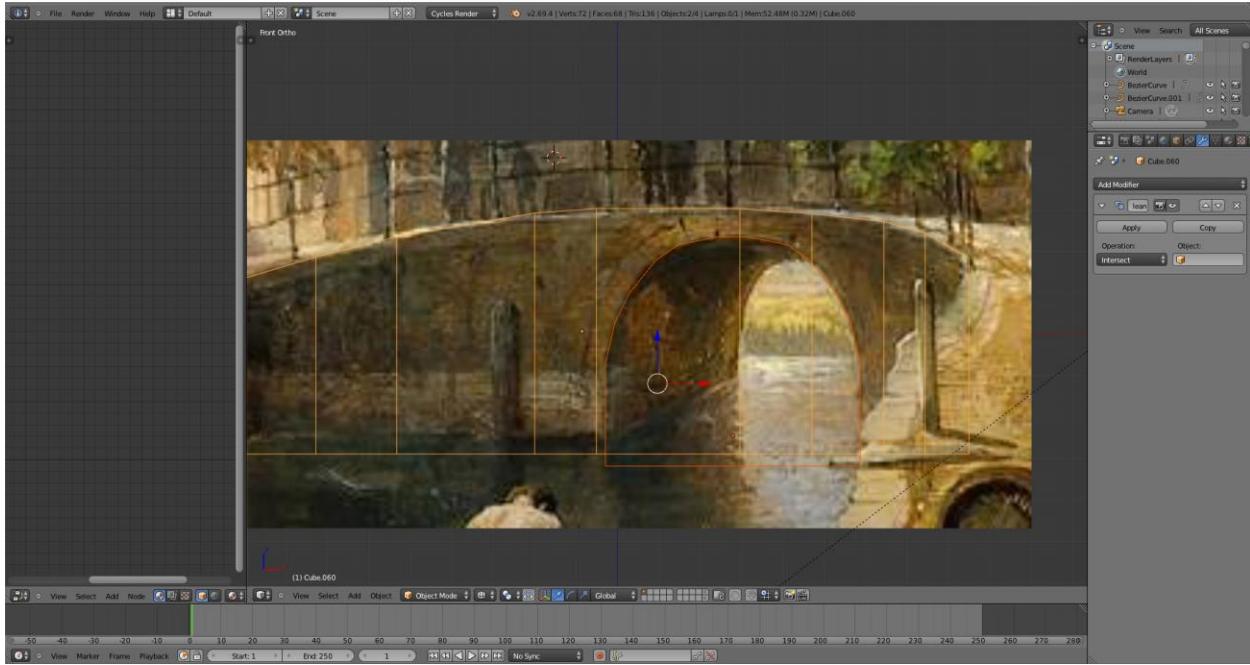
- 2. Create some extra lines by pressing CTRL+R. Then switch to the edit mode and put the vertices in position.



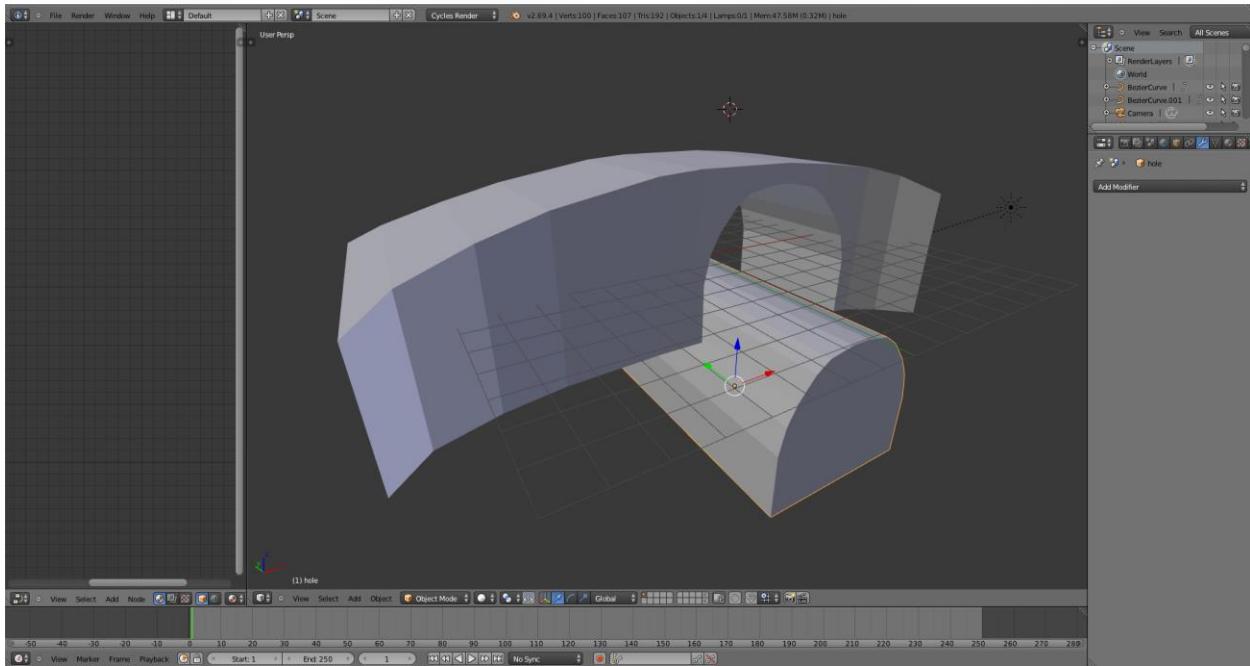
- 3. Switch to the top view (num7) and try to get a shape that matches the image in the painting. You need to improvise it of course, but you can always tweak it later if it doesn't match what is in the scene.



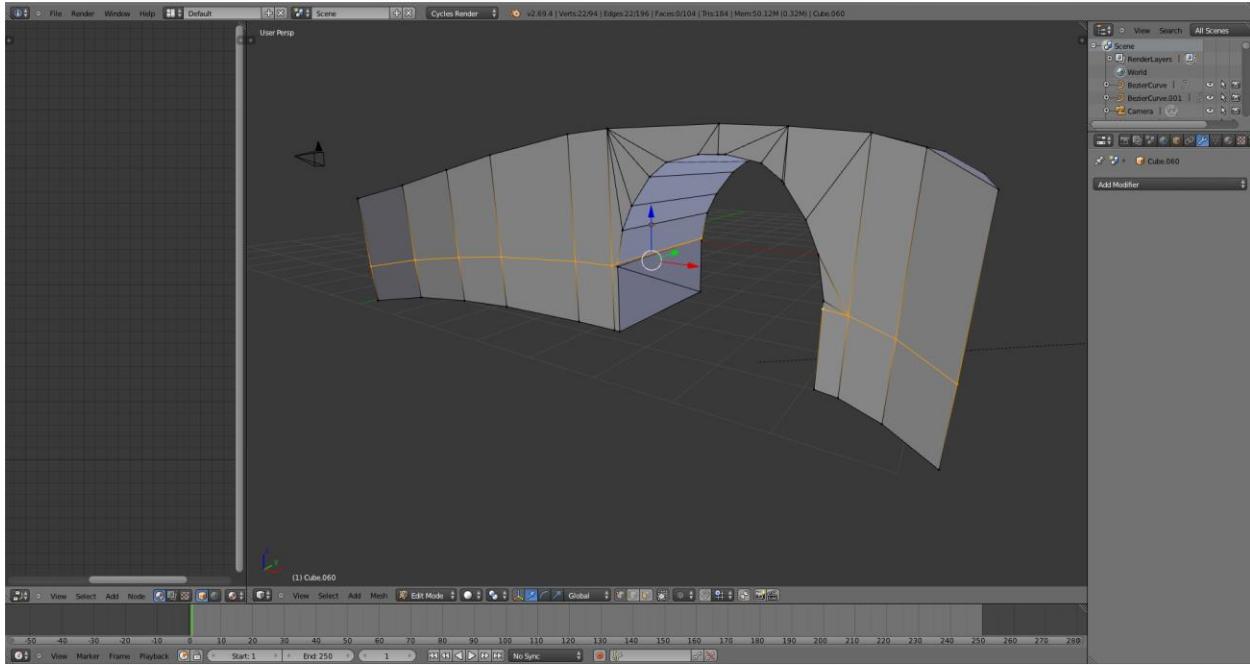
- 4. To create an arch I use the Boolean modifier. First create a new cube, make it the size of the arch, and then give the cube a name (something like 'hole')



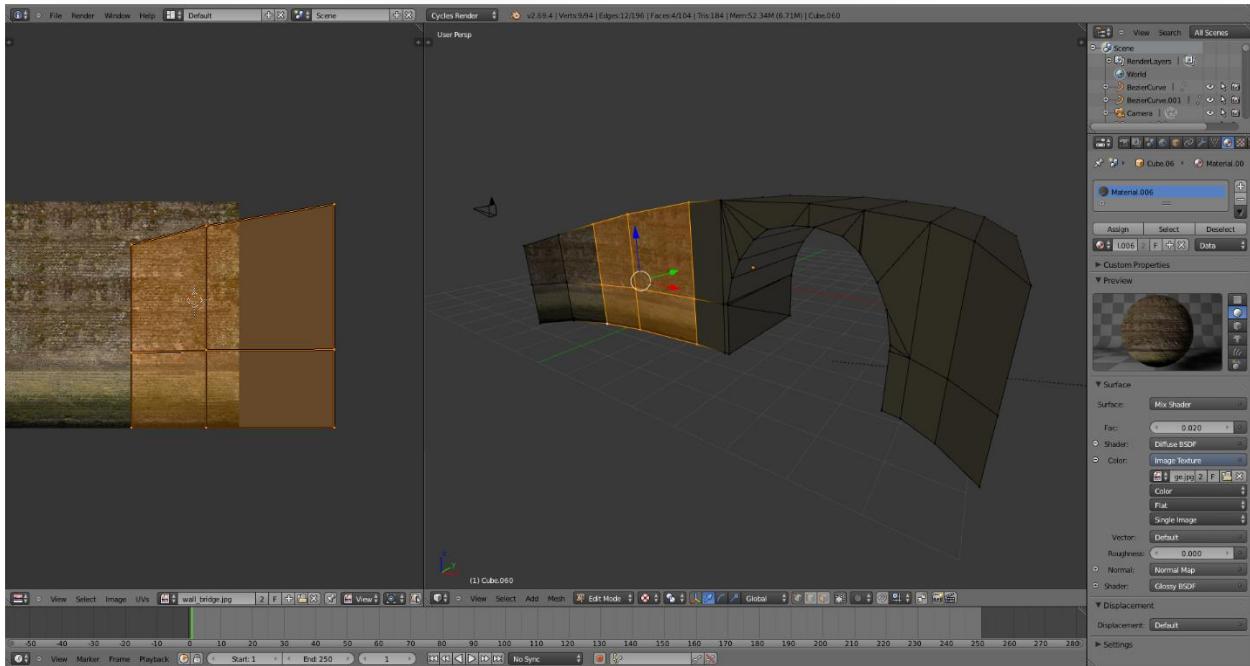
- 5. In the modifier panel I select the Boolean function, and then I combine this with the whole object and make the operation 'Difference'.



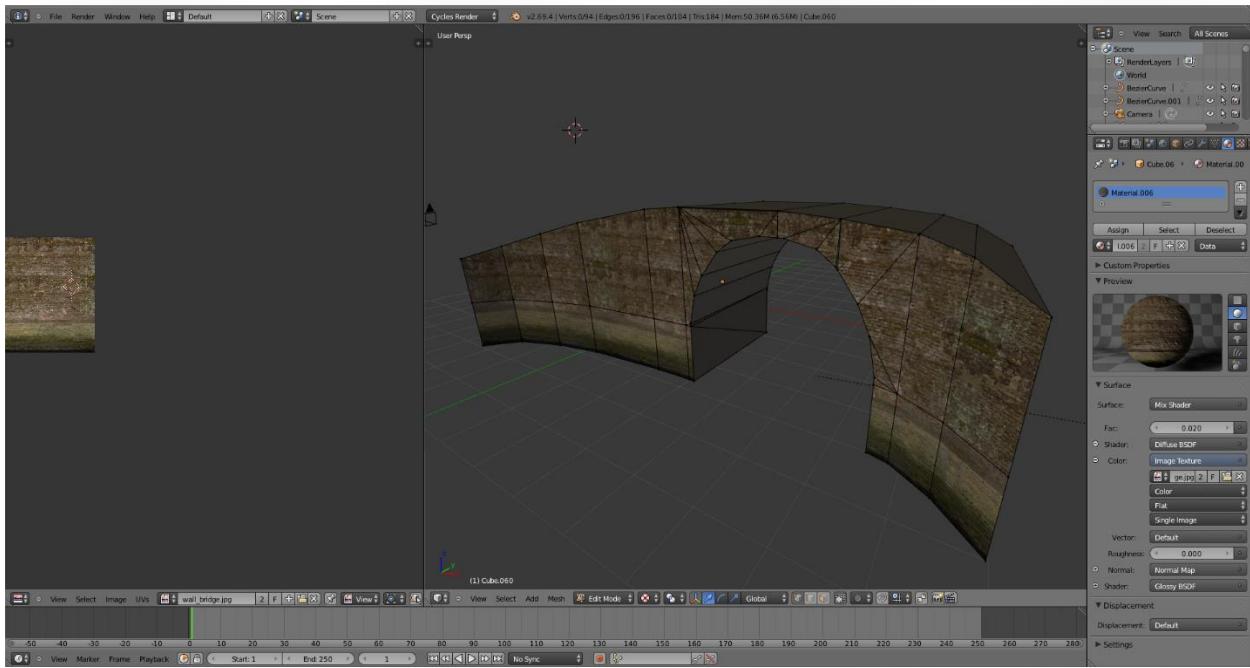
- 6. When you apply this you can remove the whole object. What is left is a nice arch shape. Sometimes the typology is a bit messy. Try to avoid using the Boolean in an edge line.



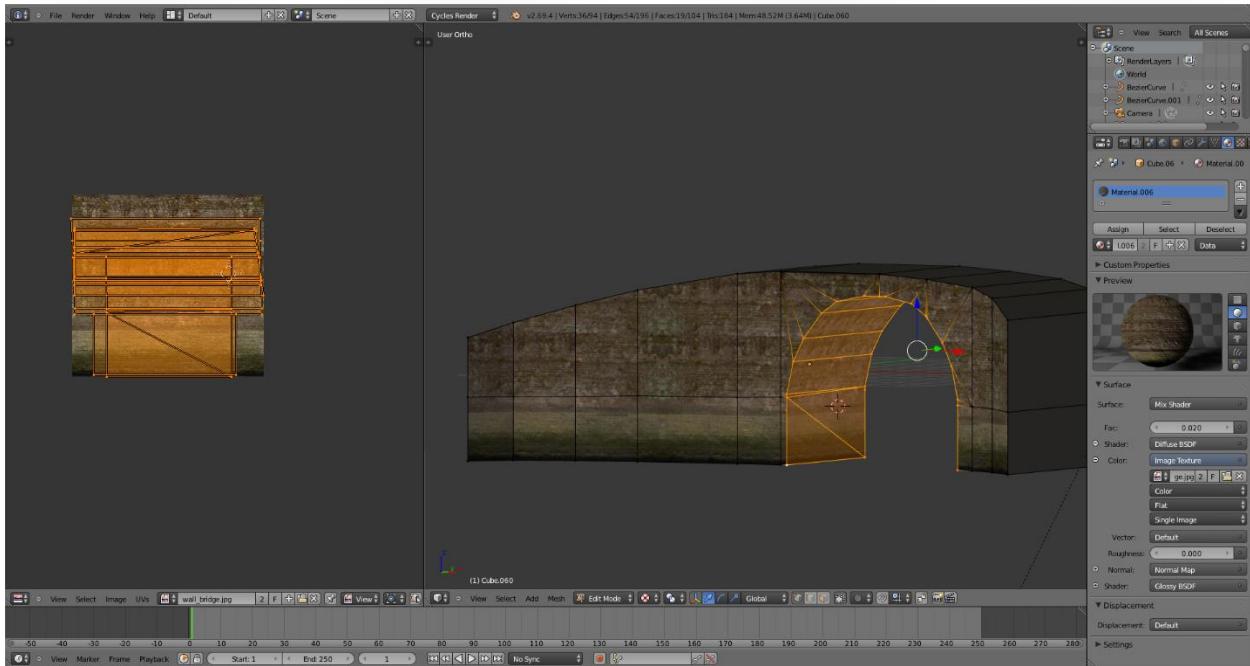
- 7. Create an extra line as sometimes this will help for the UV map process. If the typology is messy, this won't work. However, if it fits in the object, it will help you later.



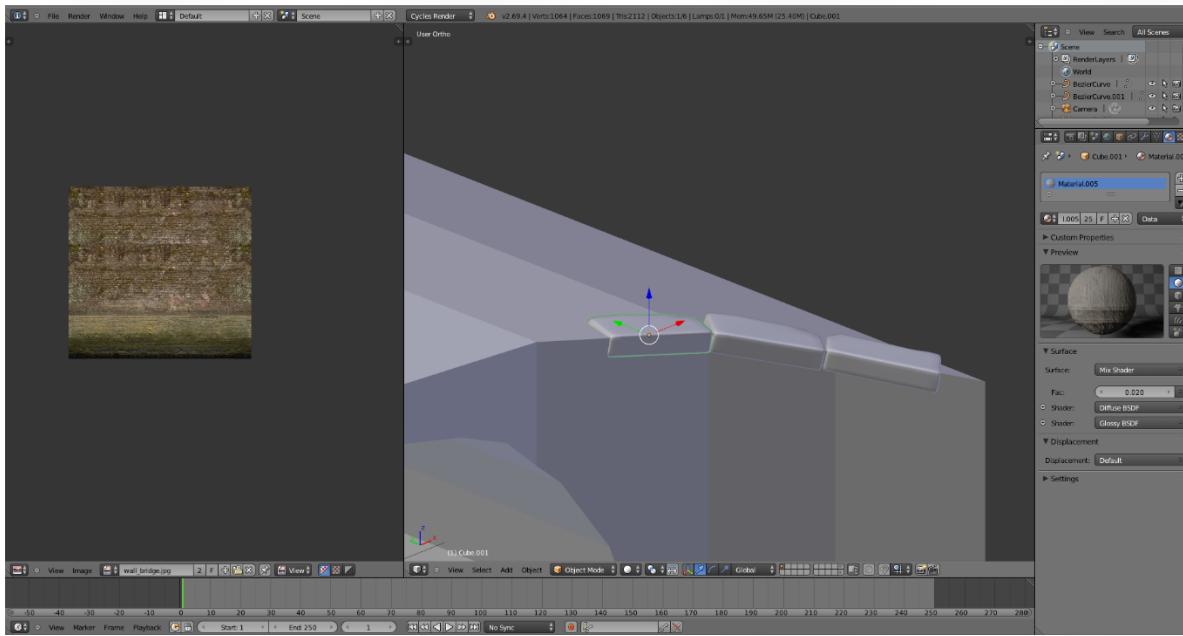
- 8. Now it's time to UV map the bridge with a nice brick pattern. You can see that the horizontal line helps us to see the transition in the texture. I'm using the 'project from view' option in this process.



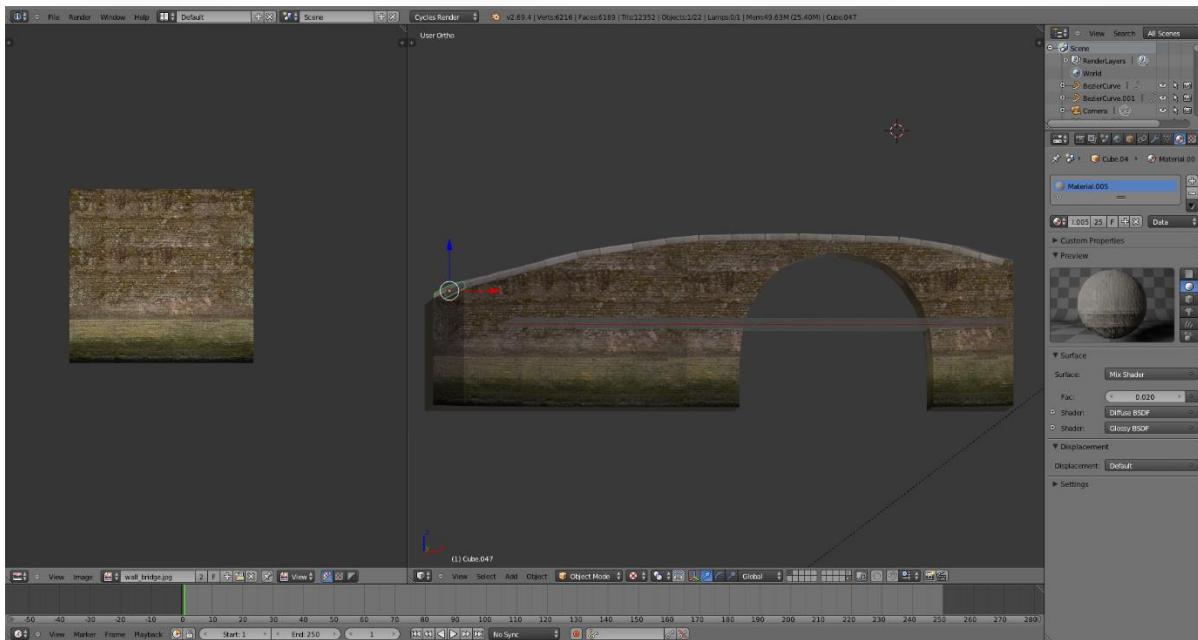
- 9. This is my UV map result. As you can see, there is a nice transition between every part. This process is not always easy, and it usually takes some time.



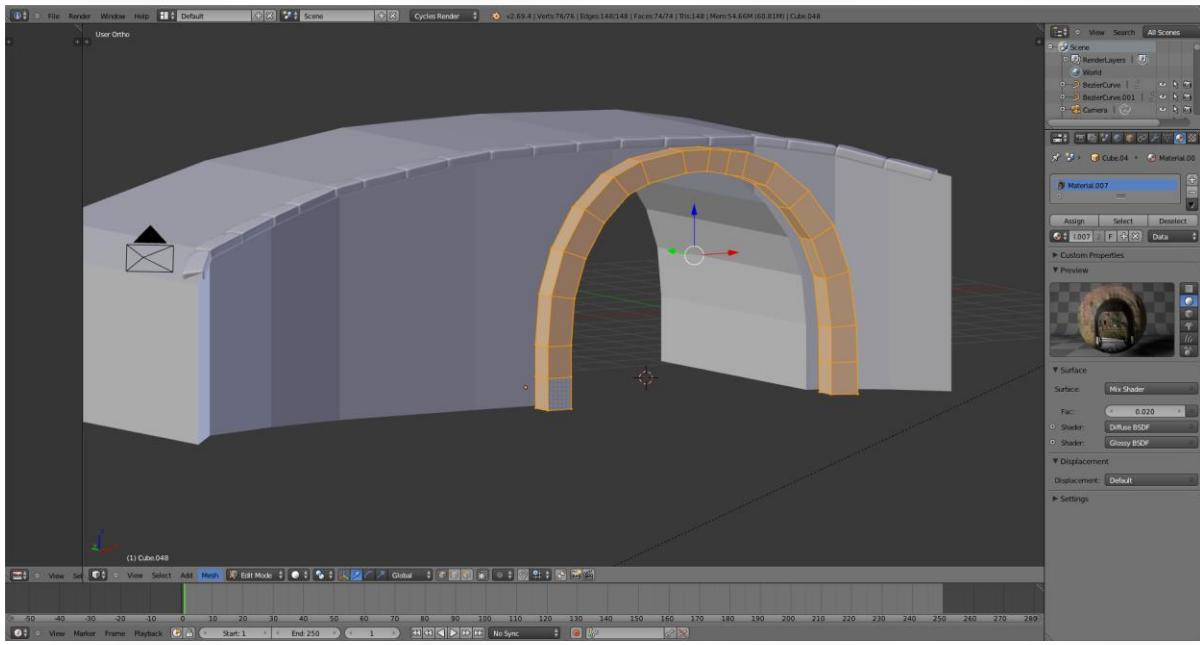
- 10. When you start mapping the arch use 5 edge lines each time. If you select all the lines, like in the image above, the texture will be stretched on the end points.



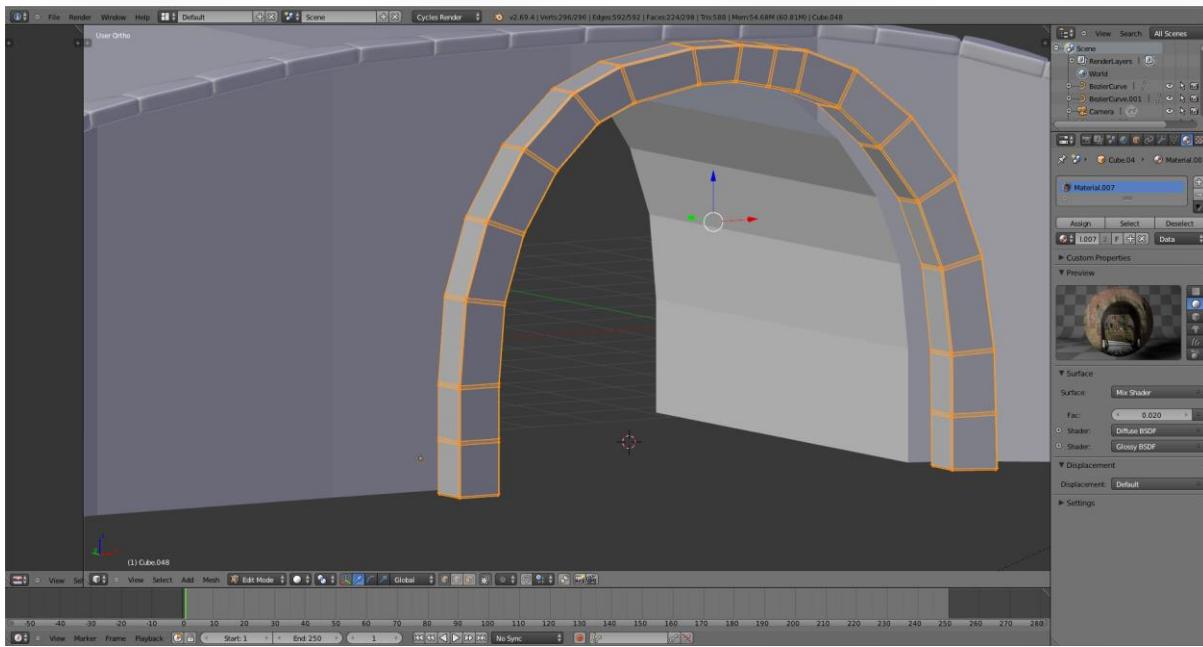
- **11.** When the texture work is finished you can add some bricks on the sides of the bridge. I chose to use single bricks to get the optimal result. From a distance it won't really matter but if you have a close camera angle it is necessary to add these details in the scene.



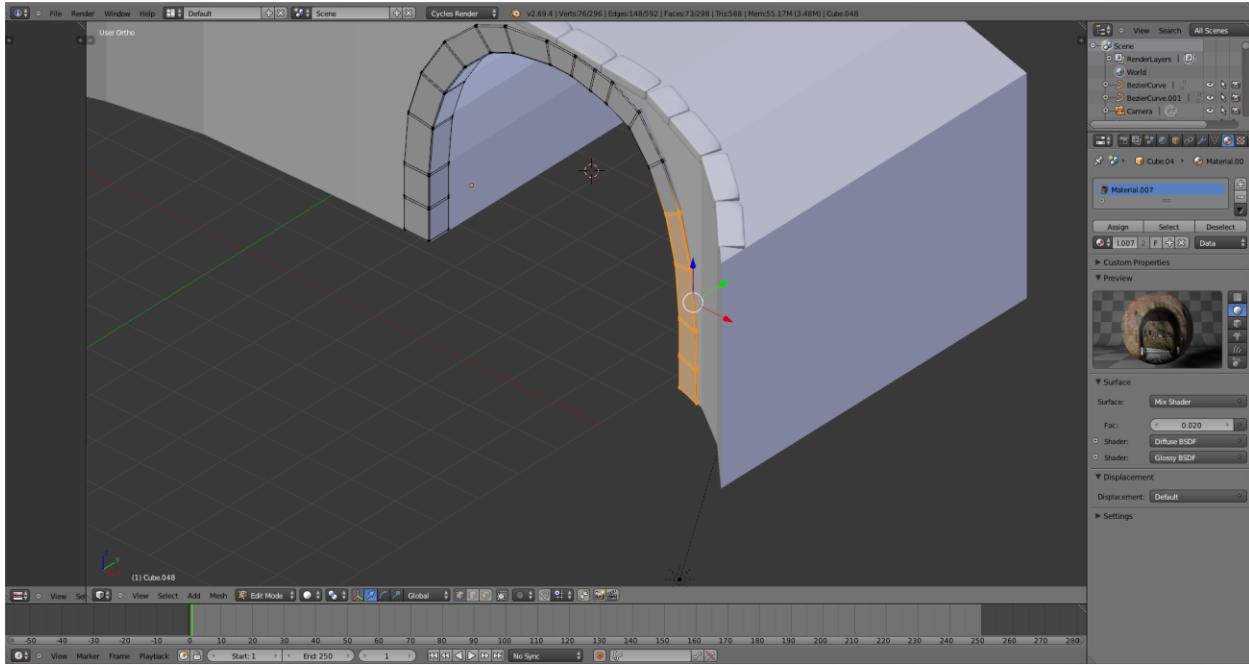
- **12.** This is how it looks when all the bricks are in place. A short tip, rotating the bricks, can be done by pressing R + Y, X or Z. It is a time-consuming process, just like all the work in the scene. You should also avoid repeating textures. Thus, change the UV coordinates in every single brick.



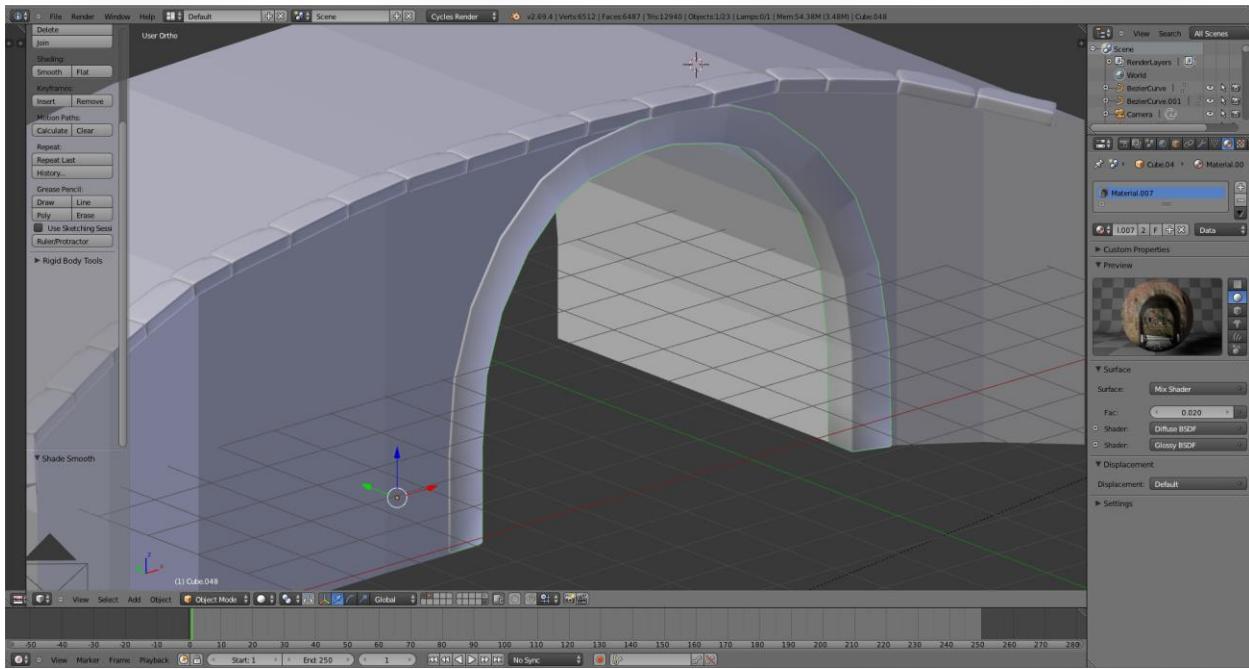
- **13.** The next step is to add an arch ornament. Start with a cube, scale it to the right size, and extrude it till you have a shape that looks something like what I created. Don't use the mirror modifier. You can extrude a cube by pressing E, and rotating the selected vertices by pressing R.



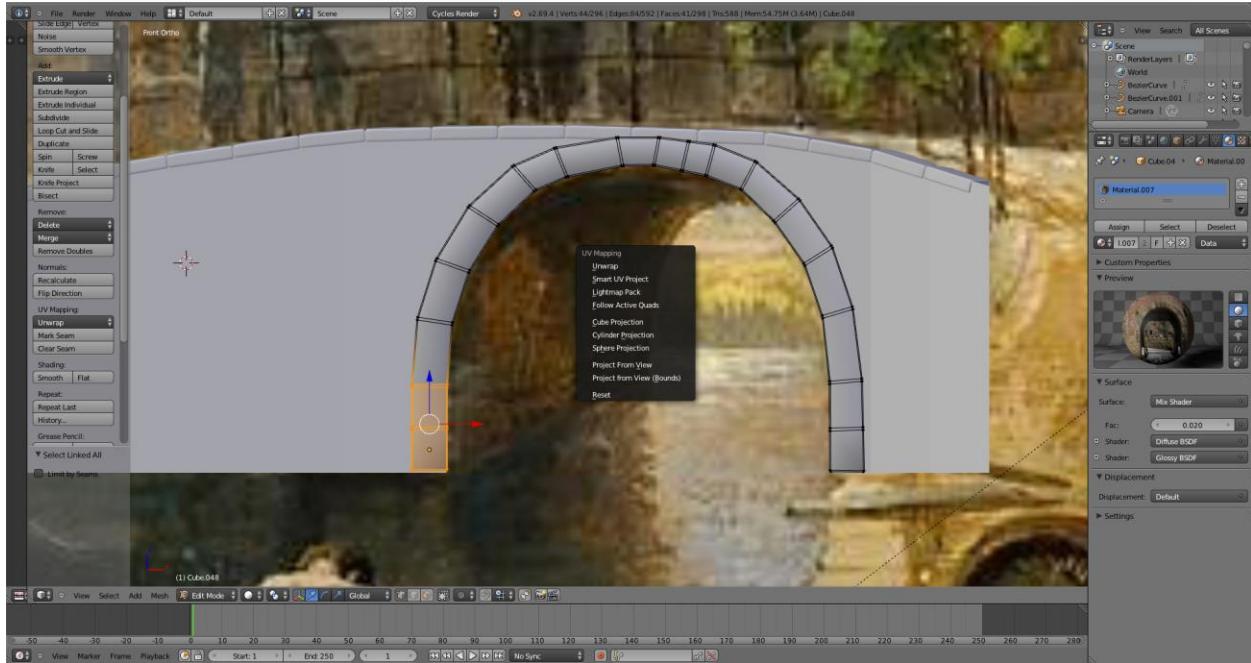
- **14.** When you are done the arch will not match the Base Bridge. Before we bring it in position we smooth it a bit. Select all the vertices and make a bevel (**CTRL+B**). You can scale it by moving the mouse and pressing the left mouse button to apply this.



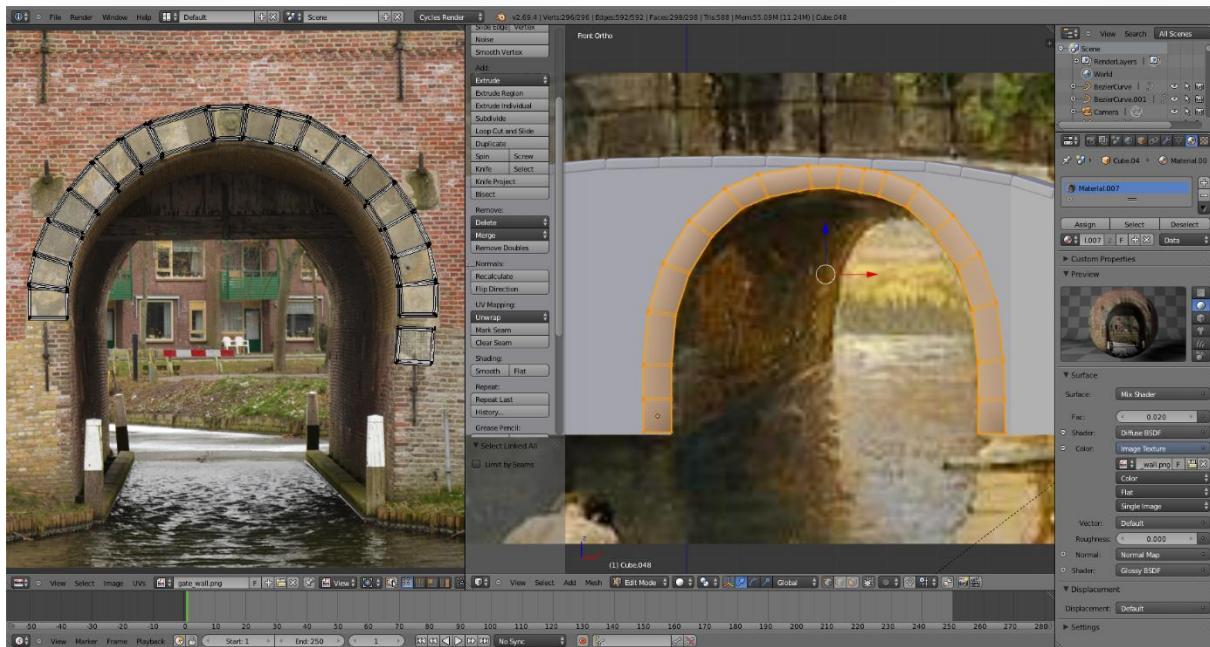
- **15.** To bring this bow in position, select all the vertices that are going through the bridge and press G+Y. Now you can move the bow a bit till it matches the base. Sometimes you have to move the vertices by hand. Be aware that this can be very difficult.



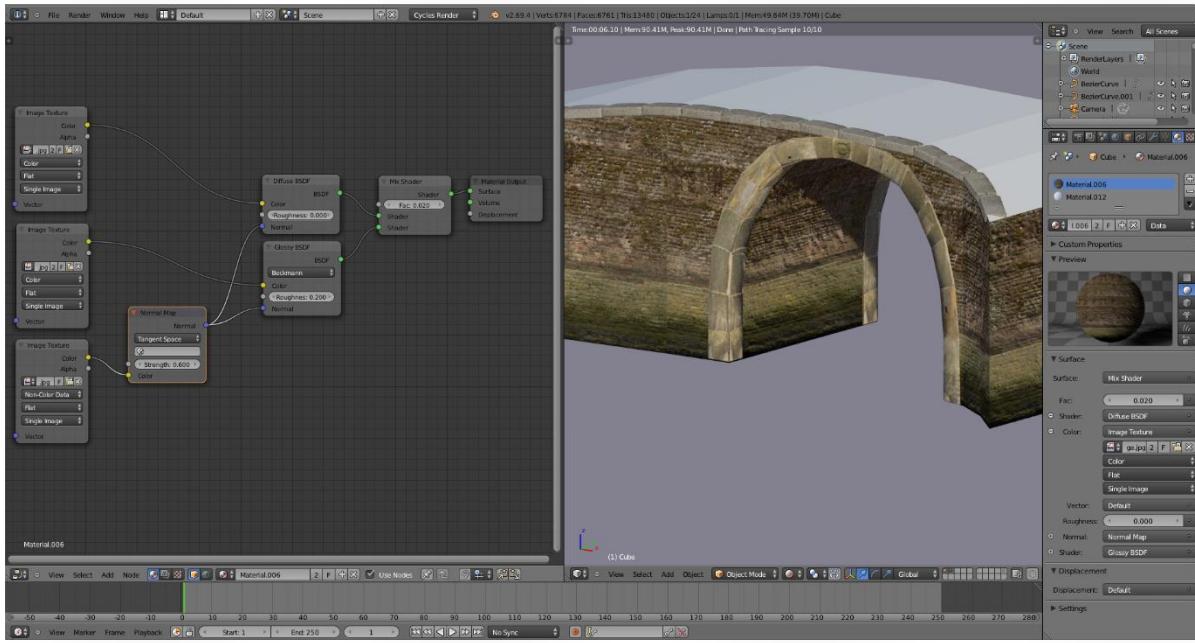
- **16.** This is my final bow shape. After you have finished this scaling process you can smooth the object.



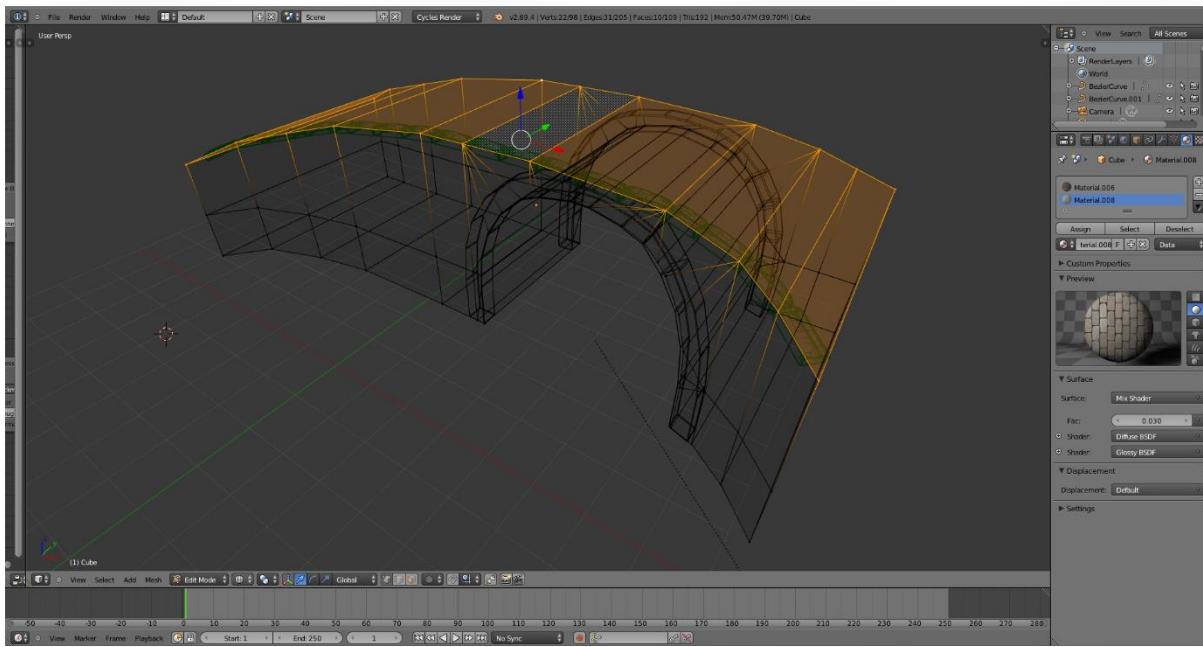
- **17.** When the modeling process is done we start to UV map the bow. I used the ‘project from view’ option to have the best control.



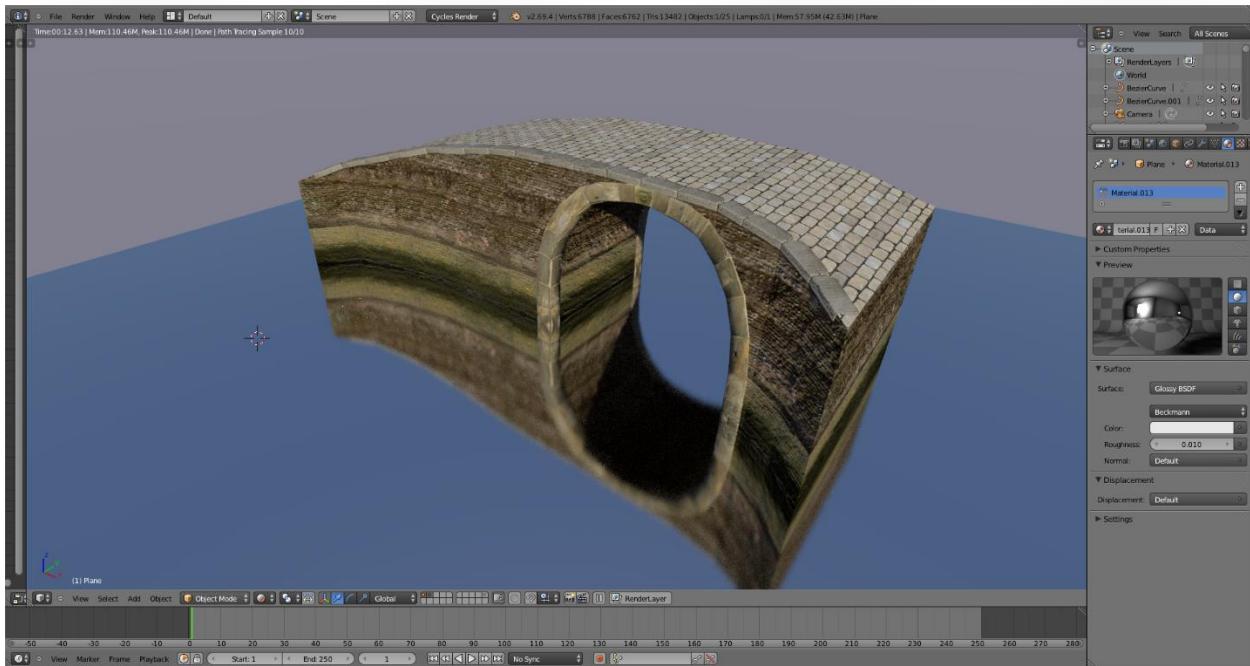
- **18.** First I put the texture on the front parts. Then I switched to the sides. Try to match every part so the end result looks solid.



- **19.** You can copy the bow and move it to the other side of the bridge. Now it's time to enable the normal and glossy nodes on the wall and the bow. Nothing really special. Don't use too much specular on the bricks, this will look fake. Most of the time a value between .01 and .02 will work.



- **20.** Of course, the top of the bridge needs a texture as well. I used the same texture as we used in the first part of this tutorial. But because this bridge is far in the background we are not going to model every single brick.



- **21.** And this is how the bridge looks like when it's done. Later we will add some props and decoration, and also some dirt to make a better transition between the bow and the bricks.

Buildings

A solid fundament is, as I said before, one of the most important things in a 3D scene. If you start by creating the buildings first you can get confused later when you want to place it in the scene and you don't know where to put it.

Over the years I taught myself a working method that helps me organize the scene and the working process. In my opinion, the buildings take the largest amount of time. Sometimes there are over 20 buildings in a scene.

Below is an explanation:



Cornelis Springer

(Fig 2)

I created this scene a long time ago in the Blender internal engine. I was inspired by the buildings and mood in the scene. Without making an organized plan I started working on some buildings and realized later that my scene was a big mess. At first, I was really motivated and spent a lot of time on one of the buildings and when that building was done (it took me over 2 weeks) I realized that I had to make 13 more of them. Now when I start on a scene I do some organization before I start. First, I count the buildings. It doesn't matter how complexity they

are, some buildings take more time than others. In the end you have to create them all, so don't panic.

When you look at the picture you can see that some of the buildings are completely visible. But if you look at building number 12, you see that you will have to use your imagination, or do some research. Number 14 is another thing. This might be more than one building, you can hide them by adding some trees or you can create a low resolution version.

Below is an example of how the final result looked in 2011:



I started working on this scene in 2008. Of course, I didn't work on it for three years. I made 22 more of these scenes and you can see the development process very well in the modeling work (Fig 2.1)

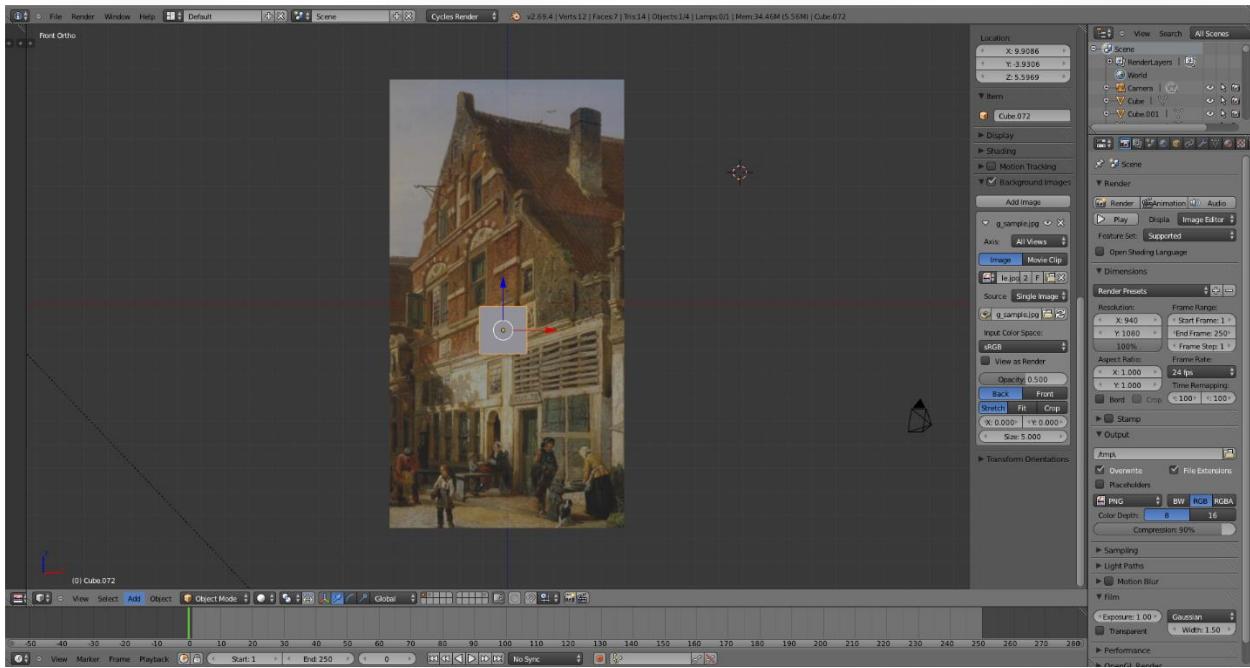


Creating a building

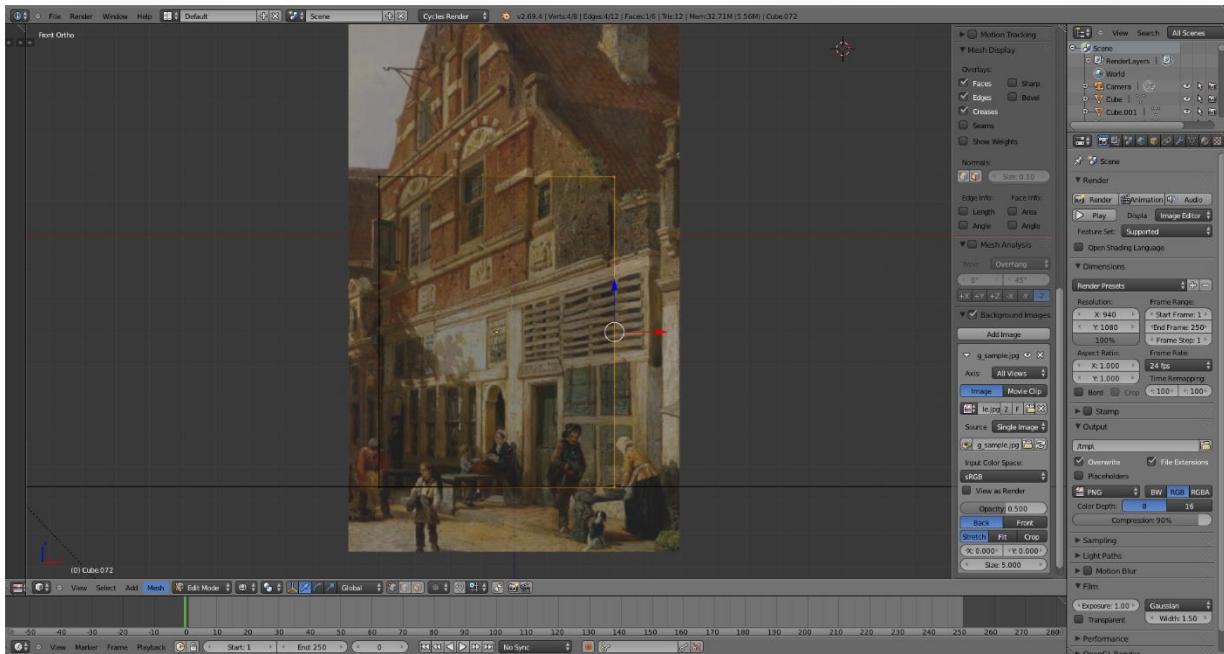
Building design

In the next part we are going to create a building that is visible in the painting. I'm going to focus on building number 2 and 3.

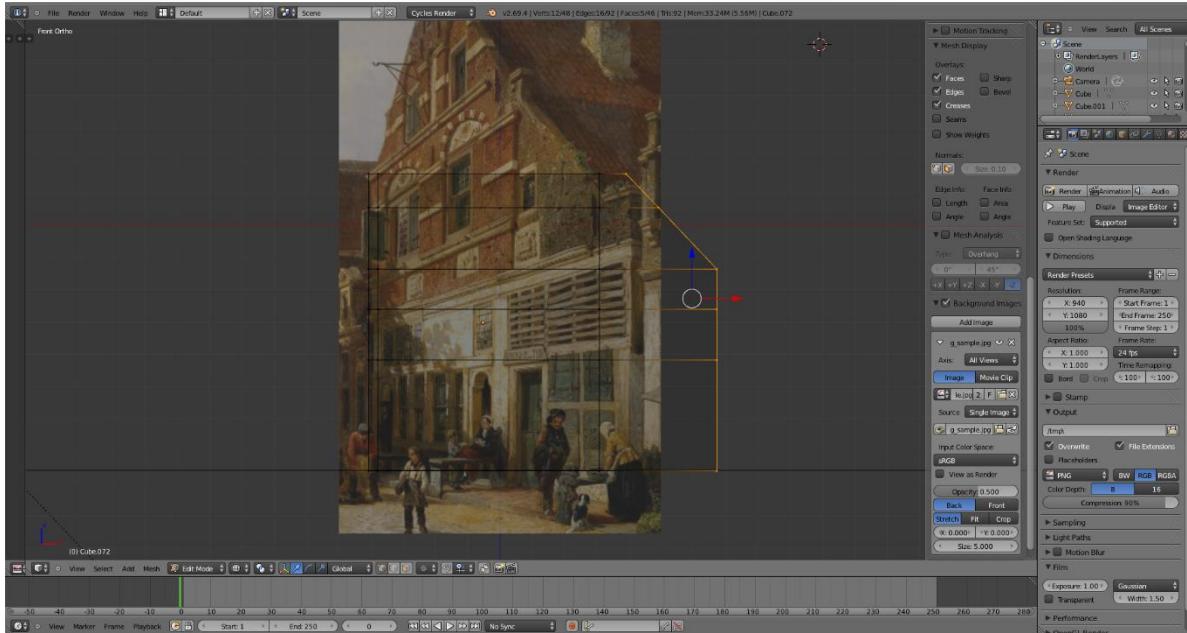
For me this is one building, but when I scheduled the work I separated it because of the time it would take to finish the building.



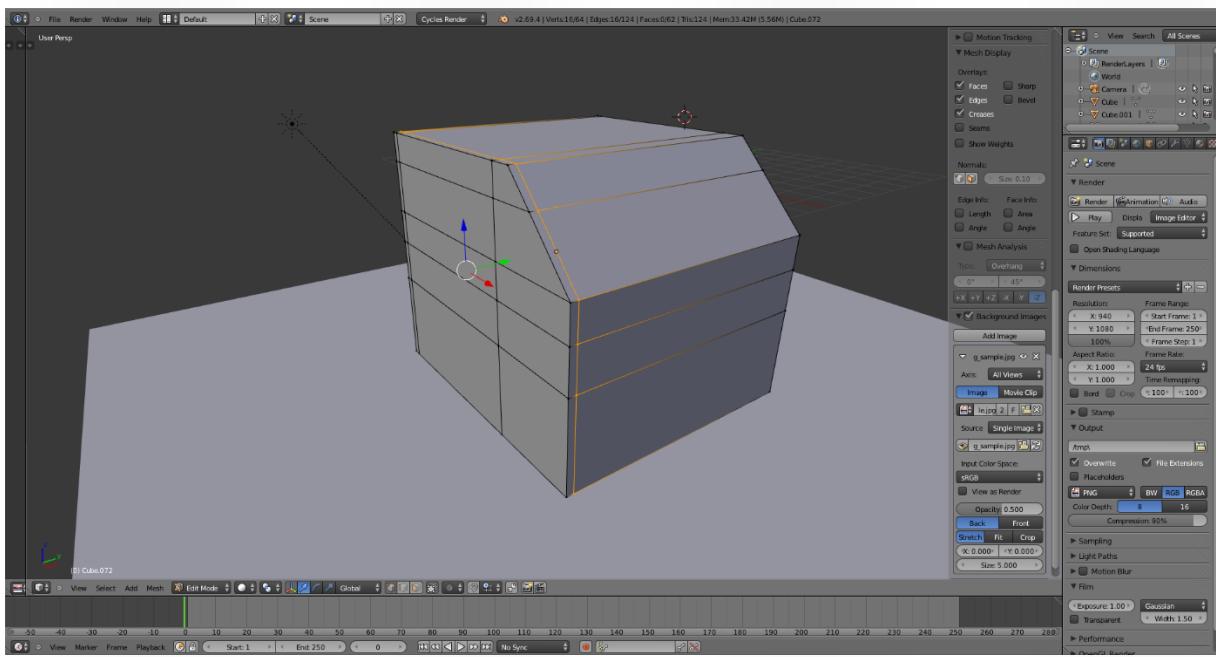
- 1. We start by adding a sample image in the background. Press N and click on add image. Choose the image you want and press open image. If you like you can scale it to the size you like. The next thing to do is add a cube.



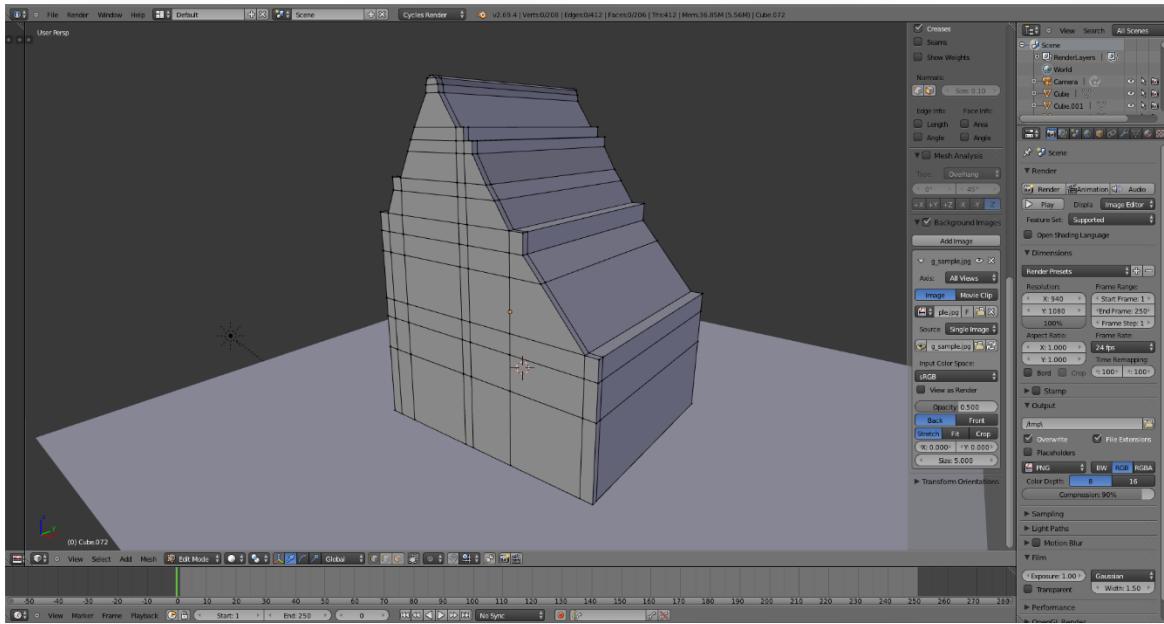
- 2. As you can see, the building is skewed in the painting. The best thing to do is scale the cube and use the left side as the right length. Alternatively you could guess the length, but the problem with that is that you can get trouble later in the scene. Of course you can always scale the cube during the process.



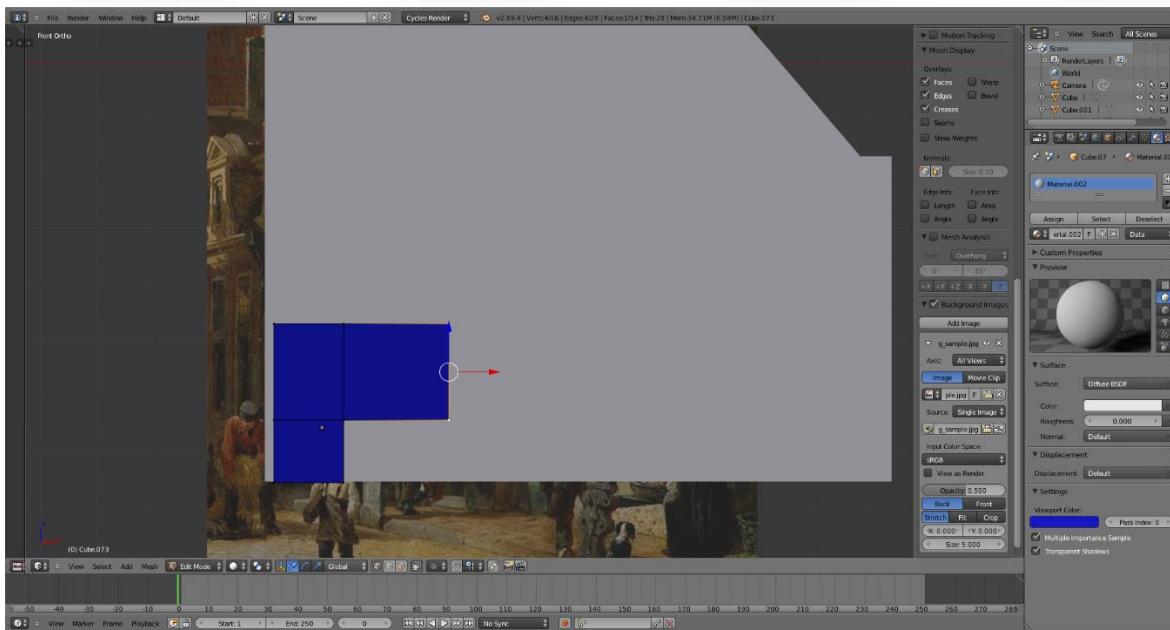
- **3.** Try to get the right shapes and make some lines that cross the door, the first level window, the ceilings and the other windows. When you have the right measurements the modeling process will be much easier. Keep in mind that the image in the background is just for an impression.



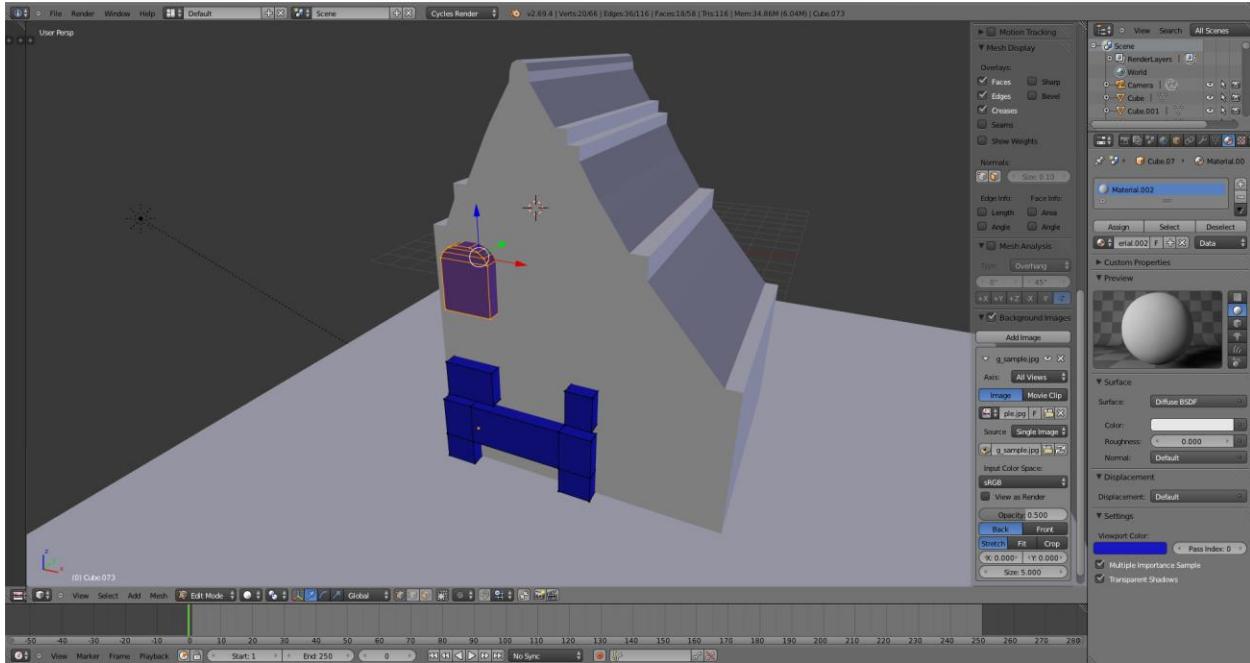
- **4.** This is the image from another angle. As you can see, I'm creating an extra line. We are going to use this later in the process. Do not forget this, or else you will get into some trouble later.



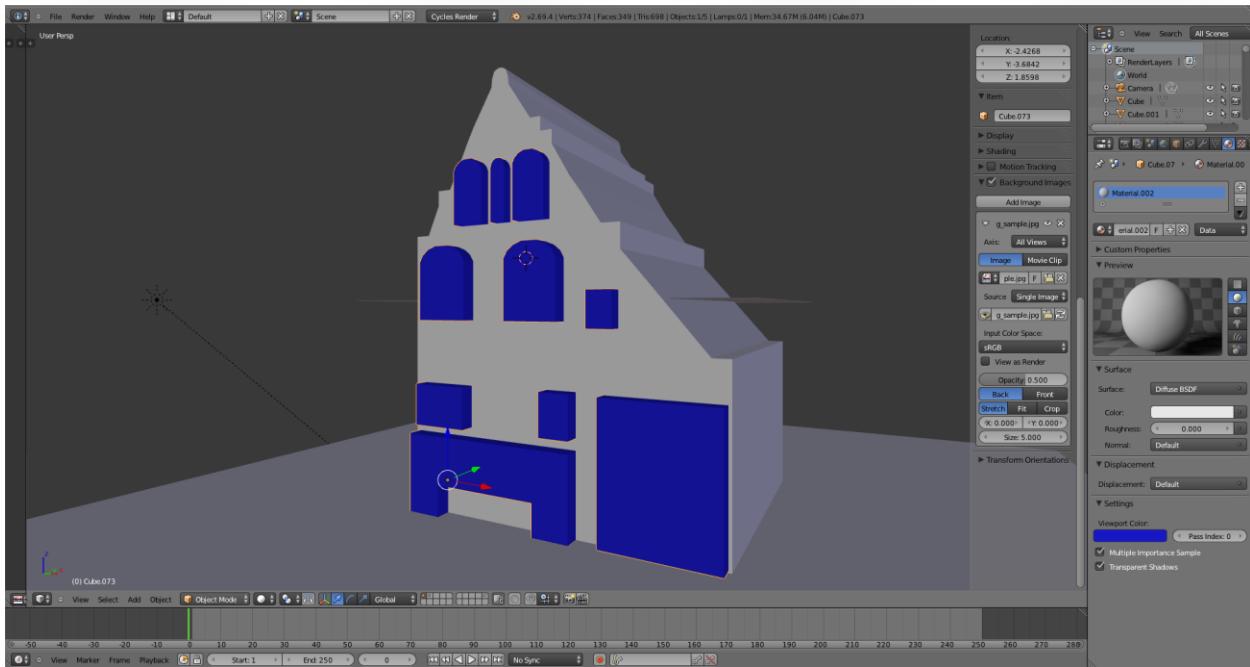
- 5. In this step you can finish the front facade. It may look a bit complex, but try to make a version you like for yourself. The goal is to make a building that looks solid, not an exact copy of how I created it. The only tool I used was the extruding tool, and moving the vertices to the left or right.



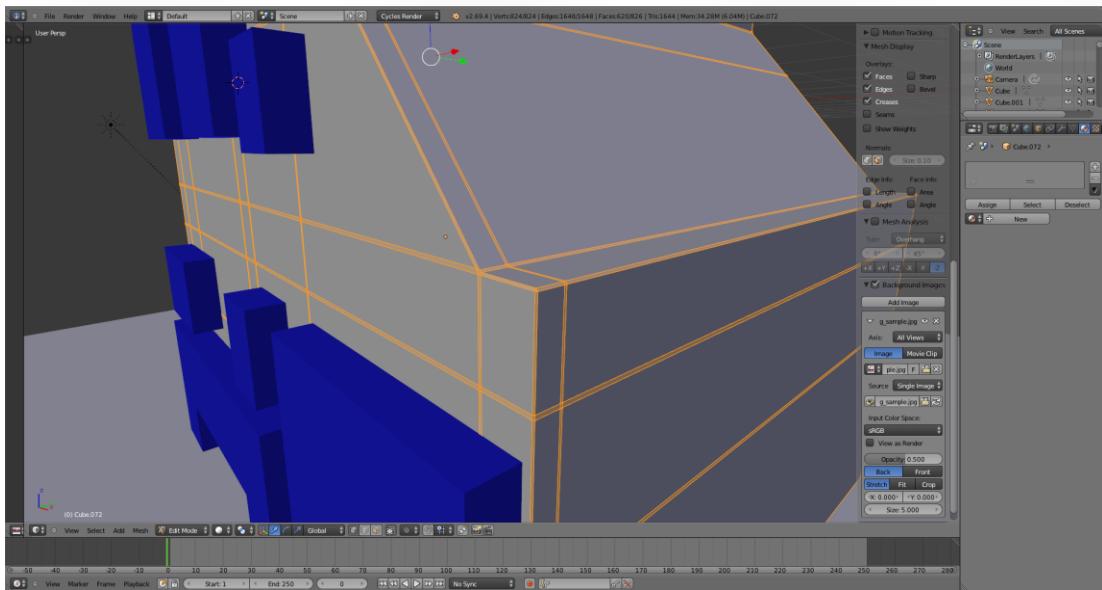
- 6. Now we start preparing to make some holes in the building. I'm using the Boolean tool for this and that means we start creating some shapes that match the original building. Same for this, you can also try to make some random shapes. Keep in mind that everything has the right measurements.



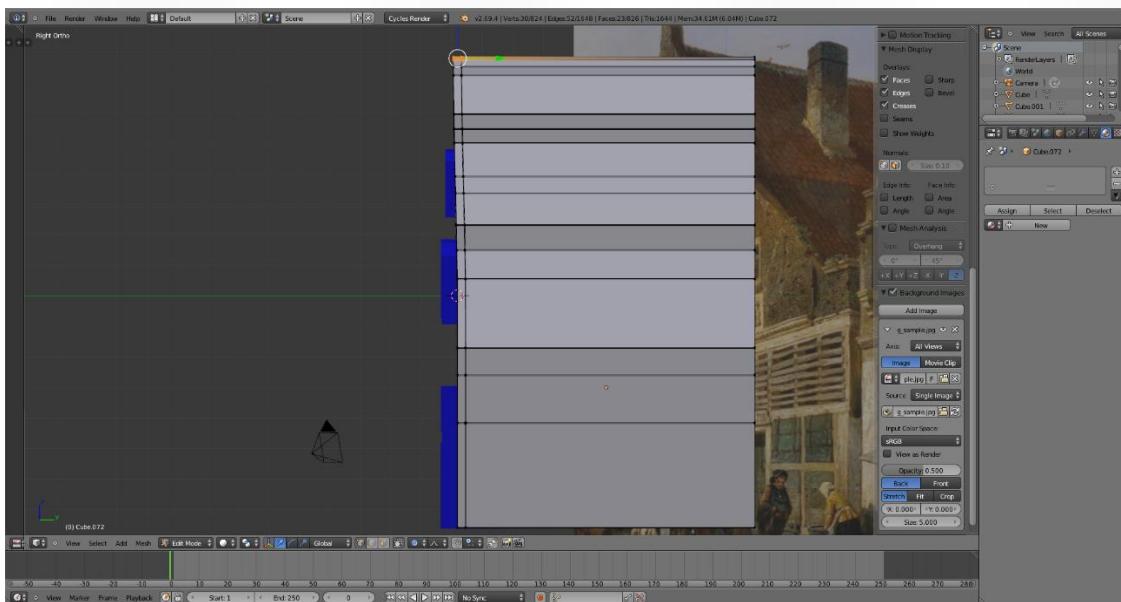
- 7. Sometimes you have to make shape variations. The selected object is for a window frame. The arch shape on top is for an ornament that we create later in the building process.



- 8. When everything is done you have to check if there is some space between the blue shapes and the orange lines. If so, you have to move the shapes a bit or else the typology will be a mess.



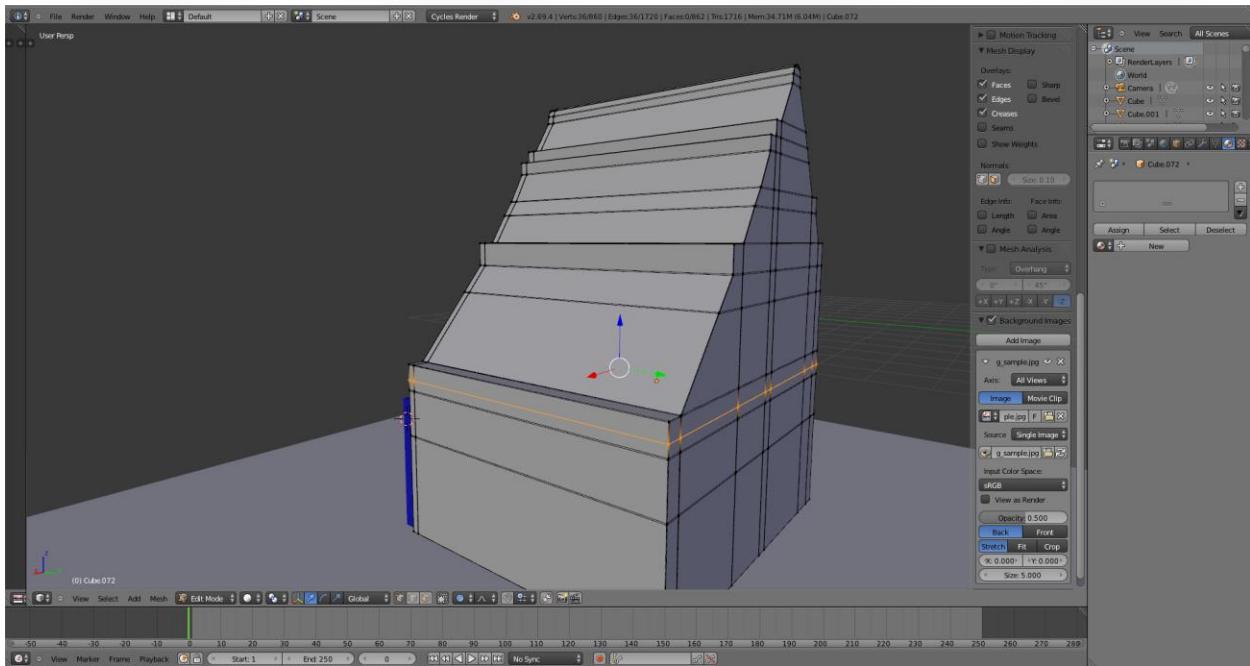
- **9.** When you're ready with the base you can start smoothing it. **CTRL+B** enables the bevel function. Scroll the mouse and you can add more detail to the object.



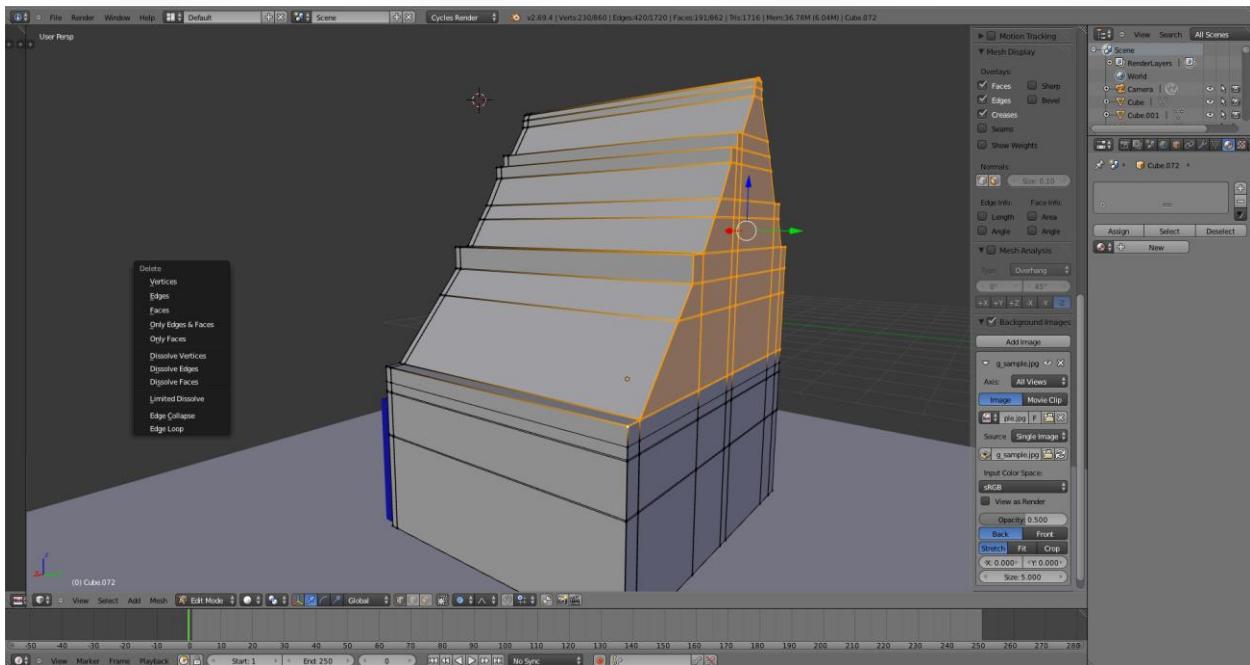
- **10.** You can also hover the facade a little bit to the left. Select the top vertices in edit mode and press O. Then press G and drag the vertices a bit to the left. Remember to just move them a bit. This will add some nice depth to the wall.



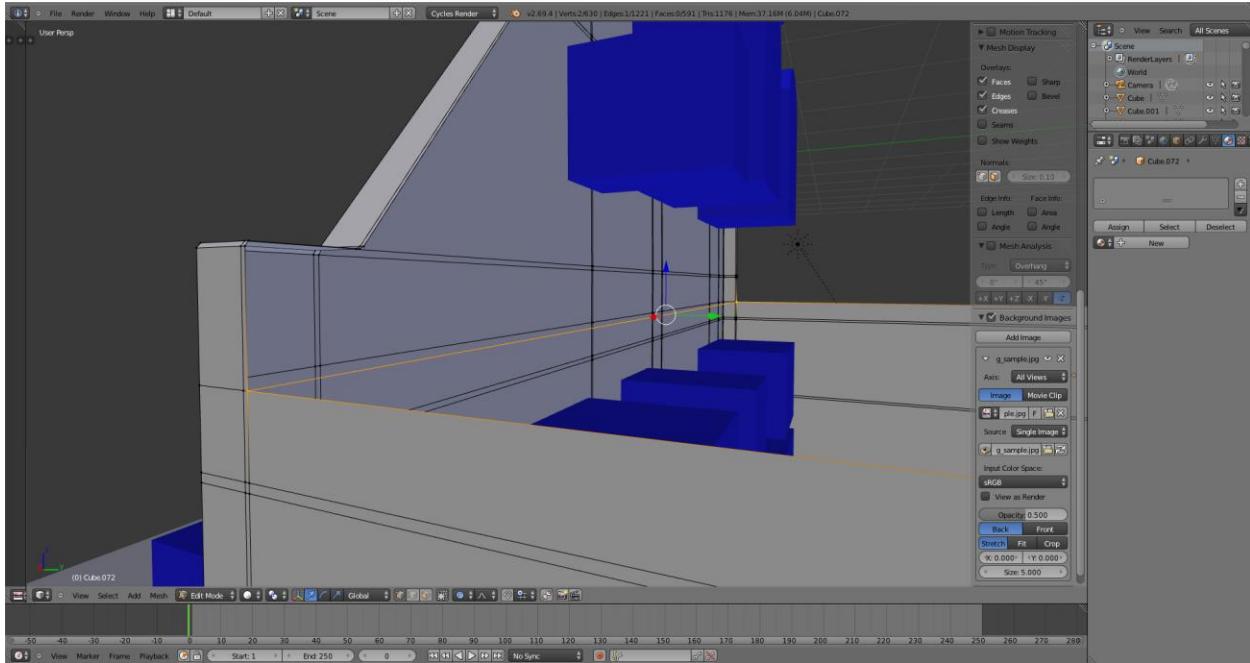
Try to save your work every 10 minutes, or enable auto save.



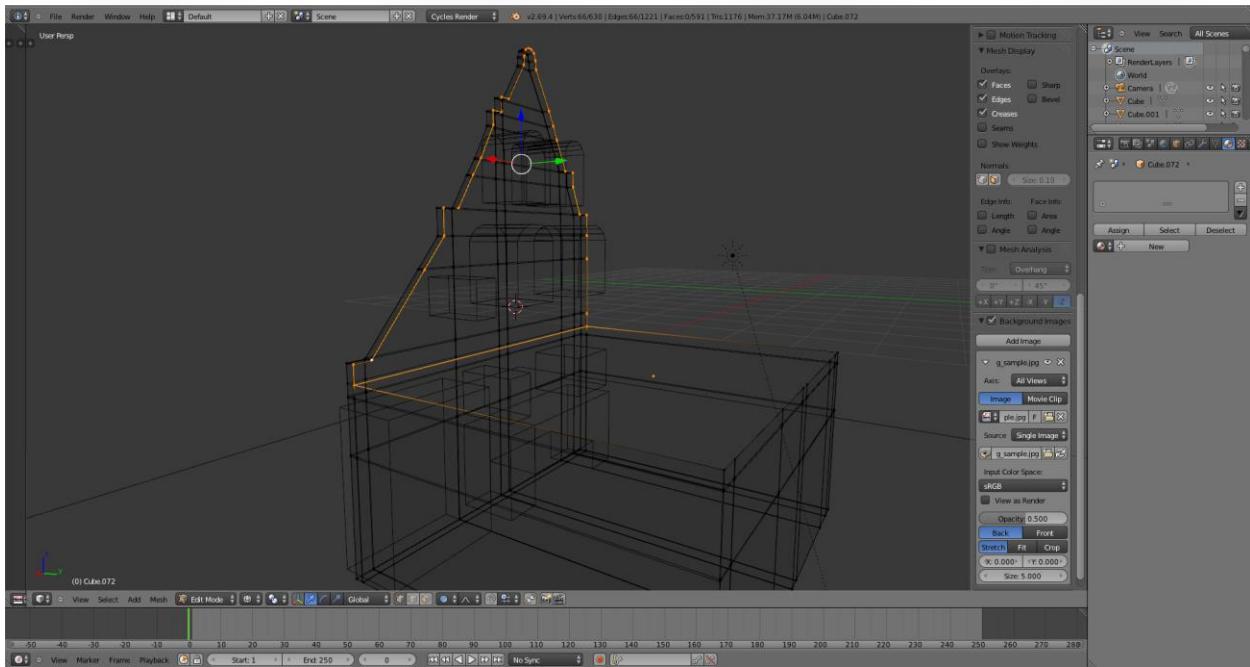
- **11.** Now create an extra line like in the image. We need this for the next step when we delete the back wall. If you don't add this line, you will get into some trouble because it's hard to fix this later.



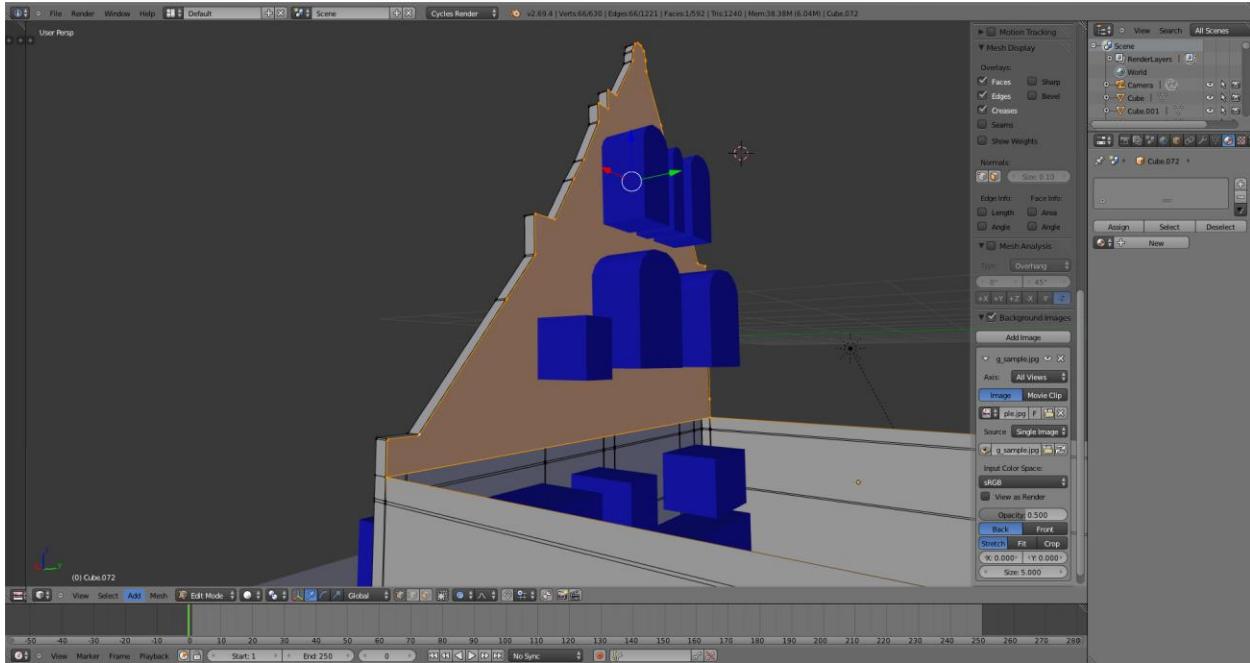
- **12.** When the line is in place you can delete the back wall.



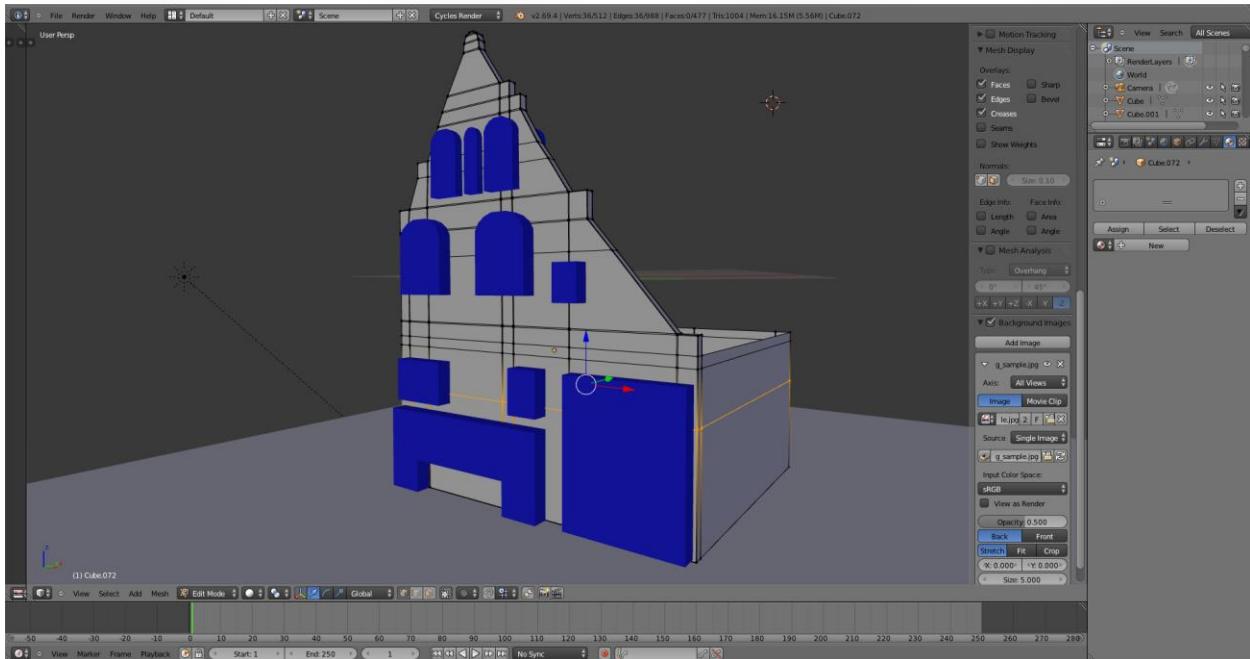
- 13. When you remove the vertices in the back wall, there will be a hole in the front facade. We have to fill this again. Start creating an edge line between the left and right vertical. When this is done, press **ALT+ right mouse** on the edge you created.



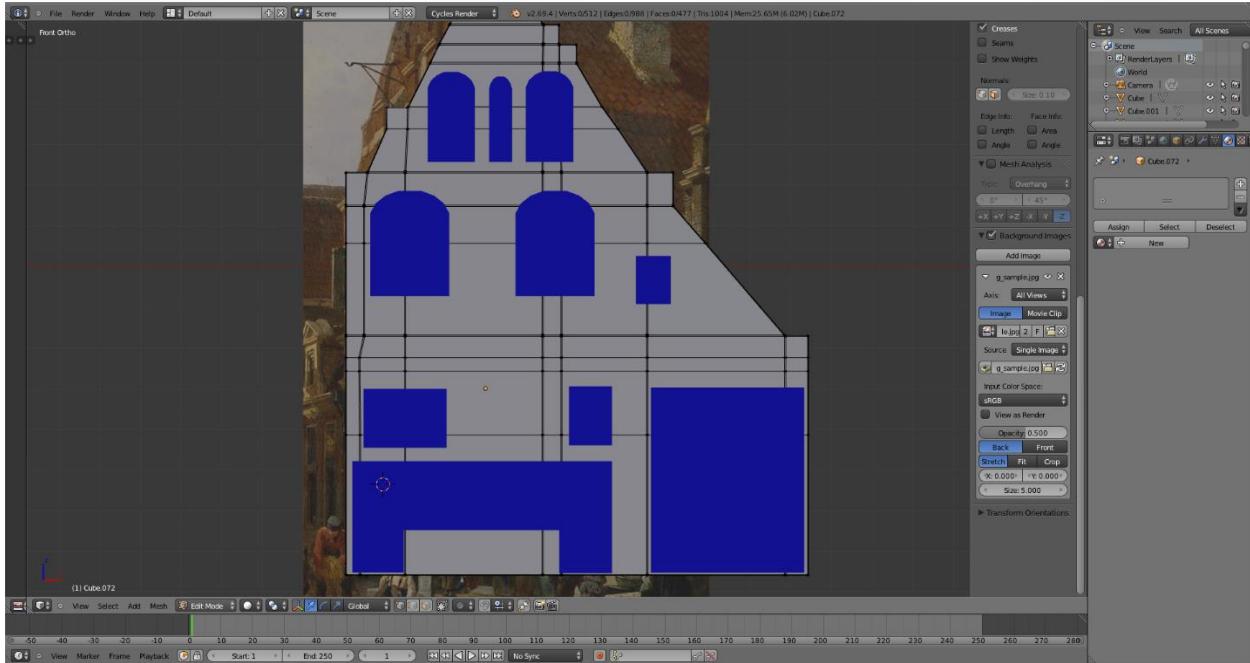
- 14. There will be a selection of a group of vertices. We don't want the selected ones in the back. To deselect these vertices press B and push the scroll wheel. Now you can deselect them.



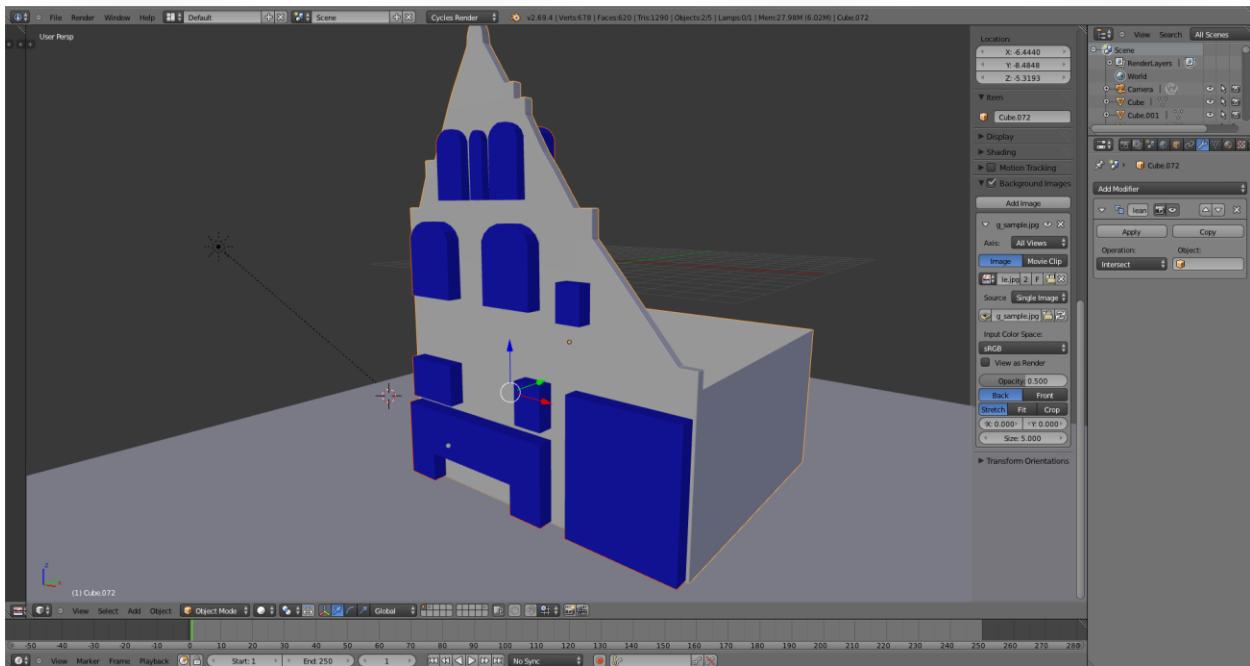
- 15. You can fill the empty space by pressing the F button.



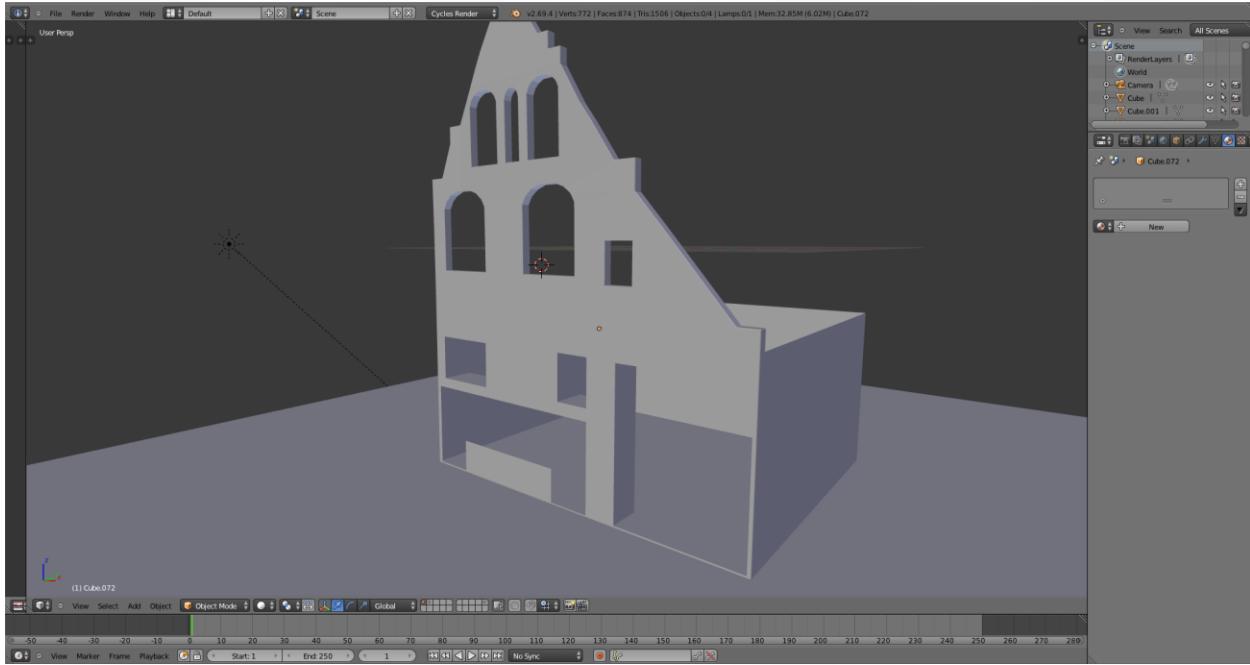
- 16. Now you can move the edge lines to prevent them from coming in line with the blue shapes when you apply the Boolean modifier. Don't forget to remove unused lines with the 'remove edge loop function. Press ALT + right mouse button on a line you want to remove, when selected press X + remove edge loop



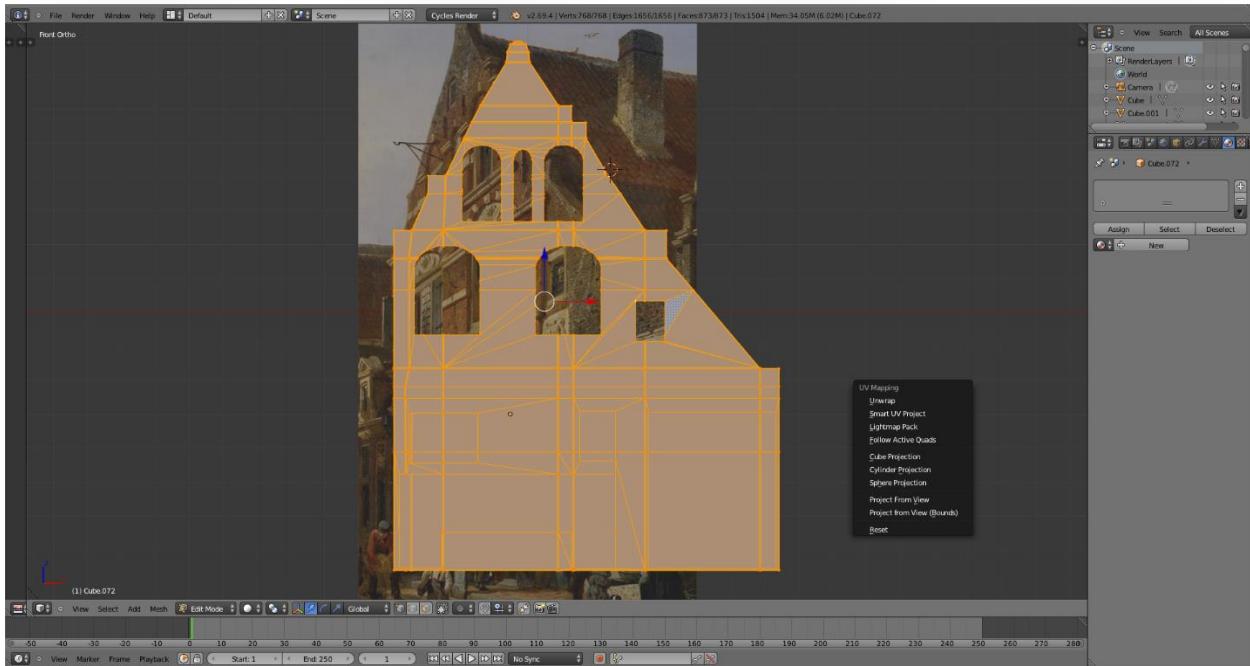
- **17.** This is the final result before adding the Boolean modifier. As you can see, the edge lines do not match the blue shapes.



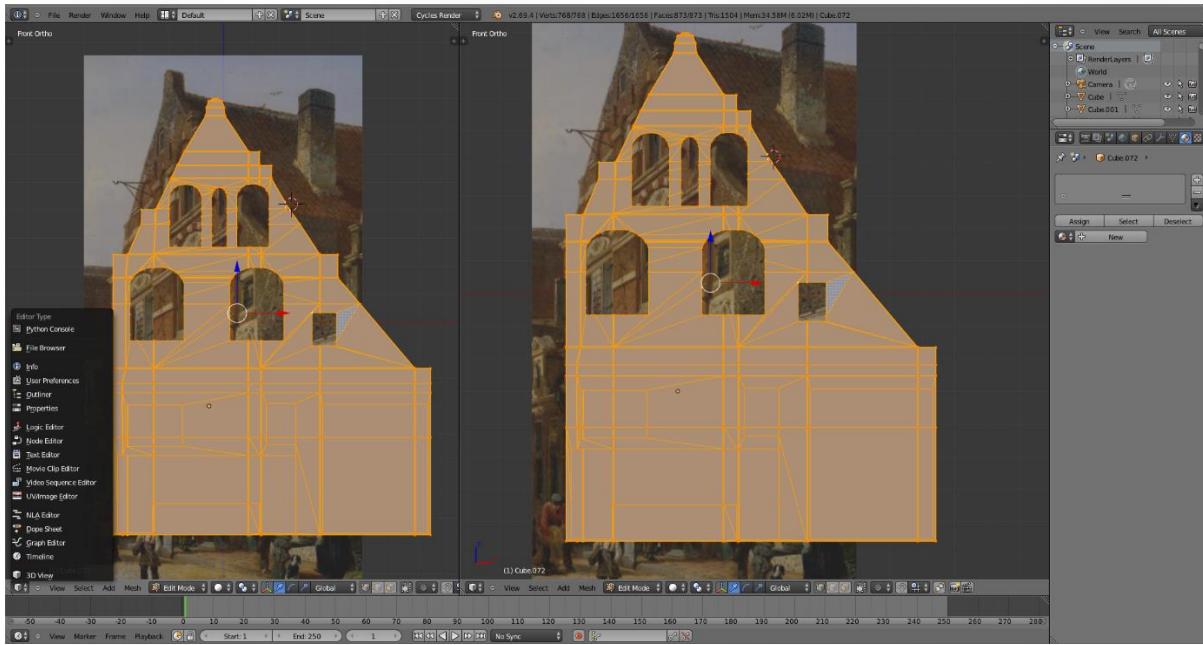
- **18.** Now go to the modifier panel and select Boolean. You need to name the blue shapes, something like 'hole' will do. This is the same process I used for the arch in the bridge. Select the blue shapes and the building, and now you can activate the modifier. Choose the difference option to make holes.



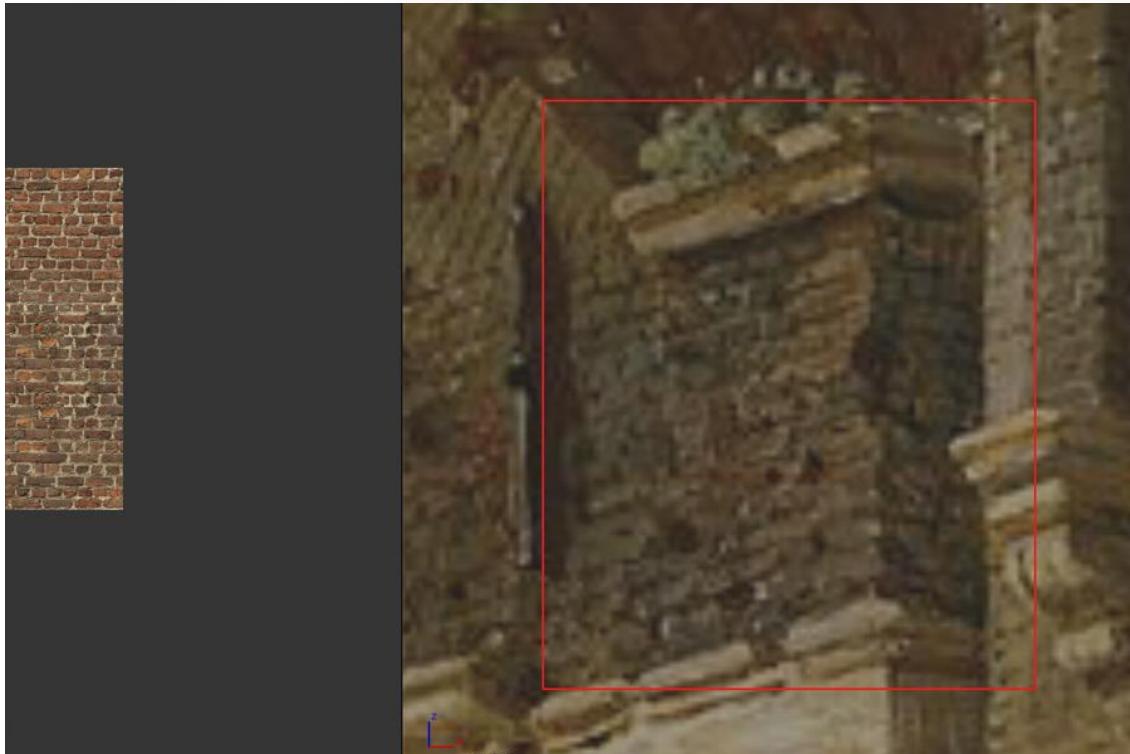
- 19. If everything works out well, this is the result. We can start by adding a texture on the wall



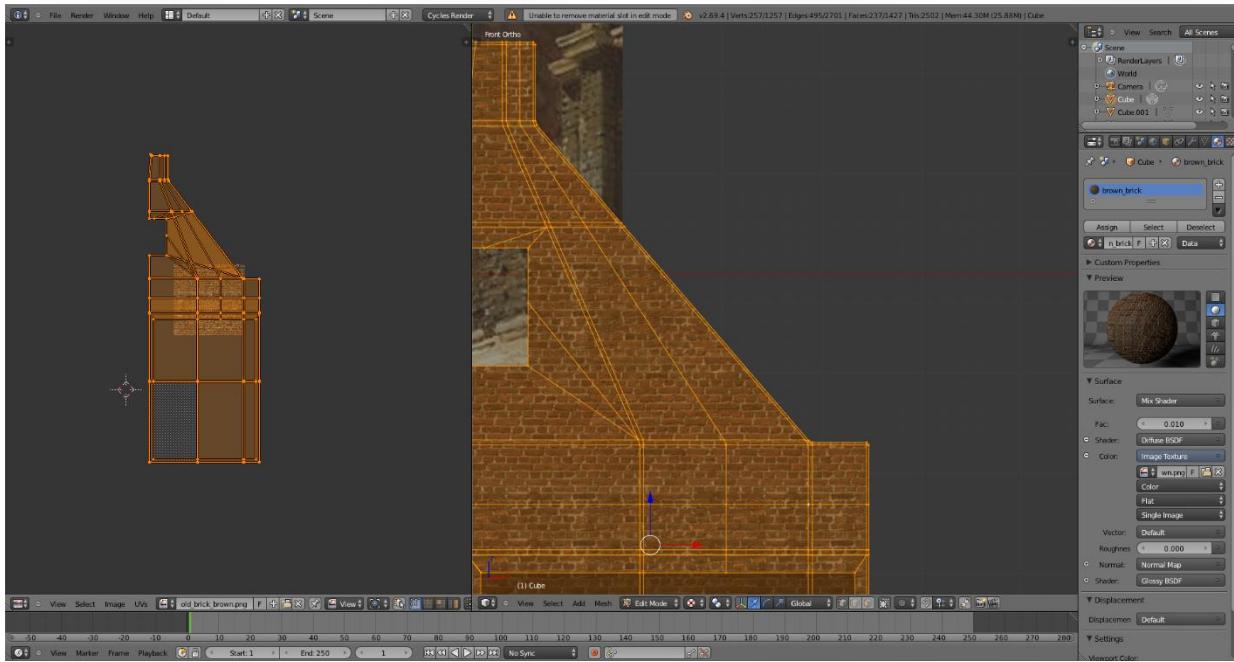
- 20. Select all the vertices and press U -> 'project from view'.



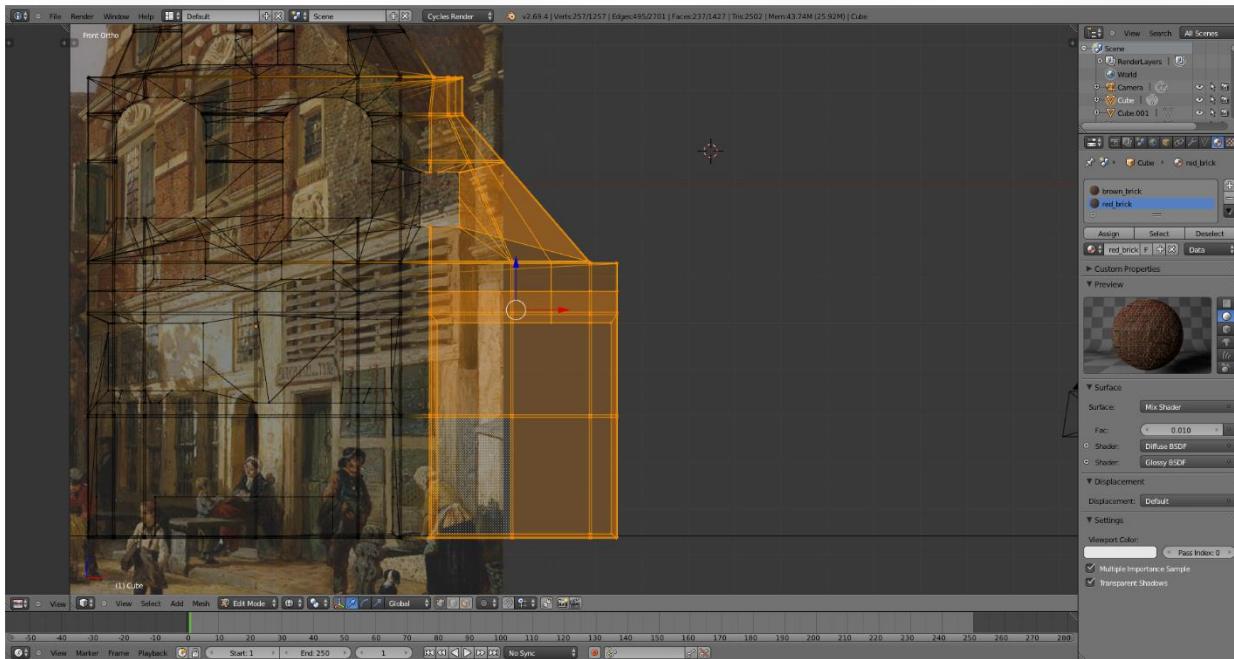
- **21.** Open a second screen and go to the UV image editor. To activate the material, choose the texture and open this in the UV image editor. You can choose the one that I used, but feel free to make your own variation.



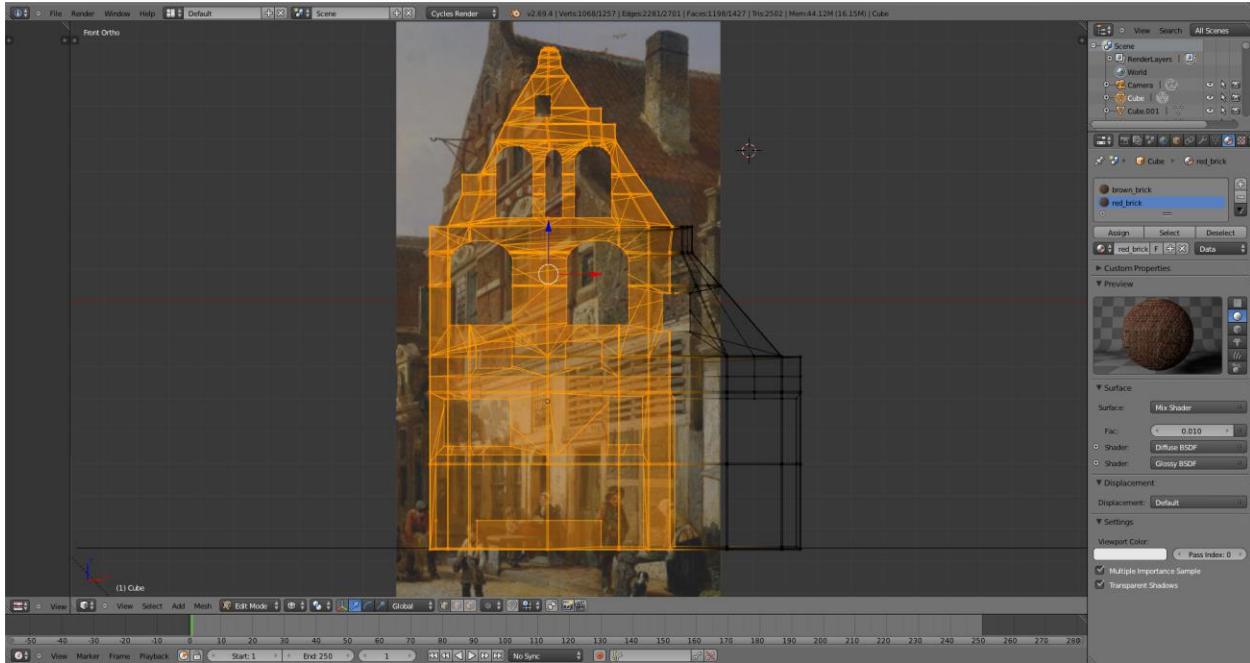
- **22.** When we take a look at the reference image we can count around 13 bricks between the two ceilings. This gives an indication of how we need to scale our texture.



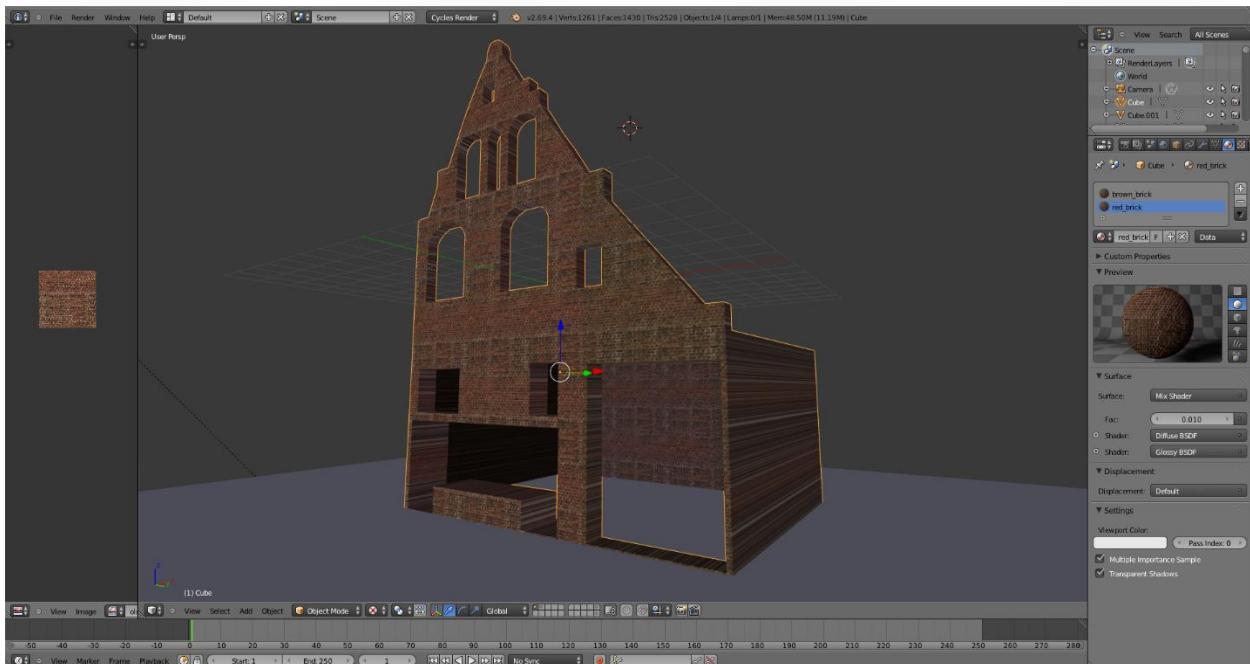
- **23.** Scale the UV coordinates till you have the number of bricks that are visible in the sample image. It doesn't need to be exactly the same number, but the wall will look much more realistic if you try to make it the same.



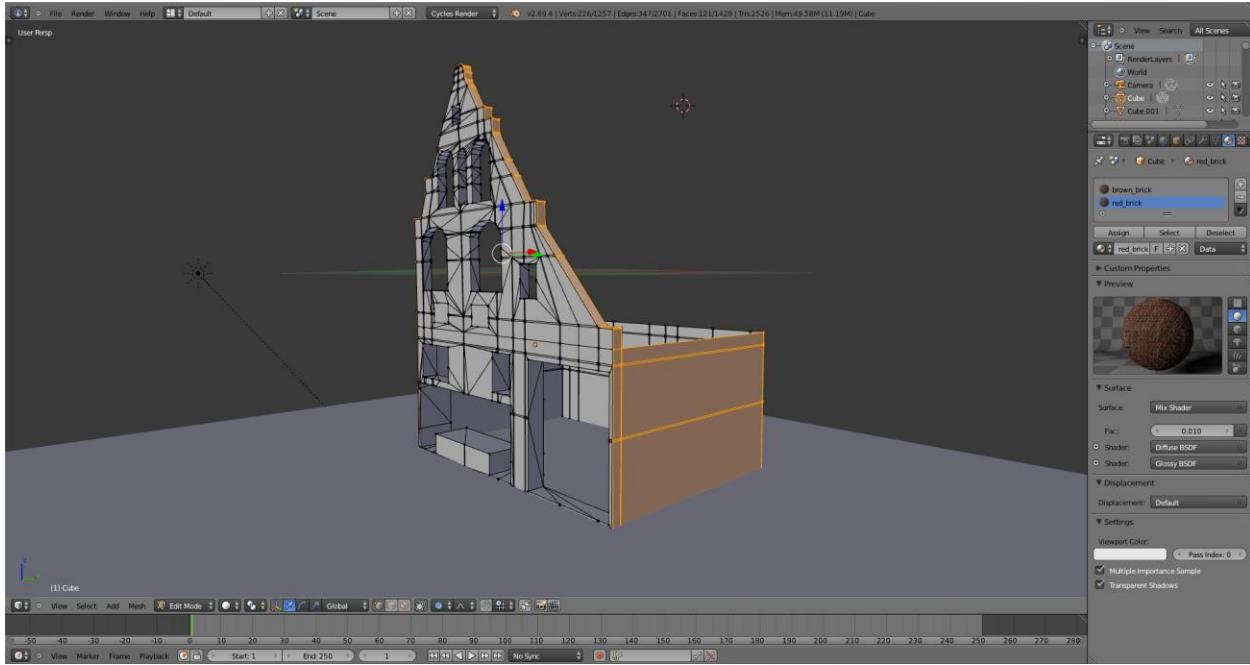
- **24.** You can also see that there are two brick color variations in the example. There is a red and a brown brick. To enable a brown color you simply change the color of the brick in a paint program like GIMP. Then save this texture and open a new material in Blender.



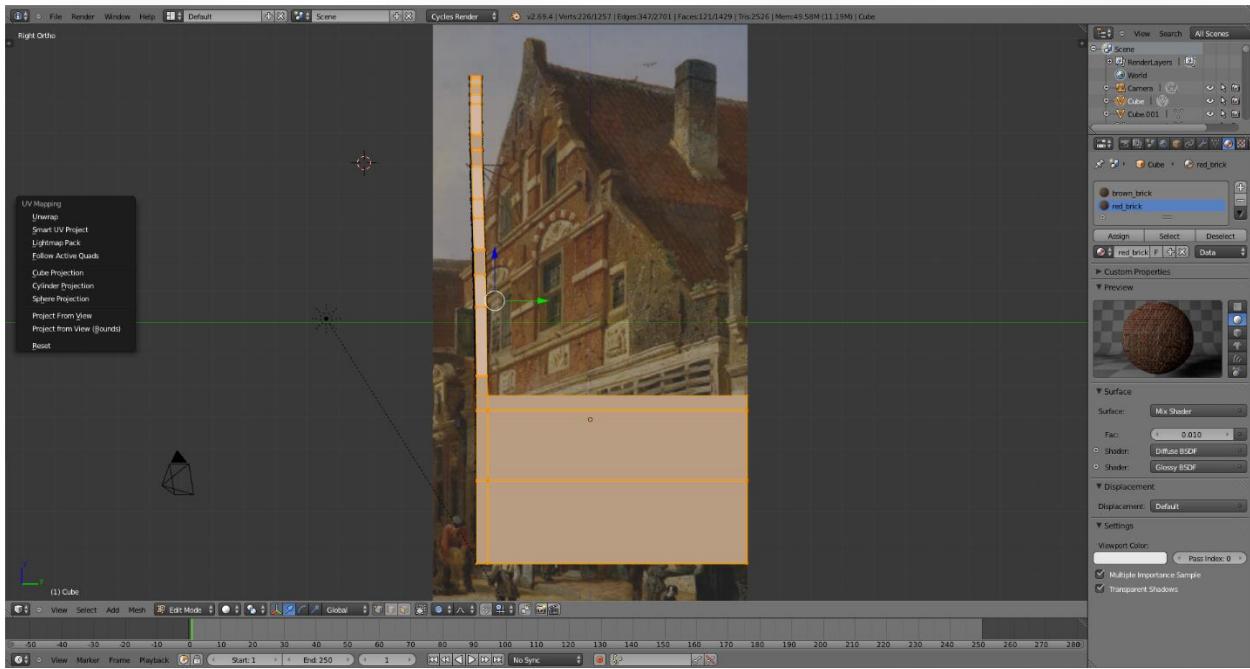
- 25. To enable a different material on the UV, select the vertices and click Assign in the material toolbar.



- 26. If everything works out well, there should be two colors now.



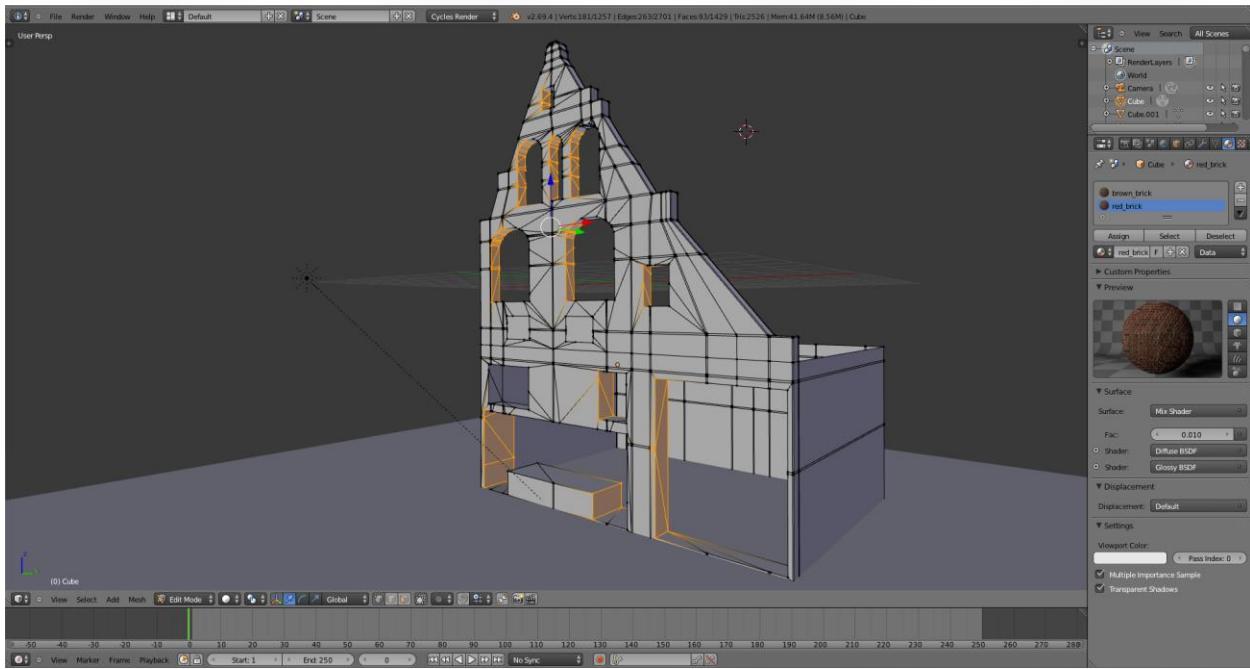
- 27. Because we worked with the UV projection, the sides of the wall have some UV problems. You can easily select them by pressing **ALT + right mouse button** on the edge lines. Because we work with two materials, they have to be enabled separately.



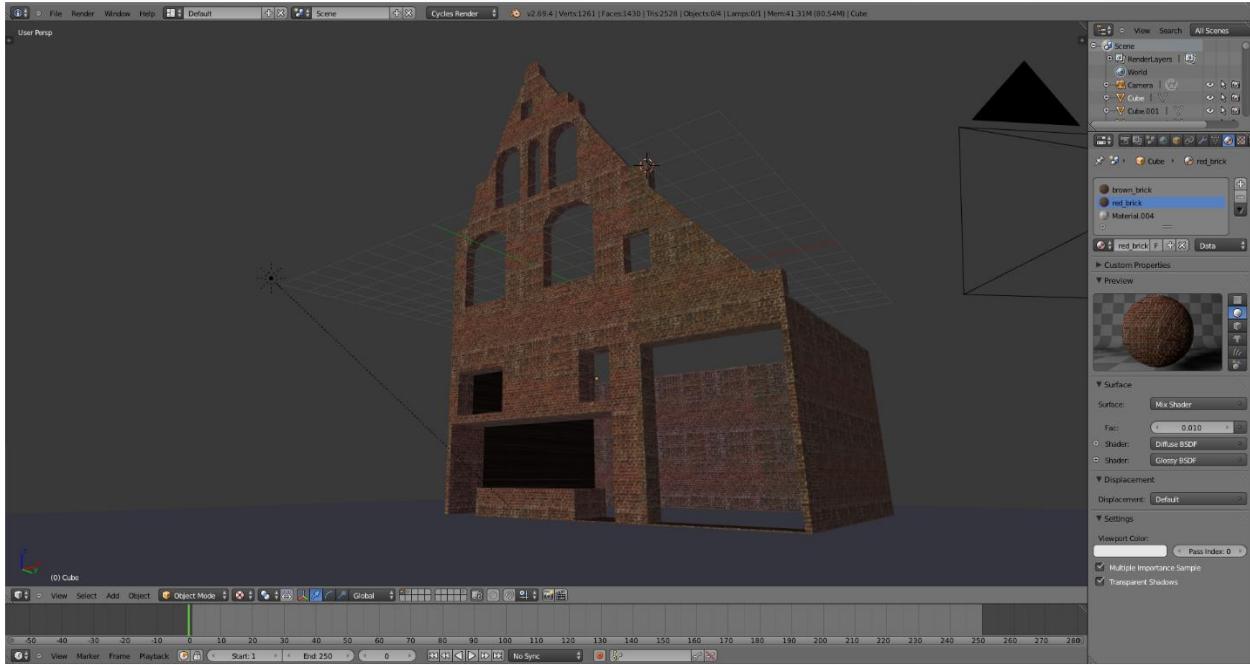
- 28. Toggle to the side view of the building (NUM3) and project the texture onto it.



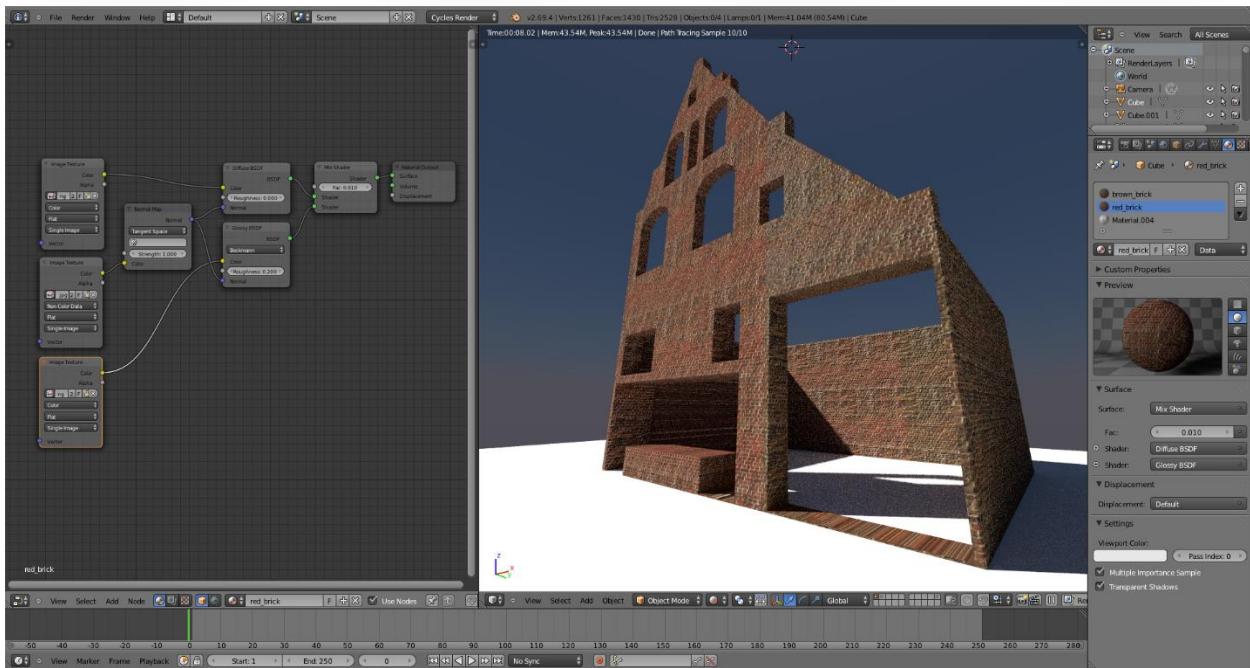
- **29.** When the texture is projected, you have to match the coordinates with the right length. A trick that I used was selecting all the vertices of the object (CTRL+L) and selecting the side projection in the editor. Scale this to the size of the front wall.



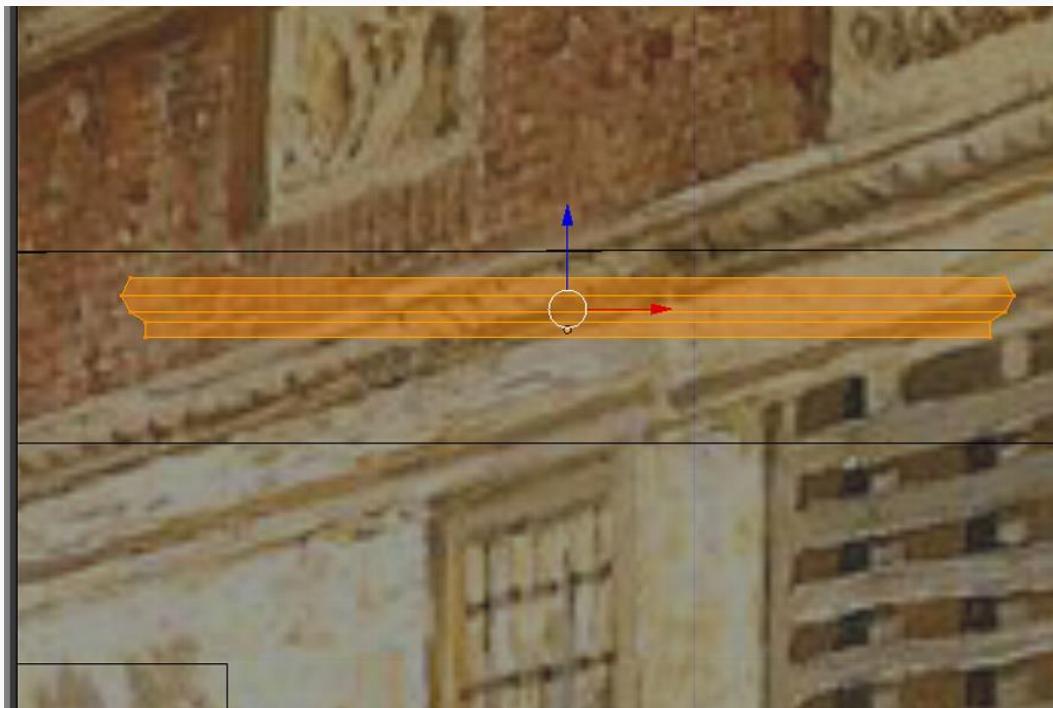
- **30.** There are a lot of broken UV coordinates. Select all the sides and project the texture onto them. This takes some time, but in the end it will look very solid.



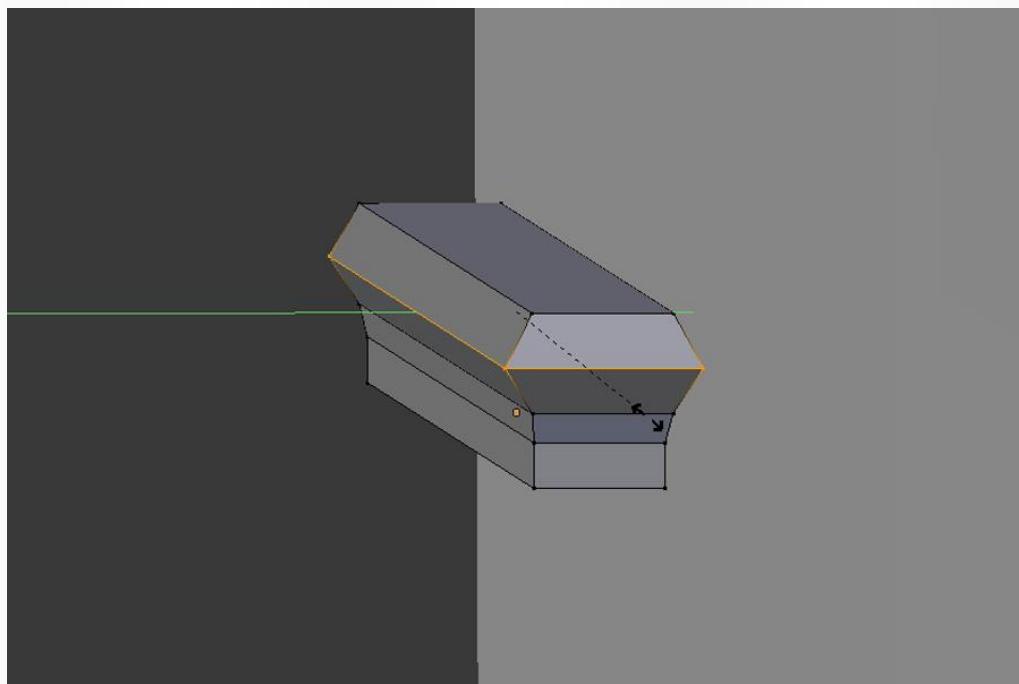
- **31.** Take a close look at the texture to ensure everything blends well. Now it's time to add some nodes on the texture.



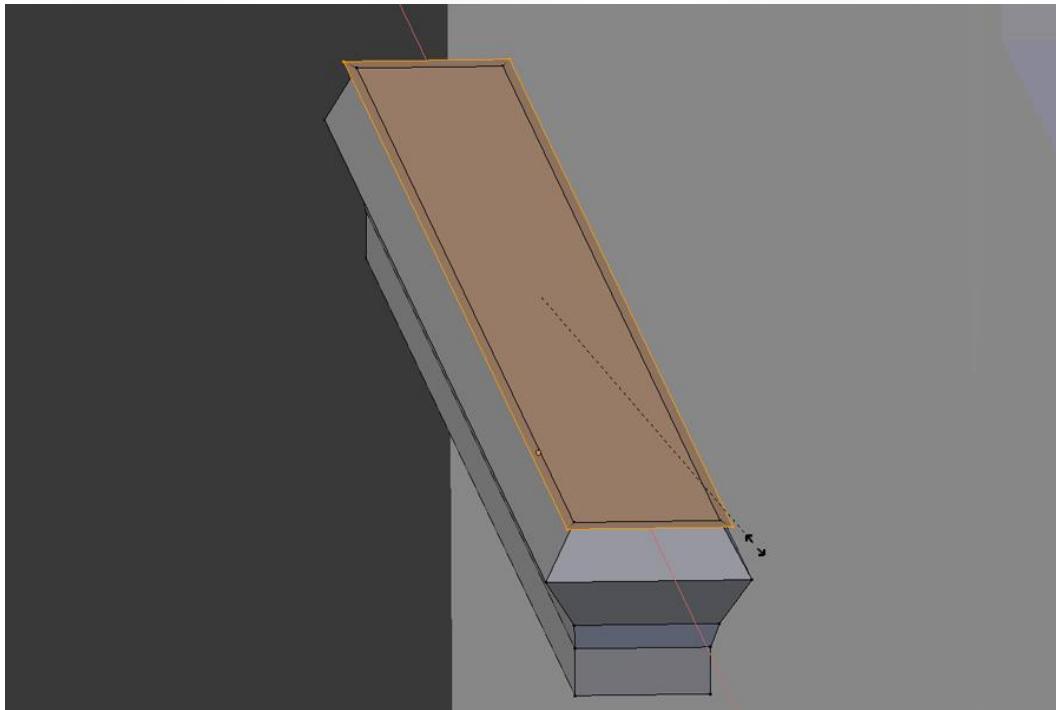
- **32.** You can add a normal and a specular map for a more realistic result. Later in this part we will add some dirt on the wall.



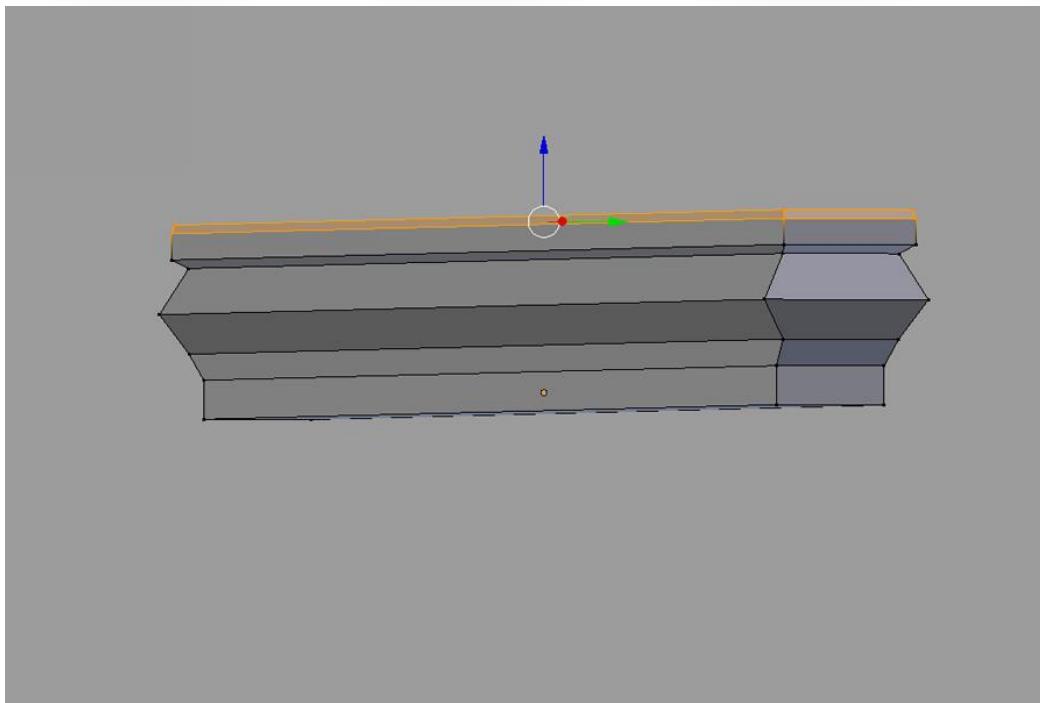
- **33.** I like to start with some ceiling ornaments. This gives you an idea if the measurements are right. Ceilings are easy to make by adding a cube and create a shape that matches the sample.



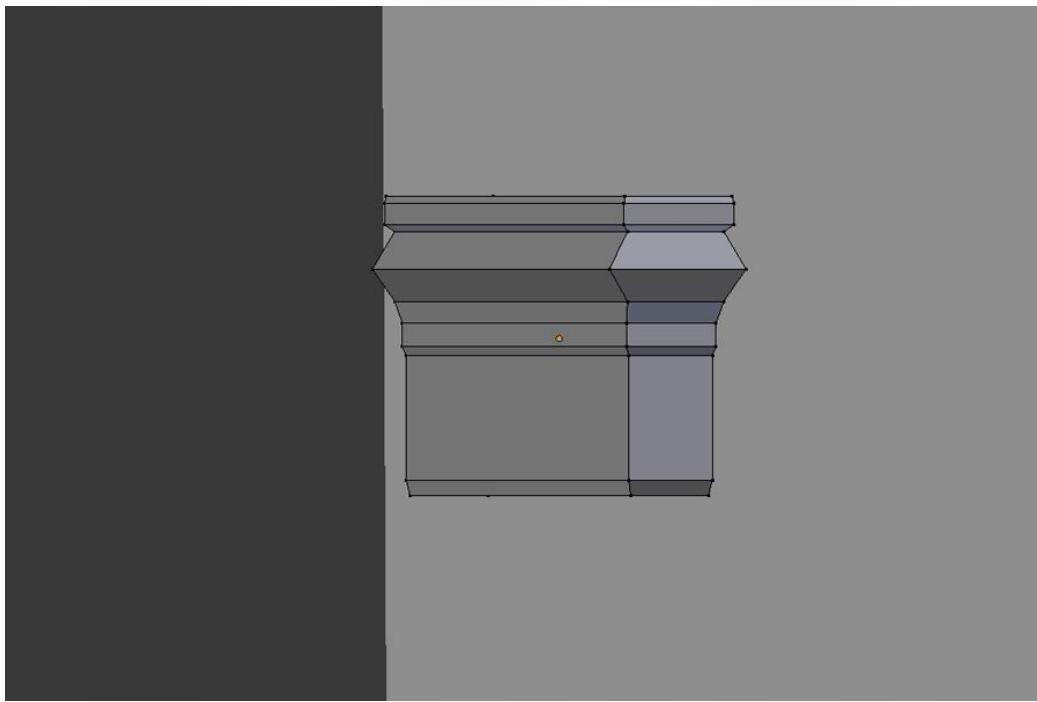
- **34.** Try to put some depth in the shape by scaling some parts. You don't want to make ornaments look flat or too straight.



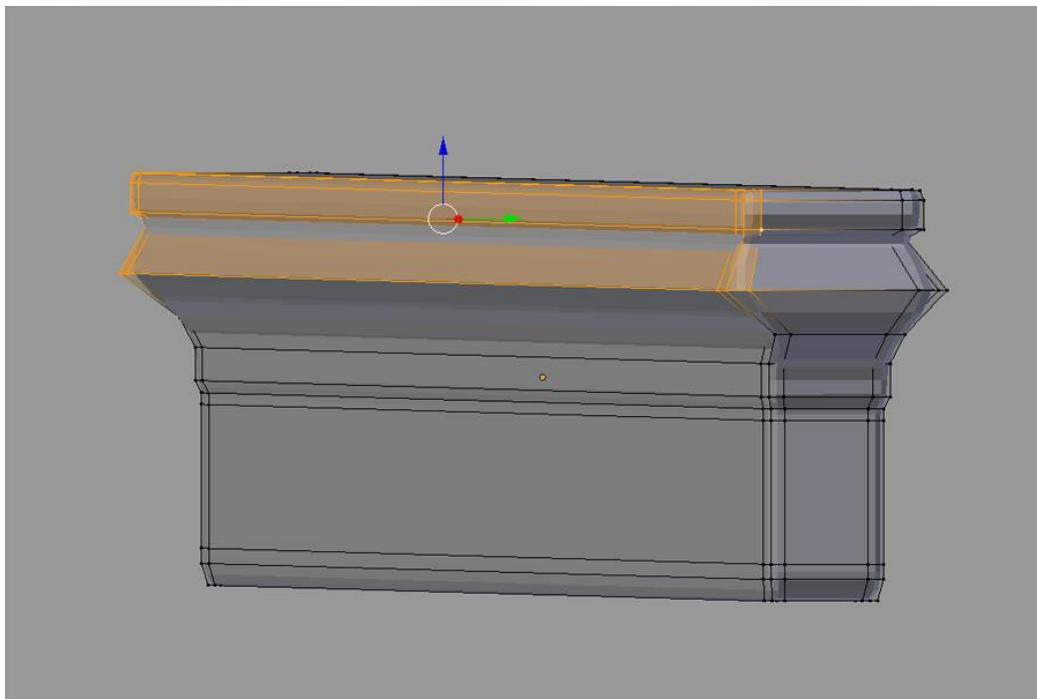
- **35.** Select the top vertices to extrude the object to make a nice shape that matches the sample.



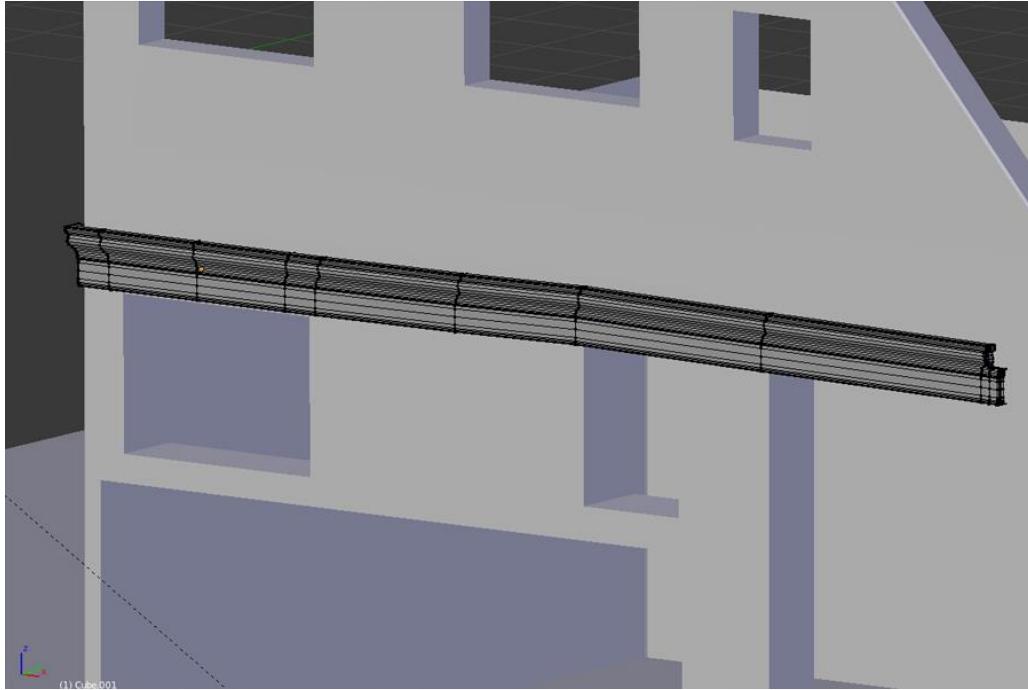
- **36.** Always end with a nice bevel. You can do that by extruding the object a little bit and then scaling it inwards.



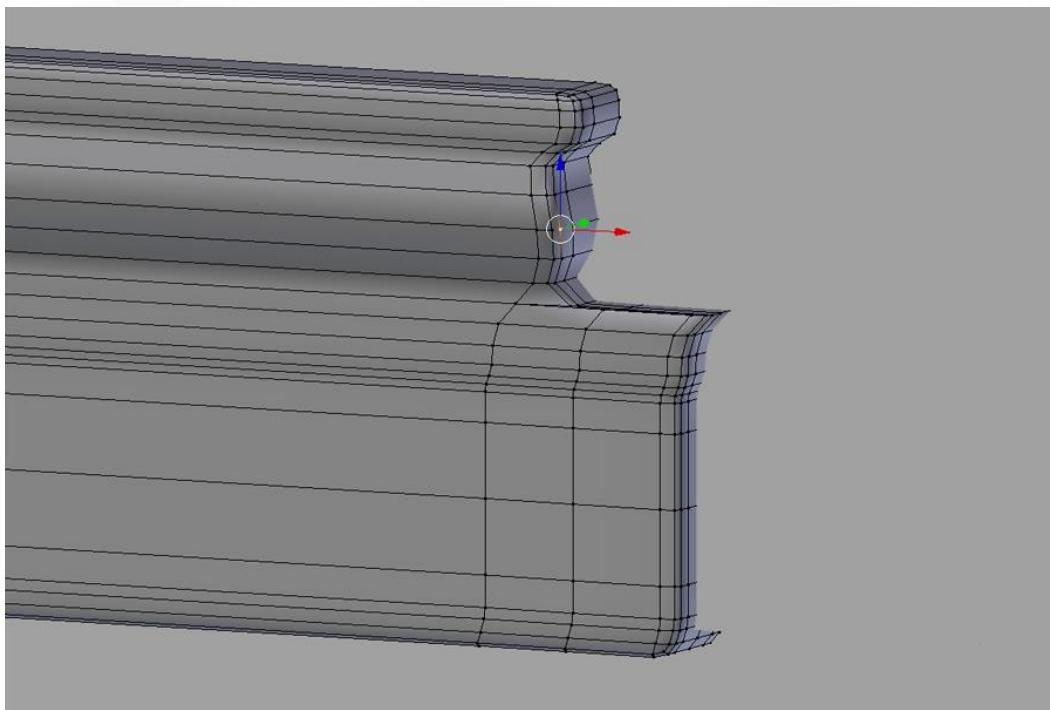
- **37.** The basic shape of an ornament can be very simple, and by adding a subdivision surface you can make it look smooth.



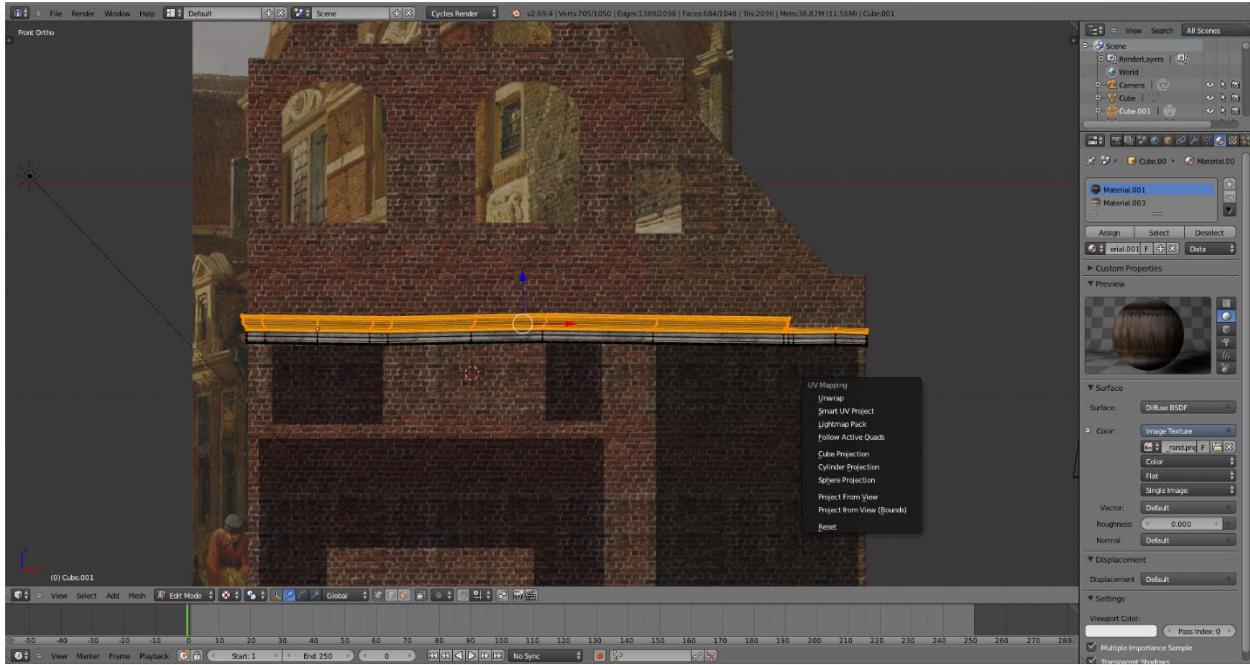
- **38.** Add some extra lines. This is the same process that we used to create the street bricks. Avoid making too many lines. When you put them in position you can scale the object to the size you want.



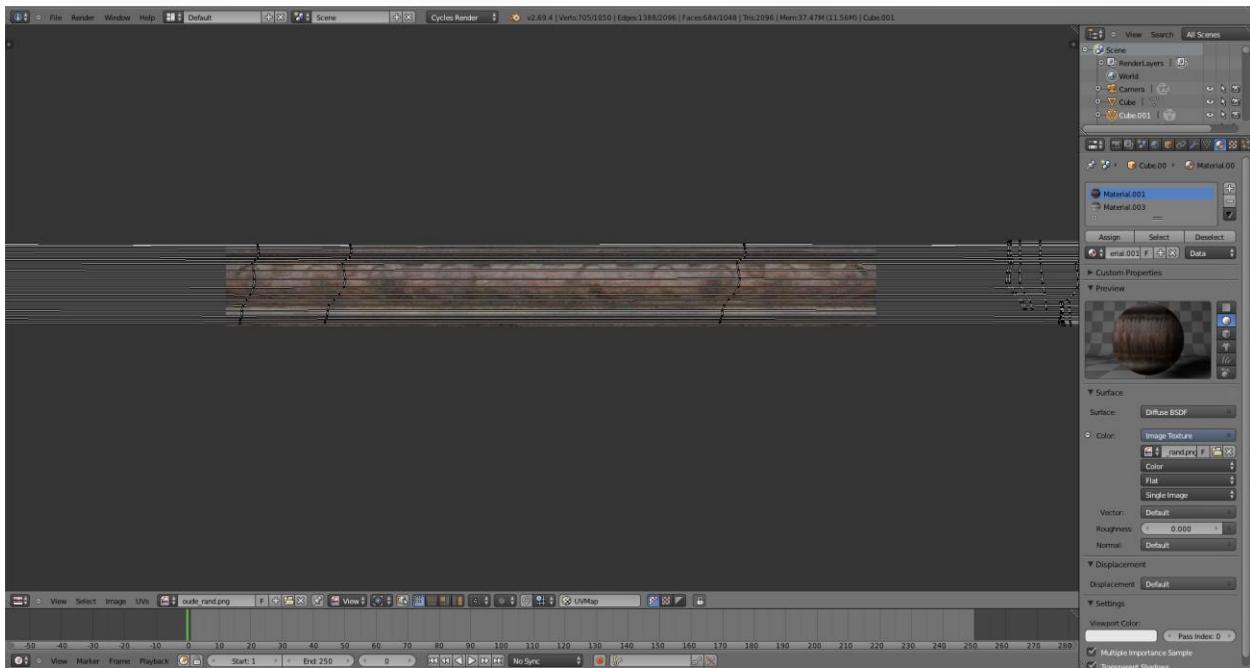
- **39.** When you are happy with the result you can extrude the ornament.



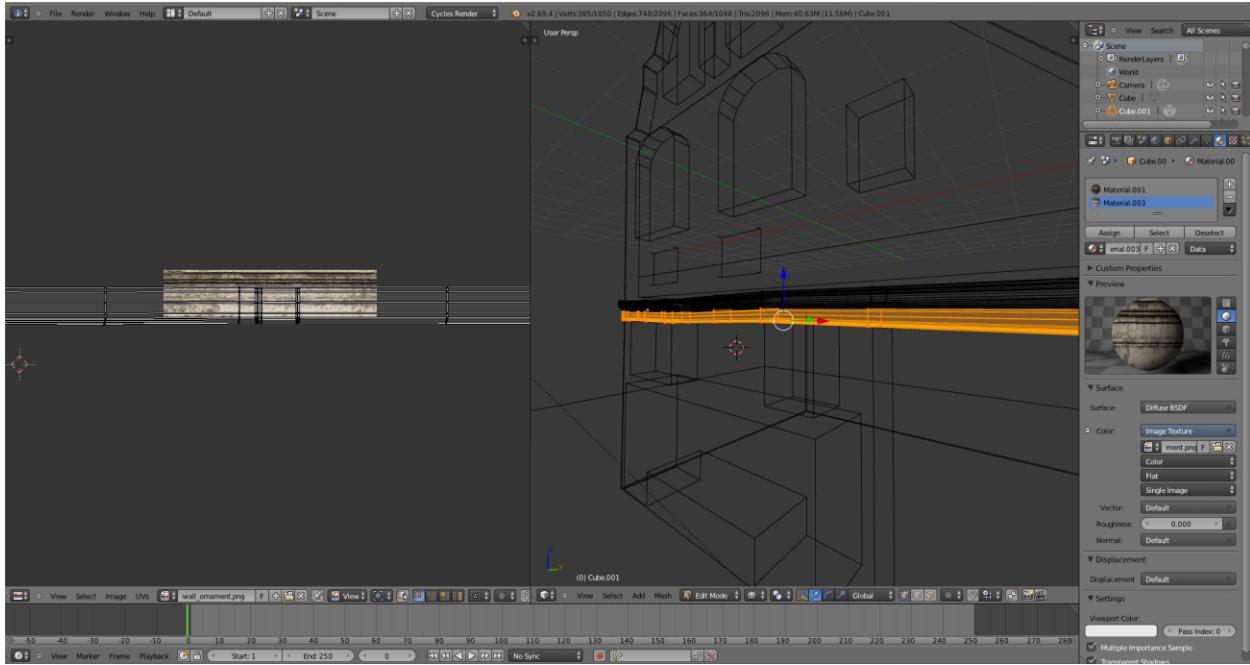
- **40.** To make it look a bit old and broken you can extrude the bottom of the ornament. Try to fix the sharp edges by selecting the vertices and bringing them back into position.



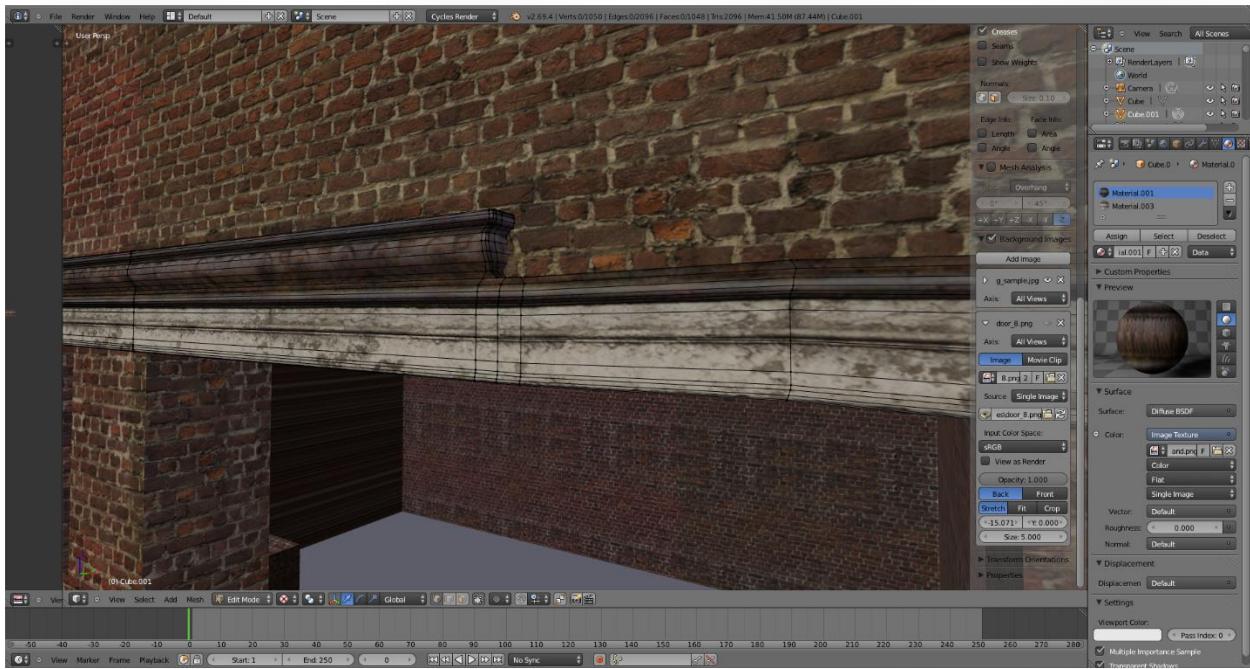
- **41.** When you are happy with the ornament you can start adding a material. I used two different types of textures, so we first need to select the top part of it.



- **42.** Open the material and scale the texture. To get an indication of how the texture looks on the object, split your screen and open the 3D viewport. You can see how the texture reacts on the ornament..



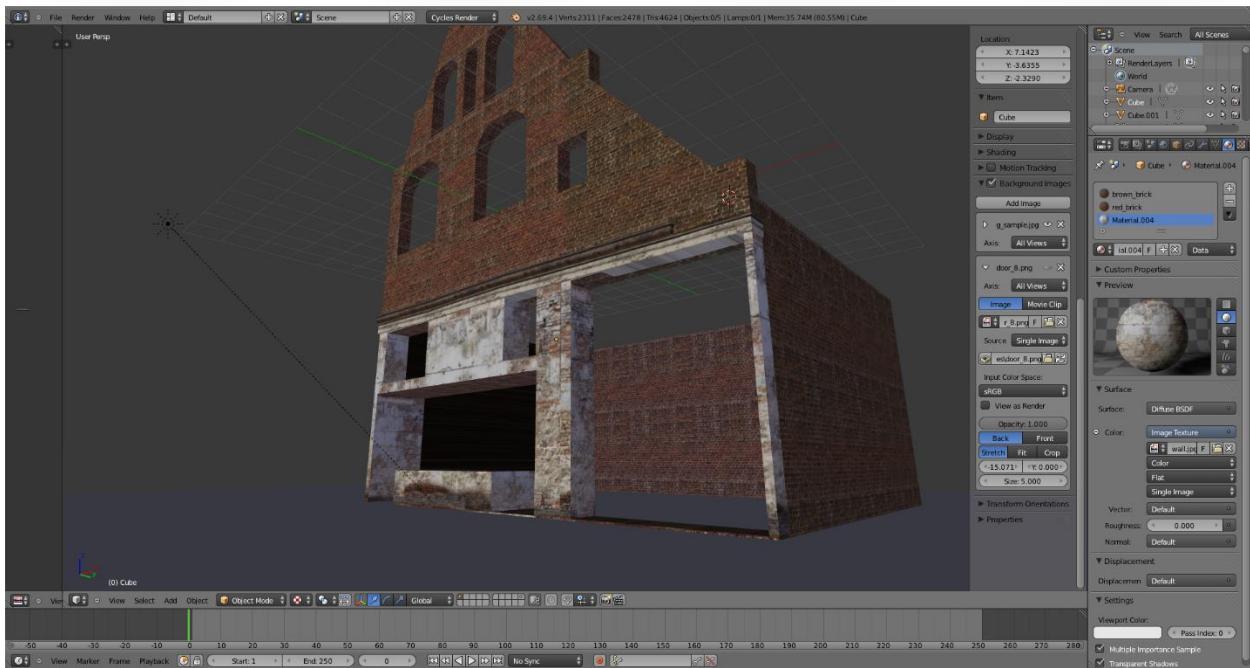
- **43.** If the top part is right, you can open a new material and enable a second texture on it. This works the same as the previous texture. When you put it in the right position, don't forget to assign it.



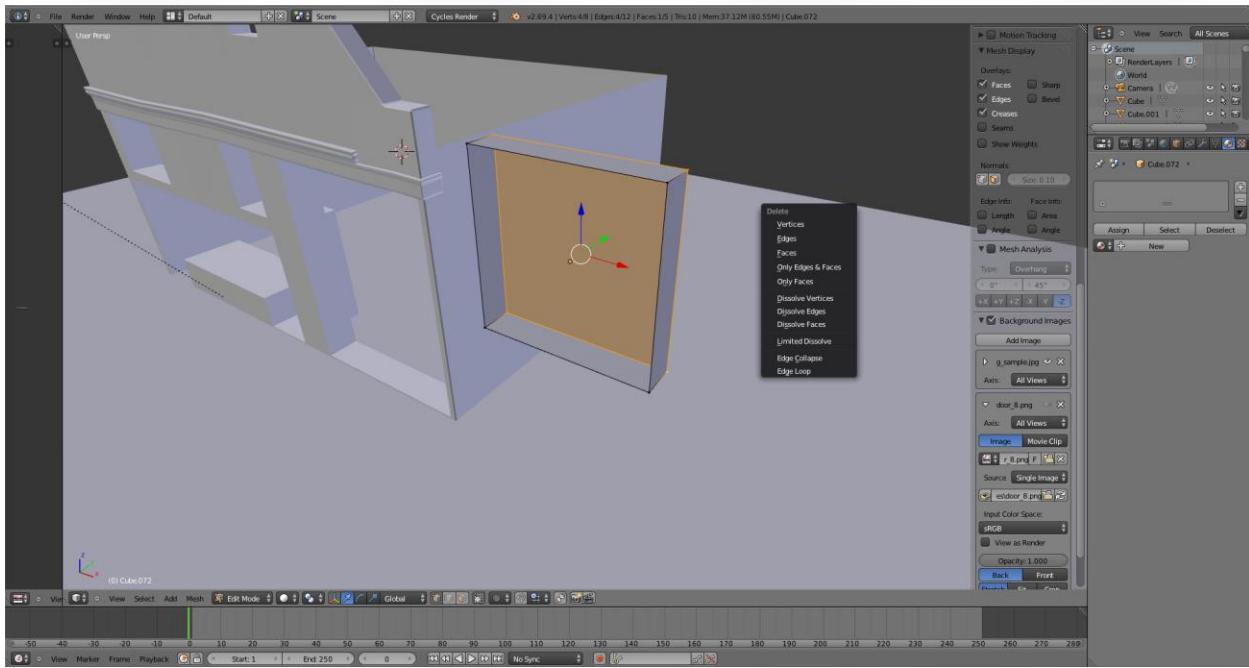
- **44.** This is how the two textures look when you mix them correctly. Don't forget to put a texture on the sides.



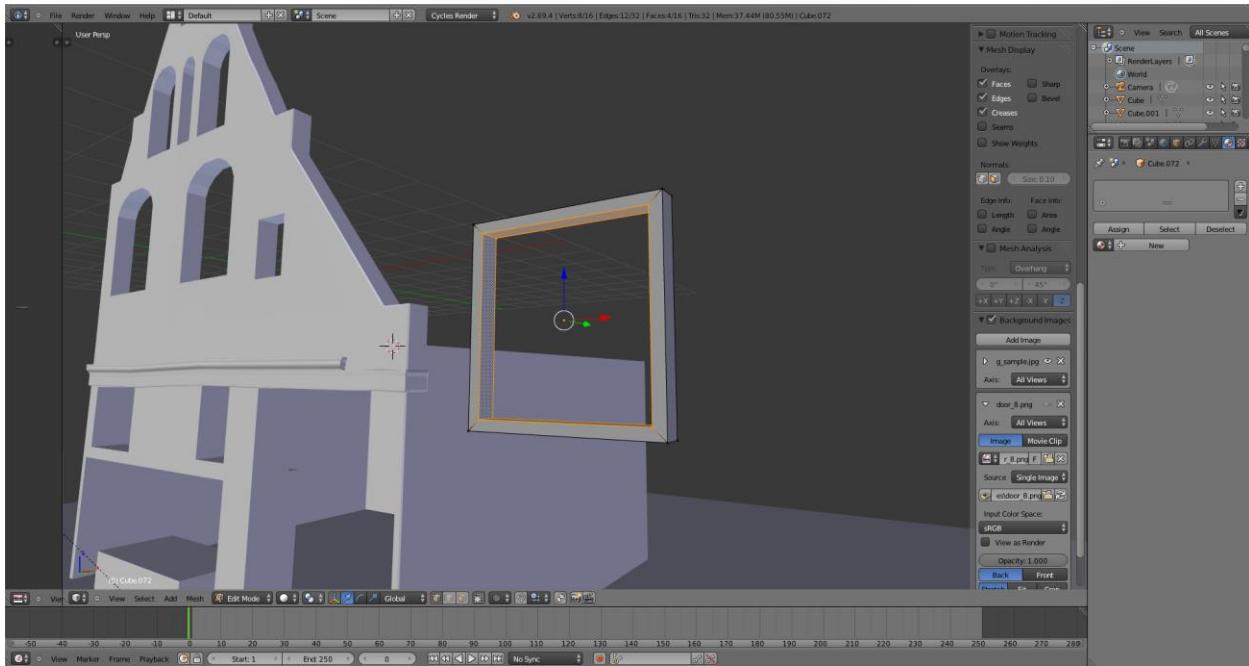
- **45.** Now that you have created the first ornament, you can apply it on the facade. The next thing to do is add a texture under the ornament. This will have a magical transition.



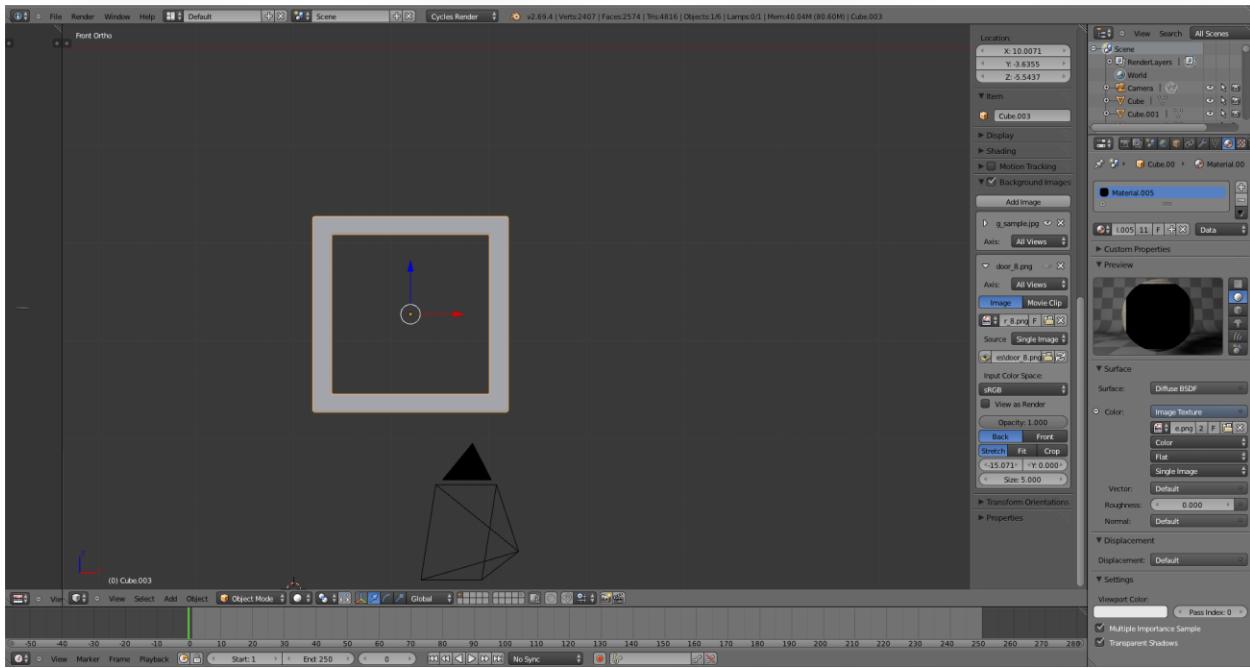
- **46.** If the texture is a bit stretched, you can tweak this in the UV image editor.



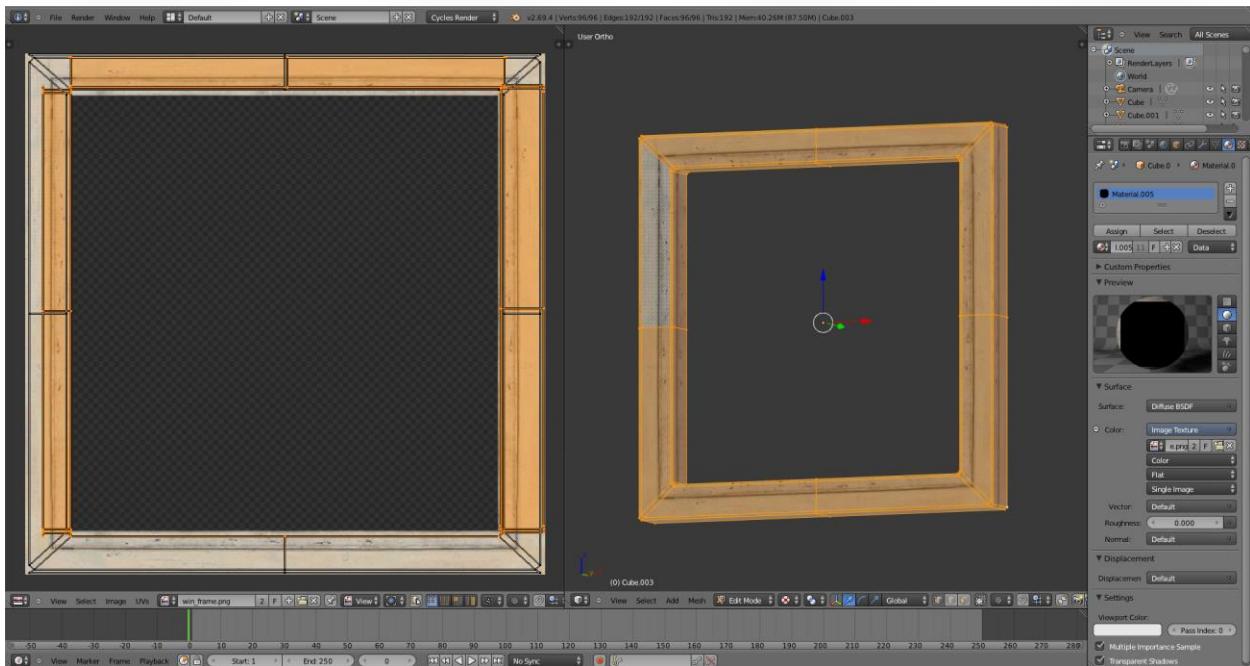
- 47. We can now start creating a window. Add a cube and scale it. Remove the front and back face, and then extrude it inwards.



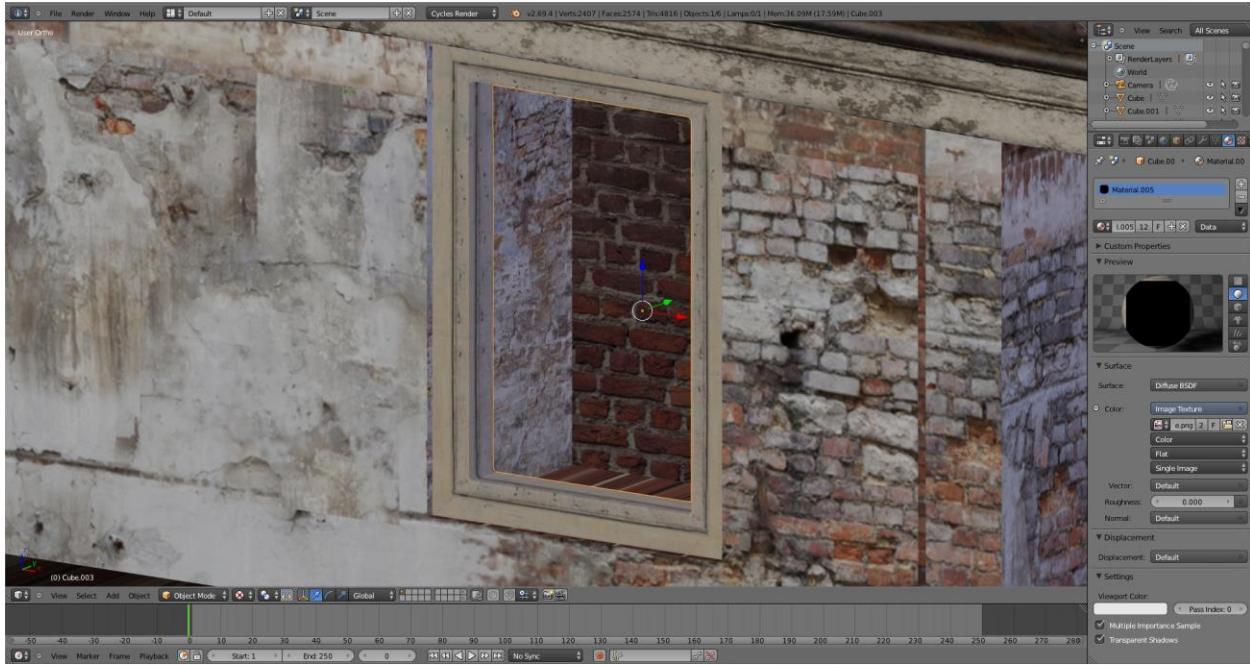
- 48. This will generate a window shape. Try to add a bevel shape on it **CTRL +B**



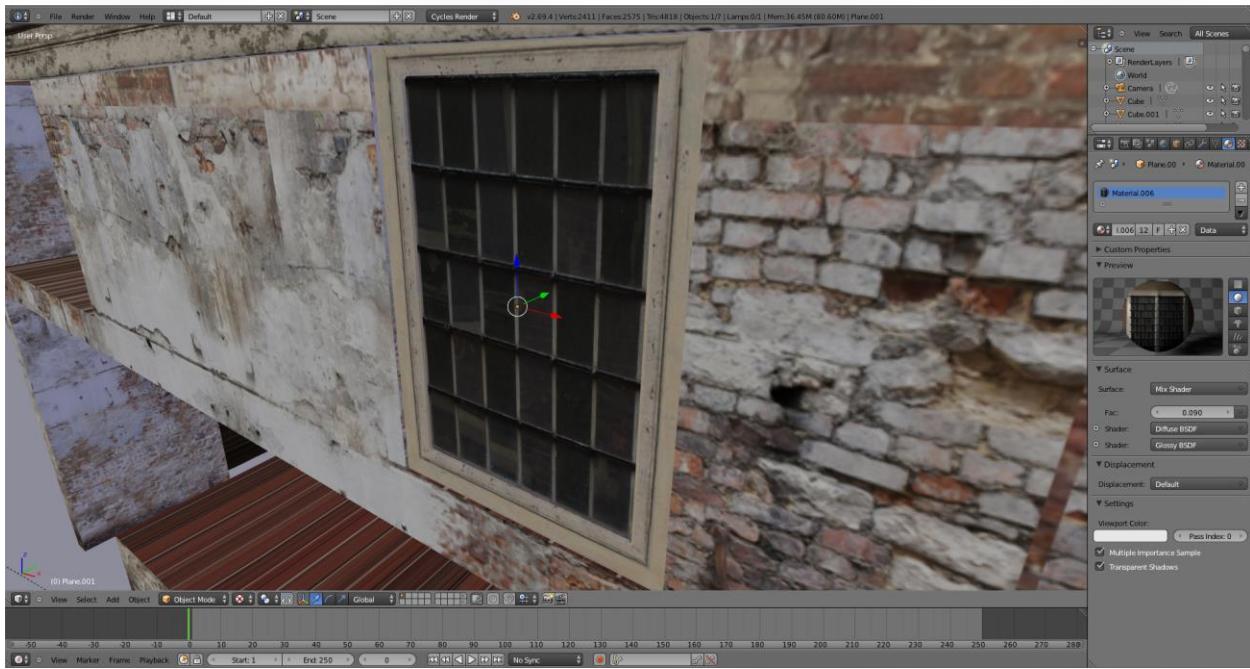
- **49.** Go to the material editor and choose a texture, use a texture you like it can be anything. Now select all the vertices and project a UV map onto it.



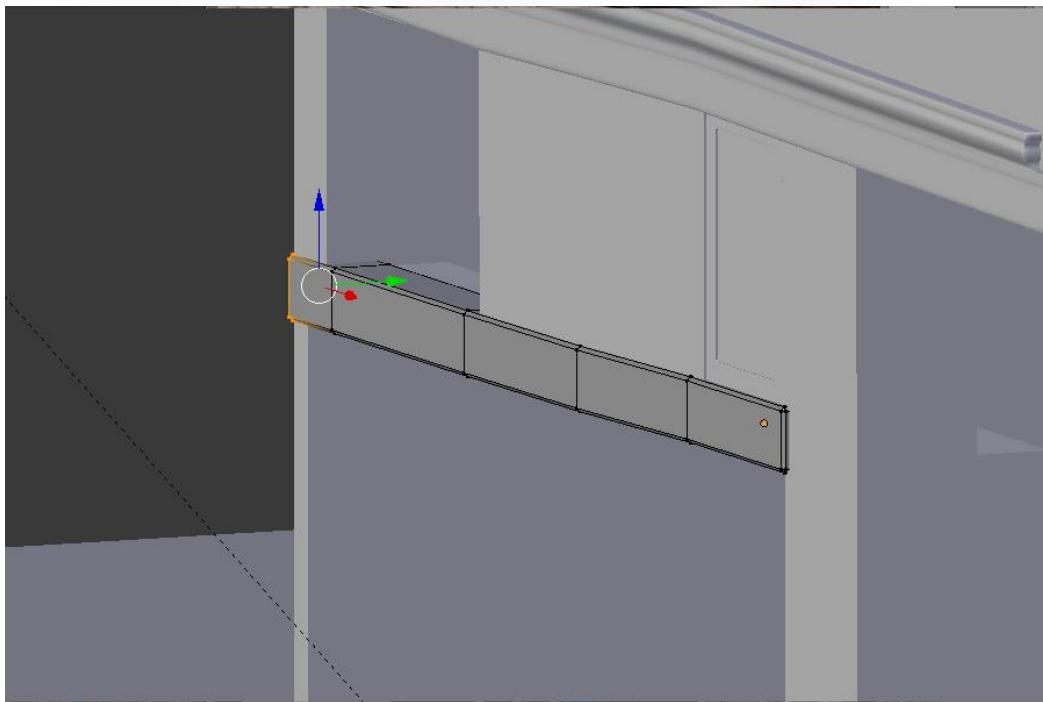
- **50.** This texture process also works well in a split screen. Don't forget to texture the sides. These are just as important as the front.



- **51.** Make a copy of the frame and put this in another layer. Now drag the original into the empty hole. Don't put it on top of the wall but drag it a bit inwards. This will generate a nice shadow on it.



- **52.** Add a plane with a texture, make it the right size, and put it in the window frame. Do the same here, and drag it a bit inward so you can see depth in the window frame.



- **53.** Create another wall ceiling, apply a bevel on it and texture the object.



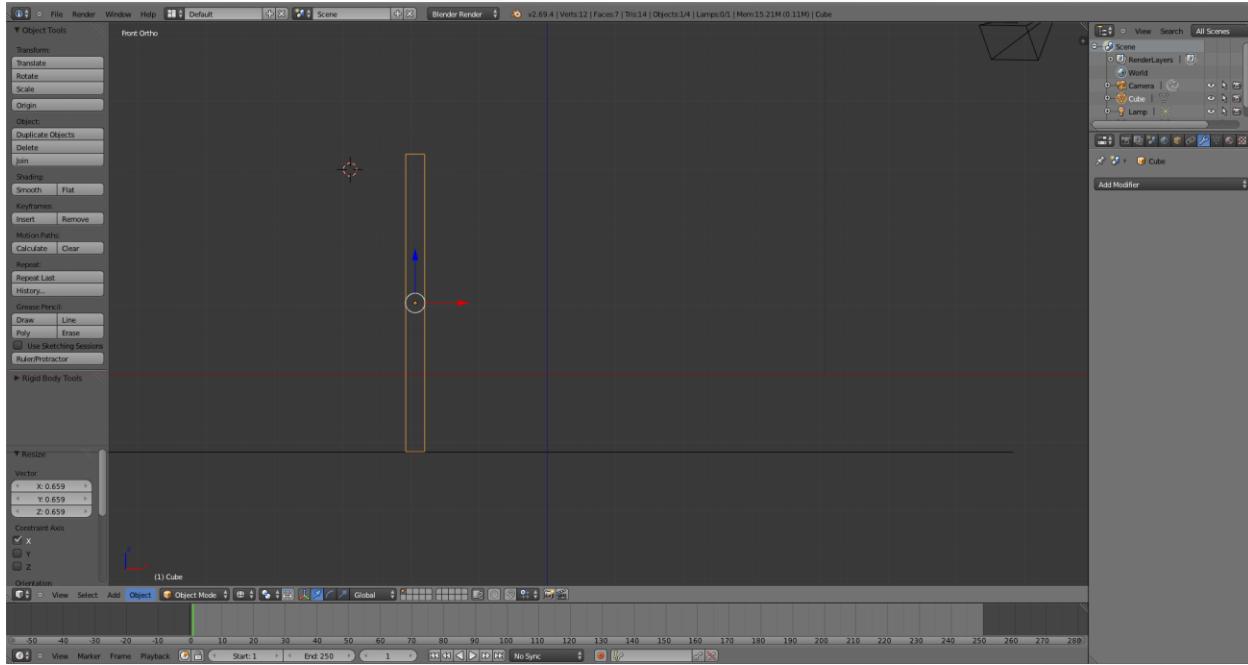
- **54.** Make another copy of the main frame and place it in the left hole. Don't stretch it in object mode. Switch to the edit mode and move the vertices so you still have the same measurements.



- 55. Create another object and use it as vertical panels. Copy the object and make some variation before you put a window in it.



- 56. It is good to know that you can choose your own size. You don't have to copy the same length. Remember to change the window size. You don't want a stretched window texture.



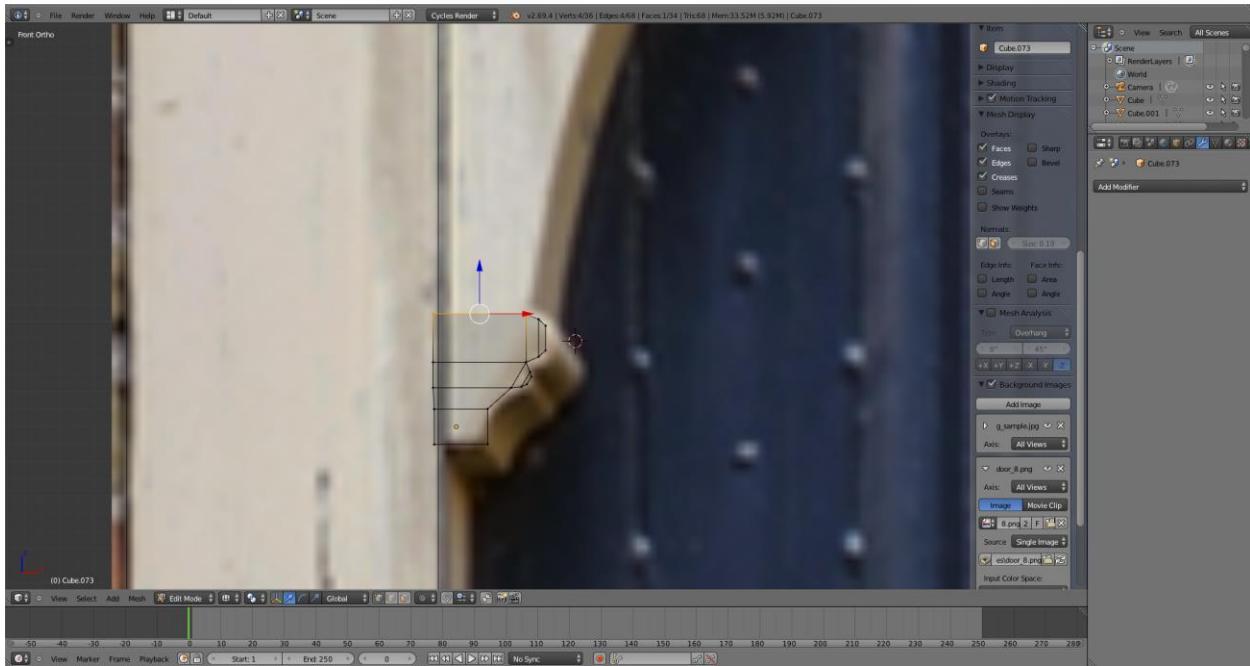
- 57. You can now start creating a door frame. The shape is a bit hard to make so I choose to work in mirror mode (Add a mirror modifier).



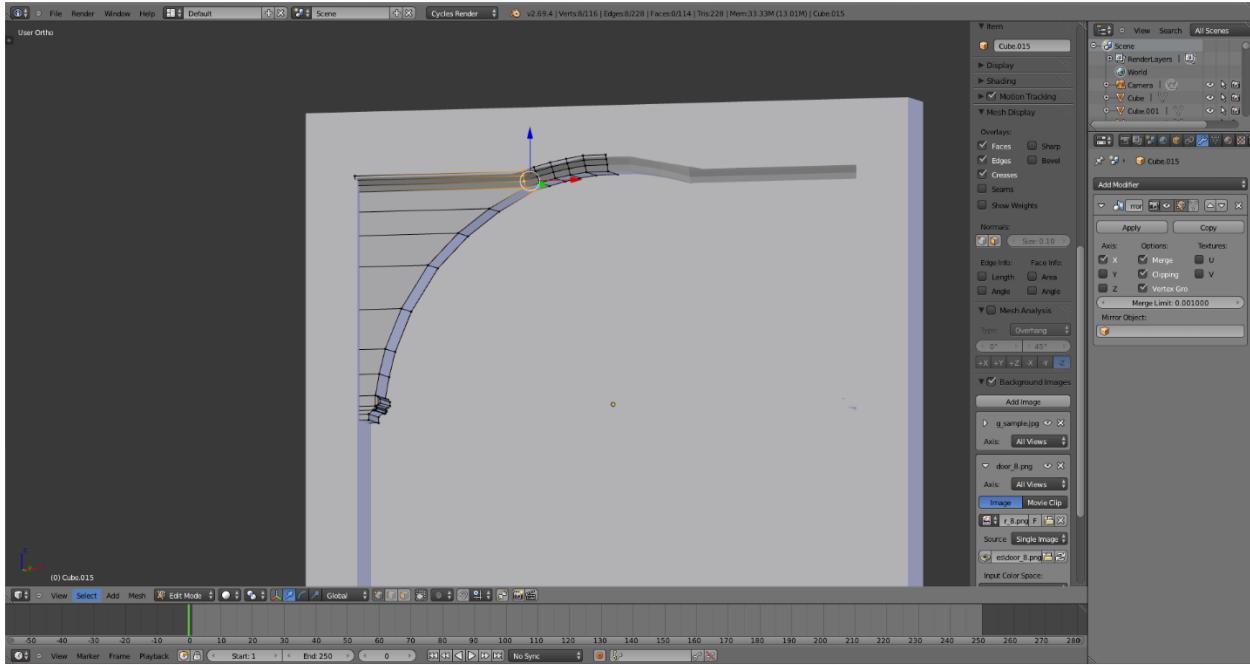
- 58. You can find this mirror in the modifier panel.



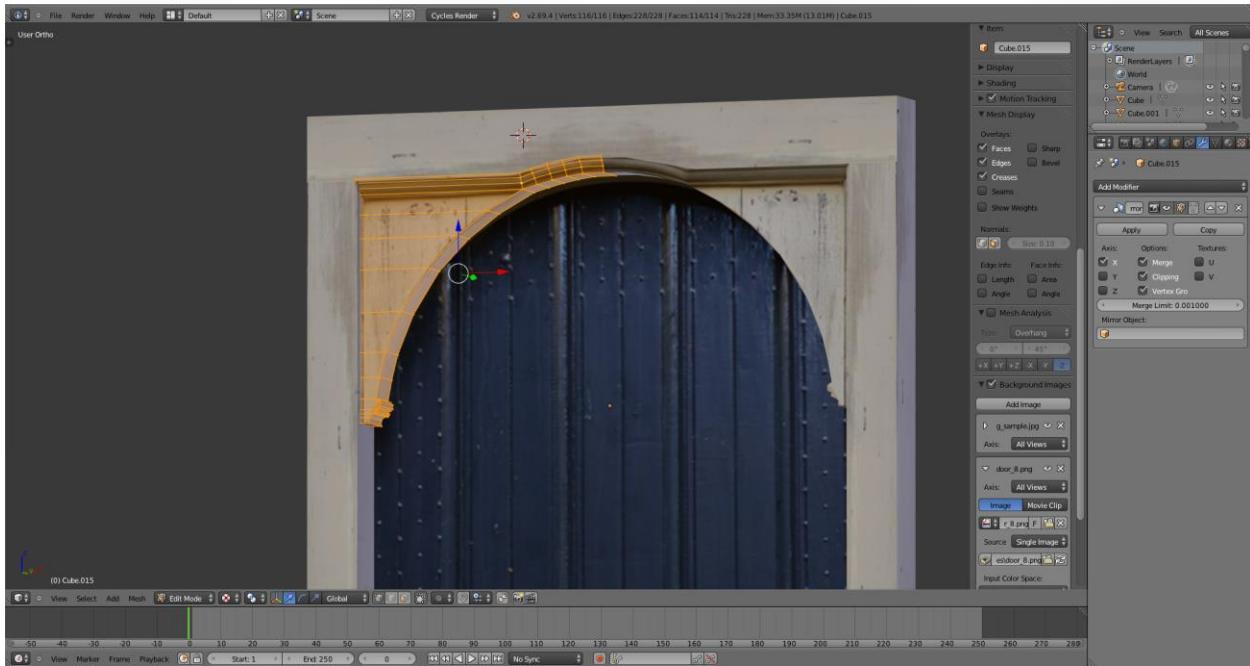
- **59.** Now you can start creating the door shapes. Do not forget to apply the clipping option to close the caps..



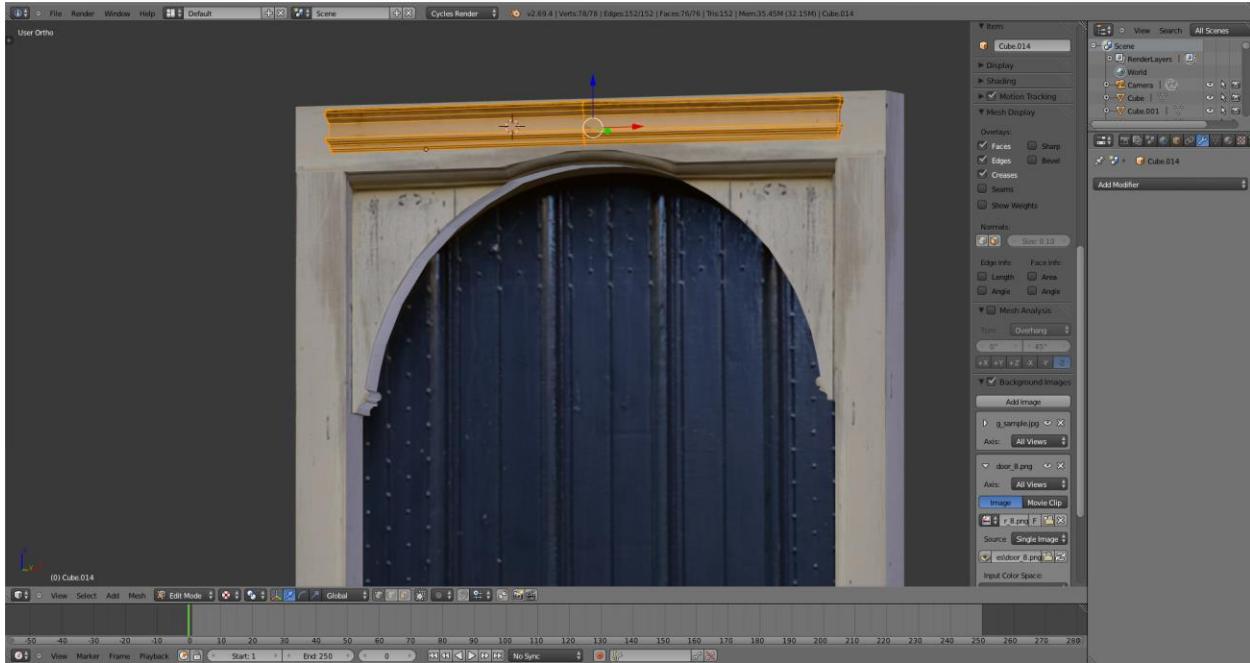
- **60.** Create a new object and start with the ornament that is visible in the door. Here it is also wise to use the mirror modifier.



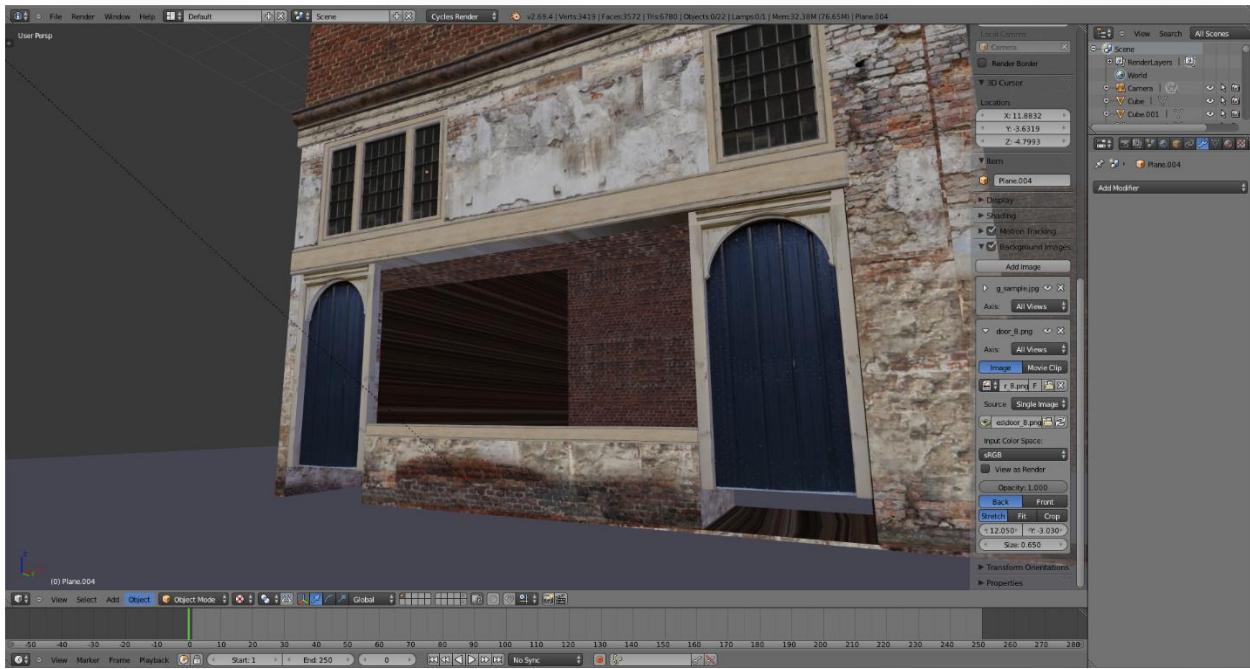
- **61.** There are some hard challenges to creating this ornament, so have some patience and don't hurry.



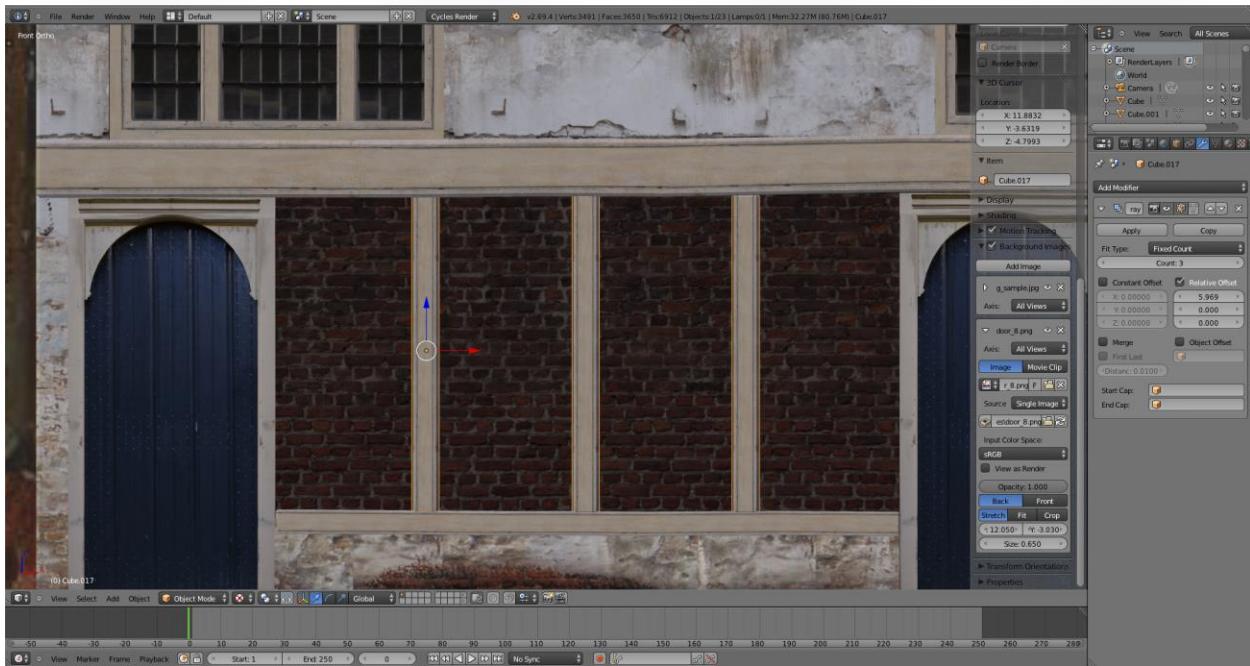
- **62.** When the work is done you can project the door texture onto it. The sides are a bit complex, so sometimes you have to select face by face.



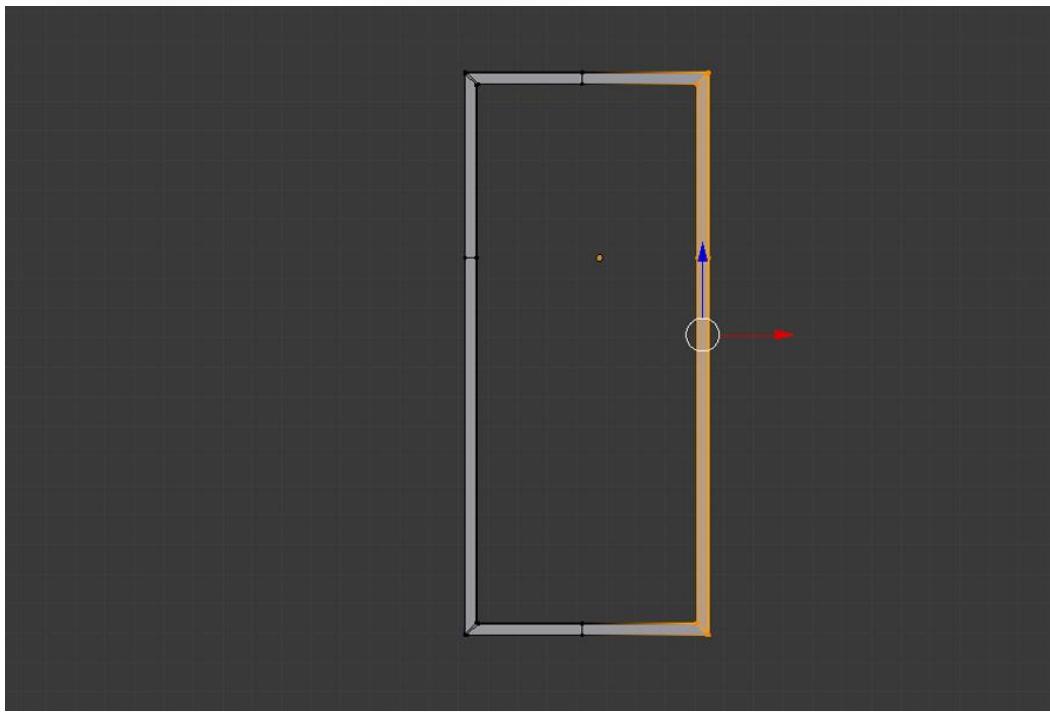
- **63.** In the end there are 3 objects: the frame, the inner ornament, and the one on top. You can choose to put a door in the frame or not. I decided to apply the blue door, but you can leave this open if you want some nice depth in the building.



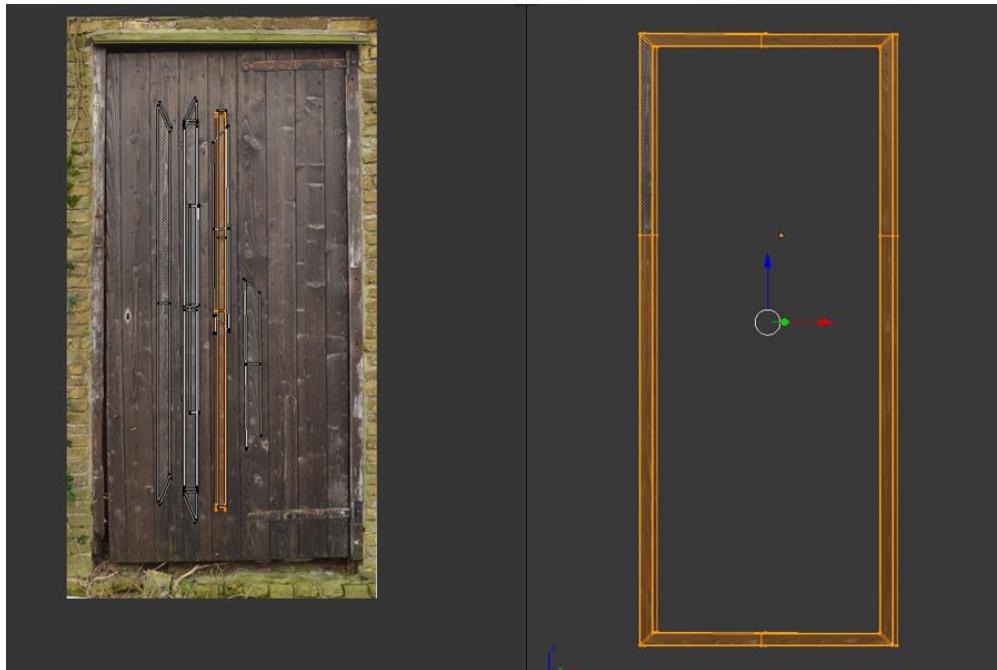
- **64.** Duplicate the door and put them in position. There is some space under the door. I will fill this later with some doorsteps. So I ignore the sample picture.



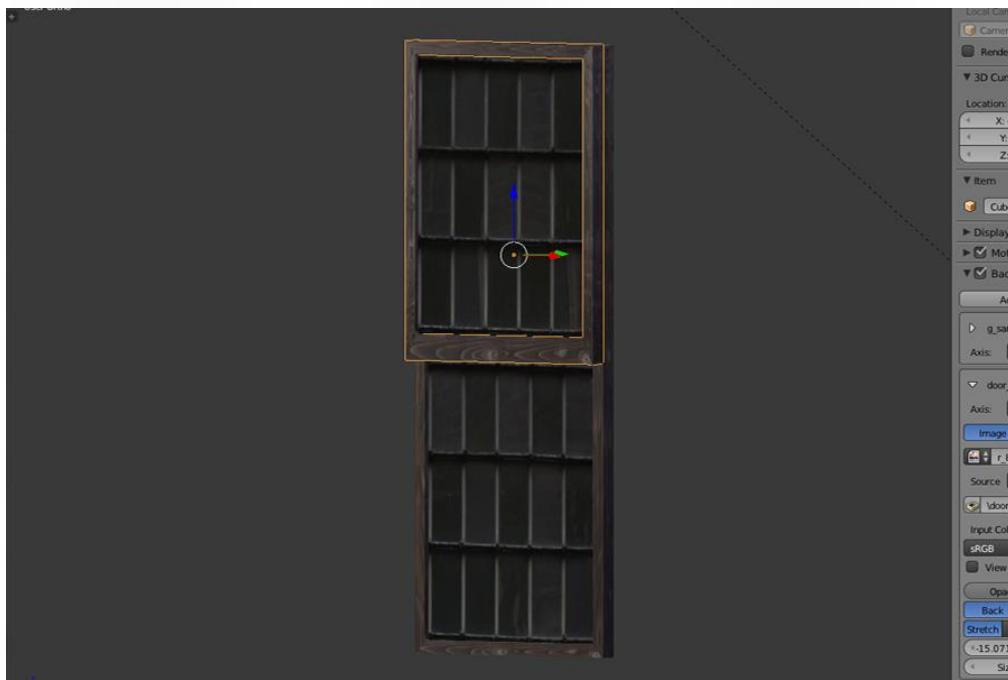
- **65.** To fill the hole in the middle, create some new vertical ceilings or copy the one we used before. I used the Array modifier to duplicate them.



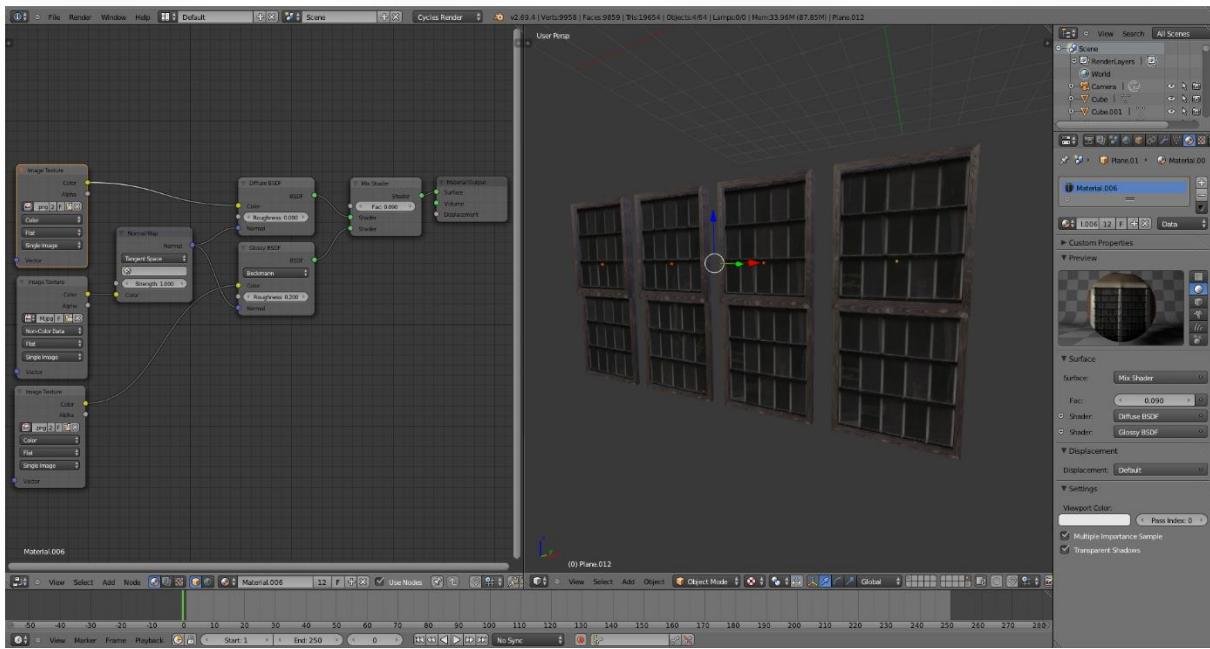
- **66.** We need a new window frame. You already know how to create the base, but now also apply a smooth bevel shape on it.



- **67.** I am using this brown door texture. First select the right and left side of the window to apply the texture. After that you select the top and bottom and then you can texture the sides.



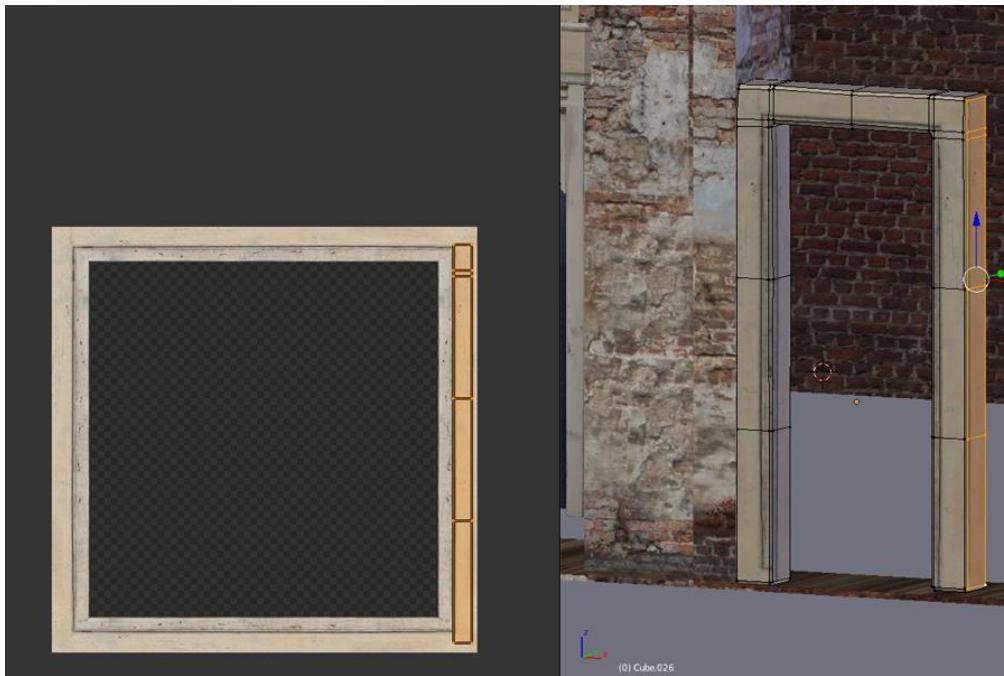
- **68.** To get this window shape, copy the frame that we made. Crop it a bit, but don't do this in the object mode (we use the edit mode). Now drag it on top of the long frame and extrude the bottom a bit. When this is done you can apply a window texture on it.



- **69.** To add more detail to the window texture, apply a normal and specular map. You can use the normal to add more detail in the specular to combine these.



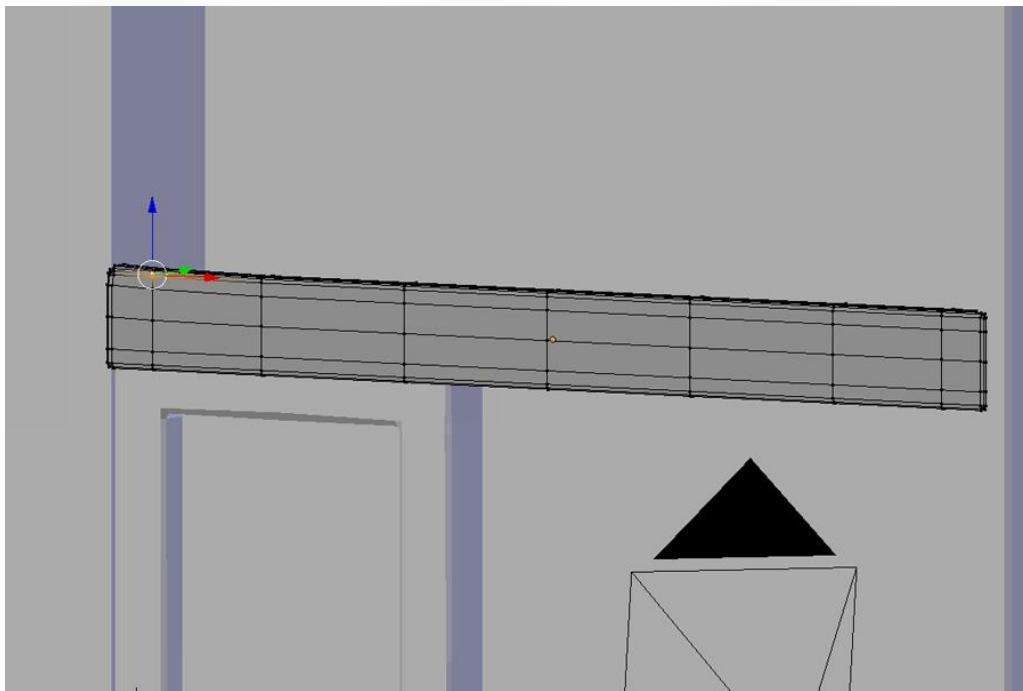
- **70.** When everything is in the right place you have a nice window frame. You can make variation by removing one of the windows. It's like someone has opened it for ventilation.



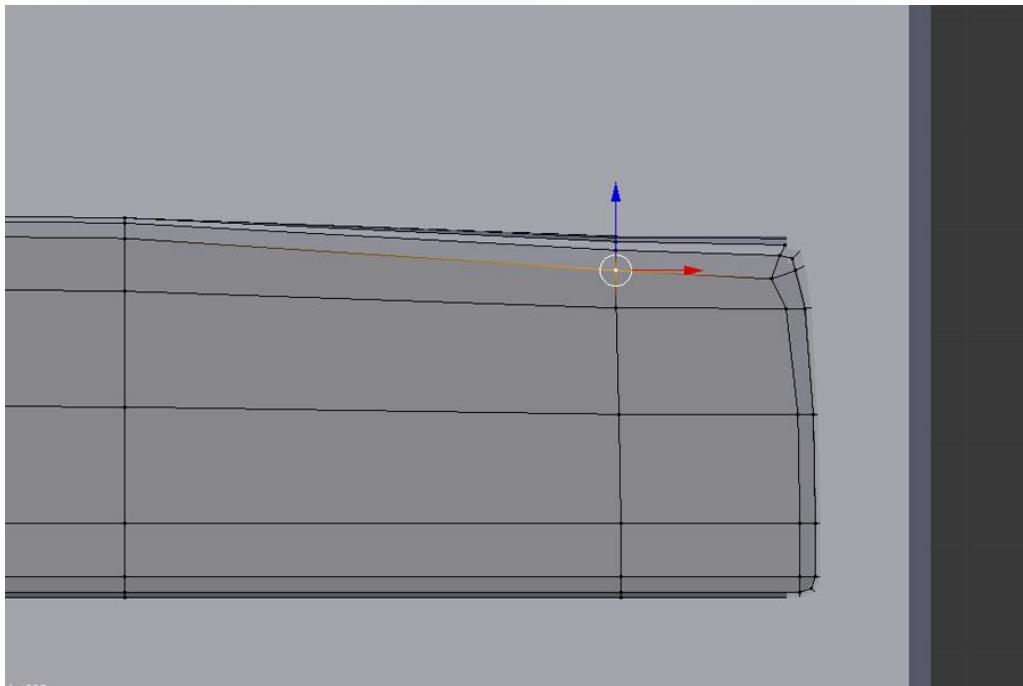
- **71.** We continue the process by creating a new door frame. This one is pretty easy to create. I used the window frame texture for the doorframe by just moving the coordinates a bit.



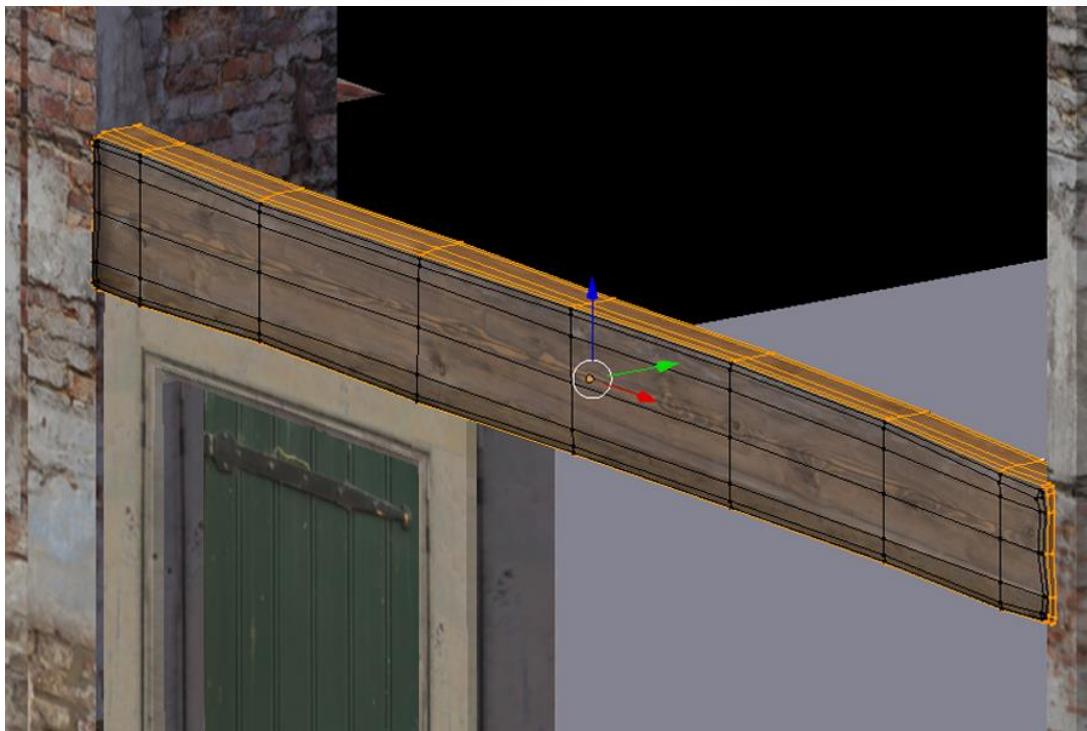
- **72.** Close the open space with a door texture, and again leave some space under the door.



- **73.** Again we create a ceiling here that makes a transition between the door and the space that is on top.



- **74.** We want to make this ceiling a bit rough, so move some vertices to get that look.



- 75. Apply a texture on it. If necessary extrude the ceiling a bit so it's not too thin



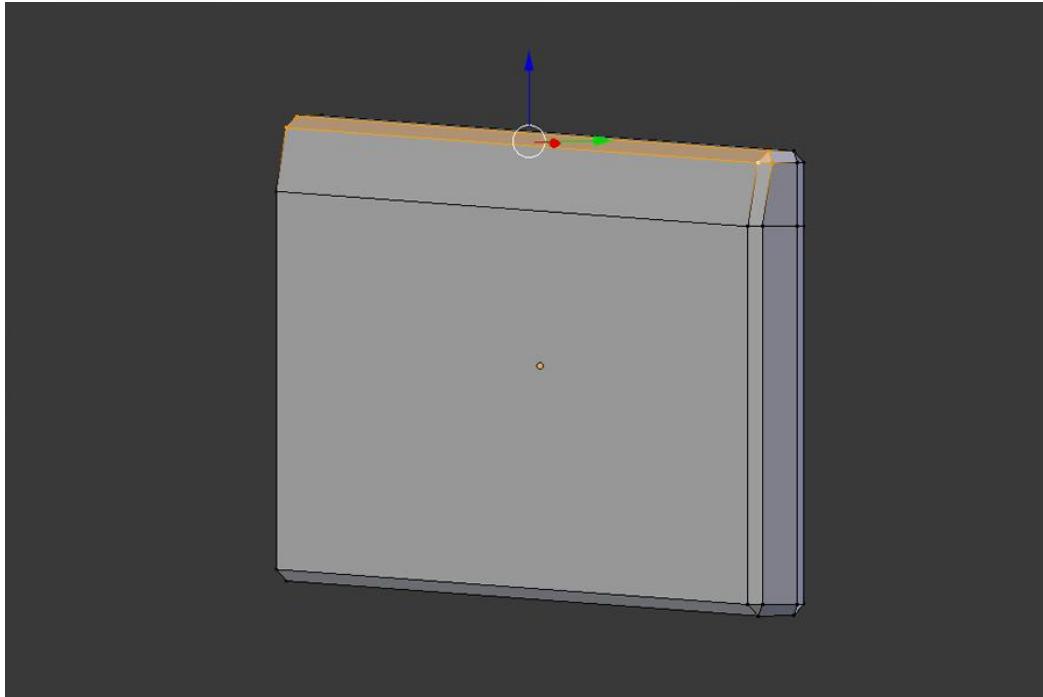
- 76. There are also some vertical ceilings here. We want some small ones on the left and bigger ones on the right.



- **77.** This time we don't put window textures in the frame but we create some wooden planks. I duplicated the big one and made it smaller. I also made some changes and tweaked the texture.



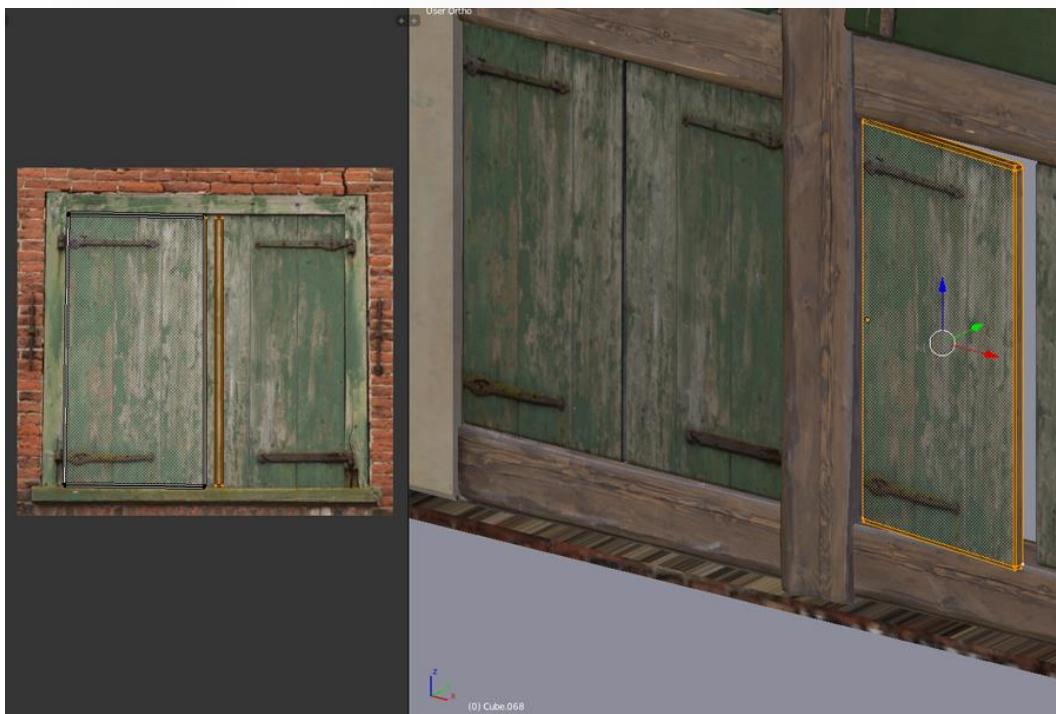
- **78.** Make some random variations so it does not look like duplications from the same piece of wood.



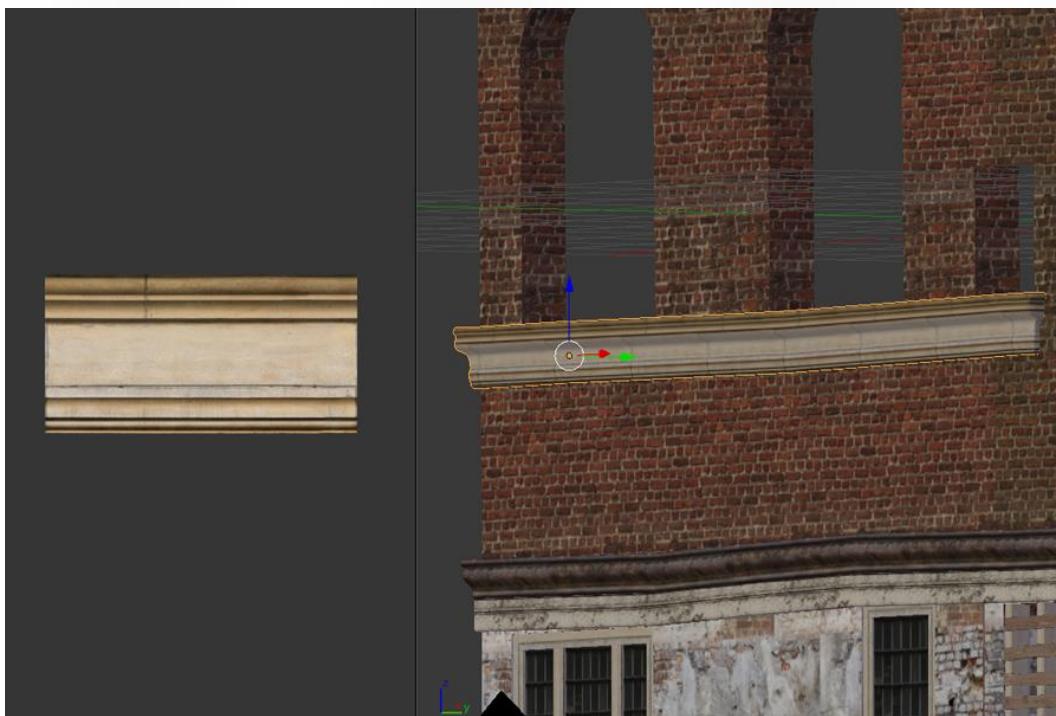
- **79.** The next thing to do is to create a wooden hatch. It's a simple shape, but with a nice texture it looks great



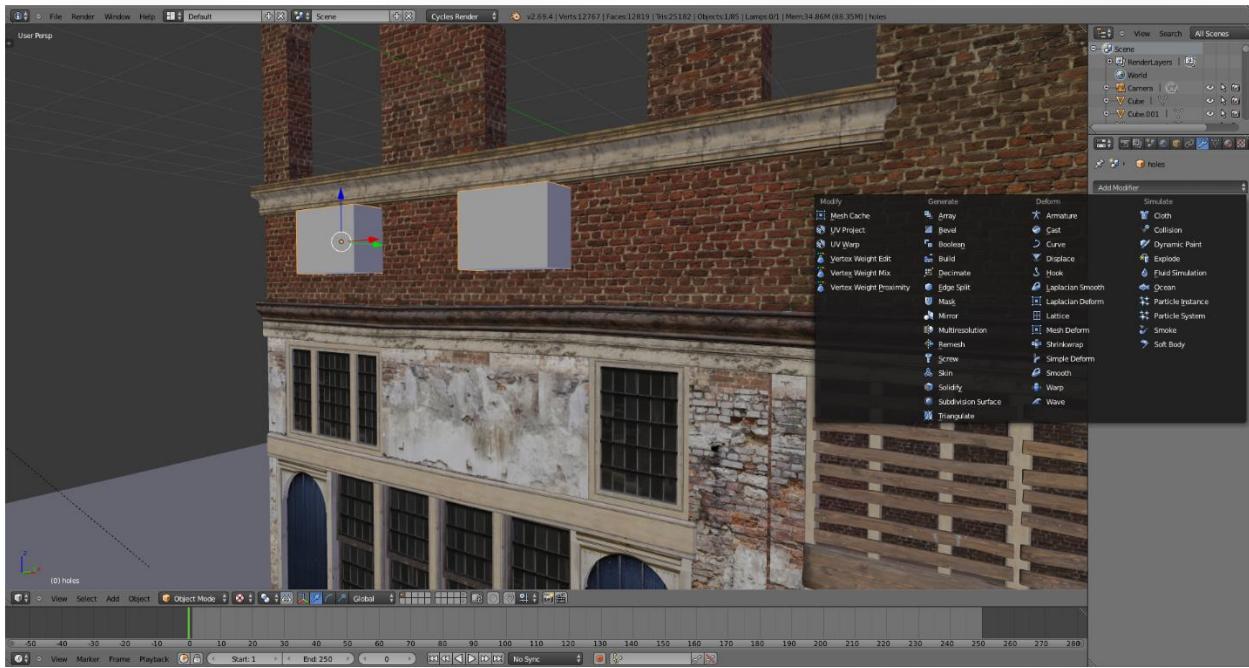
- **80.** Just as we did with the wooden planks, duplicate the hatch a couple of times and change the texture. I also rotate the hatch a bit for some nice depth and shadow generation. The brown thing is a hinge. You can create that as well if you'd like.



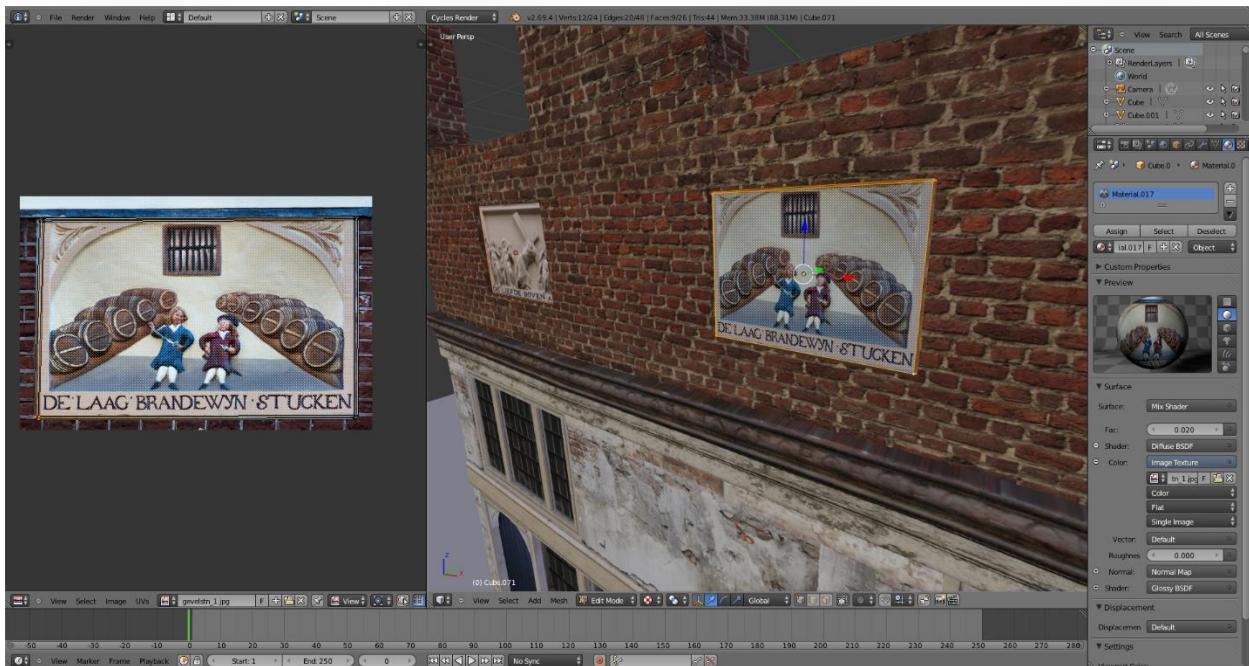
- **81.** We also want to fill the bottom space of the building. Create a new hatch and bring this into position.



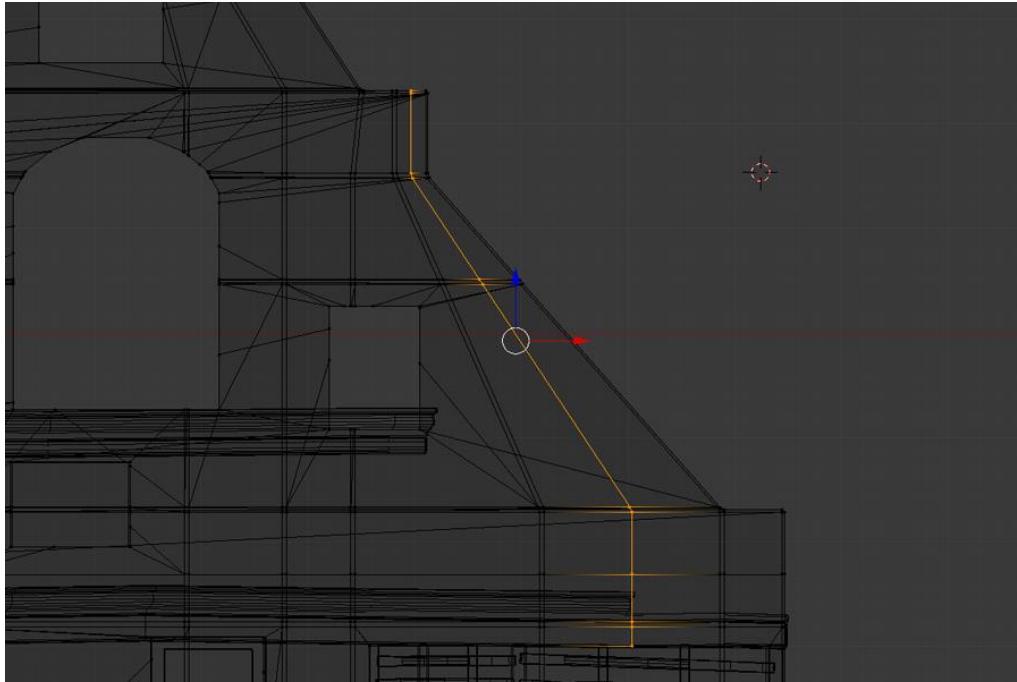
- **82.** The first part of the building is completed, and now we can work on some other parts. Create a new ceiling and apply the texture onto it.



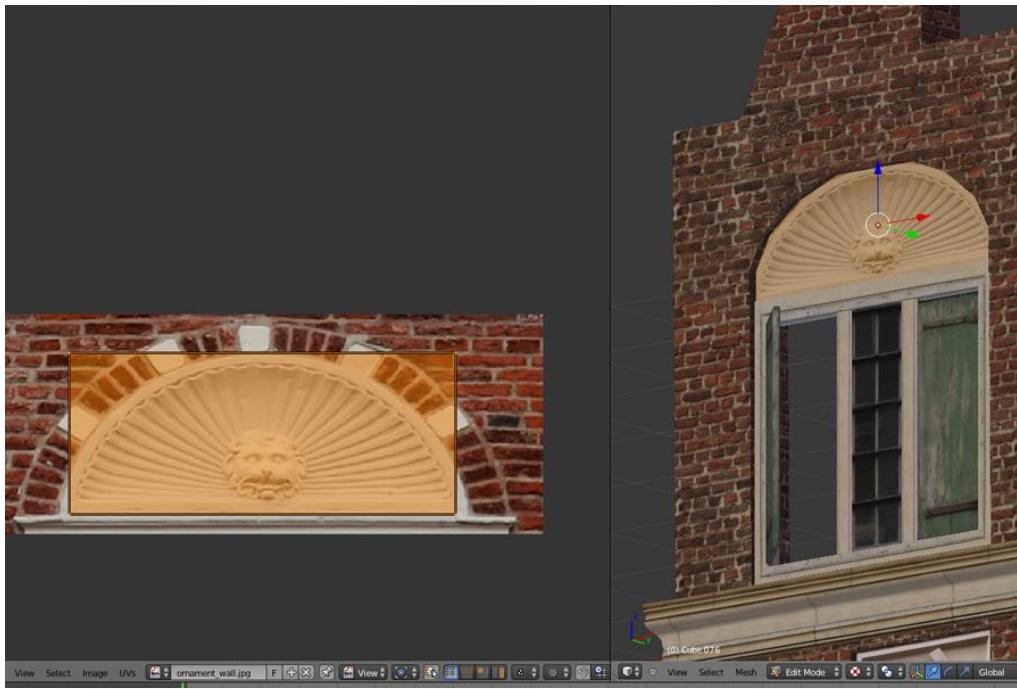
- **83.** The sample image had some nice ornamental stones in the wall. We need to make some extra holes to get this effect. Use the Boolean function to do this.



- **84.** Choose some nice textures and put the ornamental bricks in the wall. Remember that ornaments make a building more unique. It's like a sort of identity, so the building is not just some brick wall with ceilings.



- **85.** When using the Boolean after doing some texture work, check your vertices to make sure they are still connected. Sometimes they act weird and you have to fix them.



- **86.** We can now speed up a bit because you know how to make a window frame and combine this with ceilings. The only thing that is different now is that you have to add a nice ornament on top.



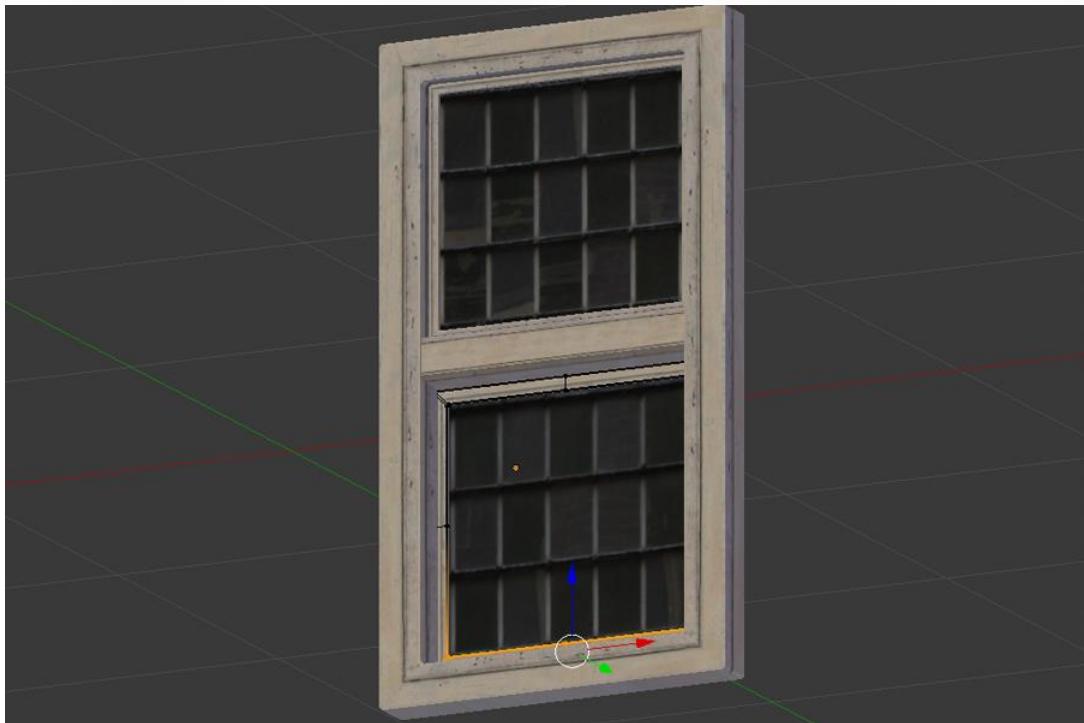
- **87.** We need to make a transition between the ornament and the brick wall. I used this arch ornament that creates a nice effect. You can apply a mirror modifier to work faster.



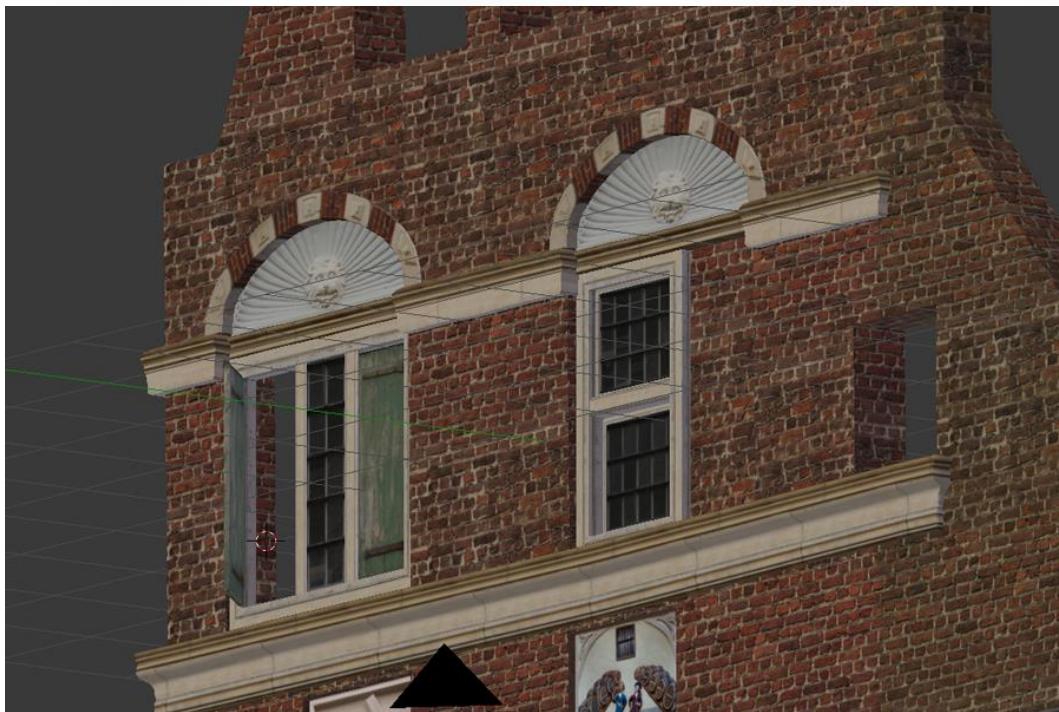
- **88.** The arch has a different length than our texture. We fix this by selecting the middle, pressing O and then dragging them a bit upwards. Don't forget to make the bottom sides flat.



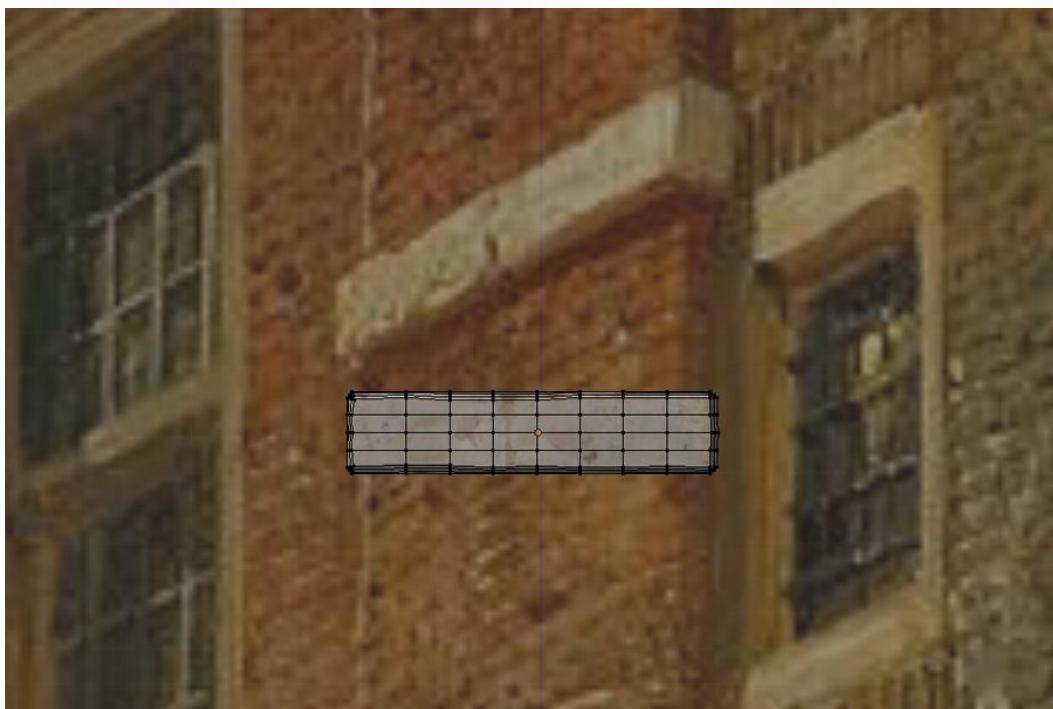
- 89. You can rotate the hatch a bit if you want variation in the scene.



- 90. The window frame on the right is a bit more complex. I used 1 main frame, 1 horizontal ceiling and two inner frameworks. The upper window texture is more in front, the one in the bottom is more backwards.



- 91. Create a new cube, apply a brick texture and put it next to the window frame.



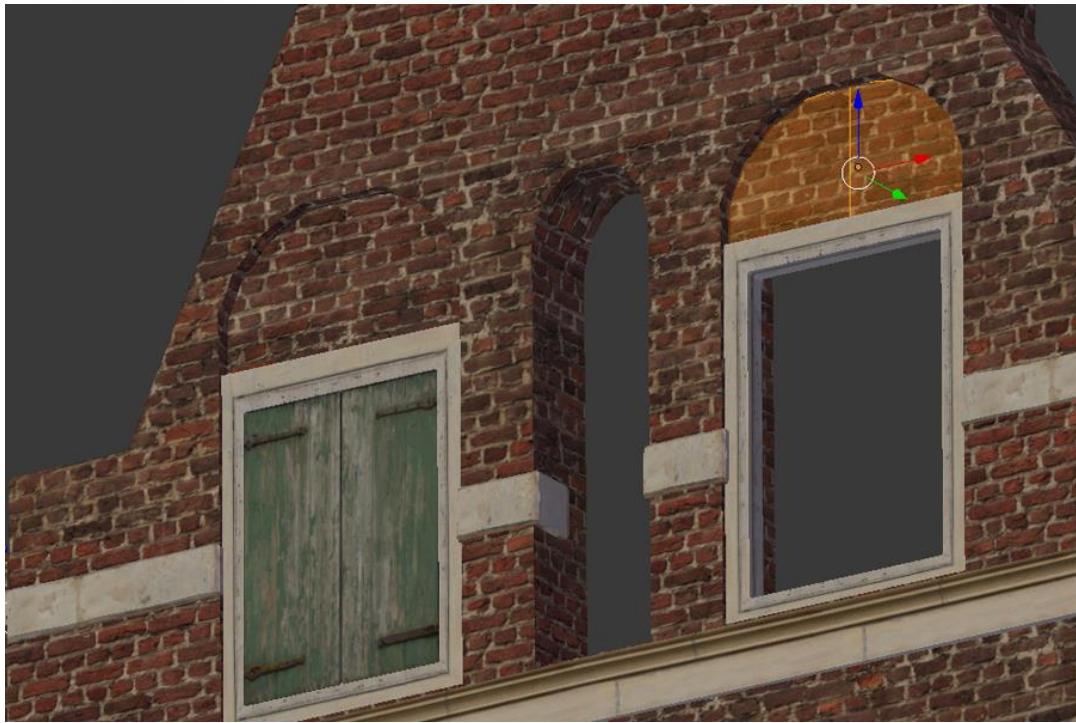
- 92. Create a new cube and make it look rough. We want to make some sandstone. If the edges are sharp, it will look fake. I used a subdivision surface modifier.



- **93.** Put the sandstone in the right position. Sometimes you have to scale it. Try to scale the texture as well or else it will look stretched.



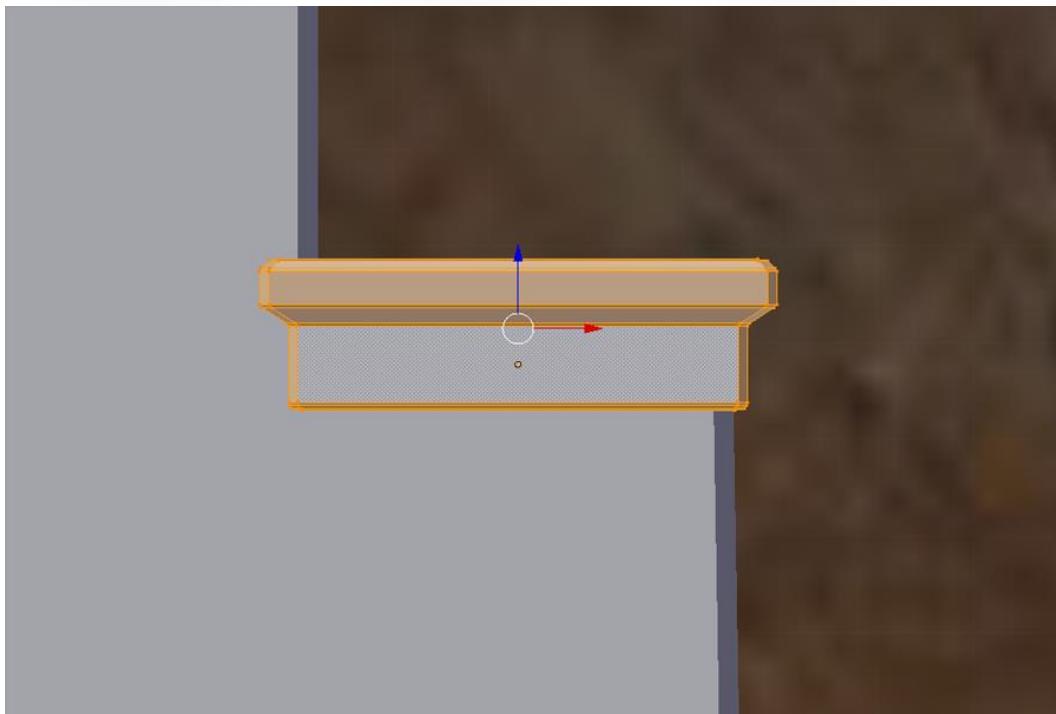
- **94.** We move up to the next window frames, and use the same method, nothing really special. Keep in mind that you may have to rotate the window frame because we hovered the facade.



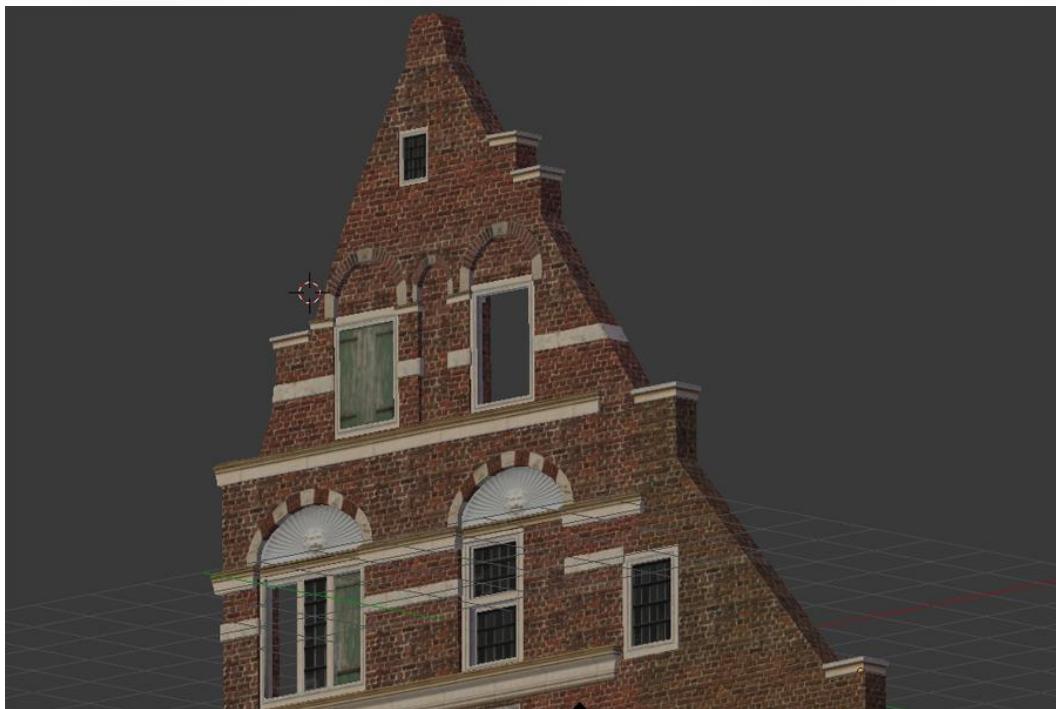
- 95. Fill the arch with a brick texture. Create a plane and put the texture on it.



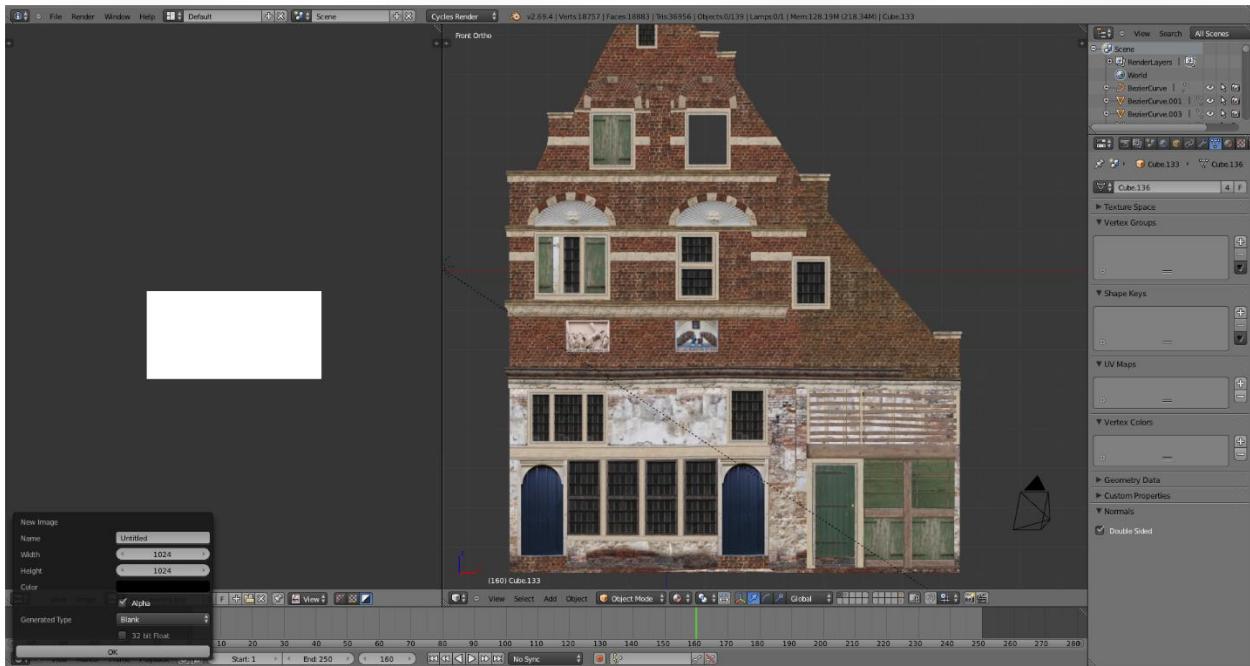
- 96. When you make these arches, first model the shape and after that apply the texture. This method is different than the one we used before.



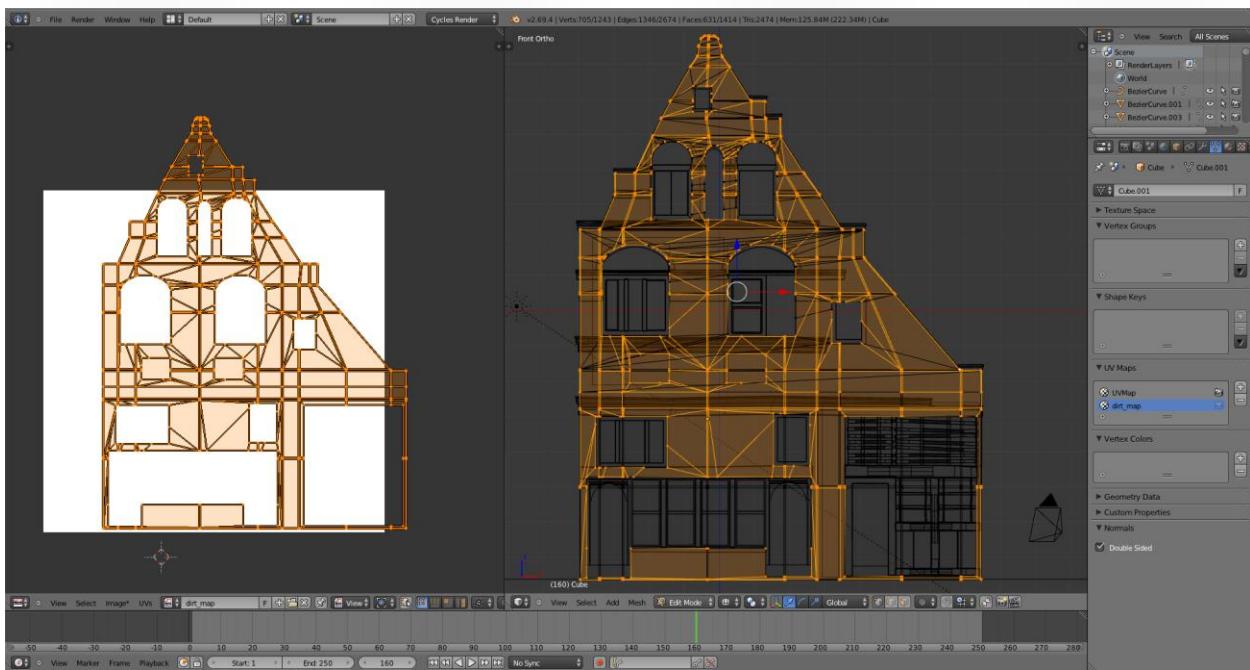
- **97.** Design some ornaments for the sides of the wall, and use a texture that we used before.



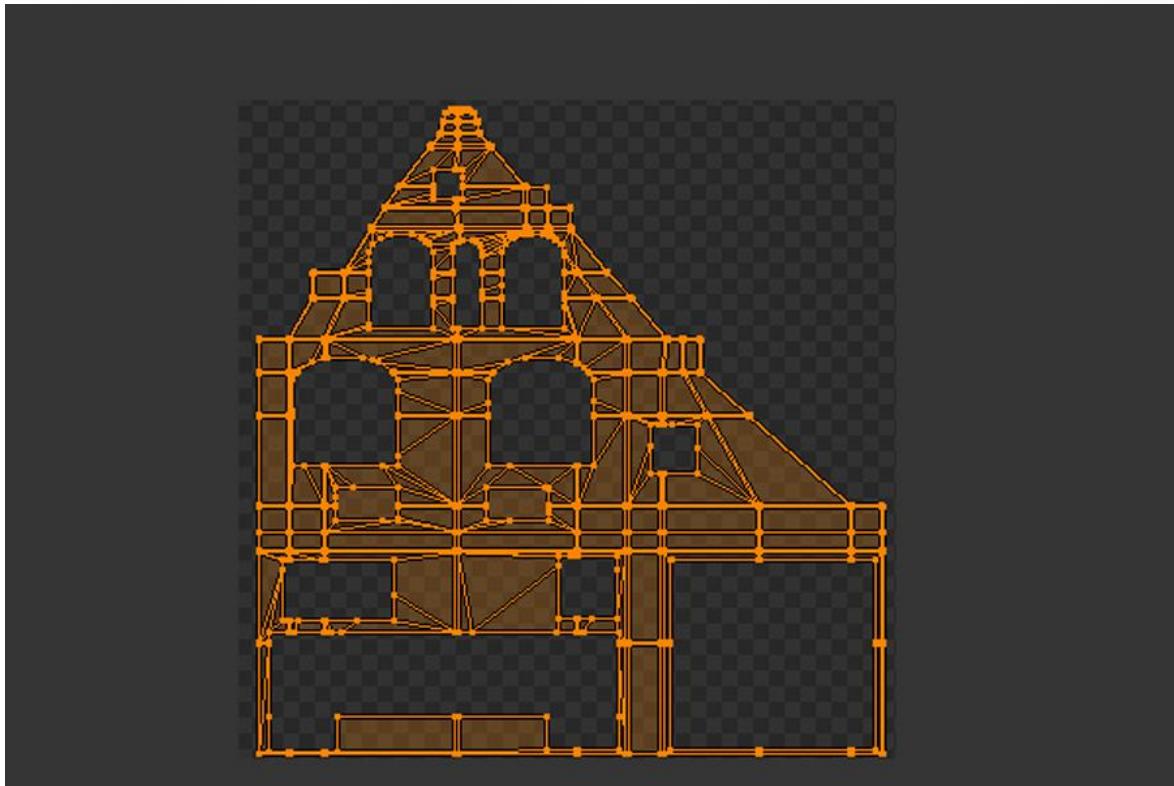
- **98.** As you can see, the wall is already getting a nice structure. There are still a lot of things to do, but we are getting closer.



- 99. Now we start on a very important part of the building process: adding dirt on the wall. Go to the UV image editor and click 'new image' and make it transparent by removing the color (Alpha). Save the texture and name it 'building dirt'.



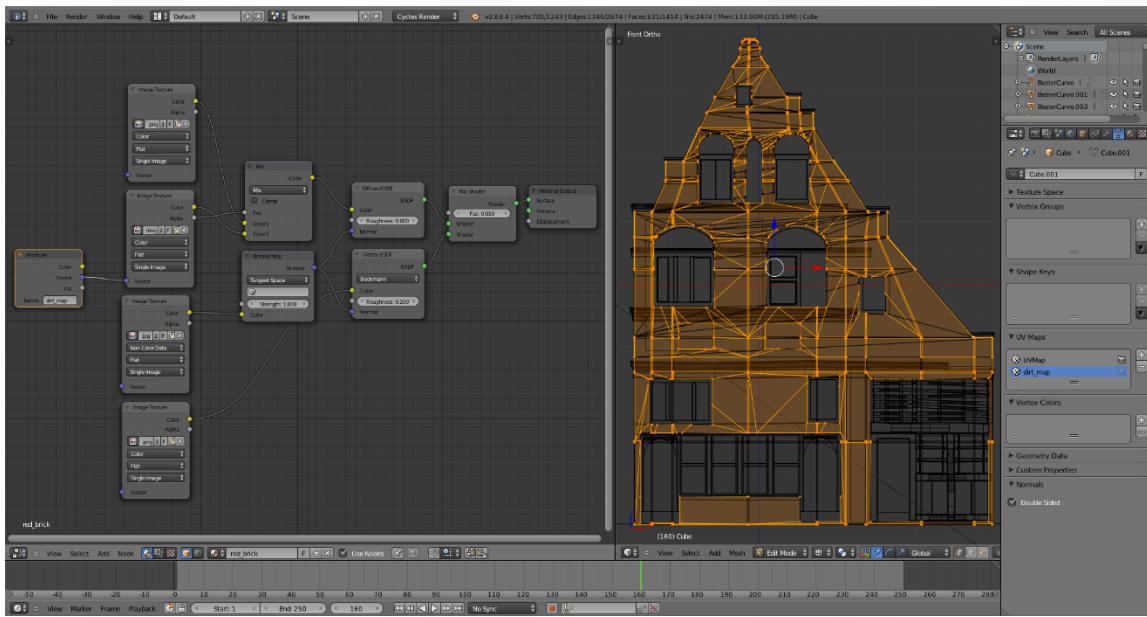
- 100. Enable a new UV map, and name this 'dirt map'. The next thing we do is select the front wall and make a UV projection. Remember, only the front wall, not the sides.



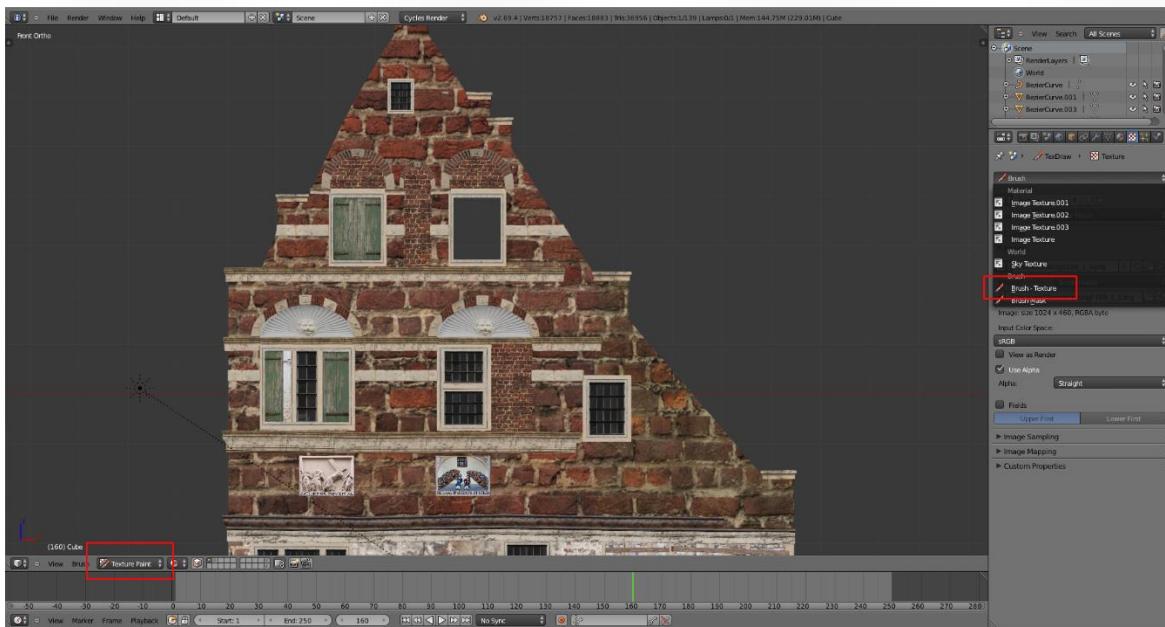
- **101.** In the UV image editor, scale the coordinates till it strikes the whole image



- **102.** When the scaling process is done, save the image.



- **103.** Before we start painting, we have to apply some nodes. First select the material. We have 3 of them. We start with the red brick material. Duplicate the image texture and open your ‘building dirt’ texture. Open a [color mix node Add--> Color--> MixRGB](#) and combine the two images. You also need to add an Attribute node [Add--> input--> Attribute](#) with the right UV map. Don’t forget to combine the Alpha into the mix node.



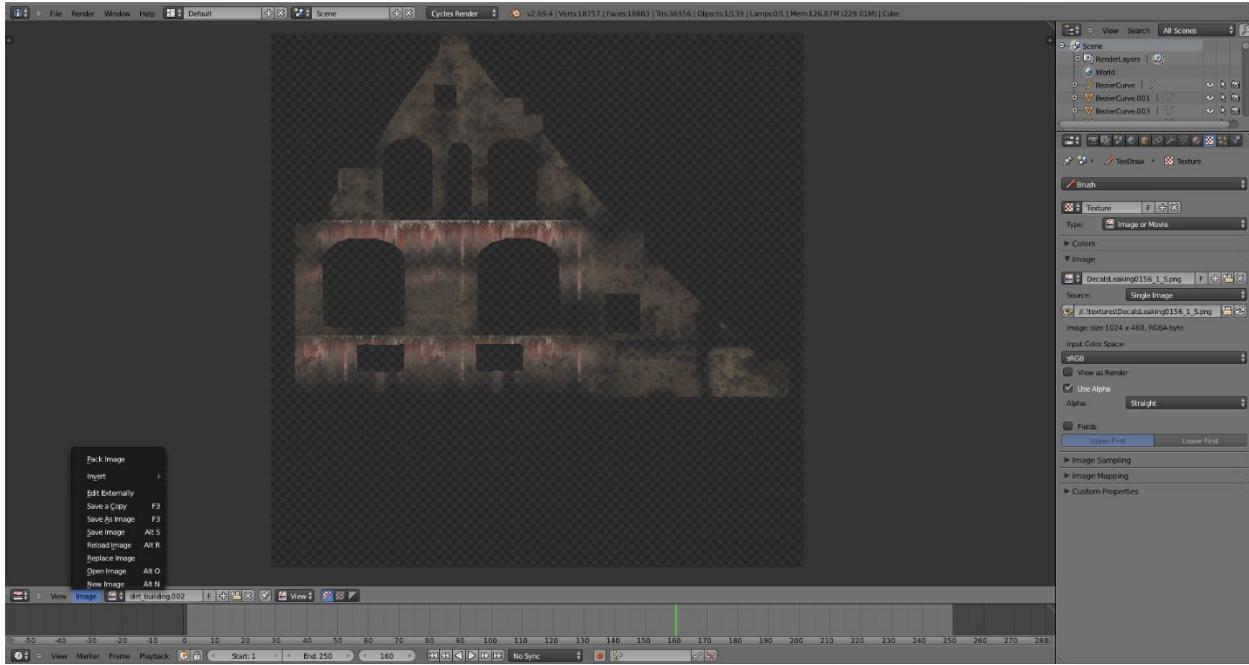
- **104.** Now go to the texture panel and switch to brush mode. Switch to Texture paint in the 3D viewport and switch to material view mode. As you can see, the brick pattern looks scaled. This is not a problem because if you switch back to the other UV map everything will be normal.



- **105.** Painting the wall is not always an easy job. For this dirt map I used two different types of decals: a leaking one and a dirty wall texture. When you apply the dirt, sometimes the decal appears in the wrong position. Push **SHIFT+scroll** mouse button to get a different view. This helps you apply the dirt map.



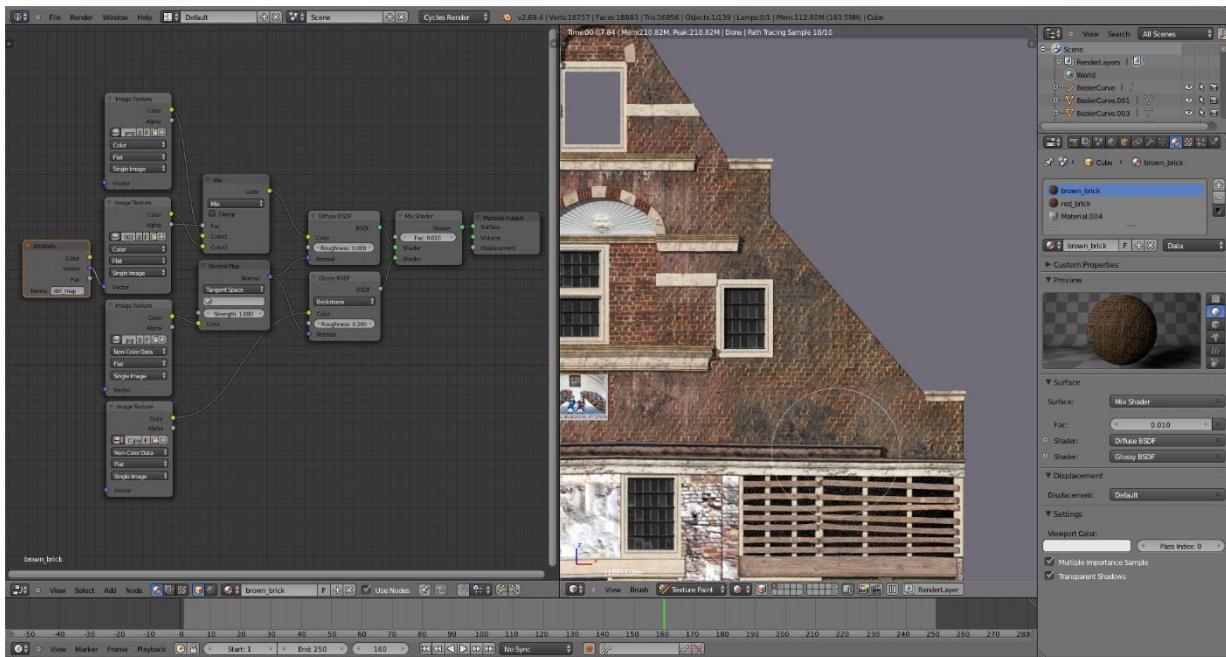
- **106.** Try to experiment with this tool. You can open the brush setting by pressing T. This makes your brush bigger or smaller. I used full strength, but it all depends on your decal texture.



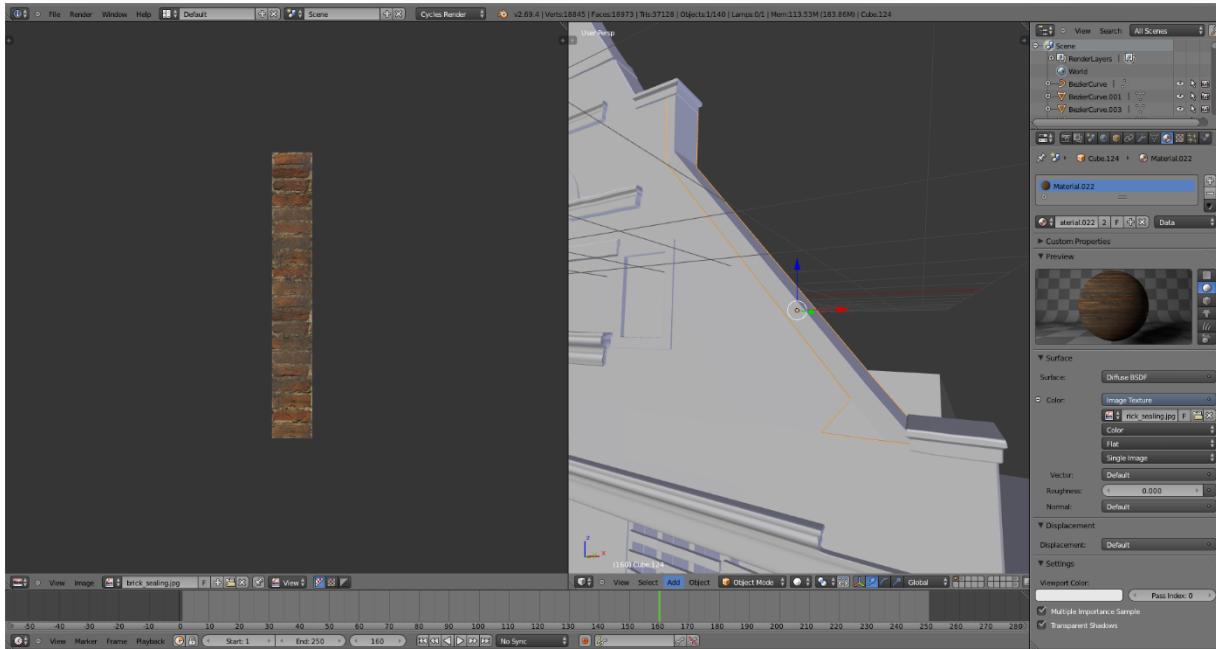
- **107.** When your dirt painting is finished, save the image. If you don't save it, you will lose all the paint data and you have to paint it again.



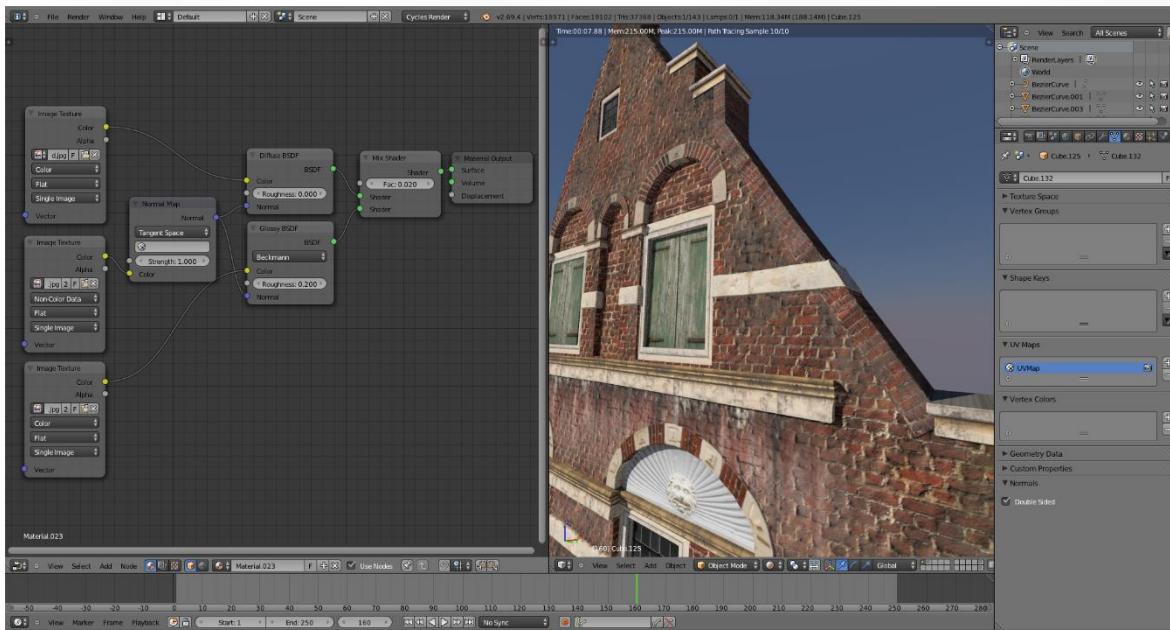
- **108.** You can experiment with the RGB MIX node, sometimes another type of blending helps with the mood. I used the mix blending, sometimes multiply has also a nice effect.



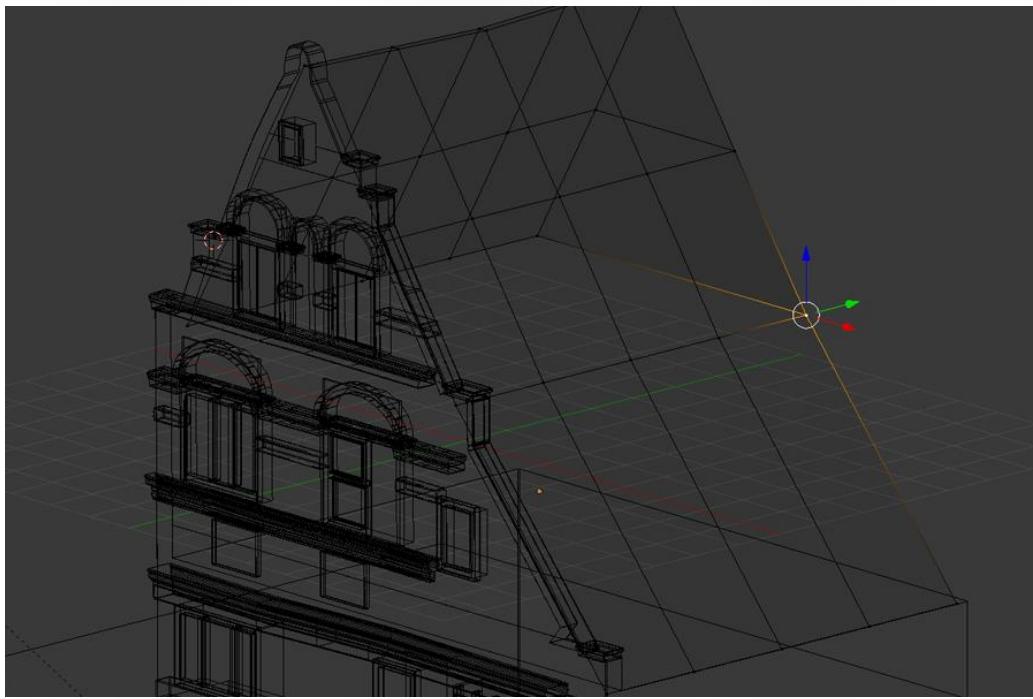
- **109.** To put dirt on the brown brick texture, activate the same node settings for this material. This also works for the white plaster texture, if you want to paint that one as well.



- **110.** When the painting is done, we start making a nice brick ceiling. If you look at the original painting you can see a different brick pattern. You can easily create this effect by modeling it and putting it in the right position.



- **111.** Attach the texture and check if the transition looks realistic. You don't want big and small bricks. You don't have to paint this ceiling. I added some dirt in GIMP so I faked it a bit. You can do the same thing with some ornaments if you like.



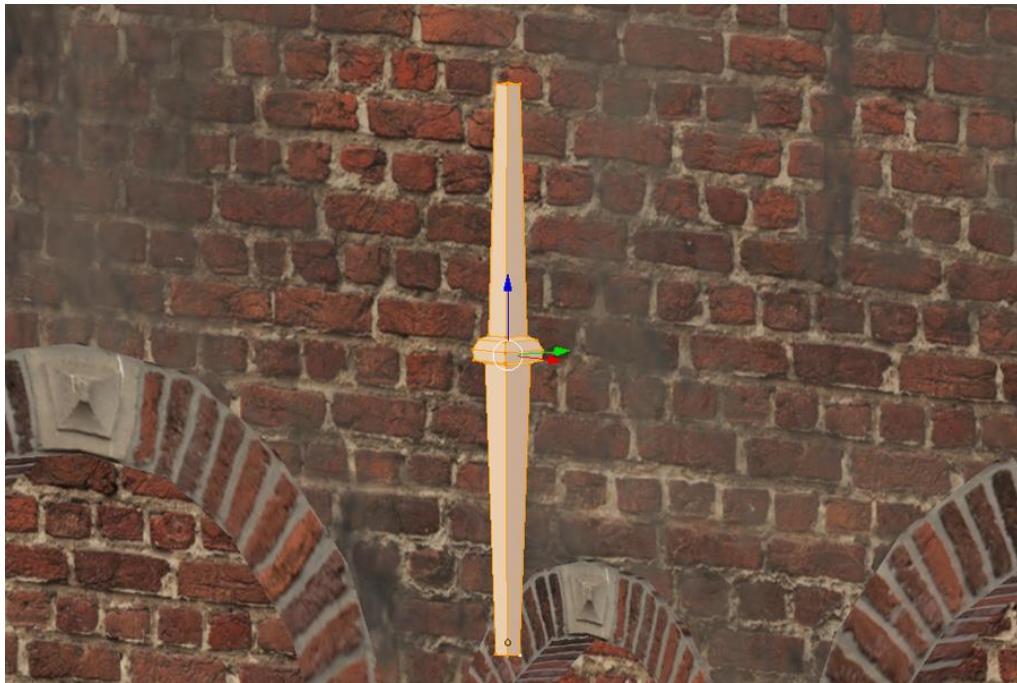
- **112.** Now it's time to add a roof on the building. Add a plane and try to get a shape like the one in the picture.



- **113.** When the roof shape is ready you can texture it. I used 'project from view'. If your scene has only one building, you can choose to model every single roof tile. We have more than 15 buildings in this scene, however, so a good normal and specular map will help us out.



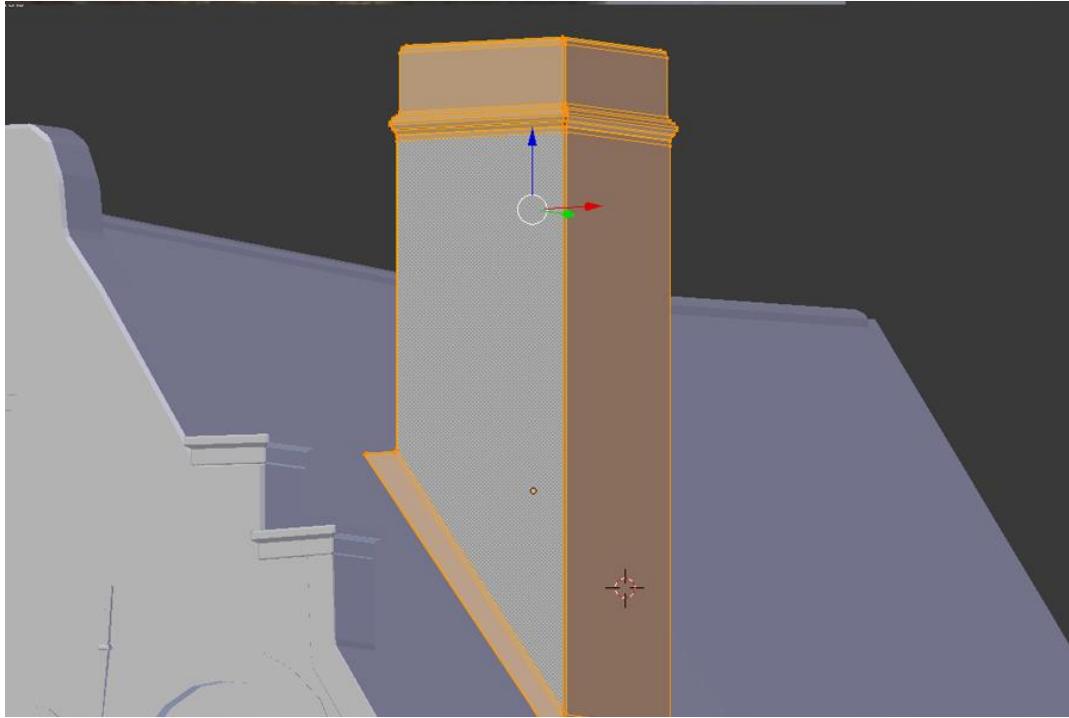
- **114.** I made a shape to make a transition between the horizontal and vertical roof tiles.



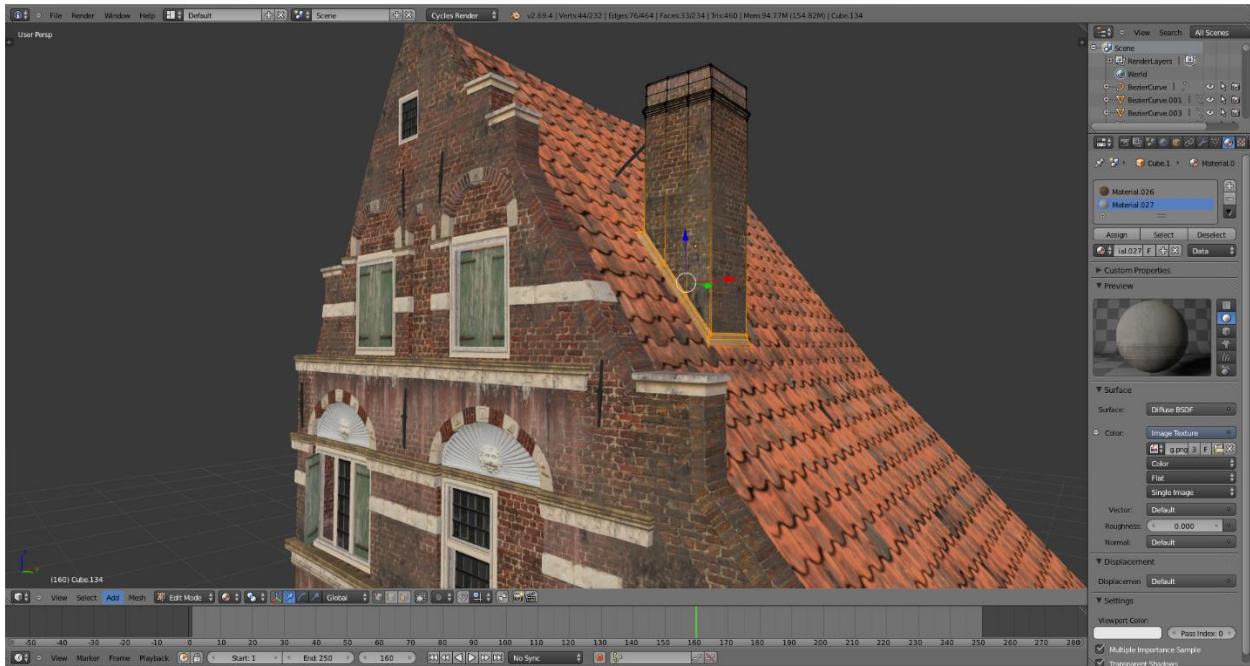
- **115.** We are almost done with the modeling work. Try to make as many extra objects as you can to make the building more special. This object is called a wall iron, and it provides more stability between the floors. You can make them black and a bit glossy.



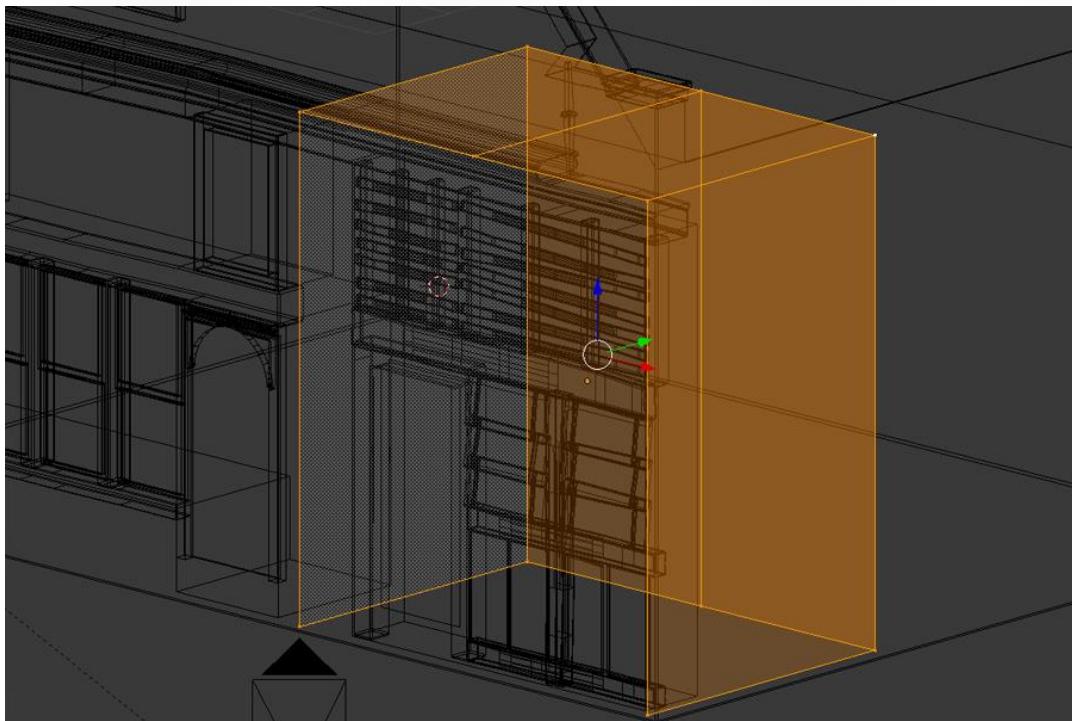
- **116.** A house without a chimney looks strange, so we have to model a chimney as well.



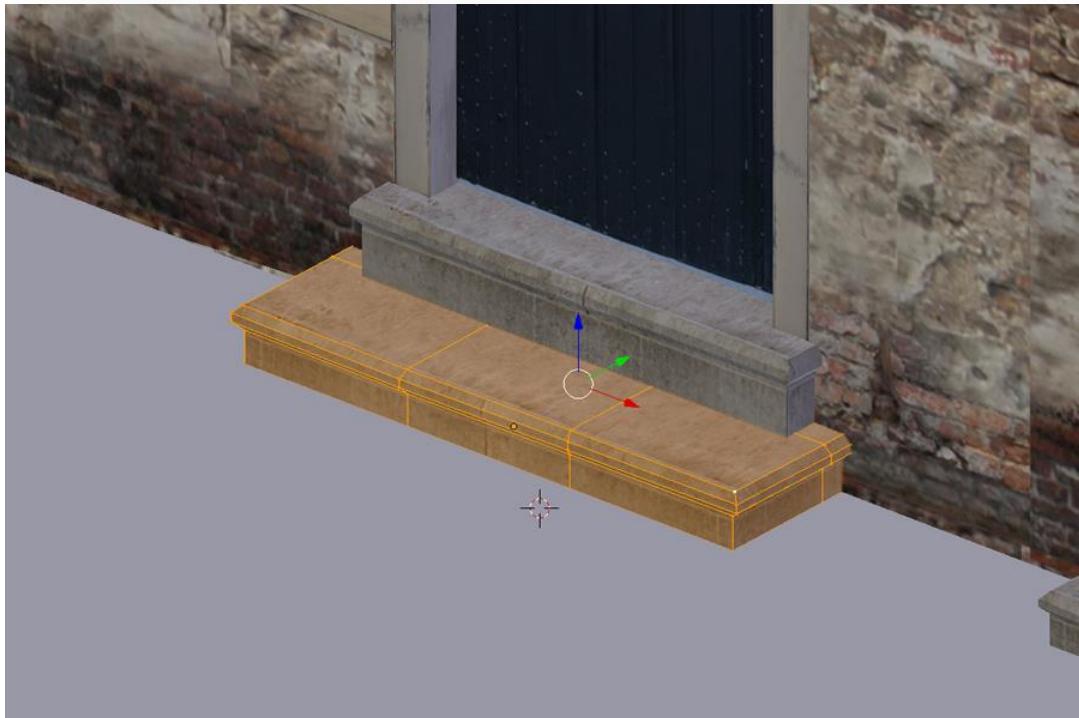
- **117.** Try to make the chimney a bit rough. This will look much more realistic than a smooth one.



- **118.** Enable a texture and do some dirt painting. I used a second material for the bottom. This will help to integrate with the roof.



- **119.** To finalize fill the empty spaces with cubes. I put a plaster texture on it so it looks like a room.



- **120.** Do not forget to make some doorsteps. They are the finishing touch in the scene.



In the end, the house will look something like this. Of course there can be an infinite number of variations. Most importantly, while making this part you need to spend time to make the scene original, make your building unique, use the right brick and find some nice ornaments.



That was a long modeling process, I made a [video tutorials](#) on this

Street furniture

One of the biggest problems in most 3D scenes is that they look too empty. We spend time on the base, add some buildings and sometimes the artist adds some trees or plants, but we forget to fill the scene with random stuff. I call this stuff “street furniture”.

If you go outside and look around, you will see a lot of props. Here in Holland you can always find some bikes against the walls as well as bins, fences, street lights, and much more stuff. All of these props make a scene look complete. If you visited a city and there were no props, you’d think, “Hmm, what’s going on?” So why should we leave them out of our scenes?

Of course, I made this same mistake when I started developing 3D street environments. Below are some nice examples:



I started working on this scene in 2012. Without props it looks too clean and you know something is wrong.

(Fig 3)



This is the same scene with some tweaks. Most importantly I have added the props on the right, which make a big difference. (Fig 3.1)

The most important difference between these two examples is that in the second example it feels like people are living here. It's not a ghost town anymore. Take time to find out what kinds of props are important for the scene. For medieval scenes you need to find out what kind of tools they used. The right combination of props makes the scene look so much better.

The next thing we are going to do is create some street furniture. To find out what we need I made a selection from the painting.



(Fig 3.2)

We can see some stools, a barrel, and some wood in the water. There are also some vegetables, a table, and some buckets. In addition, I decided to design some doorsteps.

You can make whatever you want, but keep in mind that it must come from that period and fit in the scene.

I once made a big mistake by creating street lanterns, which I later found out were invented in a later century.

One last thing: don't put too much rubbish in the scene. You still want the props to have a function. You don't want to make the place a total mess.

Now let's start with creating some props.



Street furniture

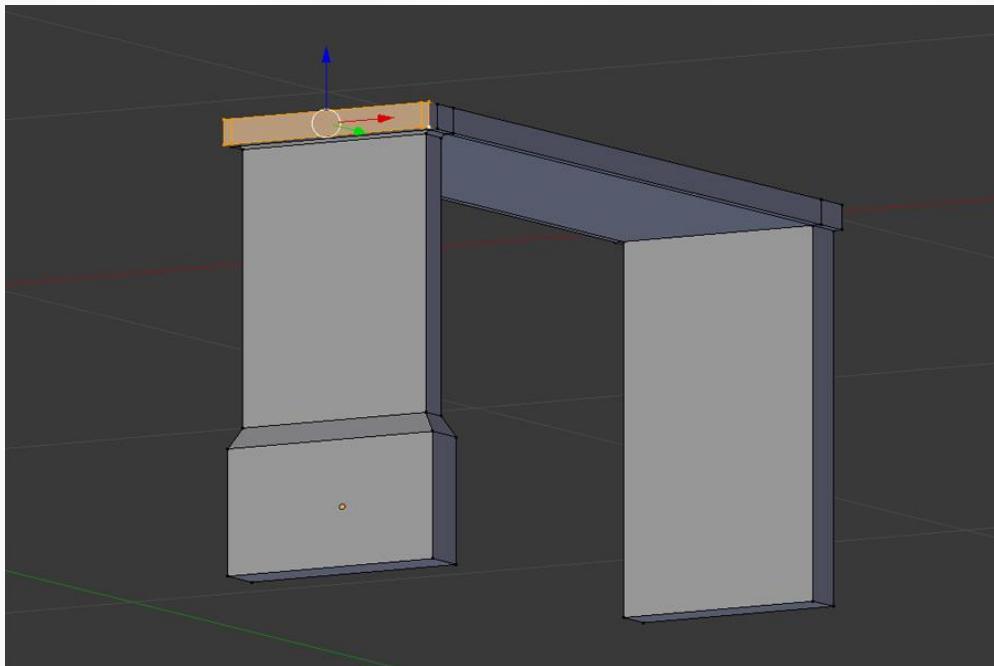
Creating props

A big problem when you start with environment scenes is that it's hard to find out what you are missing. You want the best light settings and a realistic look, but focusing so much on these details will sometimes cause you to forget to add in a scene.

This chapter is all about adding street furniture.



- 1. I am starting by creating some stools that I like to use for the buildings. To start, I add a cube and transform it into a nice shape like in the picture.



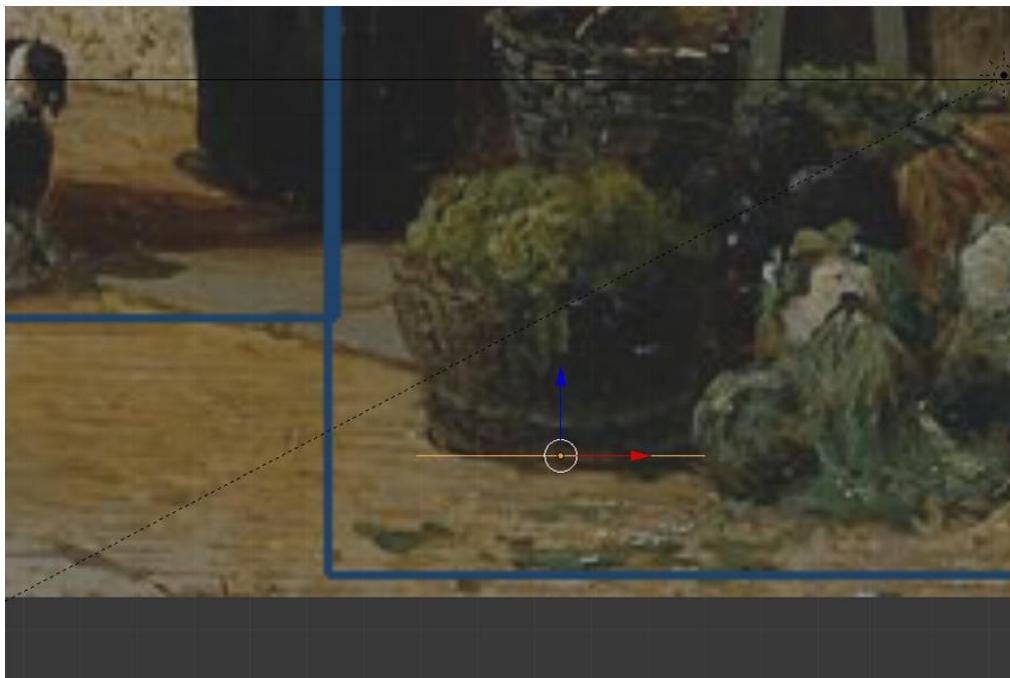
- 2. Don't make it look too simple. Try to extrude some parts so the stool has some overlapping. If it is possible, you can make it smoother. The bevel function will not always work with complex objects.



- **3.** I used a simple wood texture for the stool. After applying a normal and specular map the prop looks good.



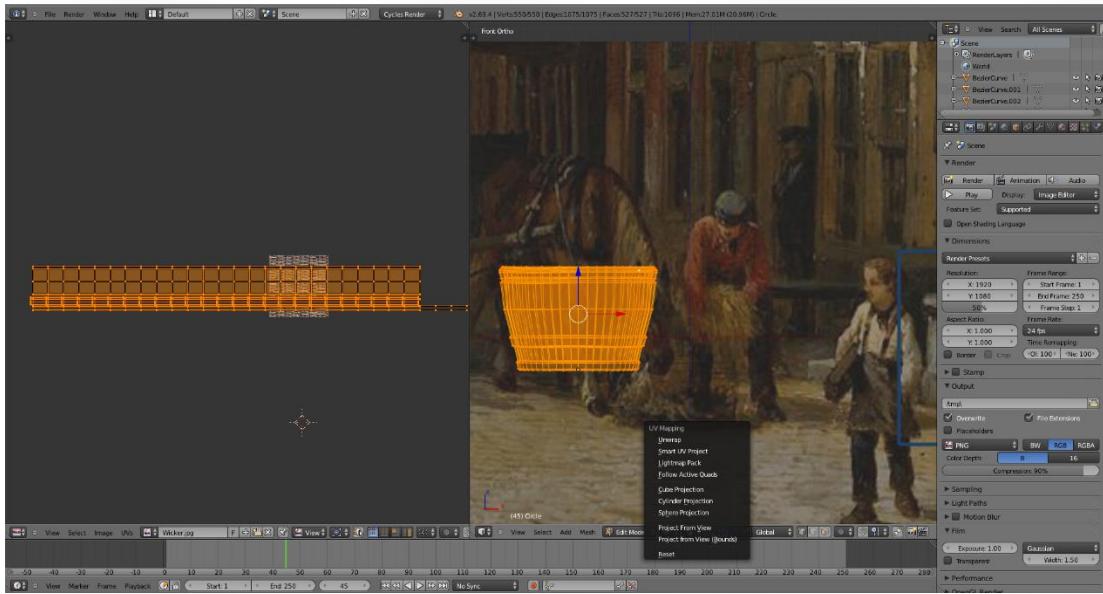
- **4.** Use some variation and try to make it a bit bumpy. You can do that by adding some extra lines and moving the vertices. I made one version, but more variation will only make your scene look better.



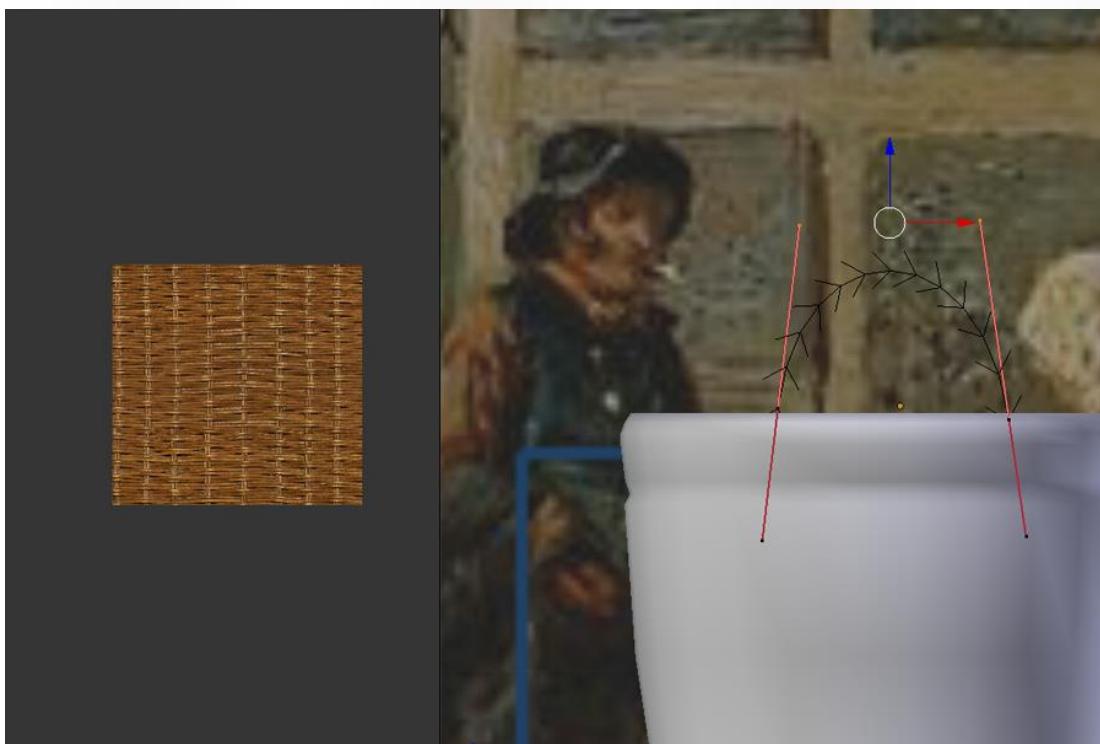
- 5. Buckets always do a great job in a medieval scene. You can just put them in a corner, but in this scene we put some vegetables in them. Start with a circle and bring it into position.



- 6. There is not really a special way to create a bucket. What I do is look at the sample and try to copy the shapes. Try to extrude the circle and scale it every time. You can make every shape you like. Just try it out.



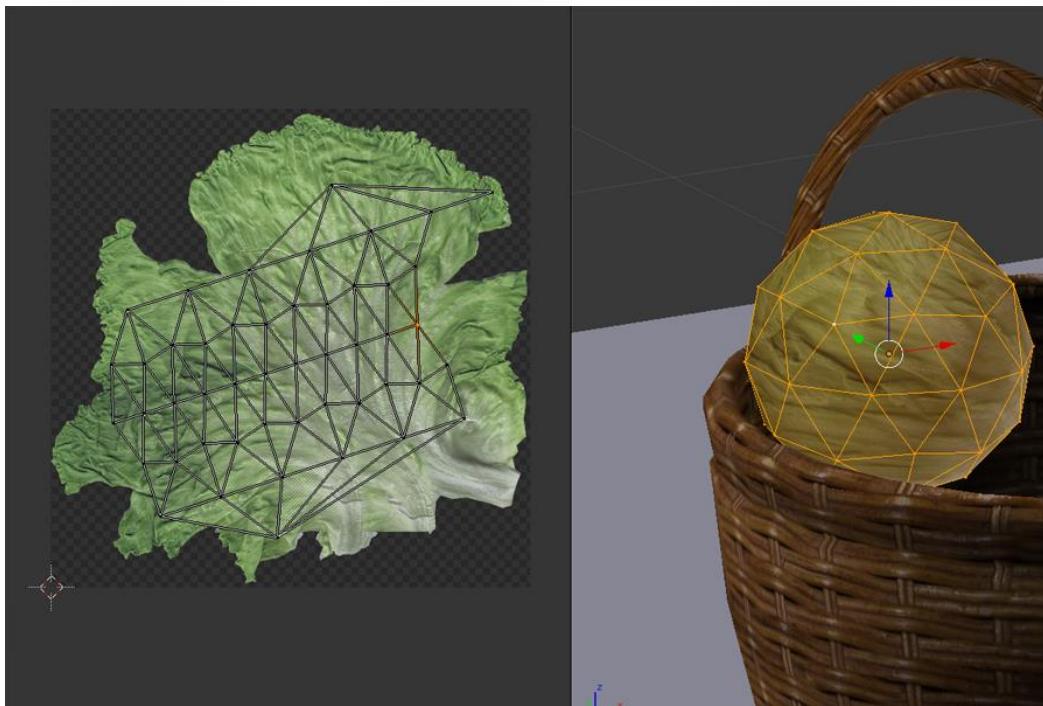
- 7. Once you have your shape you have to put on a texture. The best thing to do is to use a tiled bucket texture. To UV map the object I used cylindrical projection.



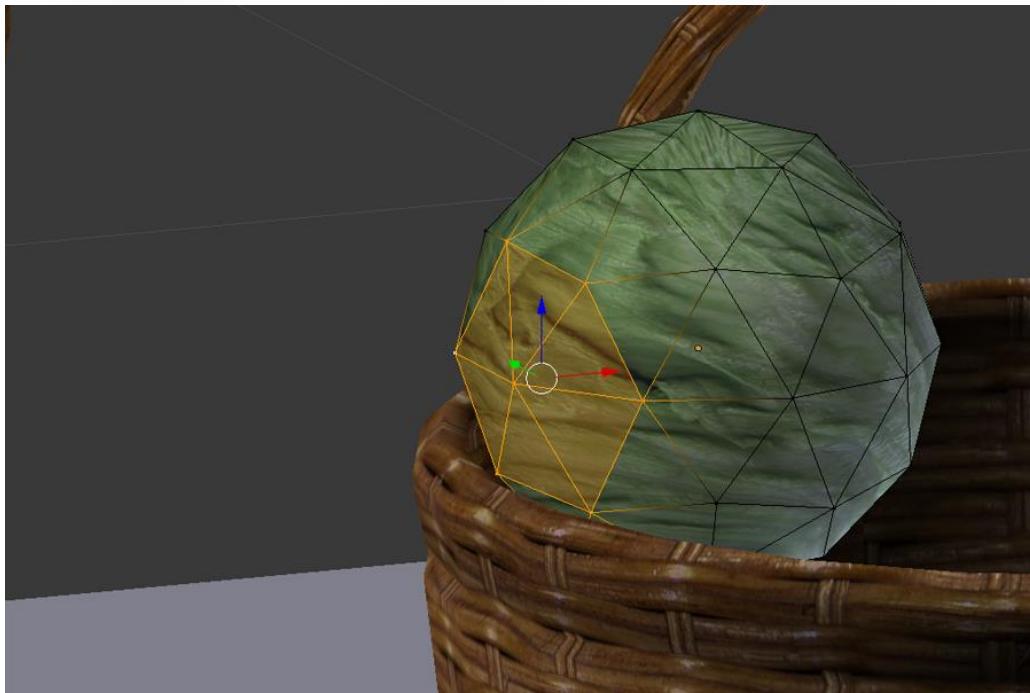
- 8. Don't forget to make some nice handles. It is a small detail, but the bucket will look much better with handles. Use a Bezier curve by changing half to full in the settings. We use a resolution of 1 but you can use any thickness that you like. To change the curve to a mesh, go to **object -> convert to --> convert to mesh**.



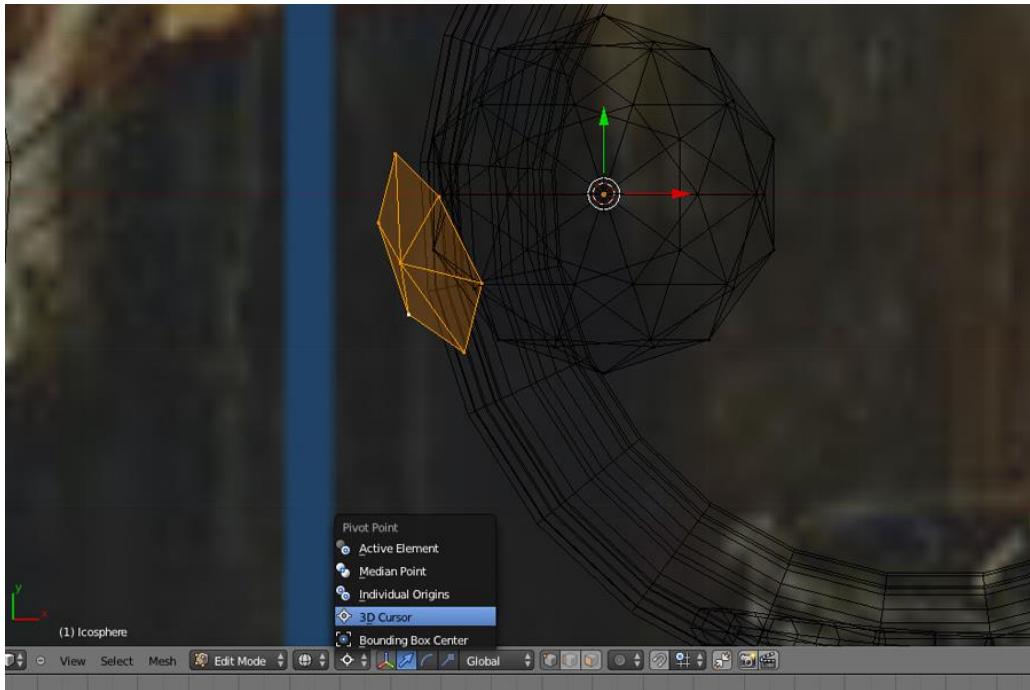
- **9.** You can make some big and small buckets, and try to use different types of textures.



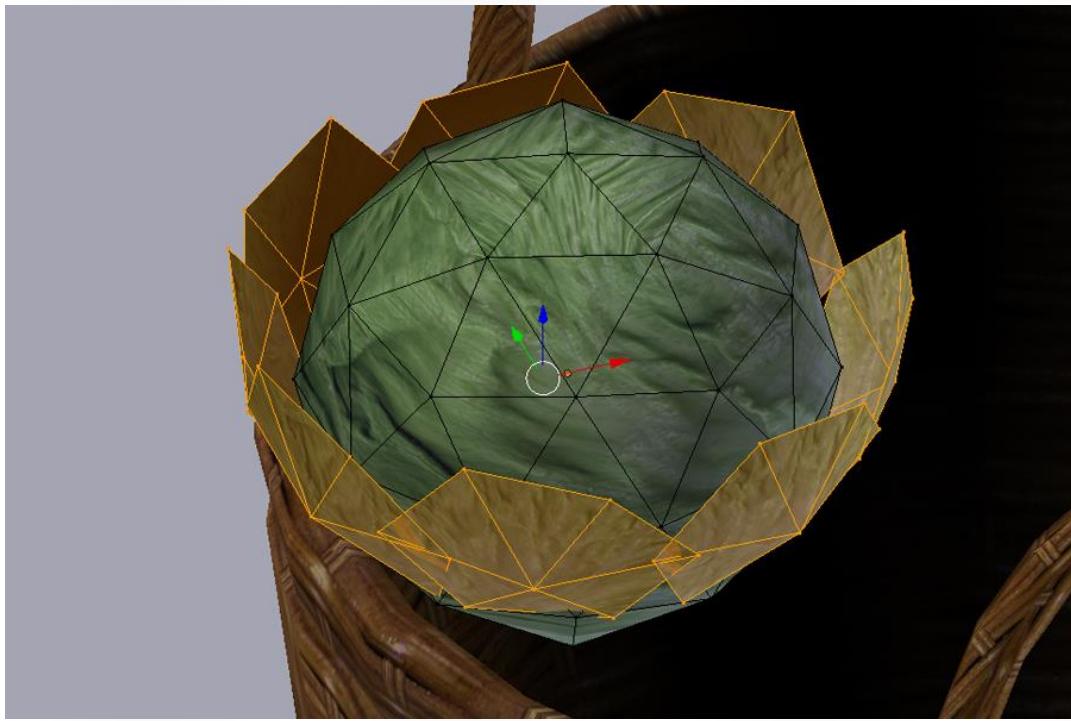
- **10.** Of course, we need something to put into the bucket. I made some vegetables. I made some vegetables. Add an ico sphere and make a UV spherical projection.



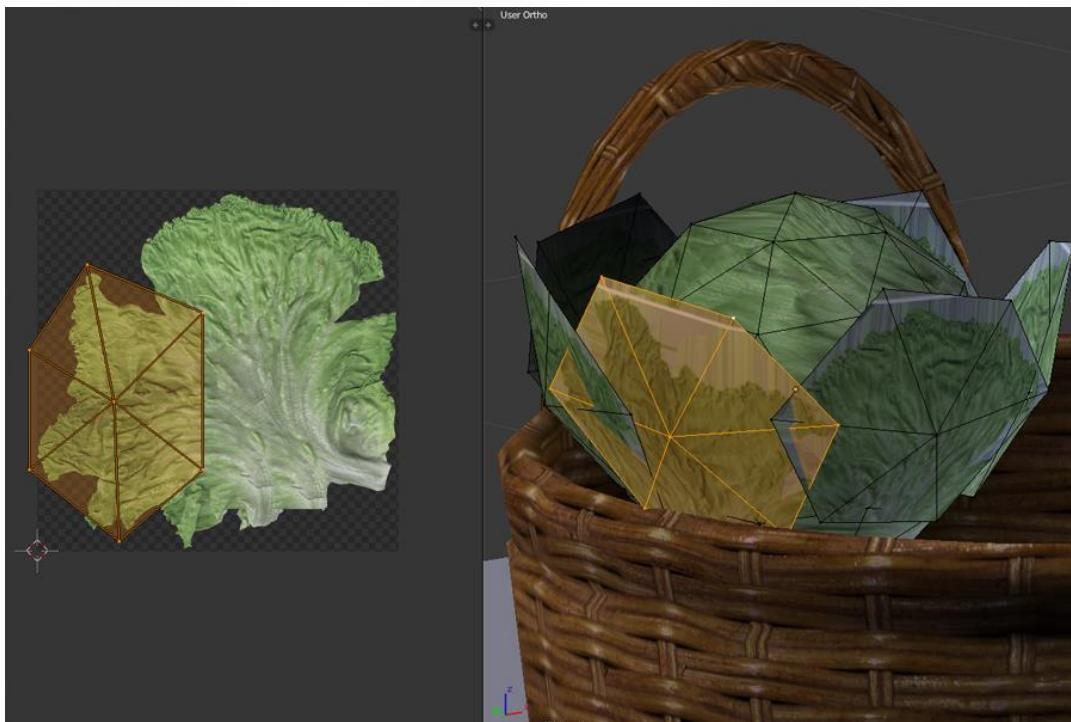
- **11.** A simple ico sphere, however, looks a bit boring and is not realistic. We need to add a bit more detail. Select some vertices and copy this shape.



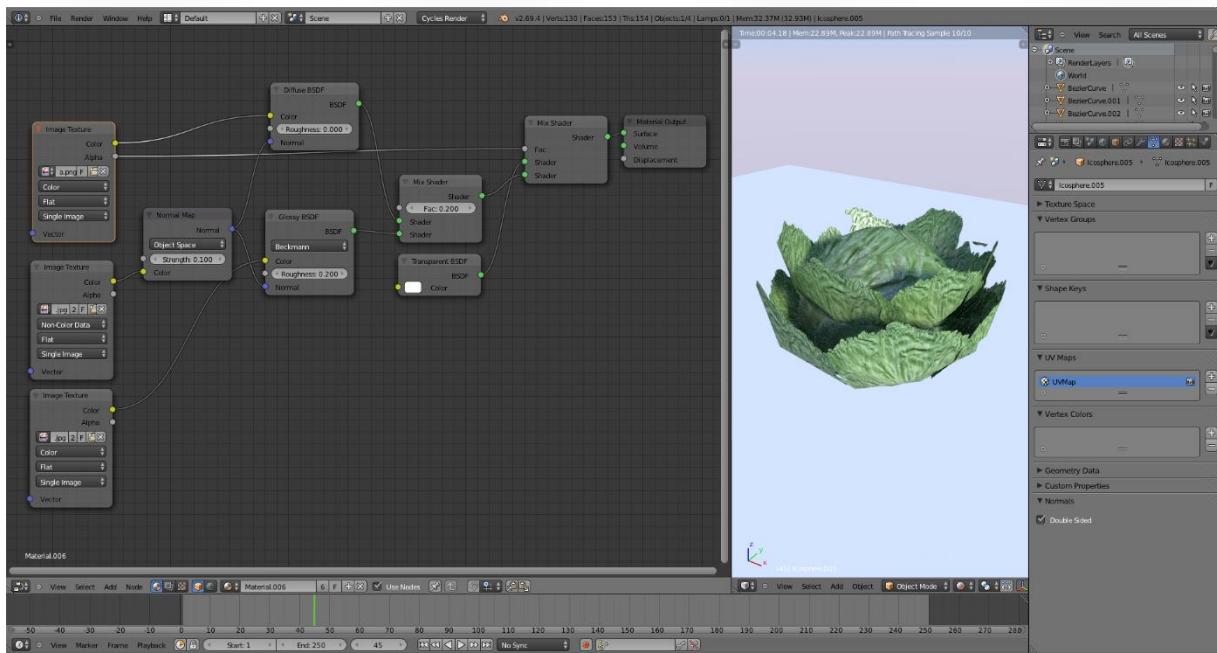
- **12.** You can easily rotate them to change the median point. Put the center on the orange dot and make it to rotate on the 3D cursor.



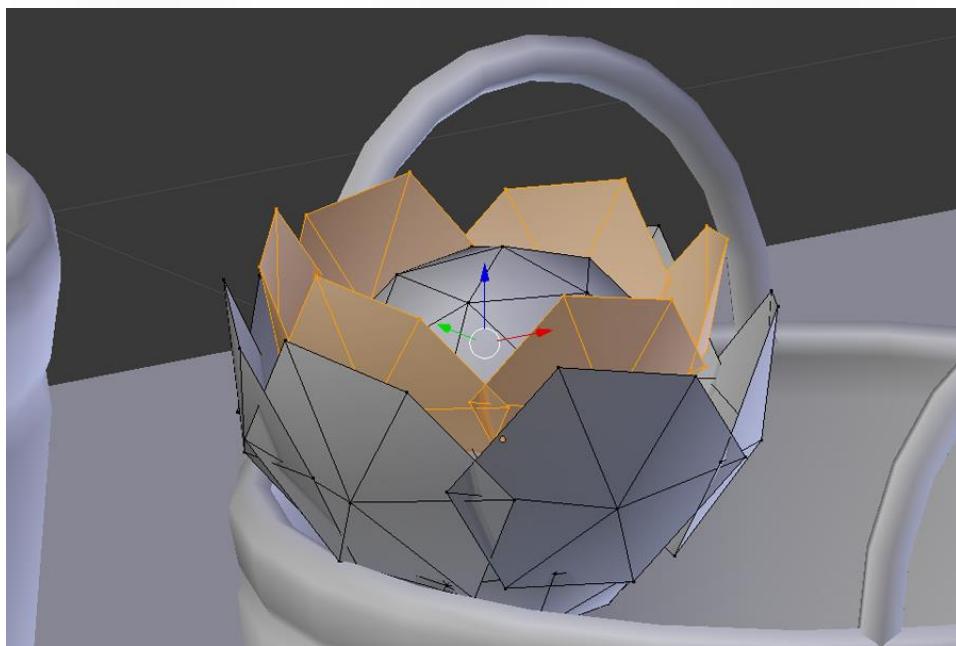
- **13.** When you are done rotating the vegetable parts, it will look a bit like the picture above.



- **14.** To make it look more realistic we are going to use some sides of the texture. To get the best result, make variations and don't use the same piece in the texture.



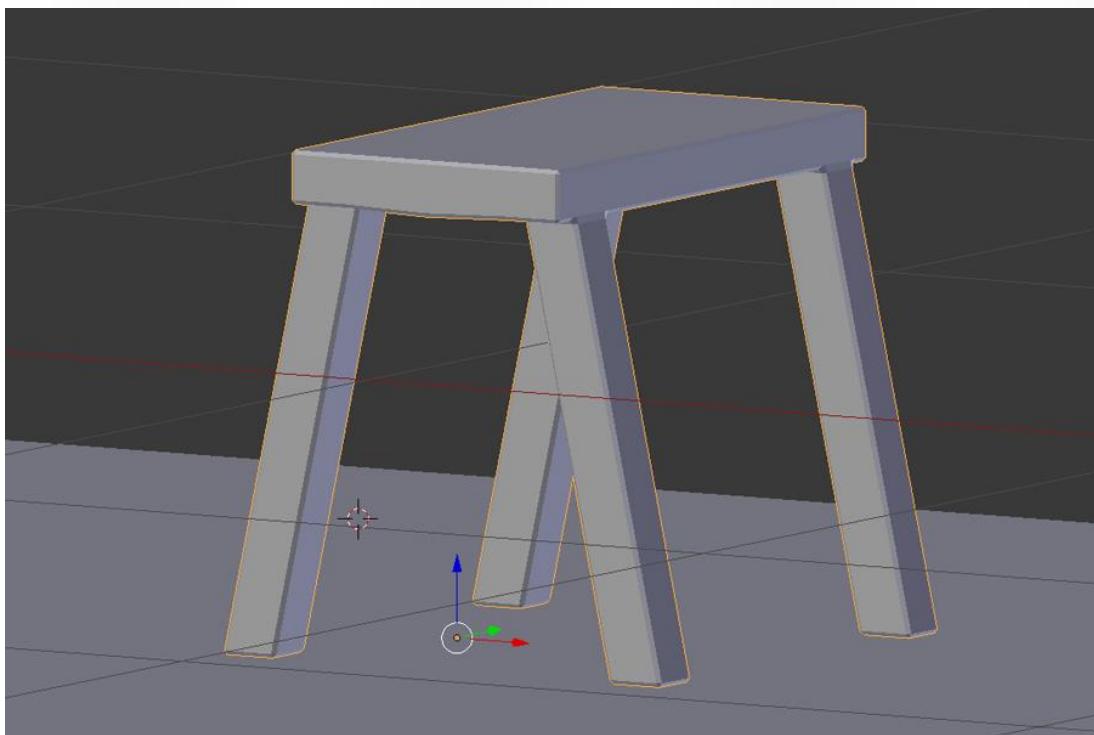
- 15. To apply the transparency you need to make the next combination. Add a Mix and a Transparency shader. Put the transparency in the top shader input, and put your other mix shader in the shader that is below the transparency. The last step is to put the image alpha into the FAC of the mix shader.



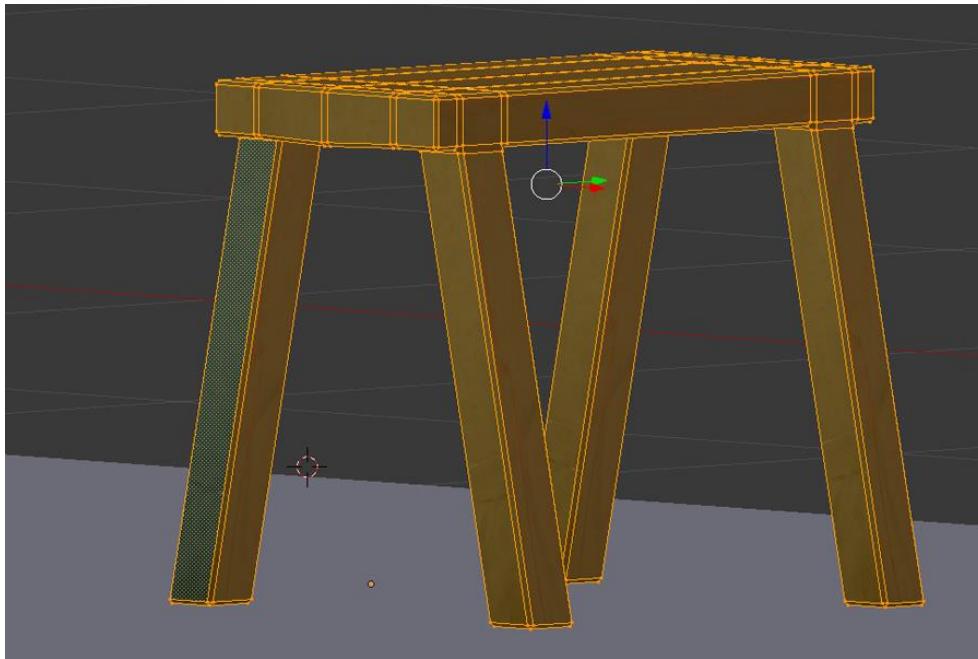
- 16. You can make some more variations. Duplicate them and rotate it a bit. One more thing that makes a cool effect is to apply a solidify modifier. This will add some thickness.



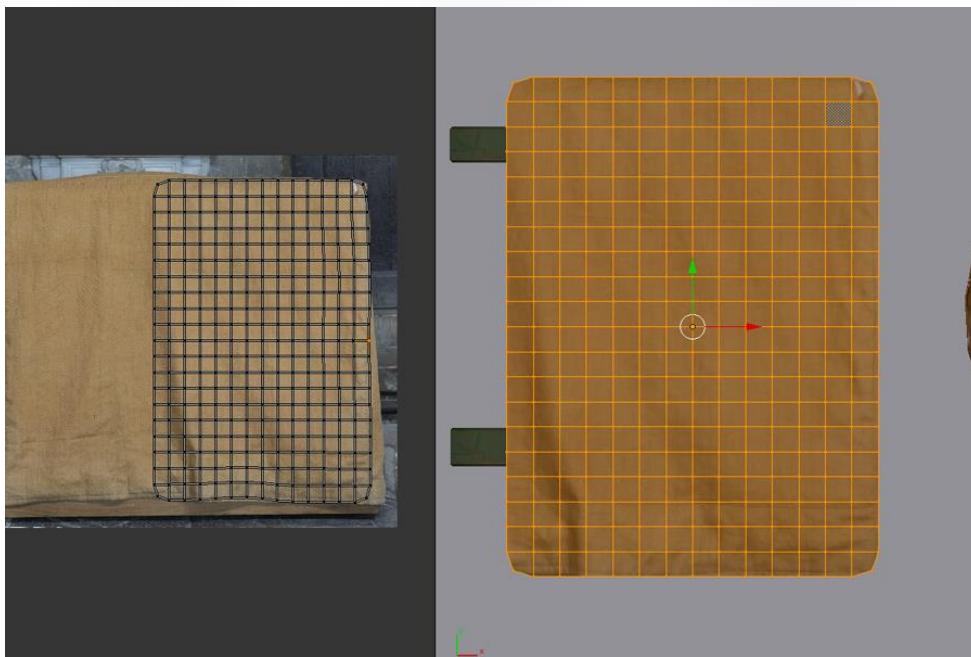
- **17.** Duplicate the vegetables and put them all into the bucket. To add variety you can make color variations. Just change the color of the texture and apply it.



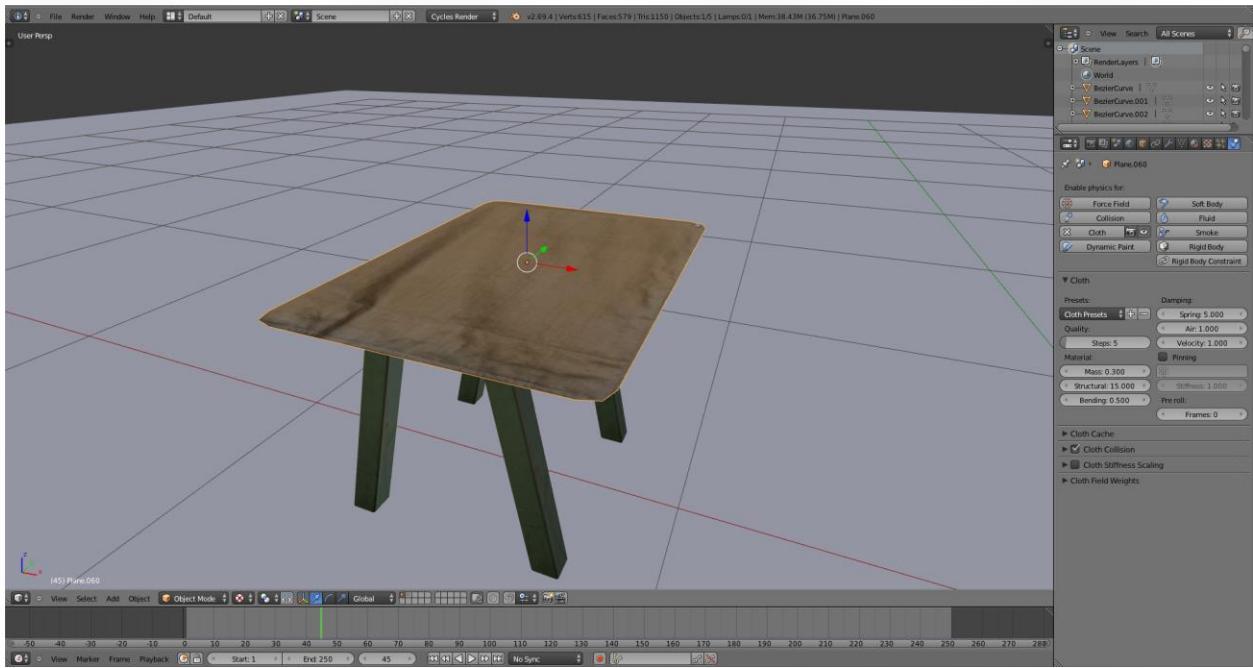
- **18.** We continue with making more objects. This is a little table.



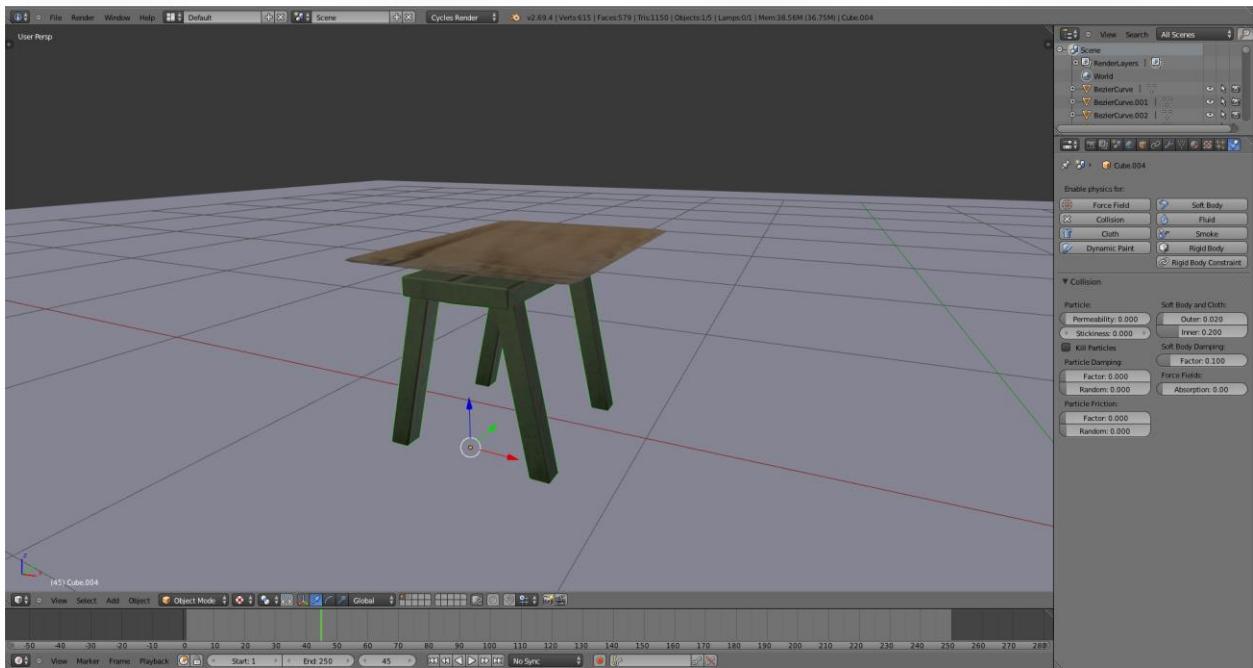
- 19. I used the same texture as I used for the stool and the hatch for this table. This is a smart way of using textures. In the picture above you can see the typology of the table. I used a bevel for some smooth edges.



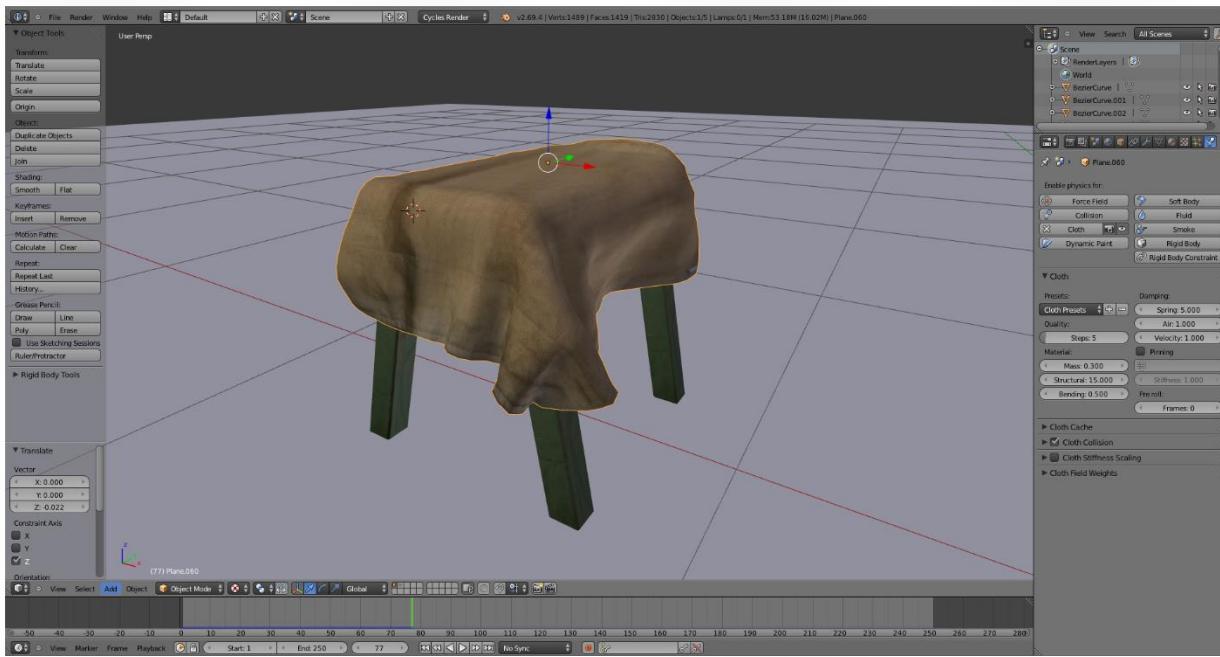
- 20. I like to put something on the table, sort of a tablecloth. Add a plane, stretch it a bit and make some extra lines. Try to make some squares. We are using a cloth physic, and rectangle shapes won't work with that. To make smooth edges, apply a subdivision modifier.



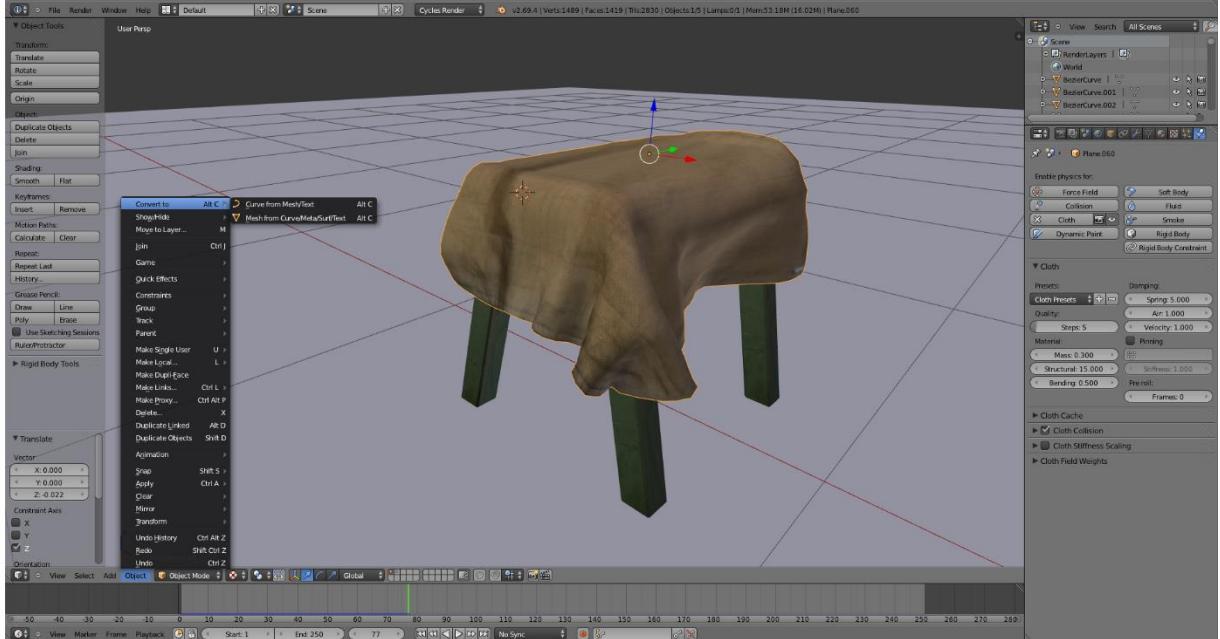
- **21.** First, select the table cloth and enable the cloth physic.



- **22.** The next thing to do is to select the table and enable collision. Now this object will interact with the cloth.



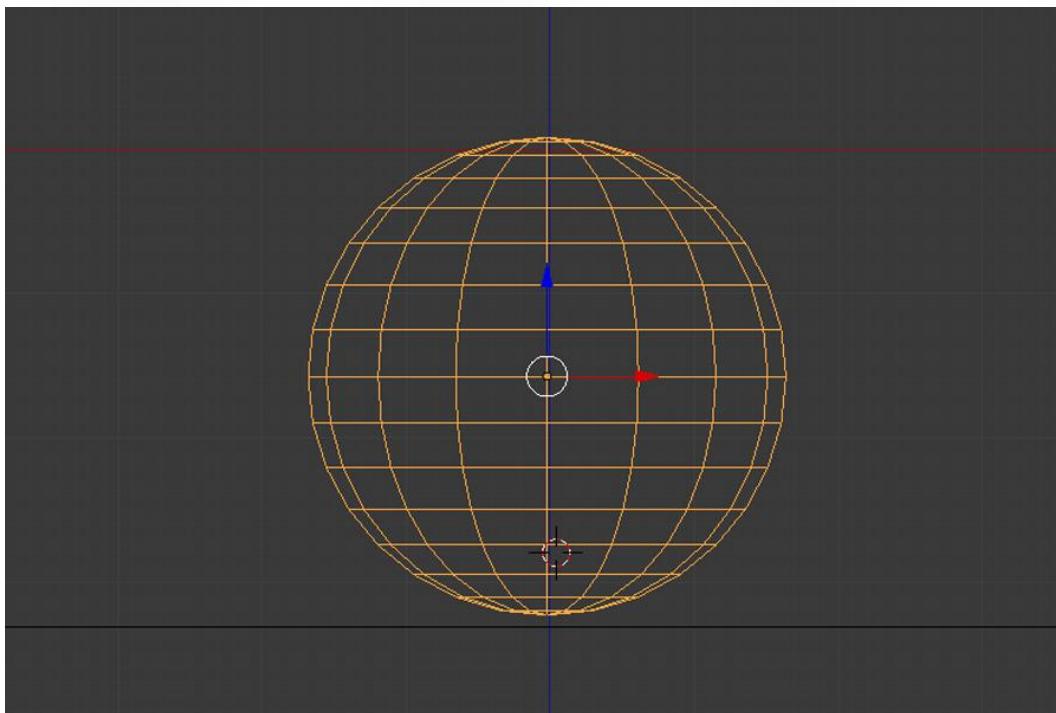
- **23.** Before you animate the cloth, make it smooth, or else it will look a bit rough. Now press **ALT+A**. If nothing happens, you need to change the animation frame to 1. Now the cloth will fall over the table. Try to stop the animation at the point that you think it looks the best.



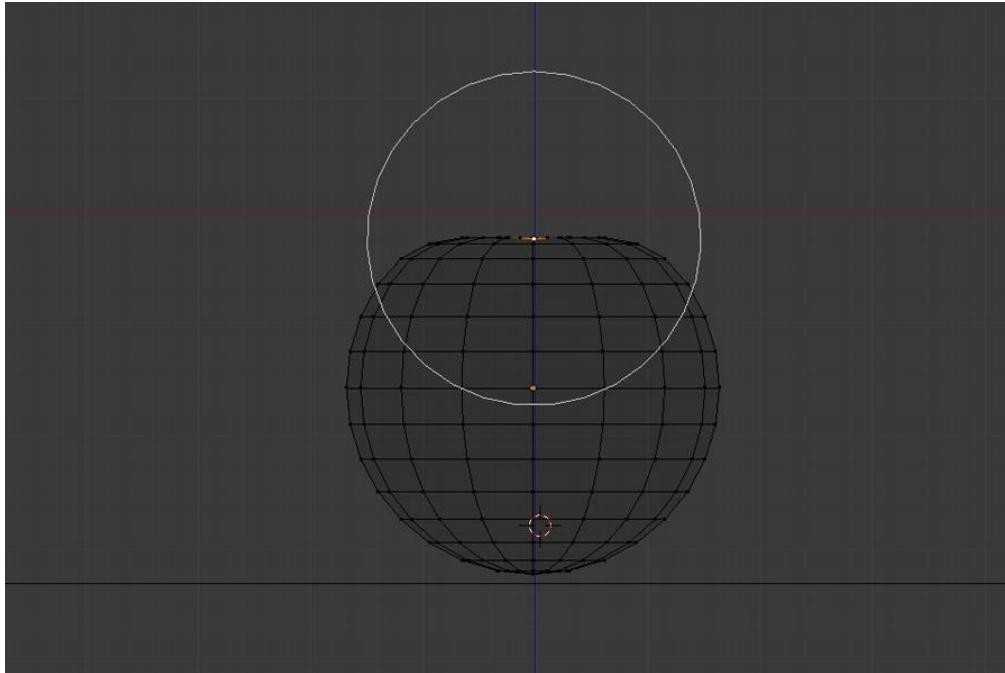
- **24.** To freeze this cloth into a solid mesh, go to **Object --> convert to --> Mesh from curve**. If you are not happy with the final result, you can also change the cloth material in the options panel.



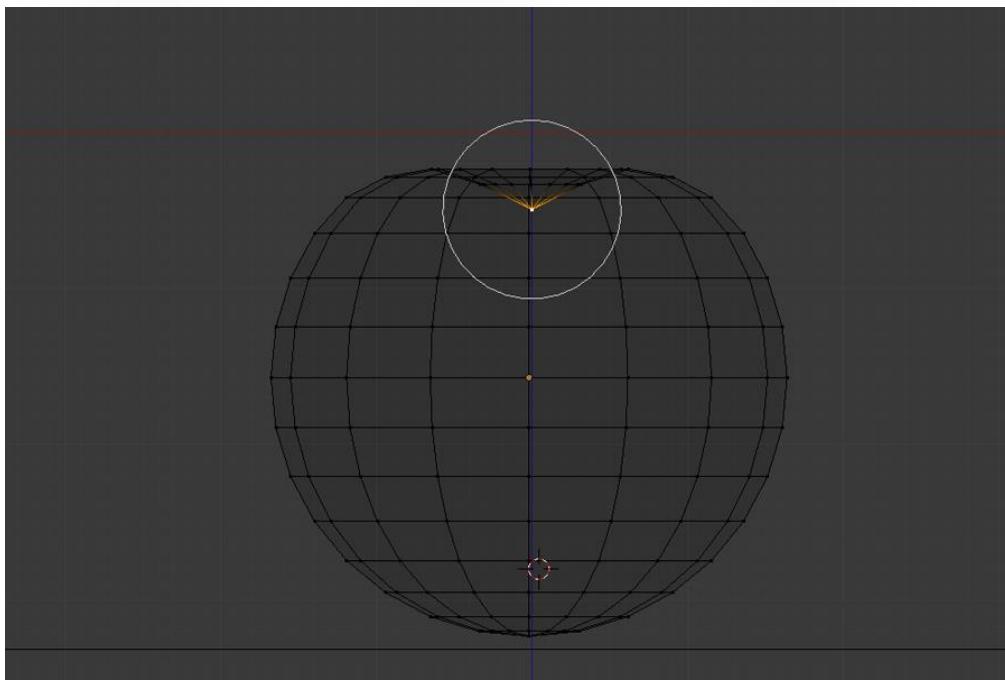
- **25.** Sometimes the cloth seems to be floating in the air. Select the object and move it downwards. Now it's time to put something on the table. Let's create some fruit!



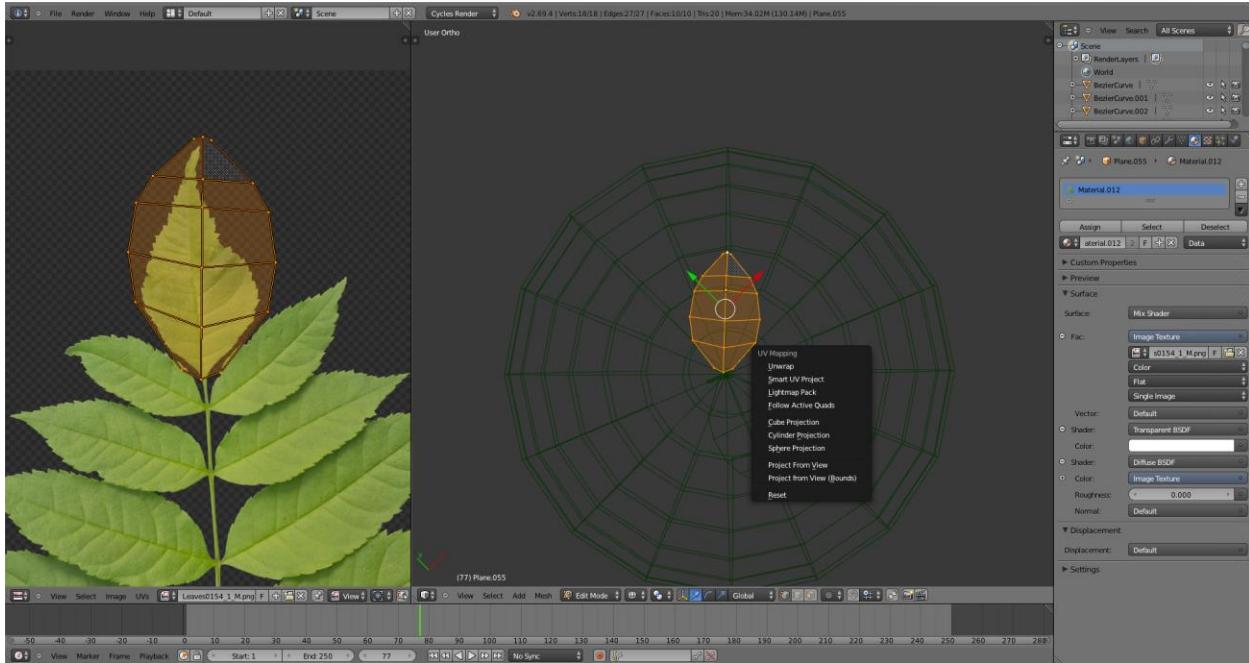
- **26.** To start with the apple you add a UV sphere. To make it low poly, open your object settings and lower the segments back to 16.



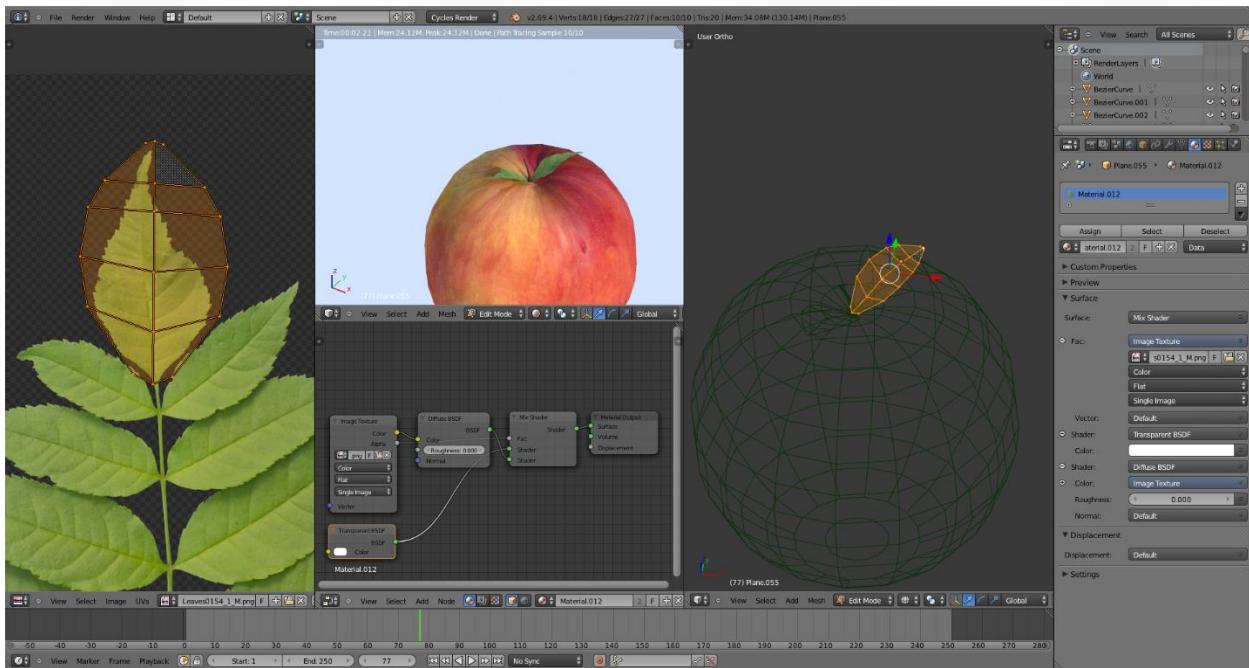
- 27. To create the apple effect, press O to make a notch in the apple.



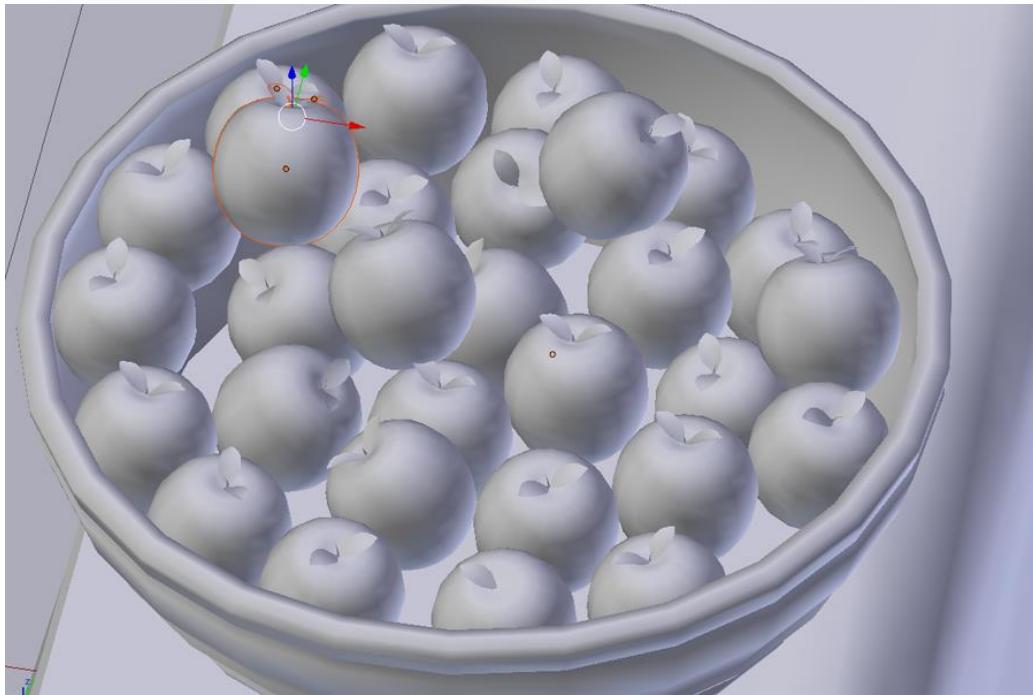
- 28. Make the circle smaller (middle mouse scroll) when you make the notch. This will generate a nice hole in the apple.



- 29. A nice detail is adding some leaves on the apple. Make them transparent.



- 30. When this is done, make some apple variations. They don't all need to have leaves. Some apples are big; some are small.



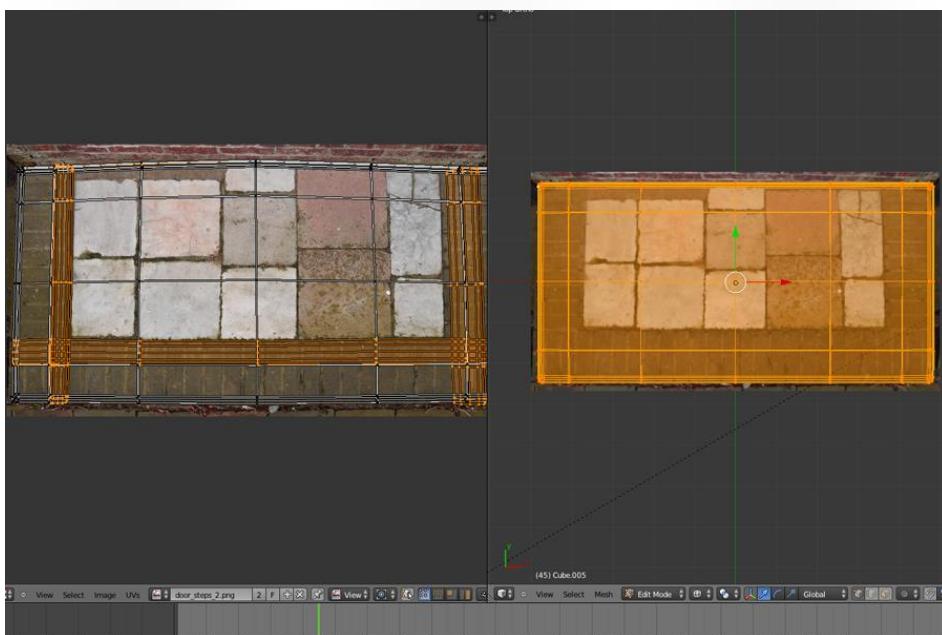
- **31.** This is a sample of a bucket filled with apples. Try to be creative, you can also add other food or change the color of some of the apples.



- **32.** When you put them in the bucket, it looks like this. Of course the effect will be much better when you apply a normal and some specular.



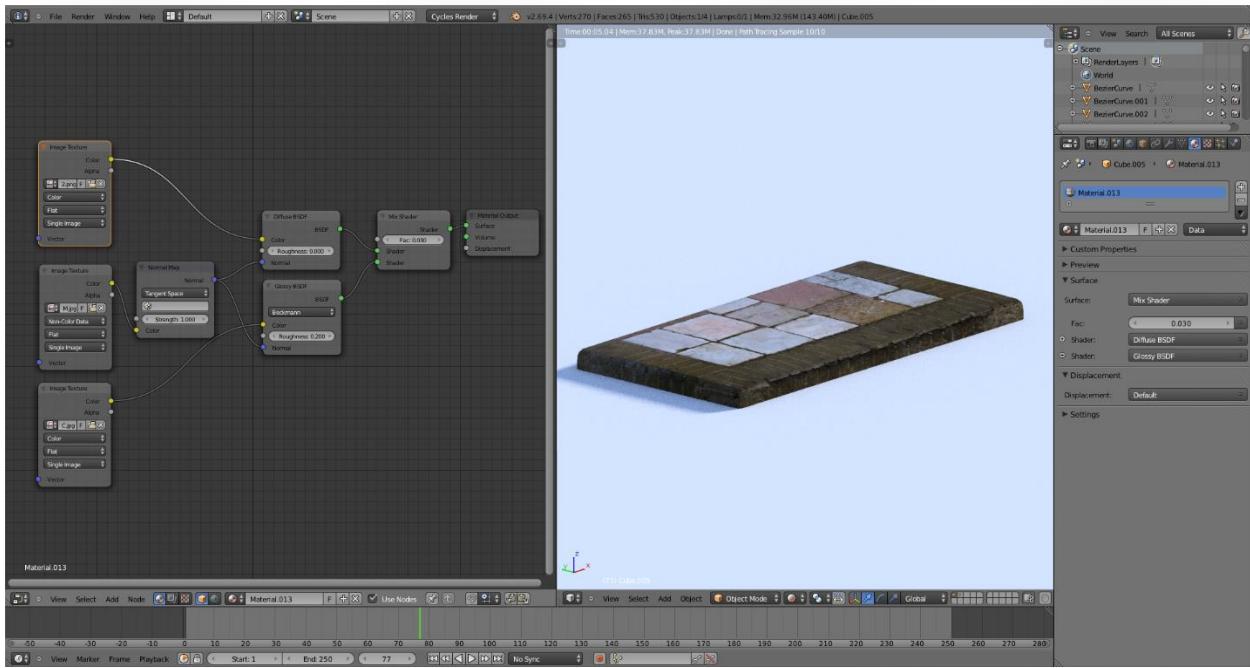
- 33. When you are done you have some nice props. You can use these everywhere in the scene.



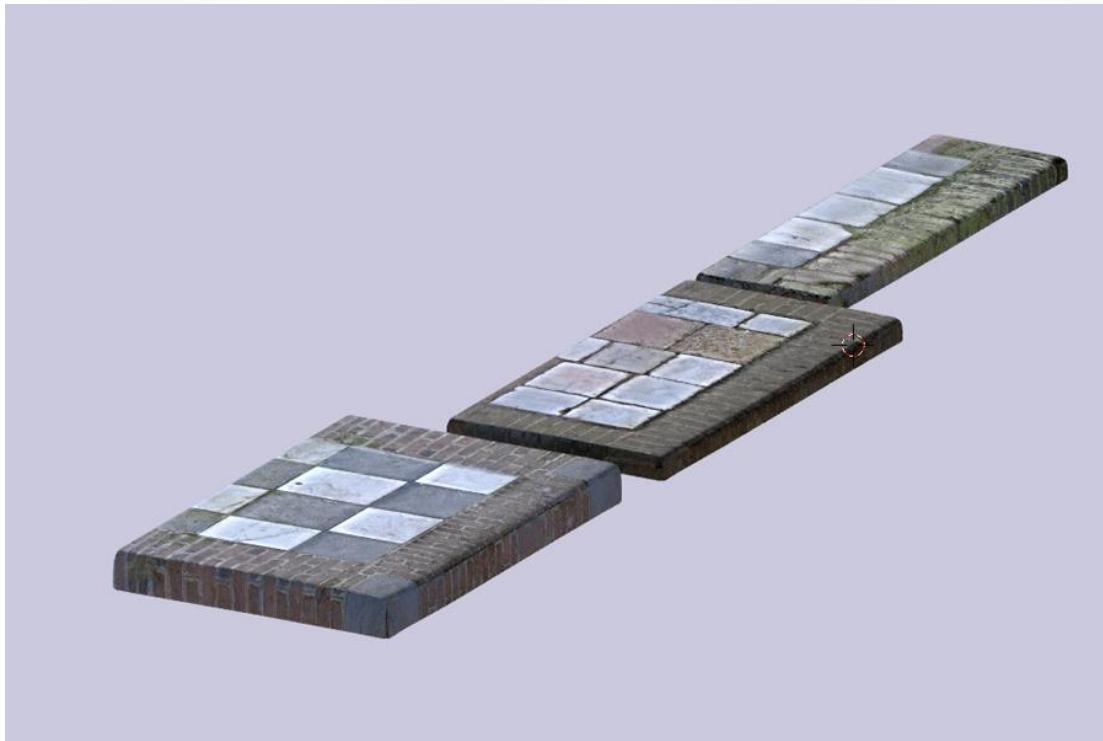
- 34. Next we will create some doorsteps. Start with a cube and scale it till you have the right shape. Use the image as your reference. Apply a subdivision modifier to make some smooth corners. I used the 'project from view' projection to add the texture.



Fake it till you make it, you don't need a photo realistic prop to create a nice environment



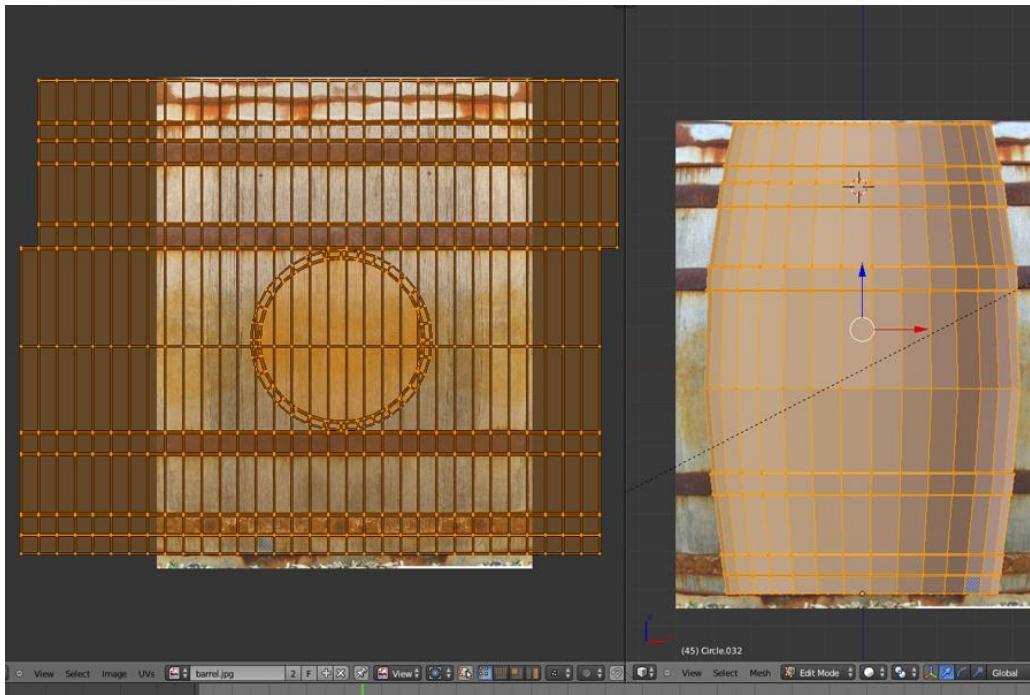
- **35.** These objects really need normal and specular, otherwise they look flat. When you apply these shaders though the effect is great.



- **36.** The more variation you make, the better your scene will be. Four different types are enough to fill a scene with more than 14 houses. Without these doorsteps, the transition between the house and the street is a bit hard.



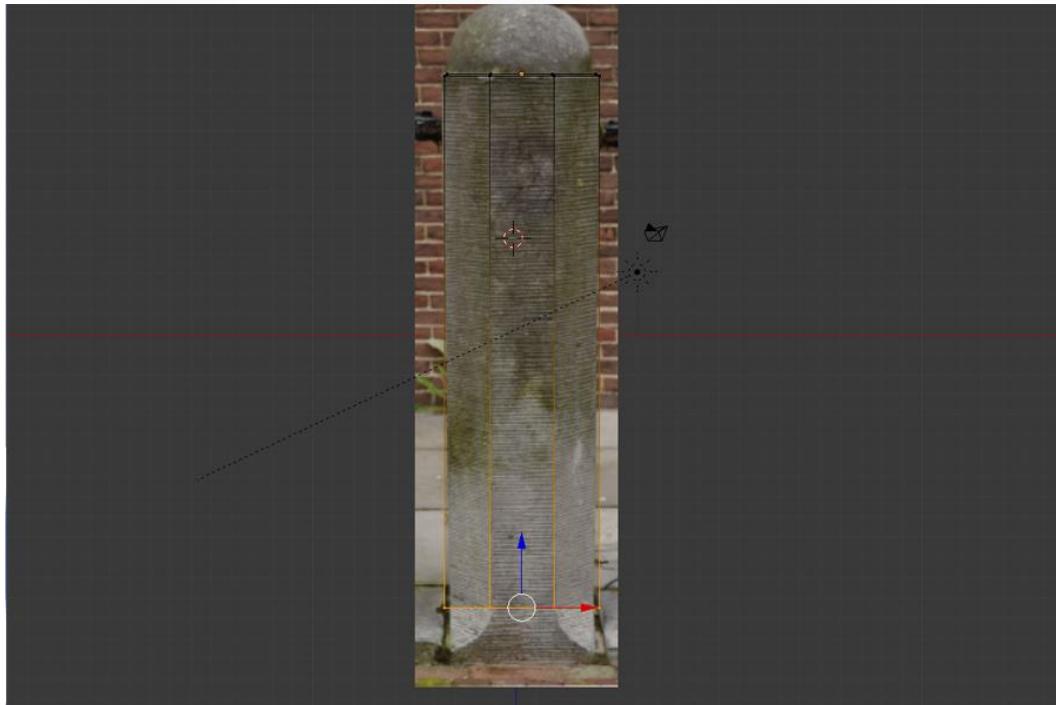
- **37.** Combining the doorsteps with the props makes it look more complete. Of course it's still a bit empty. So let's make some more props.



- **38.** A medieval scene is not complete without some rusty old barrels. To create this shape start with a circle and extrude and scale it till you have the shape you want. I used the texture as a reference. In the end I used the cylindrical projection to apply the texture.



- **39.** The final result is a simple barrel. You can put them everywhere in the scene. They do a great job. Of course, you can use different types of textures.



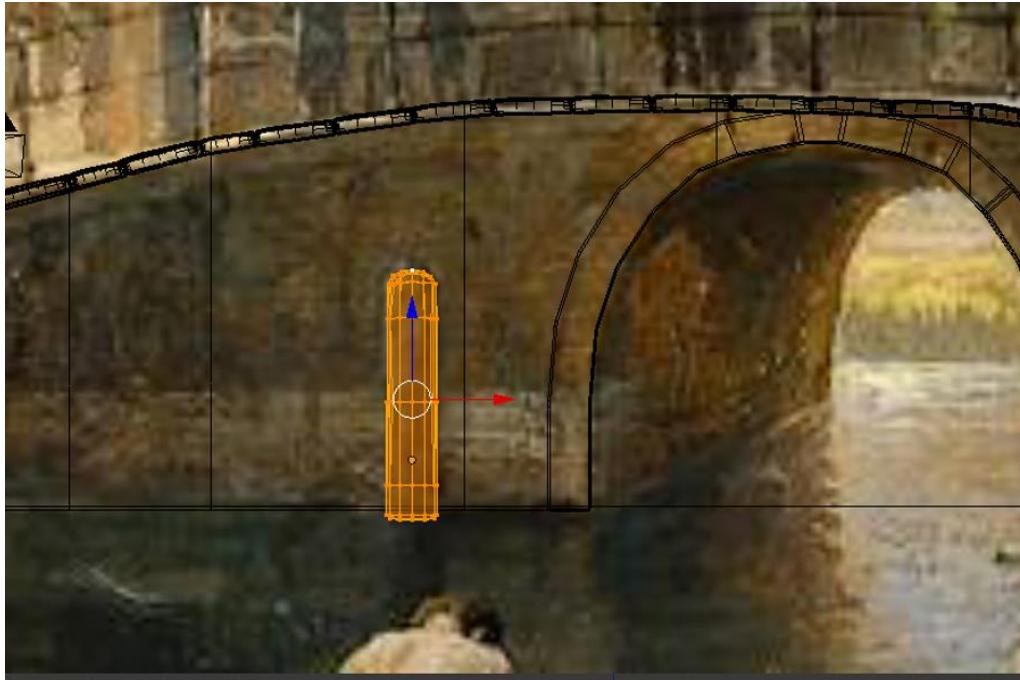
- **40** The last object we will make is a pale. It's my favorite prop because the light makes a nice reflection on it. I start with a circle with 8 vertices. Extrude them till you have something like this.



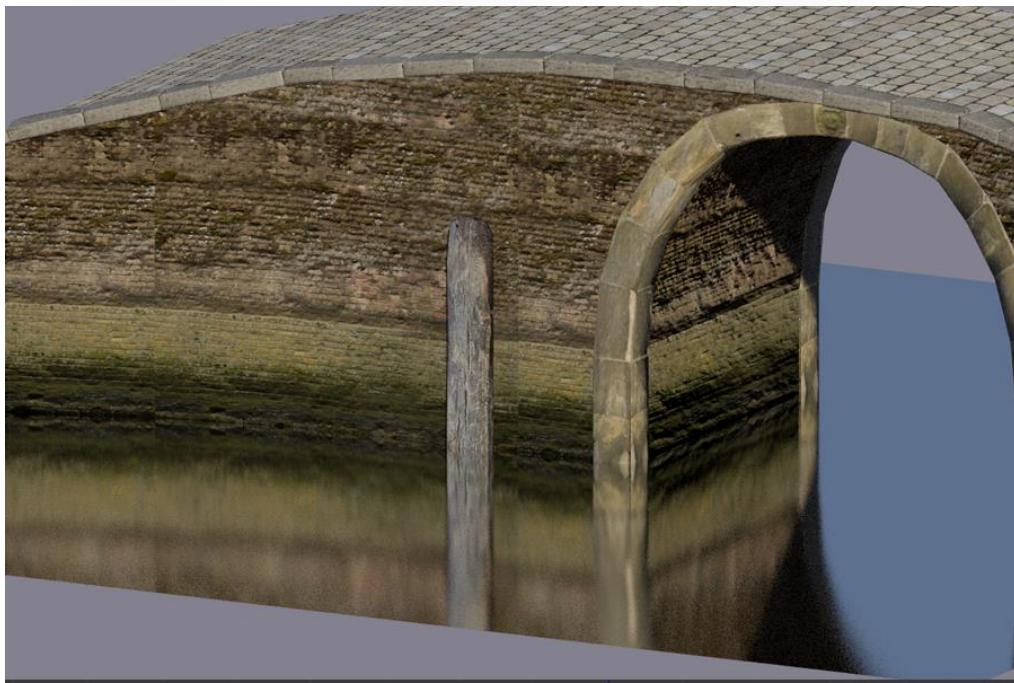
- **41.** The downside is that the pale is a bit complex. Extrude the vertices and scale the middle ones a bit. You have to do the same thing on the other side. That's pretty much it. Now create a sphere and cut it in half. You can use this on top. I used 'project from view' to apply the texture.



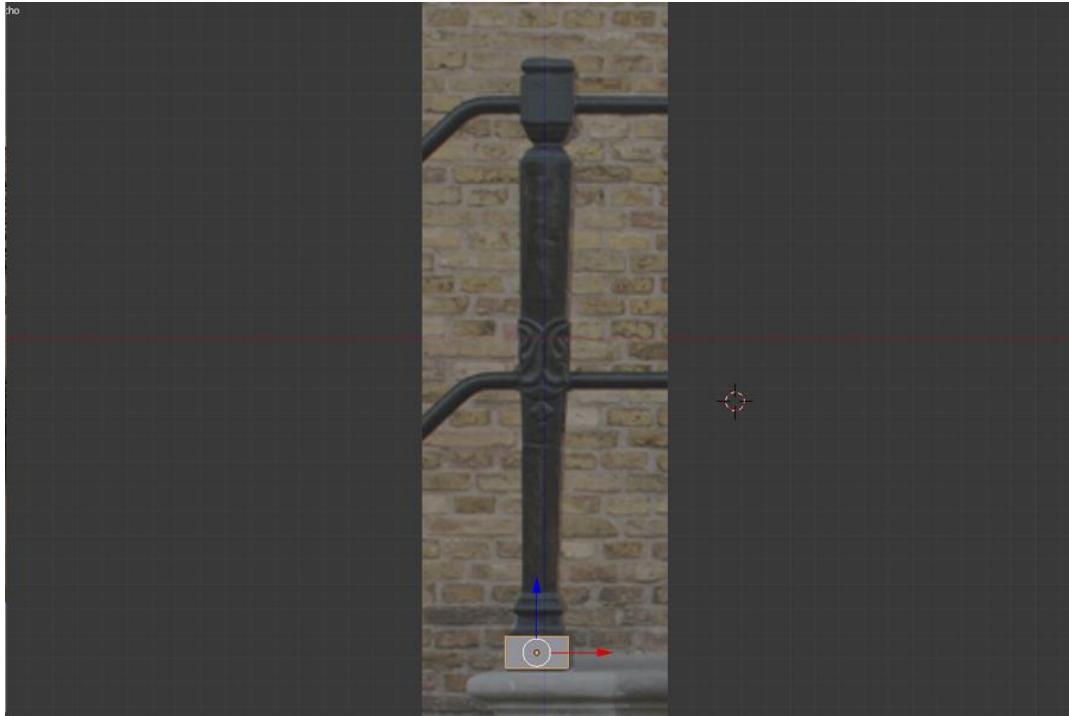
- **42.** When you look at the shape it has eight sides. This works great when you put a light on it. You can see bright and dark sides, which gives the effect of depth in a scene.



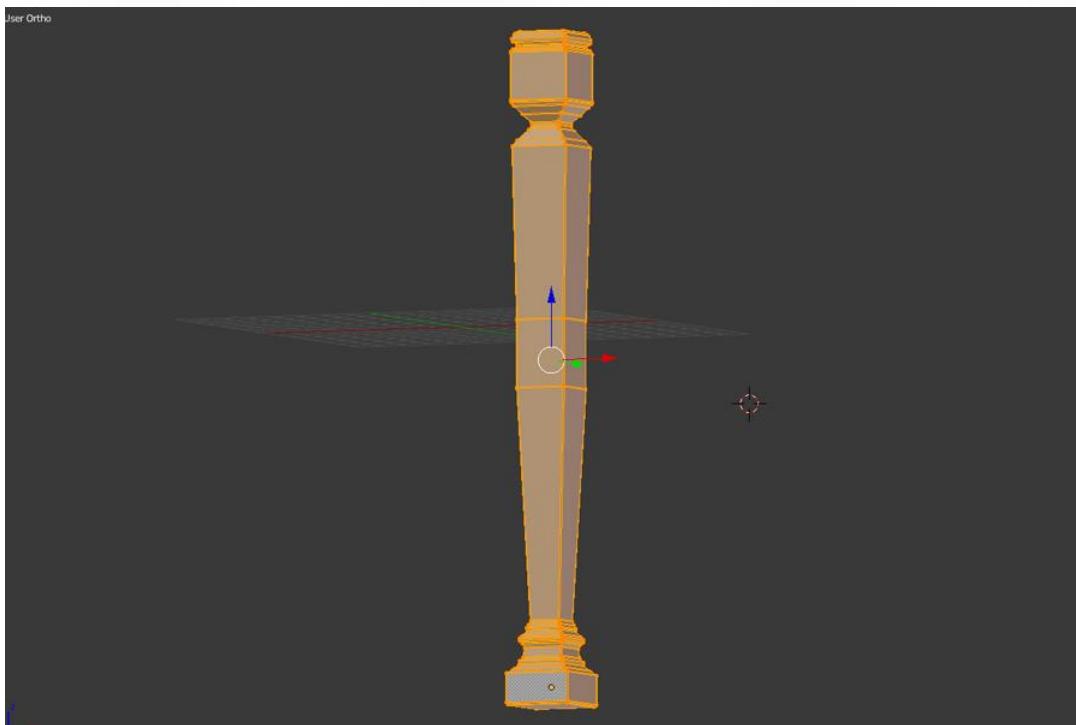
- **43.** Bringing our attention back to the bridge, we can see that it looks a bit empty. Thus we will also add some props here. I chose to make a piece of wood. It is simple but also very effective. Don't bother to paint the bridge. You can make nice transitions between the bricks and the wall/arch.



- **44.** You can put the piece of wood against the wall.



- **45.** We also want some ornaments on the bridge. These black pales are very popular. Start with a cube and extrude it upwards.



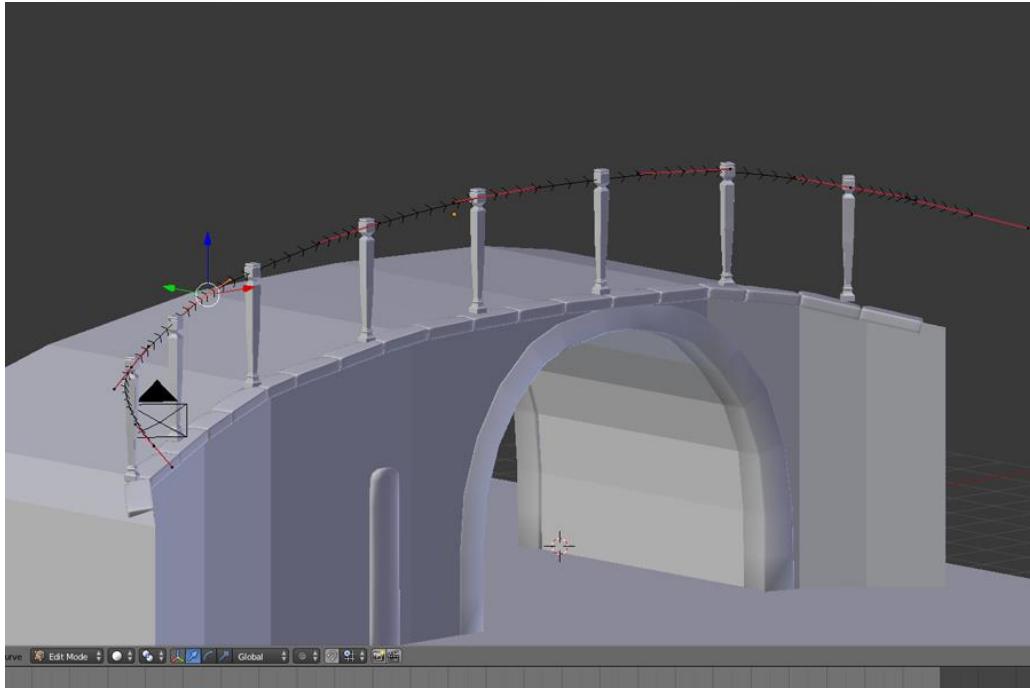
- **46.** In the end you can enable some bevel on it, but that is not really necessary because it is far away in the scene.



- 47. After projecting the texture onto it, it is ready to be placed in the scene.



- 48. Don't make them look exactly the same. Sometimes it will help to rotate them a bit or make them a bit different from the others. Use the bricks on the bridge to put them in the right position.



- 49. The next thing we need to work on is a handrail. Add a Bezier curve and try to make a nice shape. The Bezier curve is sometimes a bit hard to handle, but in the end you will love this tool. Don't forget to make it Full and make the resolution 1. I applied a black color with some gloss to it.



- 50. This is the bridge with a nice handrail on it. The ends of the handrail are not finished yet. I need to combine the street with the bridge. When this is done I can make a nice ornament on the handrail.

Vegetation

One of my biggest problems in my scenes was the lack of vegetation. I was always focusing so hard on my buildings and other things in the scene that I didn't spend time adding more greenery in the scene.

This is a big problem because without vegetation the scene will never look good. Of course it depends on what kind of environment you make; some scenes need more greenery than others. But if there is no vegetation, the final picture will look empty.

Vegetation is everywhere. Think about trees, grass, moss, flowers and ivy. Take a look out of your window and, unless you are living in a skyscraper, most of the time you will spot something green. A random street view in any kind of city will have vegetation.

Therefore we need to create it and understand how it works. First, we take a look at some pictures.



There are some little trees in this photo. They have a significant impact on the scene because of the green. If they are not there, you would miss them. (Fig 4)



In this picture there is a lot more vegetation. It has the look of an abandoned building that has been reclaimed by nature. For me this is a nice example of nature combined with architecture. (Fig 4.1)

A big misunderstanding that many artists have is that they think by adding some random vegetation in the scene everything is done. You have to find out what the best combination of greenery is. Does the scene need a lot of trees or would some moss and grass between the bricks be better?

I think that adding nature into a scene is one of the hardest things to do well. The difficult part is not the creation of good-looking vegetation, but placing this vegetation correctly in the right place so that it looks right. Below are some examples in which the natural features don't work:



This image is from 2011, I think the architecture was fine but the trees and the ivy were ruining the scene. It was too much and not realistic at all. Try to find the right balance and don't just drop green in the scene, that doesn't work. (Fig 4.2)



Problem in this image is that the colors from the trees and grass are not matching. It has a weird look. The problem is not the resolution from the trees or grass, the quality was great at the time. So keep in mind to use the right color combinations. (Fig 4.3)

The vegetation in the following images worked out pretty well:



This picture has a lot of warm tones, so when I used the same trees as in picture 4.3 it worked out. Now they have an important function and if I would remove them, it would look empty. (Fig 4.4)



In this picture the trees fit perfectly between all the buildings. (Fig 4.5)

The big questions are, of course, how do we create good-looking nature in a scene and how do we determine what the right combination is for a particular scene.

To answer these questions we take a closer look at the vegetation in the same painting we were using before.



(Fig 4.6)

One of the most eye-catching details in this scene are the trees. There is some grass on the house on the right and we can also see some moss on the wall, but because this is far away it's a bit blurred.

We are going to create all of the types of vegetation that I think are useful in a scene like this. I will add some more flowers and grass just to demonstrate how it works and what we need to create all of this.

Since the beginning of this year I have been working with a new program called 'Flora3D'. This is a handy tool for creating trees and flowers and all other kinds of vegetation. I am still using Blender for grass, moss. Flora3D is a commercial program but it is free for the first month, so you can try it out if you like it. I really recommend using external programs because it saves you a lot of time and the final result looks nice. There is nothing wrong with creating your own vegetation and I do this for myself a lot too.

So what is Flora3D? I discovered this program about a year ago. It works perfectly with Blender and it has a huge library of customizable trees, flowers and bushes. Of course, you can also make everything from scratch. I use this program for low poly trees. For high poly trees I use the Sapling add-on in Blender.



Vegetation

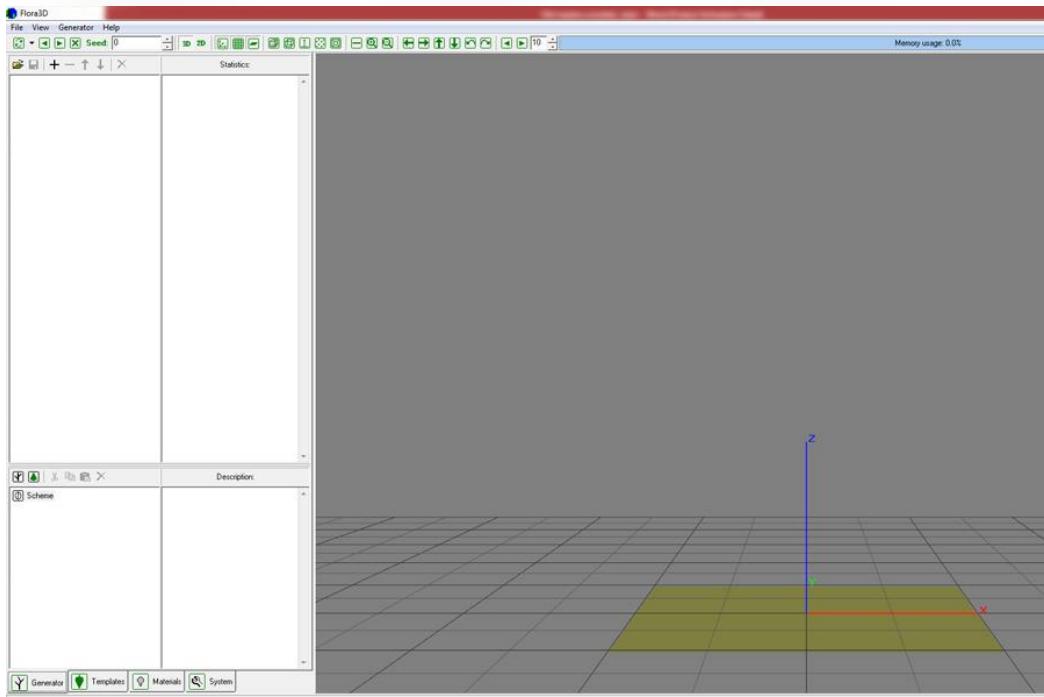
In the next chapter I will introduce how to create grass, moss. Flowers, bushes and trees.



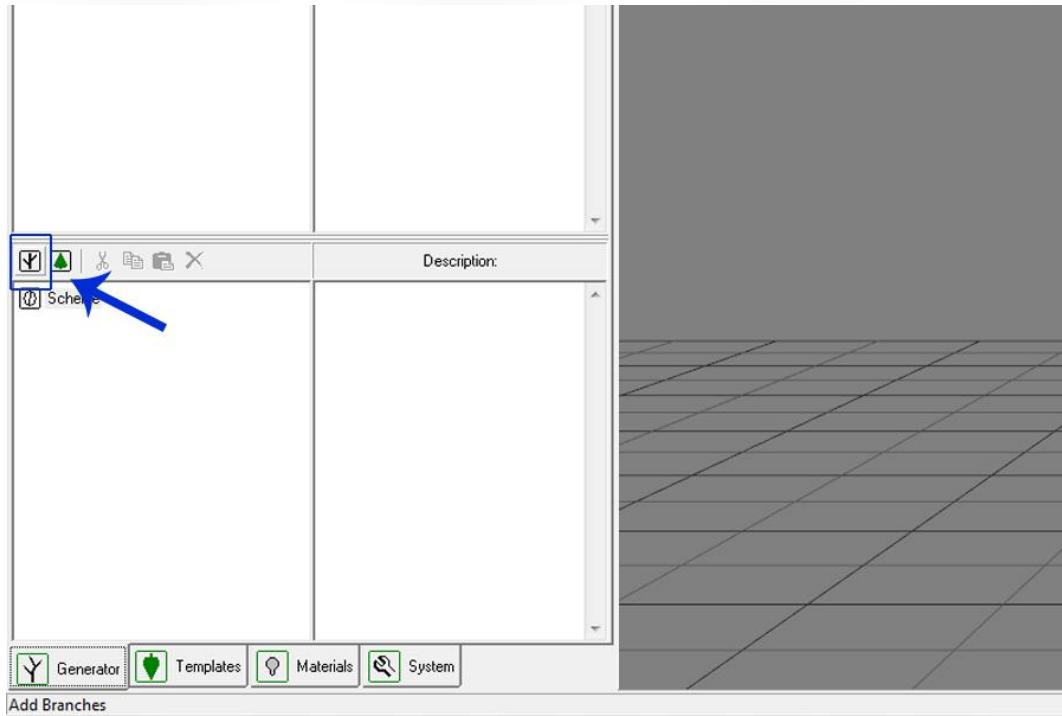
Creating a tree in flora 3D

This program is utility for artists, game designers and 3D-modellers. The main function of the program - the generation of three-dimensional models of plants

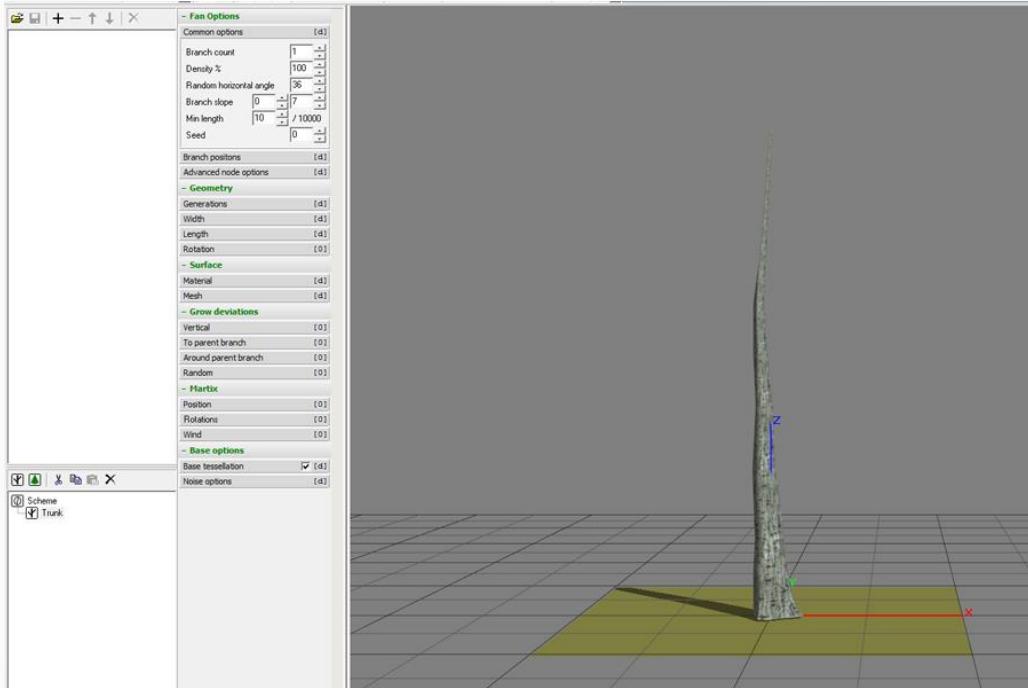
A simple alpha tree created in flora 3D



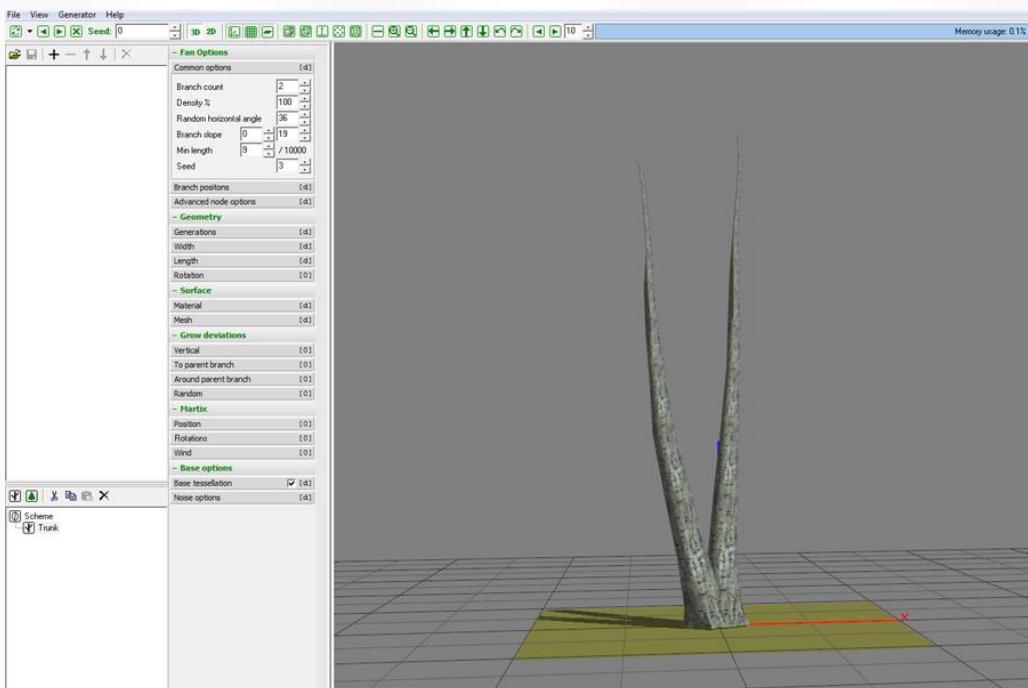
- 1. When you open Flora3D you get the following interface.



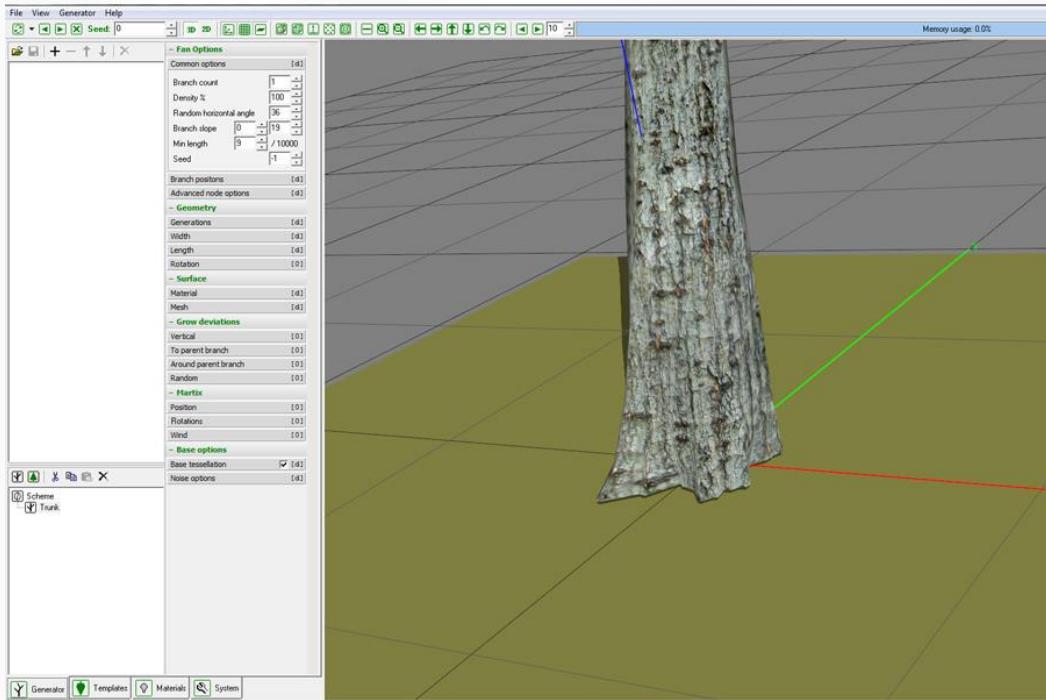
- 2. There are many options in this program. I will not discuss all of these components. We are going to focus on making a tree. To start click on --> [Add branch](#).



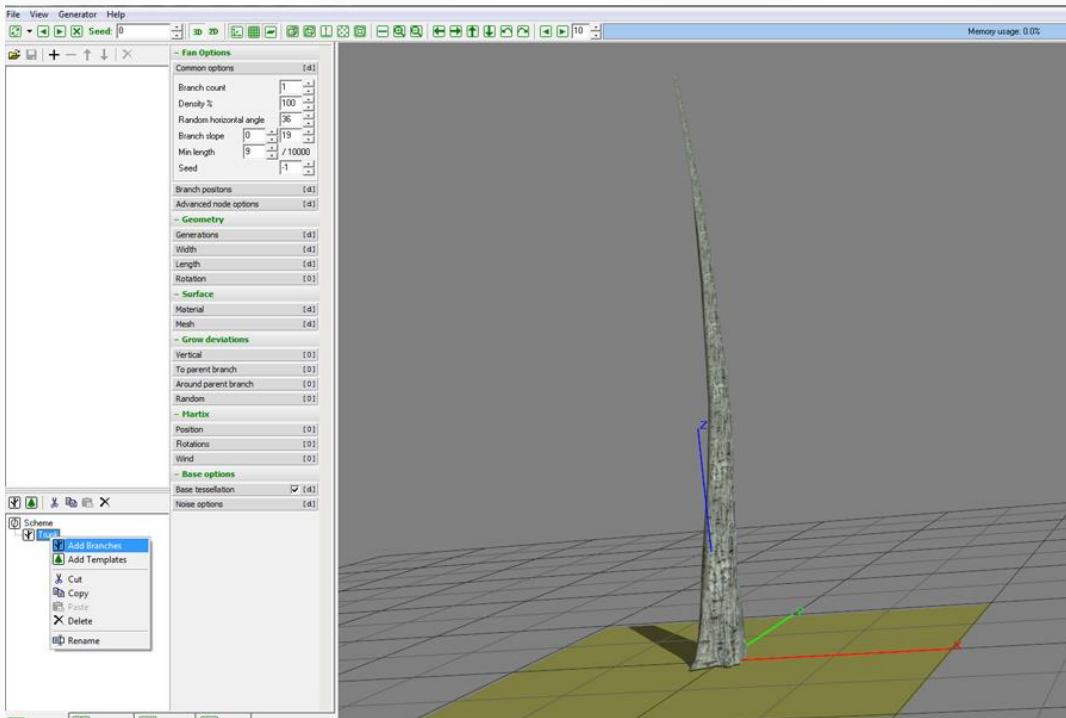
- 3. Now you can change the branch, by opening the panels and changing some values.



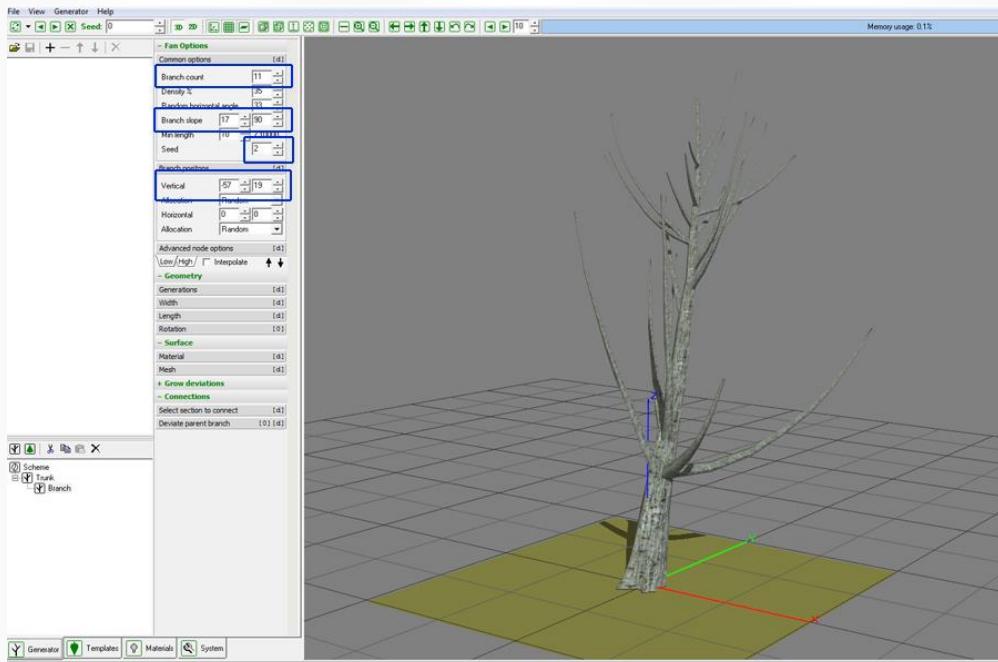
- 4. You can make a multiple trunks by changing the value of the branch count. For this tree I only want one trunk.



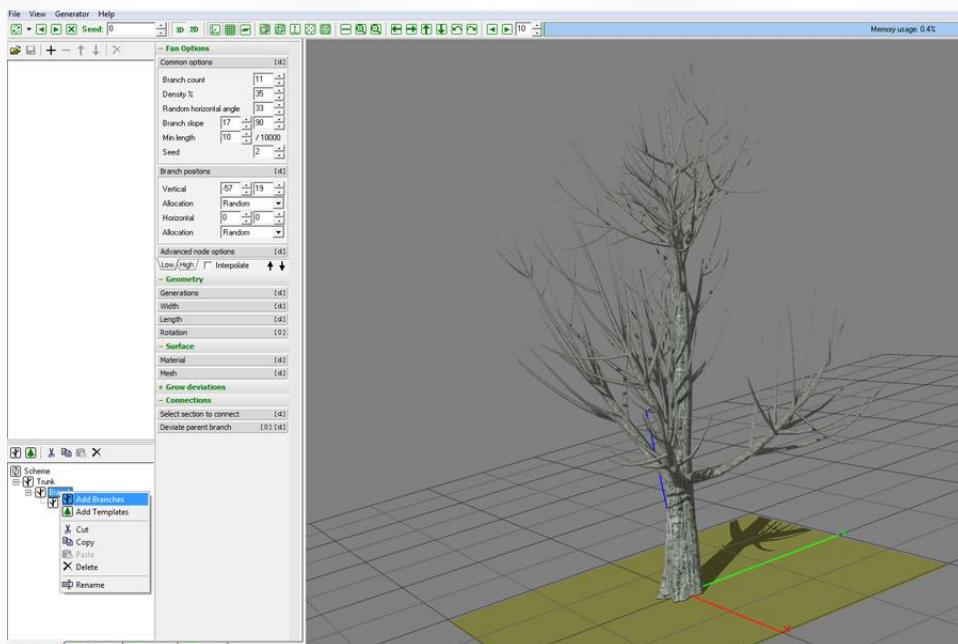
- 5. By changing the seed you can get different types of trunks.



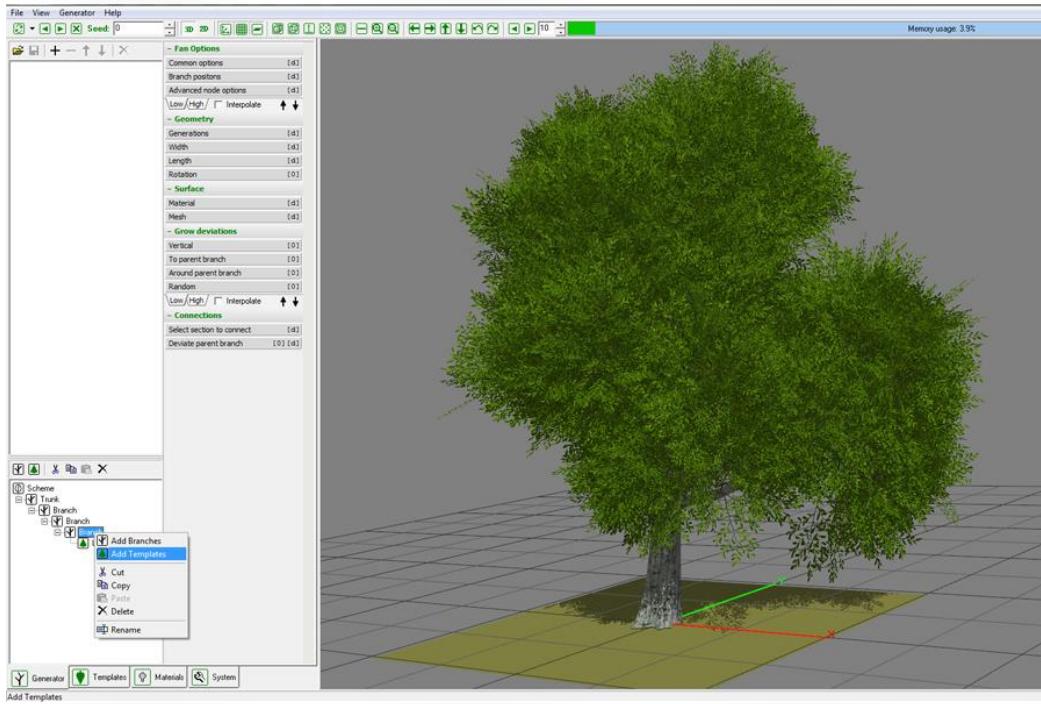
- 6. If you are happy with the shape, you can start adding branches. Right click on the trunk icon --> Add branches.



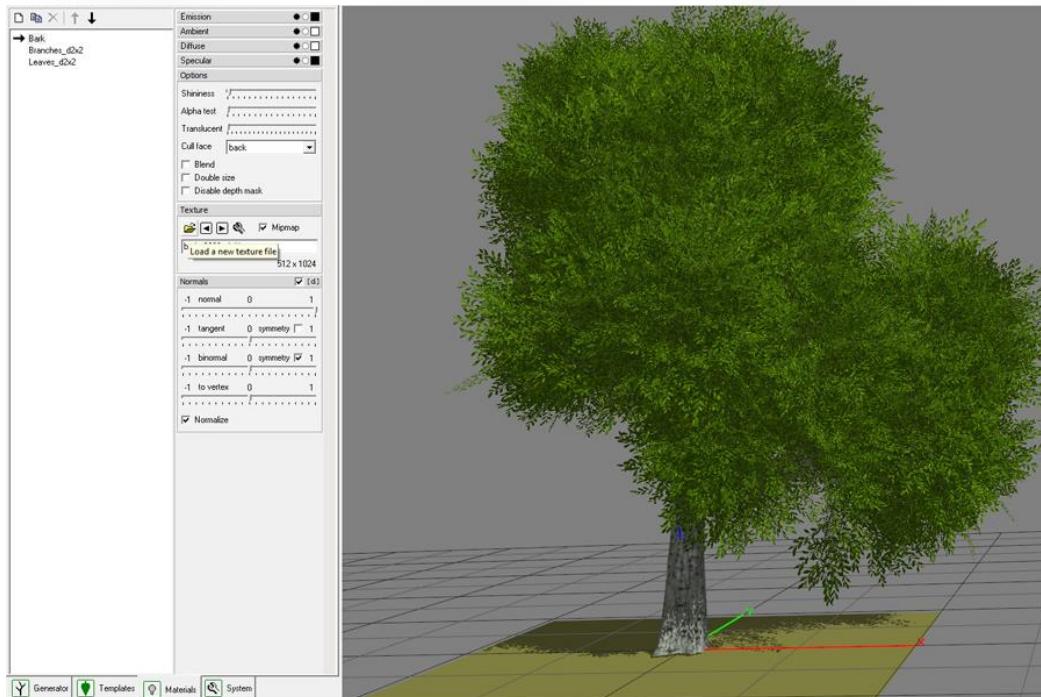
- 7. At this point you can make a lot of variations. I kept it simple and only changed the branch count, the branch slope and in the branch options I changed the vertical size. I am now showing values. You have to decide what you want, so you get something original.



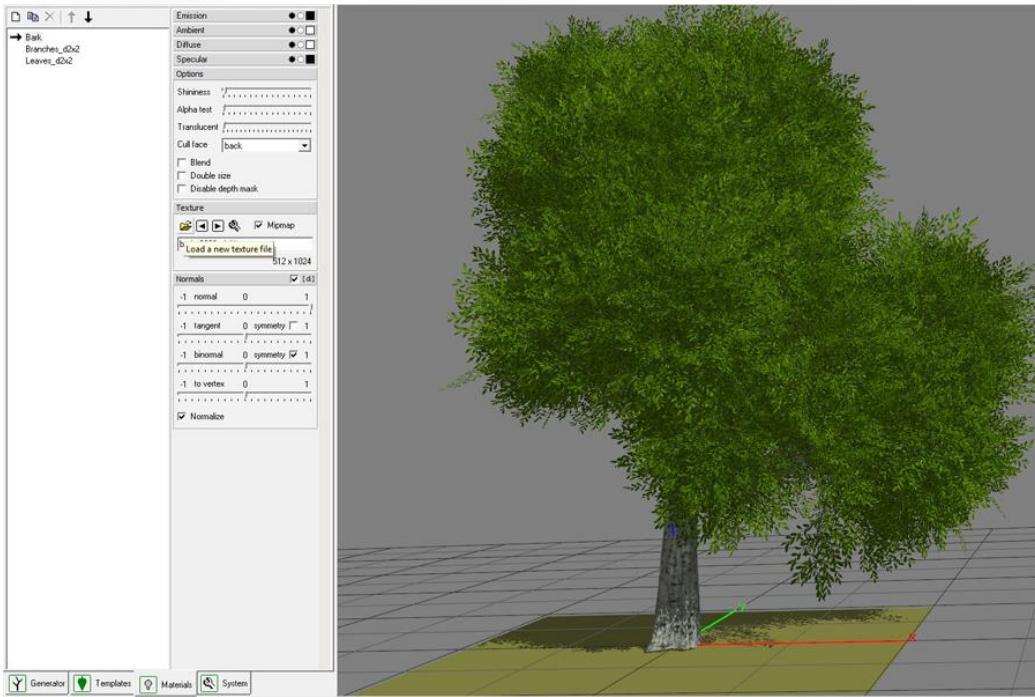
- 8. Now we make a level two branch detail by adding a new branch. Select the branch in the scheme and create some new branches. Now the tree has a lot more detail. If you'd like, you can change values.



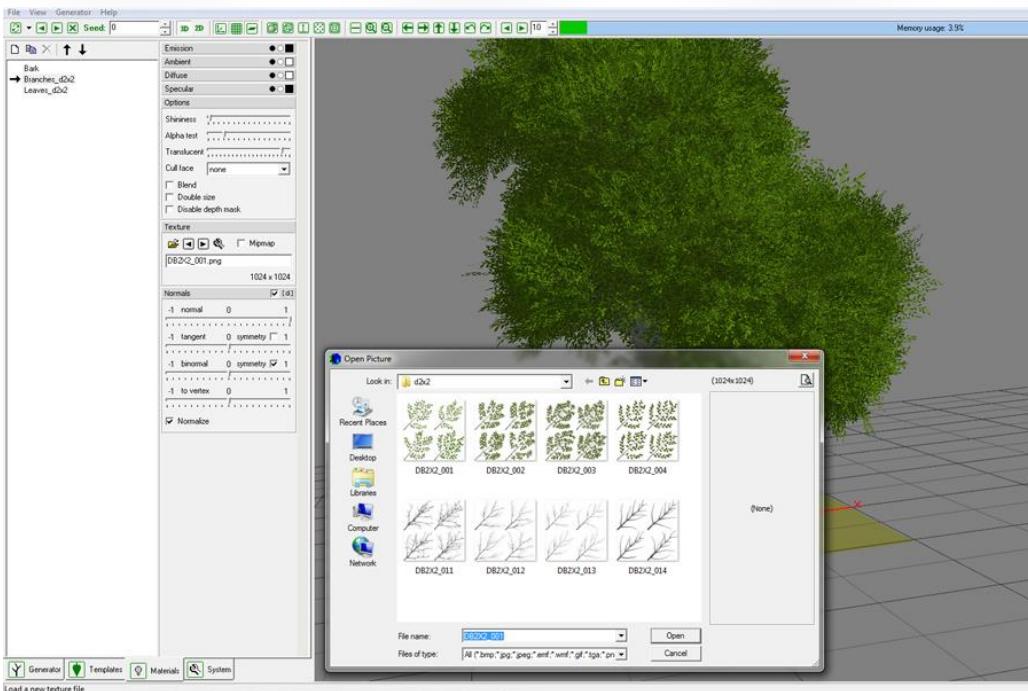
- **9.** The most realistic trees have a level 3 branch, so we add another branch in the schedule. You can do that by selecting the latest branch and [right click](#) --> [Add branch](#).



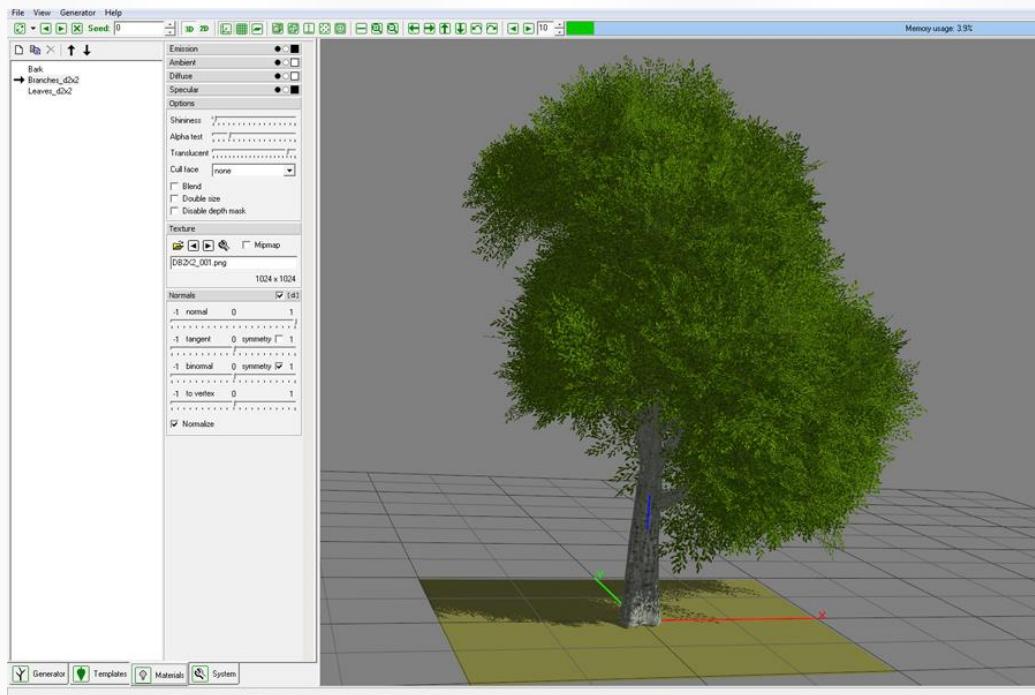
- **10.** The next step is adding leaves. Select the latest added branch in the schedule and [right click](#) --> [Add template](#). Now a lot of leaves will appear.



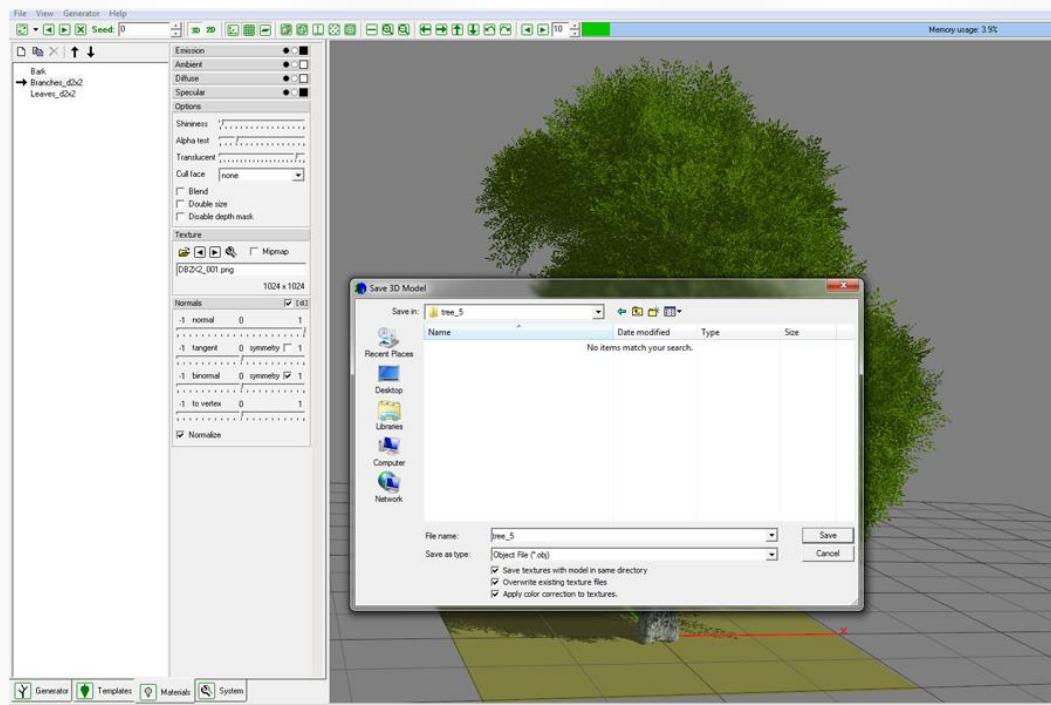
- 11.** The first thing you can do is change the leaf texture. Flora3D has some nice samples, but you can also add your own.



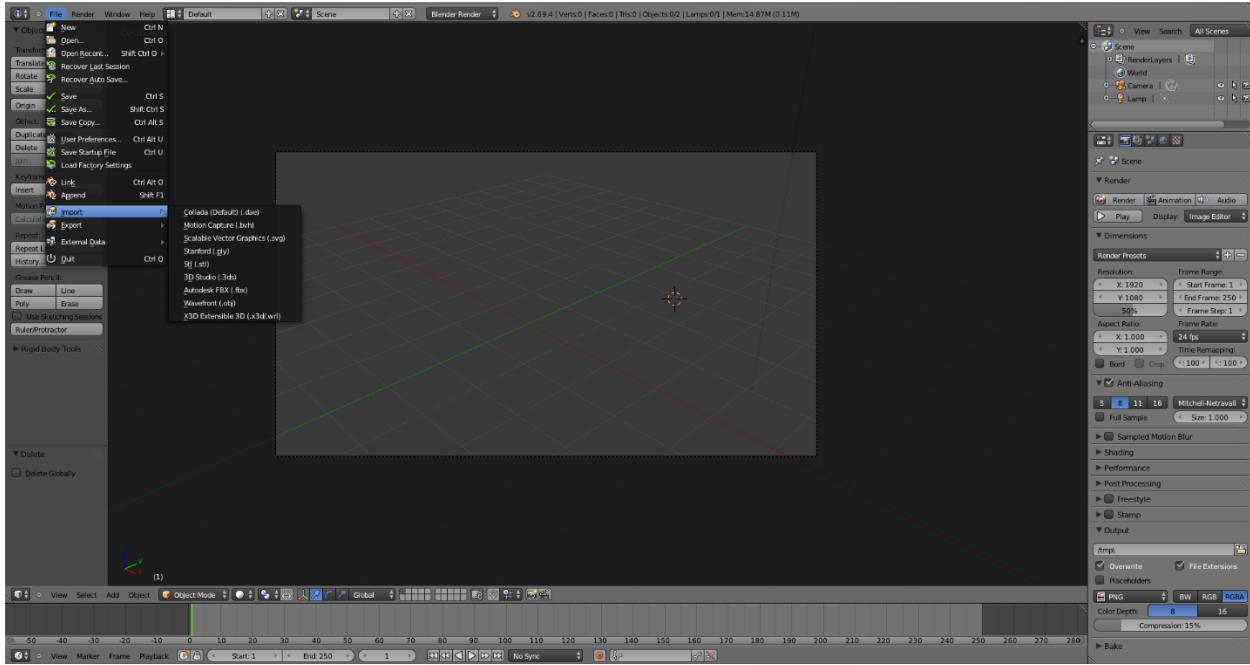
- 12.** In this panel you can select the texture you want. If you add your own texture, keep in mind that Flora3D is using four types of variations. Therefore the best thing you can do is copy one of the textures and overwrite your texture.



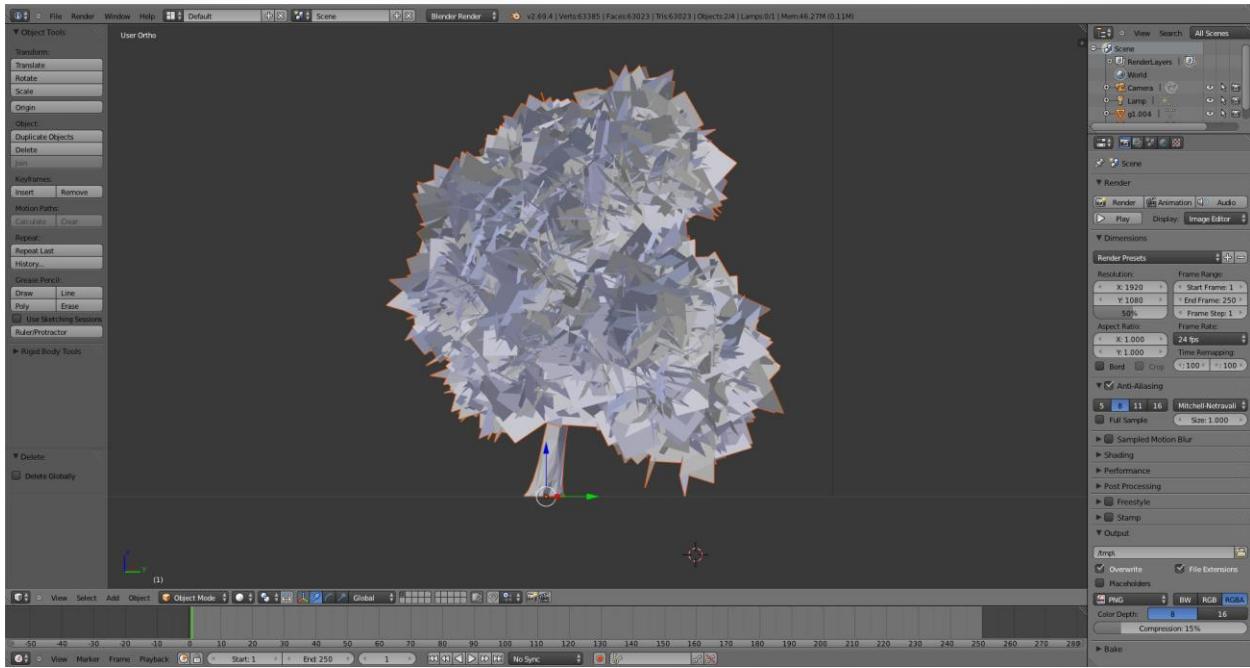
- 13. If you think the tree is ready, go to file and select --> Save 3D model.



- 14. A screen will pop up and ask where you want to save the file. We want to save the tree as an OBJ file. Make a new map and put it there. It will copy the bark and leaf texture.



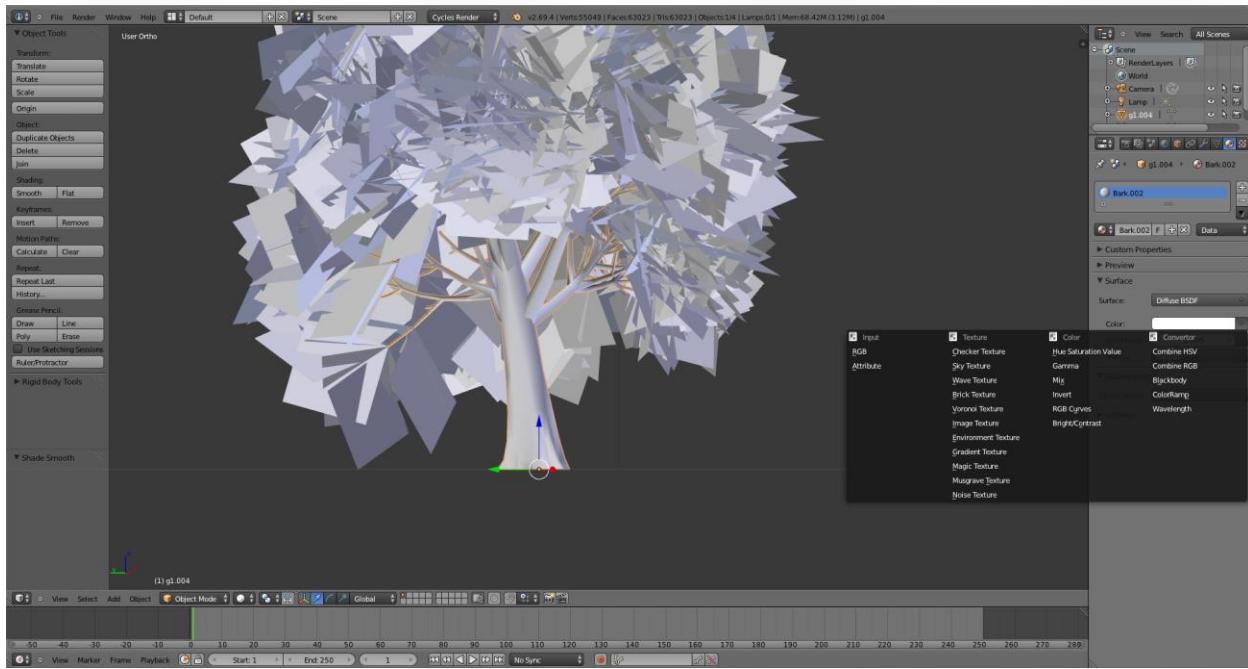
- 15. Now you can open Blender and insert the tree file. [File](#) --> [import](#) --> [.OBJ](#).



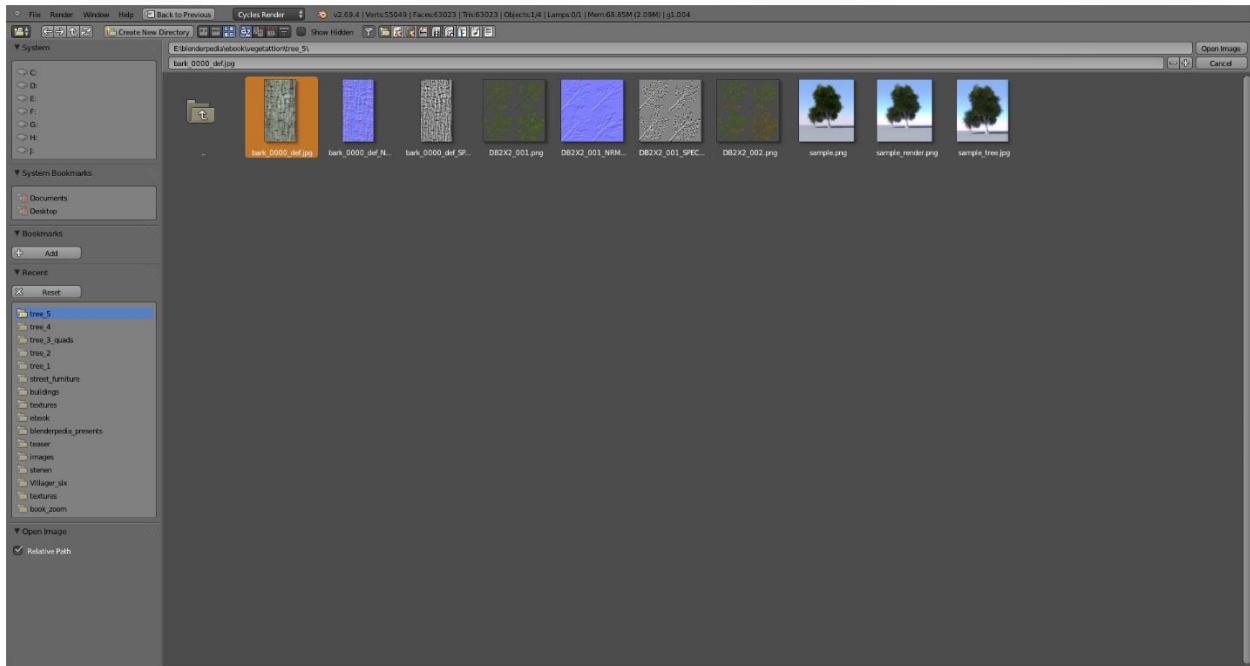
- 16. Now we have the tree in Blender, but we need to do a couple of things before we get it to work.



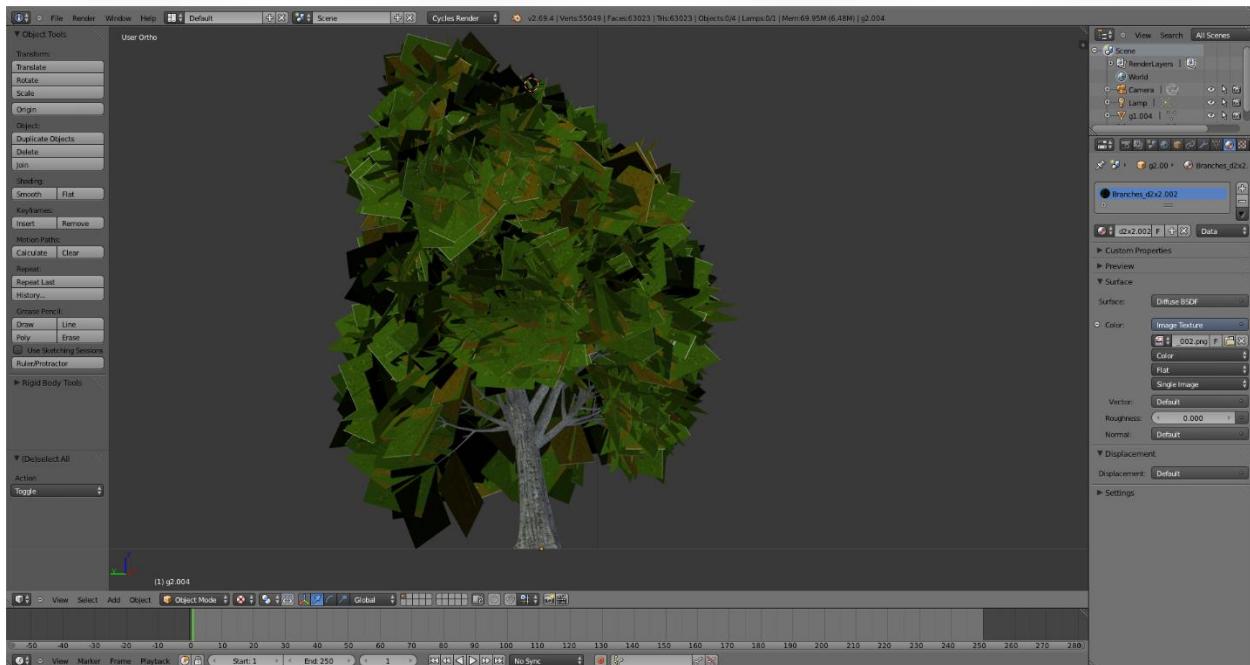
- 17. First, we remove all the doubles in the tree. Select the trunk with the branches and go to edit mode. When everything is selected you open the right panel and press T. Now click on remove doubles. You can also smooth the object for the best result.



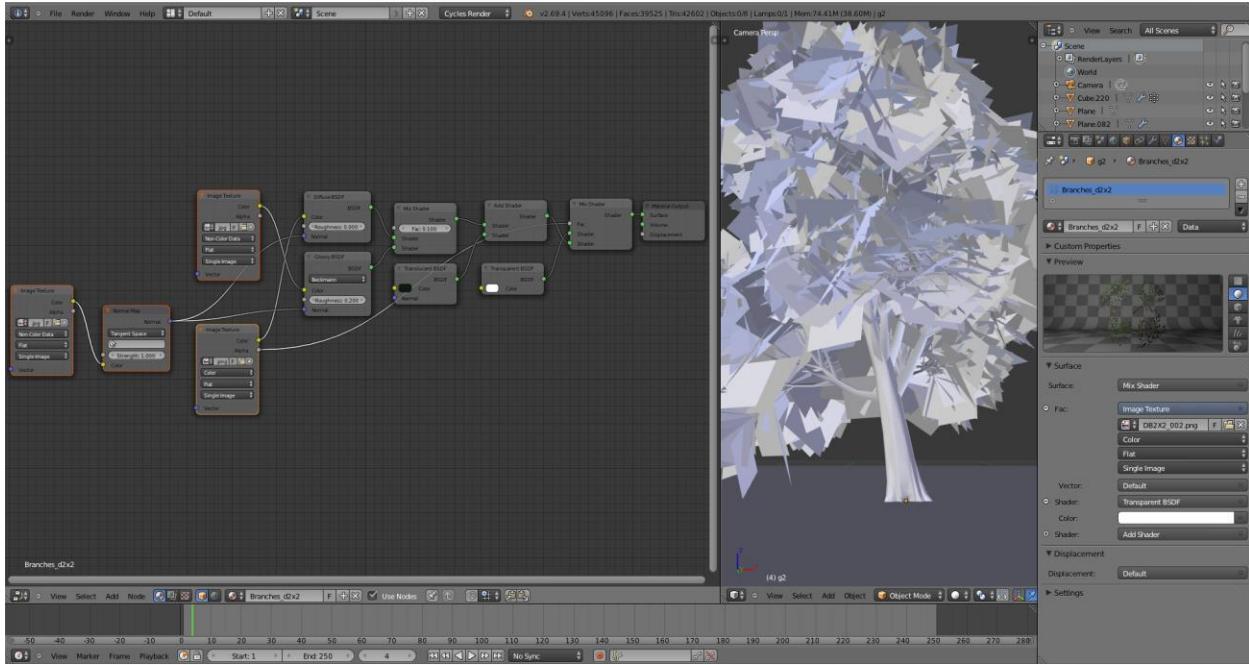
- 18. Now we start adding the textures. Flora3D already made a UV map from the bark and leaves. Therefore we need to select the object and add the material.



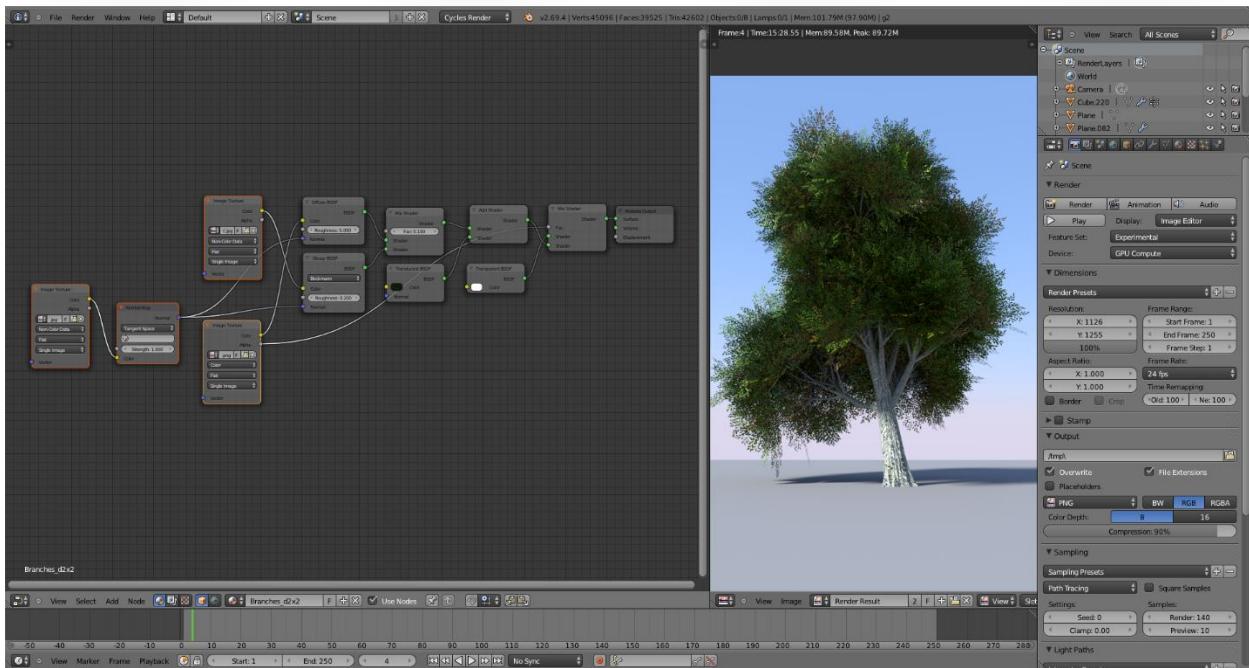
- 19. Start with the trunk. If you open your tree map you can find the bark texture.



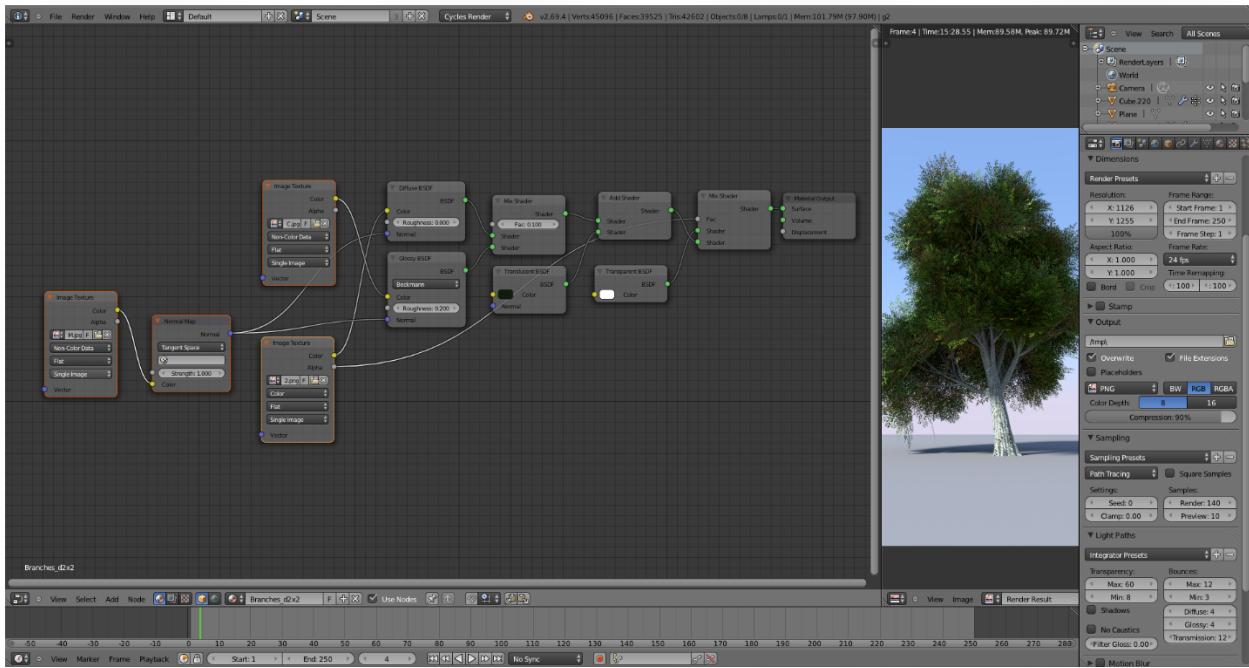
- 20. When you apply the bark texture you can do the same thing with the leaves.



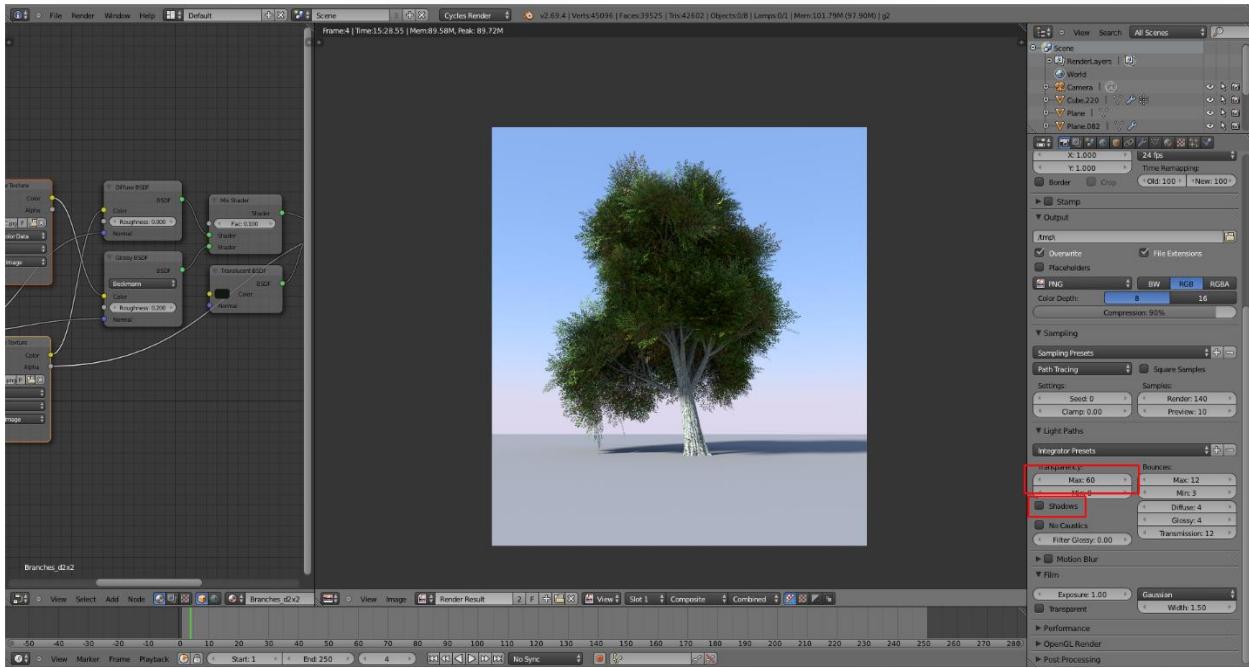
- 21. The leaves need a node setup to make them transparent. I am also using a translucent shader. With this you ensure that light shines through the leaves.



- 22. It is very important that you make the right node combination. When you put the 'mix shader' after the 'add shader' the translucent and glossy will make the transparent plane visible.



- 23. Once everything works out right we need to change some render settings.



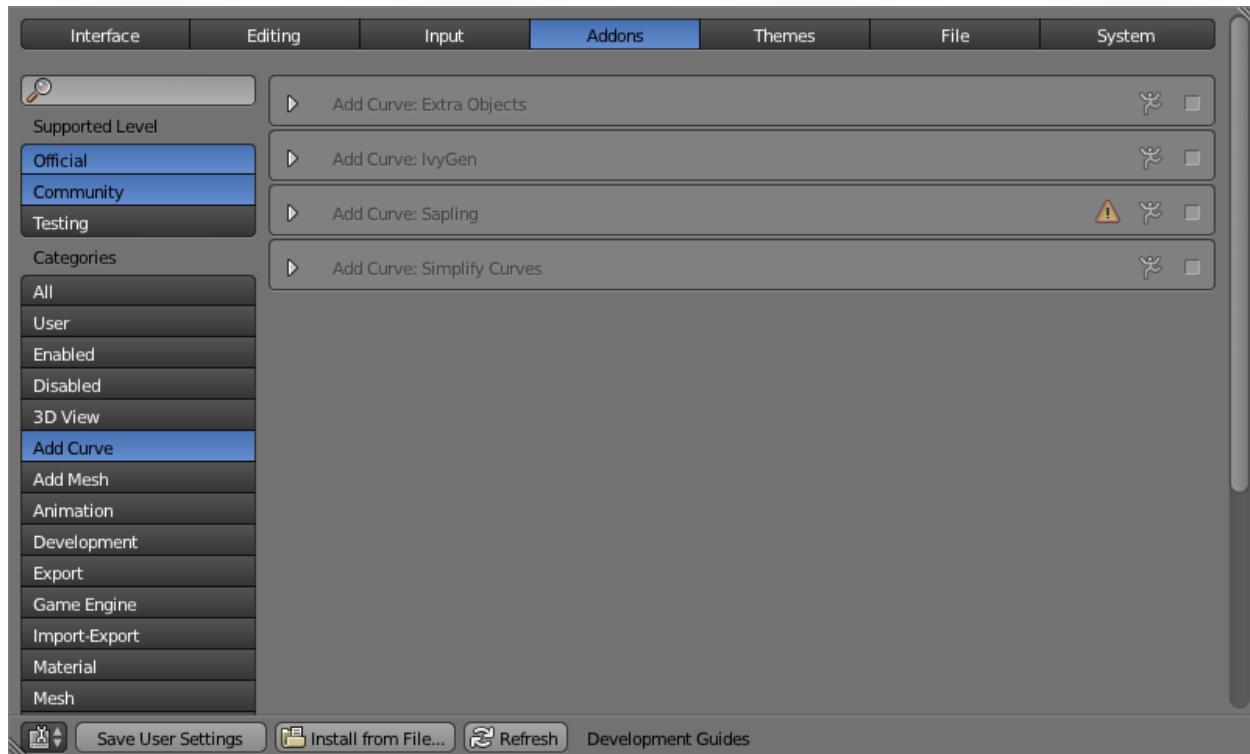
- 24. Because we are working with a lot of transparent planes we need to increase the light path. In the transparency panel I used a max of 60. Now the render will look much better. The problem is the huge render time. This is normal when rendering trees. You can turn off transparency shadows, which makes the rendering much faster. Of course, the shadows look a bit ugly now



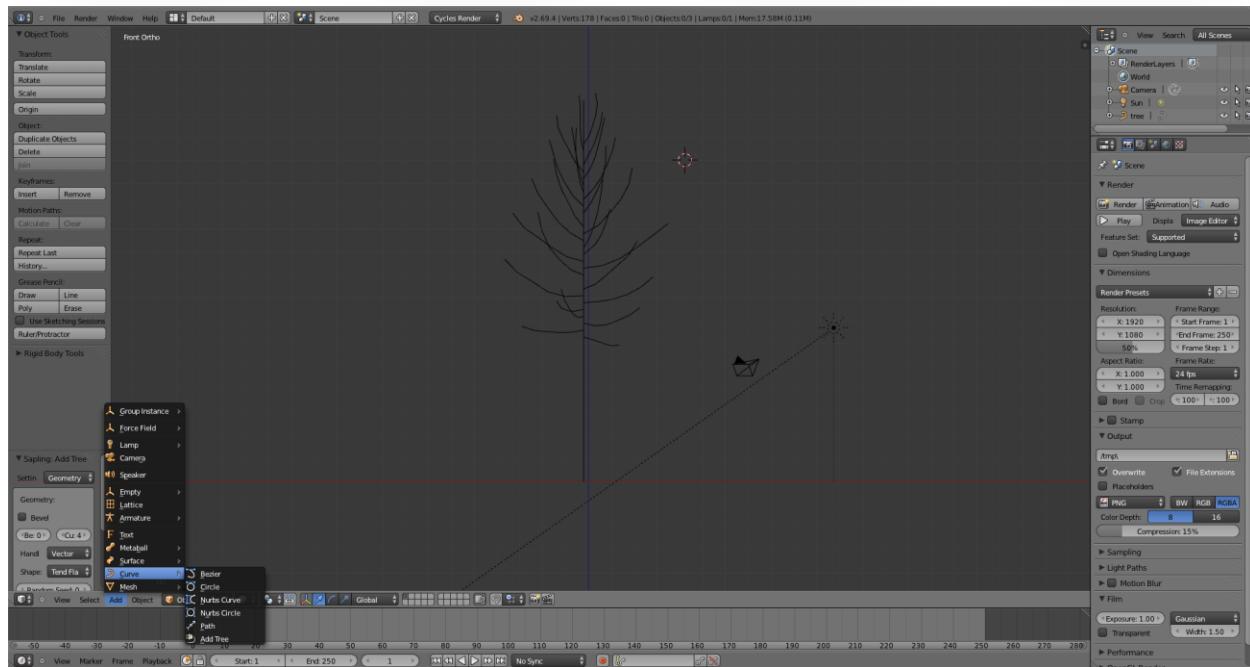
Sapling Tree

It is also possible to create your tree in Blender. There is an add-on called ‘Sapling’, which you need to activate in the preferences window.

The Sapling tool is a fantastic way to create realistic trees, but I have to say that it takes a while to understand how it all works. We are going to create a tree using the Sapling add-on.



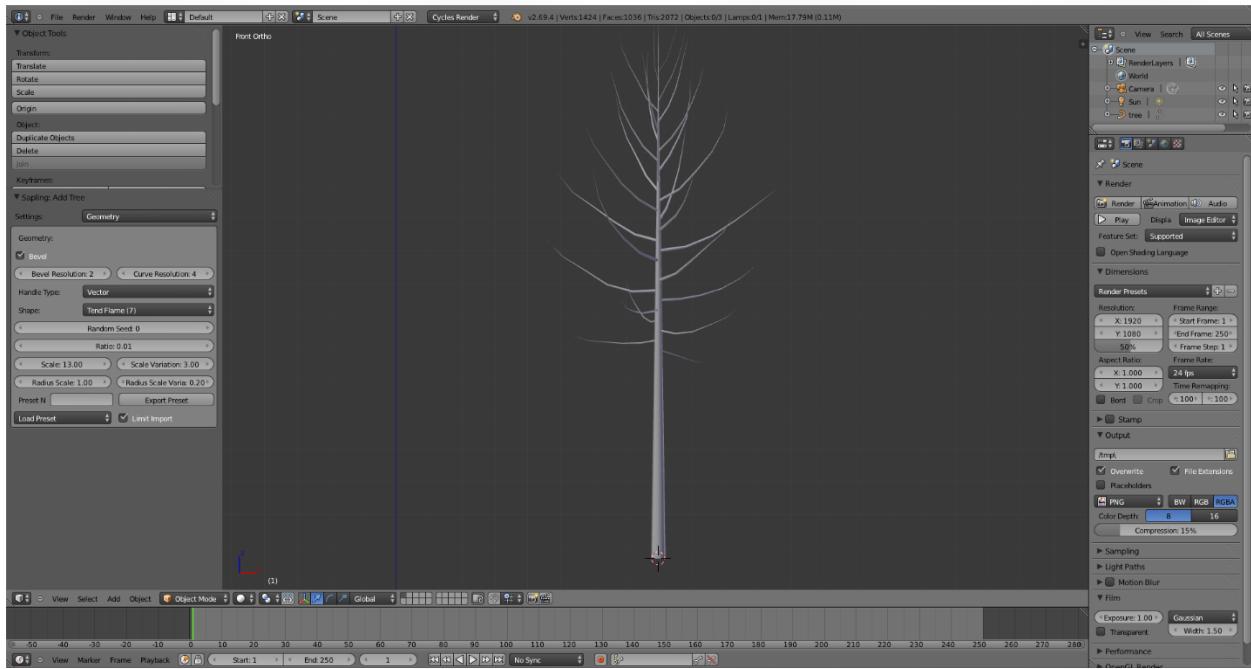
- 1. First, open the preference window and activate the Sapling add-on.



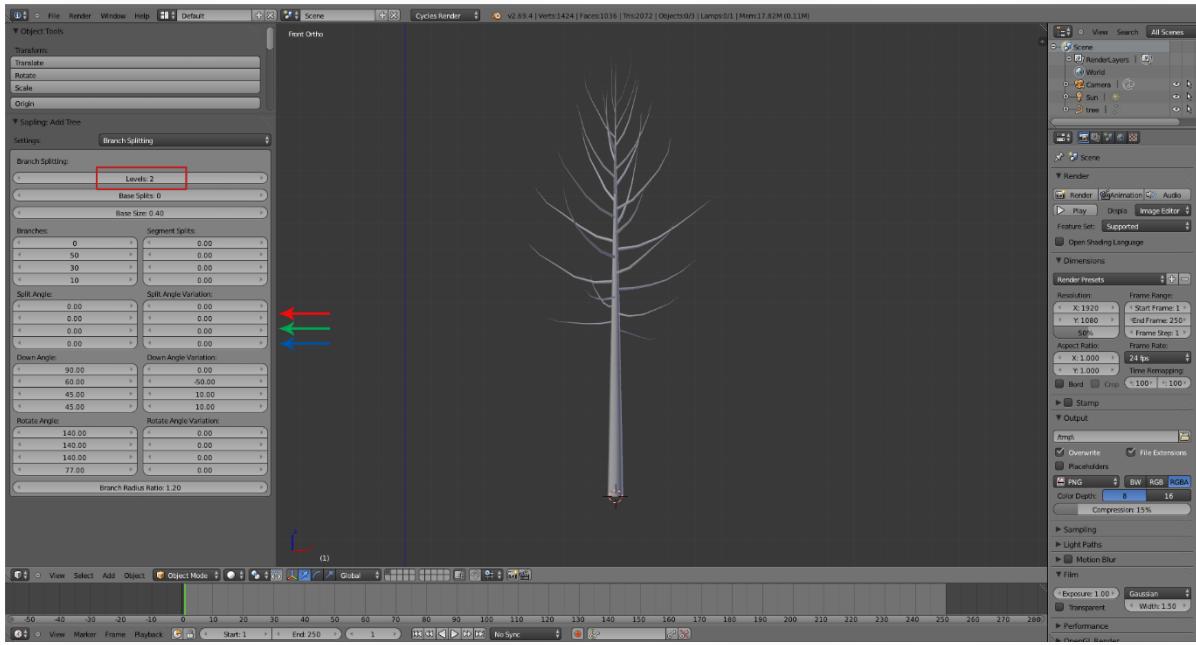
- 2. Now we can start modeling a tree in Blender. Go to **Add->curve-> Add tree**. Remember to put the cursor in the right position as the tree will be linked to this.



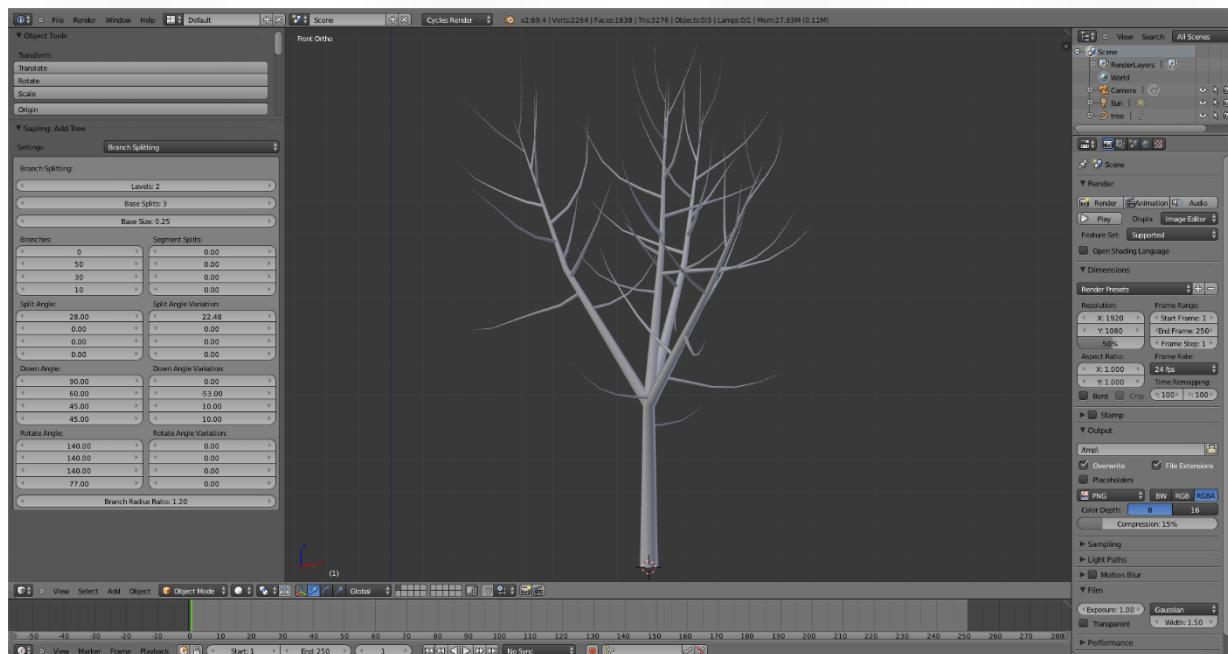
- 3. The Sapling add-on has some random tree samples. If you'd like, you can start with one of these. I leave everything standard and enable the bevel. You can make it smoother by giving it another value. I used a value of 2.



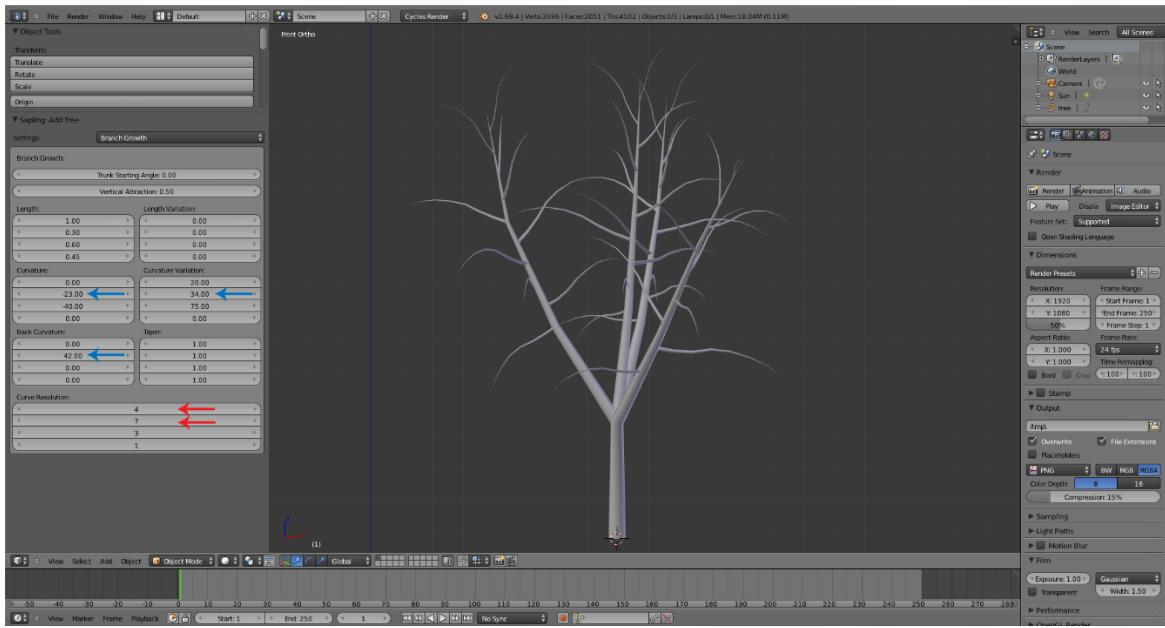
- 4. You can also tweak the trunk if you like. Move the radius scale to get a bigger trunk. It all depends on what kind of tree you want.



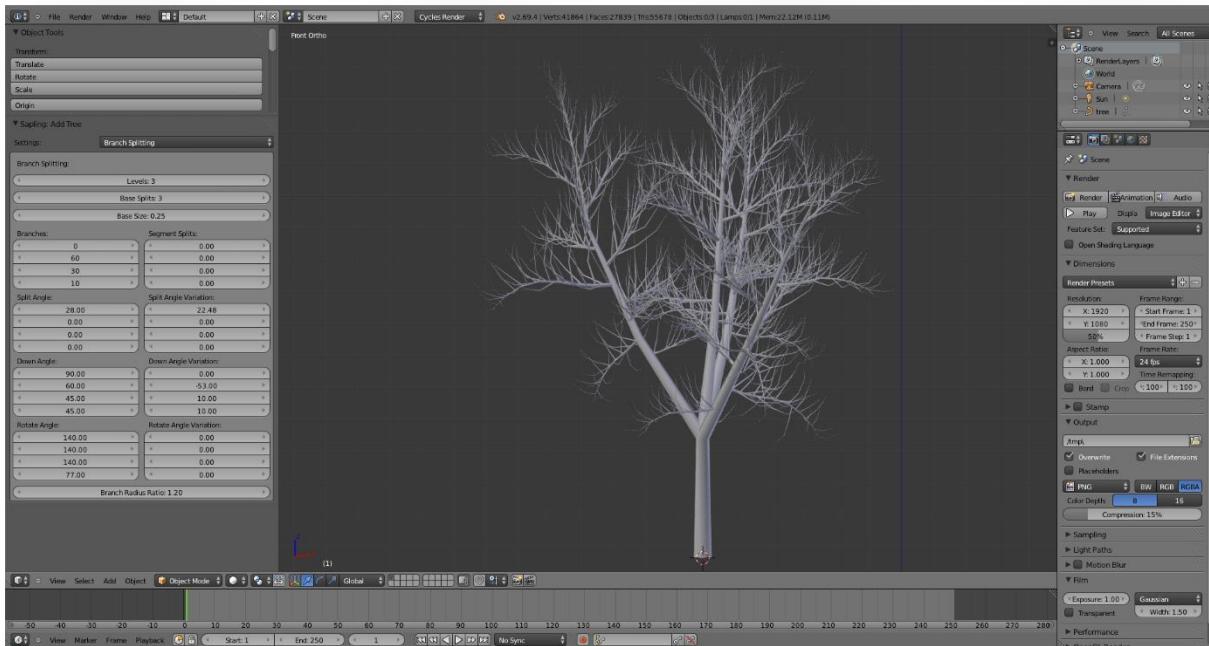
- 5. When you switch to the branch splitting panel, you get a lot of sliders. Don't panic, there is a logical system and it is easy to use. There are 4 levels of detail. Trunk(1), branches(2), side branches(3), little side branches(4) every parameter has 4 sliders. These sliders are for every level. The best thing to do is just experiment with it. It's actually really funny and easy to use. For this tree I used a base split count of 3.



- 6. This part of the modeling is the most important, as it determines how the core is going to look. Use the split angle slider to change the look of the tree.



- 7. Before I switch to another level, I want to change the look of the branches. I switch to the Branch growth panel and I change some of the level two sliders to get a droopy look. The blue arrows in this picture show the look of the branch, the red arrows show the look of the core. Just try to play with it. There is no specific way to get the best tree look. I can recommend experimenting with all of the values in level 2.



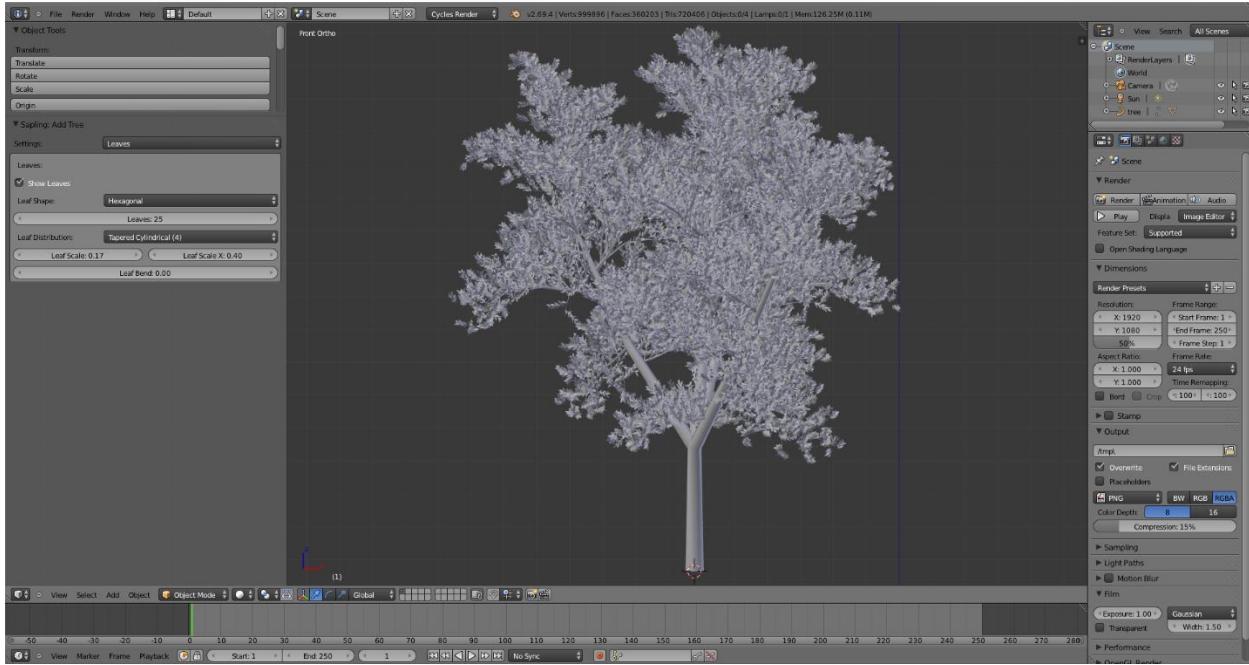
- 8. If you are happy with the result, you can go to level 3. I changed the same sliders as in level two, just to keep it easy. Feel free to play with some other sliders from level 3. Keep in mind that level 3 is already making the computer slower.



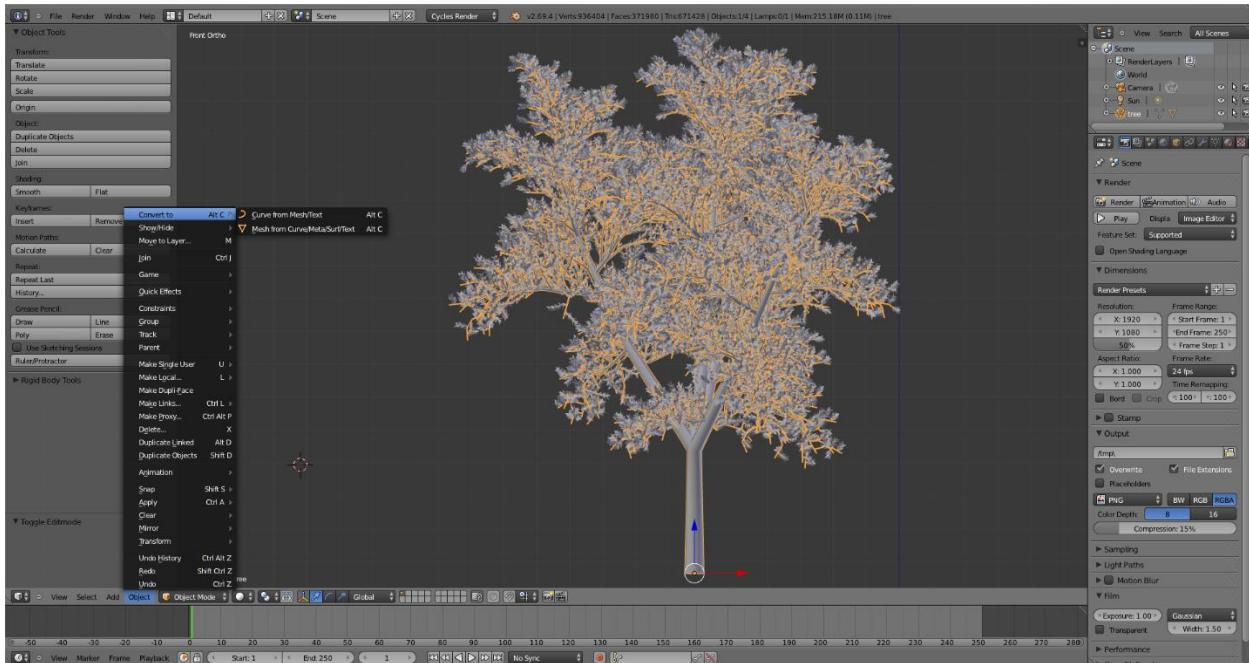
- 9. I tried to make level 3 look a bit droopy, the same as level 2. If this process is done, you can enable level 4.



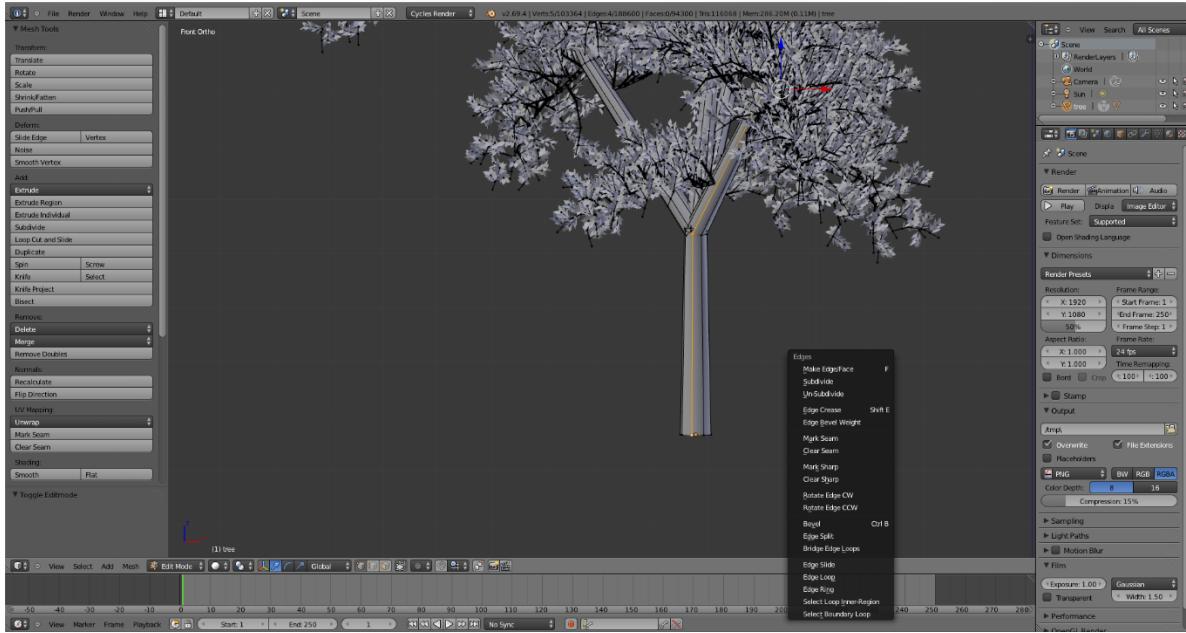
- 10. Of course, it is possible to make changes in level 4. Keep in mind that the computer can be really slow. A simple trick to avoid that problem is to reduce the number of branches and increase the number again later. Now switch to the Leaf panel and change the Leaf scale X to a value of 0.4, which will make the leaves smaller. When you use a value of 1, the leaves will look rounded and, most of the time, not realistic.



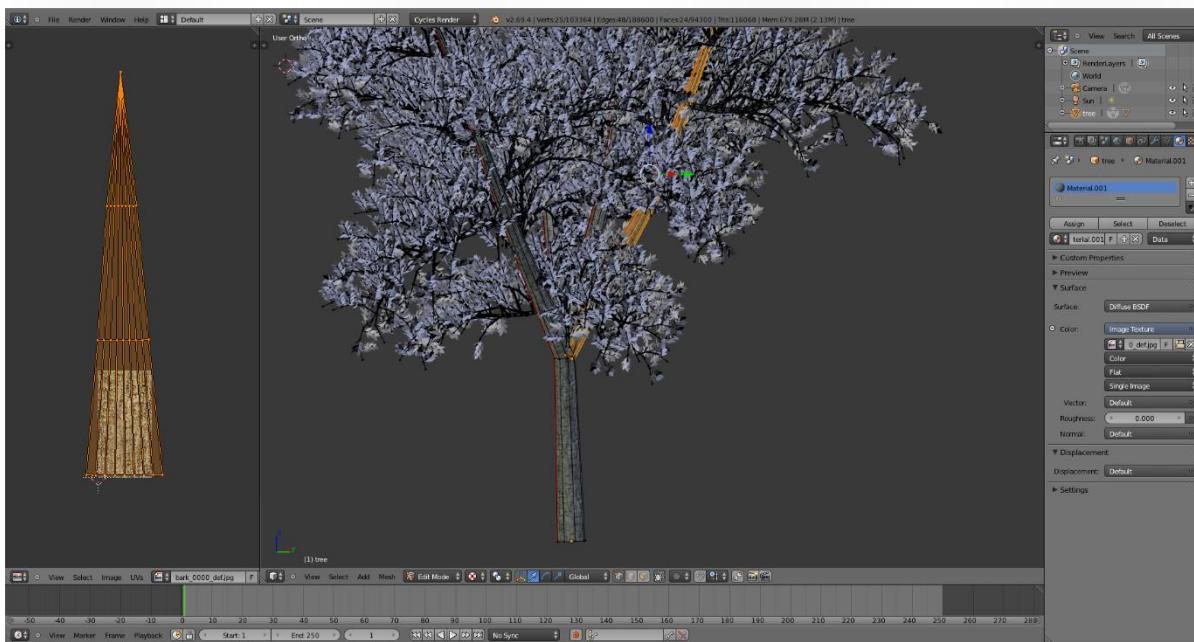
- 11. When you enable the leaves, the result is something like the image above. I hope your result looks a bit different. I don't want you to copy all of my values. It's better to try to be original. As you can see, the trunk is low poly. We are going to change this later by hand.



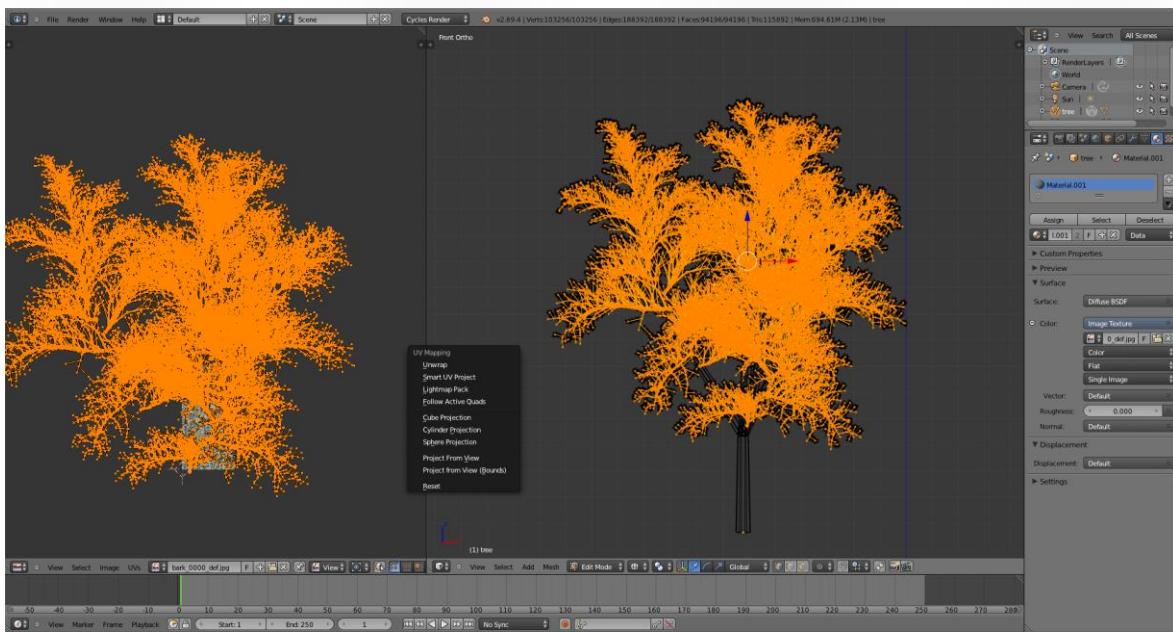
- 12. Next we need to make is to change the trunk from curve to a mesh. Go to [Object](#) --> [convert to--> Mesh from curve](#).



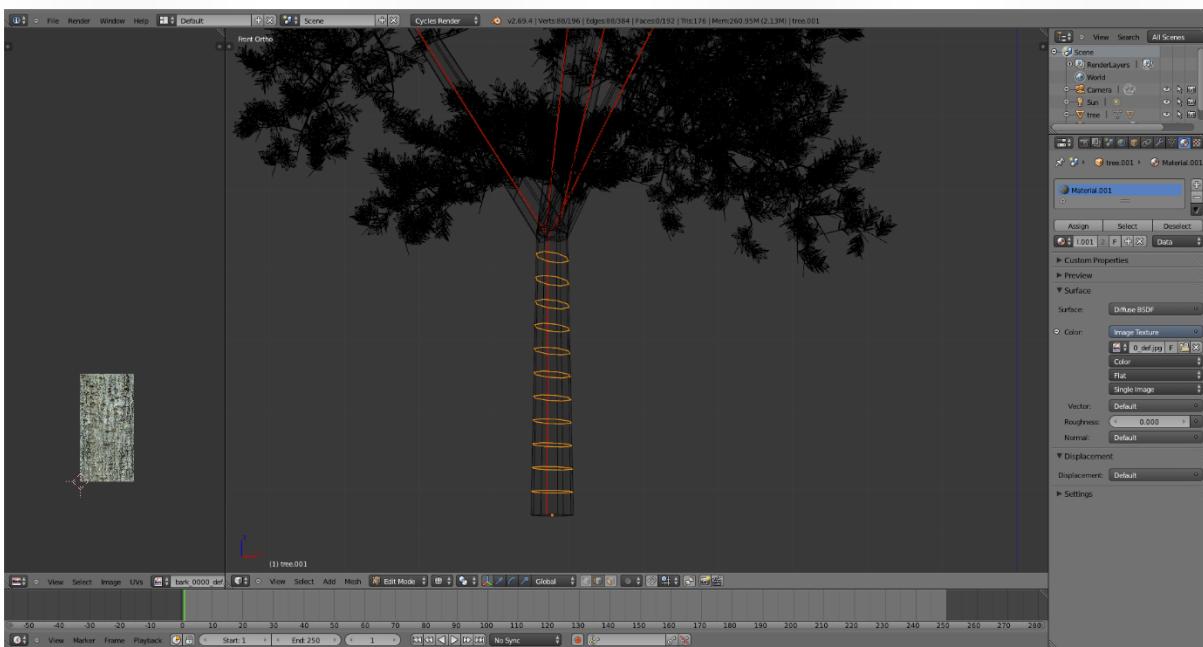
- **13.** First we need to add a texture on the trunk and branches. For some reason, there is no UV Map applied on the trunk. To enable a good working UV Map, first select an edge line (**ALT + right mouse click**). When a line is selected press **CTRL+E** and select mark seam. Now we can unwrap the mesh by pressing **U --> unwrap**.



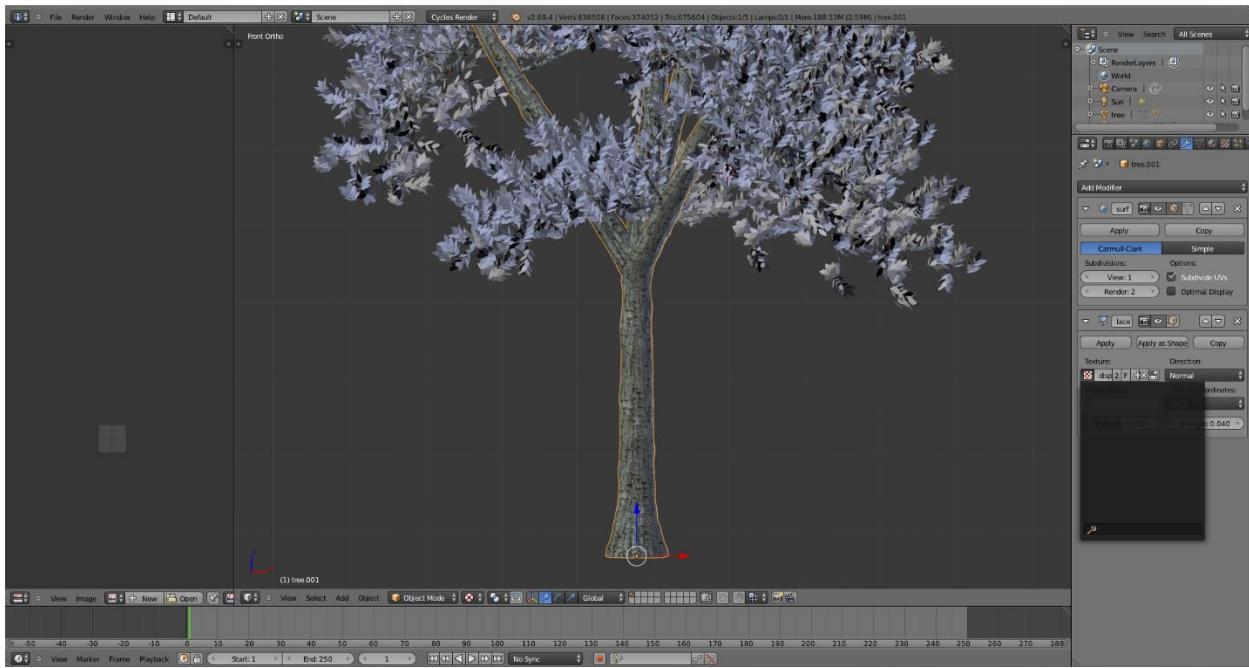
- **14.** If you have more than one trunk, you have to unwrap all the other splitting trunks. When this process is done select all the base trunks and separate them from the branches (**CTRL+L**), selecting all of the vertices, and in edit mode press **P** to make it an individual object.



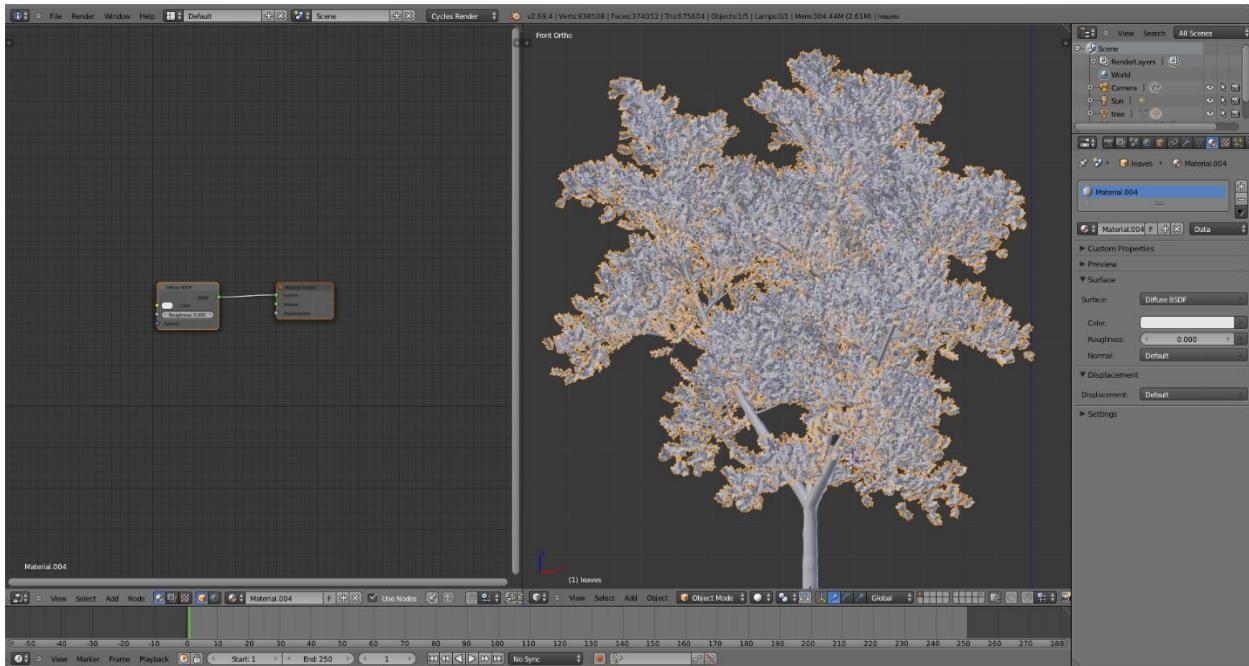
- **15.** Now you can easily select all the branches without selecting the trunk. I used the ‘project from view’ projection to UV Map the branches. This sounds a bit weird, but you won’t see big UV problems. I used the same bark texture as I used for the trunk.



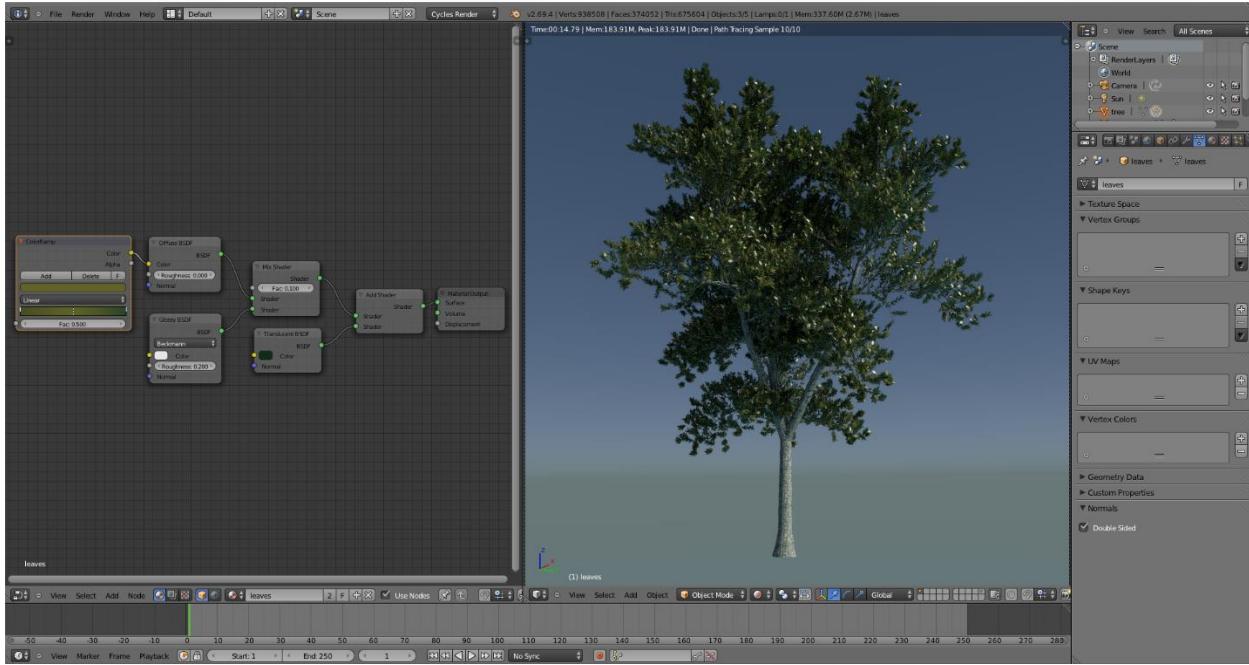
- **16.** As you can see, the trunk does not look realistic because it’s a bit flat without a bumpy look. To get this look I added some extra lines (**CTRL+R**). Now you add a displacement modifier and combine this with a cloud texture. If you don’t know how this works, I always use the Blender internal texture mode to create a cloud with a lot of contrast. Then I switch back to cycles and apply this texture in the displacement.



- 17. You can also tweak the bottom of the tree by scaling this a bit. Avoid making the trunk look like a cylinder because this makes your scene very unrealistic.



- 18. Next we need to add a color on the leaves. It is not only a green color, we need to add some gloss on the leaves and make them a bit transparent so they don't have a plastic look. It is also important to keep color variation in mind. We want some yellow and brown in the leaves.



- 19. As you can see, I am using a translucent shader for transparency. You have to mix this with an Add shader. Don't use the mix shader because that won't work. To mix the colors I used a color ramp ([Add-->converter--> color ramp](#)). To mix this all over the leaves I also used a noise texture. Open your preview window to see what kind of result you get with this node. Giving values is not the right thing to do. Try to experiment and make something nice out of it. One last note: don't use too much glossy. A value of 0.1 is the maximum.

Grass & Moss

In the previous section we created two different types of trees. You have to find out what kind of tree works best for you. My experience is that low poly trees work best in the background, some people try to avoid using these kinds of trees in their scenes. My opinion is that it is not a problem to integrate them into a scene. It depends on how you put them in an environment.

Most of the time I use the HD trees in the foreground, and the low poly trees in the background. Usually this is a magical combination. Later in this book I will show some scenes where this works pretty well.

We created a basic tree with the Sapling add-on. The possibilities with this add-on are great as it allows you to create every kind of tree you like.

You still need to know the basics and how trees look in real life. The best advice I can give is to go outside and look for the trees you like. There is so much variation in nature that it is impossible to discuss everything in this book.



Nice example how a tree makes the scene much more beautiful (Fig 4.7)

Now that we know the basics on how to create a tree, it is time to take a look at grass and moss. We can simply create grass with the strand render tool in Blender.

Hair strands are small polygons, which are extruded to follow the direction of the static particle line, but their width is exactly perpendicular to the viewing angle and precisely 1 pixel wide. This ensures that for any distance the strands will render without aliasing problems. In this sense it resembles a bit the "Wire render" option, with the main difference being that here the actual face normal is still valid for rendering, and always points - perpendicular to the strand - in the direction of the camera.



Sample of a grass ball

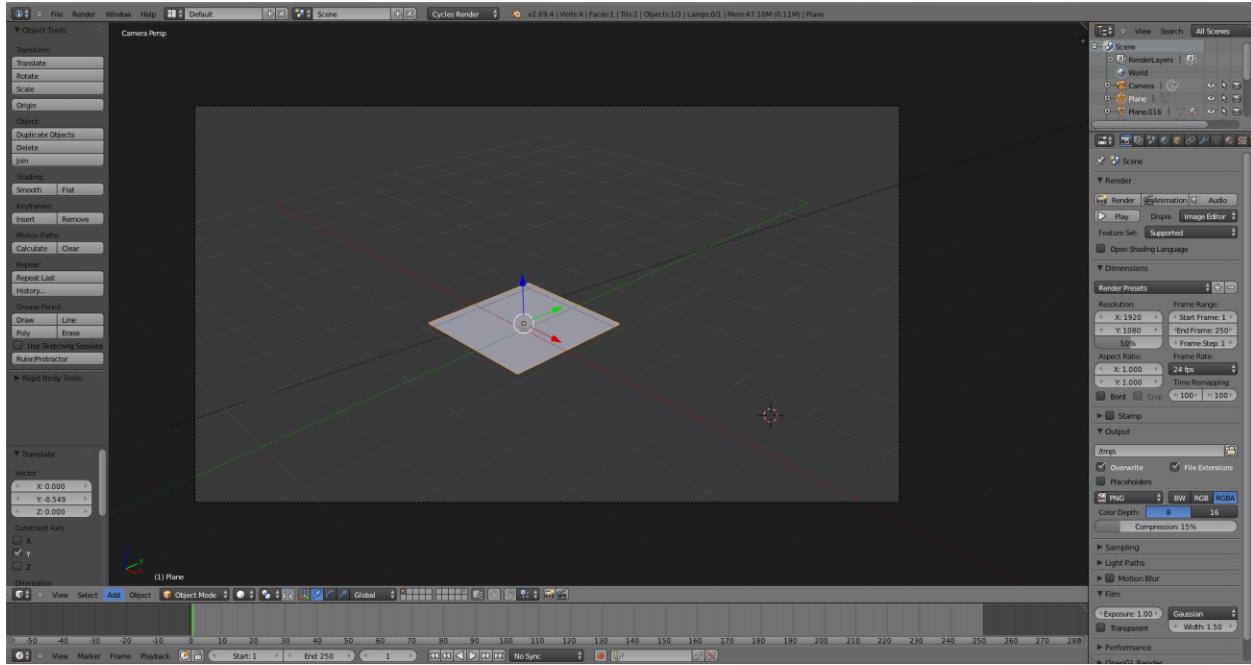


Sample of a mos ball

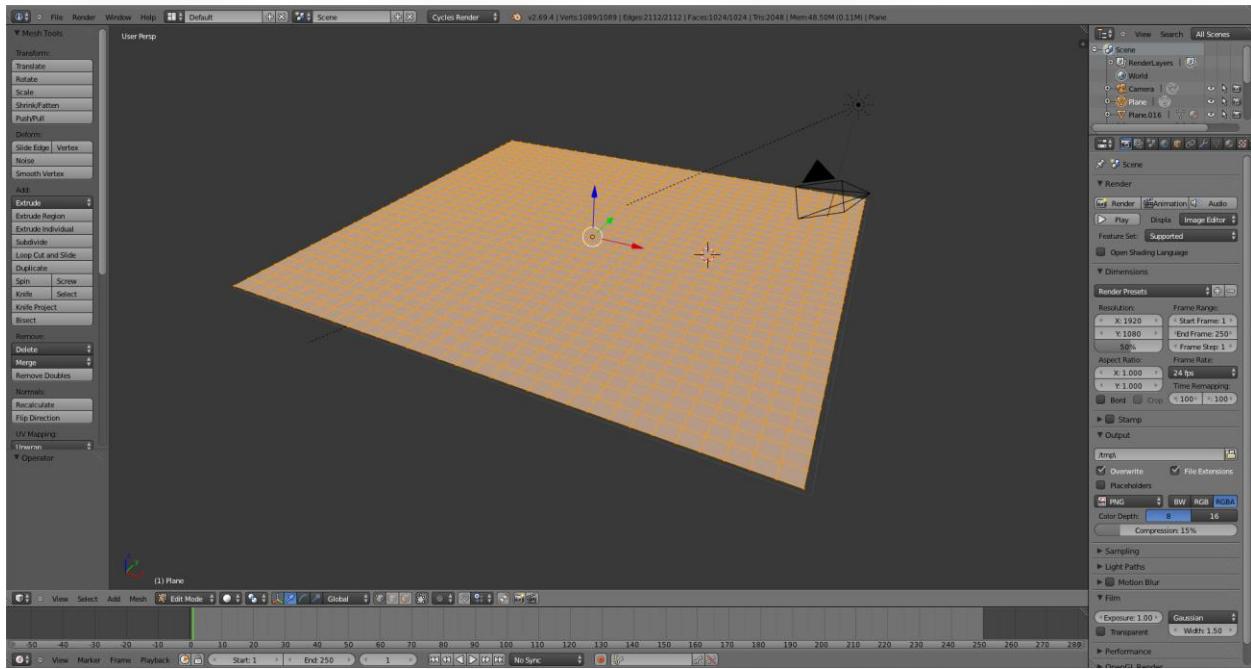
In the next section we are going to focus on creating grass and moss. Remember that this is not the only way you can create them. I use this method because it looks good in my scenes. You can use this technique to get an idea of what strands can do in a scene, but creating grass and moss is all about your creativity what kind of type you like to create



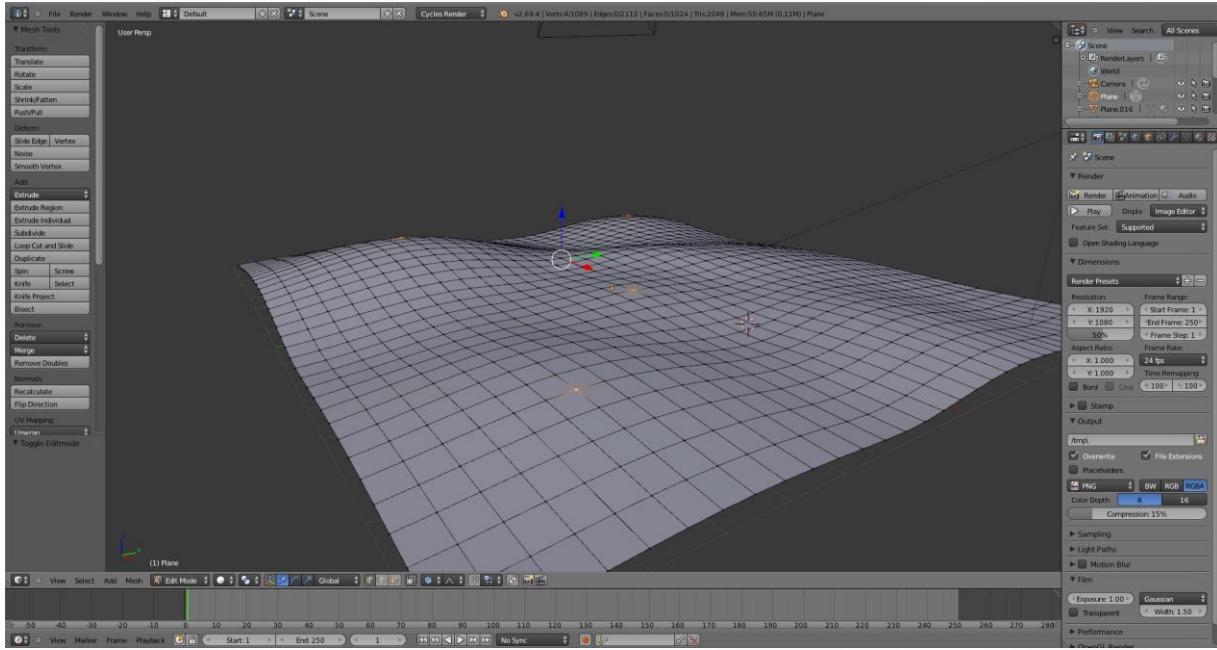
*Grass and moss generated with strand rendering in
Blender*



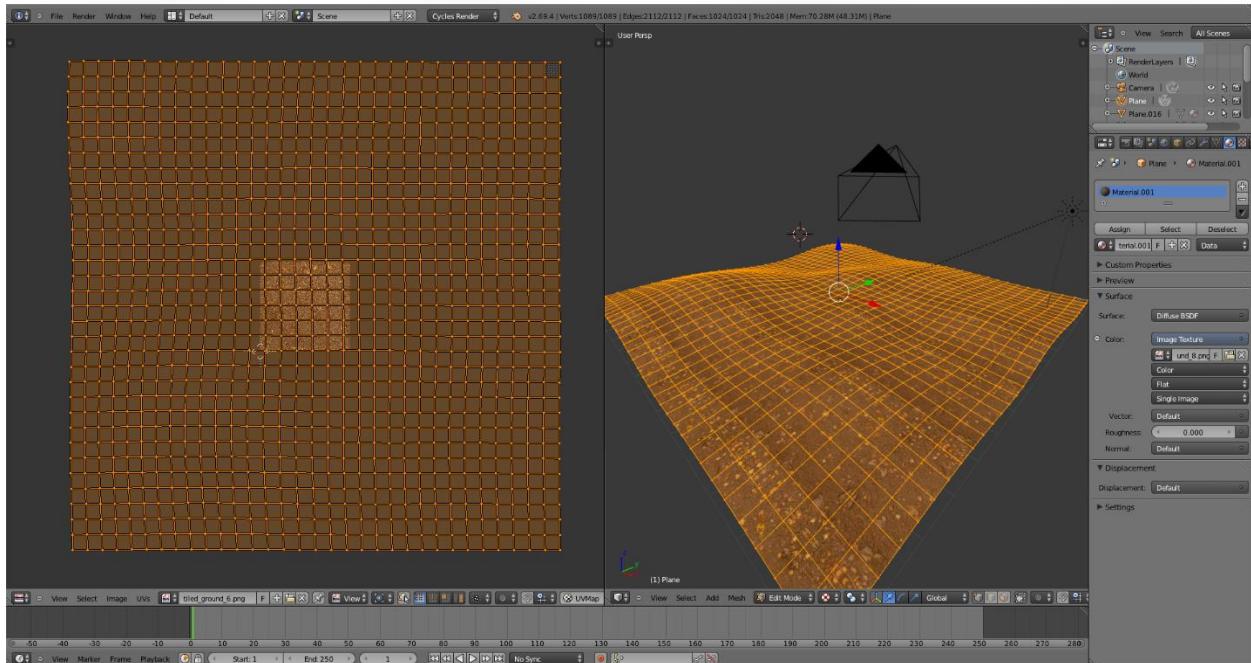
- 1. We start the scene by adding a plane, and then scaling the plane in edit mode. Don't scale it in object mode, as this will change the values of the strands. When you are in edit mode press **S+8** to scale the plane. We need the same scale as the grid.



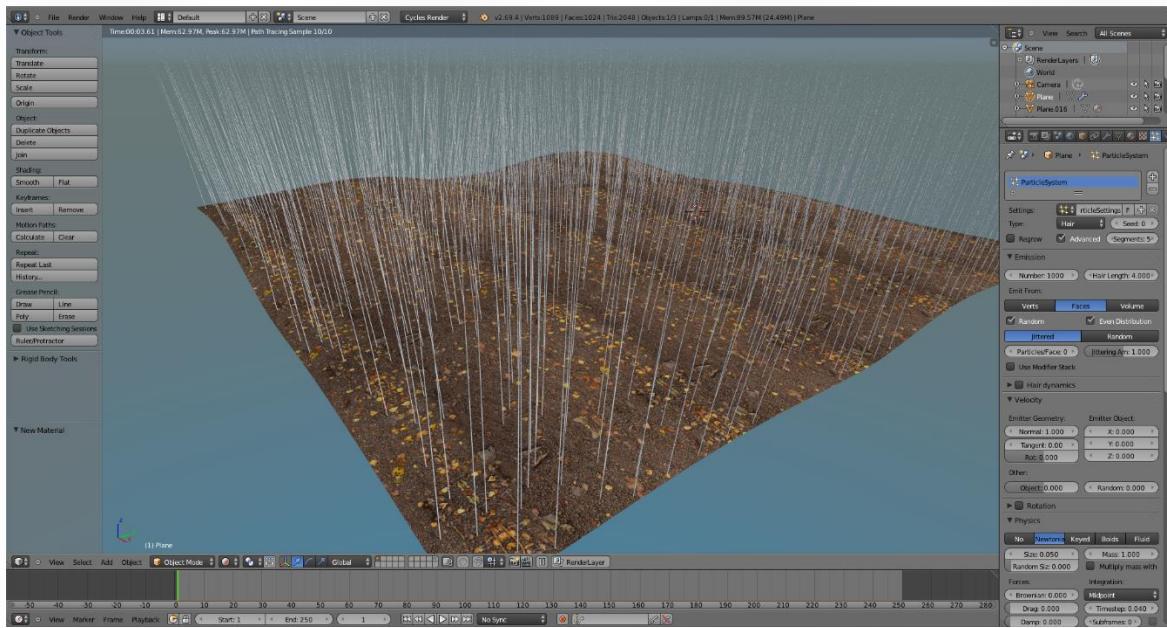
- 2. Now we subdivide the plane a couple of times. There is not really an exact rate of duplicating the vertices. Keep in mind that we want some simple shapes, so we don't need too many of them.



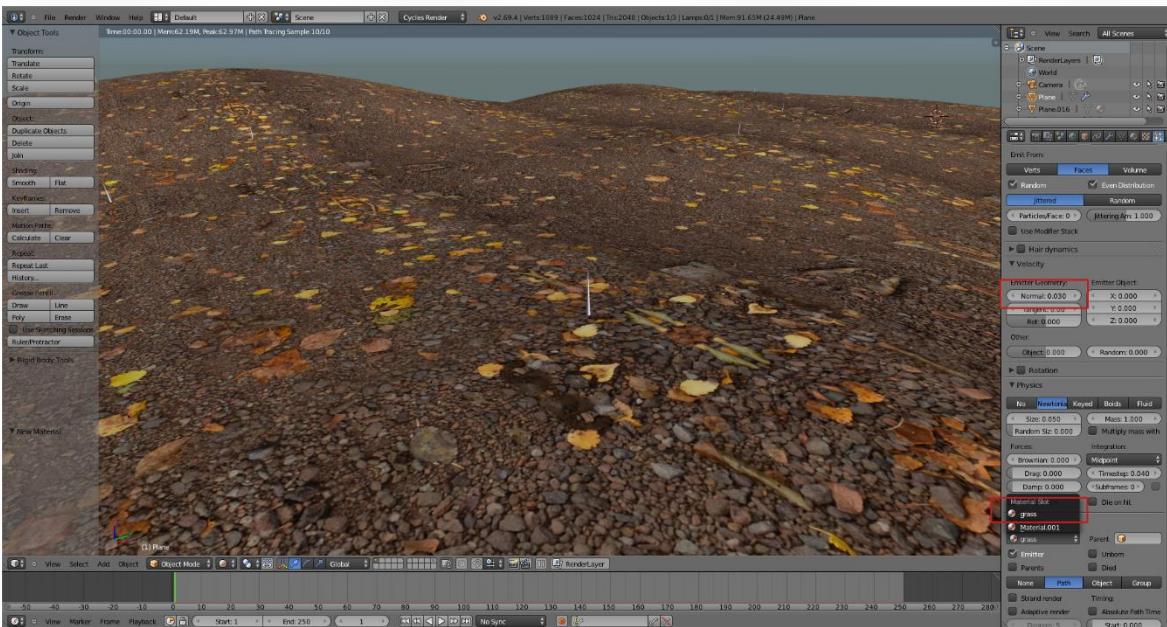
- 3. Try to make some random shapes on the plane. You can press O and use the G key to drag some vertices. You can also change the shape when dragging. There is a little curve icon that lets you change it the way you'd like. Again, try to experiment. There are many ways of creating shapes in a plane.



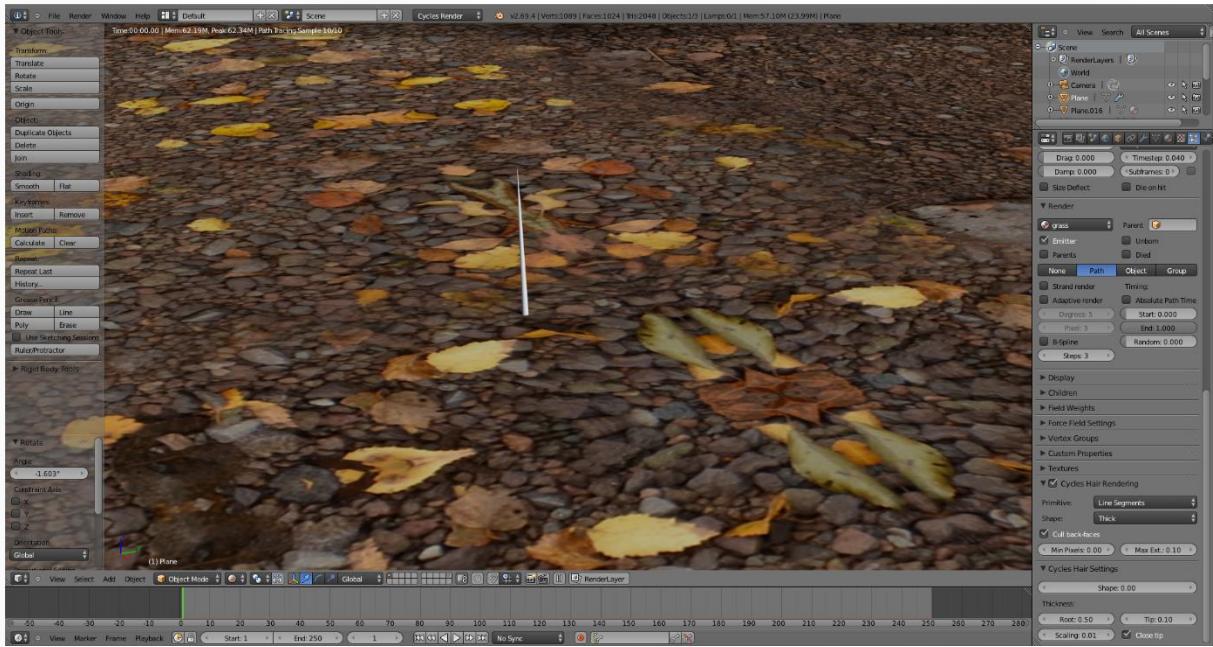
- 4. I also put a texture on the plane. As you can see, it is not a tillable texture, but this one will do the job well. You won't see them in the final render, but sometimes there are some empty spaces in the grass. This is where the ground texture will pop up.



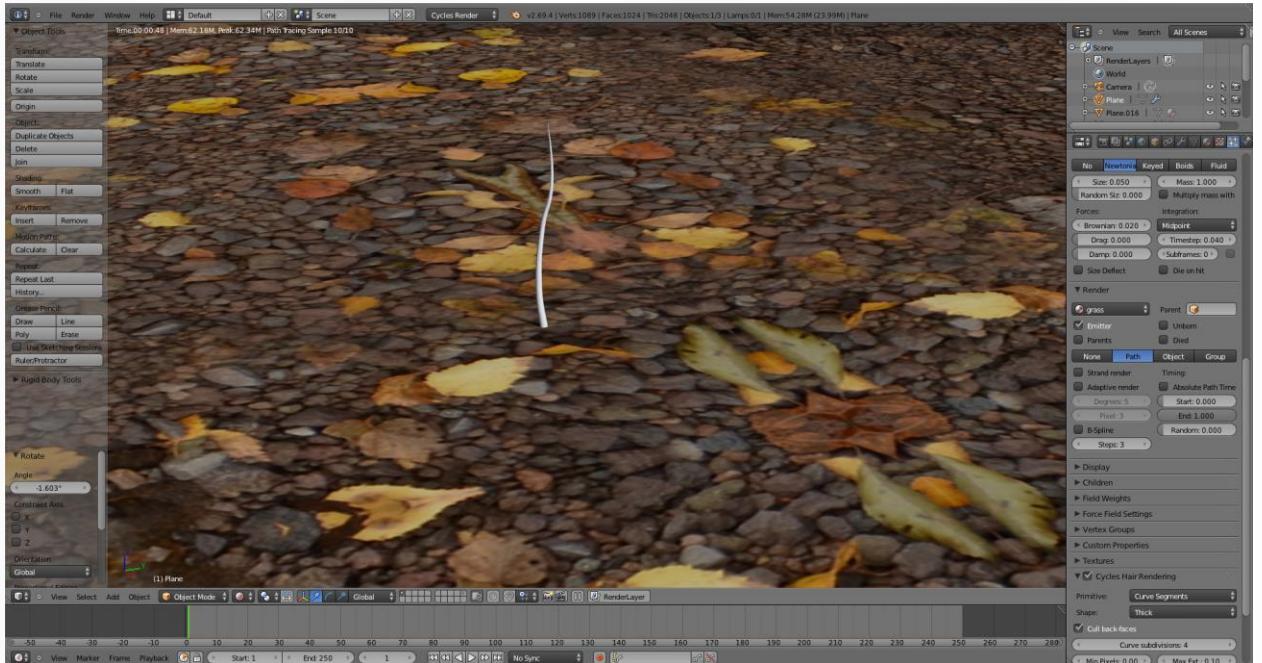
- **5.** Now we start adding a particle system. Change it from emitter to hair and click advance. You should name the particle system so you can change it or use it multiple times. Change it from jittered to random because now we don't have a pattern in the grass.



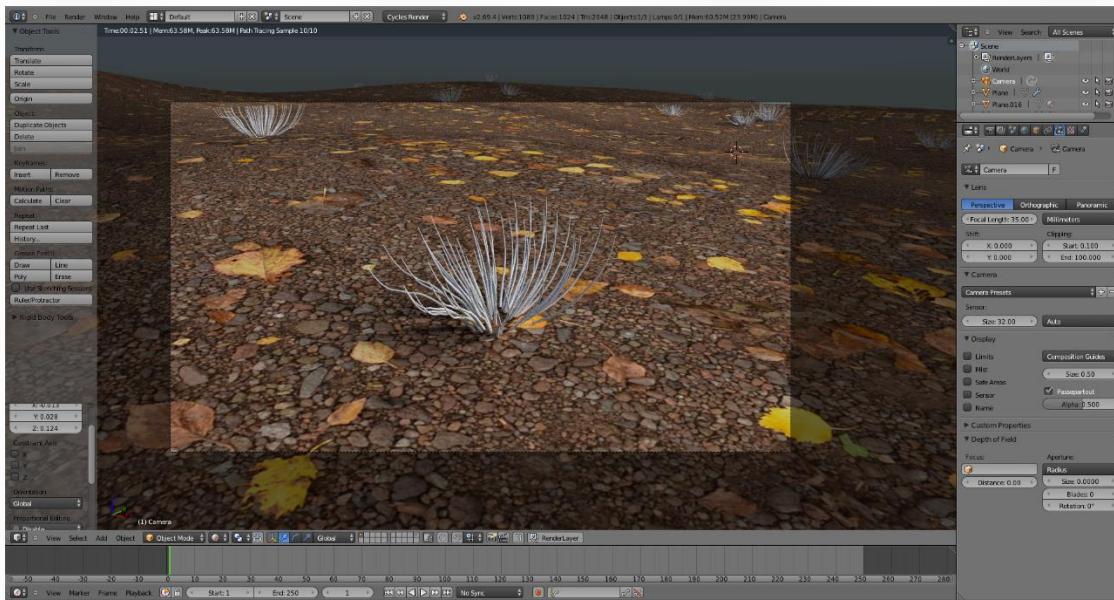
- **6.** I reduce the number of hairs to something like 30, and then I zoom into one of the strands and start tweaking it. You also need to make the strands smaller by changing the emitter normal to something between .02 and 0.5. If your strand has a brown color, add a second material and change the material to 2.



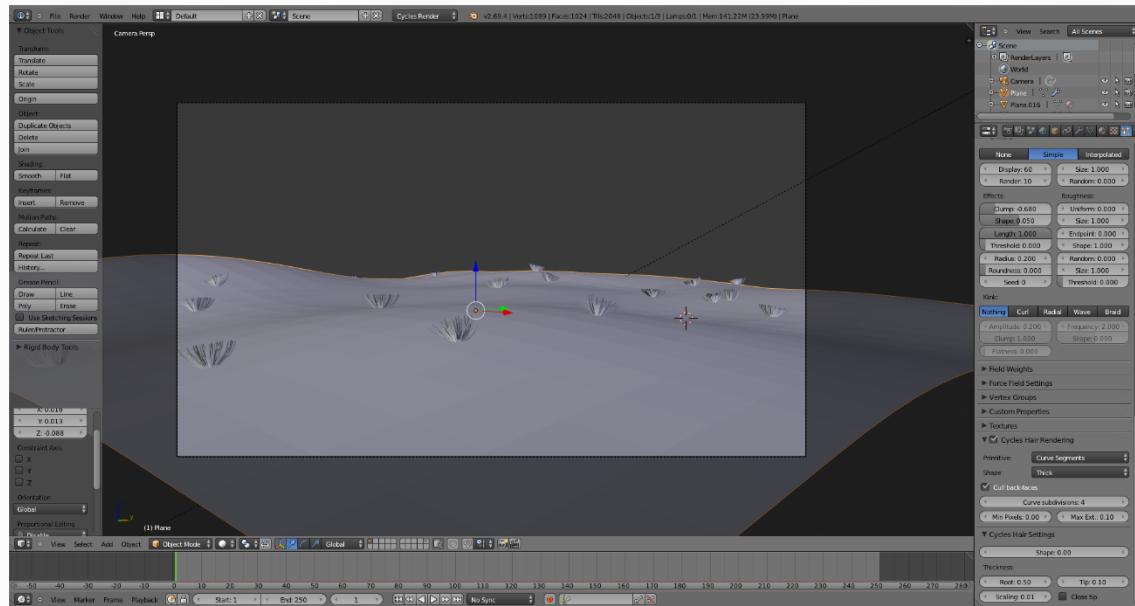
- 7. Now we need to make the strands a bit thinner. This is one of the most important parts of generating grass. I used a root of 0.5 and a tip of 0.3, but later you will find out that you have to change this a bit.



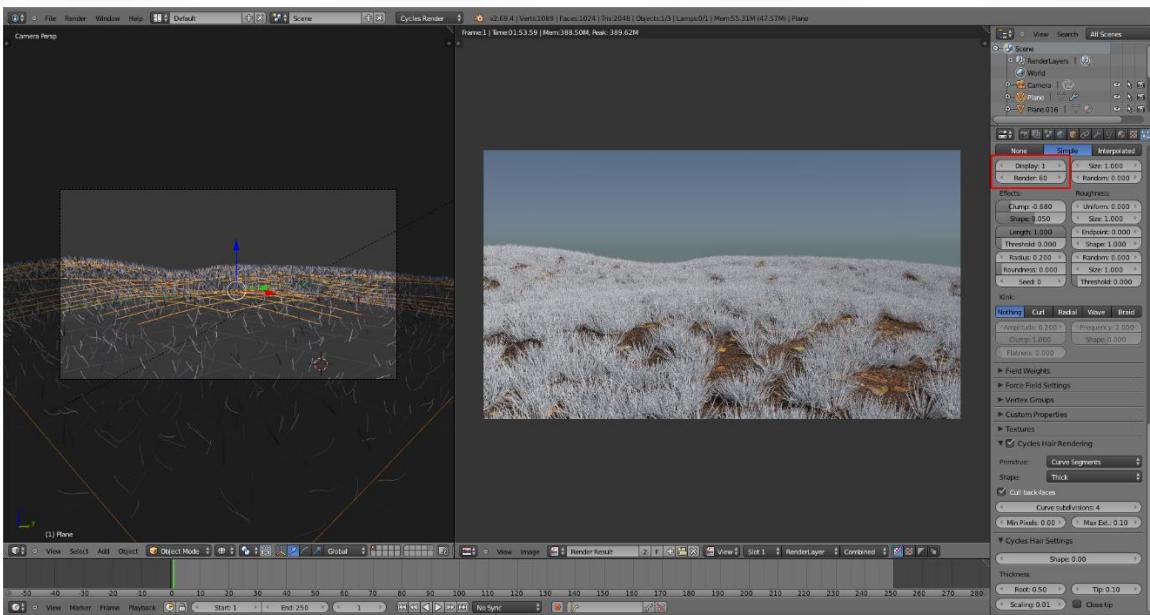
- 8. To get this curvy look, you can change the Brownian value. I used .02, but I learned that I had to change this later in the process. Strands can act very weird sometimes. Keep this in mind and don't panic if the result looks terrible. It's all part of the job and there is not a specific number for generating grass or moss.



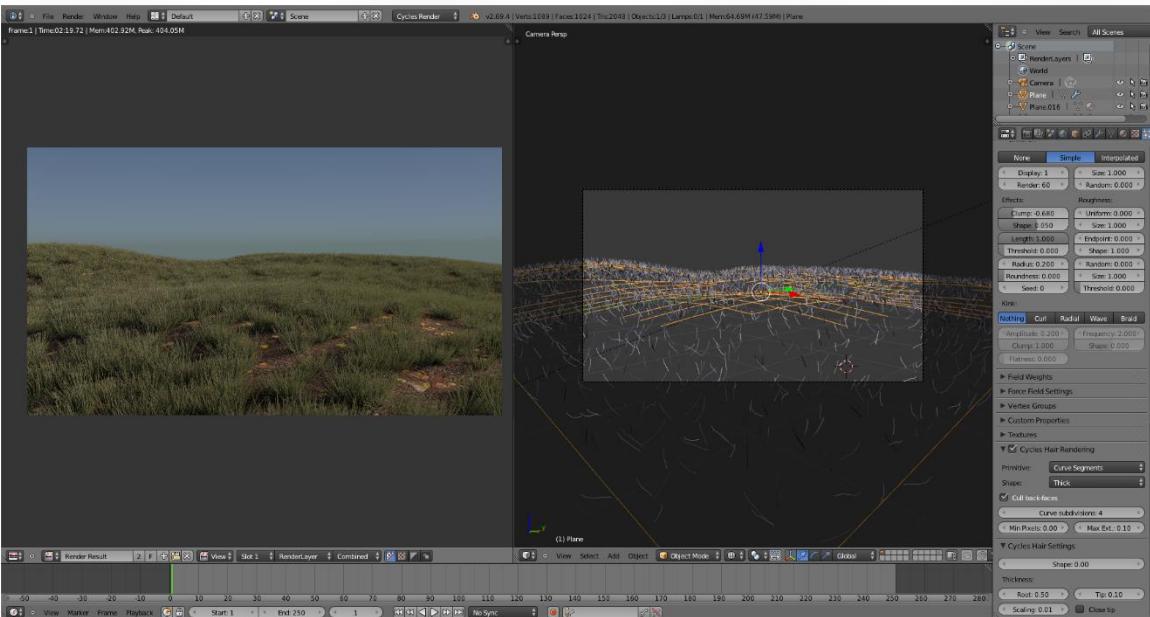
- 9. The next step is using children. Select simple and try to get the look that best fits your expectation of how small grass looks. I used a clump of -0.684, a shape of 0.05, a length of 1, and a radius of 0.2 Most of the time you will get a look that is different from the image above. That is not a big deal because it is a sample.



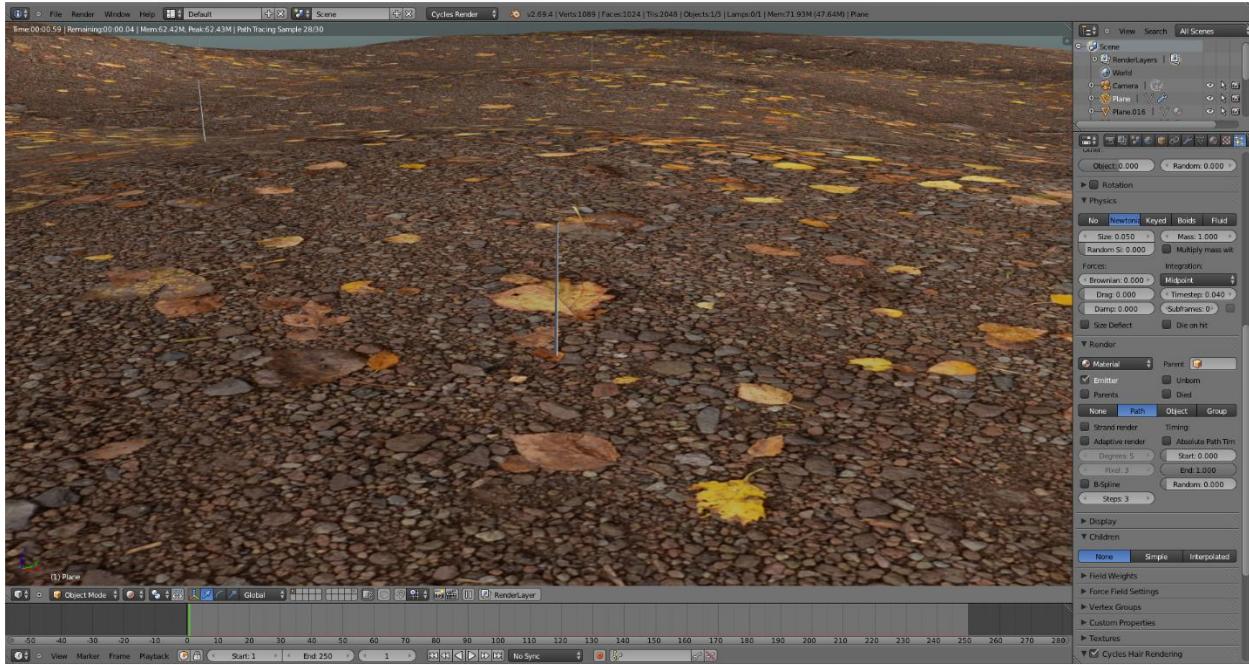
- 10. When we put the camera in position the scene looks a bit like this. You can make a render and, if you are happy with the result, you can increase the number of strands. I used 4000. One important thing to know is that the computer will be slow when you leave the children display on the same level as the render. I used a render amount of 60 and a display value of 1.



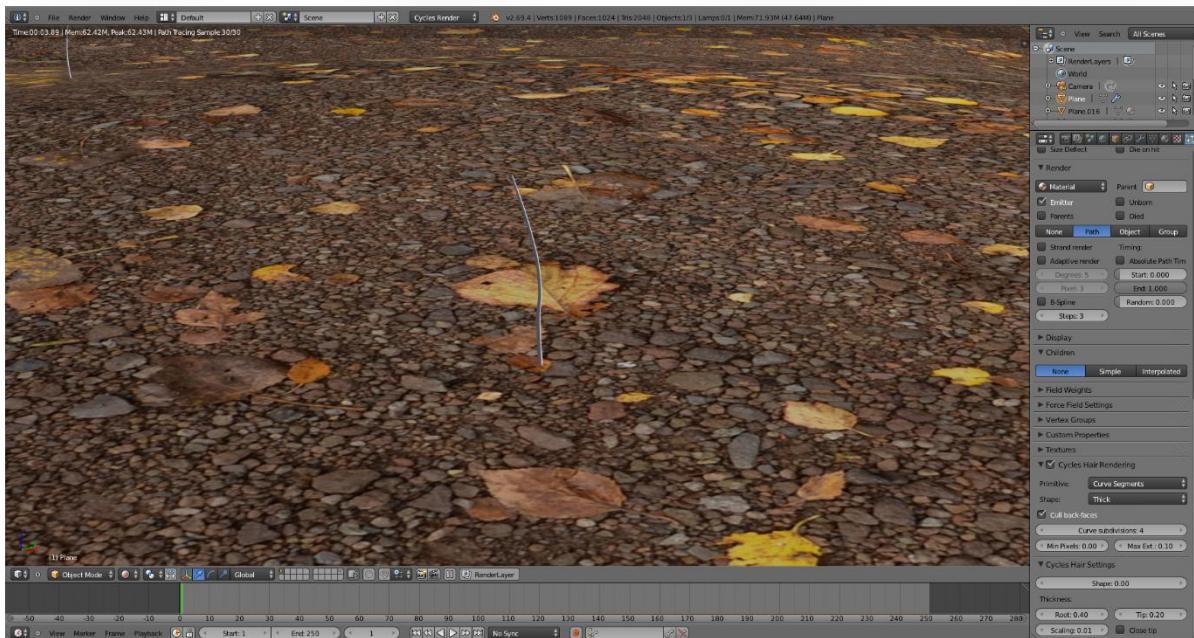
- **11.** A quick render shows how the grass looks. This is where you start tweaking the values if you don't like the result. If the render doesn't look good it's usually because of a thick strand or bad children settings. Brownian can do bad things to strands, so keep an eye in this value as well.



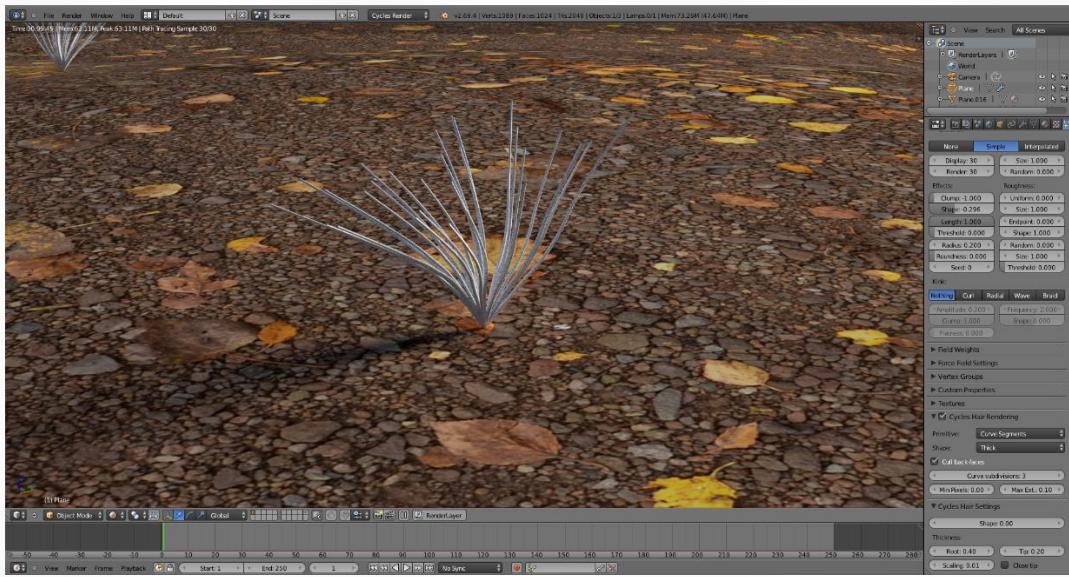
- **12.** Of course, adding a color will help you determine if the grass has the right mood. I used a color ramp and a hair info node to apply the color. There is also a glossy and a translucent node. You have to spend some time on this process to get the right look. Sometimes I spend hours on grass settings. It is not something that you tweak in a minute. The more time you spend on the settings, the better it will look.



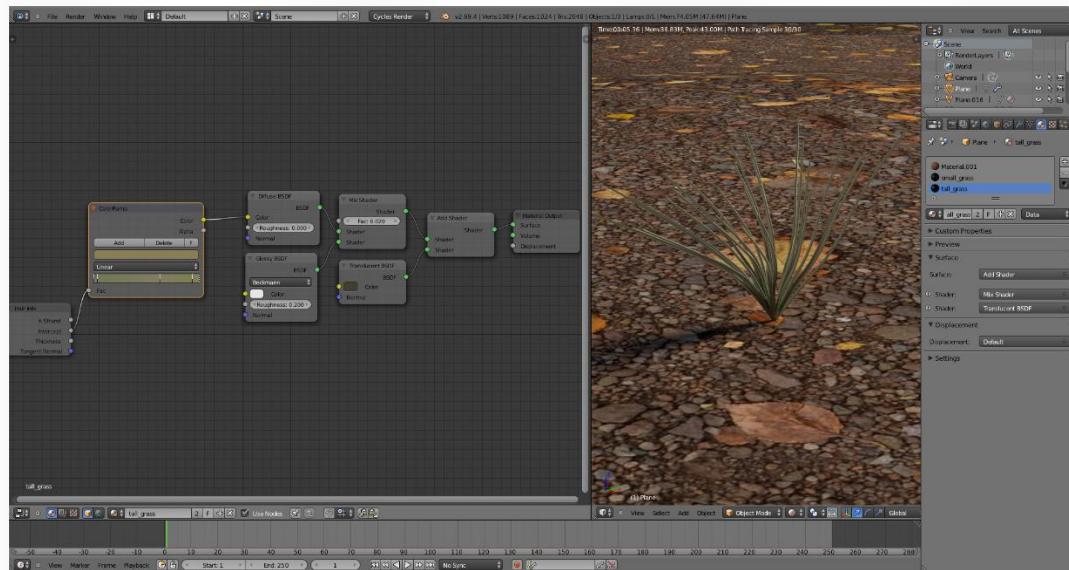
- **13.** I used two different types of grass in the scene. Now it's time to create some taller grass. I created a new particle system, changed to hair and clicked advance. I used an amount of 30 hairs and a normal value of .04 to start with. Switch to render mode to see how the strands look.



- **14.** I created a new material and changed the particle material count to 3. Now it is white again. I used a root value of .04 and a tip of .02. I also used the Brownian again, but now a very small value of .02



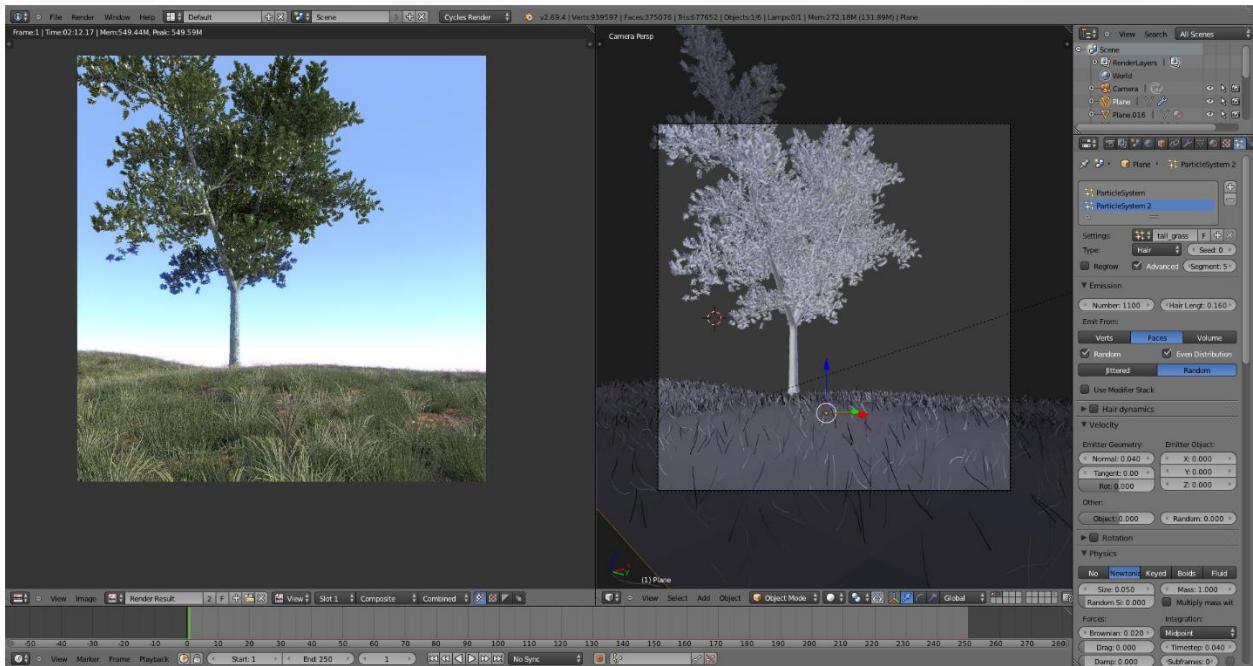
- 15. Switch to the children and use a render value of 30. I used a clump value of -1 a shape of -.29 and a radius of 0.20. The result looks pretty nice when you mix it with the small grass. You should also change this grass from jittered to random.



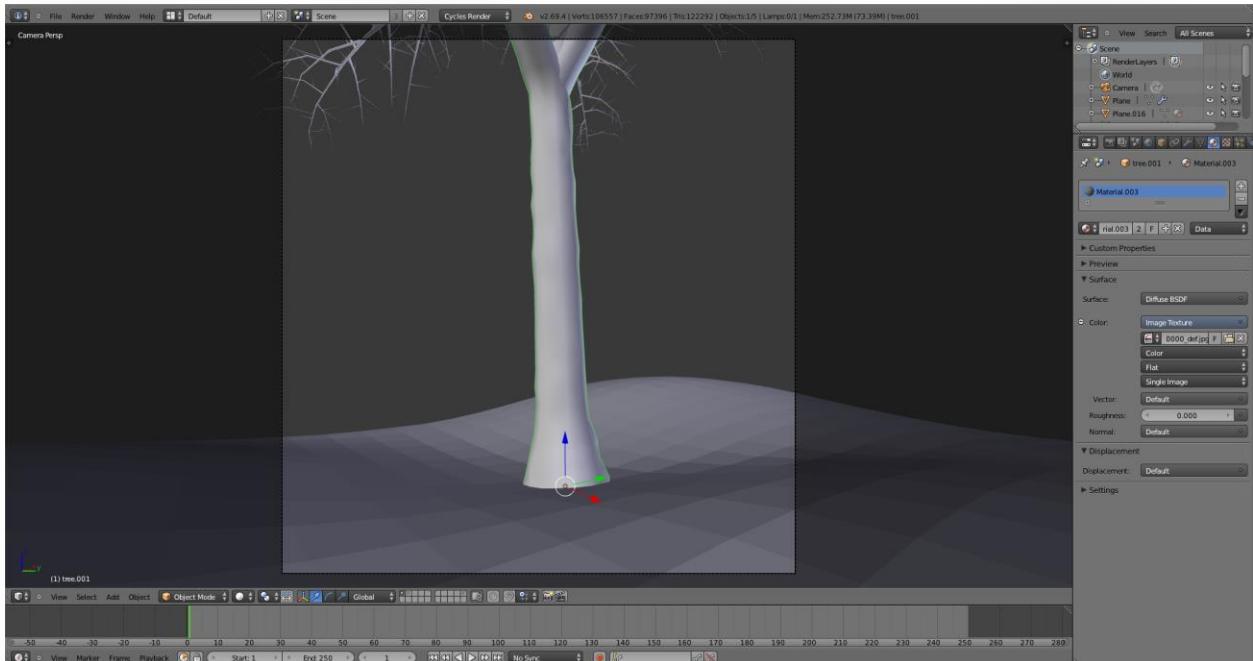
- 16. The color of the grass needs to be different than the small grass. I used a darker color, but with a bright tip. When you tweak the grass in render mode you can see that the mood of the grass immediately changes when you change the tip of the grass. when done increase the grass amount



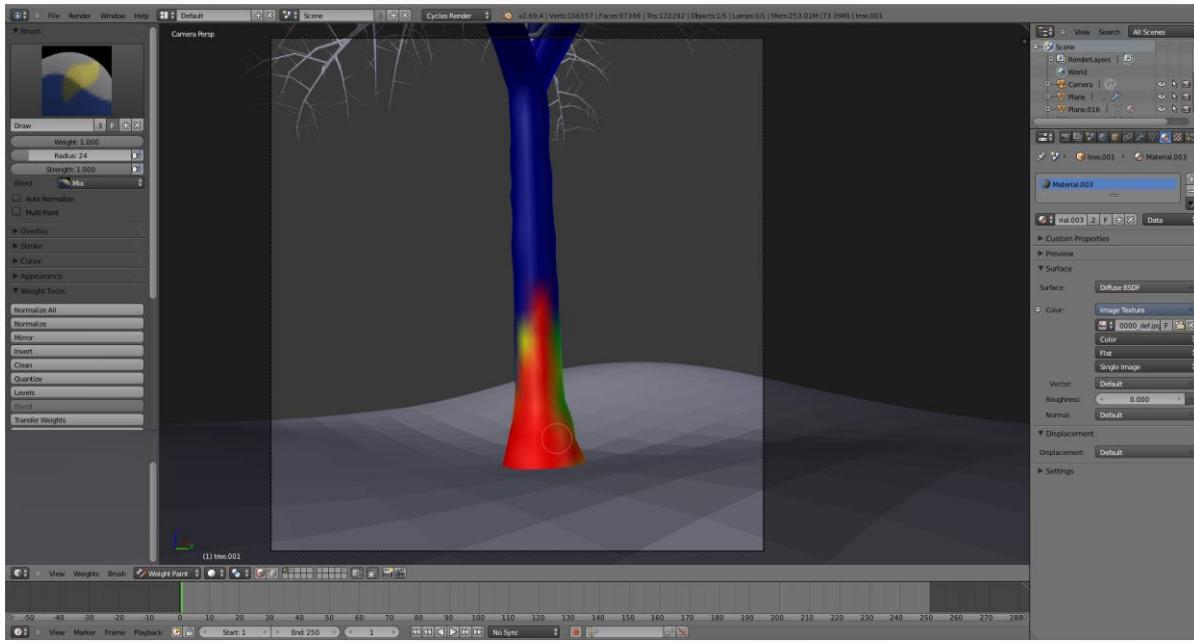
You can copy the settings, but I can recommend using your own values for the best results.



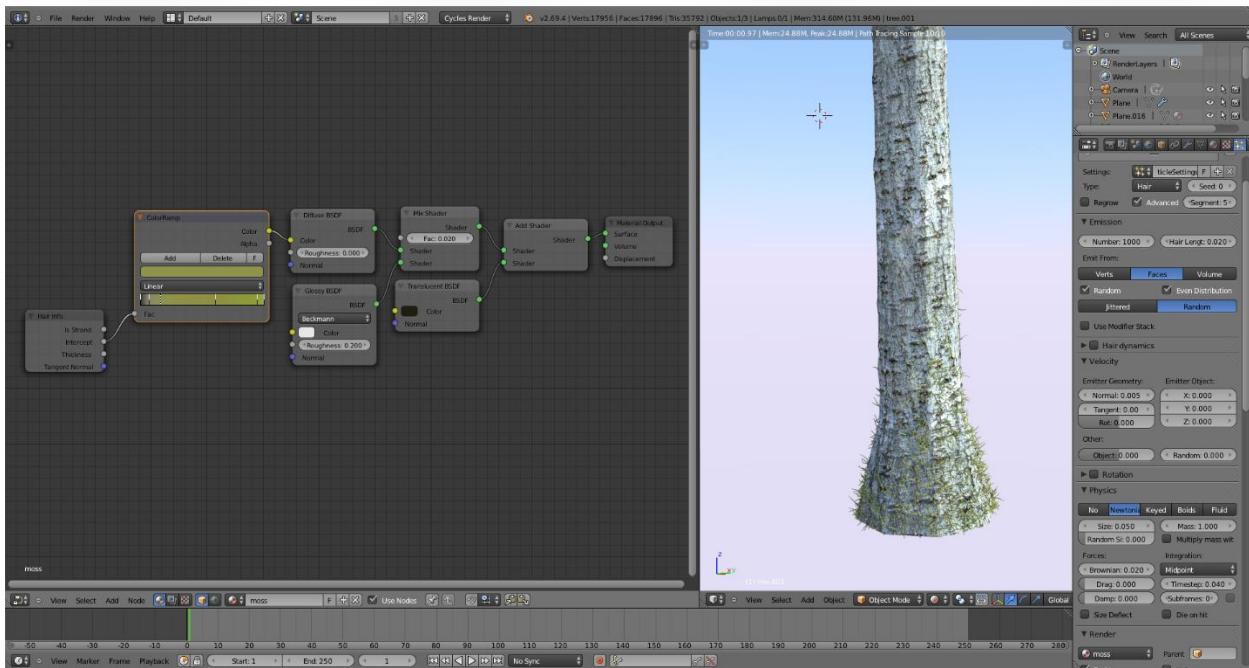
- **17.** Try to make a lot of renders and be critical about the result. Sometimes this tweaking process takes hours, but it's worth it to have the best result. In my opinion thin grass works the best. You don't want thick-looking grass in your scene. Additionally, you can also try another grass variation. Try to work with photo samples.



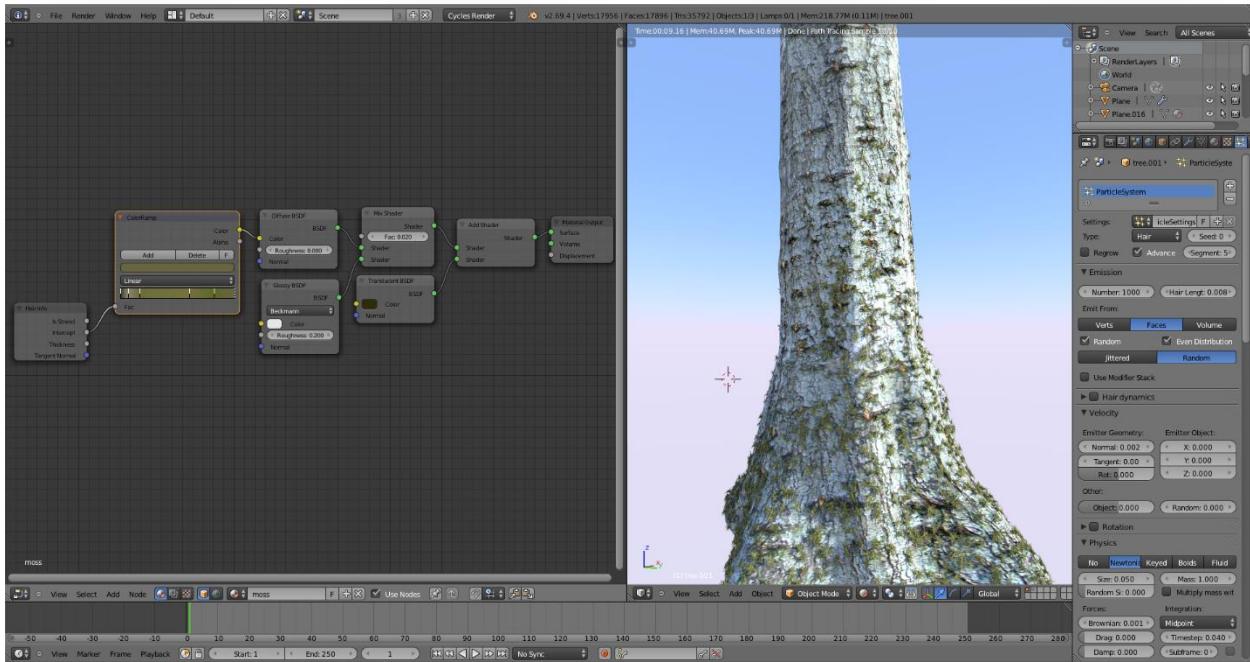
- **18.** Now that we know how to create grass, we can start creating some moss. I used a trunk from the sapling tree.



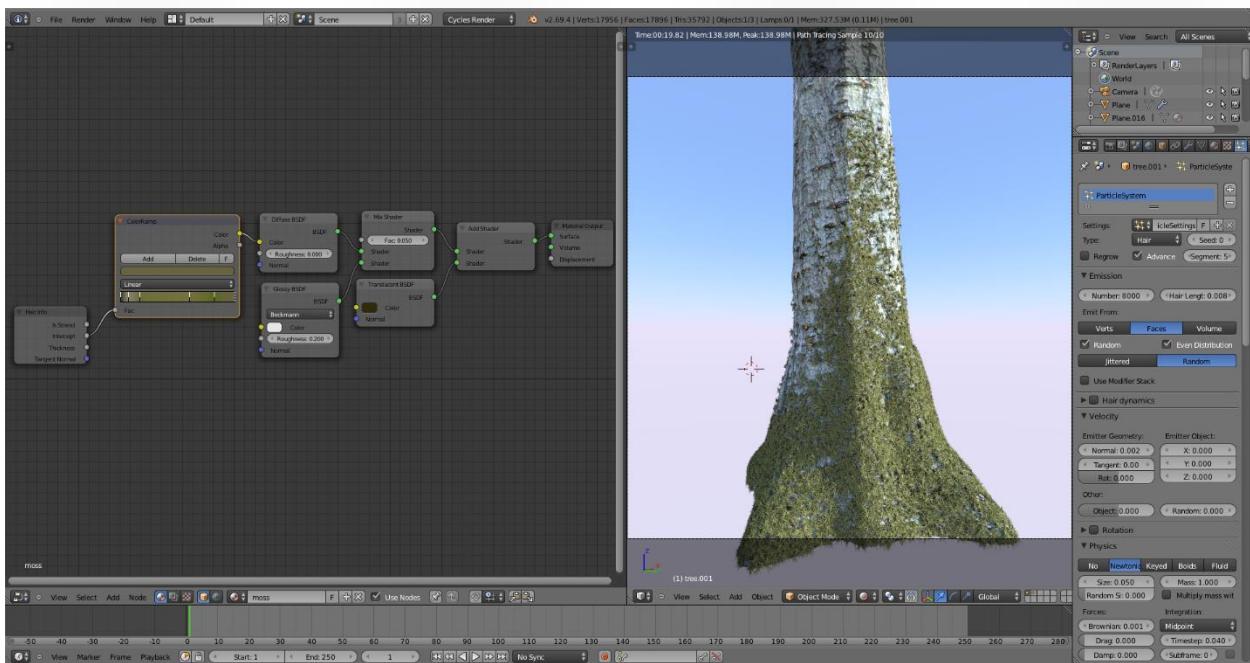
- 19. I switch to weight painting and put some red color on the trunk. There is not really a specific way that this has to be done. Just try it out and remove the color if you think there is too much.



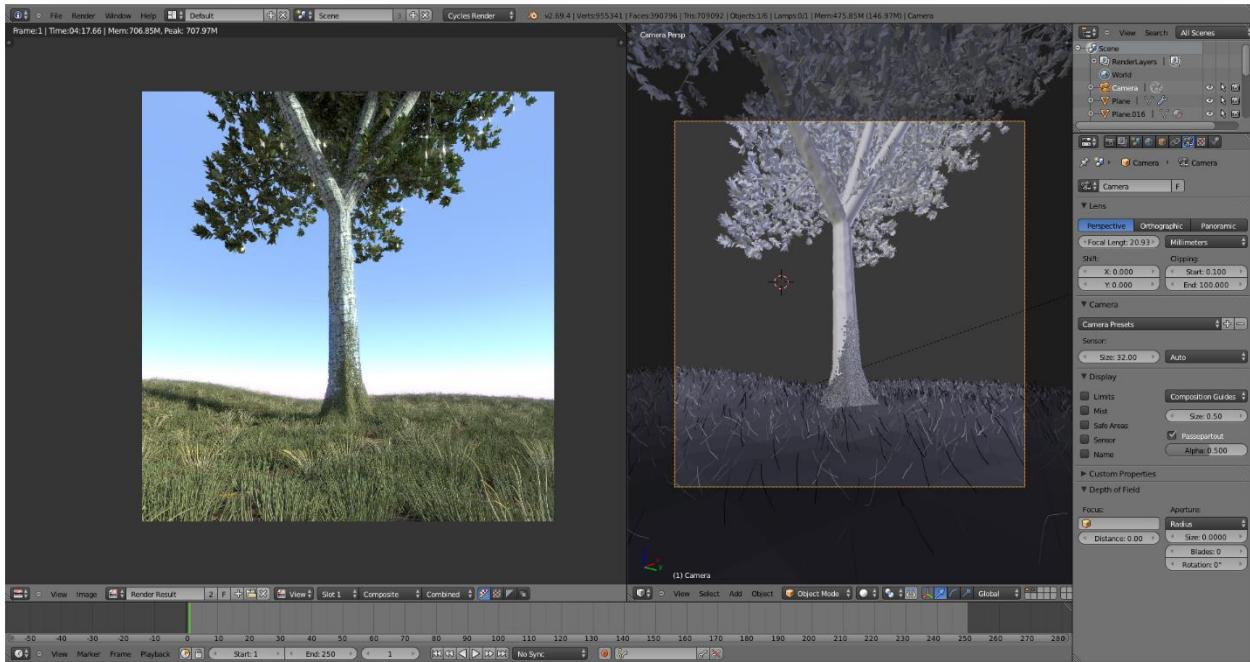
- 20. Now we add a hair particle system, just as we did with the grass. If you don't have a trunk material you can leave the particle material on 1. This is just for testing so we don't need one yet. Go advance and change the hair normal to 0.05, the thickness of the root to 0.3, and the tip to 0.1. don't forget to enable the weight group in the vertex panel



- 21. You can already start adding a color on the moss. Because there are many types of moss colors you have to try out what works the best. In my opinion a bright green color works the best with moss. Here also the tip makes the difference in the final result.



- 22. We use the children option to get a mossy look. I used a render of 30, a clump of -0.8, a shape of -1, and a length of 1. I changed the radius to 0.02. You can also use some Brownian; I used a value of .001.



- **23.** If everything works out fine, the moss will integrate with the grass. This is an extreme example of using moss. Most of the time moss is not the same as my sample, but this gives an idea how moss can be generated and how it looks. Moss works great on almost everything. I use it on rocks, wooden objects and sometimes buildings. Once you are happy with the grass or moss you have created, try to hide it because it will slow down your computer when you work on other objects. You can also drag the object to another layer, but hiding works the best.

Bushes, flowers and low poly trees

An environment scene without flowers or bushes can look a bit empty. Most of the time there is a lot of vegetation in the scene and it is not an easy job to recreate all of this in Blender. Below are some photos.



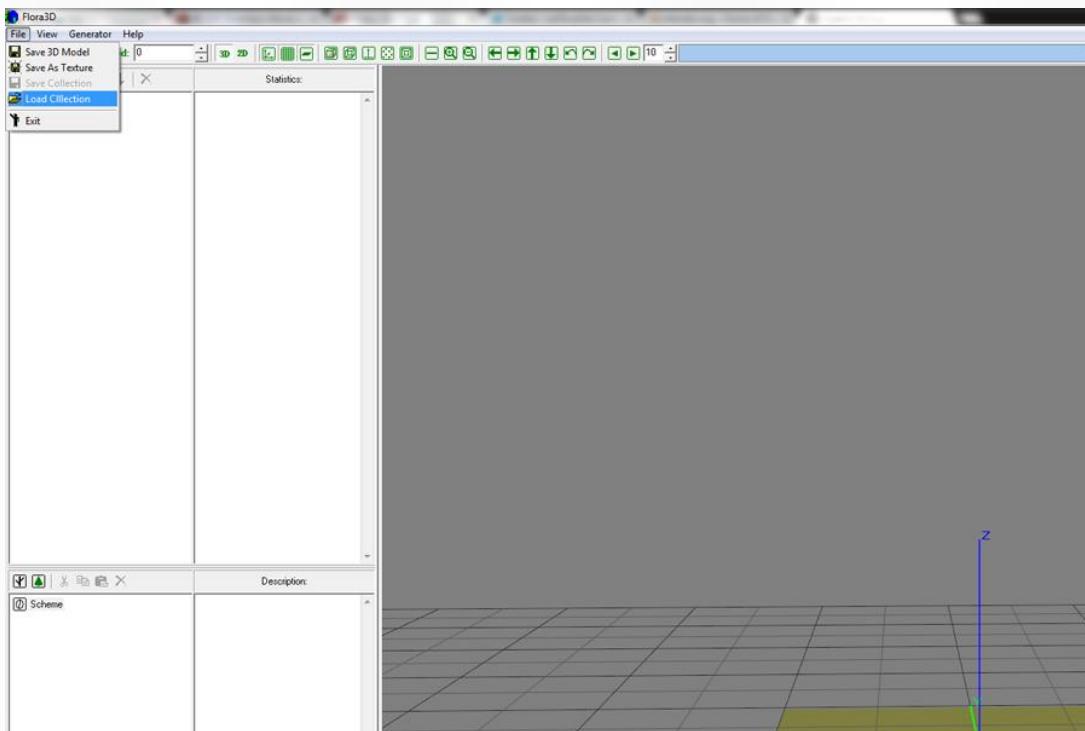
The trees and bushes make a nice transition with the blue sky in the background. Real nature doesn't need fog and DOF to make this transition possible. Only use these effects when they have a function, not an excuse.
(Fig (4.8))



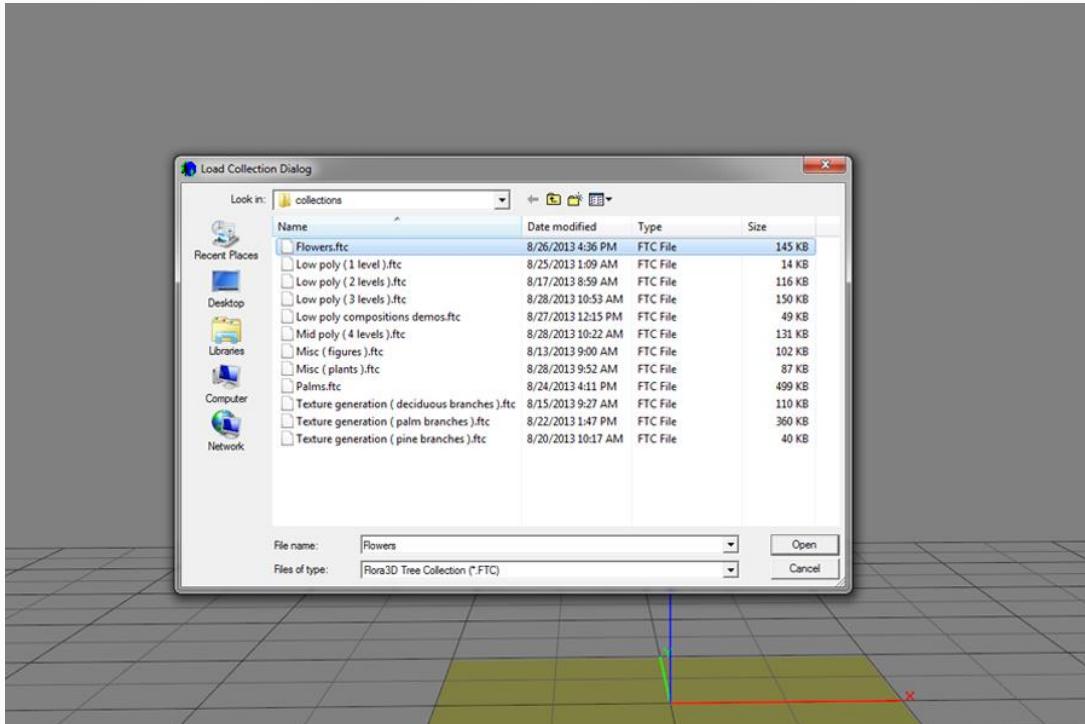
There are many different trees and bushes in this scene. The trees have different colors. That variety makes them look nice but more importantly it has a depth function.
(Fig 4.9)

There are a couple of ways creating this type of scene. One of the most common ways is using Blender, which allows you to design your own bushes/trees from scratch and then add them into your scene. The same is true for the flowers. It won't cost you a lot of time to design some of them and they add a lot too in our scene.

I like to use Flora3D for creating this type of nature. Flora3D has some very nice samples that are easy to integrate into your scene. In the following section I will create a flower and background vegetation in Flora3D.



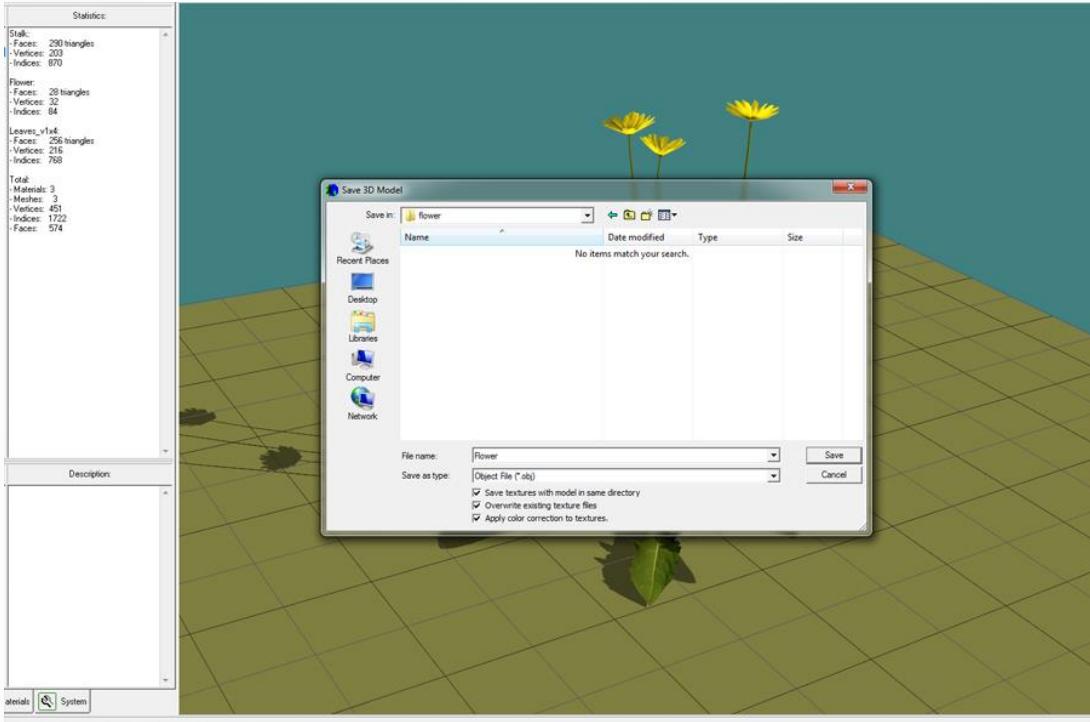
- 1. Open the Flora3D program and go to 'Load collection'.



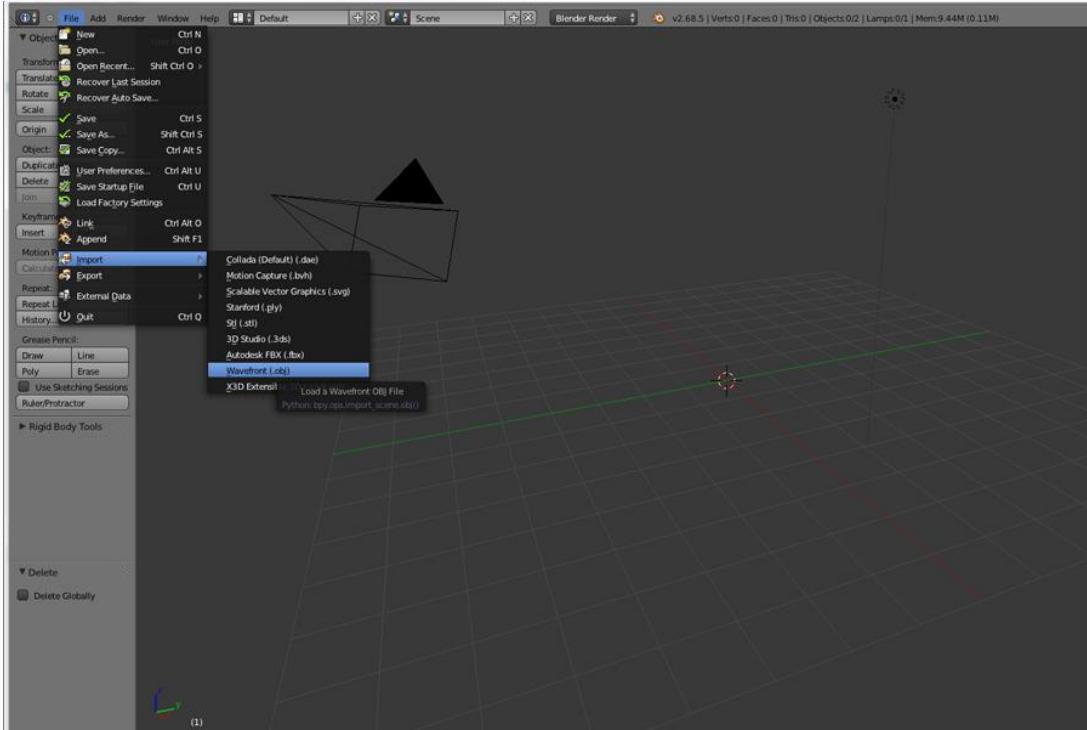
- 2. In this tab you get to choose what kind of vegetation collection you want to open. We chose flowers.



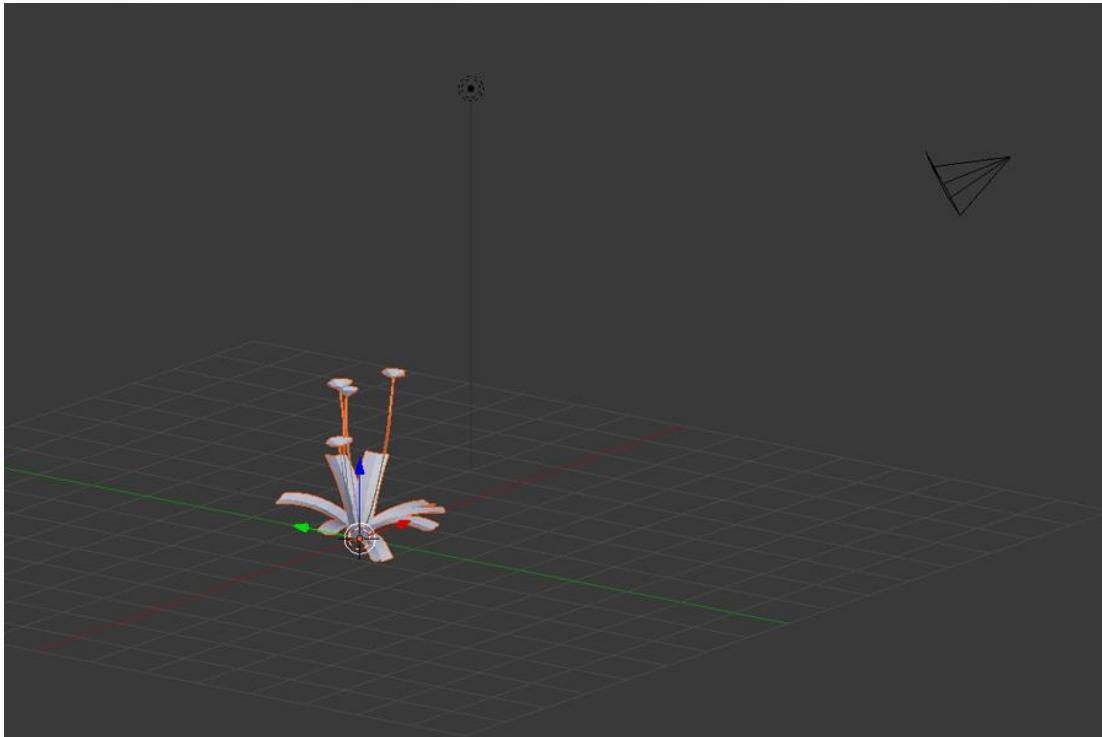
- 3. Now you get a panel on the left with some flower variations. Choose the one you like.



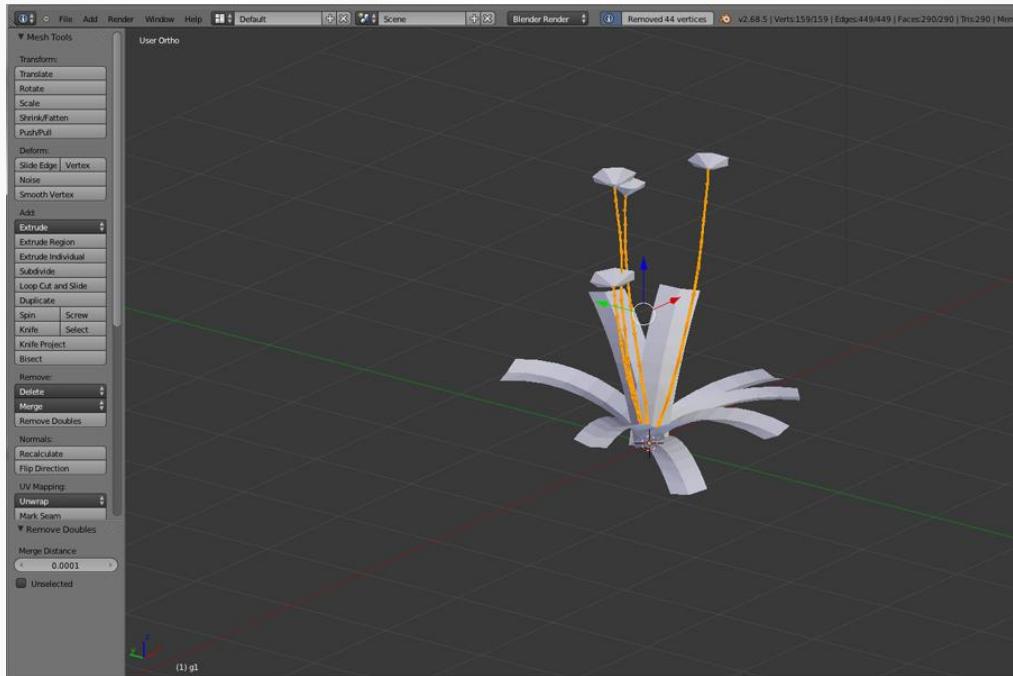
- 4. Next we need to save the flower as an .OBJ. Create a new folder and save the file.



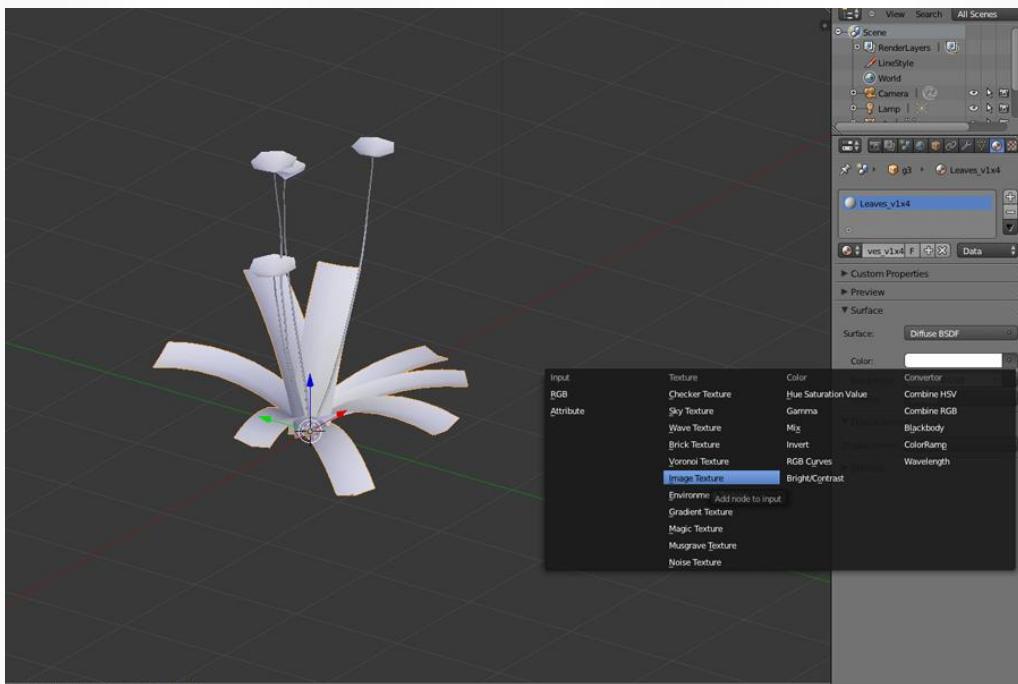
- 5. Now we switch to Blender and import the .OBJ we just saved in the folder.



- 6. Now a grey flower will appear. We need to fine-tune it a bit before we can use it in cycles.



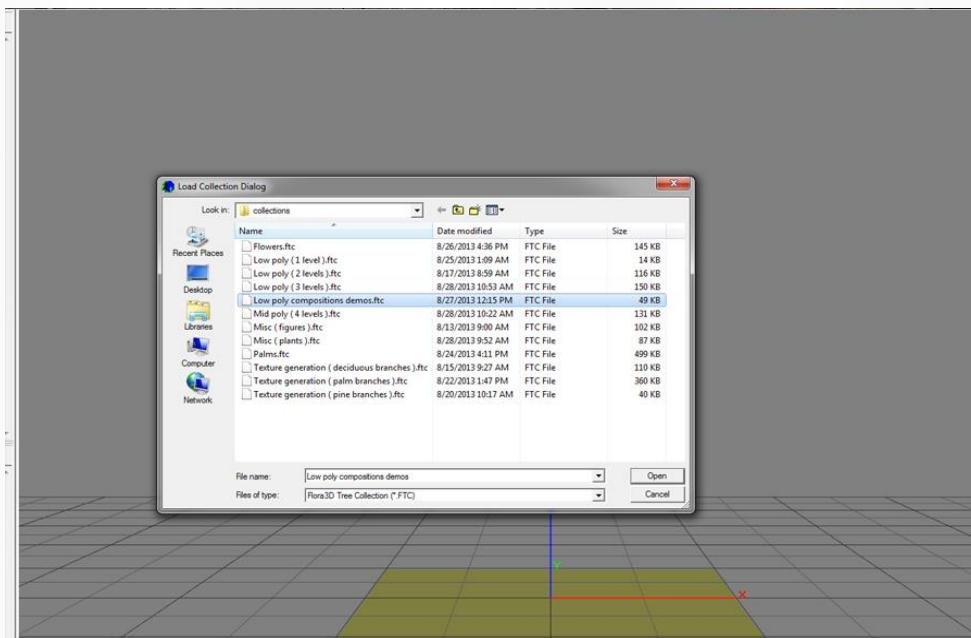
- 7. Because this is a flower from another program and an .OBJ file, we need to remove some doubles. Select all the parts in edit mode and press remove doubles in the left side bar.



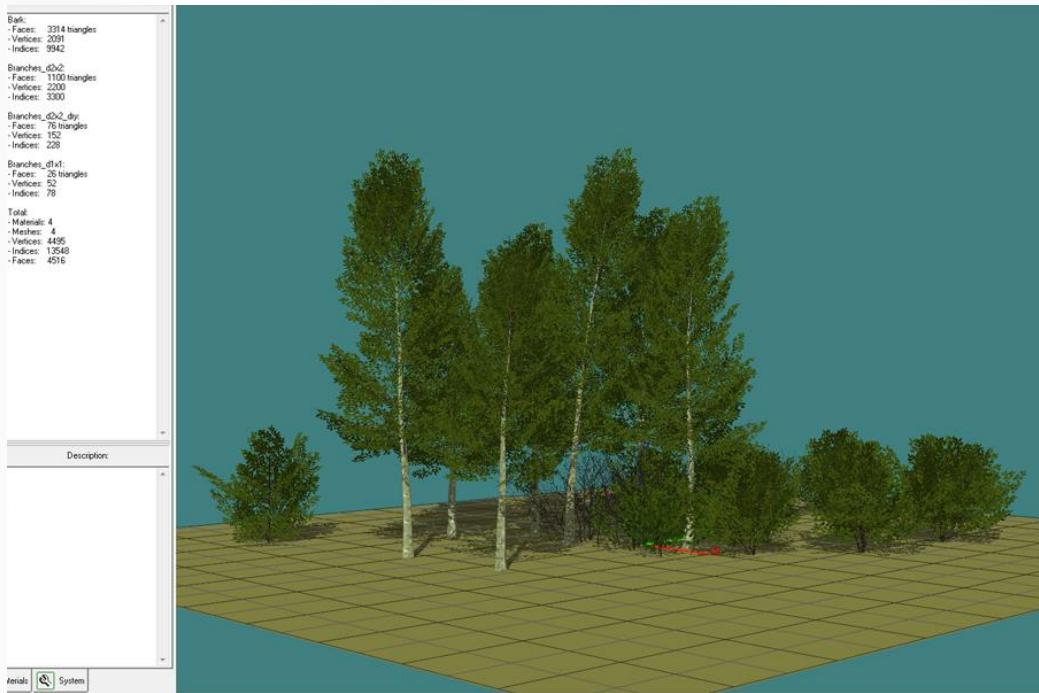
- 8. If everything is ready, we can start adding textures on the flower. The leaves and the flower on top are transparent textures, so keep in mind to add the right transparent and translucent nodes.



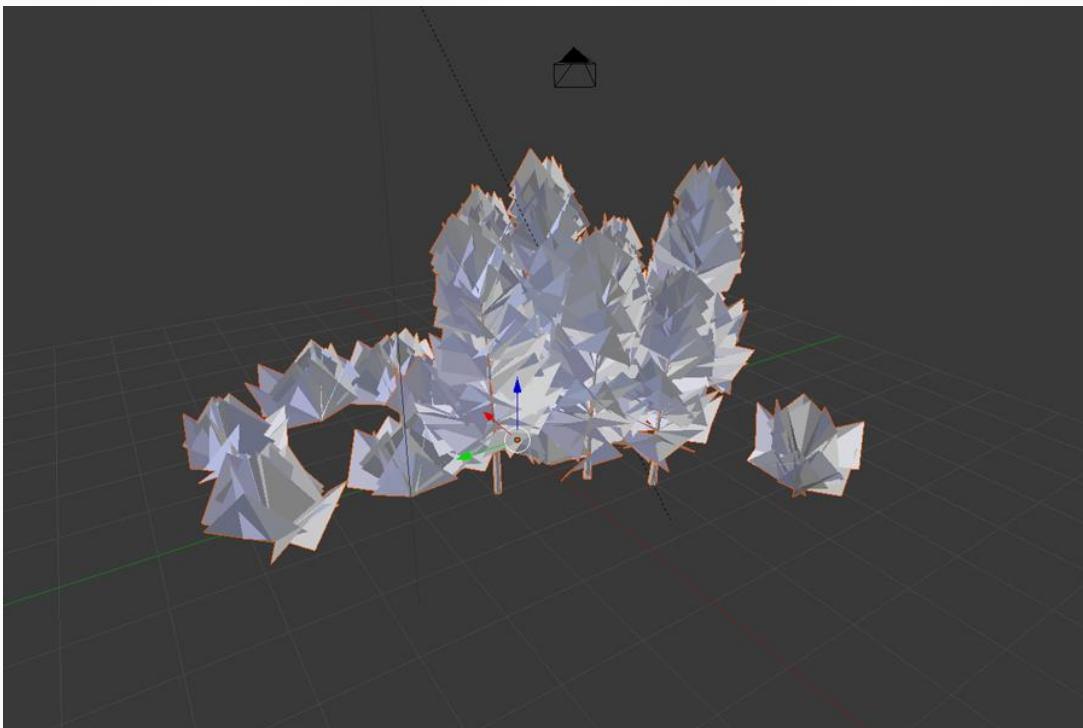
- 9. Most of the time I use a normal and a spec map for a flower. The images that are applied on the flower can be found in the export map. I used a different flower image because I didn't like the original one. When you are finished with the flower, put it in a group so you can use it in a particle system.



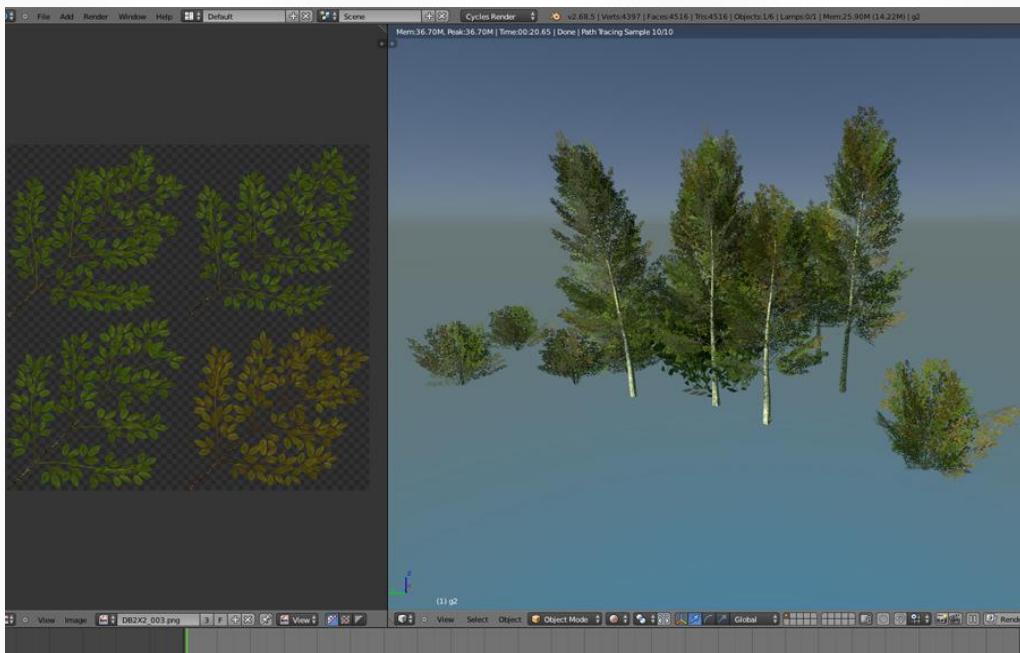
- 10. We continue the process by generating some bushes and low poly trees. Go back to Flora3D and open the low poly compositions.



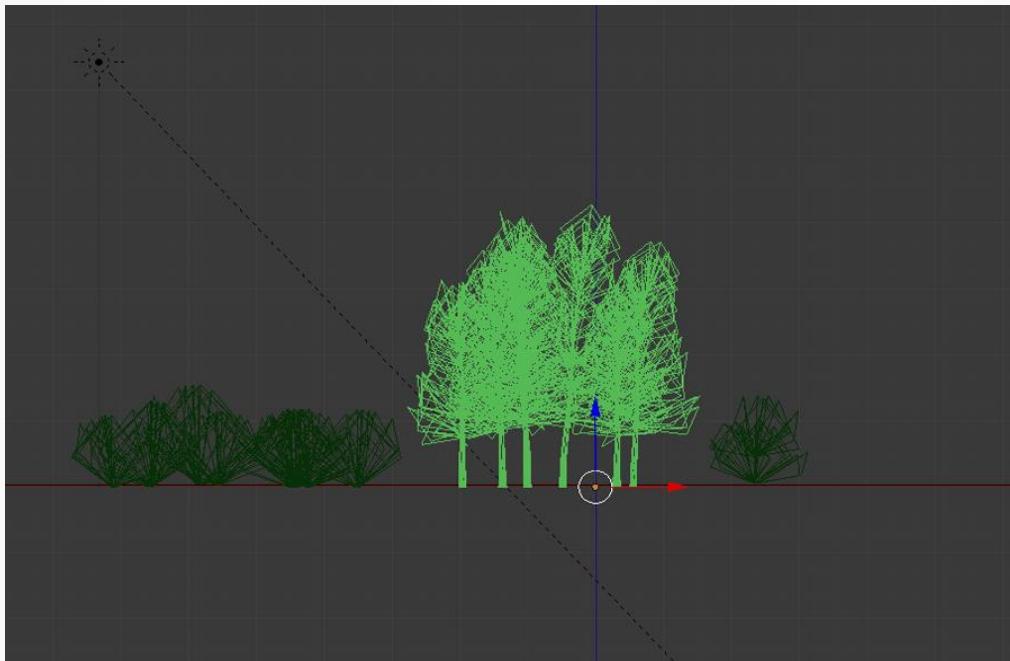
- **11.** You can choose a couple of variations. If you know what kind of collection you want to use, save it as an .OBJ in a new folder.



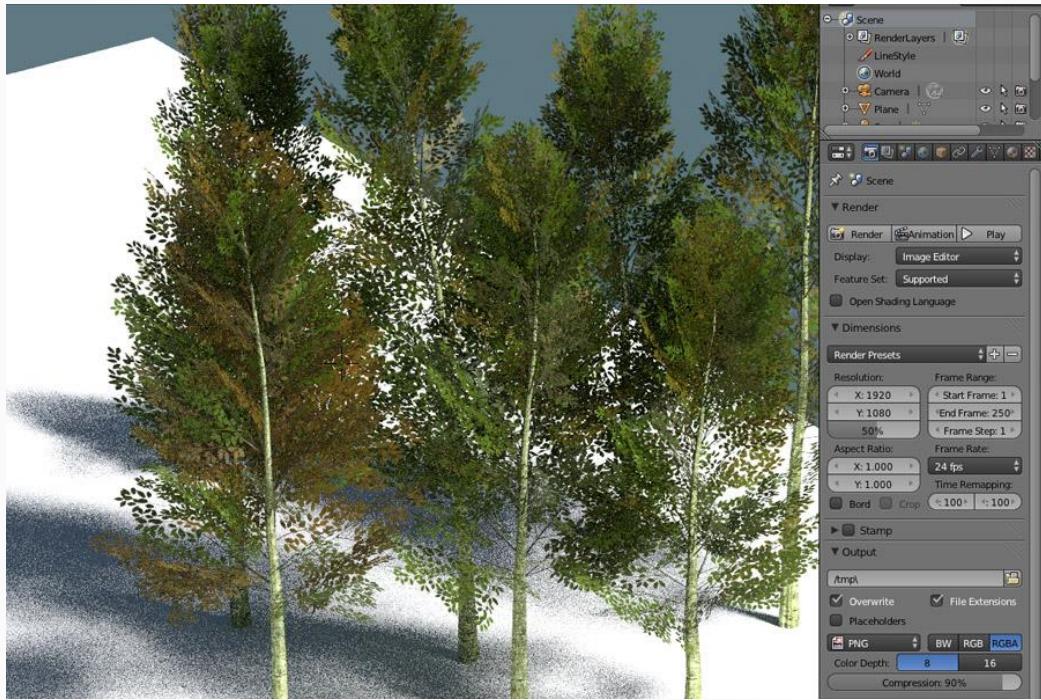
- **12.** Import the files in Blender and start adding the textures. This takes more time than the flower did because you have to unlink the bushes from the trees.



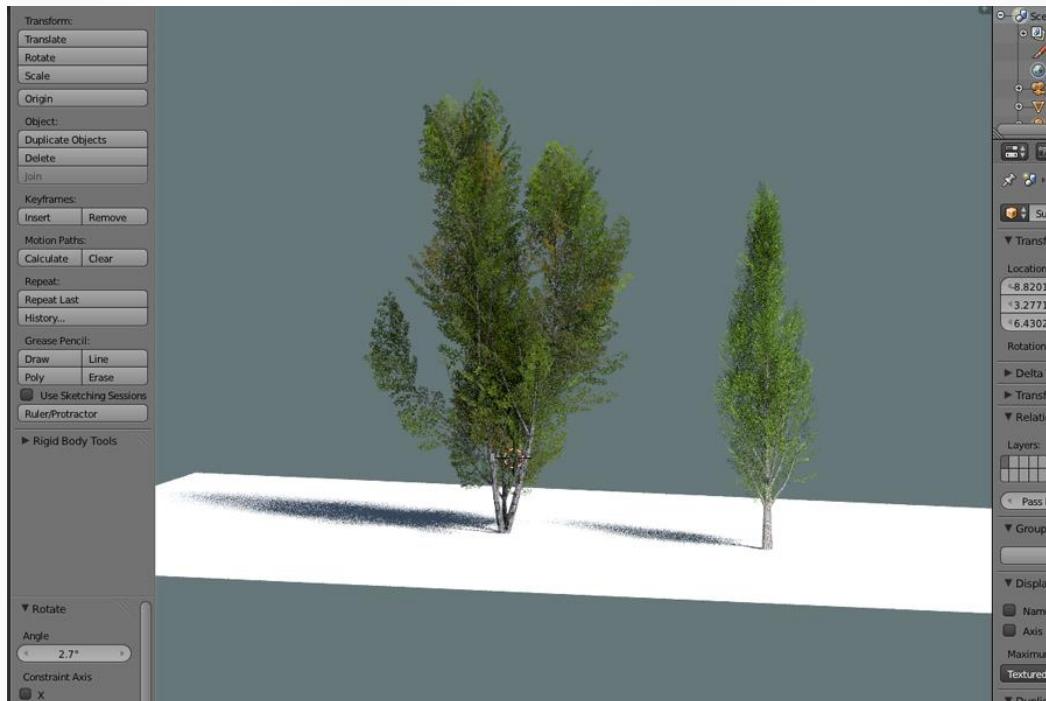
- **13.** Try to make some color variations in the texture. Since these trees were created with transparent planes, you can change the color of a branch and the tree gets a nice twist.



- **14.** After the texture process we need to organize the trees and bushes. A simple way to do this is to select all the trees and press **(CTRL+L)** followed by pressing **P--> selection**. When making a group, try to join all the parts together and put the orange dot at the bottom.



- **15.** When we zoom in we can already see some nice variation in color. You can also try to make one brown tree in a group. To create this you have to add a new material and apply this on the tree you want.



- **16.** Try to make some more variations and put them in a new group. Using one type of tree can look a bit boring and not realistic.



- **17.** All the low poly trees together make a nice composition. Try to use these types of trees only for background filling. Using them in the foreground can sometimes look very unrealistic because of the transparent planes. We are going to use these trees and bushes in a later part.

Finishing the scene

My experience is that vegetation is a very complicated part in an environment. Creating trees is not the big issue. There are many types and variations, however, it's up to you to know how to integrate them into a scene. Combining high and low poly nature to get the best result is a time-consuming job. Only by experimenting and using a 'trial and error' method will help you to get a good result.

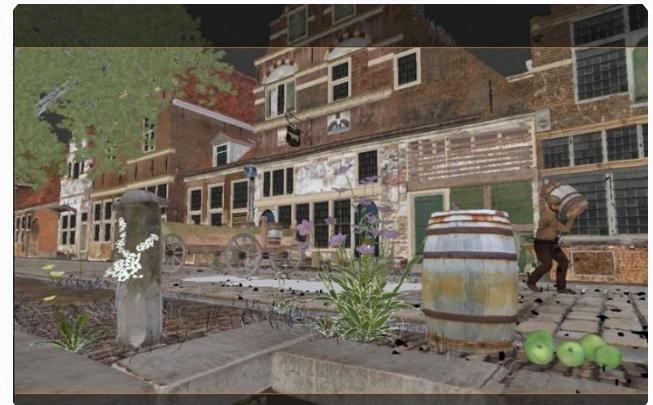
If you are wondering if your vegetation is realistic, compare it with nature photos. You have to be very critical of your work, only then is it possible to bring your 3D work to the next level. It is also important to keep a scene renderable.

Of course the render process all depends on the computer you are working with. If you have a high-end system, you can add more stuff in the scene. I am working on a system that I built in 2009: Core i7 920. My GPU is from 2011 (GTX560) and it has 1.5 GB of Ram. I don't think this is a high-end system, but I can still realize huge scenes just by working intelligently and organizing my work logically. Everything is possible. It is you who makes the scene beautiful, not your system or the program.

Below are some images from the scene that we worked on earlier. I integrated some vegetation into the scene and completed the rest of the scene by adding some more buildings, and I completed the base. Maybe this is a bit weird, and you expected that I would explain how to create every single part, but that is not the right thing to do. I think it is up to you to decide what kinds of buildings you want to create and how the base needs to looks.



18. Adding more buildings, vegetation and some characters ensures that the scene will look better and more complete. The trees have an important function: they will cast shadows on the buildings. We will need this to bring some depth into the scene.



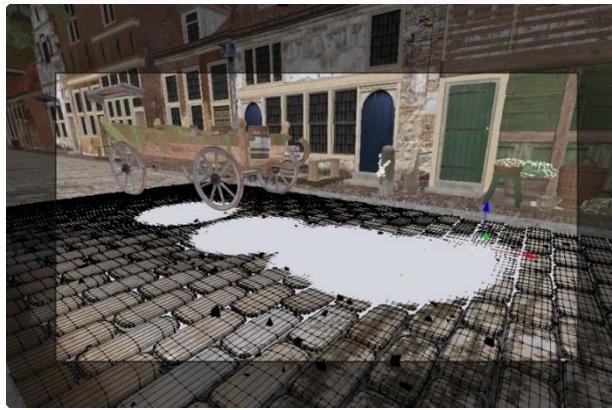
19. For vegetation I used some plants, a flower, grass on the ground, and some ivy on the pole.



20. I used weight painting to decide where it should be. I always copy the single object to another layer together with the light to fine-tune the result. Never just apply your grass on the ground. Most of the time you have to change the thickness and the length.



21. Ivy works like magic in an environment scene. You can almost use it for everything. Don't try to make it look like a post-apocalyptic scene. Use it only on the places that need it.



22. Pulling down the bricks and adding a glossy plane will create some nice reflections. Try to make the plane also a bit transparent so you can see the bricks.



23. Sometimes I add moss or grass on buildings. It covers sharp edges and, if you use it gently, it has a magical effect. Use the weight paint tool to define where you want the ivy.



24. I also spent some time creating some buildings in the background. They are covered by the leaves from the trees, but it looks very realistic if you can see some trees behind these leaves. You don't have to spend too much time on them. Make the contours, but it is not necessary to add street furniture or high-res bricks.



25. At the end of the street I connected the bridge to the street. As you can see, there is a transition between the high-resolution bricks and the low poly. Most of the time you won't see this in a final render. If you can see it, just cover it with a prop or something else.



26. The further you go down, the lower the resolution of the houses becomes. Don't spend too much time on buildings you won't really see in your final composition.



27. I also created some pebbles and used a particle system to define where I want to put them. Try to keep them low resolution, so you can create a lot of them.



28. When your scene is ready for the lighting process, choose a nice camera position. After you put this in the right place, you can start lighting the scene.

In the following section I will begin discussing the mood of the environment. You can also call this the atmosphere or lighting the scene.

Atmosphere and lighting

One of my favorite aspects of working on an environment scene is creating the atmosphere or mood, which for some people is known as lighting the scene. Before we start with this part, I would like to give you some background information that will help you to understand what this is all about.

It took me a very long time to learn to use my eyes to see what really makes the difference in real life and in a 3D world. When I started working on the Golden Age 3D environments, I had very little knowledge about this material. There was also a big difference in the render engine. The Golden Age 3D is created in the Blender internal render engine and the Golden Age experience is created in cycle render engine. Below are samples from some of my first 3D scenes.



One of my very first environment scenes created with the Blender internal render engine in 2008.

(Fig 5)



Render from the same project the Golden Age 3D (2008).

(Fig 5.1)

The problem in picture 5 is that I did not use the sunlight to create depth. In addition to that, I used a cloudy sky and I think a lot of ambient occlusion, which is not the right combination for creating a good-looking environment. Of course, the modeling quality is also very poor, but with some nice lighting it could look much better. The same is true for picture 5.1. The modeling is maybe a bit better, but again I have not used good lighting in this scene. If the sunlight came from the right, we could see some shadows in the ground. The absence of trees, however, ensures that there is almost no shadow effect, which makes the scene boring and not impressive.



I continued with development of the scenes and two years later the second scene was good enough to be published in a Dutch art book (Fig 5.2)

But what happened in the meantime that changed picture 5.1 into 5.2? The answer is: a lot. I started reading books about how the old Dutch masters used light in paintings. I studied the paintings and tried to understand why these images looked so great and realistic, and why my scenes did not.

Most of the time, the biggest difference between my work and that of the masters was the use of light and atmosphere. First I thought that my problem involved poor compositing. Later, however, I learned that scene compositing is just the finishing touch. My node trees are small and easy to understand. I believe that, in order to create a good-looking environment scene, the modeling process must be very good and it must be combined with an appropriate atmosphere. There is almost no need for complicated compositing. Of course, you need the compositor for masking and other functional things, but don't try to make your scene look nice in a compositor. Instead, try to change textures or models. This will usually do the trick.

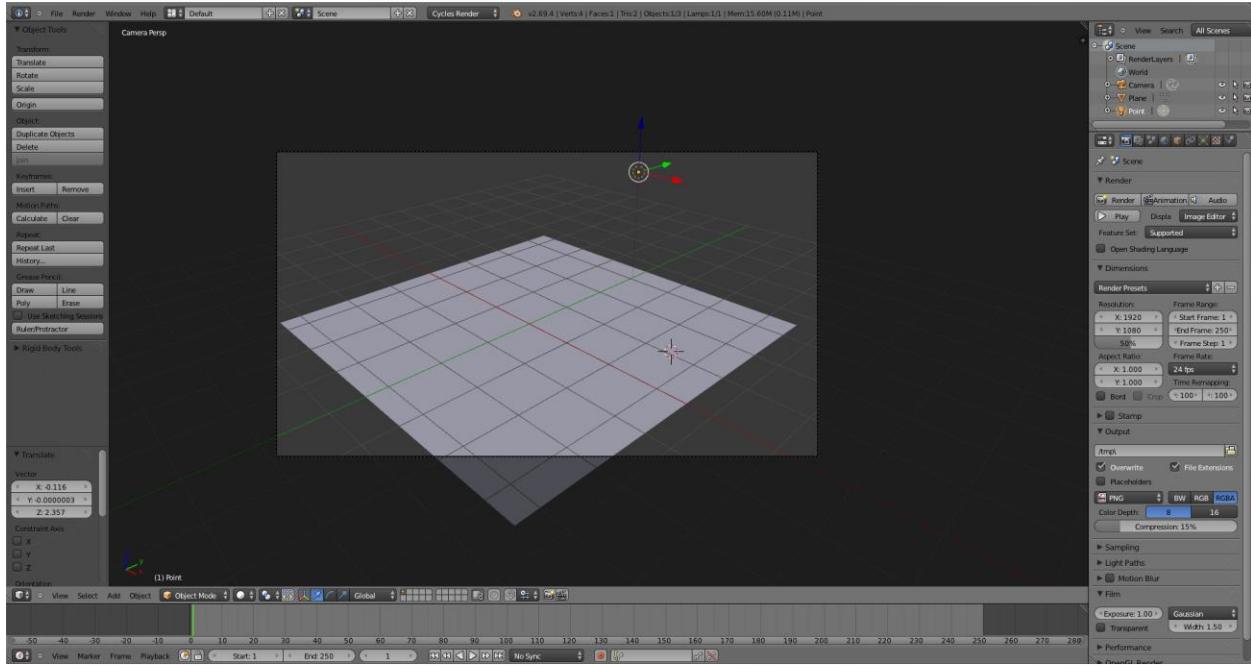


Light & Atmosphere

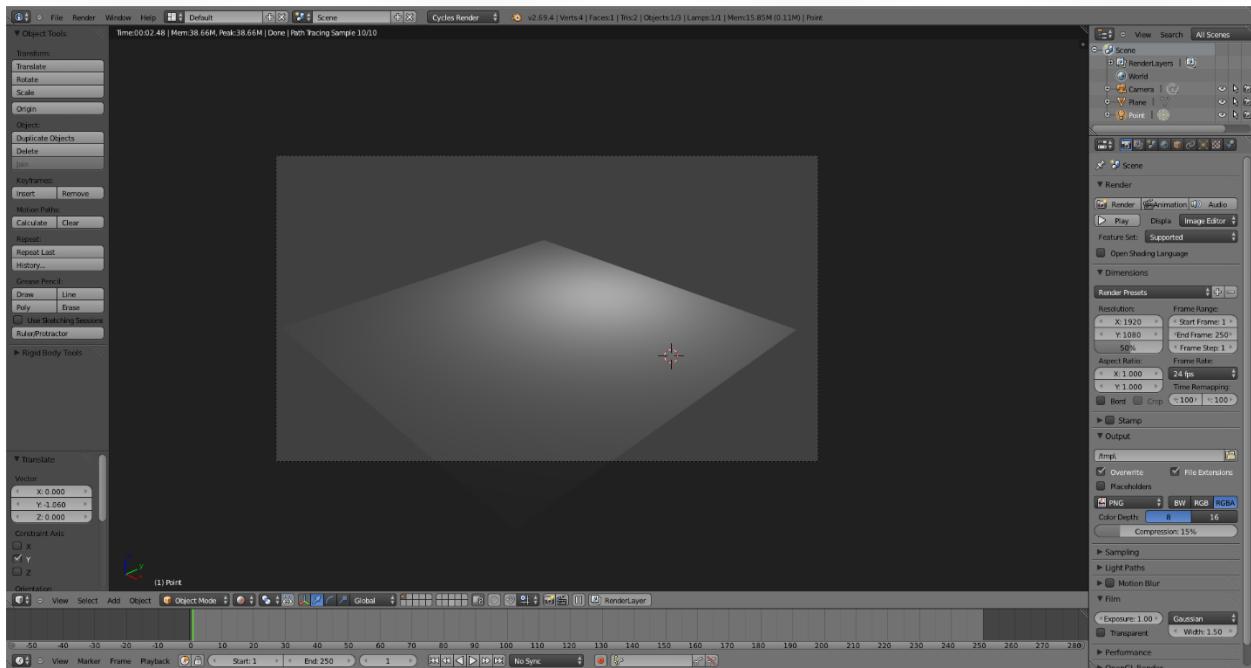
Adding the lights

Lighting is a very important topic in rendering, standing equal to modeling, materials and textures. The most accurately modeled and textured scene will yield poor results without a proper lighting scheme, while a simple model can become very realistic if skillfully lit

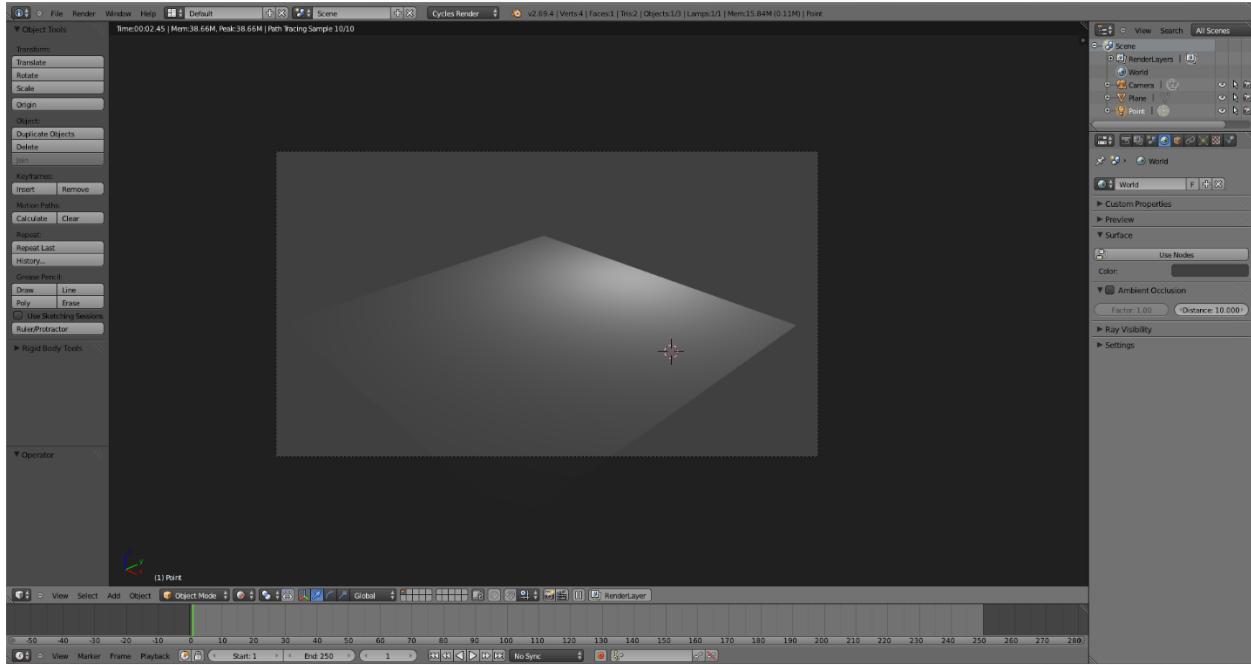
In this chapter I will handle the light and atmosphere.



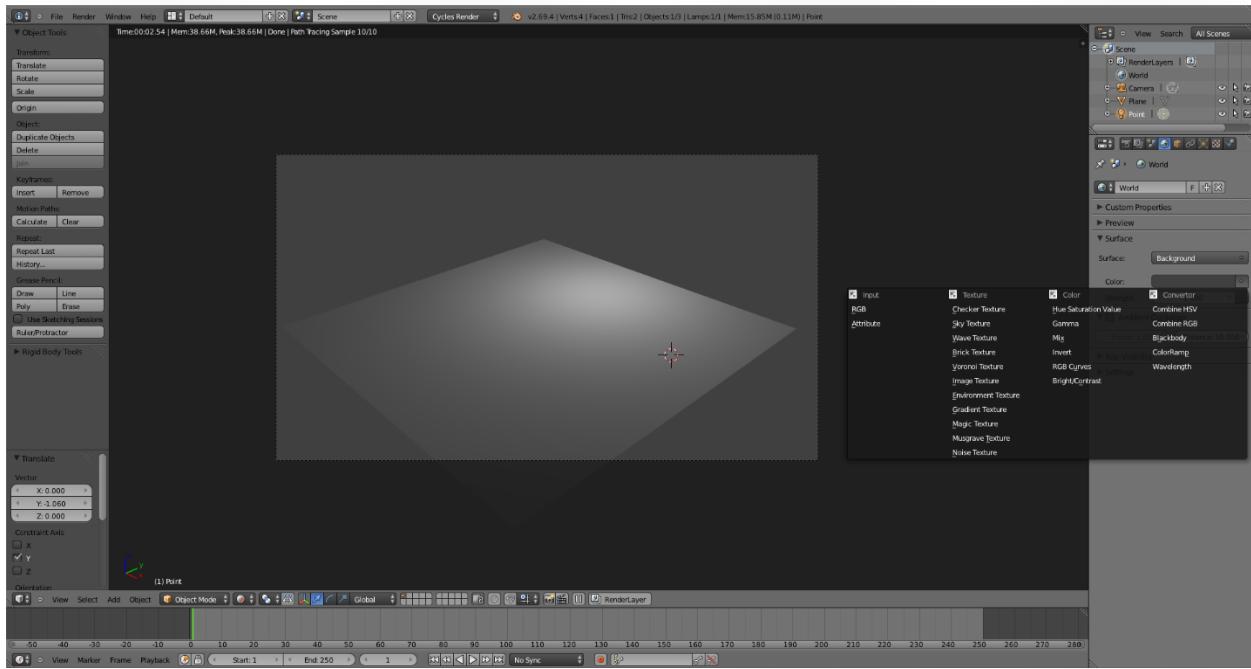
- 1. To get an idea of what you can do with lights in cycles, start with the default scene in Blender. Remove the cube and add a plane in the scene.



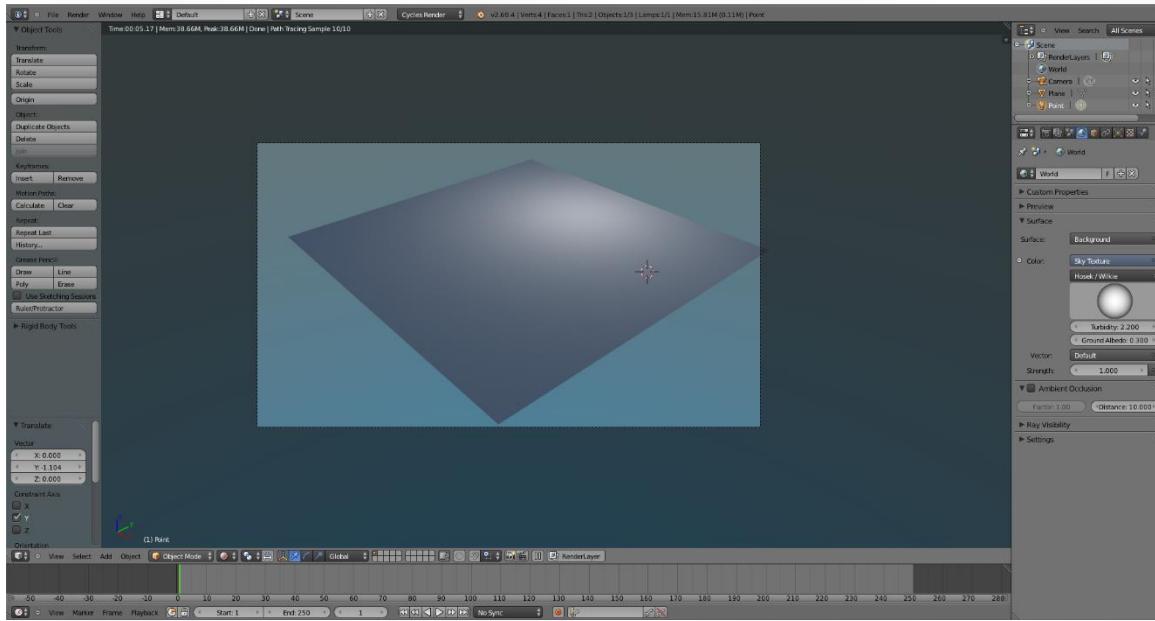
- 2. When you render the scene the point lamp will cast some light on the plane. The lamp has a light size of 0.1. You can try out some other values to get an idea of what the light does in the scene.



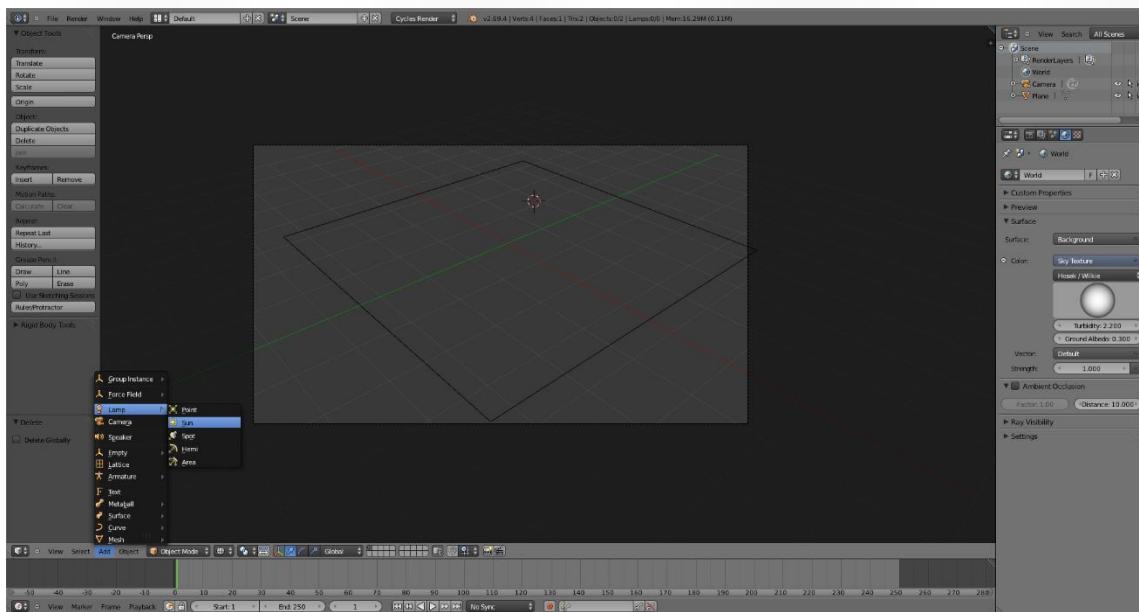
- **3.** We want to create an environment mood, so the next thing we have to activate is some sky light. When you switch to the world panel click on the 'Use nodes' button'. Now you can choose your kind of world light.



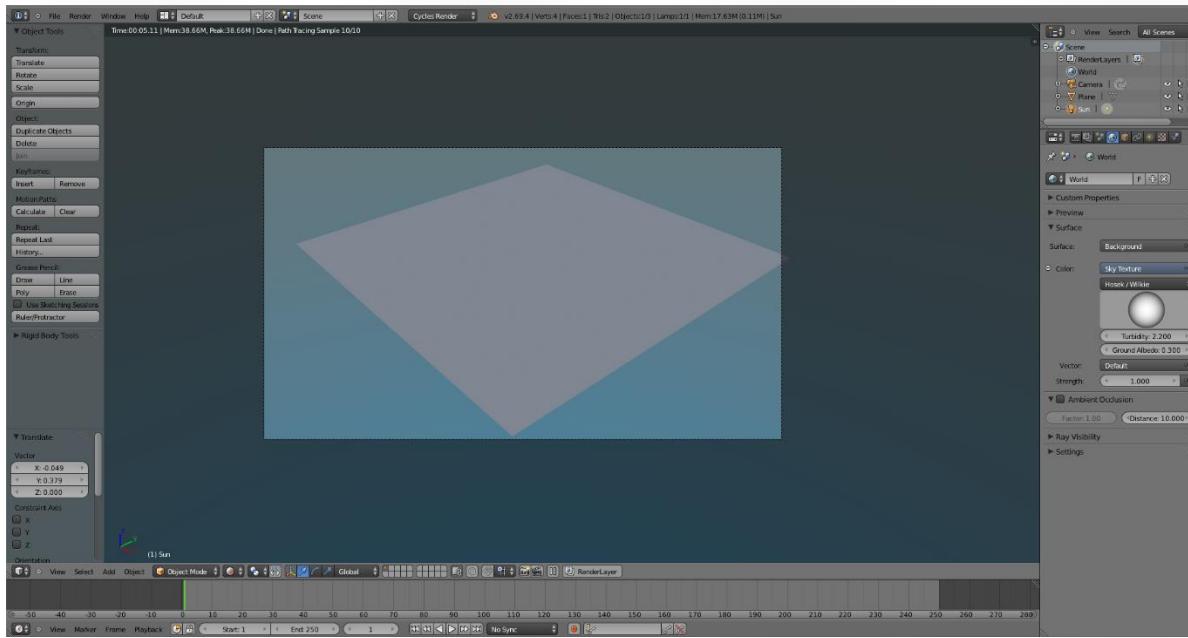
- **4.** To start I choose the sky texture. Later we will change this type, but it will help us to understand the basics of the light system in cycles.



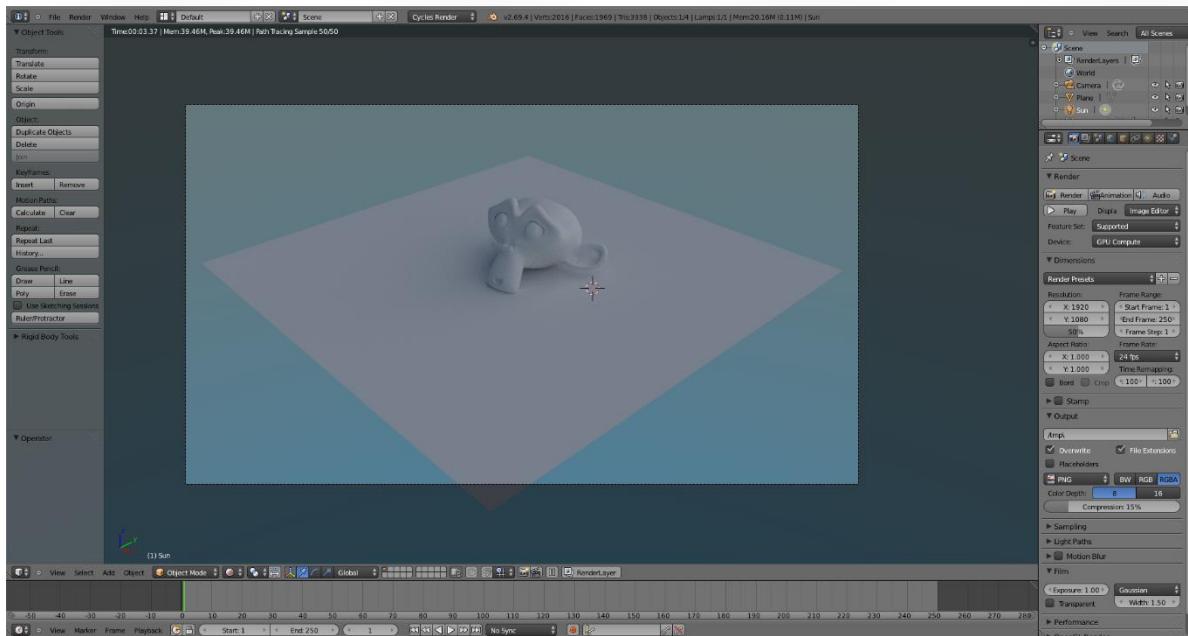
- 5. When we make a new render of the scene you can see that there is a blue color around the spot lamp. This is the light from the sky. If you are not familiar with this type of light, this is what the sky reflects on the landscape. In real life there is light from the sun and light from the sky. Without this sky light, the scene can look unrealistic. Don't use too much blue light. Most of the time a value of .5 is normal but this depends on the scene.



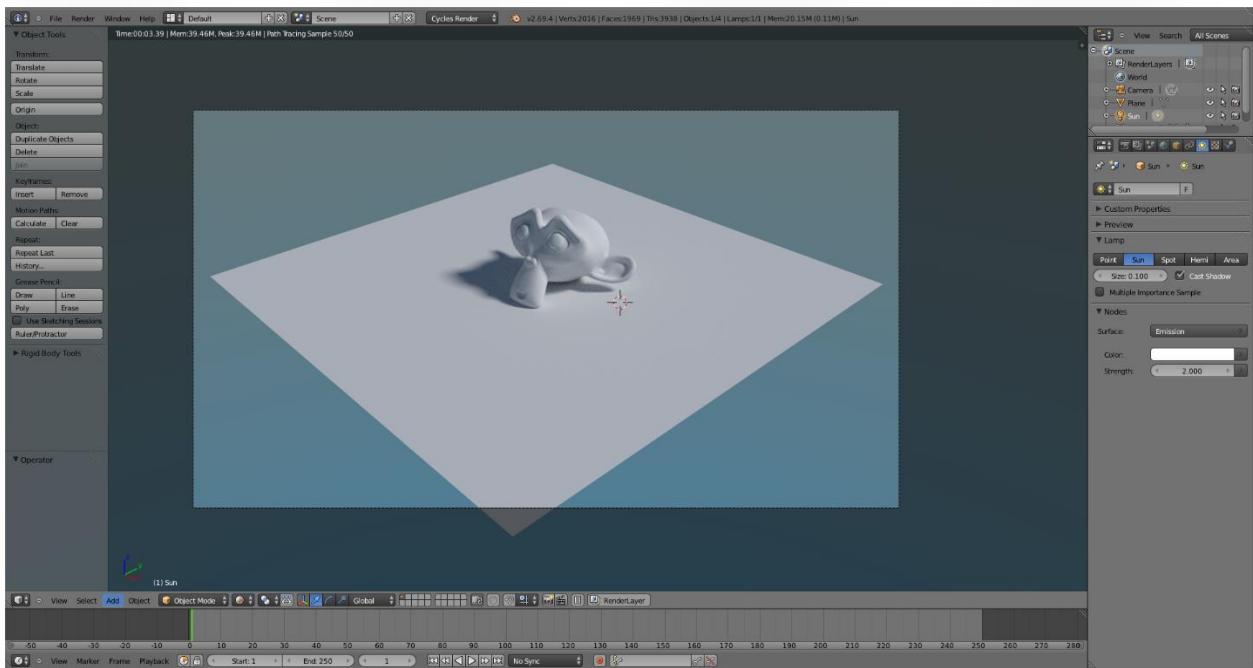
- 6. Next we have to remove the lamp and add sun light. Go to **Add --> Lamp--> Sun**. Try to rotate the sun light so it's not straight downwards. Leave the strength on 1. We can change this later.



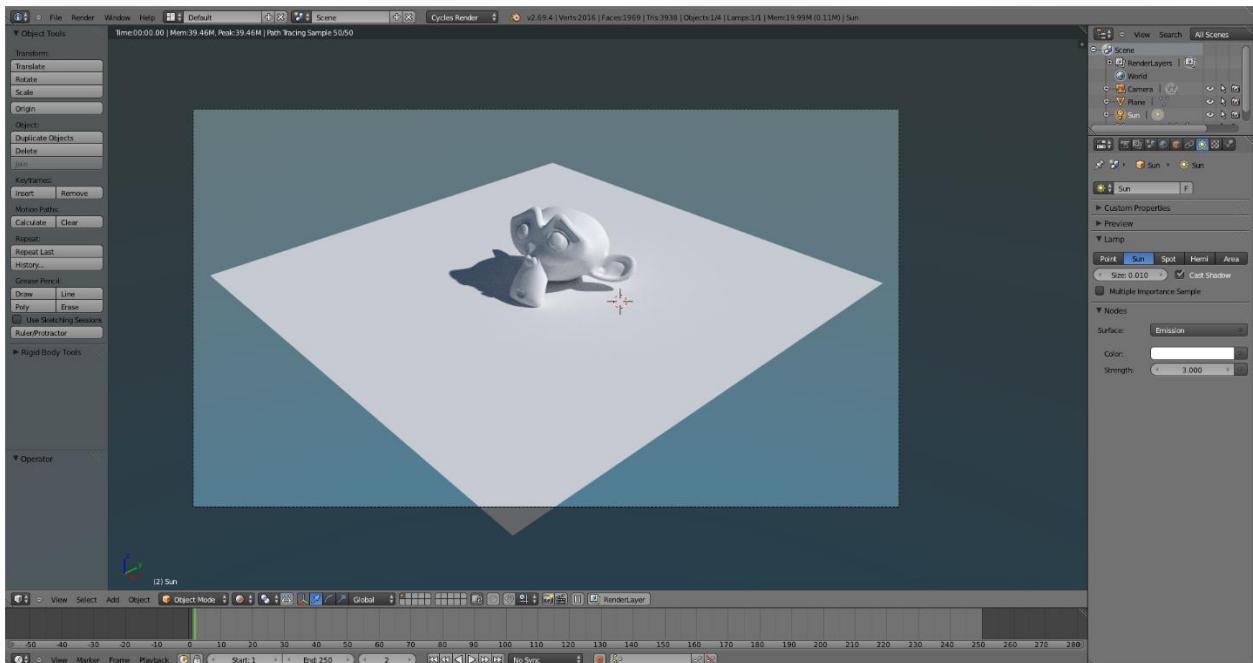
- 7. When we make a new render you can see that the plane has only one color. The blue sky light merges with the sunlight, which is exactly what we want. Now it's time to add an object to do some experiments.



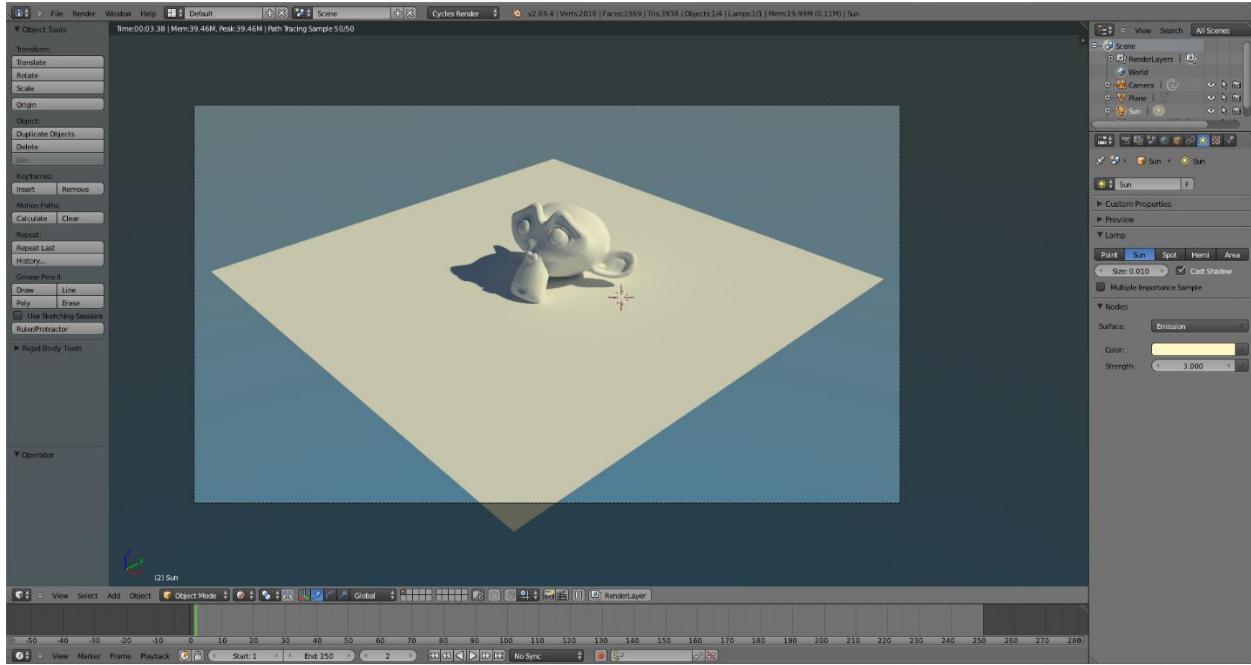
- 8. The best thing to add is a monkey. Add a subdivision surface and smooth the object. When you render the scene again you can see some nice shadows on the monkey. That's why this object works great for experiments. You can see what kind of effect the light in your scene has on an object. I changed the size of the sun to 1, which in real life means overcast weather with no hard shadows.



- **9.** In this render I changed the size of the sun back to 0.1 and the strength up to 2. There is a huge difference between this image and the previous one. Just by changing a couple of values you can create a different mood in the scene. This could be a sunny day with a couple of clouds in the air.

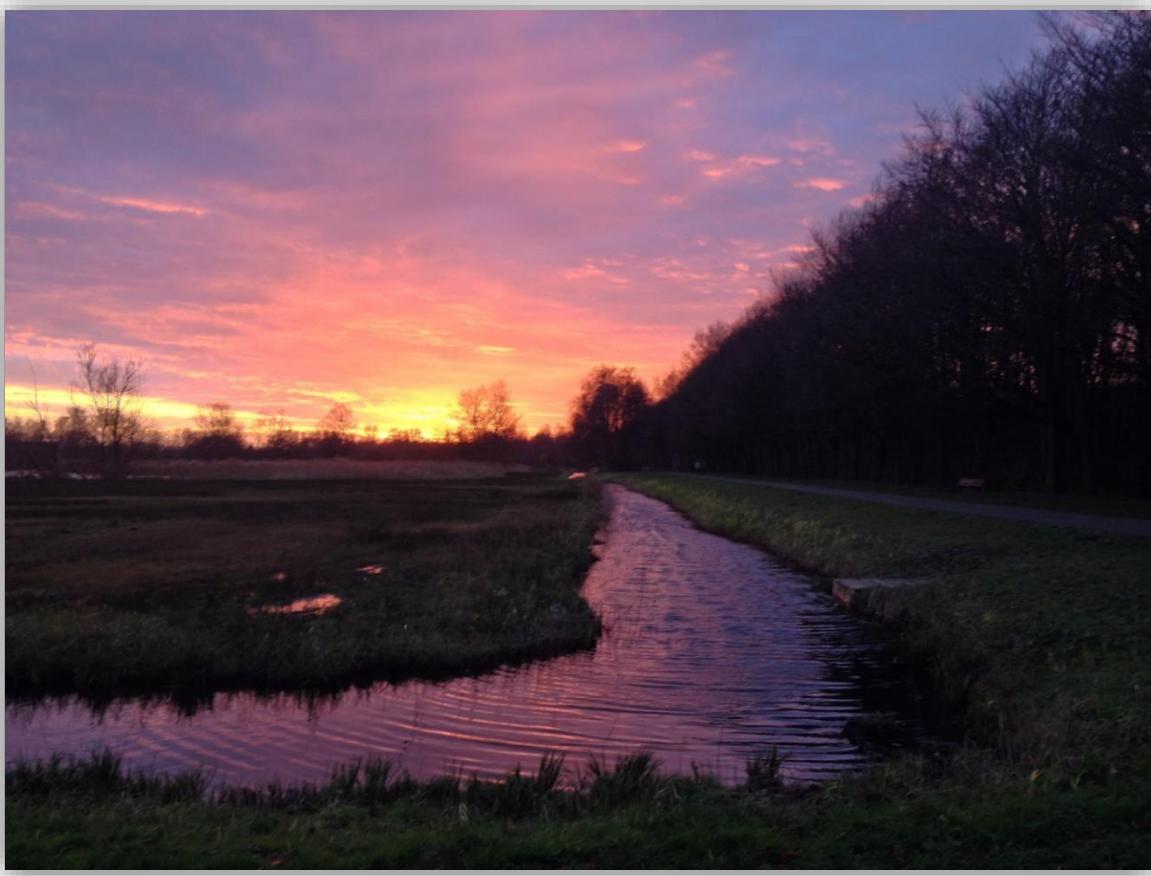


- **10.** Now I turn the strength to 3 and lower the size of the sun to a value of 0.01. Now we have hard shadows and a bright object.



- **11.** We can also change the sun color. Try a bit of yellow/orange for the best effect.
Later I will explain why the color of the sun sometimes changes.

Before I continue with the explanation about light and atmosphere, here is a sample that shows why the color of the sun sometimes changes.

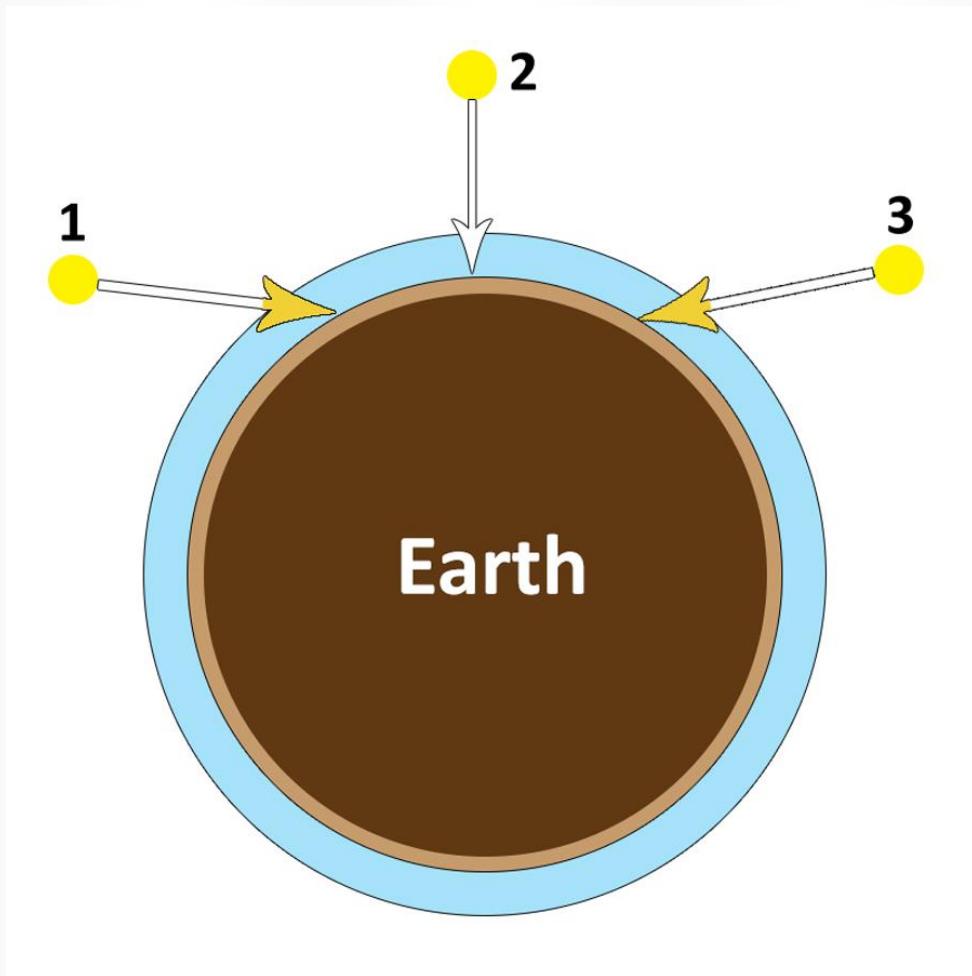


12. Sometimes these nice orange colors appear in the sky and the sun has a red/orange color. But why? (Fig 5.3)

I will try to explain this effect as it is important to know how the sun's colors act in order to understand when you can use different types of colors.

The light of the sun has all the colors: red orange, yellow, green blue, indigo and violet. The light rays travel to the Earth and when they arrive the magic happens.

As you probably know, the Earth has an atmosphere which contains a lot of molecules. When the light rays enter the atmosphere they reflect a color. In our atmosphere there are a lot of blue molecules, which is why the sky looks blue, that's the easy part. The question is: Why can you sometimes see these orange/purple colors? To answer this I made a diagram.

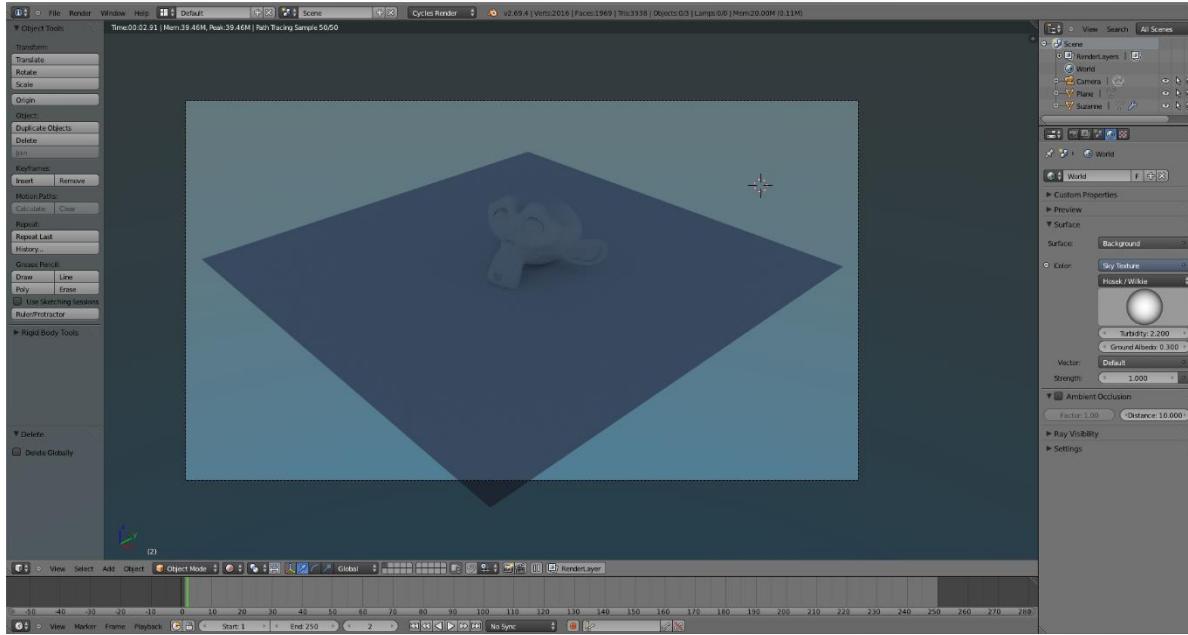


13. Simple model of how sky light works (Fig 5.4)

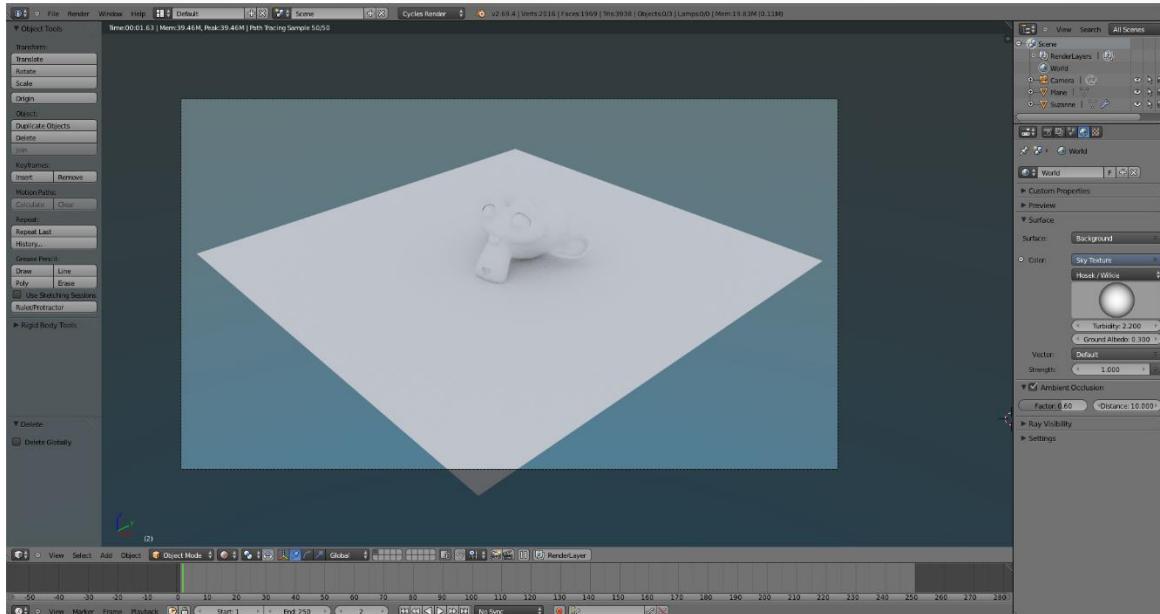
You can only see the orange color in the morning and evening because that is when the sun is low on the horizon. The light needs more time to reach the Earth. As it travels it hits other molecules in the sky and these tiny objects reflect the orange color. When this process happens we see a colorful sunset.

In the diagram number 1 represents the sun's rays in the morning. Later on (2) they cast white light and reflect the blue color in the atmosphere. When the sun goes down (3) you can see the orange color again.

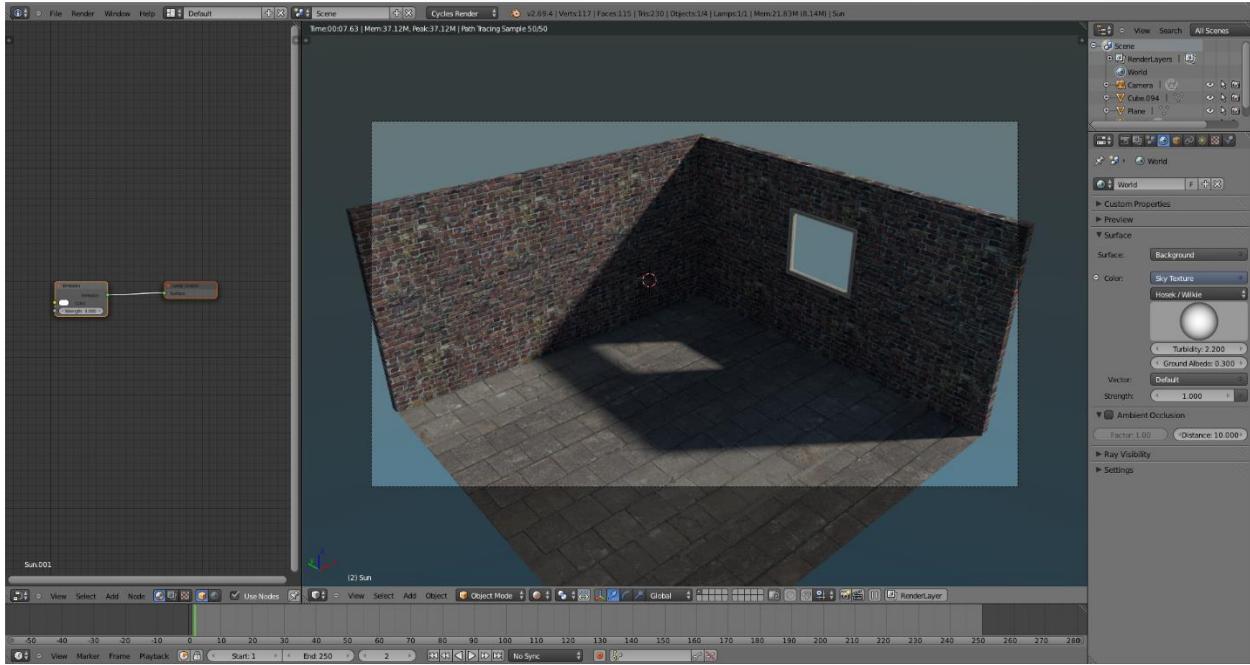
Of course this does not always happen. There must be the right combination of conditions. When it all happens, there is an orange sunrise or sunset. It is important to remember not to use the orange color if you are making a scene that is in the middle of the day.



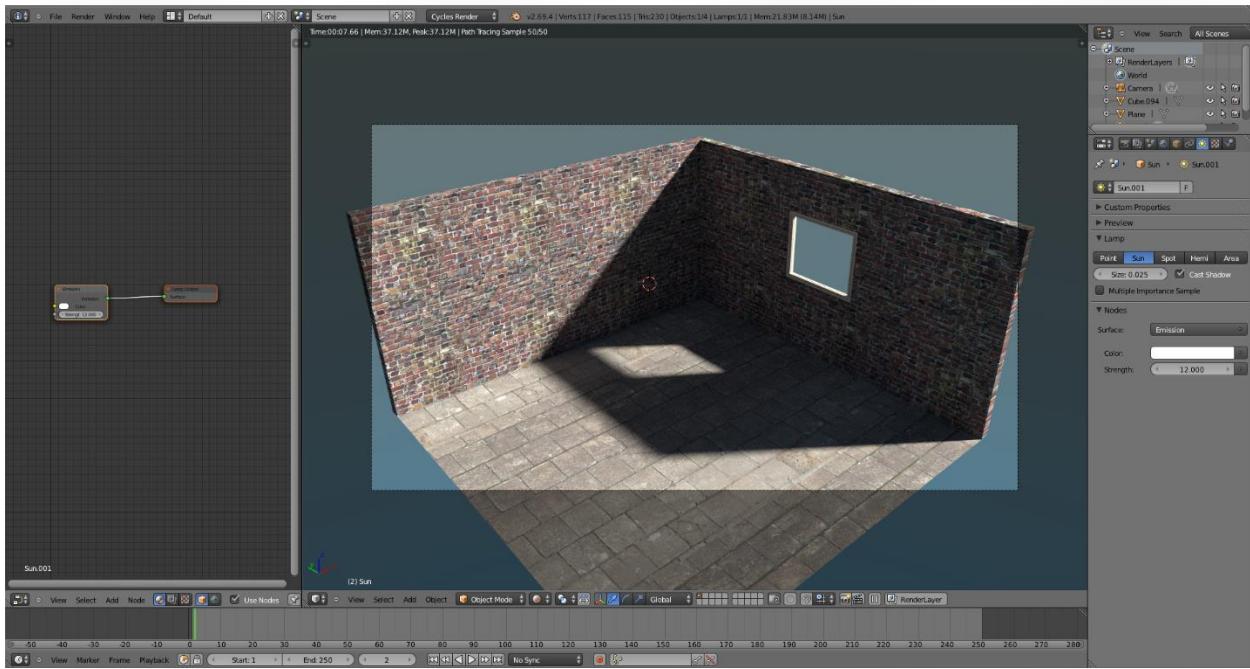
- **14.** Before I used the cycles render engine, the way of putting light in the scene worked differently. Another option that I used a lot was the Ambient Occlusion. In the image above there is no sunlight, only sky light. With ambient light the object itself will cast light and shadow. This works great when the room is dark and you don't want to change the light for some reason.



- **15.** When we enable the ambient light and fill in a value of 0.6 the scene looks much brighter. The big problem is that it is fake. I can recommend using values of 0.1/0.2 Cycles is a powerful ray tracer.



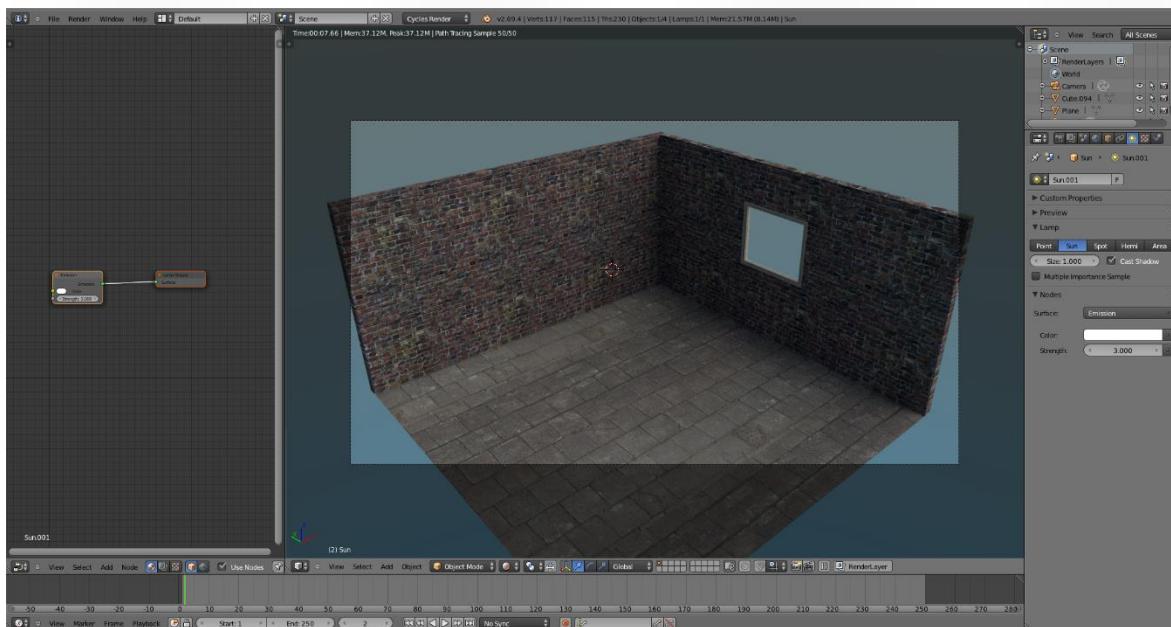
- **16.** Now we try some lighting with a wall and window frame. The sun has a strength of 3 and a size of 0.025. The sky texture has a value of 1. As you can see, the sun is casting a nice shadow on the floor and the other wall.



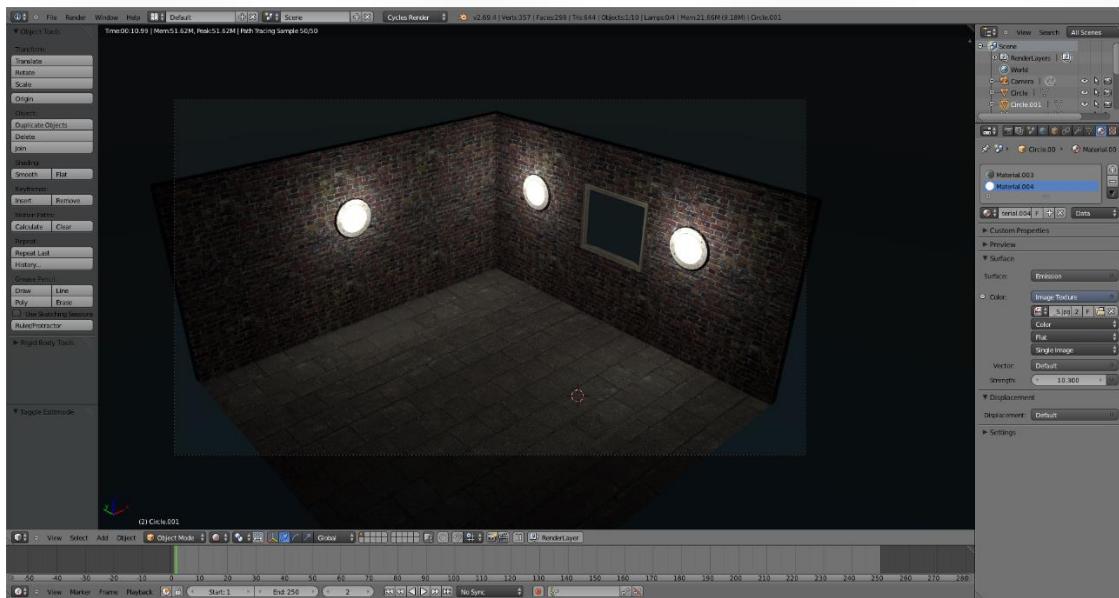
- **17.** By increasing the strength to a value of 12 you get a brighter result. I use these settings a lot, but try to avoid objects with a white color getting too reflective.



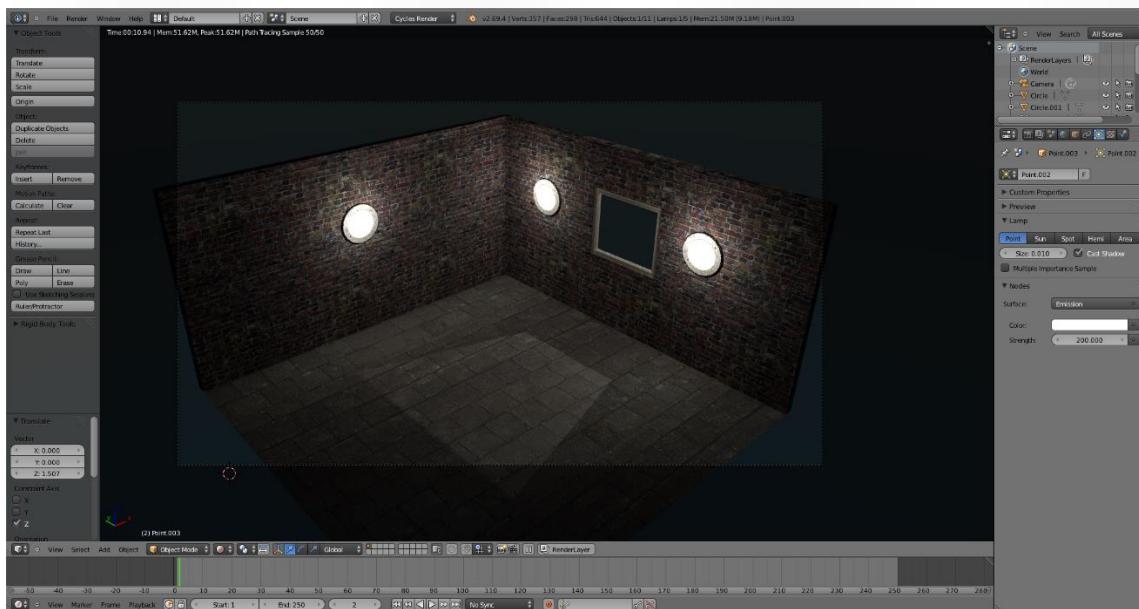
- **18.** In this image you can see what light strengths can do with bright textures. The number in the picture is the strength of the sun. When we use a strength of 12 some parts in the texture are not visible anymore. Try to find the right strength in your scene for the best result.



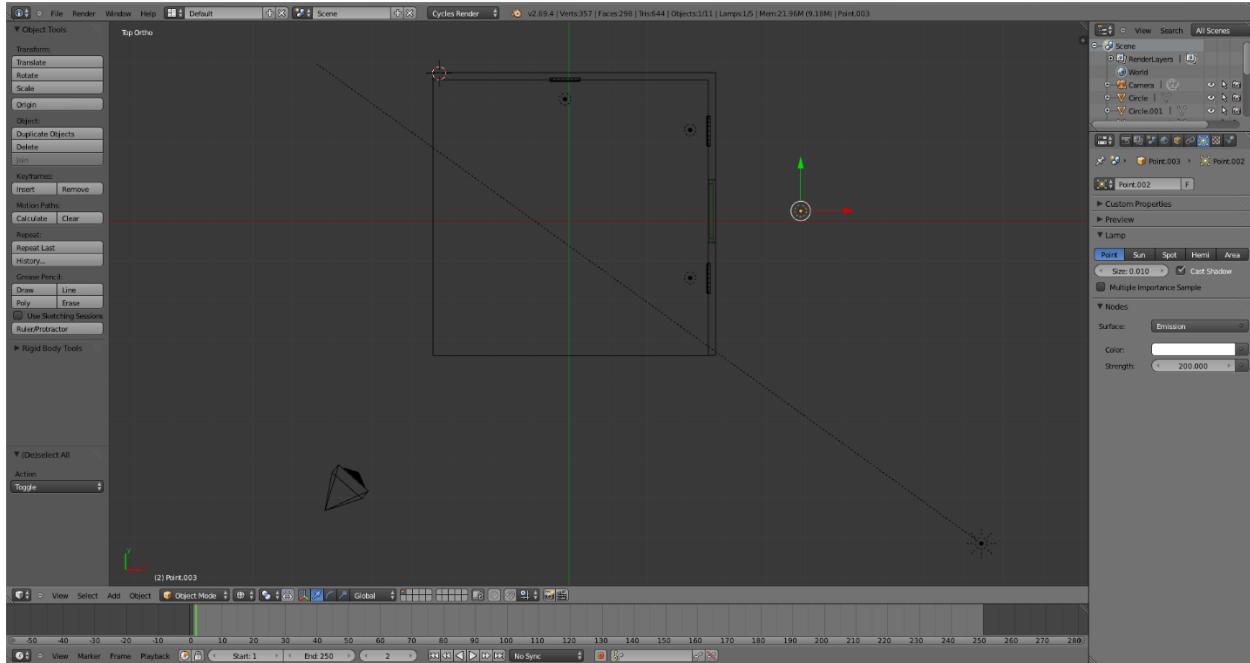
- **19.** In this sample I used a sun size of 1. All the shadows are blending with the texture now. Sometimes this is a nice effect when you have a cloudy day in a scene.



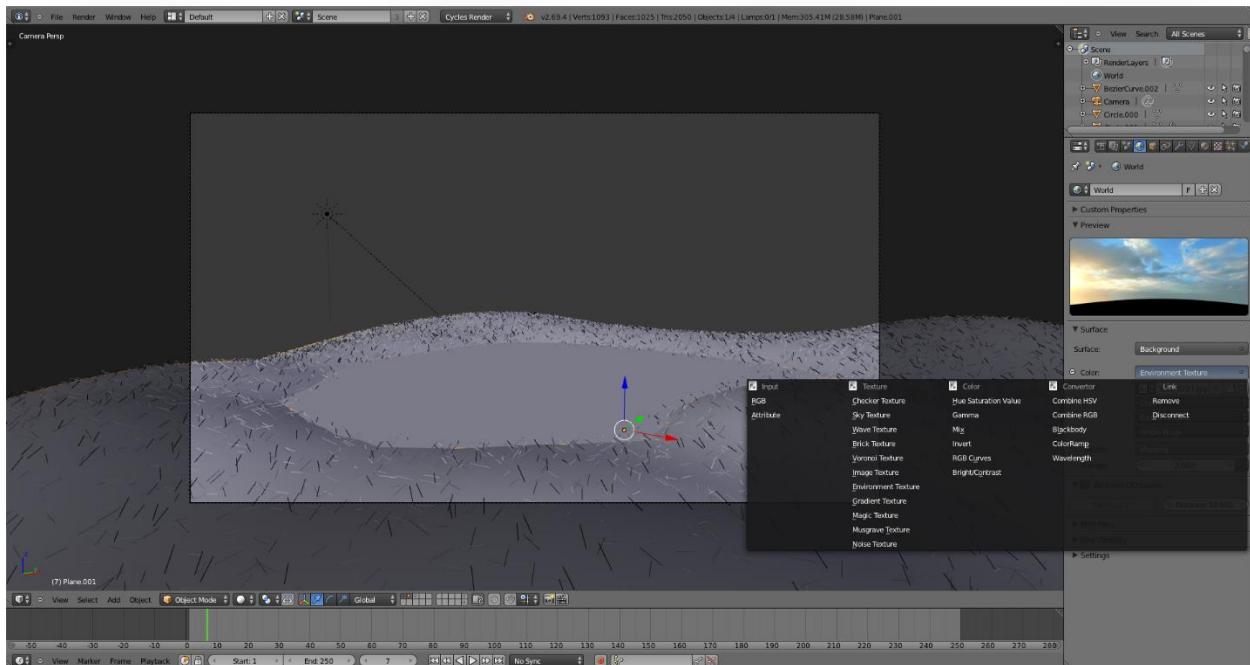
- **20.** When you want to create a night scene you have to lower the sun strength to a value of .001 or remove it. Sometimes it helps to leave the sun in the scene and use it as moonlight. Now we work with lamps in the scene. Create a lamp object and put your lamp close to it. I used a size value of 0.01 and a strength of 20,000. Of course, this all depends on the mood of the scene you have. Sometimes a value of 10,000 works great.



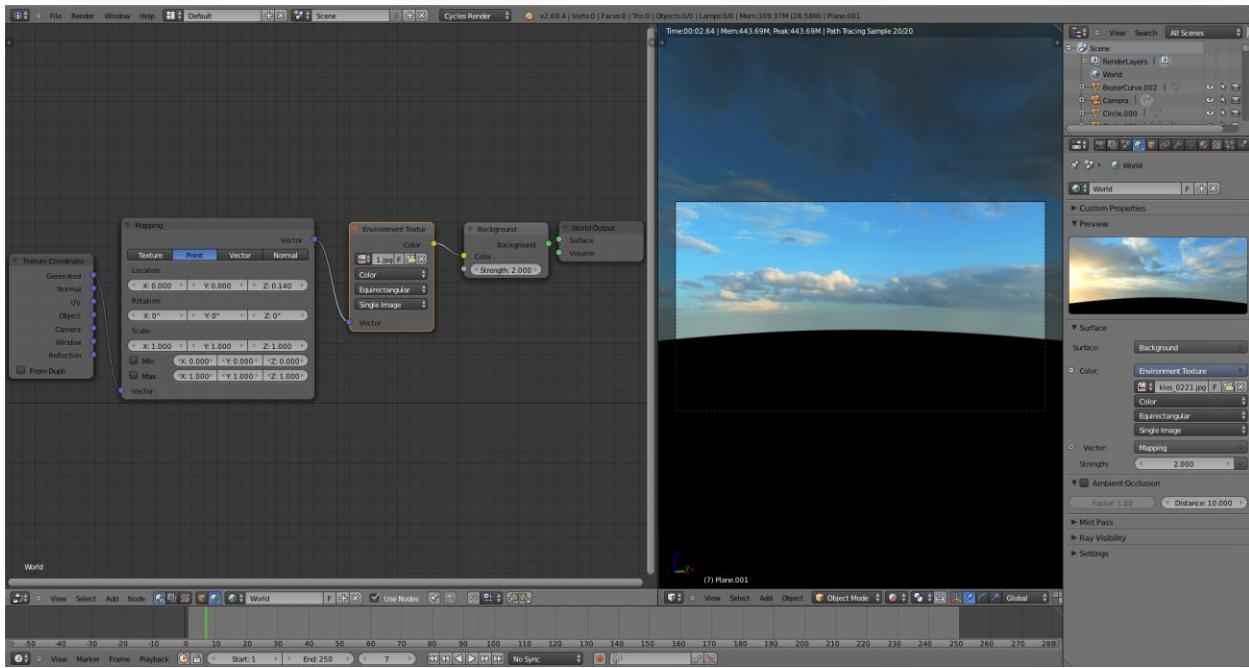
- **21.** A trick I used to put some depth in the scene is putting a lamp outside of the room. I changed the strength to a value of 200,000. This sounds like a lot, but it is the only way to create a light beam on the floor. Do not put the lamp close to the window. The window frame will be very bright, so move it a bit backwards.



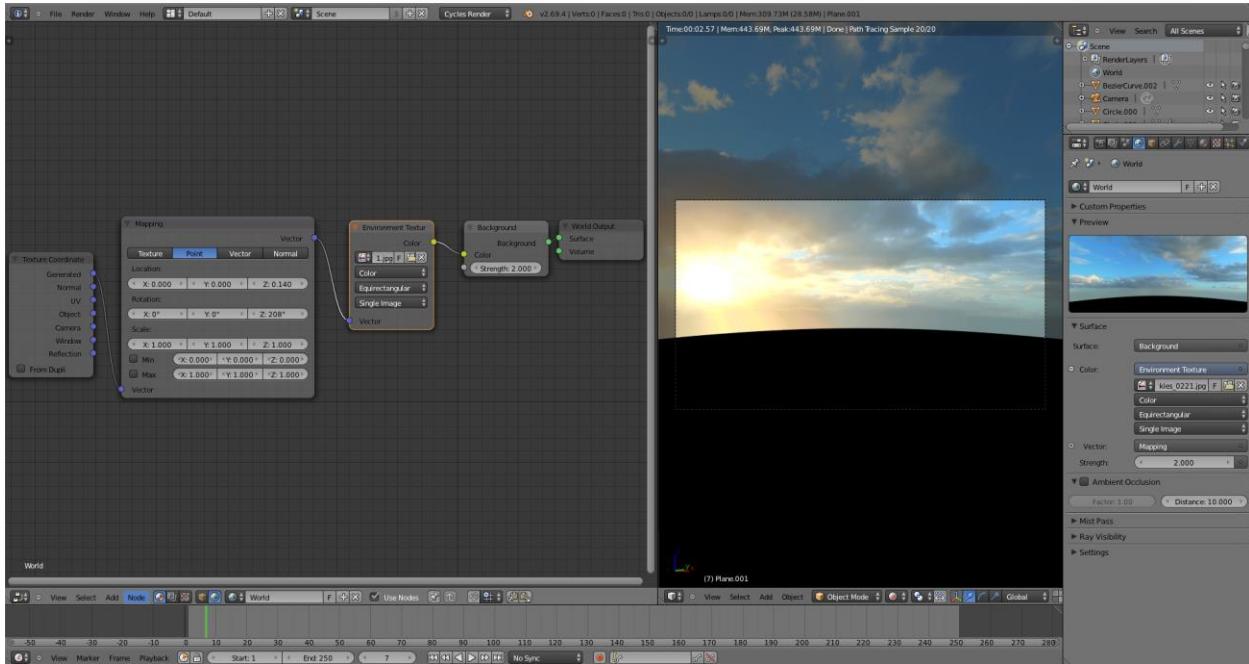
- 22. The light setup from a top angle with 1 sunlight and 4 lamps.



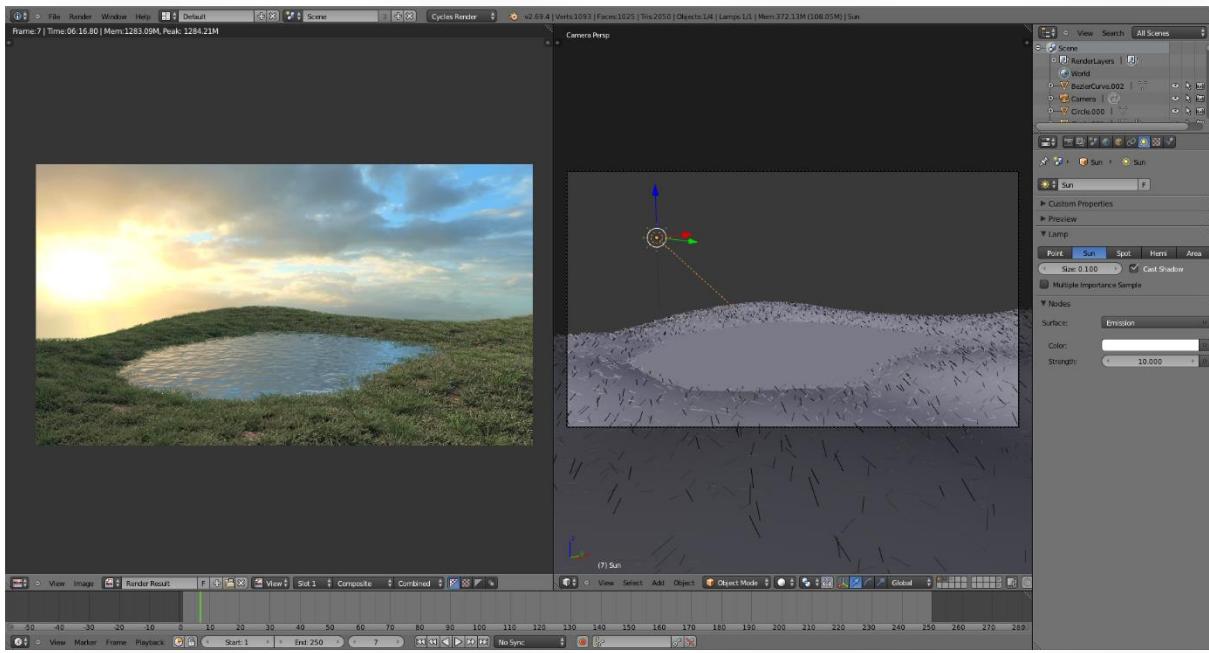
- 23. Now we switch to another scene and do some more light experiments. I created a grass field and in the middle is a little pool of water. We start by adding an environment texture. I used a Panoramic 360 HDR texture.



- 24. Before we can use this texture, we have to tweak it a bit. I want to rotate it till we have the sunlight in the left corner of the scene. Go to the node panel, and add a mapping ([Add--> Vector--> Mapping](#)) and a texture coordinates node ([Add --> input --> Texture coordinates](#)). Combine these nodes and rotate the Rotation Z value.



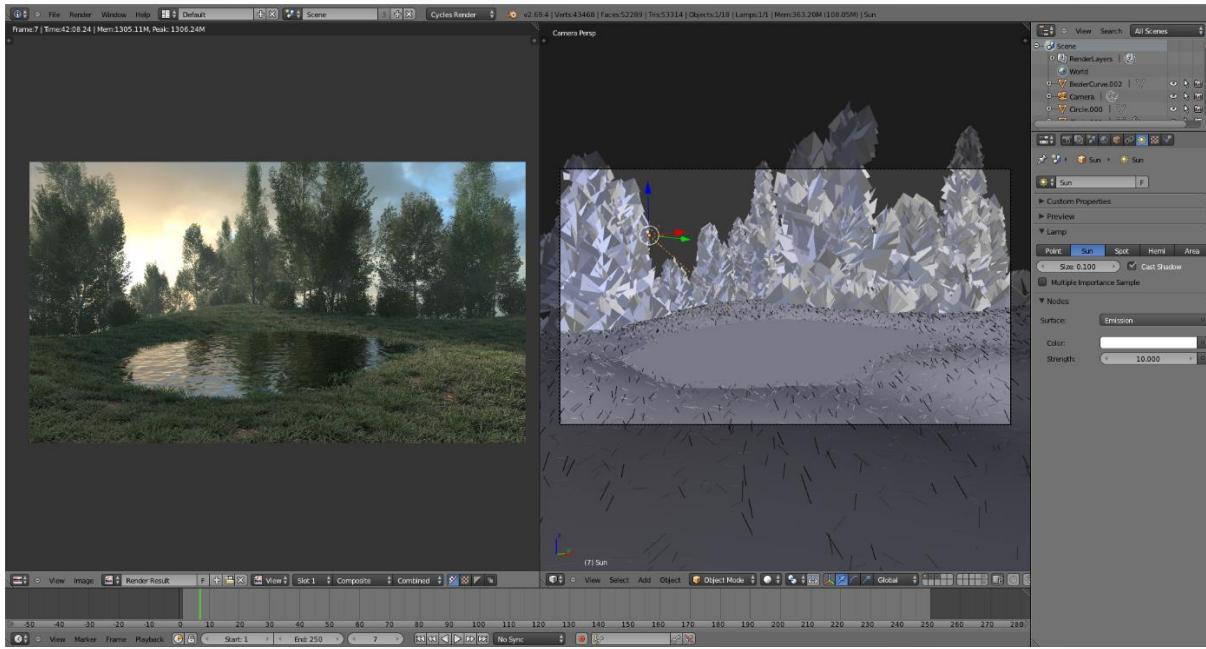
- 25. Ignore the nodes on the right. I used these settings for the water reflection of the water. As you can see, the sky texture is rotating. You can also lower the texture a bit to cover the black, because you don't want this in your scene.



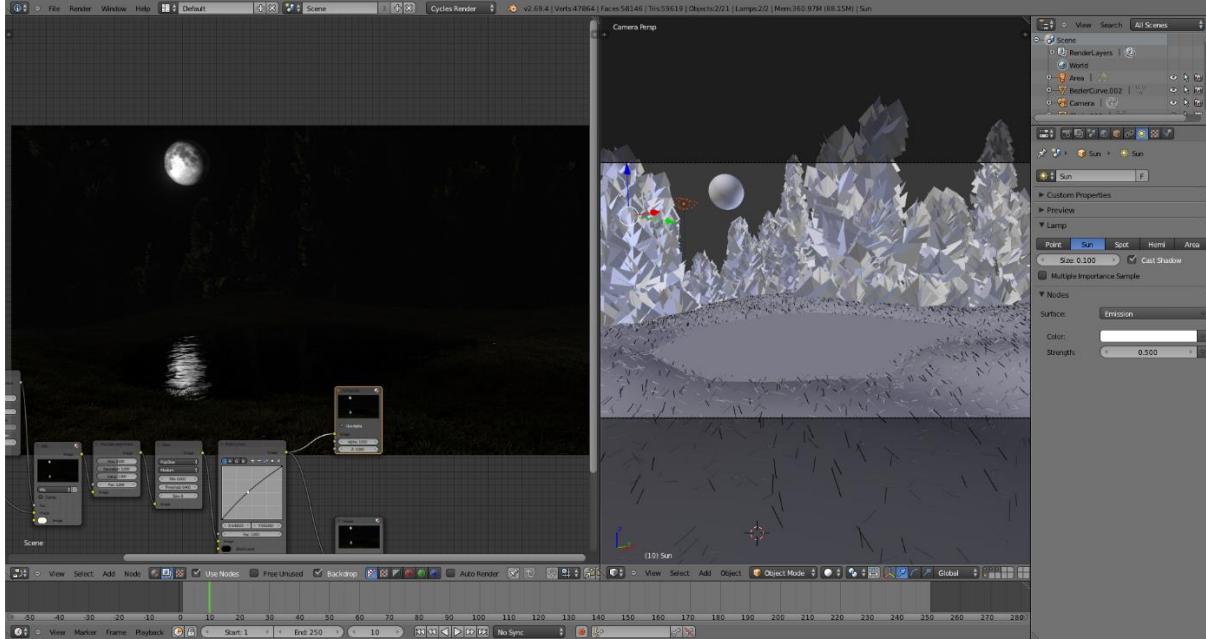
- **26.** When rendering the scene with a sun strength of 10 and a size of 0.1, I used a strength of 2 for the surface (environment texture). The result is not bad, but we have to solve some problems in the scene. The transition between the grass and the sky texture is not smooth. The biggest problem is that the scene looks empty. Before we add more vegetation, we have to fix another thing. I always use two kinds of atmosphere effects, glare and mist. You can activate the mist pass in the render layer panel.



- **27.** When we create a new render and we combine the mist pass with a map value node in combination with a mix node, the scene blends better with the sky. Now you can also add a glare node with the fog glow option, but in this scene we already have a nice blending. All we need to do is add vegetation.



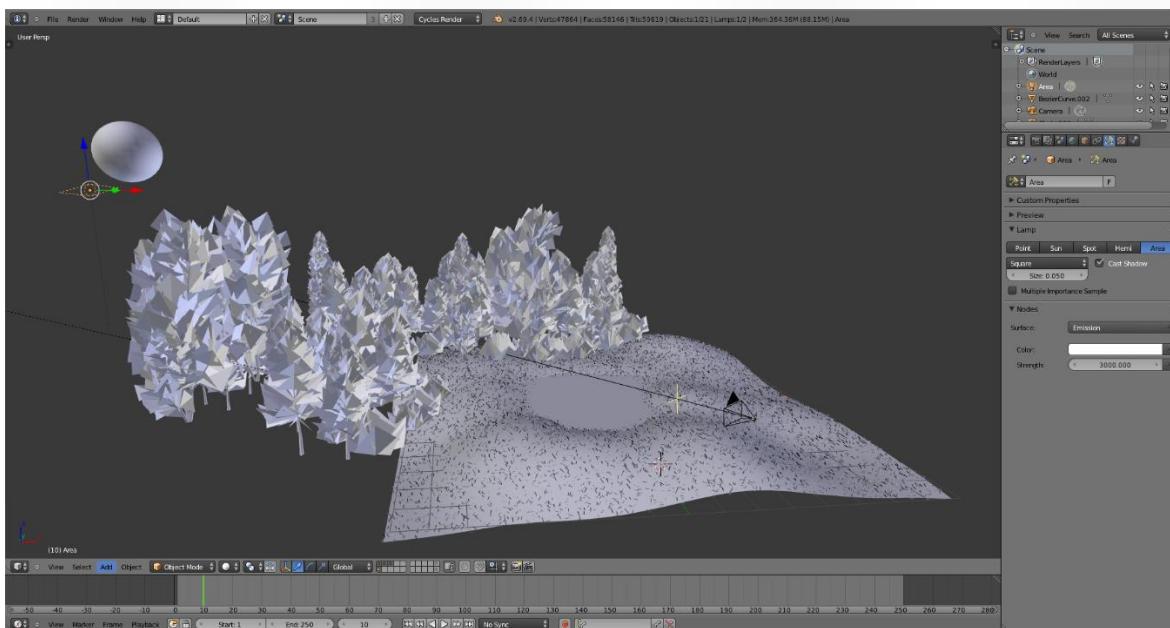
- **28.** You can now use the trees and bushes that we created in the previous part. Try to make a nice composition and also put some trees in the background. When you make a new render the result will look much better. Keep in mind that this is only an atmosphere sample. Normally this is the point where you start building a scene. If the base is not solid you can try to fix it by adding props and buildings, but this will not help.



- **29.** Turning the scene into a night environment can easily be done by changing the light values. I lower the environment light from 2 to 0. I used a sun strength of 0.5 and, as you can see, I also added a moon. I used an area lamp to illuminate 80% of the moon. The sky needs to be 100% black. If not, you will see the other side of the moon.



- **30.** This time I also used a fog glow node for a nice halo effect around the moon. Because this scene is very dark I also added a RGB curve node to increase the brightness a bit.



- **31.** This is a closer look from the 3D viewport. The scene looks small and simple. I used two lights: a sun and an area lamp.



Is this all going a bit too fast? In this [video](#) I'll show the basics of compositing

Creating your own unique environments

Notes before we start

The big question you have to ask yourself is, “Why am I creating these environment scenes?” In the previous sections I explained several techniques. It’s useful to copy the settings and artwork, just to be aware of all the possibilities in Blender. Similarly, in the next section I am going to create a different type of environment scene to demonstrate the workflow.

Once you have followed all the sections and you are ready for your own creations, you have to decide what you are going to create. I often see people trying to recreate the scenes from a tutorial and then using that in their portfolio. Although there is nothing wrong with that, I don’t understand why more people do not challenge themselves by creating original artwork. There are so many ways to create something original and you learn so much more when you try something new. Keep this in mind when starting a new scene. You don’t want people to tell you that it is a copy of someone else’s work. That can be discouraging after all your hard work.

Below is a sample from an old painting.



This artwork is from painter Willem Gerrit van Ulzen (1762 - 1830). The painting has a nice yellow mood and we can see a peaceful landscape. We can also see two guys in the foreground fishing. In the background is a guy with some sheep. This is where my imagination starts to work. Who are these guys and why are they fishing? My mind starts filling in a background story and I get more fascinated by the painting. (Fig 6)



This is the same painting, but I have removed the guys in the foreground. This makes a huge difference. The painting still looks beautiful, but I have nothing to focus on. After a couple of seconds I get a bit bored of looking at just a painting of nature that I have already seen a lot of in my life. It sounds a bit rude, but this is what really happens in my head.
(Fig 6.1)

Maybe you think, “I’m not that good at character modeling. Does that mean I am a bad artist?” Certainly not. As I mentioned before, most environment painters in the past didn’t paint their own characters. They had someone else paint them in their paintings. Instead of people, you can add animals or maybe a structure like a windmill, but the mind wants something to think about, something organic, not created by human hands.

Looking for some inspiration

Once you know the basics of environment modeling, and you want to start working on your first scene, you must ask yourself what kind of environment will I start with? Although it may be a hard question, you should be sure to choose a scene that inspires you. To be more specific, if you are not inspired by vegetation/nature scenes surrounded by trees and bushes, don't try to create this kind of scene. You will end up with a scene that will not look like what you expected. Maybe you have a fascination with old, abandoned buildings. This is a great starting point for creating a scene.

You can start by looking for images on the Internet or by going outside and trying to find some scenes in your own city. I get great ideas when visiting locations that I like. I start taking photos and trying to visualize the perfect scene that would fit in that setting. When I get really excited I start working on the scene.

Inspiration is a strange thing. Sometimes it takes a while for you to get great ideas. You can't force it and inspiration can sometimes come from an unexpected place. Sitting behind the computer and thinking will not really help you find a great idea. If you really want to trigger the mind, find some useful soundtracks that fit with the scene. For example, if the scene involves an abandoned place, listen to some music from a movie set in an abandoned place. Alternatively, go to a place where you can find this emptiness and sit down. Focus on the emptiness and think about the history of this place. Soon your whole body will start to react and you will be in the perfect mood to get inspiration.

This works for me most of the time, but feel free to use any method you think works.

In the next chapter I will explain the whole process: getting an idea, visiting the location, trying to get the right inspiration, and putting this all in a nice 3D environment. This will demonstrate the workflow, and to show that creating 3D scenes involves much more than simply modeling objects and trying creating a 3D scene

The subject in this chapter is abandoned buildings. From the starting point I don't have a final image in my head. I have to visit some places and hope to get the right mood for visualization.

Visiting locations

As has probably become apparent, I love medieval buildings, and they often feature in my 3D work. This is because I am really sensitive for inspiration when I visit locations with medieval architecture. I love working on these buildings and I never get tired of it, even after long working days. Therefore I will combine this subject, abandoned buildings, with medieval architecture.

Even if you have no interest in medieval buildings, this will still be a very interesting chapter. I will explain the workflow, which is usually comparable for other environment styles.

For this project the perfect location to visit is one with an abandoned medieval structure. The problem is that we have really good facilities in the Netherlands for maintenance of these buildings. Most of the time they are kept in perfect condition and all the ornaments are well painted. I had to do a lot of research to find a location that was suitable. I was lucky that a friend of mine told me about a small Dutch town called Oudewater with a lot of medieval buildings. I had never visited the town and I hoped that I would find some dilapidated buildings there.

After I arrived, I took a couple of photos. Below is a sample of these:



Two random buildings in Oudewater. They are in perfect condition, and the ornaments look new and well painted. For tourists this is perfect, but for an artist this can be kind of disappointing. I like to see them in rough condition, with the original wood and bricks. Most of the time when people renovate buildings the charm of the buildings can be diminished. (Fig 6.2)

The challenge from the site visit was to find dilapidated or abandoned buildings. This was a hard task, but after several hours of walking around I found a perfect example of an abandoned Dutch building.

Below is a photo of the building.

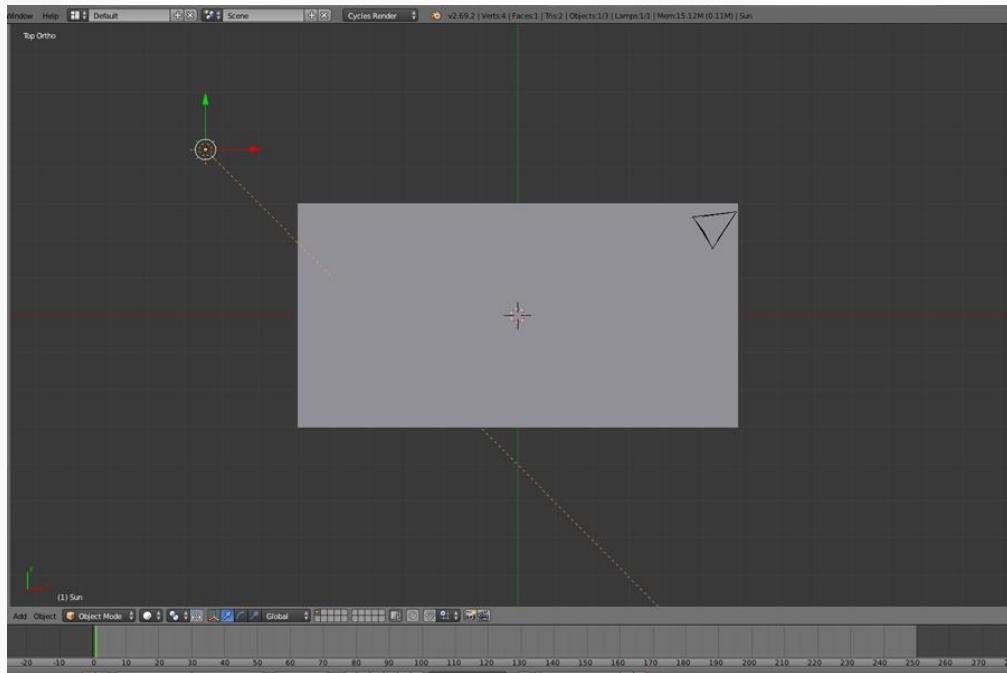


Sample (Fig 6.3)

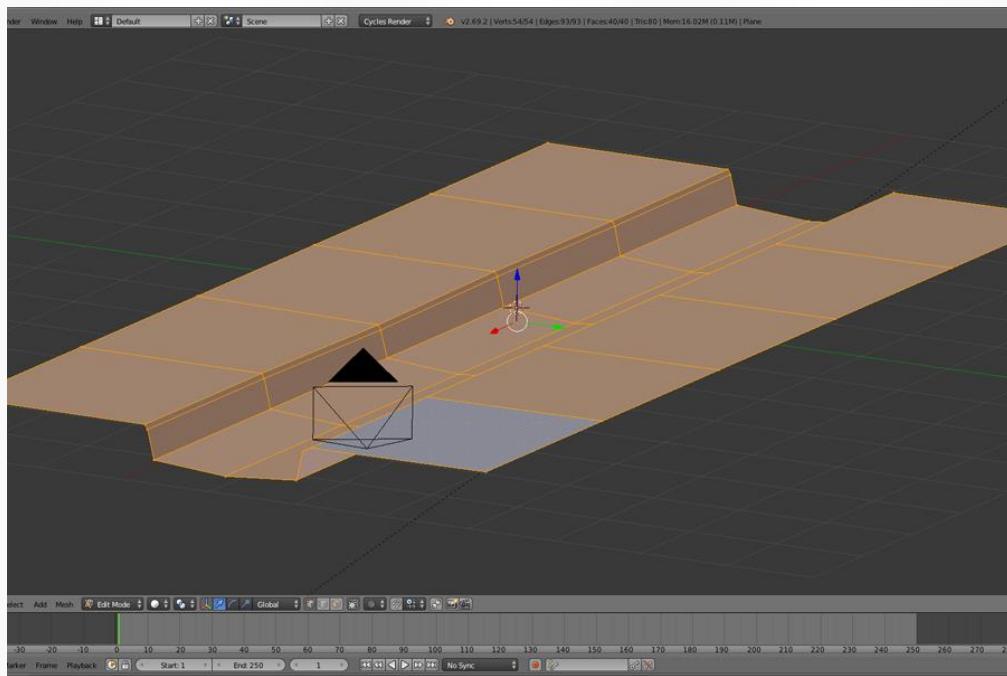
I have only rarely seen a medieval style building in this kind of disrepair. It was surrounded by ivy and moss.

Here started the inspiration process. I wanted to use this building in a 19th century setting, which was a time of widespread decline in the Netherlands. The scene that came to me featured a ditch with this building in the middle of it. This building would be one of the last remains of a once-busy urban street. To create this scene I would need to make a simple sketch and a plan, outline how many days I would spend on each task and what I would need to create. Below I have explained how I worked this out.

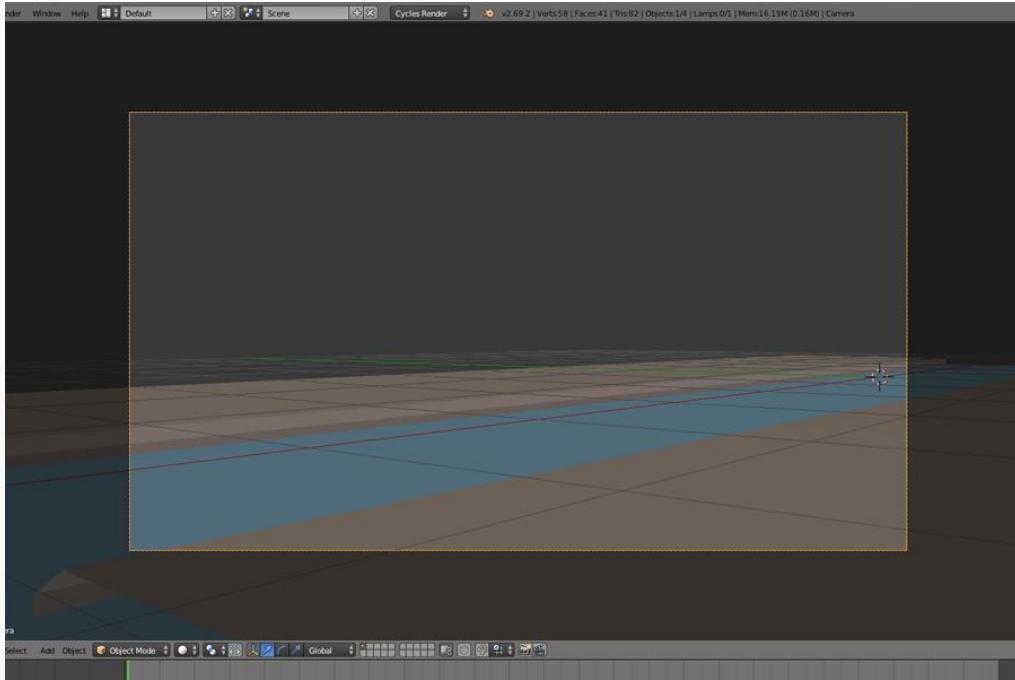
Creating the scene



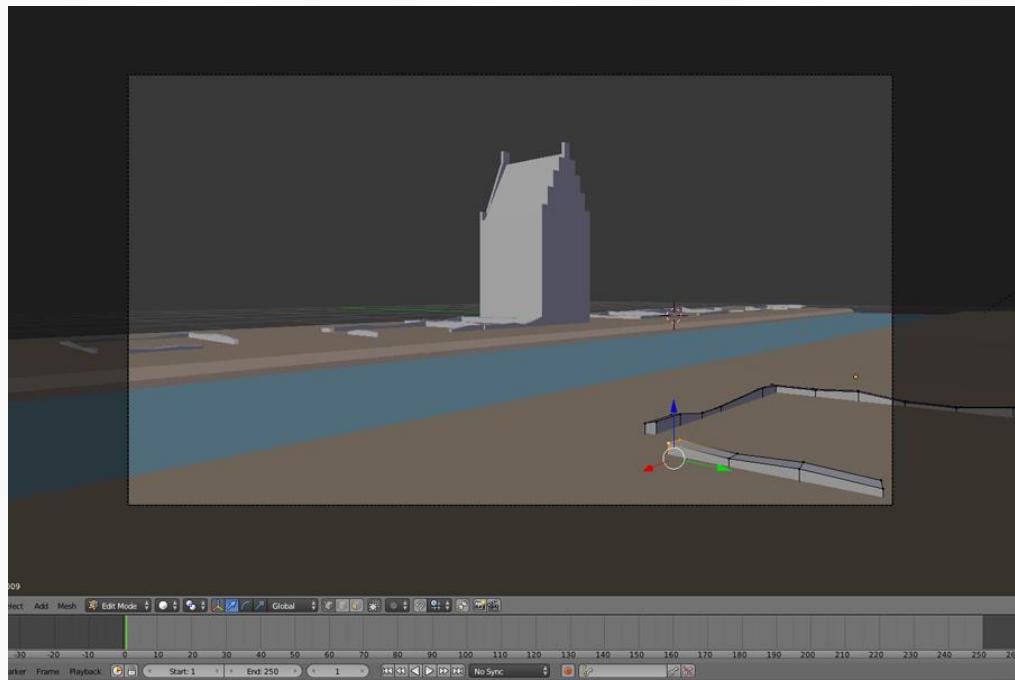
- 1. As usual, I start with an empty scene. I added a plane to transform this into a solid base.



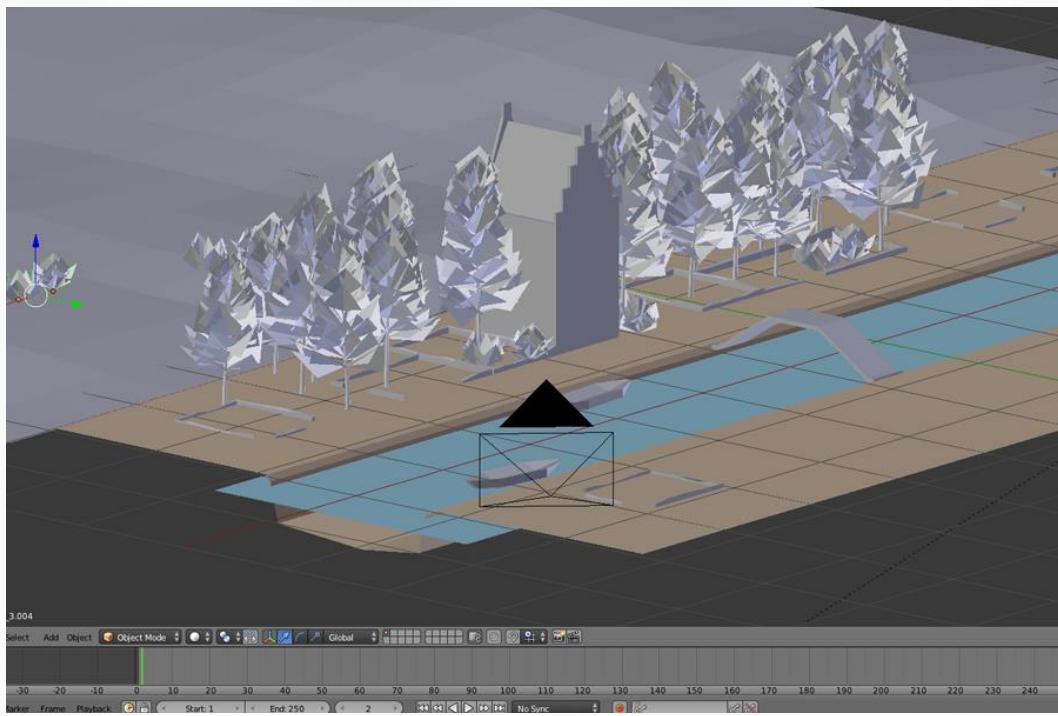
- 2. I wanted to create a ditch. To make this shape I created some extra lines and made a ditch for the water.



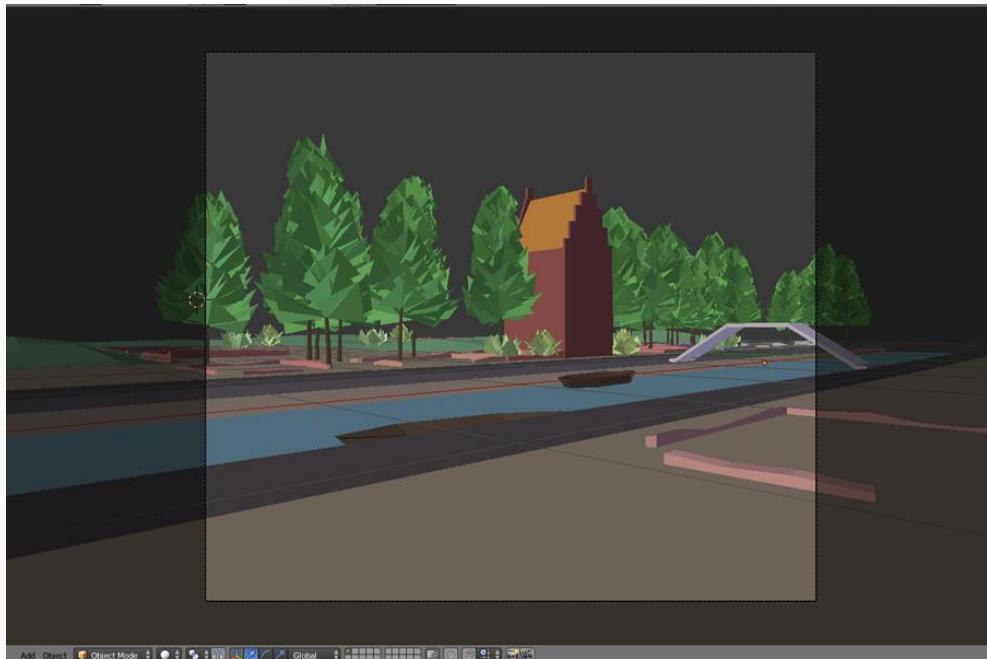
- 3. To make it a bit easier for yourself, give color to your materials. If you leave everything grey, it's hard to see depth in the scene and separate the objects. As you can see, I also put the camera in position. This is not the final composition, but you need some reference to start with.



- 4. I made a very simple house without any detail. It's important to scale it to the right size. I also created some ruined buildings with only the remains of some bricks.



- 5. Start adding more stuff in your scene. Make some simple trees and bushes. Keep in mind this is a simple sketch of your work, so don't go in to much detail.



- 6. This is the final composition. Everything has a color and I also changed the camera settings, using wider lenses and a more vertical perspective.

The sketch is finished. If you are a good 2D artist, try to improve it by painting it over and adding all the details you want. If you have one frame with the right mood, it makes the work much easier. The problem with not having a reference is that you don't have a point of focus in the scene. This means that you will have to work on a lot of objects that you might not be able to see in the final result.

The next step is writing a little story that explains what this scene is about. This may sound a bit odd, but I will explain why this is important.

The scene in picture number 6 can have multiple background stories and also different styles. This could be a war scene with destroyed buildings, in which case I would need to make a lot of broken stones, maybe some smoke, etc. If, however, I want to show a city in economic distress, the scene would have a completely different look. I would need more vegetation, and less broken bricks. It sounds simple, but in my opinion a lot of people don't think about the story behind the scene. Here is my story about the scene that I am going to create:

'An unknown city was extremely powerful for more than 100 years. People had so much money to spend that they built very beautiful buildings in their city. After the long successful period, things changed. People moved out of the city because there was no more work. The city became very poor and there was no money to renovate these buildings. 200 years later the city was a completely overgrown, and over the years people demolished all the impressive buildings to sell the bricks. The few remaining rich citizens kept some of the buildings in good condition. They were trying to save the last remains to show the next generations a few of the impressive buildings the city once had and to keep the city's identity and history alive'

This is what the scene is about. Even this short story provides some idea of what kind of mood the scene needs.

The next thing we need to do is create a time schedule for what we are going to create and how much time we are going to spend on it. This is important if we have a deadline or simply don't want to lose control in the scene. If you know that this scene requires two weeks of work, then you know what you can expect.

| Sort of object/work to do | Time you need to spend |
|---------------------------|------------------------|
| The base | 1 Day |
| Water | ½ Day |
| Building | 3 Days |
| Remains of buildings | 2 Days |
| Bridge | 2 Days |
| Boat | 2 days |
| Trees | 2 days |
| Bushes | 1 day |
| Ivy and moss on buildings | 2/3 days |
| Atmosphere | 2 days |
| Lighting | 2 days |

If I total all the days there is around 3 weeks of work to do on the scene. This depends, of course, on several factors:

- How fast you work
- How much detail is in the scene
- How many hours you work on the scene each day*

*Creating environment scenes, or to be more specific creating 3D models is a very intense, mentally exhausting job (but not in the negative way). I have now been working for more than 5 years on environments. I spend more than two thousand hours a year modeling. From experience I know that working this much can sometimes blow your mind, simply because you love what you are doing and you forget the time. Becoming burnt out after doing too much 3D work can be very nasty. To avoid this, don't spend too many hours working in a day, take breaks, and work with a time schedule. Ignore motivation speeches like '*I work 24 hours a day, if you don't you never become a talented artist*'.

I am not telling you this because I am a lazy worker but because I want to prevent you from succumbing to one of the most common causes of burnout in this area of work. If you work for an employer, be strict with yourself and let the employer know what your limit is. 3D modeling is fun; keep it that way.

Building a scene is not just making objects in 3D. You also need to put textures on the surfaces. Finding the right textures to use is a hard job, and most of the time the difficulty of this is underestimated. At the end of this book I have listed some websites with good textures. However, if you are taking your work seriously, you will be collecting your own textures as you go. It is fun and once you know how to do it, you can create stunning scenes that have an original style I work with a Nikon D5100. For the next scene I use a combination of textures.

Over the last couple of years I have taught myself to be more organized about using textures. Before, I just cut some parts out of a photo and I used it as a texture. This means sometimes my textures had a resolution of 2400x1600 or, even worse, 4000x2500. This worked out most of the time, but it slows down your computer and it uses a lot of RAM memory. I am now only using organized textures with tiling sizes. This means the sizes are easy for a computer to handle.

For example, the smallest texture I use is a 64x64 resolution. If I want to use a higher resolution, I use 128x64 or 128x128. It is also possible to use 256, 512, 1024, 2048 or 4096. You can even make combinations like 2048x1024 or 1024x128. These formats are normal in the game industry, and I use it also for my CG worlds. The computer really likes these resolutions. Try to save them in a PNG format. Don't use jpeg, as this format involves compressing and you will lose quality. When you are using the textures in a game, use jpg. Since this book is not about game environments, I use PNG.



PNG and JPG texture (Fig 6.4)

Now I will show how I manage my textures using a normal photo. Before I start though, I'd like to explain one more thing. In the VFX world, people use a lot of photo mapping. This means taking a photo of a building, tweaking the photo in Gimp or Photoshop, and then projecting the photo onto a model. I used this technique for the Blender open movie Tears of Steel.



Image still from the movie Tears of Steel (Fig 6.5)

For VFX movies this technique is common and I can recommend the photo projection method for this kind of work. If however you are creating a CG scene for an animation, this is not the best method in my opinion. Below I have listed some of the reasons why:

- There is a limited variety of unique buildings because it's still a photo.
- When the camera comes close, you can see the photo projection, which is undesirable.
- You have less control tweaking the building mood because it is only one photo.

In my opinion there is a huge difference between photo mapping and working with separate, tillable textures. In the next scene I demonstrate the workflow with tillable textures.



In this [video](#) I am hunting for textures, a funny way to understand how to find textures

Now I will show how many brick textures I created from the building in picture 6.3



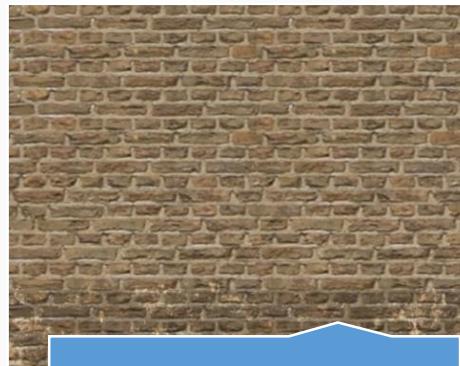
The clean brick texture



Brick texture with red pattern for the sides



Dirty bricks



Brick texture with dirt on the bottom



Brick texture with some burned corners

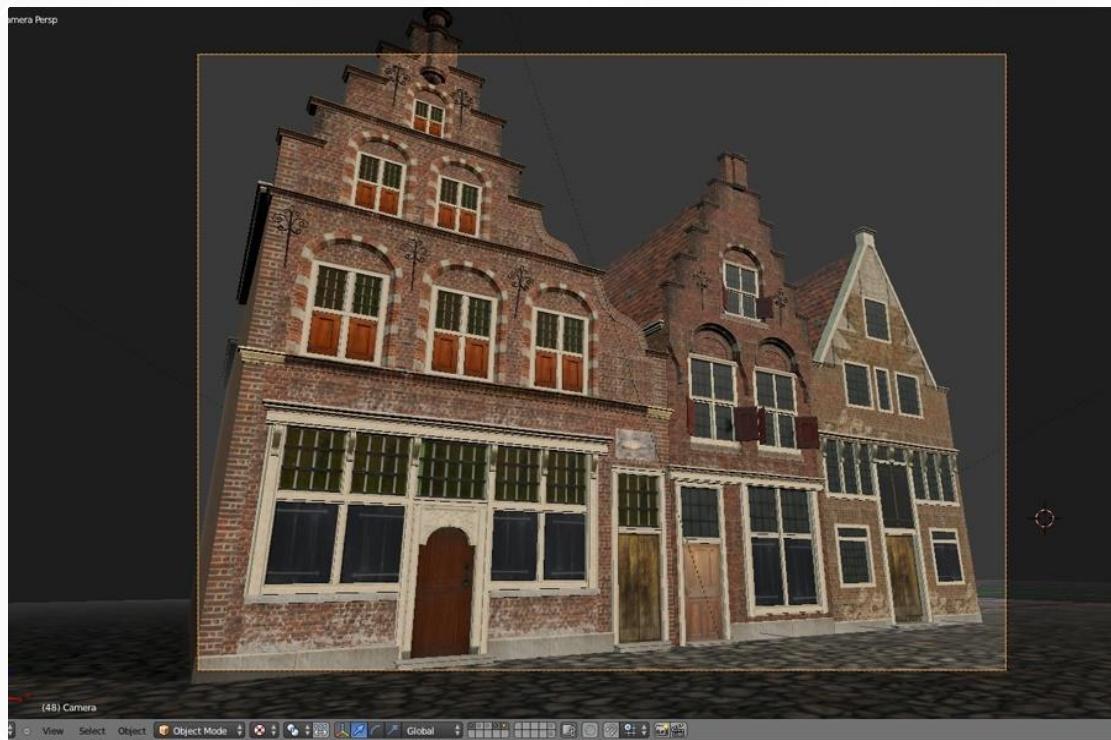
Of course I created more textures from the photo. Think about the window, ceilings, small ornaments, etc. The textures above are the main ones. They need to be tillable, or else you will see duplications on the wall.

Before I tried this technique I used a photo of a rough wall and I projected this onto the façade. This worked out pretty well, but it felt like photo mapping. I had less control and when you create over 50 different buildings, you always see the same pattern in the brick with the same dirt and scratches. With this tillable texture technique you can make any variation you want and if you spend enough time on the buildings, you can make it look very realistic.



If you don't like this way of working, watch this [video](#). I used another texture method

In the following image you can see a combination of the textures I showed above.

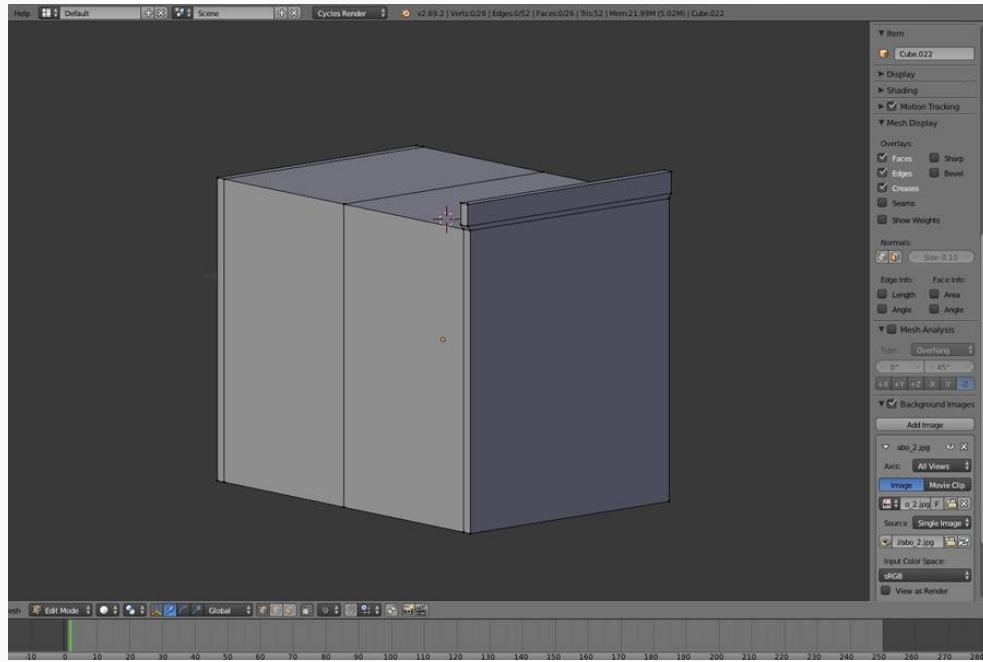


Using the right types of textures to make all the combinations you want.

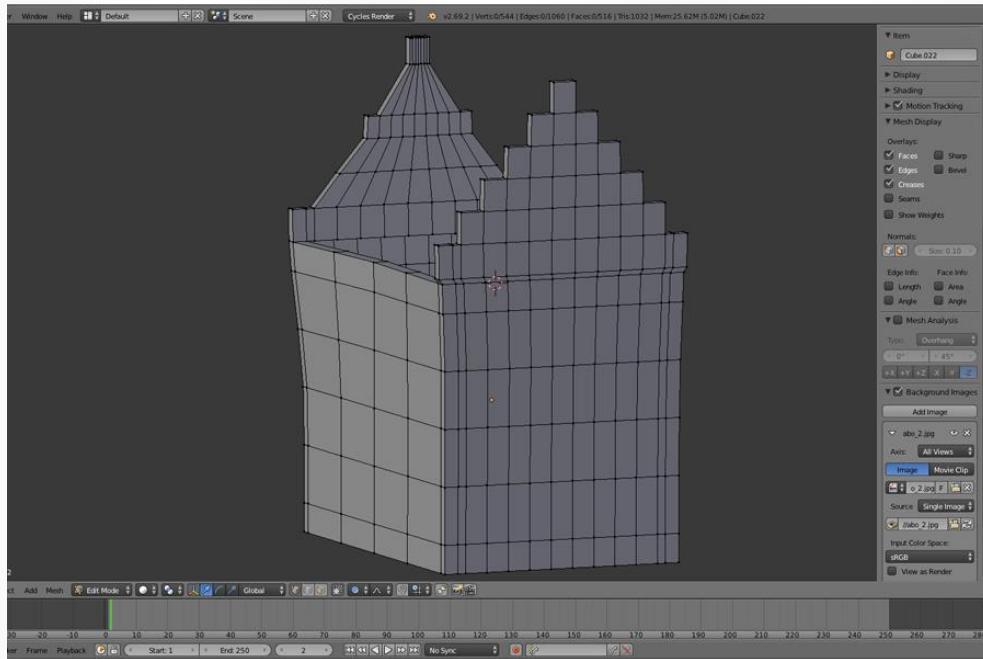
By changing the color of the texture you can create yellow bricks.

(Fig 6.7)

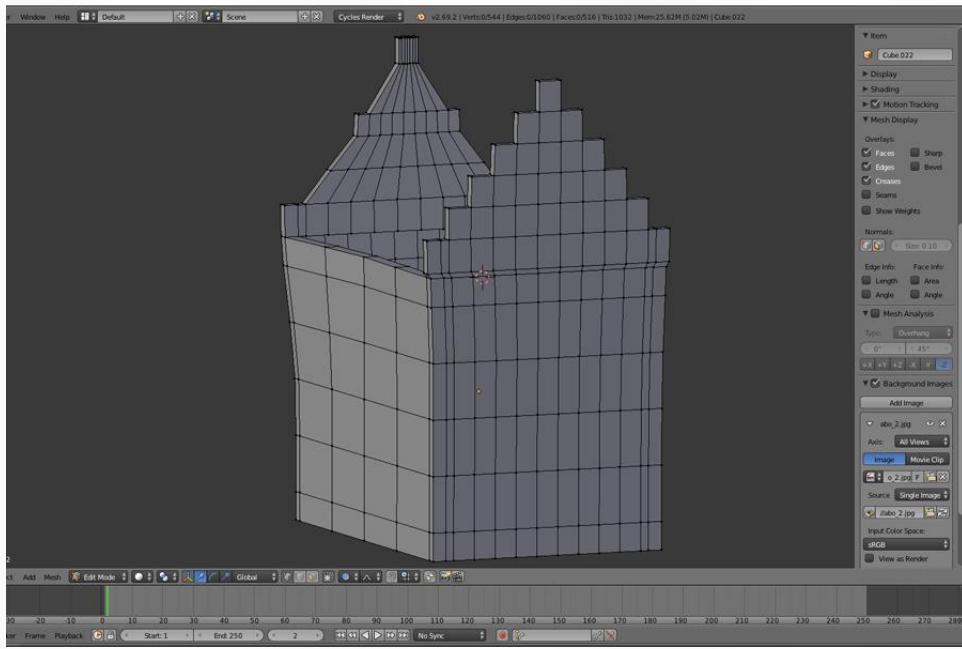
When you work with tillable textures and with different combinations it is important to have a solid typology in your modeling work. The UV coordinates are very important when using this working method. In the following section I show how I quickly build up the first building in the scene. I will also use some other textures, so keep in mind that not everything is from the photo.



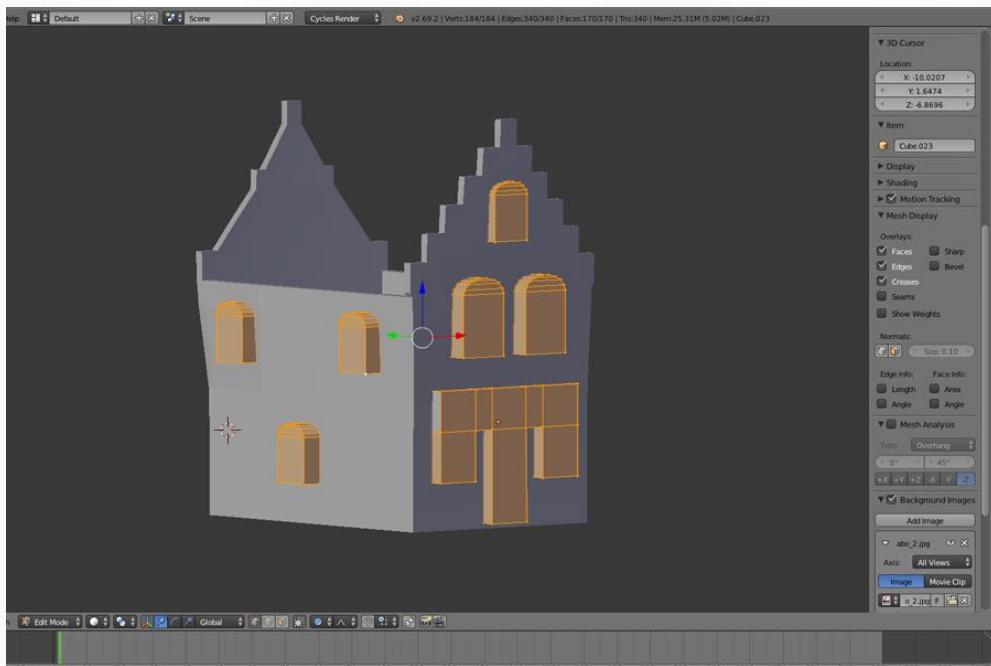
- 7. I start with a simple shape using a background photo of the building as a reference. Put the lines in the right position, but don't put too many of them in your model.



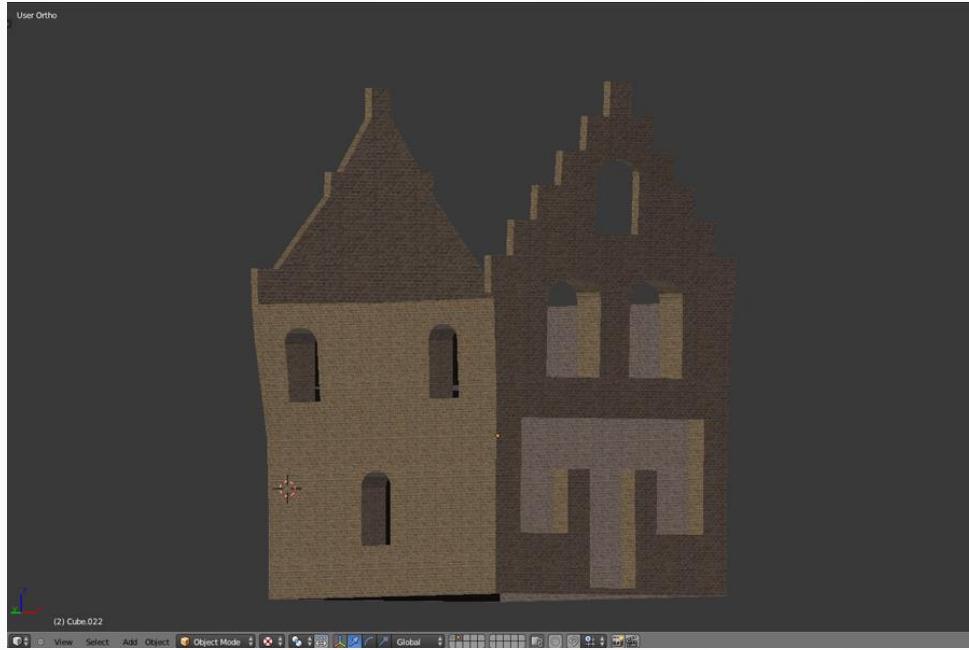
- 8. It is hard to see it in this image, but I removed most of the straight shapes in the building. I want to make it look old and broken. You can also see that I added more lines. The lines on the sides are especially important when we start texturing the model. Be aware that, because I work with the Boolean, the typology is going to change.



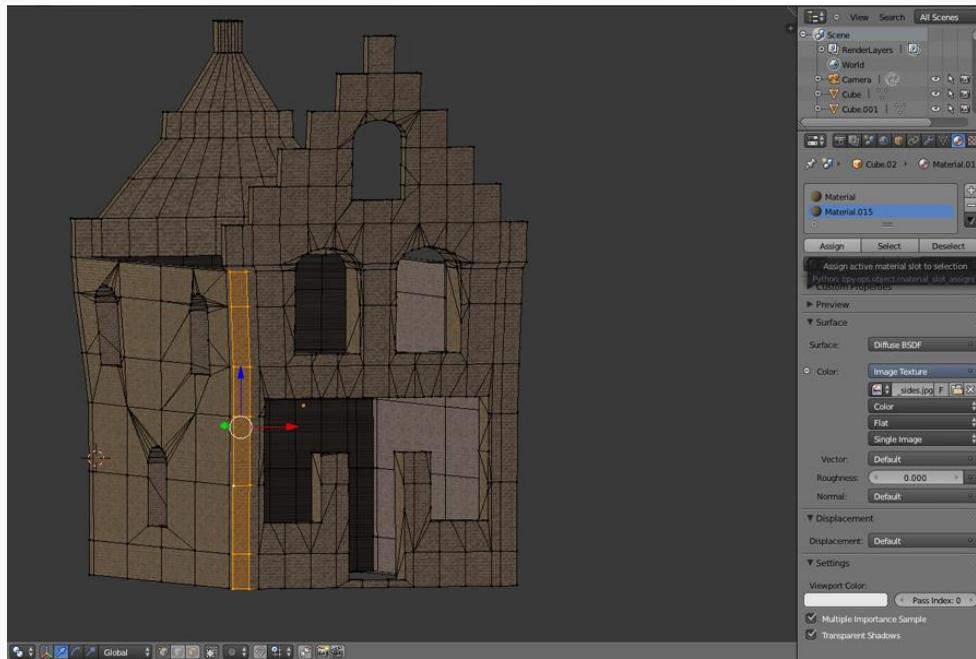
- 9. The holes that we are going to make don't need to be perfectly in line like in the photo. We are not going to make a perfect copy of the building. This also makes the working process a lot easier.



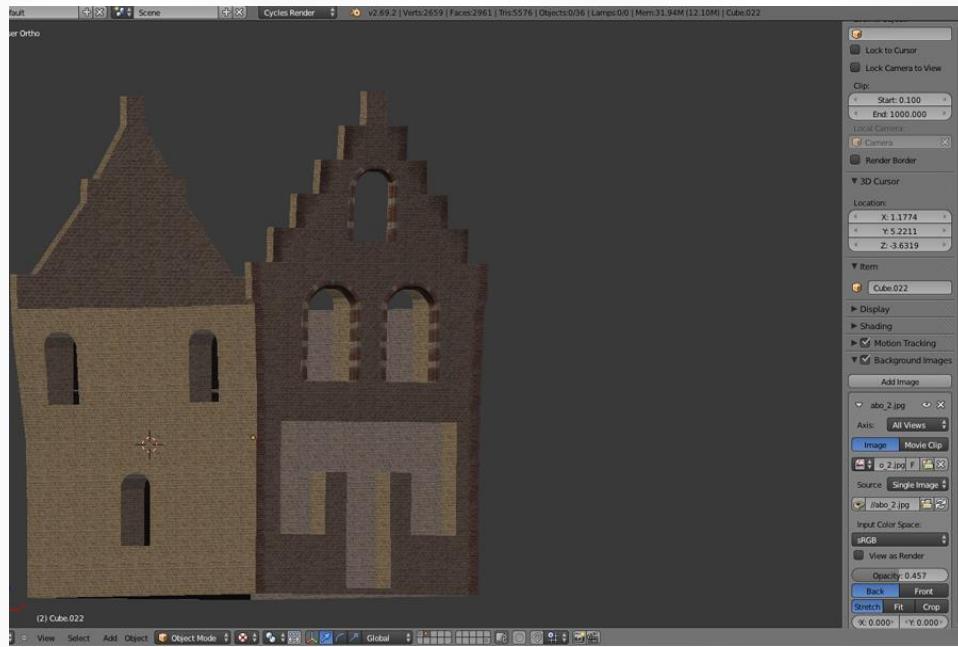
- 10. After applying the Boolean you can see that the typology is not the best, but we still have a workable UV space. If you are not happy with the result, try it again and move some lines.



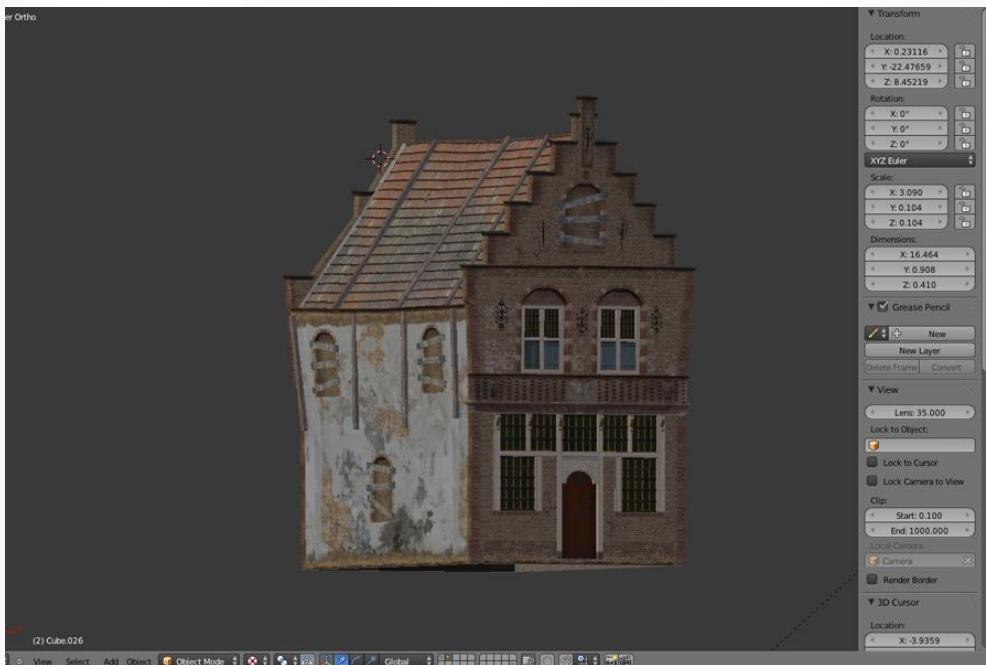
- 11. We start by applying the first texture. Take your time with this process. Everything needs to be in line with each other. When you are done the pattern looks a bit boring, but we will fix this later.



- 12. Now I add a new material, the one with the red sides. Select the UV coordinates on the sides and press assign. Switch to the UV editor to move your coordinates to bring them in line.



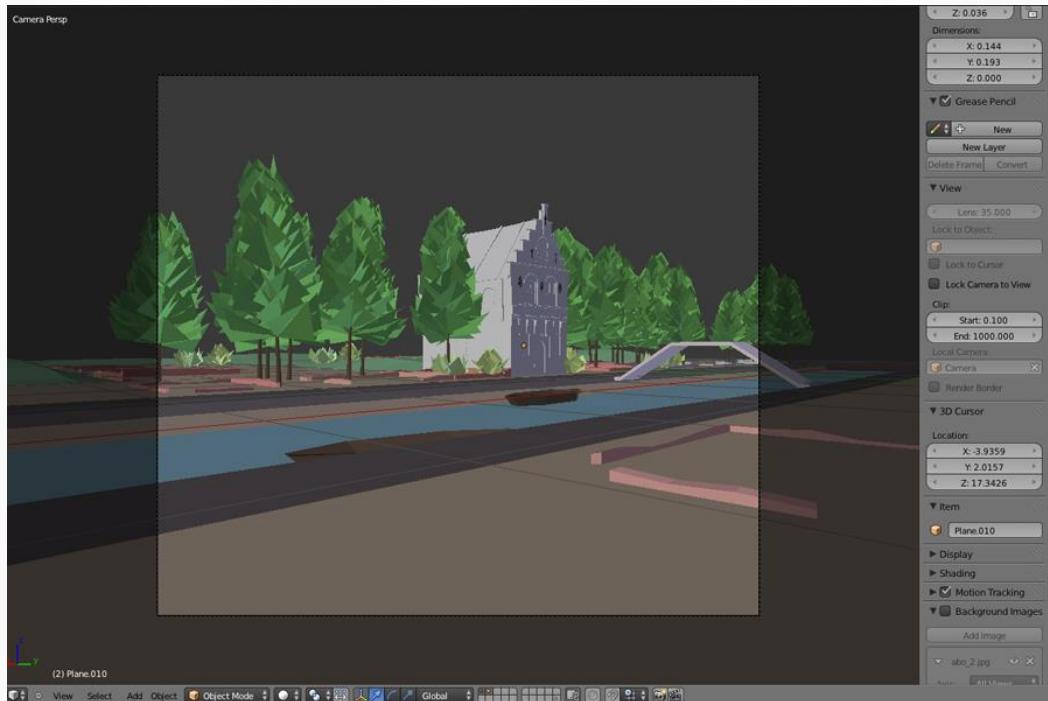
- 13. Try to apply all the different types of textures on the building. The more variation you use, the better the final result will look. Don't hurry in this process.



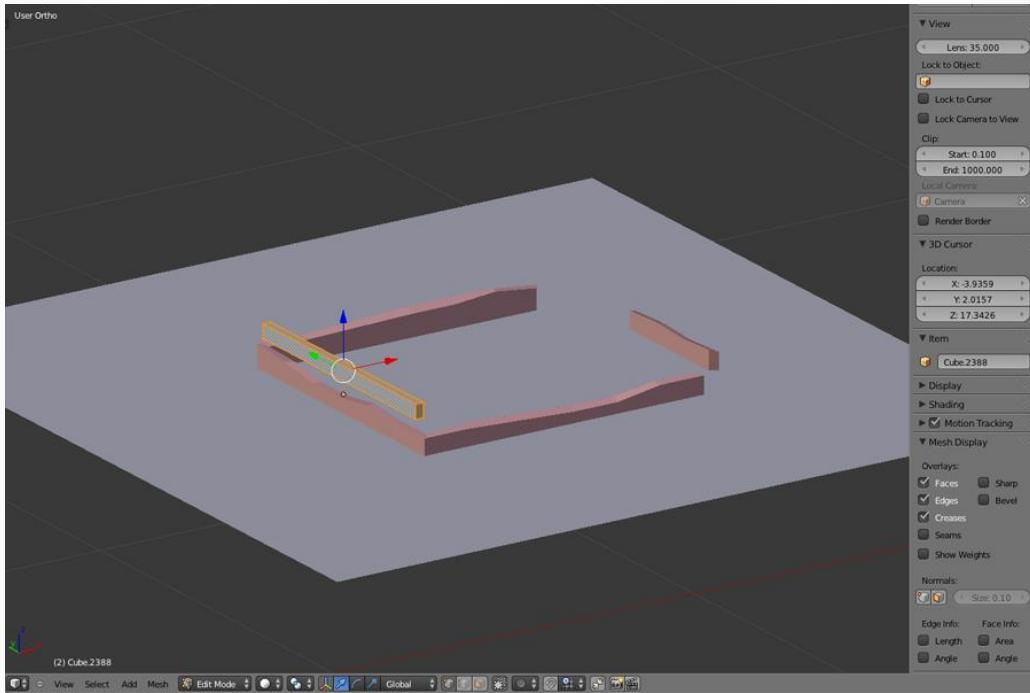
- 14. This was my final result. There are a couple of extra textures like the plaster and the roof. They fit perfectly in this model. Keep in mind that a model is never finished. You can always try to improve little things and use a higher quality texture. The one I used was from the photo and was low resolution. This model also has no normal or specular. Try to add these as well.



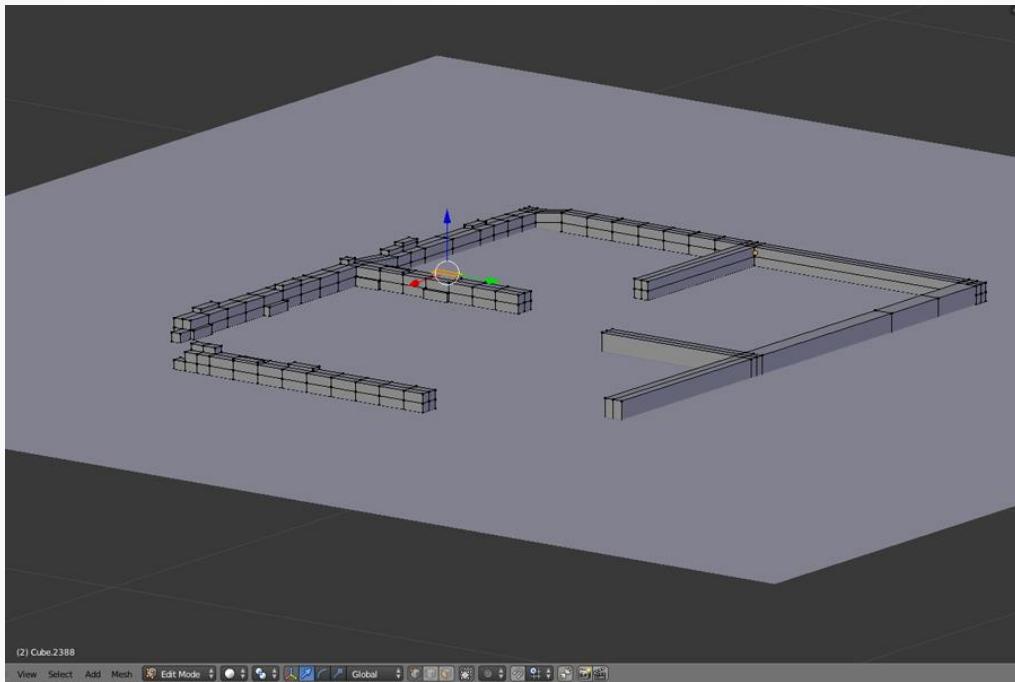
- 15. If you take a closer look you can see all the little details on the building. The main brick is still a bit empty. Feel free to put in as many details as you want to make it look more realistic.



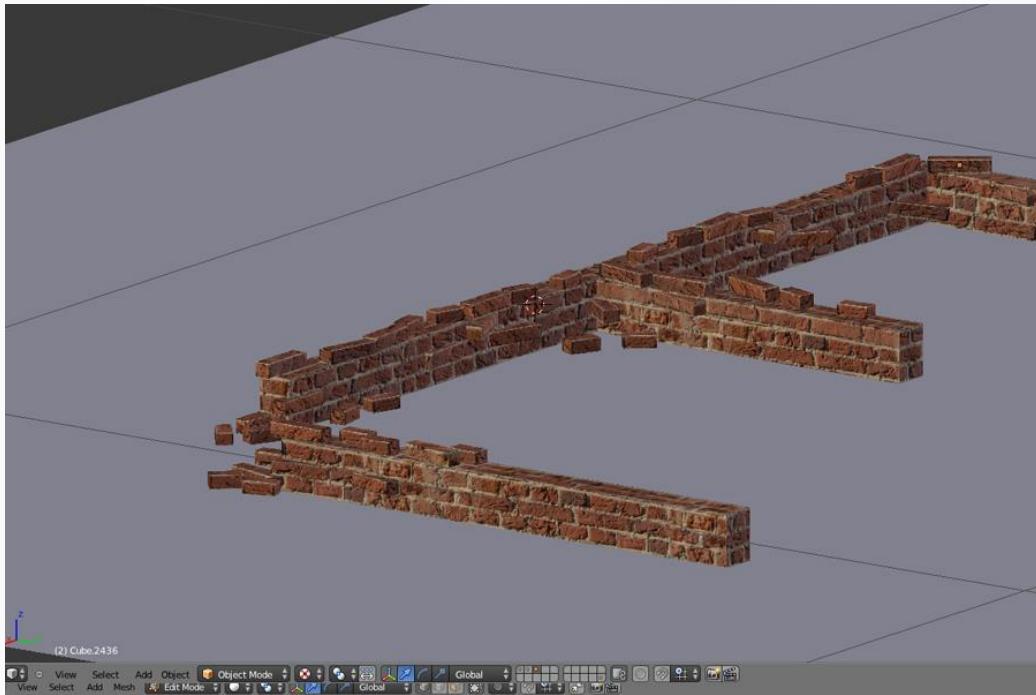
- 16. When the building is finished, you can replace it with the low poly model.



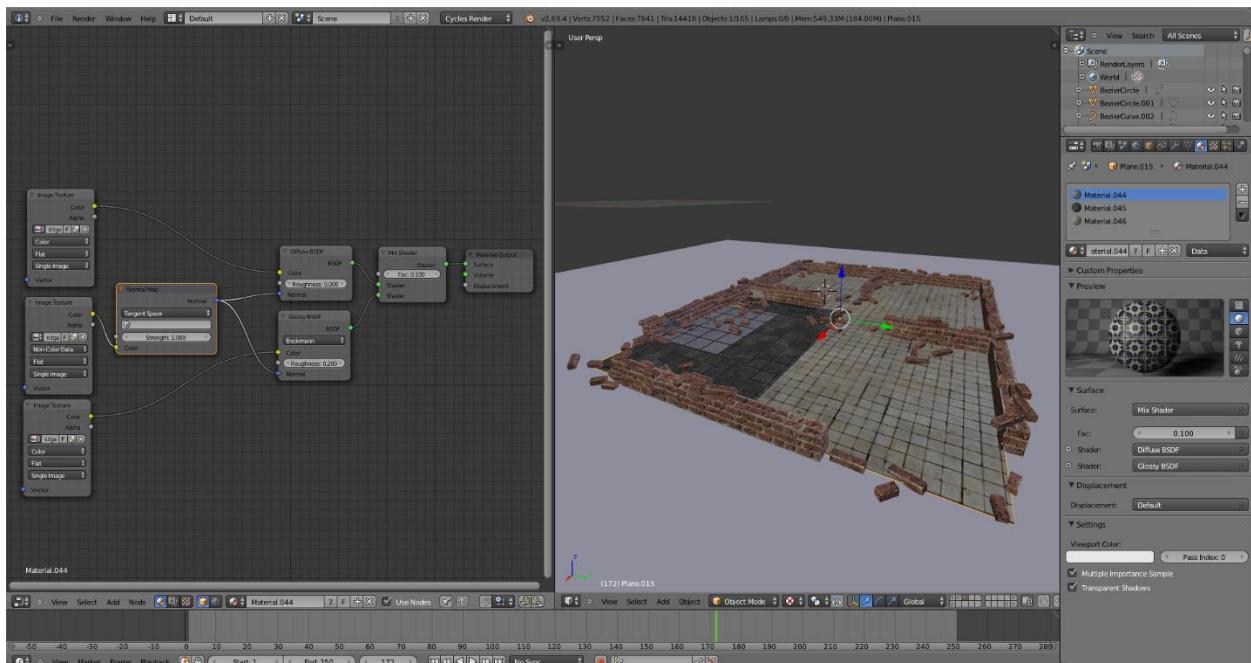
- 17. Feel free to pick your own objects in the scene to create. I don't have a special workflow, but I try to finish the buildings first, then the smaller parts and after that the nature and atmosphere. This object is going to be some remains of a demolished building.



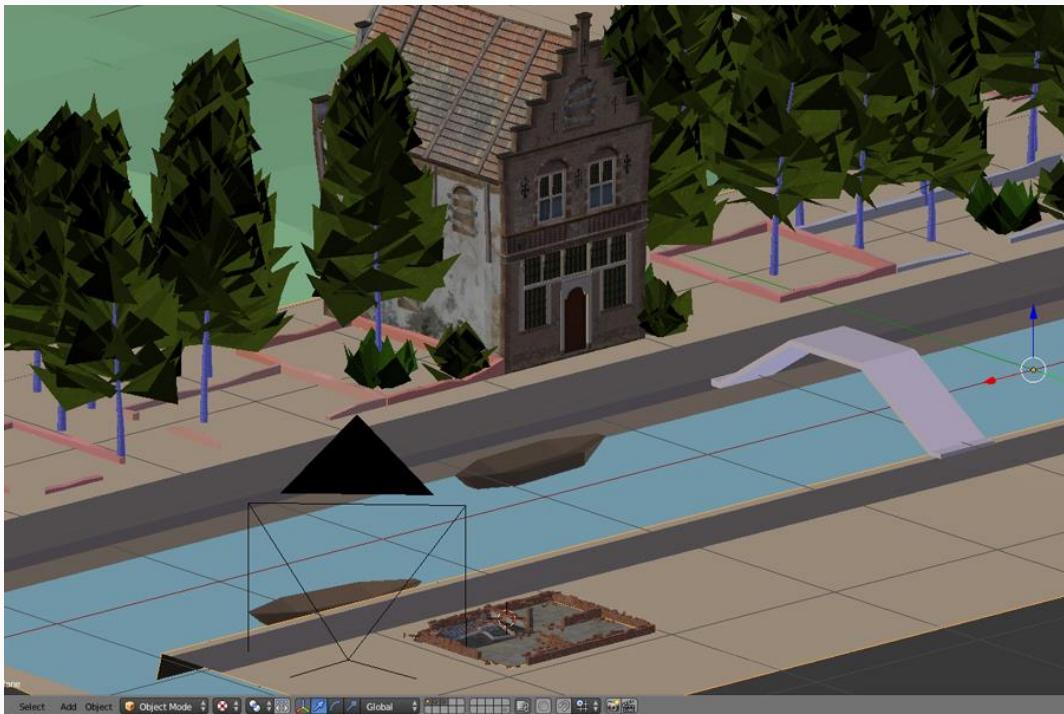
- 18. As I have no idea how I want this to look, I experiment with different types of styles.



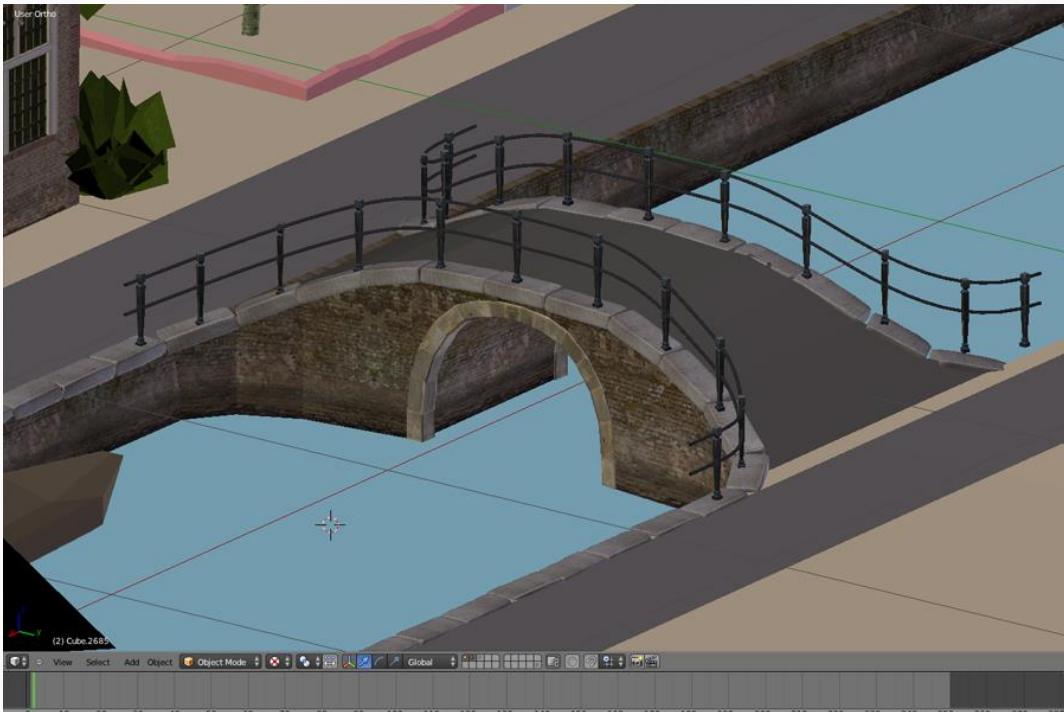
- 19. After some experiments I ended up with this result. I made a main shape with some separate bricks. Later I will add some details on the bricks to indicate that they are old and that nature has had some influence on them.



- 20. I try to imagine what type of flooring they used in the house. After applying grassy plants it will look ruinous.



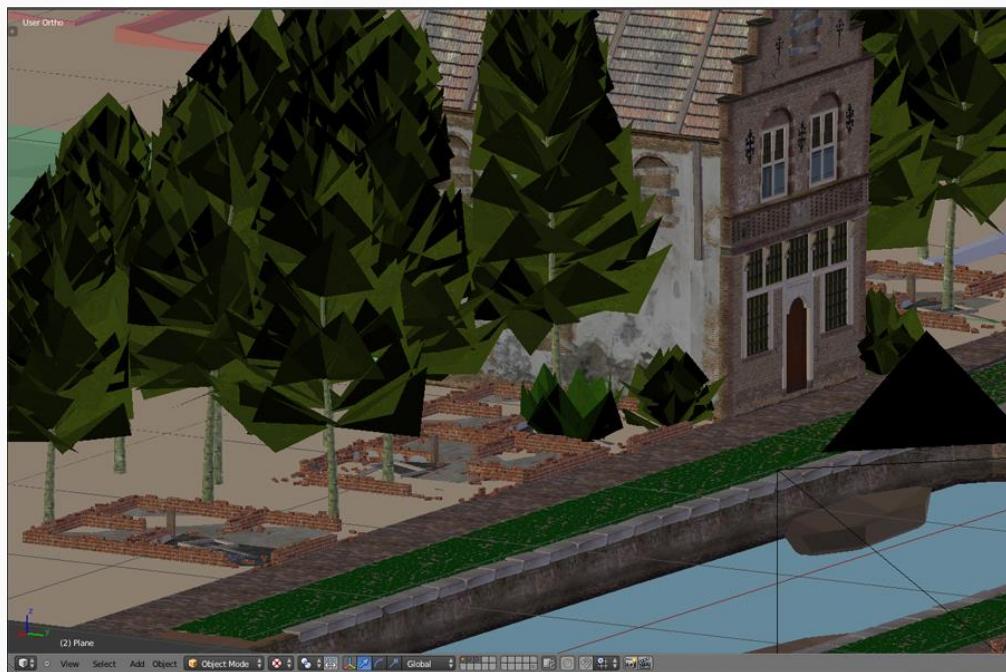
- 21. When this object is completed I put it in the right position as I did with the building. Later I will duplicate this object to replace all the other empty building spots.



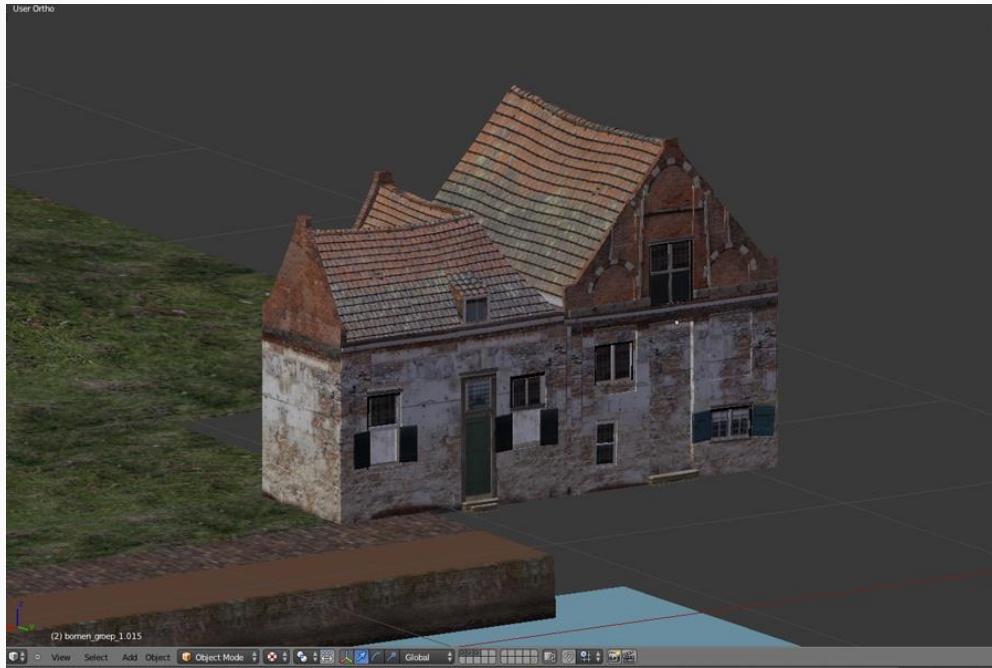
- 22. I tweaked the bridge that we made in a previous part and used it for this scene. The hard part is to surround it with the big grey bricks.



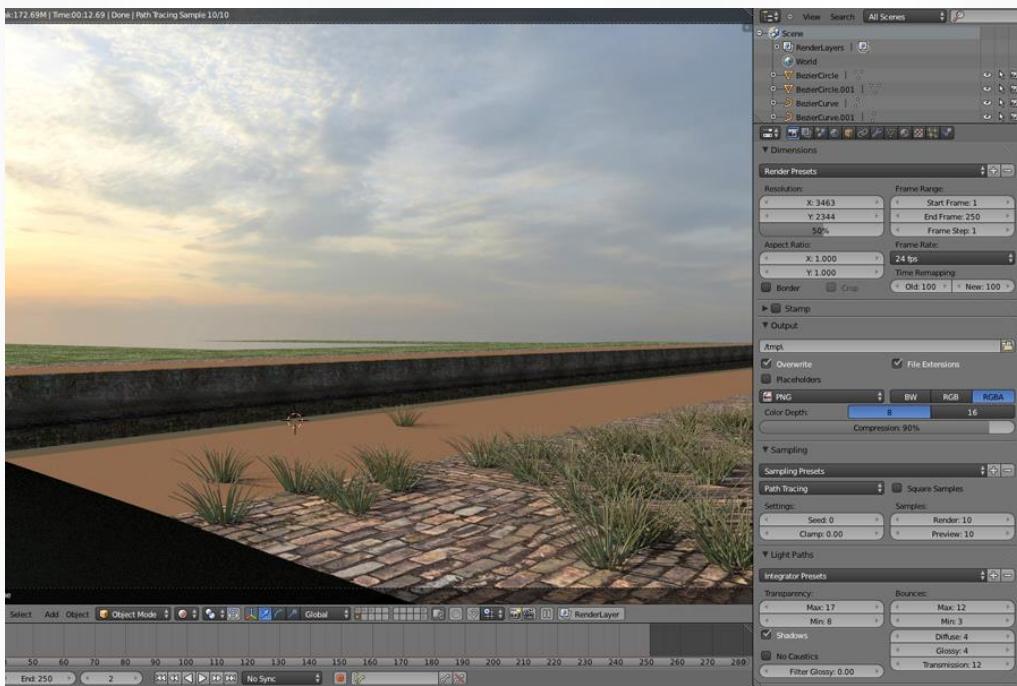
- 23. This picture looks a bit complicated but what you see are tiny bricks that I used as a road. I used the same modeling technique as I demonstrated in the previous part. Because this technique is heavy I switch to box displaying for a fast viewport.



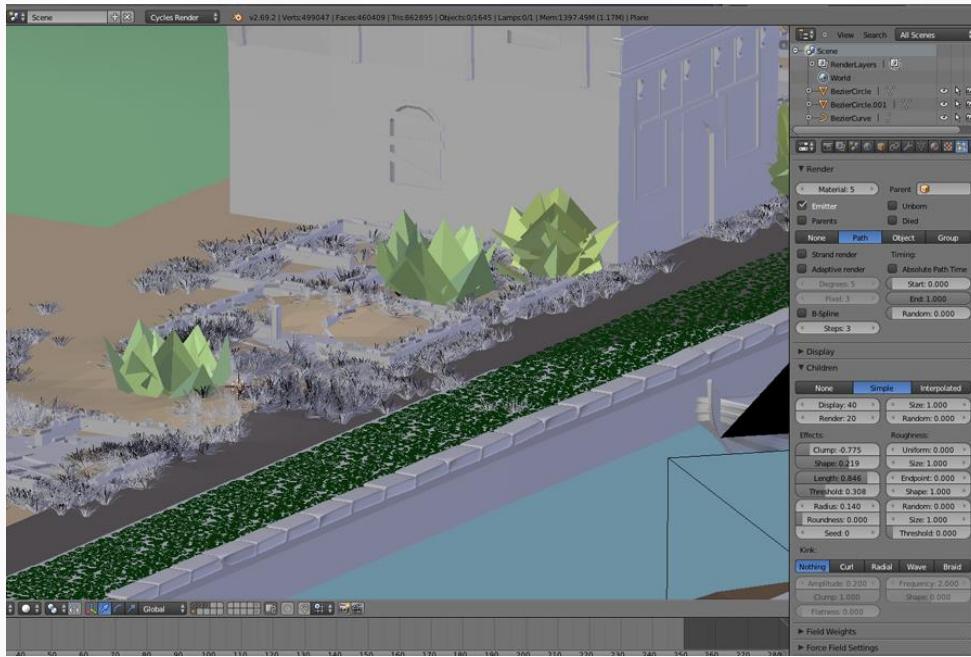
- 24. Gradually the scene is taking shape. I'm now working on the road and the building remains.



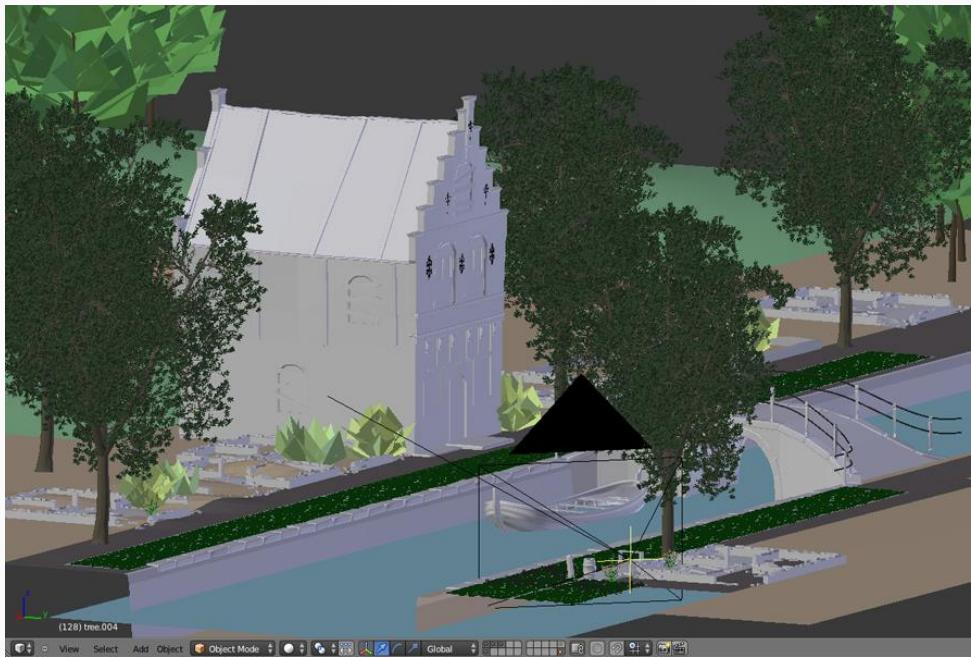
- 25. In the meantime I have created another building. This one is almost not visible because I put it far away in the scene. Don't spend too much time on buildings that are not in a short range.



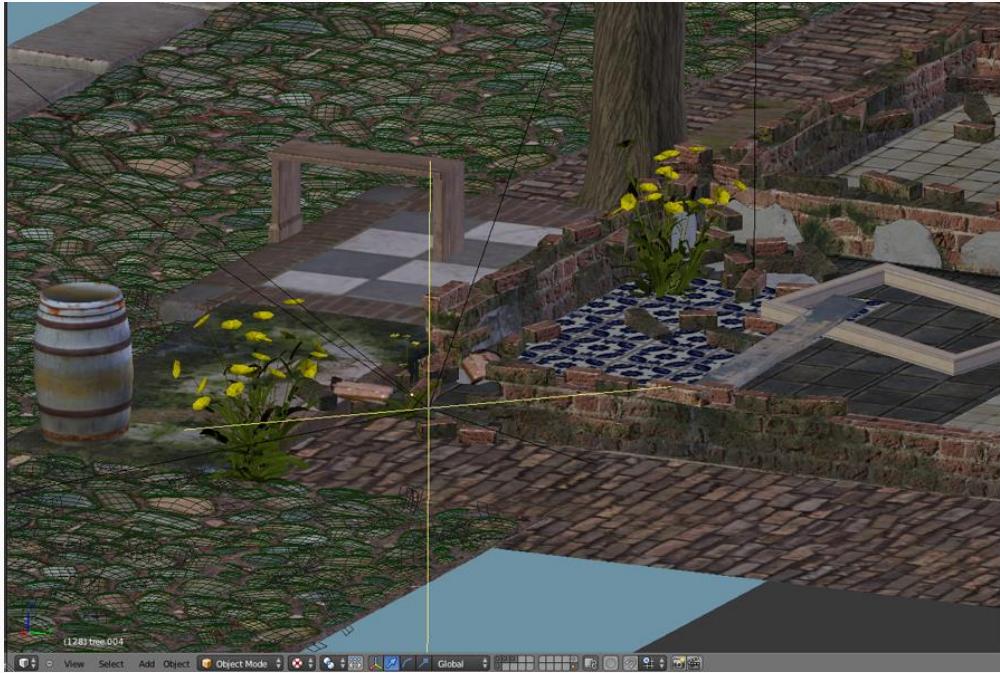
- 26. Slowly I start creating grass. I don't have presets for this so for every scene I start creating a new type. For this scene I create two types of grass: tall and short. As you can see, I also added an environment texture.



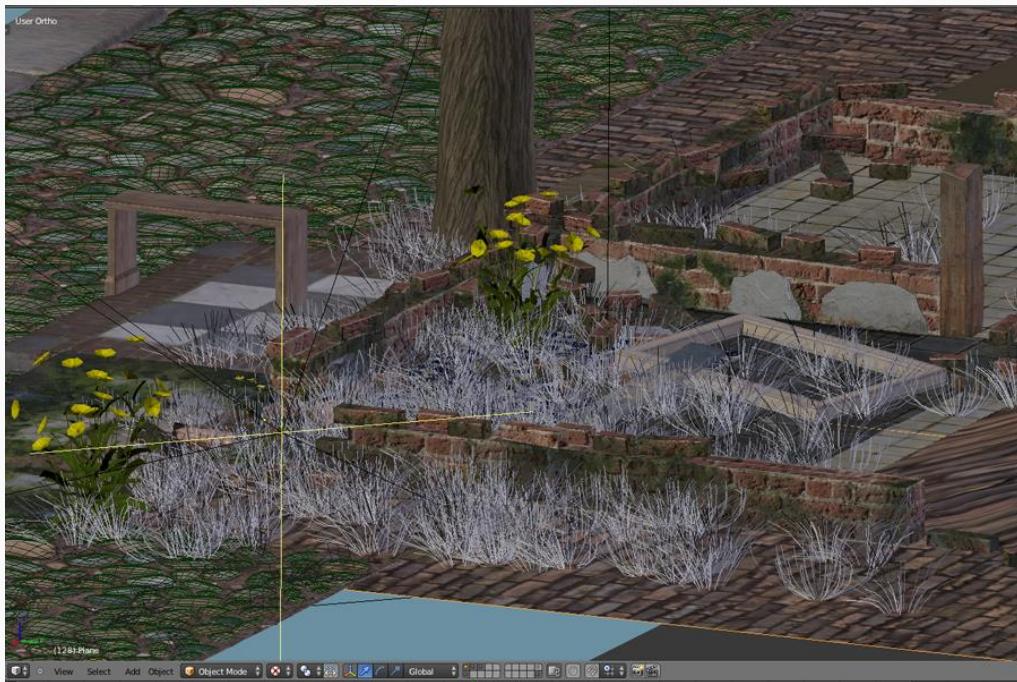
- 27. When the grass is done I put it in several places in the scene. Don't go too wild. Grass is havy for the rendering process. I also hide the grass from the viewport to have a faster performance while I'm working on the scene.



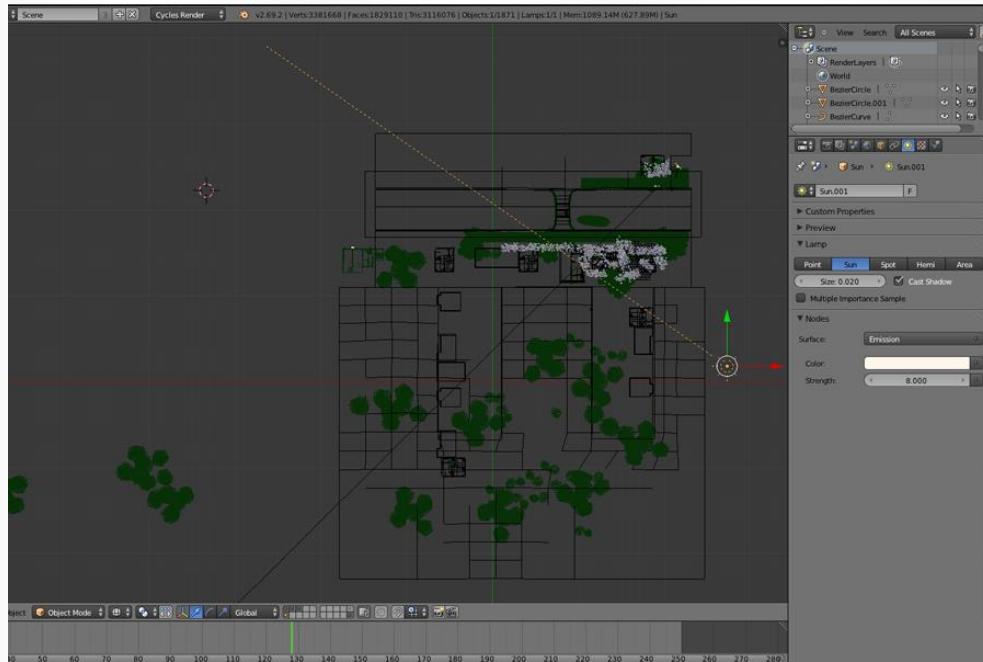
- 28. I have replaced the trees with the ones that we created in the vegetation part. Of course, you need to tweak them a bit. Try to use a different bark texture or change the leaf color. Try to put the trees in a separate layer so you can hide them in the scene for fast viewport performance



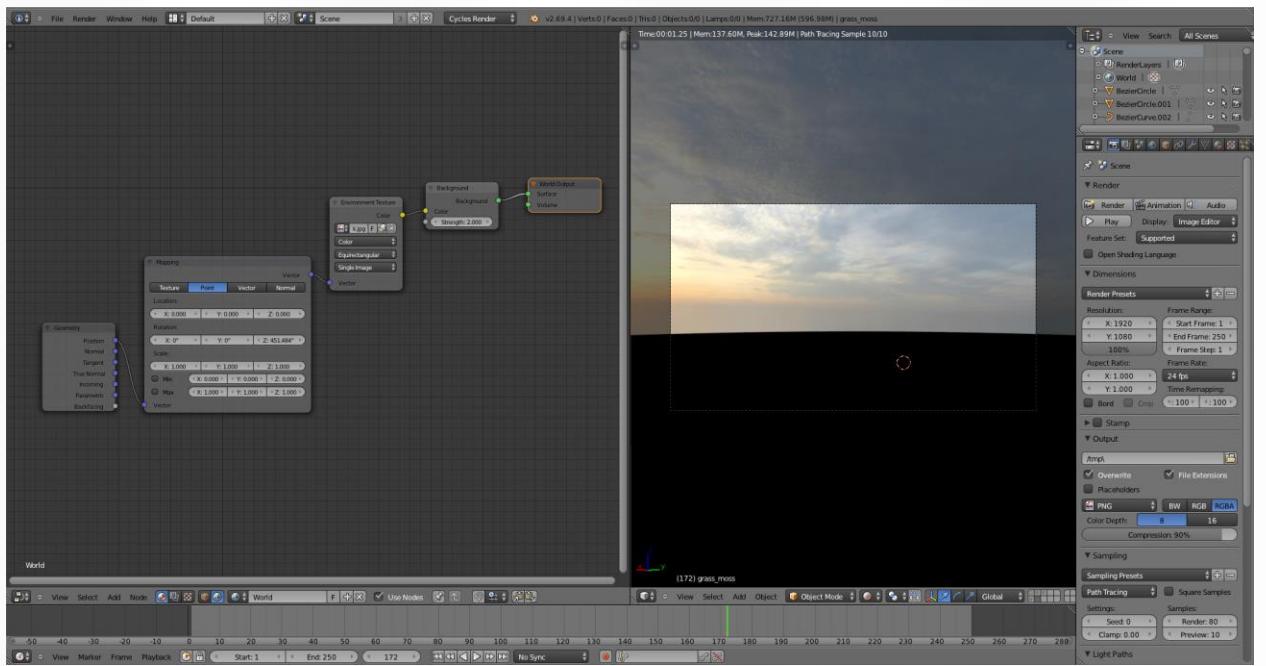
- 29. Now it is time for the little details. I add plants, moss, and flowers on the bricks by changing the texture in GIMP. I love to add details in the scene. At this stage details can only improve it. Make leaves on the ground and little pebbles.



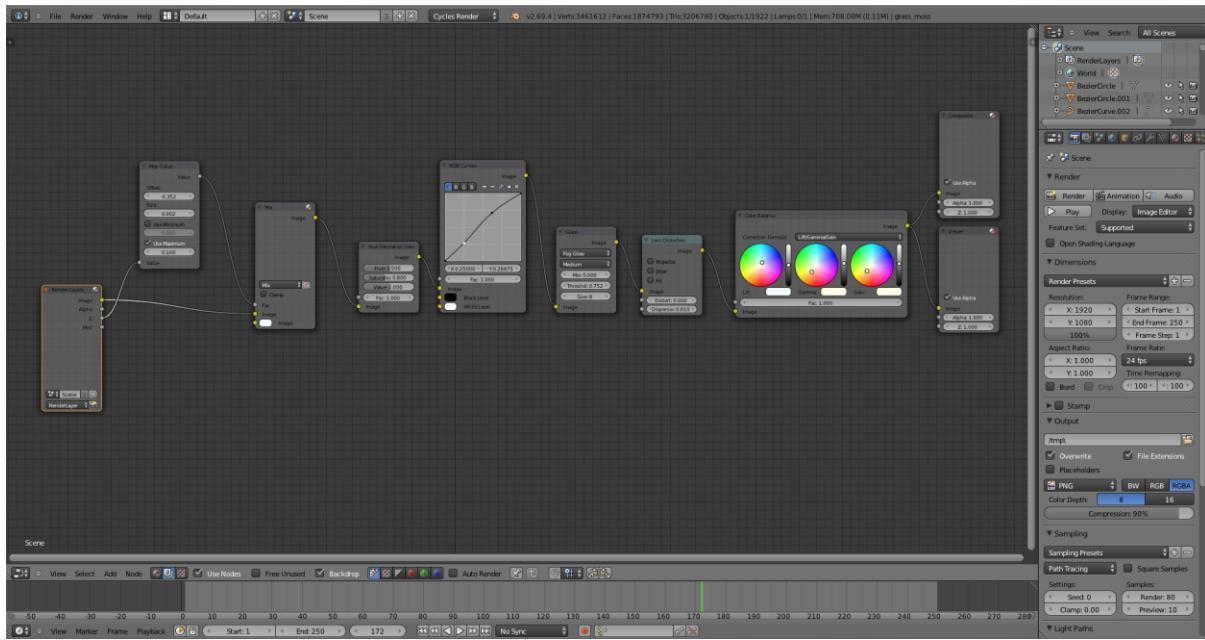
- 30. When I enable the grass you can see that all the parts in the scene are coming together. When I render this scene it will look like these remains have been here for ages, and that's what we want to achieve.



- 31. When everything is in position I start tweaking the light source. I only have one sunlamp and I give it a strength of 4 with a size of 0.02, which will cast sharp shadows on the objects. If you'd like a softer mood, make it a size of 0.1.



- 32. This is my environment map setup. I used an HDR image. I applied some nodes to rotate the map in the scene, and I used a strength of 2 to cast sky light in the scene.



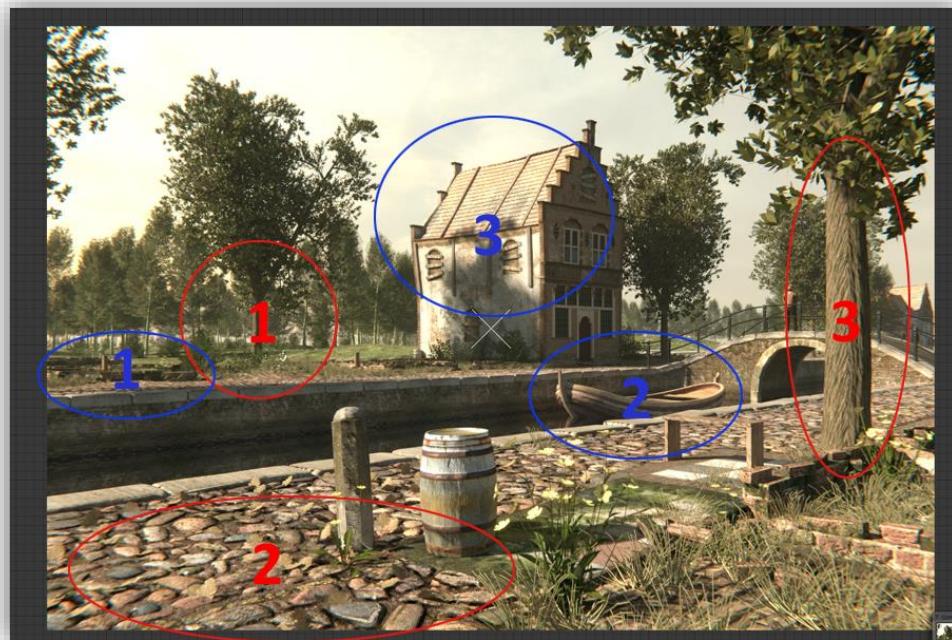
- 33. My node setups are always simple, for me it is all about color management and fog. I also use the glare node to blend the sky with the scene. Don't go too wild with this node. If objects start glowing, decrease the glare strength.



- 34. This is not the final image. For me this is the point where I stop working on the scene and start watching it for hours. Because this is a fresh design, I am not going to be able to see the critical points right away. I have to put the scene away for a couple of days and after that I can work on improvements. For now I know that the grass needs some work, and I'd like to give the guy on the bridge more accent. I also want to put something on the left of the building (perhaps an old gate with nice ornaments). I am also not happy with the color of the trees. Maybe I have to put more yellow in them.

Reviewing the scene

When you have created a final scene but are not sure what to change to make it look better, it is important to take a critical look so the right improvements can be made.



In the picture above I have circled objects using three red and three blue circles. The red circles indicate the bad parts in the scene and the blue circles indicate the parts that are fine. In other words, I don't want to touch the blue parts because they have a function. Sometimes when you tweak the scene in a final stage you forget that certain parts have a key function in the scene.

Let me explain each part further.

Blue:

- 1: The remains work well as they give the impression that this place is abandoned.
- 2: The sun streaks on the boat add depth in the scene. Because this boat is in the middle, it is a very important object, so I am not going to touch it anymore.
- 3: The shadow cast by the tree on the house works great, it is not just a white surface.

Red:

- 1: This area feels a bit empty. I think I can solve that by creating an old gate.
- 2: This area is empty and boring. I am going to fill it up with leaves and change the grass.
- 3: The tree looks fake because of its straight shape. I will add some ivy to fix this.

Keep in mind that these critiques are just some random examples. I can always find new ways to improve the scene. I recommend that you be strict with yourself. The scene can only grow, so give it time and don't hurry.



The final result

Extras: Common questions and tips

In this chapter I will answer some common questions about environment modeling. Over the years I had several questions and it was hard to find answers. Today we have platforms like Youtube and a great Blender wiki, but there are still common questions which are difficult to answer. I'll try to provide more clarity on these points.

System specifications

One of the most urgent questions I always had was about the system specifications. Some people think you need a really high-end system to create environments. In my opinion, however, your requirements actually depend on your workflow and the size of the scene.

| My specifications | |
|--------------------------|--------------------------|
| CPU | Core i7 920 (2.67 Ghz) |
| GPU | GeForce 560 GTX (1.5 GB) |
| Ram memory | 16 GB |
| SSD | 110 GB |

I bought my system in 2009 and I updated my GPU two years ago. To be honest, everything works fine and I can create whatever I like. Whether or not you think this is an expensive system depends on how much you like 3D modeling. For about \$800 it is possible to create the same system I have. Most of my components are out of date, so you would even have better quality for that price.

If I can recommend a high-end system for environment modeling I suggest a powerful CPU with more than 3 Ghz for every core. The reason is simple. The 3D viewport in Blender only uses 1 CPU core, which means that if you have an i7 that is clocked on 2.5 Ghz for every core it can be slower than an 'old' CPU with fewer cores but a higher Ghz performance. Only the render process is faster. A slow viewport performance is horrible, so think about it. In my opinion, I have no problems with render time as this can be done in the night, but a slow viewport is horrible and can make you crazy when you have a big scene.

At the time of writing (October 2013) the best CPU in my opinion is the 'Intel® Core™ i7-4771 haswell'. It has 3.5 Ghz on every core and incredible rendering performance. If you buy a processor like this, don't combine it with a low-end GPU, as the computer can still perform slowly because it also uses the GPU. I made this mistake a couple of times when I had no idea how Blender worked. The next question you may have is: What kind of GPU works the best in combination with a high-end CPU? I can recommend a Nvide Gforce GTX card. I am not a fan of ATI simply because I bought two expensive cards a couple of years ago and they had no support for the cycles render engine. Maybe that has been fixed by now, but I recommend Nvidia cards.

Of course there is a lot of variation on the market, so here is some information about GPU support in Blender. When I was working on the open movie Tears of Steel I was thinking about buying a GTX card for one of my systems. I discussed this with one of the developers but strangely he said that buying an older type of GTX is a better choice than buying the newest with the best performance.

Of course I wondered why but the answer is simple. When there is a new GPU release it comes with software, but this software is usually a bit buggy and it needs to be improved for all kinds of software. Every month there is a new GPU software update and your GPU performance gets better and better. Therefore when you buy an older type, a lot of the bugs have already been fixed, so it can perform better than a more expensive card.

In my opinion, you don't need an expensive GPU card to make good-looking 3D scenes, but if you have the money, why not? Spending around \$200 on a GPU is fine and spending \$300 on a CPU is also realistic.

Perhaps you are wondering why you should spend more money on a CPU than a GPU if cycles can render on GPU with CUDA and it is much faster than rendering on a CPU. This is because creating an environment scene takes so much memory that you don't have enough memory on a GPU. Nowadays a high-end GPU has around 2 GB of RAM. My scenes take around 6 GB of RAM. If I try to render the scene on a GPU, it crashes.

However, recently there has been an interesting development. The new GPU card which costs around \$1,000 has 6 GB RAM, which makes it possible to render environment scenes with a GPU. In about two more years I expect the new GPU will replace the CPU on my system. The price is not worth it yet, but the development is interesting. If you create characters or cars, I recommend spending more money on the GPU, simply because you don't need a lot of RAM memory. As this book is about environments, right now the CPU is the best choice.

Try to work on a SSD. This is much faster than the old SATA storage. It is a bit expensive, but your computer will handle all the files very quickly.

I would also like to discuss the operating system. I am a real Windows lover, but when I worked on the open movie I tried Ubuntu, and I loved it. First of all, it is free and open-source software, just like Blender. Moreover, its support is better than Windows' support. For now I still work on Windows, but in the future I will change to Ubuntu.

Motivation

The 3D art world is growing every day. In my opinion, this is because we are at a point that we are now able to create good-looking, realistic scenes. You don't need to be a professional 3D blender user to make this happen. Technological advances, such as the cycle engine, have revolutionized 3D art, while the internal is not a bad renderer, it does have its limitations.

I think we are at a point where 3D art will be available for a huge group of people. The reason is simple. When I started with 3D modeling I could choose between commercial and open source. Because I was a student and did not have a lot of money I chose to use Blender. The big problem at the time was the complexity of the program. Over the years, Blender has changed a lot, and it is able to do everything that commercial software can. It is still a bit complex, but you are going to love that when you learn the program. It is not that Blender has limitations; it is that the user is often not yet ready to use all of its functions

Let's assume that you are new to Blender and the first day you start working with it you freak out. You hate the interface and you get lost among all the buttons. This is normal. Almost everyone has the same experience, including myself. At this point you have to ask yourself the next question: 'What is my motivation?' I think there are a number of target groups that use Blender and they all have their different motivations.

- | | |
|---|--|
| - | 1. Using it for fun and having a great time |
| - | 2. Using it to create serious objects, but also for fun |
| - | 3. Using it as a professional tool to become a professional artist |

If you belong to the first group, I understand your troubles. You just want to make some random objects and the program is not easy to learn. I recommend watching tutorials on the Internet. There are also very good websites with fantastic explanations.

If you belong to the second group, I recommend that you watch tutorials but maybe also think about taking a paid quality course to improve your skills.

If you belong to group number three, don't watch too many tutorials, but instead explore the tools by yourself and *be original*, this means you have to face the horror. The biggest problem with watching tutorials is that you copy someone else's working style. This also happened with me in the beginning and it is the worst thing that can happen when you want to be unique. If you watch tutorials on YouTube you will usually learn presets and standard values. You won't find these standard values in this book, or at least very few, because in my opinion you have to find out what works for you. Don't learn a trick but learn the tool.

A great sample was my first car tutorial, at the time there were plenty of professional tutorials how to create cars. I was a total noob in cars and I still am, but it became one of my most popular videos because people loved it that I just started and experimenting with it



[Watch](#) the car tutorial, I created this car without car modeling experience, people love that

I may be in the minority with this opinion, but after studying so many paintings I know that the best artists were the most original. They tried to experiment with art, as a result, most people were critical of their work. Sometimes their work was so different that it was ignored. Later the critics would understand that being unique was not a bad quality. You are welcome to disagree with this idea, but Rembrandt, one of the greatest artists of all time, was also famously hated to copy work (which is taking to following tutorials nowadays).

The main questions of course are: Who do you want to be as an artist and what is your main goal for the upcoming years? These questions are important but not everyone takes the time to ask themselves. If you want to be a 3D artist, you need to invest in this goal. It takes time and it is not always fun. However, and this is the cool thing about 3D, everyone can make great-looking art.

For example, even though my drawings are horrible, I am able to create environment scenes that entertain many people. Of course I spent a lot of time working on them, but I like the results of my effort. More importantly, I can create whatever I like, and that idea is fantastic.

The Blender community has a wide variety of users. Some are using the program for fun, and some as a professional tool to create scenes. Deciding which group you belong to will help you decide what your next step should be.

To conclude this chapter, I'd like to say one final word about 3D art. I think that over the next 10 years 3D art will reach a huge number of people, because it is free, easy to learn, and fast computers are becoming increasingly available. These three key factors are the same as those of traditional art. The tools like pen and paper or canvas are almost free and nowadays there are enough books and trainings to improve the work. Therefore we can expect a tremendous increase in the number of upcoming artists in 3D art in the next 5 to 10 years. I recommend that you try to learn a unique style that makes differentiates you from all the other artists. Follow your passion and put all your enthusiasm into your work. It will probably take more than a couple of years to become a pro, but you can easily learn to create promising scenes in the first year.

There is so much more to say about 3D modeling, but I hope this book will help you in your quest to become a better artist.

Index:

A

[Alpha channel](#)

[Amsterdam](#)

[Array](#)

B

[Bevel](#)

[Bezier curve](#)

[Boolean modifier](#)

[Bump Map](#)

C

[CG \(Computer generated\)](#)

[Composition](#)

[Coordinates](#)

[Cornelis Springer](#)

[Cycles render engine](#)

D

[Depth of field](#)

[Dutch Renaissance style](#)

E

[Edit Mode](#)

[Edge Line](#)

[Edge Loop](#)

[Empty](#)

[Enkhuizen](#)

[Extruding](#)

F

[Face](#)

[Flora 3D](#)

G

[Gimp](#)
[Golden Age \(Holland\)](#)

H

[High Dynamic Range Image \(HDR\)](#)
[Hoorn \(city\)](#)

I

[Internal renderer](#)
[Isaac Ouwater](#)

J

[Jan van der Heyden](#)
[Johannes Vermeer](#)

K

[Keyframe](#)

M

[Mesh](#)
[Modifier](#)
[Multiply](#)

N

[Nodes](#)
[Normal Map](#)

O

[OBJ file](#)
[Object Mode](#)
[Open source](#)

P

[Project from view](#)

R

[Rendering](#)
[Raytracing](#)

S

[Sapling curve](#)
[Shaders](#)
[Smart UV Projection](#)
[Solidify modifier](#)
[strands](#)
[Subdivision Surface](#)

T

[Texture](#)
[Translucency](#)

U

[UV Map](#)

V

[Vertices](#)

Image Credits:

| | |
|------------|--------------------|
| Image 1: | Rob Tuytel |
| Image 1.1 | Cornelis Springer |
| Image 1.2 | Cornelis Springer |
| Image 1.3 | Cornelis Springer |
| Image 1.4 | Jan van der Heyden |
| Image 1.5 | Jan van der Heyden |
| Image 1.6 | Isaac Ouwater |
| Image 1.7 | Isaac Ouwater |
| Image 1.8 | Cornelis Springer |
| Image 1.9 | Cornelis Springer |
| Image 1.10 | Cornelis Springer |
| Image 1.11 | Cornelis Springer |
| Image 2: | Cornelis Springer |
| Image 2.1 | Cornelis Springer |
| Image 3: | Rob Tuytel |
| Image 3.1 | Rob Tuytel |
| Image 3.2 | Cornelis Springer |
| Image 4 | Rob Tuytel |
| Image 4.1 | Rob Tuytel |
| Image 4.2 | Rob Tuytel |
| Image 4.3 | Rob Tuytel |
| Image 4.4 | Rob Tuytel |
| Image 4.5 | Rob Tuytel |
| Image 4.6 | Cornelis Springer |
| Image 4.7 | Rob Tuytel |
| Image 4.8 | Rob Tuytel |
| Image 4.9 | Rob Tuytel |
| Image 5 | Rob Tuytel |
| Image 5.1 | Rob Tuytel |
| Image 5.2 | Rob Tuytel |
| Image 5.3 | Rob Tuytel |
| Image 5.4 | Rob Tuytel |

| | |
|-----------|-------------------------|
| Image 6: | Willem Gerrit van Ulsen |
| Image 6.1 | Willem Gerrit van Ulsen |
| Image 6.2 | Rob Tuytel |
| Image 6.3 | Rob Tuytel |
| Image 6.4 | Rob Tuytel |
| Image 6.5 | Blender Foundation |
| Image 6.6 | Rob Tuytel |
| Image 6.7 | Rob Tuytel |

Interesting page Links:

www.blender.org (Homepage of Blender 3D)
www.flora3d.net (Download the external vegetation program)
www.cgtextures.com (Textures)

Latest blender version: [Download here](#)

Special credits:

- I like to thank all the Blender developers for the amount of work they spent to develop blender and keeping the software up to date.
- Special thanx to the Westfries Museum of Golden Age art for supporting my work and projects

Copyright © 2013 by Blenderpedia

All rights reserved. This book or any portion thereof
may not be reproduced or used in any manner whatsoever
without the express written permission of the publisher
except for the use of brief quotations in a book review.