Modeling / Texturing / Lighting & Rendering in 3ds Max & V Ray + Postproduction in Photoshop

Stellwerk Building / Herzog & deMeuron Design Review Tutorial

Software: 3ds Max + V Ray + Photoshop
Difficulty: Begginer / Intermediate
Completion time: 3hrs

Milan Šimšić, May 30th 2011

Content

Introduction / Why all this?

In this article, I tried to walks us through the most important chapters of the most popular software tools in the field of architectural design. It covering all of the modeling, a bit of material creation, lighting, camera parameters, rendering settings and the post-production techniques used.

All this could have been done in dozens of ways. Therefore, I would suggest not to look for mistakes, but to try to get through the example and learn a new steps. So, we will try to use as many tools and find the simplest and the most logical principles of modeling. The point is to learn something that will make much benefit to the profession!

Good luck! Enjoy working!

Modeling

The geometry is very simple – walls on all four sides. No curves. No intersection. Part that we will be doing is just the front one (because it is repeated along the other side). We will use a simple box as a secondary form, which will be (at the end of this story) completely covered with a facade that actually right now we design.

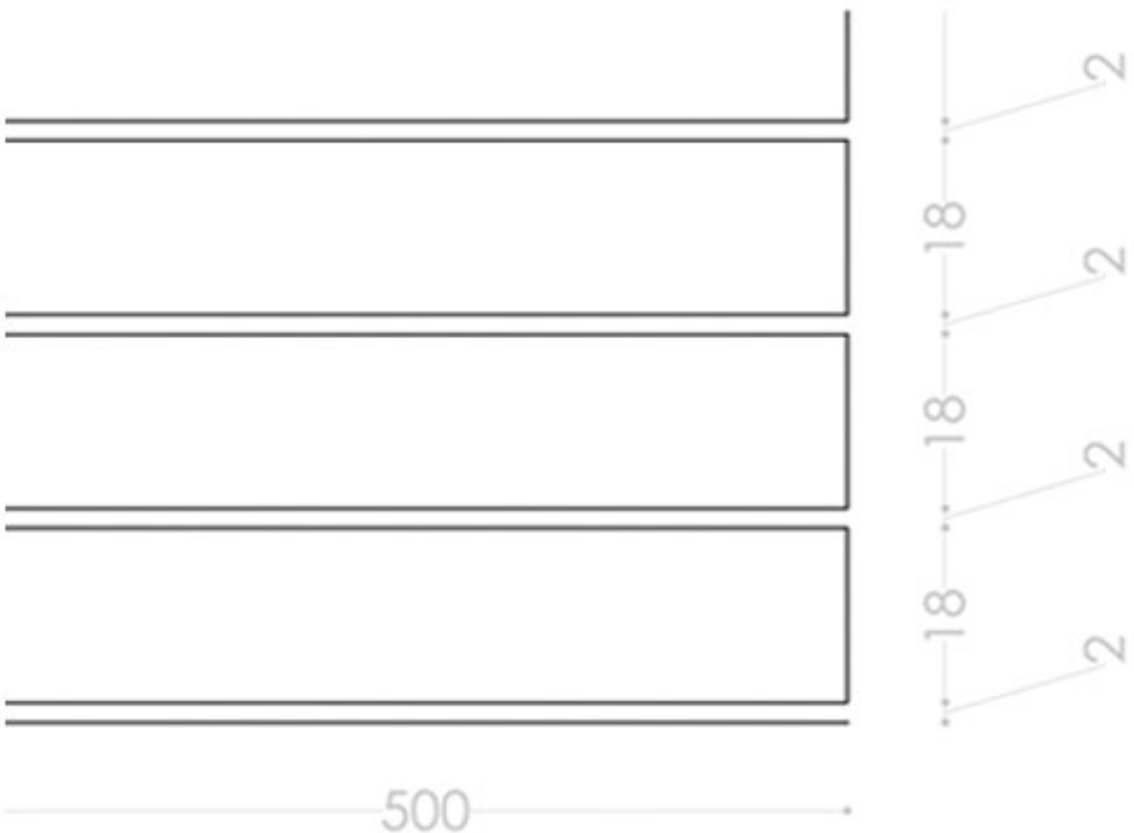

Parameters
Length: 1000,0cm
Width: 2000,0cm
Height: 1500,0cm
Length Segs: 1
Width Segs: 1
Height Segs: 1
Generate Mapping Coords.
Real-World Map Size
z
y
x

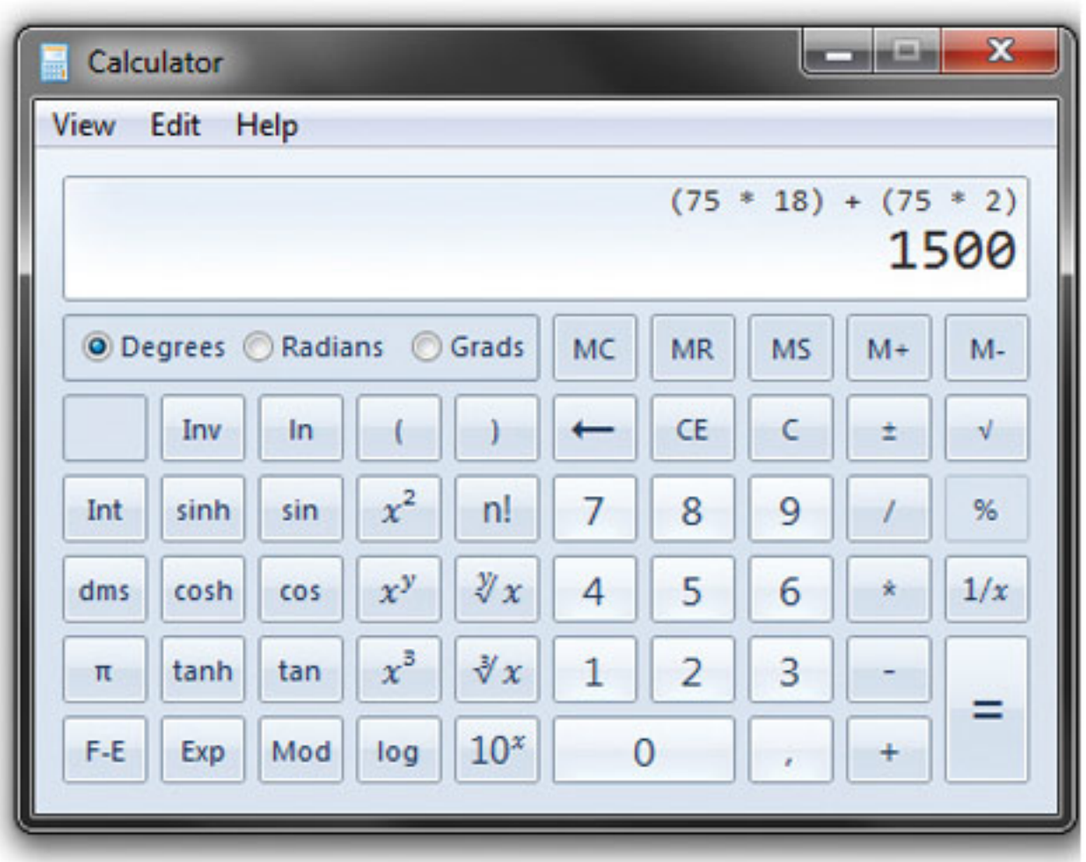
Calculate the number of horizontal elements.

What we got here?

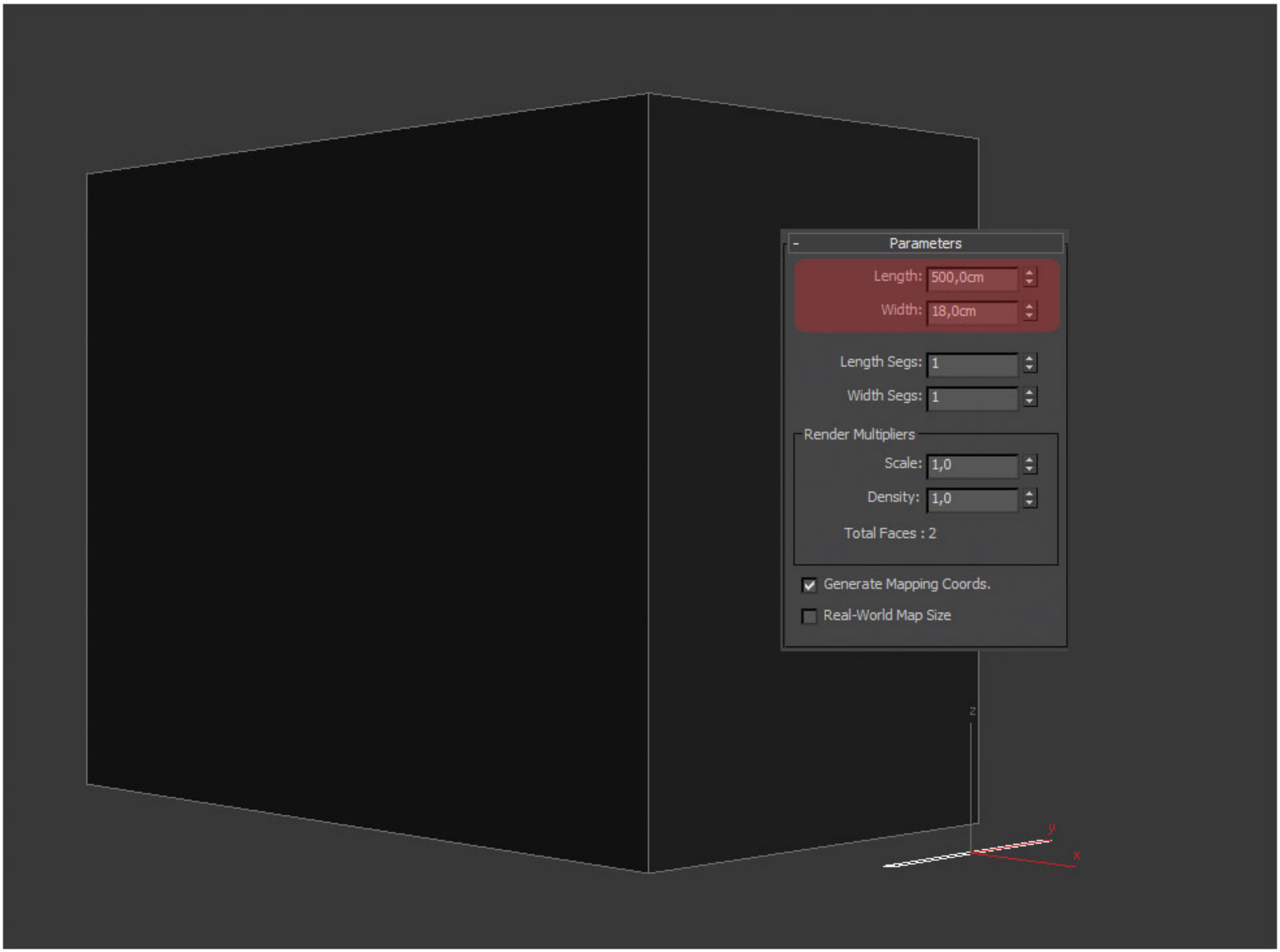
No need to agonize calculating, but since we're here, it is something like this... 75 horizontal elements of 18cm height plus 75 spaces between the elements of 2cm. That's it. We got 1500cm.

(500cm is half the width of the facade front. Why 500cm? Will be explained later.)

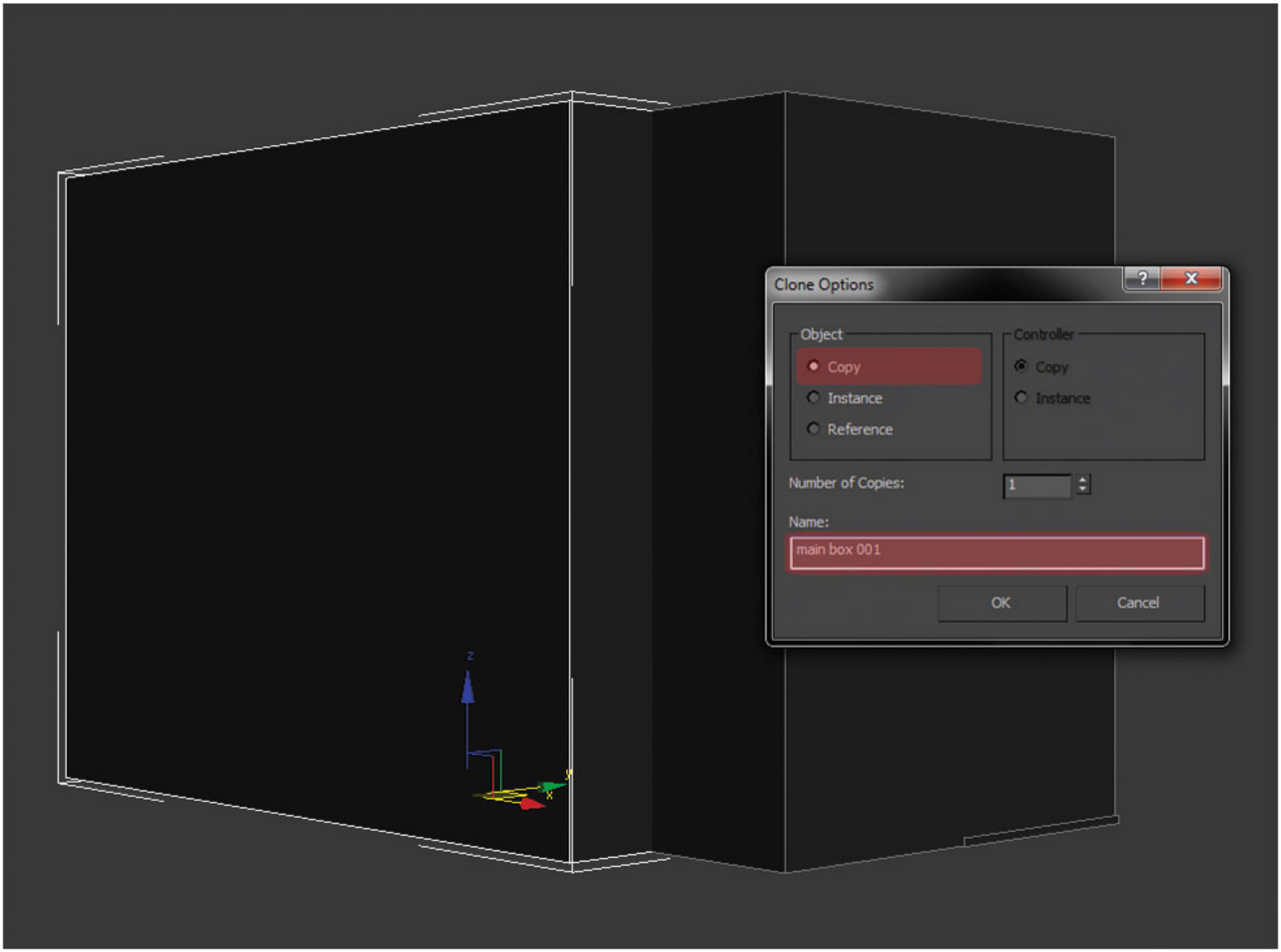


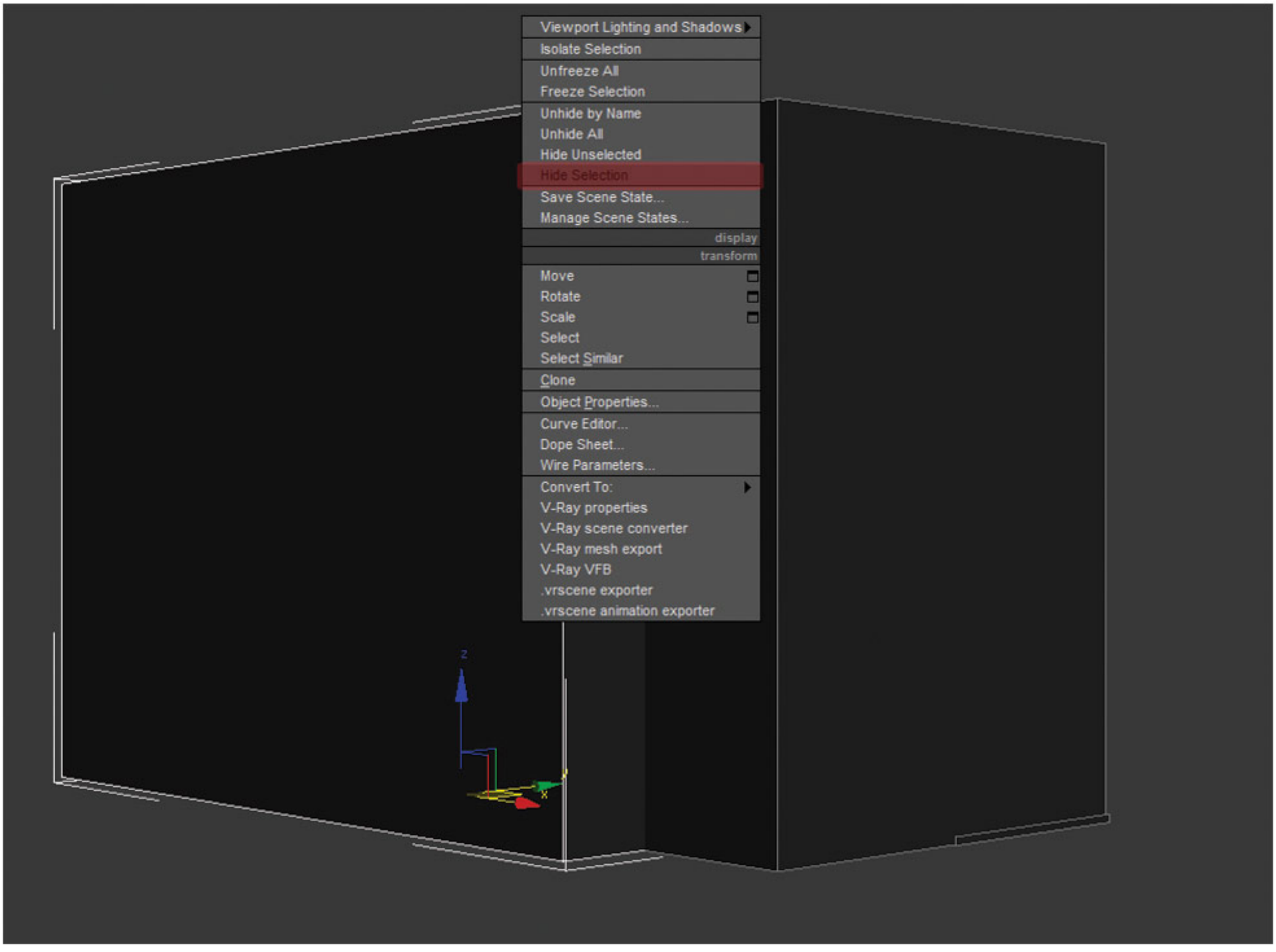


Make this element (*Plane*) to half the length of the facade.

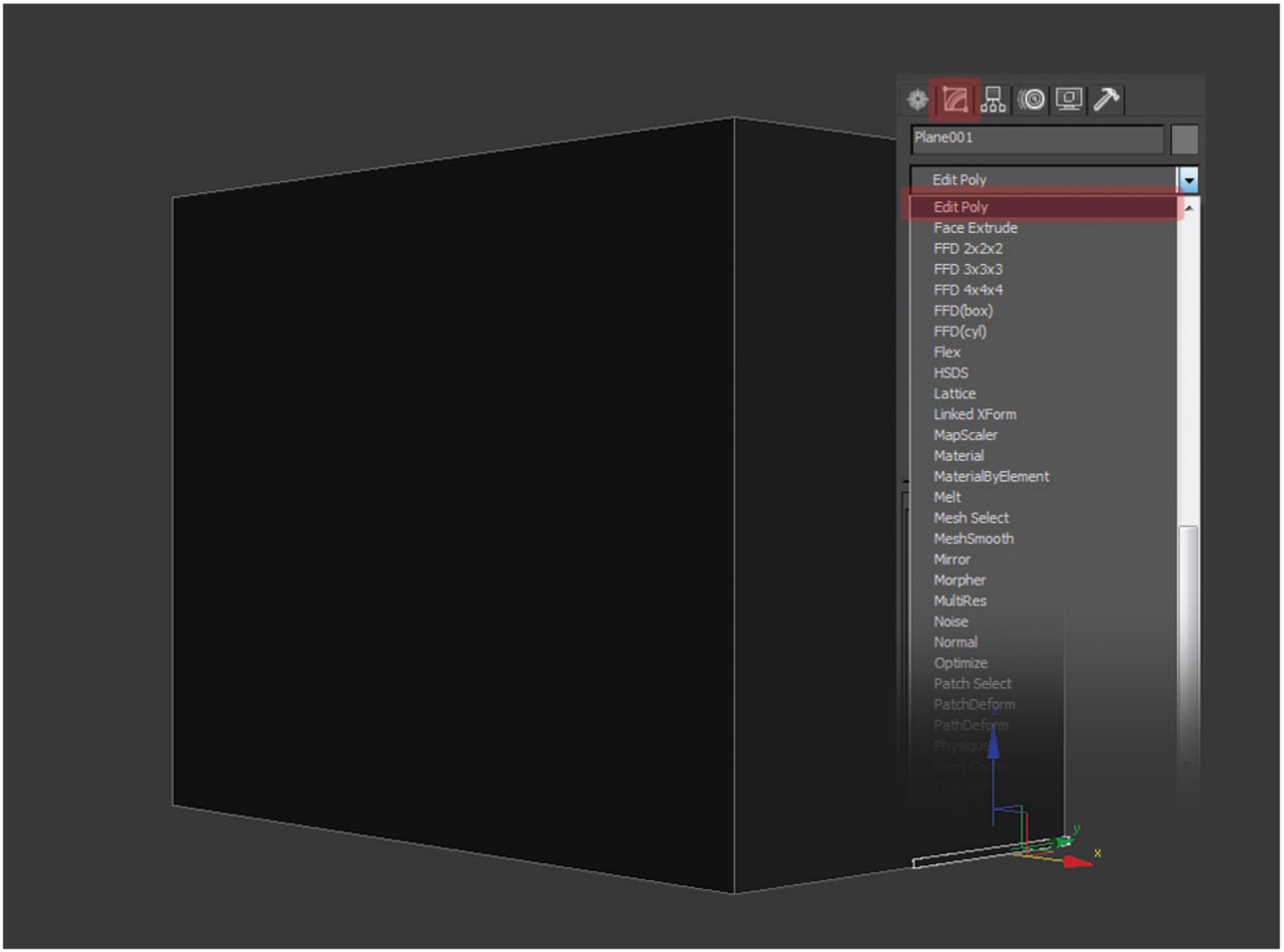


Note:
Always copy the basic elements of the scene as backup (assign them a name (eg the *´main box 001´*, the *´horizontal element 001´*, etc.). Hide them later.

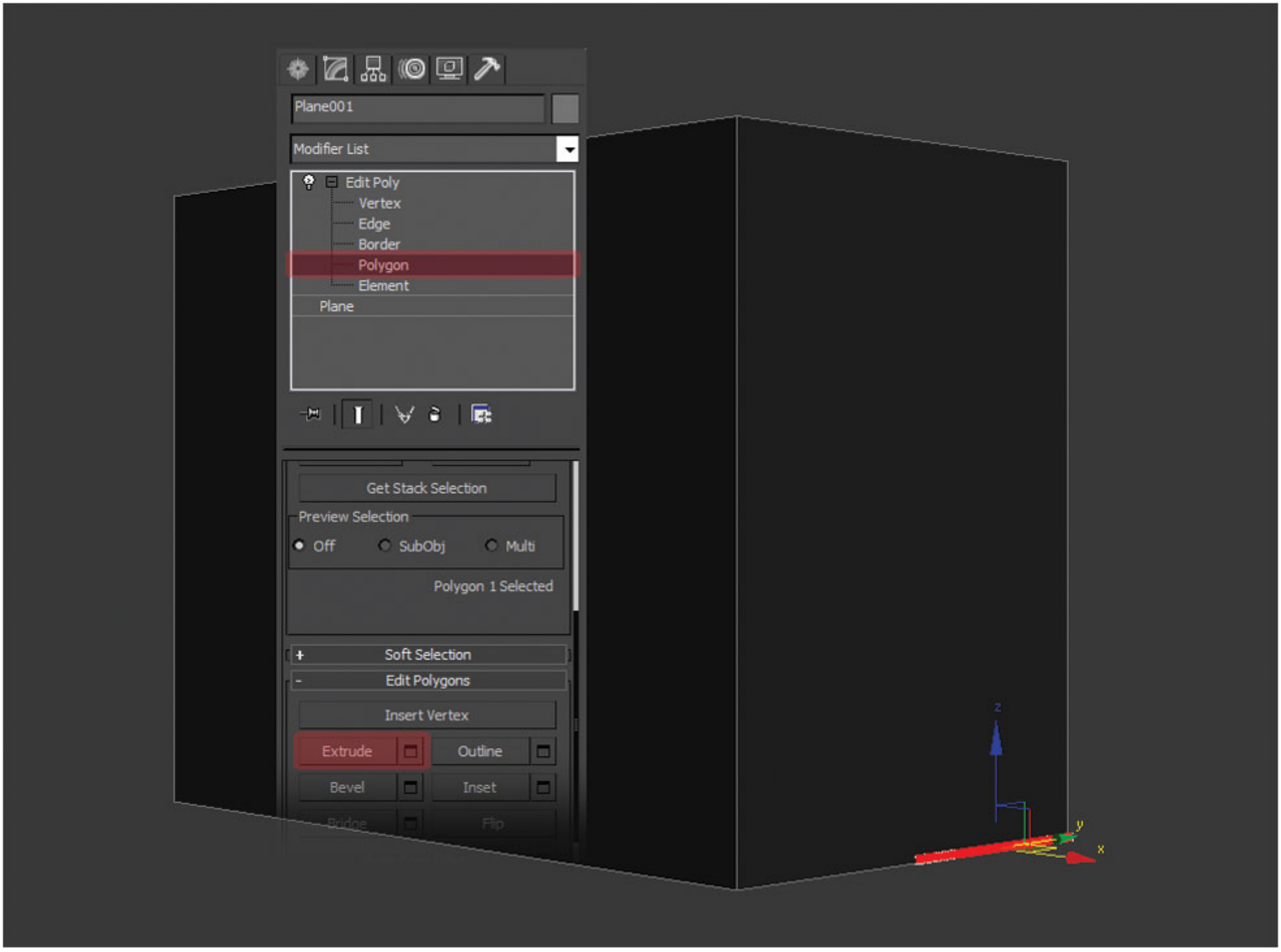


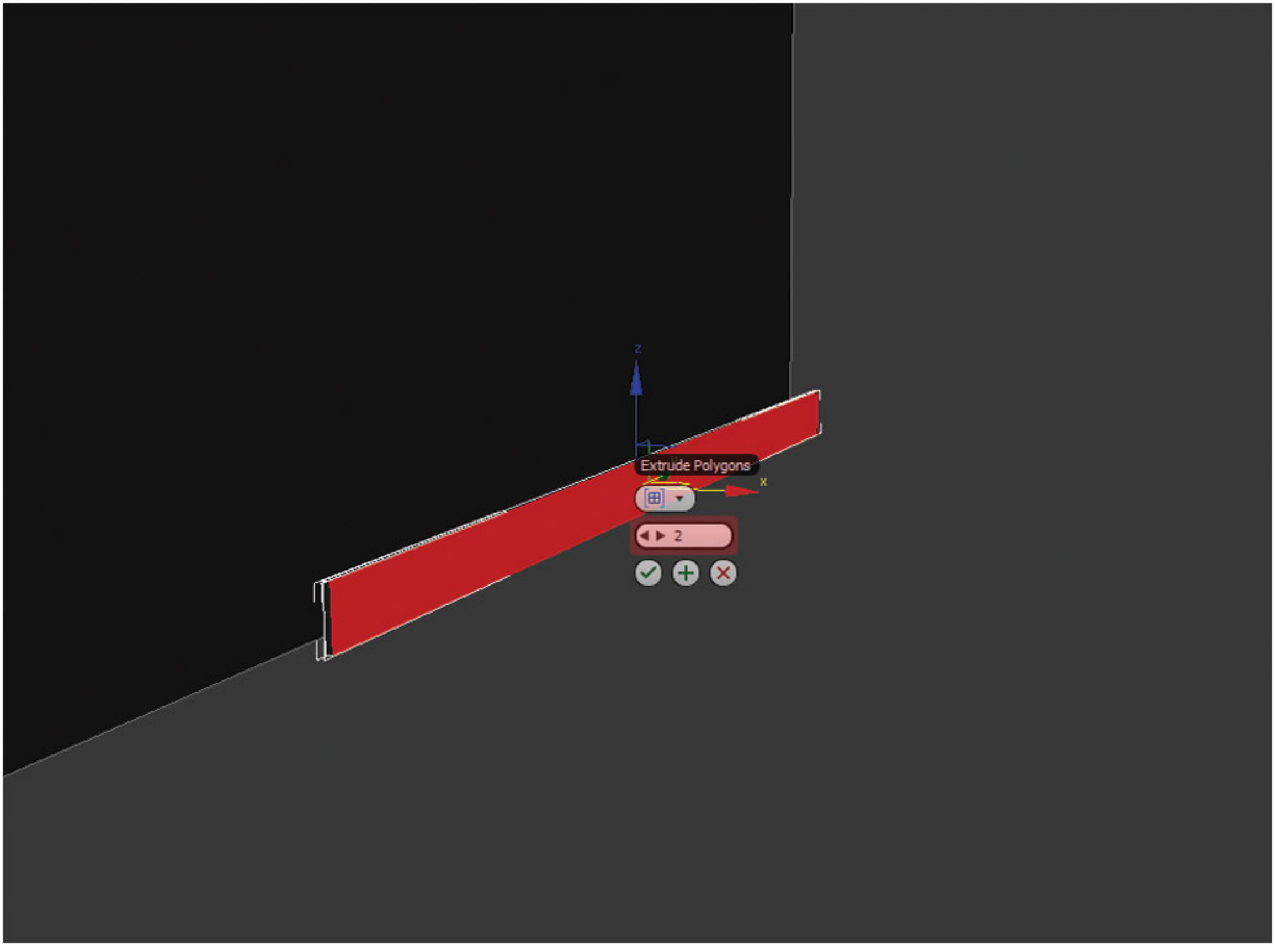

Viewport Lighting and Shadows
Isolate Selection
Unfreeze All
Freeze Selection
Unhide by Name
Unhide All
Hide Unselected
Hide Selection
Save Scene State...
Manage Scene States...
display
transform
Move
Rotate
Scale
Select
Select Similar
Clone
Object Properties...
Curve Editor...
Dope Sheet...
Wire Parameters...
Convert To:
V-Ray properties
V-Ray scene converter
V-Ray mesh export
V-Ray VFB
.vrscene exporter
.vrscene animation exporter
Z
Y
X

Rotate it 90 degrees and stick them to the main box at an arbitrary distance (eg 10cm). Add *Edit Poly Modifier.*

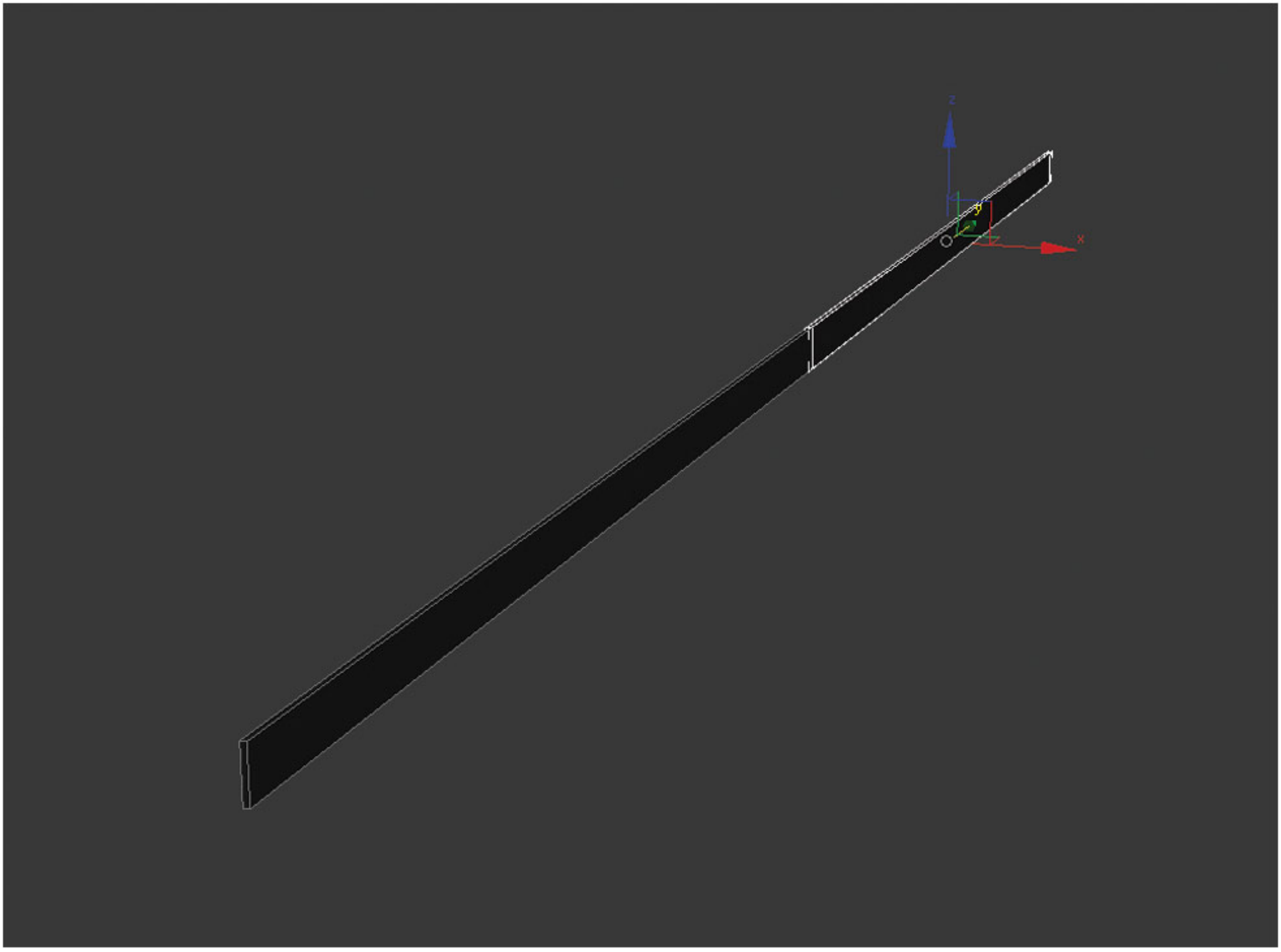


Copying (to the top) goes in three stages:
The first step of three - modeling of the lower elements. (Earlier, we done the basic geometry of horizontal element.)
Then, we use a basic modifiers in the *Modifiers Palette + Sub Modifiers Options (of Vertex, Polygon..)*
Select *´horizontal element 001´* then *Polygon/Extrude2cm/OK*.

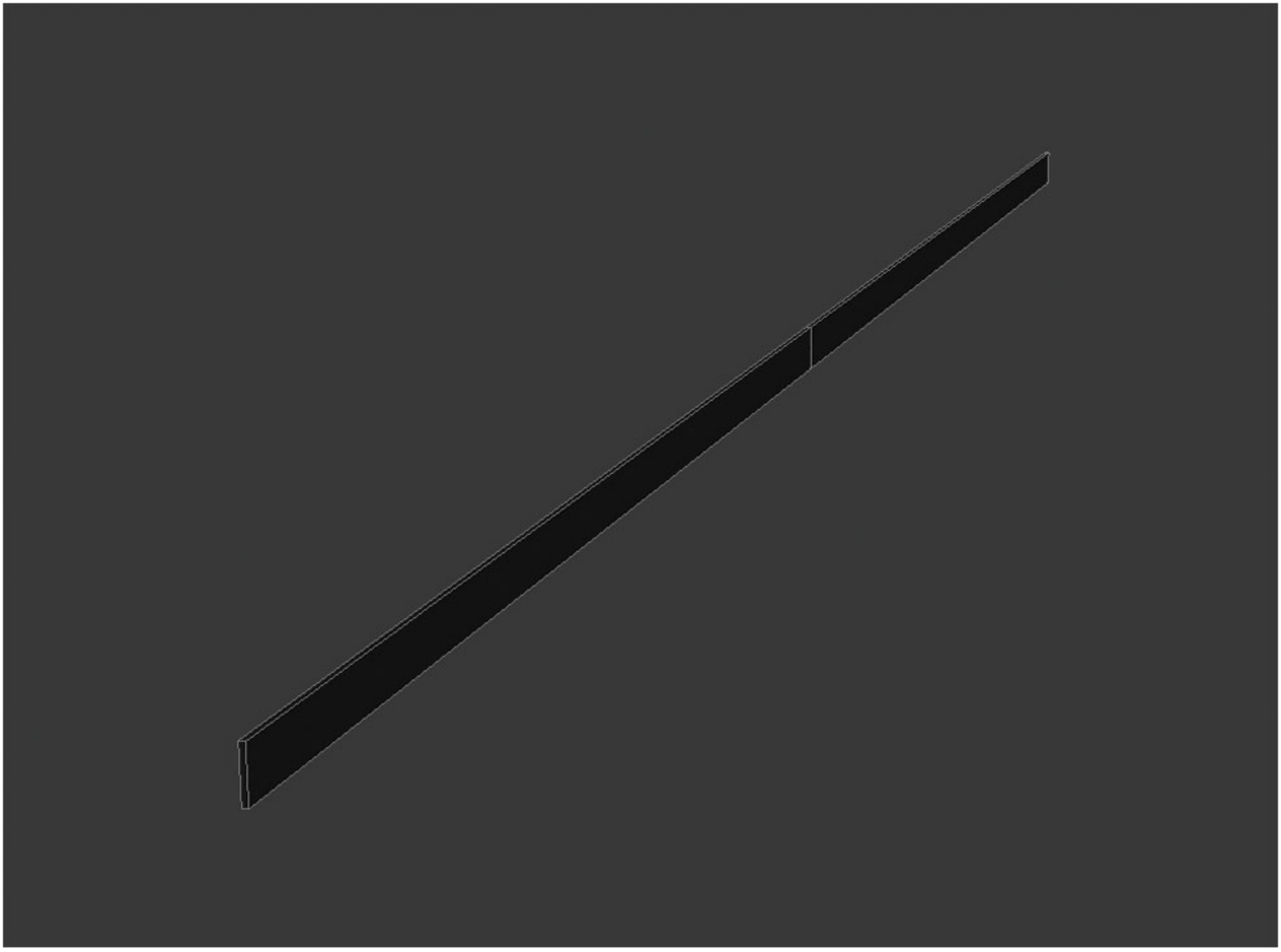



z
x
Extrude Polygons
2

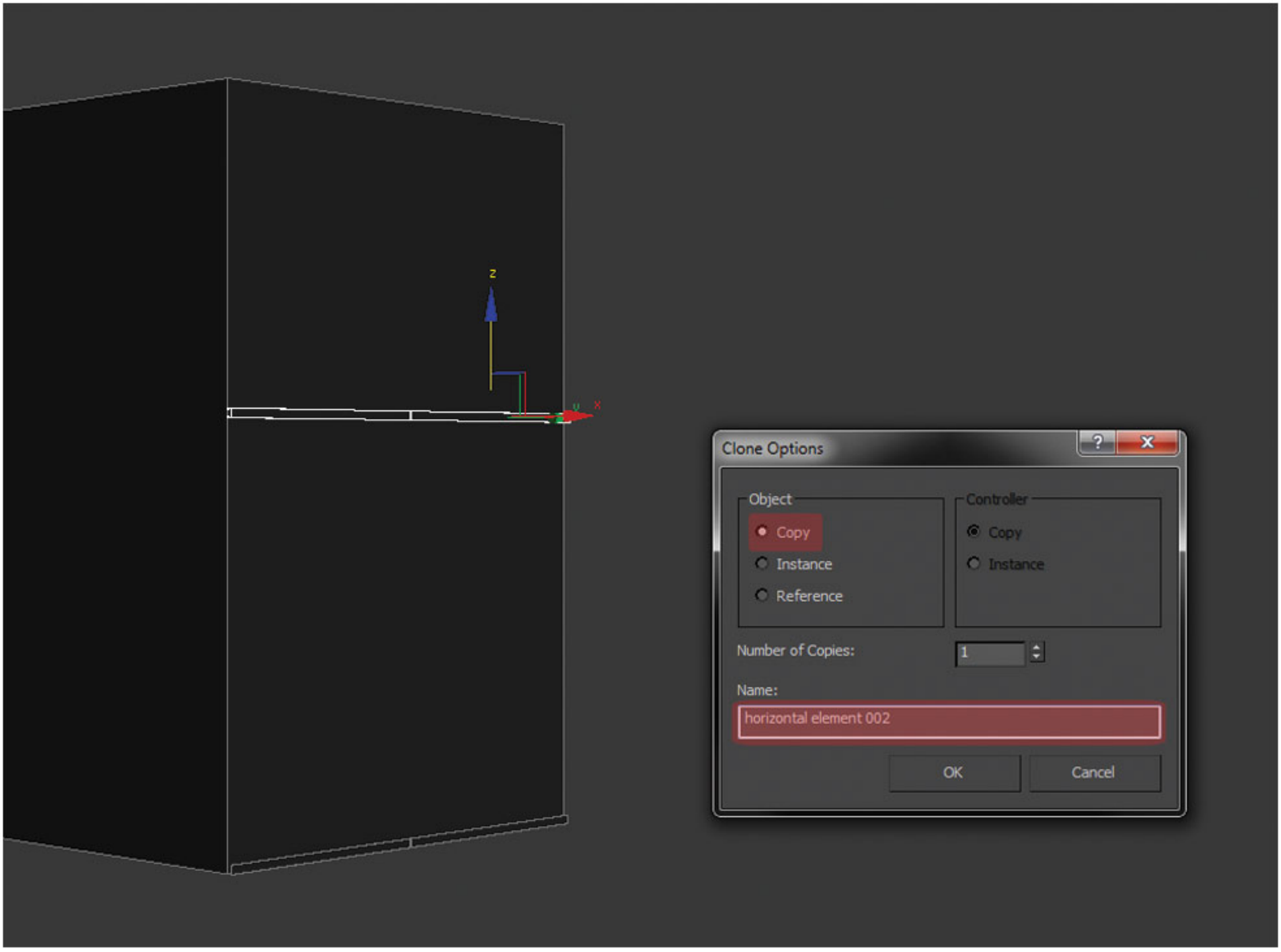
Copy 'horizontal element 001'. New element *'horizontal element 002'* set it to the beginning of the first.



Atach them (select the first horizontal element, then *Atach* button and then select a next horizontal element).

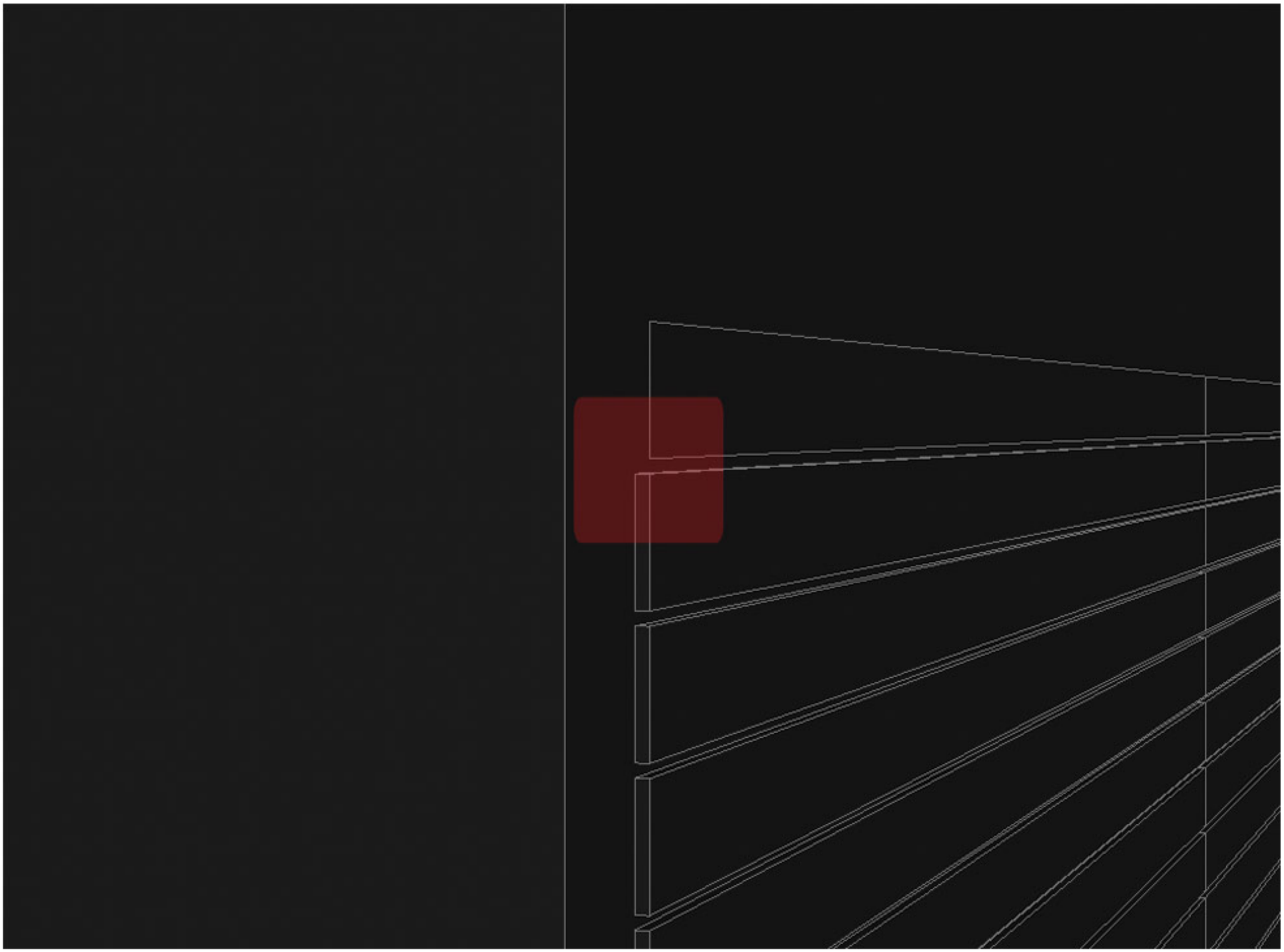


Copy and *Move* it (*'horizontal element 002'*) somewhere to the top.
Turn off *Edit Poly* layer (Because we need a horizontal element without thickness. „Why, again?", later it will be clear.)

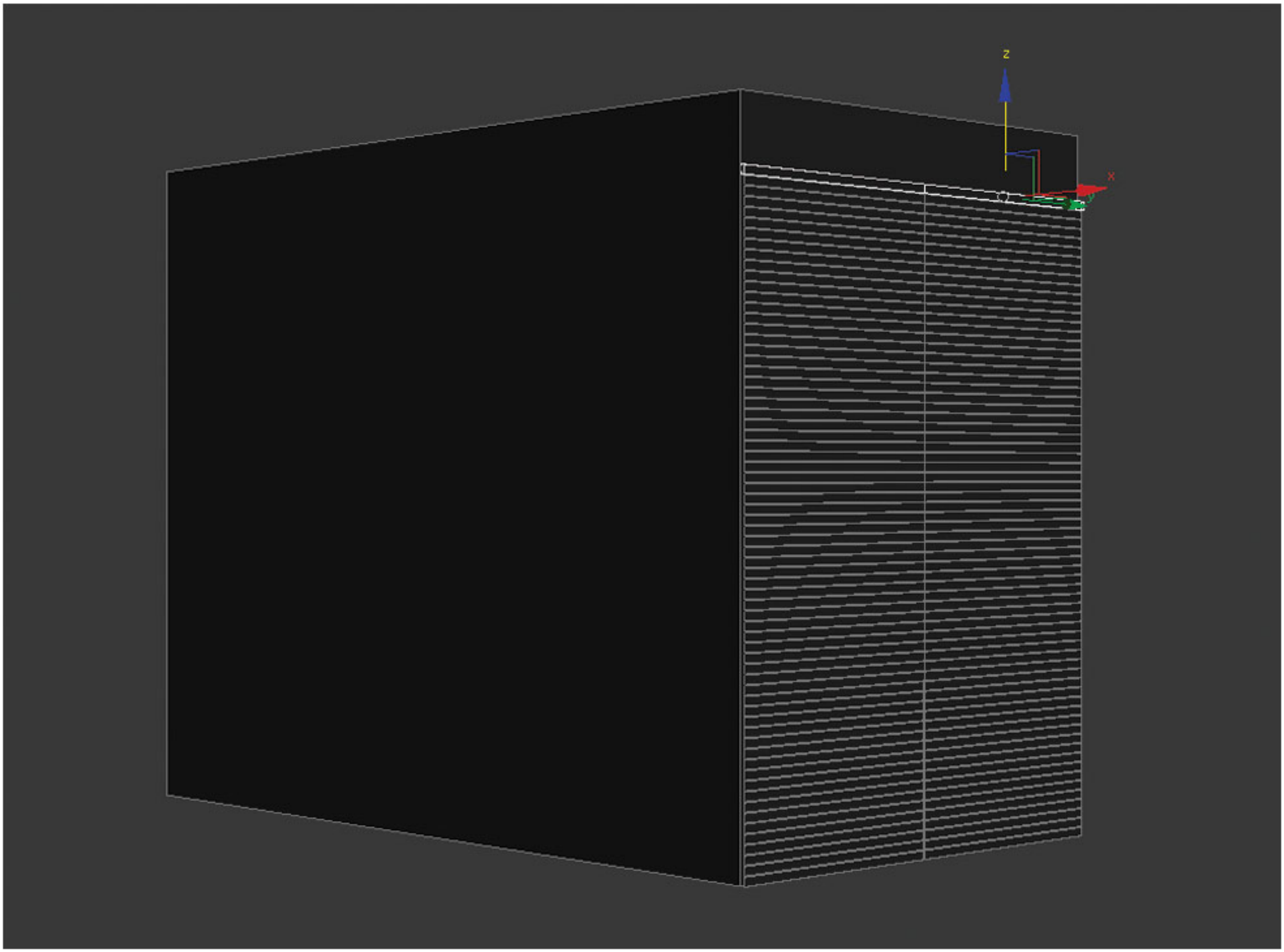


Array tool! With the selected element we will create a series of 18 new.

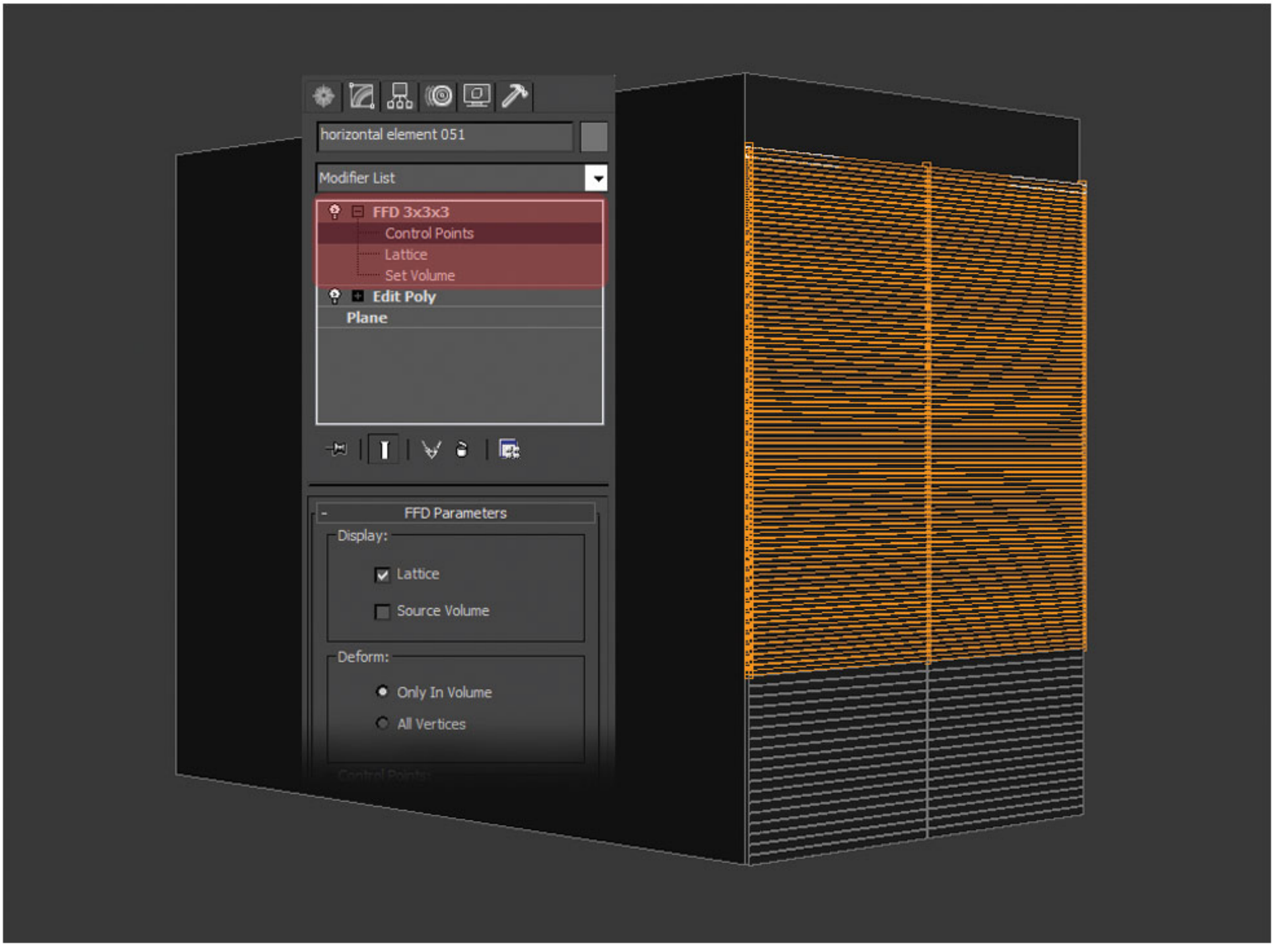
The second step of three - modeling of the midle elements (curved horizontal elements).
We will do again previous *Array* operation, but with 50 pieces.
How?
At first, bring to the position of the copy element (*'horizontal element 002'*) 2 cm above the rear below horizontal.



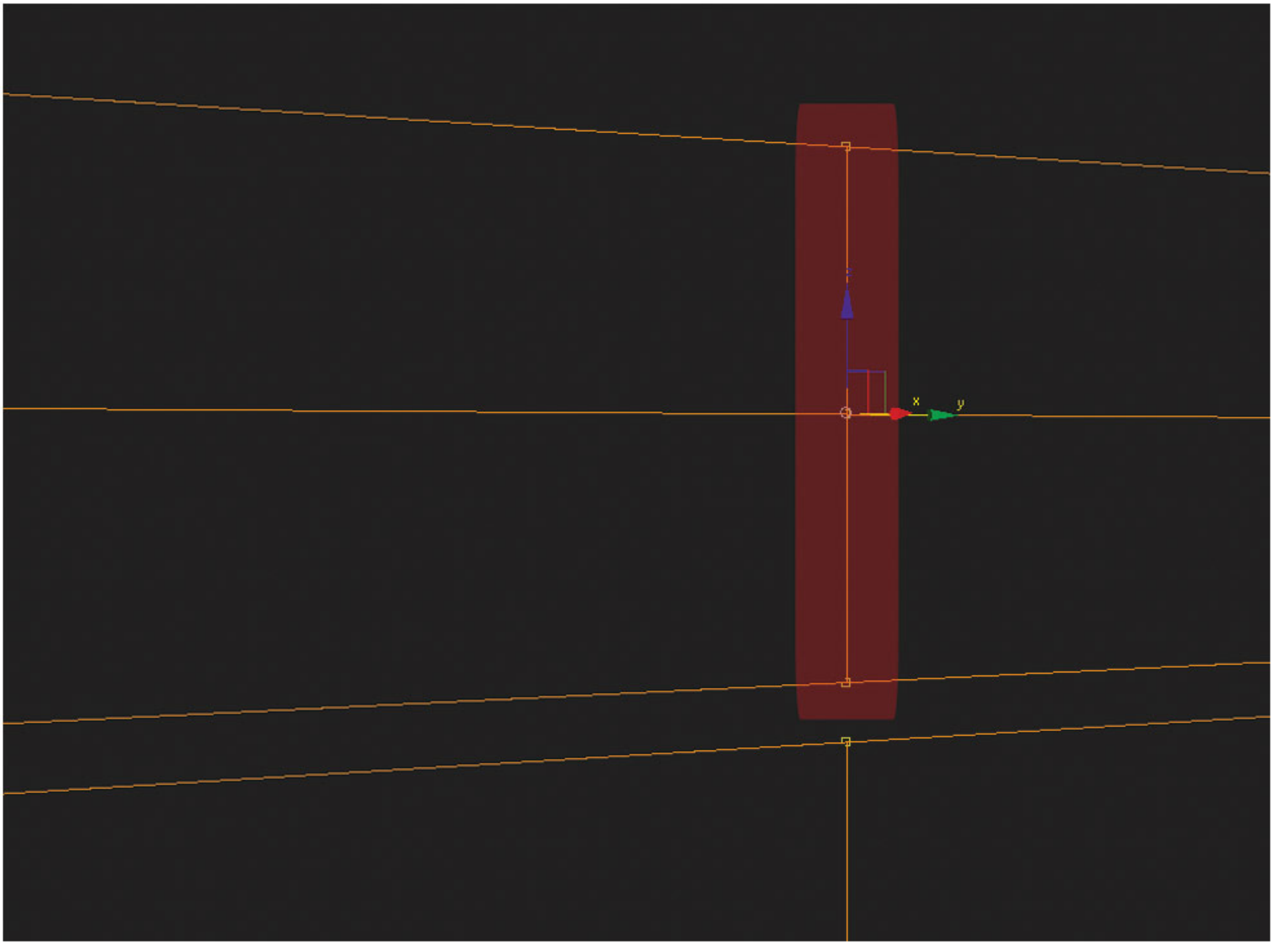
Repeat operation (instead of 18 make 50 new).

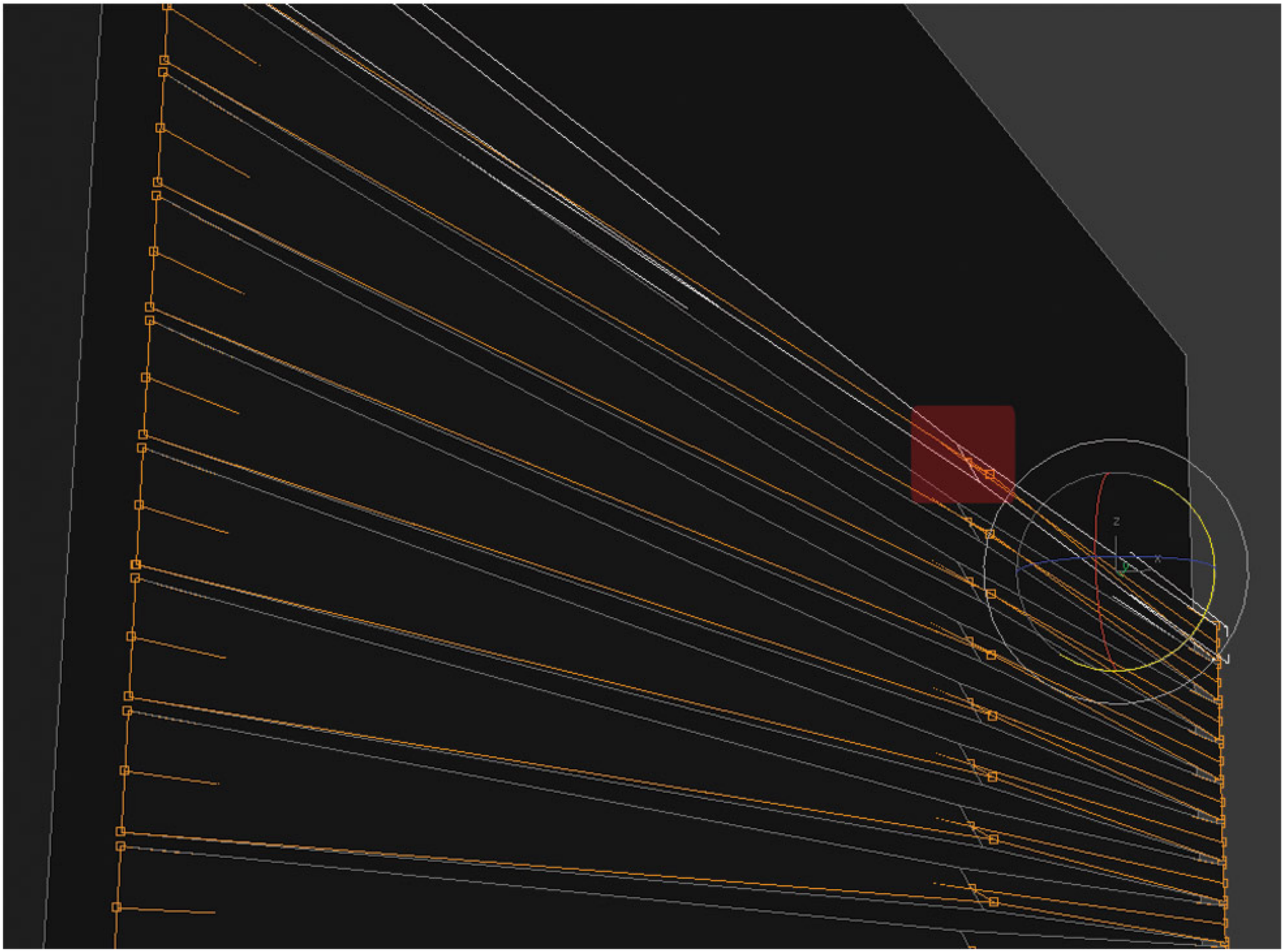


Select last one on top and use *Modifier FFD 3x3x3* then select *Control Point* of that one, middle points.



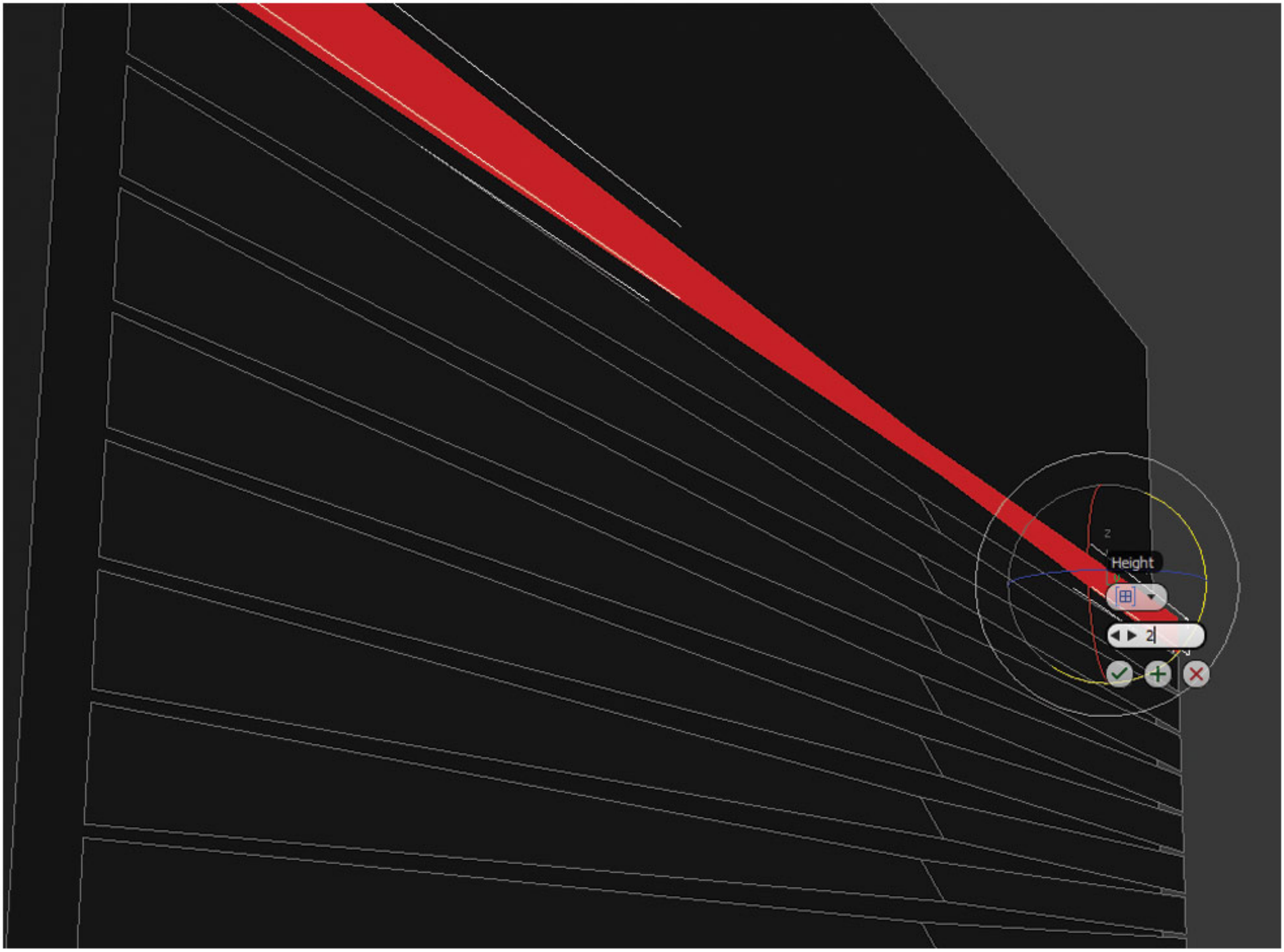
Control Point selection of the highest element.



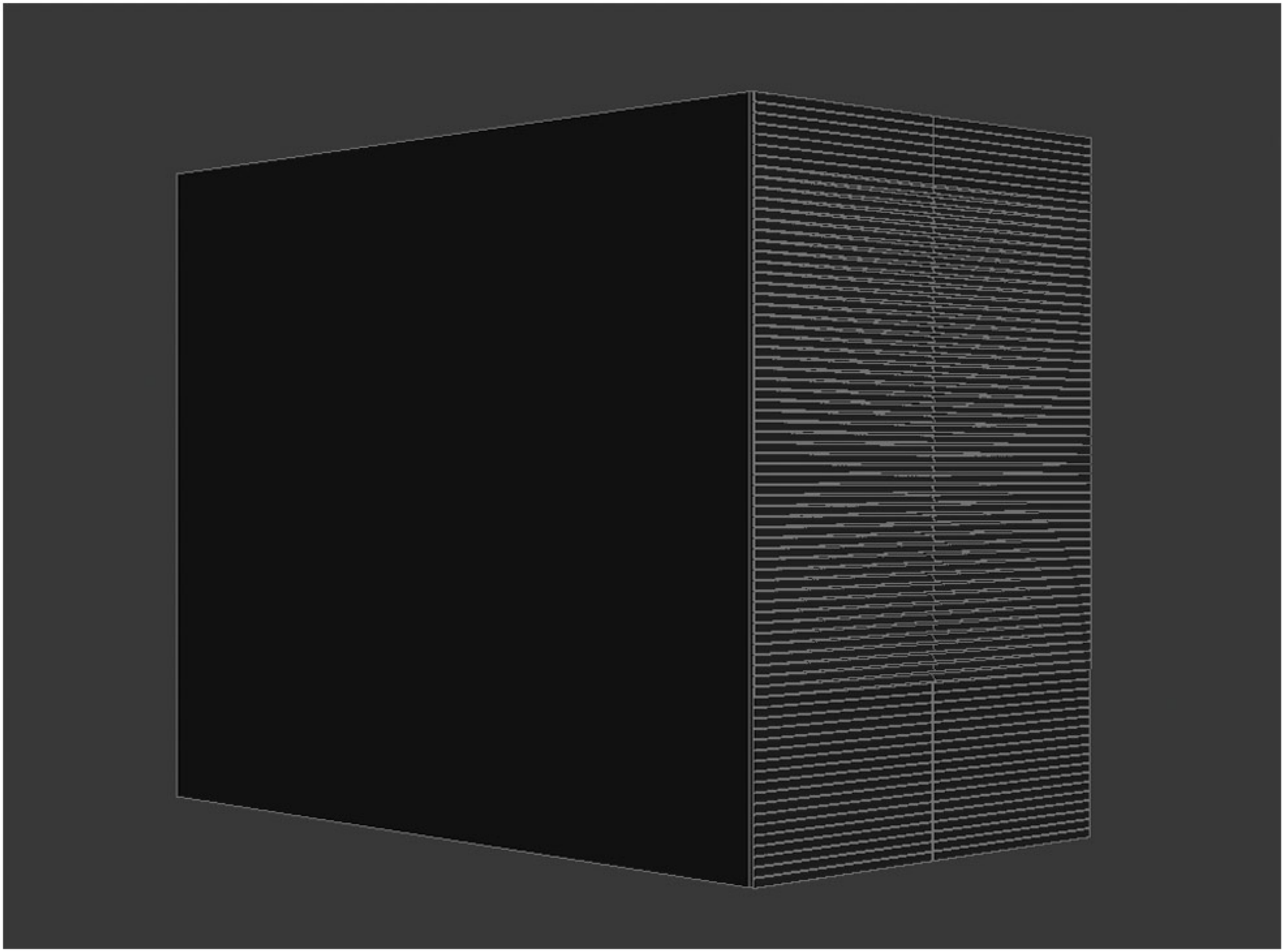


Now, add *Edit Poly Modificator* and select P*olygon/Extrude2cm/OK*.

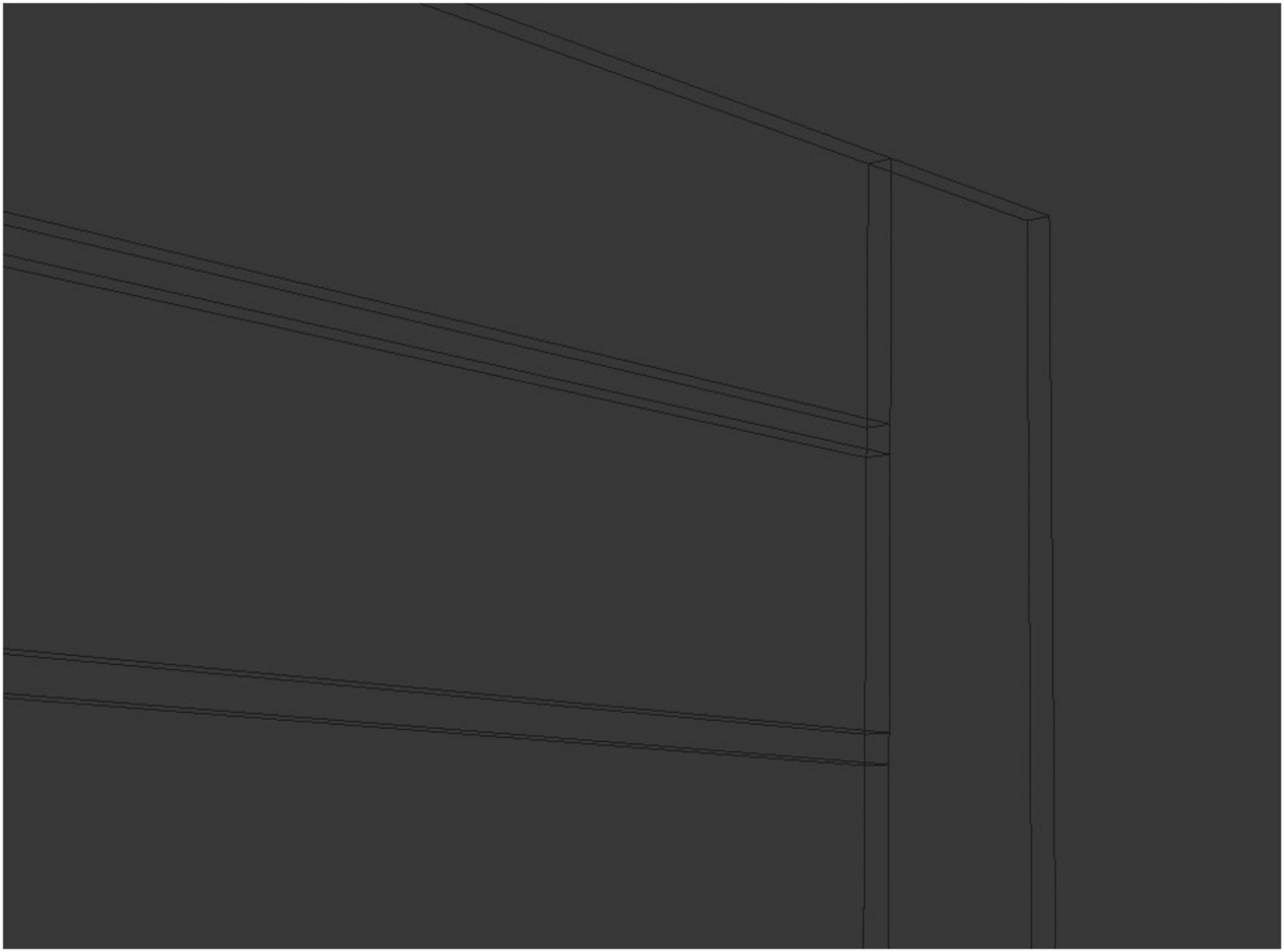
Note: It is now clear why we have a horizontal element made of two parts. We have worked for *FFD* and *Rotation*, that those tolls be able to operating.



The third part...
Copy a couple of the lowest *horizontal elements* and take them to the top, to complete the facade line.



Finally, add two vertical elements at the edges of the facade as a frame.



Note:

Copy – creates a stand-alone copy of an object; changes to the copy and its modifiers do not affect the original object.

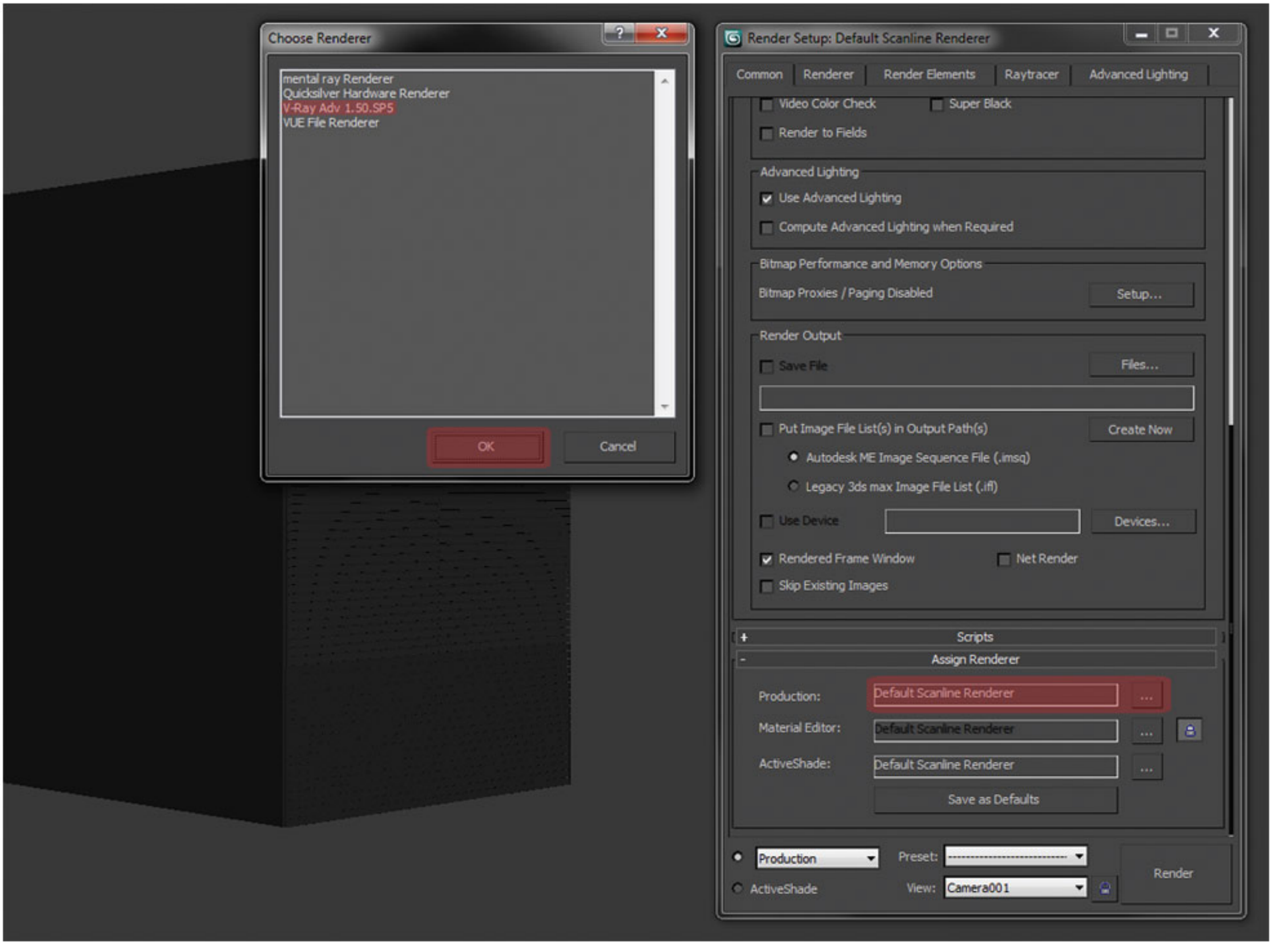
Instance – creates a mirror of the original object; changes to the instance and its modifiers affect the original object and all other instances, and vice versa.

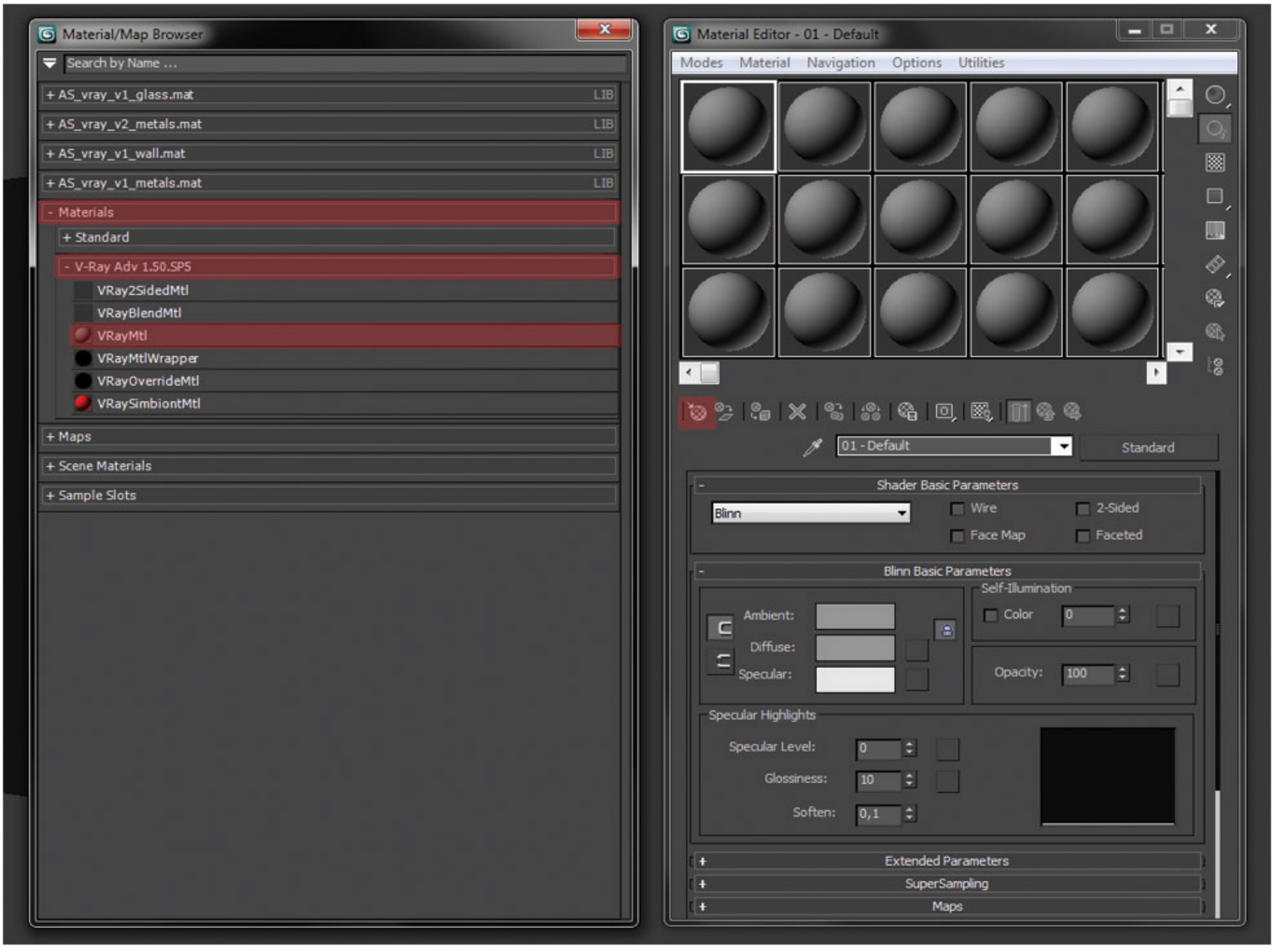
Reference – creates an object based on the original; changes to the original will affect all its references, but changes to a reference will not affect the original or any other references.

Texturing / Material Editing

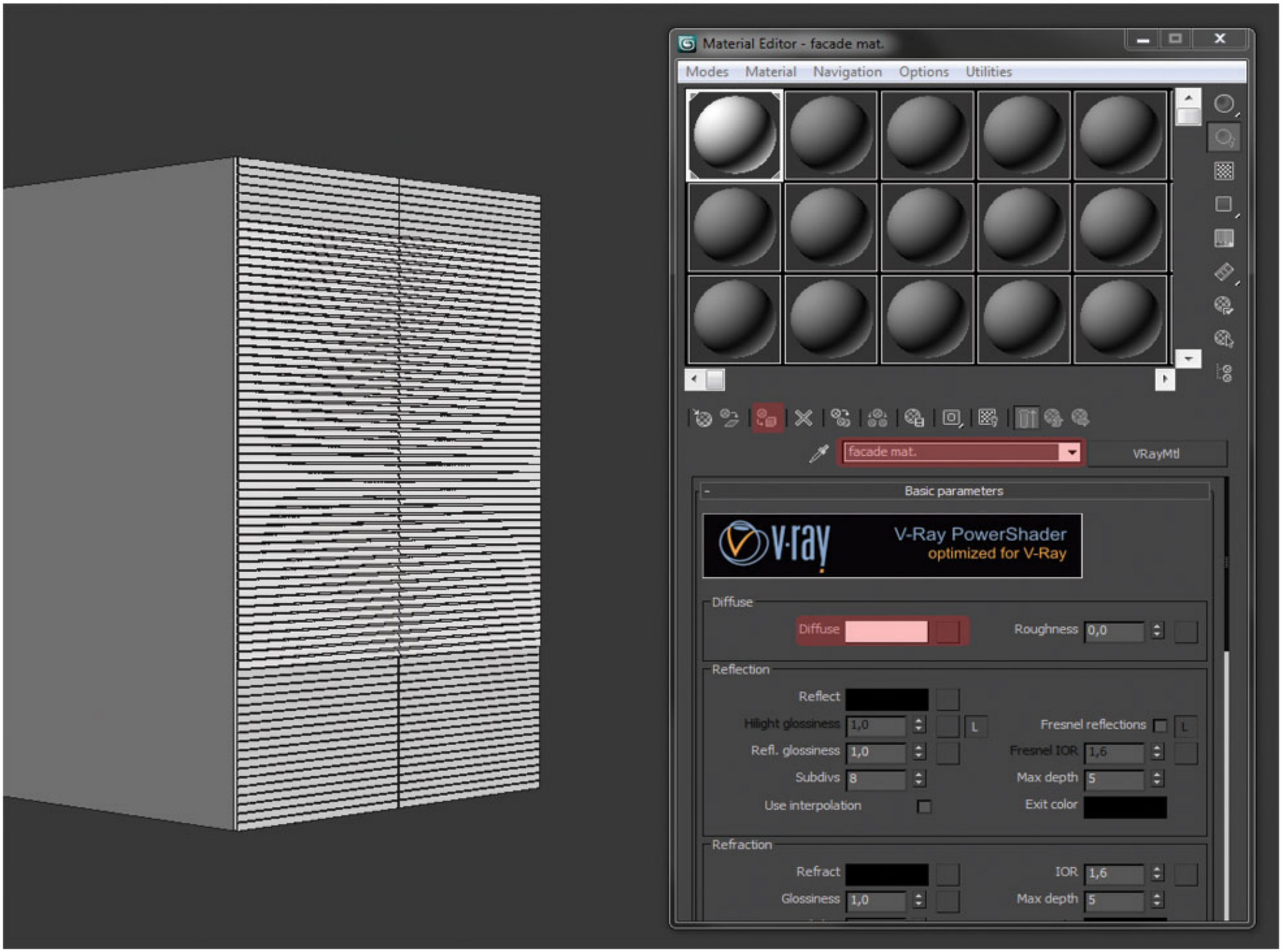
Scene that we do is very simple. Therefore, the texturing was brought to a minimum. No matter of all that, we will open *Material Editor* and do a few things.

To be able to create *V Ray Materials*, we must first to activate the *V Ray Render Setup*.

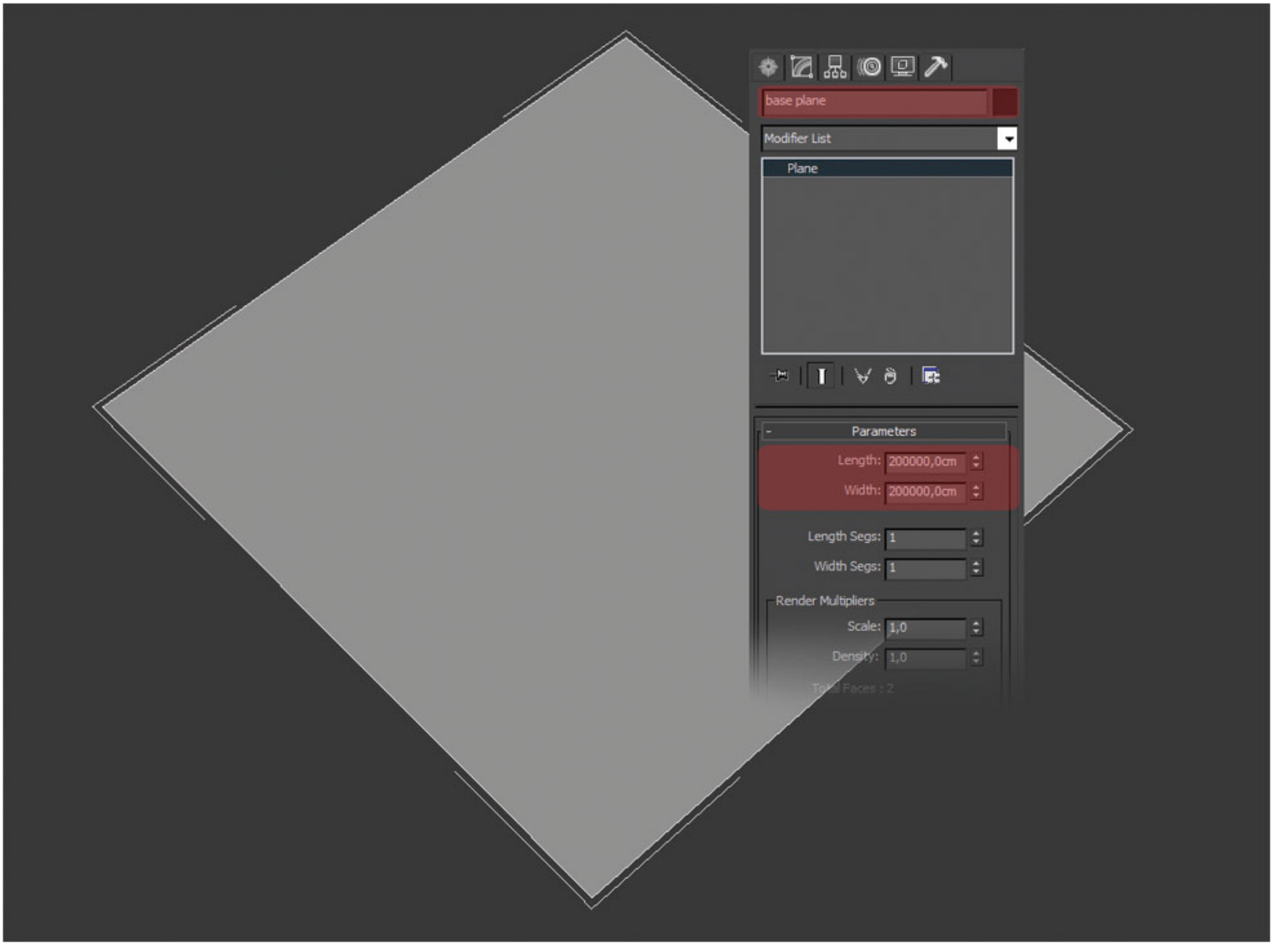



Material/Map Browser
Search by Name ...
+ AS_vray_v1_glass.mat LIB
+ AS_vray_v2_metals.mat LIB
+ AS_vray_v1_wall.mat LIB
+ AS_vray_v1_metals.mat LIB
- Materials
+ Standard
- V-Ray Adv 1.50.SP5
VRay2SidedMtl
VRayBlendMtl
VRayMtl
VRayMtlWrapper
VRayOverrideMtl
VRaySimbiontMtl
+ Maps
+ Scene Materials
+ Sample Slots
Material Editor - 01 - Default
Modes Material Navigation Options Utilities
01 - Default
Standard
Shader Basic Parameters
Blinn
Wire
2-Sided
Face Map
Faceted
Blinn Basic Parameters
Self-Illumination
Ambient:
Diffuse:
Specular:
Color 0
Opacity: 100
Specular Highlights
Specular Level: 0
Glossiness: 10
Soften: 0,1
Extended Parameters
SuperSampling
Maps

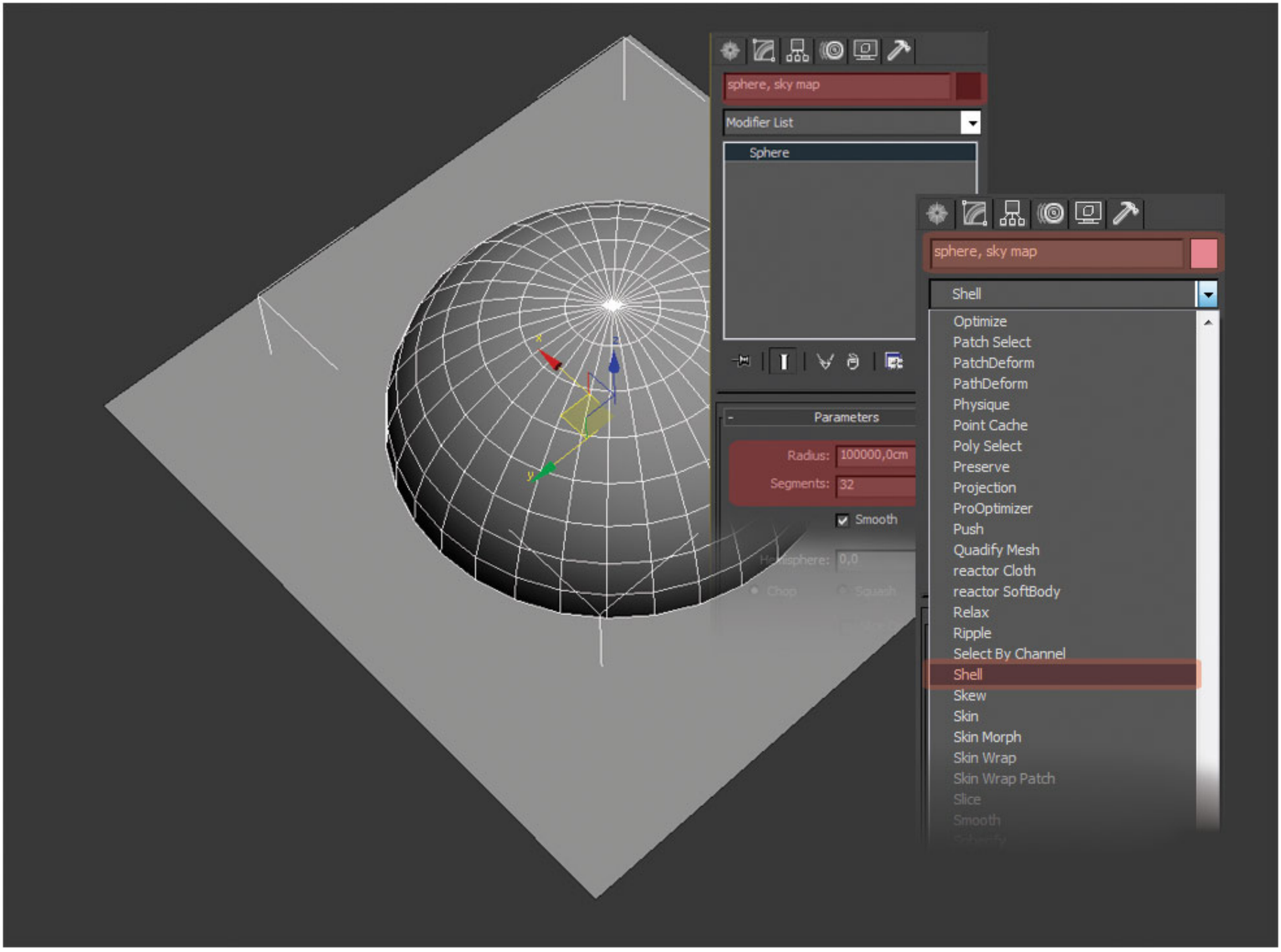
Finally - selects all objects from the scene and insert material to them.



Lighting & Rendering

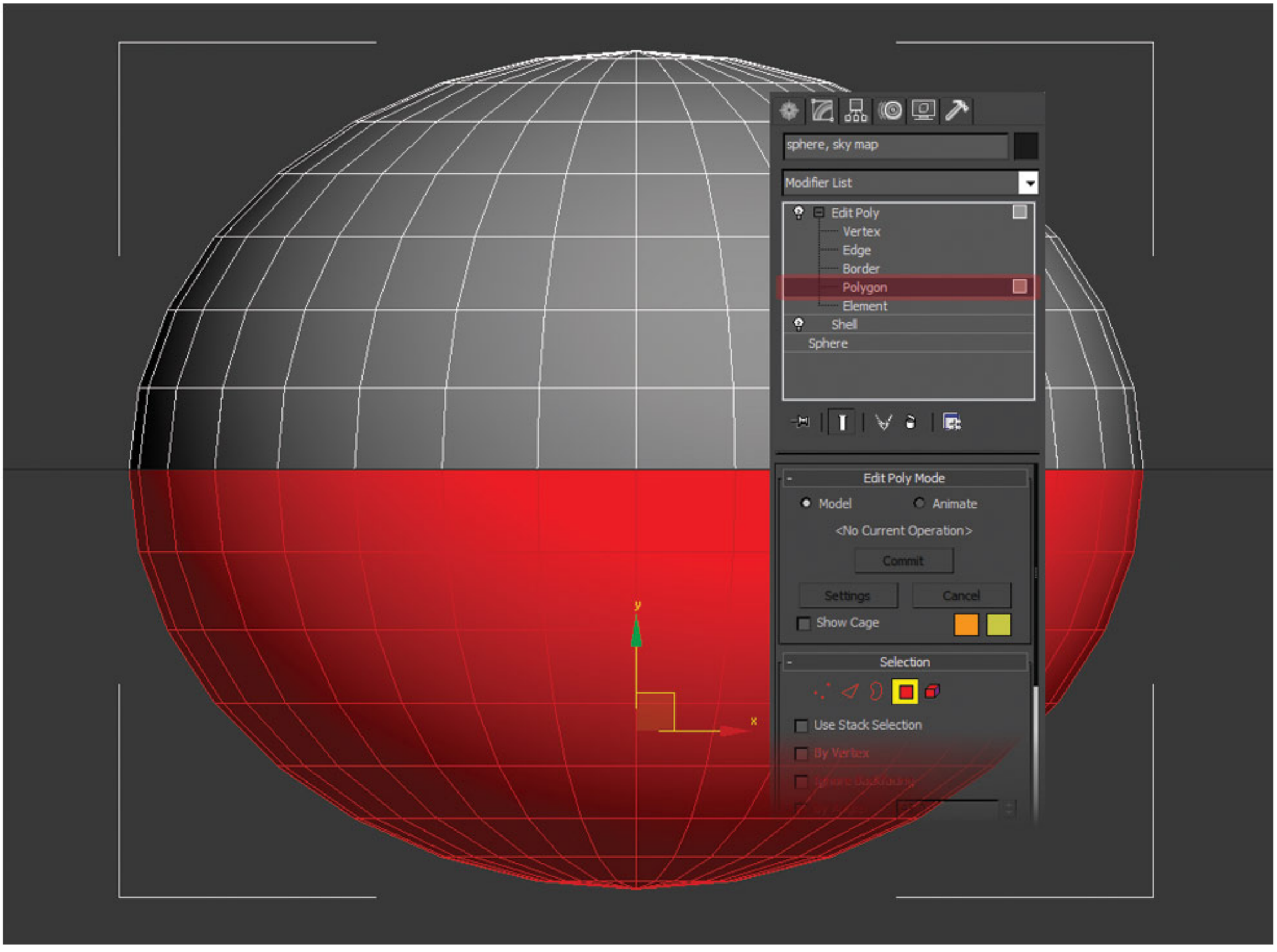

base plane
Modifier List
Plane
Parameters
Length: 200000,0cm
Width: 200000,0cm
Length Segs: 1
Width Segs: 1
Render Multipliers
Scale: 1,0
Density: 1,0

Make a *Sphere* and add a *Shell Modifier* from *Modifier List* (the surface will be visible from the inside).

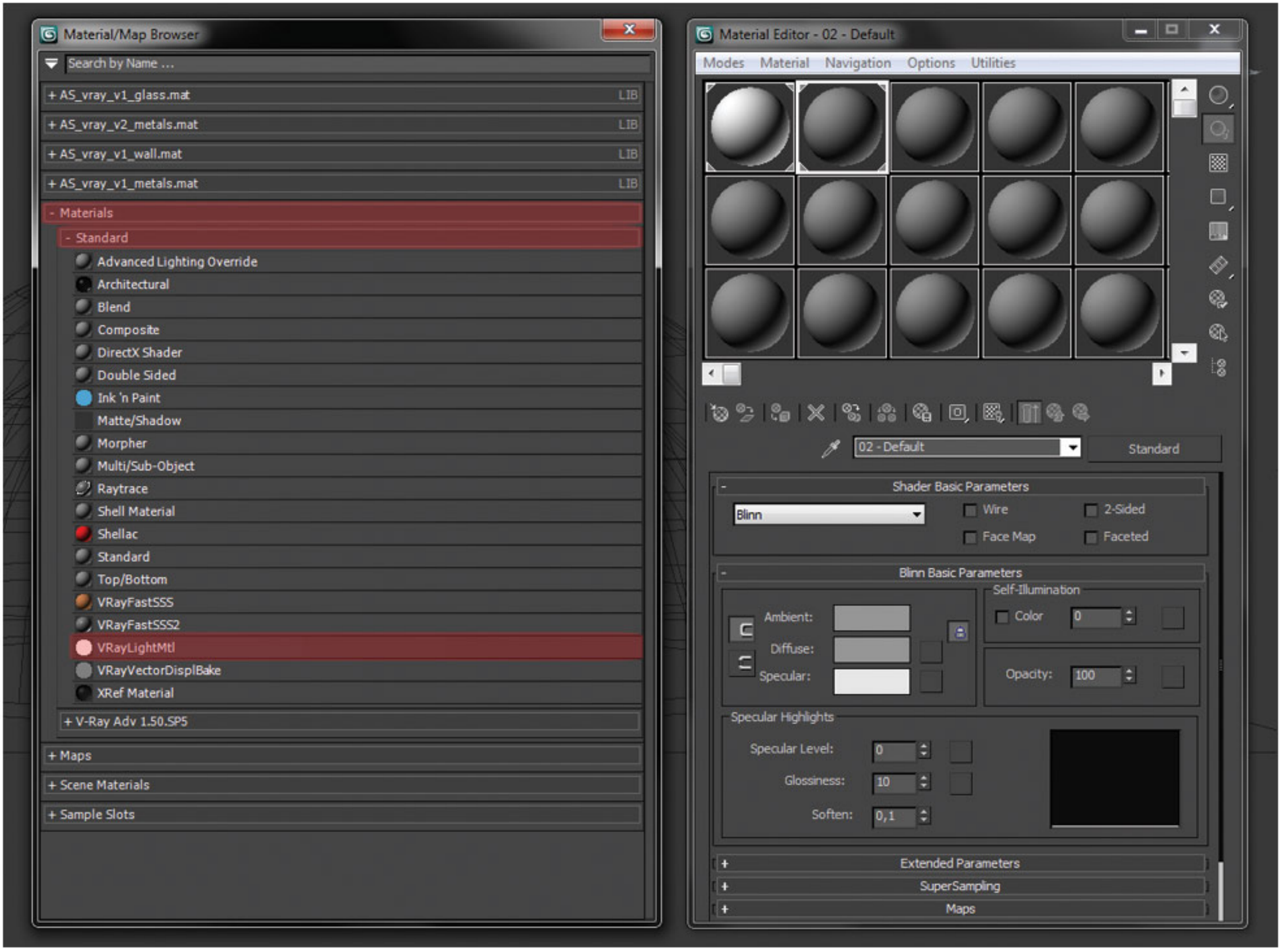


Then, we add one *Edit Poly Modifier* and delete the bottom half of the *Sphere*.

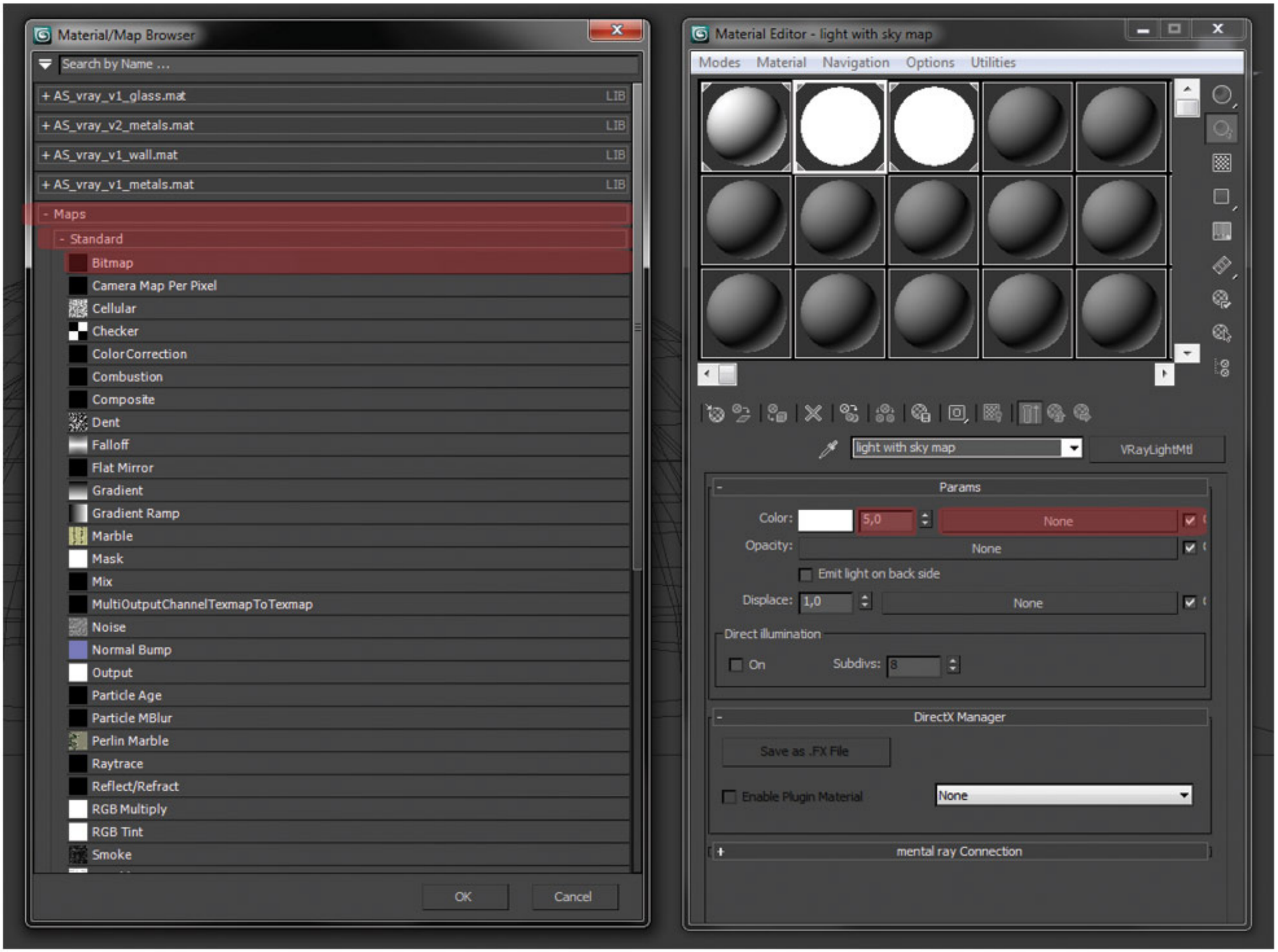
After deleting bottom part, *Copy* the *Sphere* and increase by a few percent. So now, the scene has two spheres of different sizes (they will be used for the *Atmospheric Light*).



Then, we goes to the *Material Editor* and make two *Light Materials*.

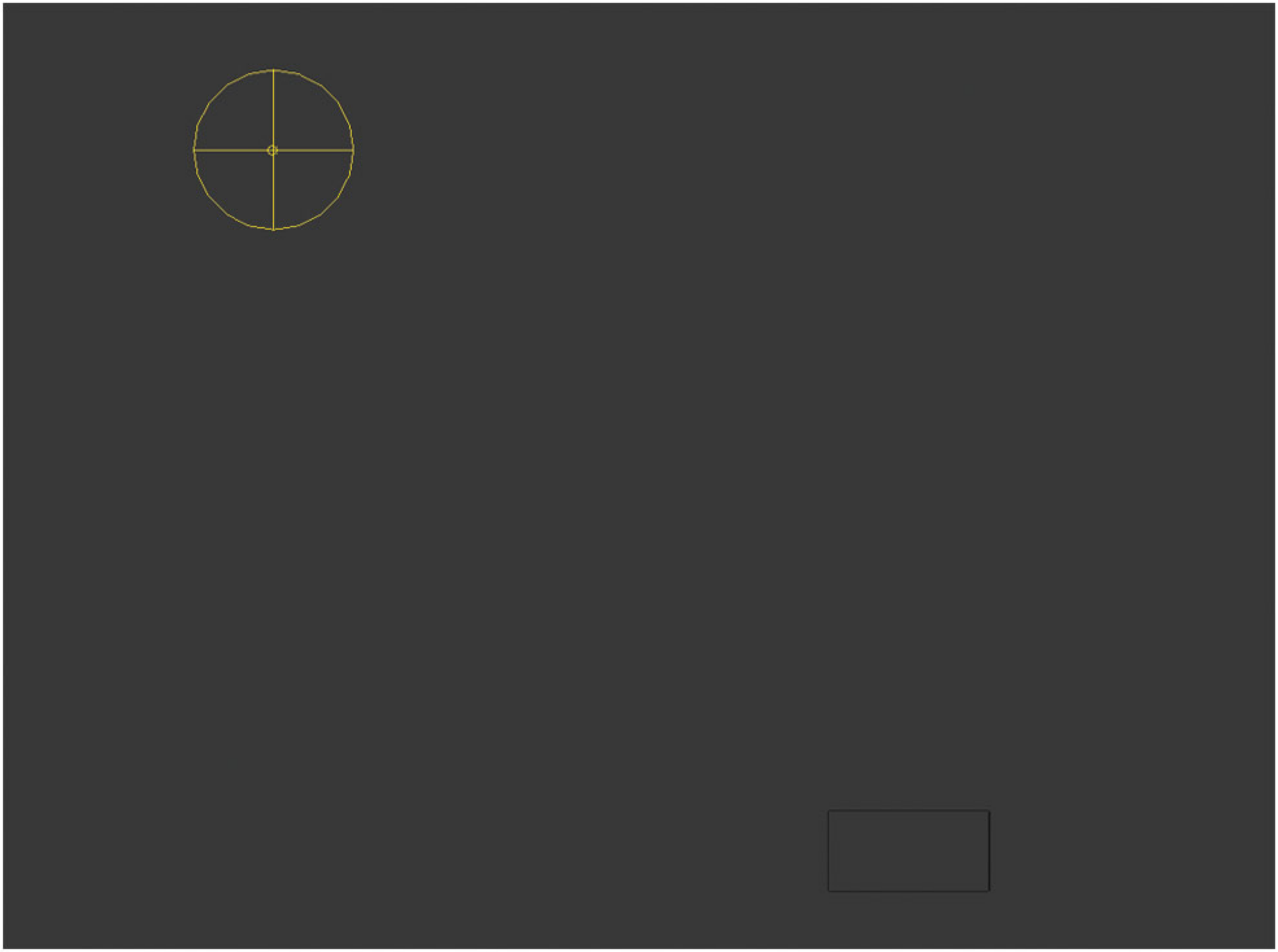


Select a smaller *Sphere*.
Bring sky map in the scene.

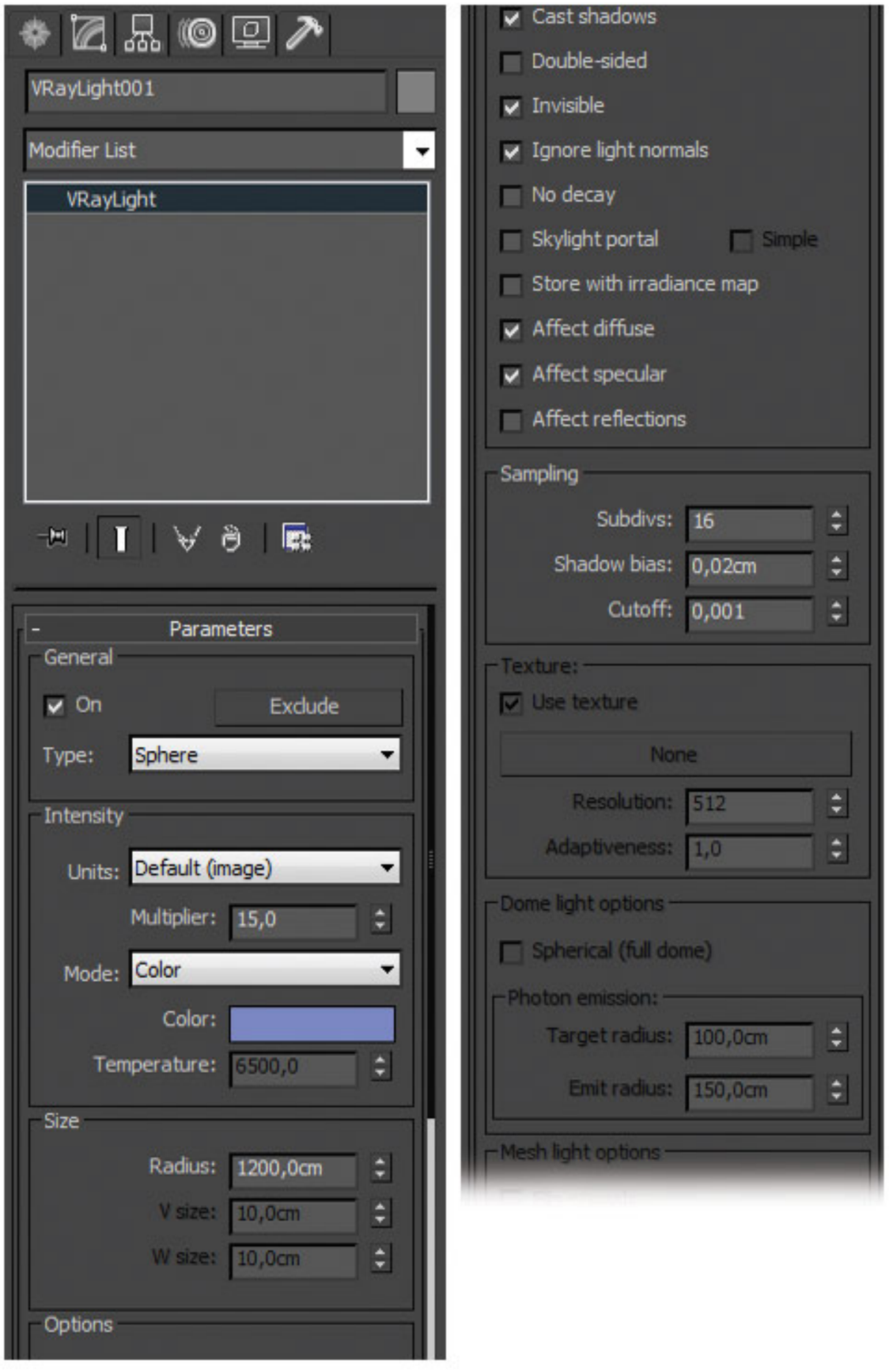


With *Light Material* we have now the atmospheric lighting.
Next is the *V Ray Light Sphere* (as an imitation of sunlight).

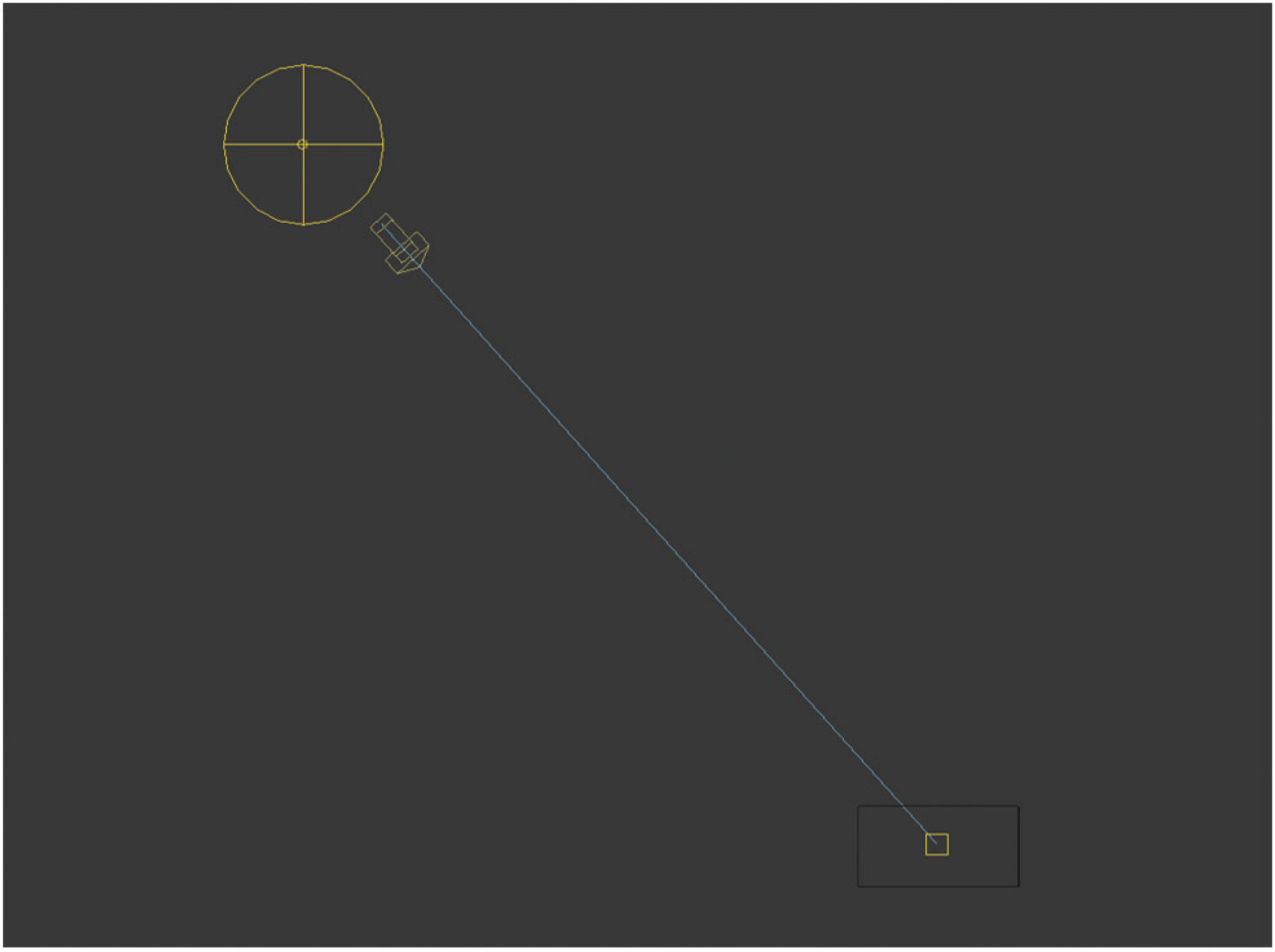
Make it with this distance from building...



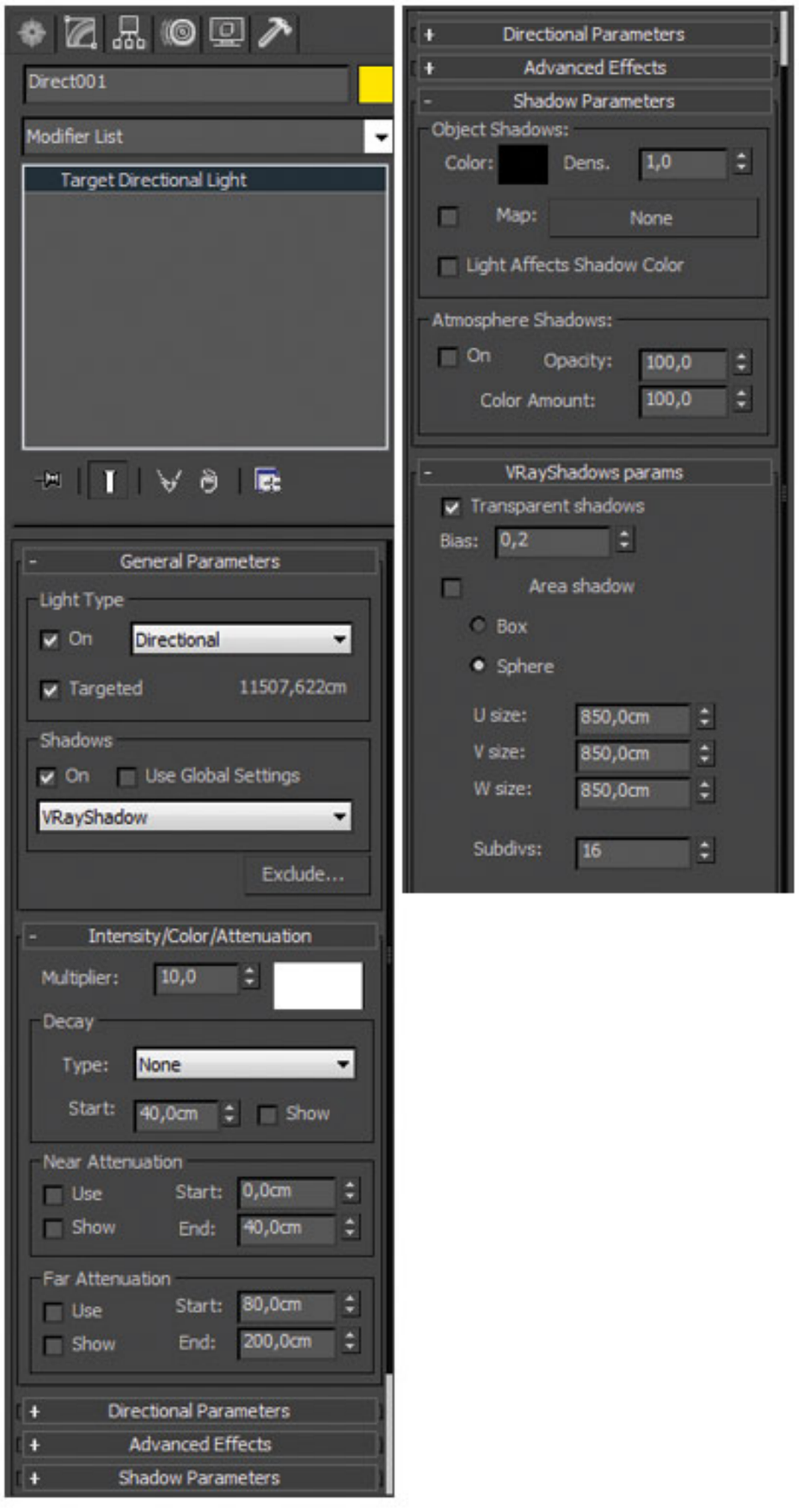
... and these parameters.



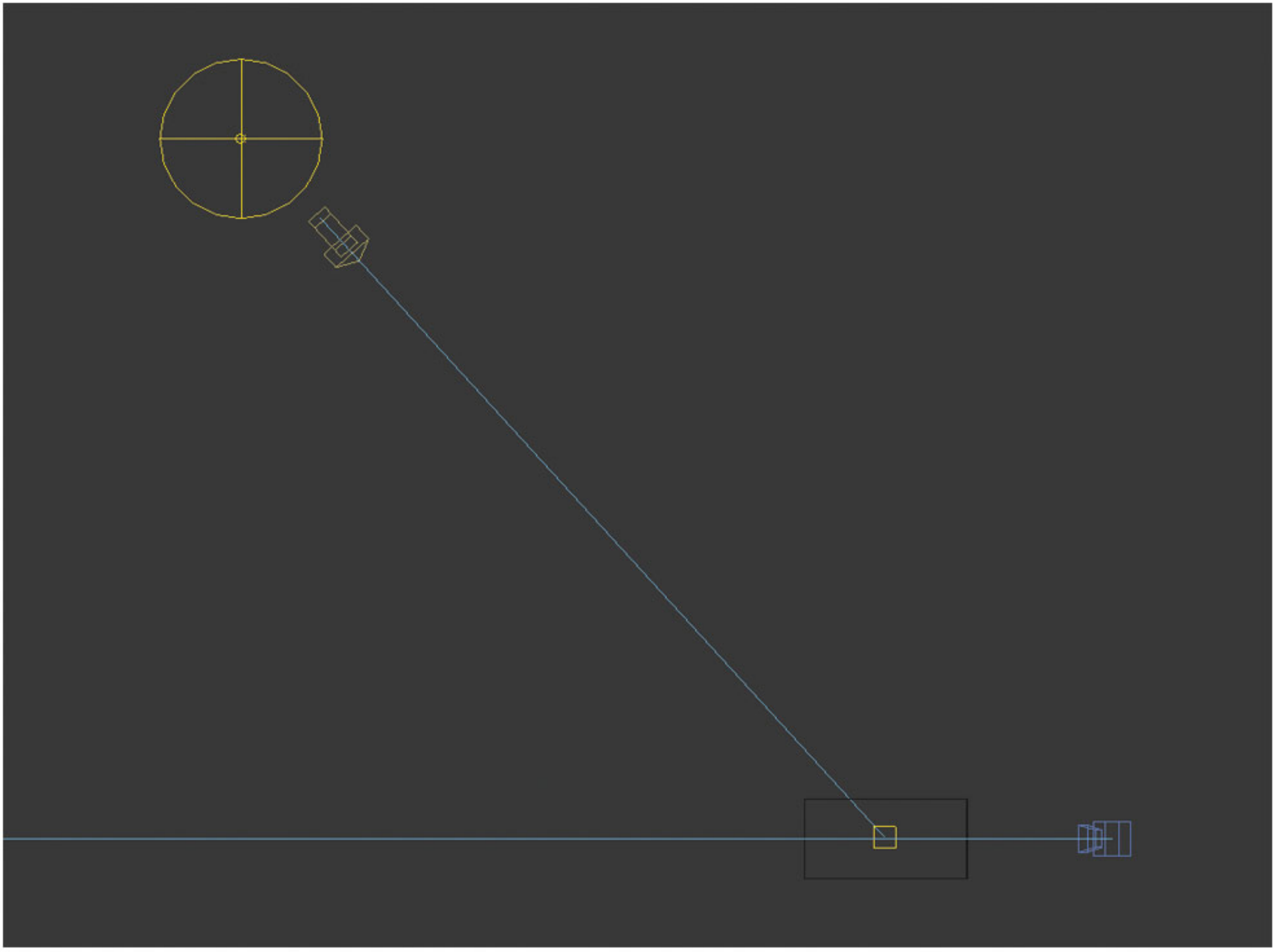
Light no. 3 is *Target Directional Light*.
Again, we use this distance (as shown below).



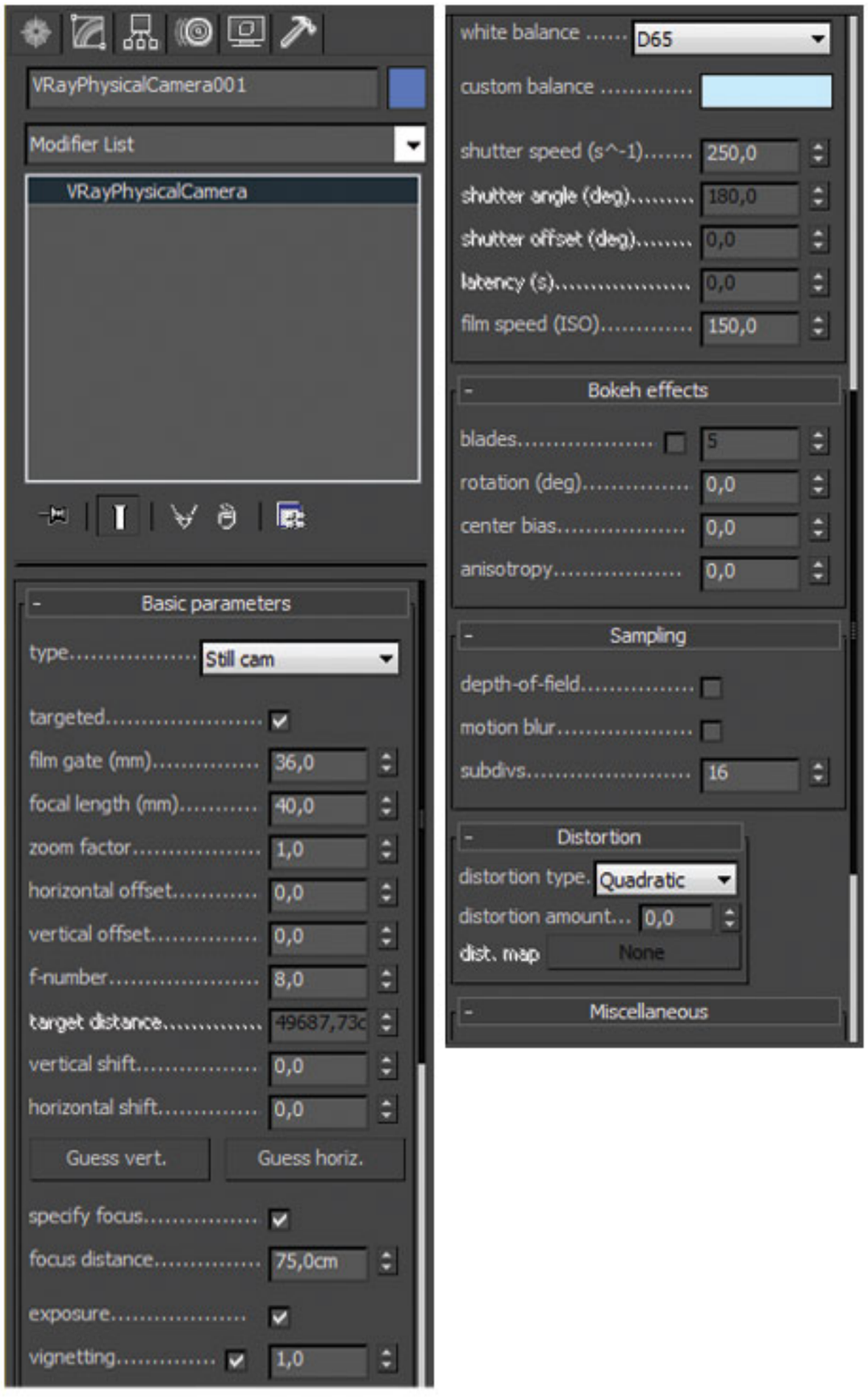
... and these parameters.



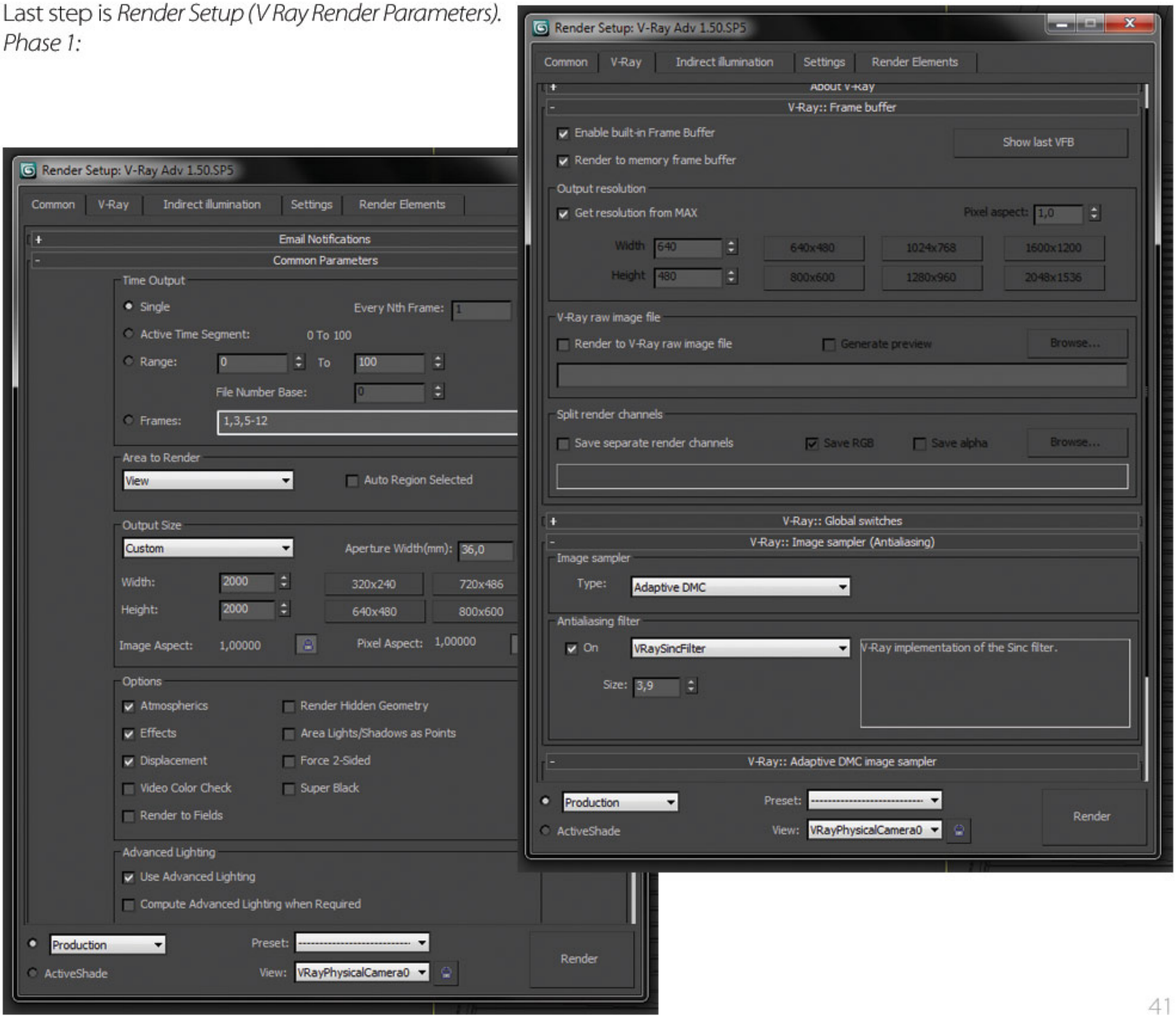
Use *V Ray Physical Camera*.
Make it with this distance...



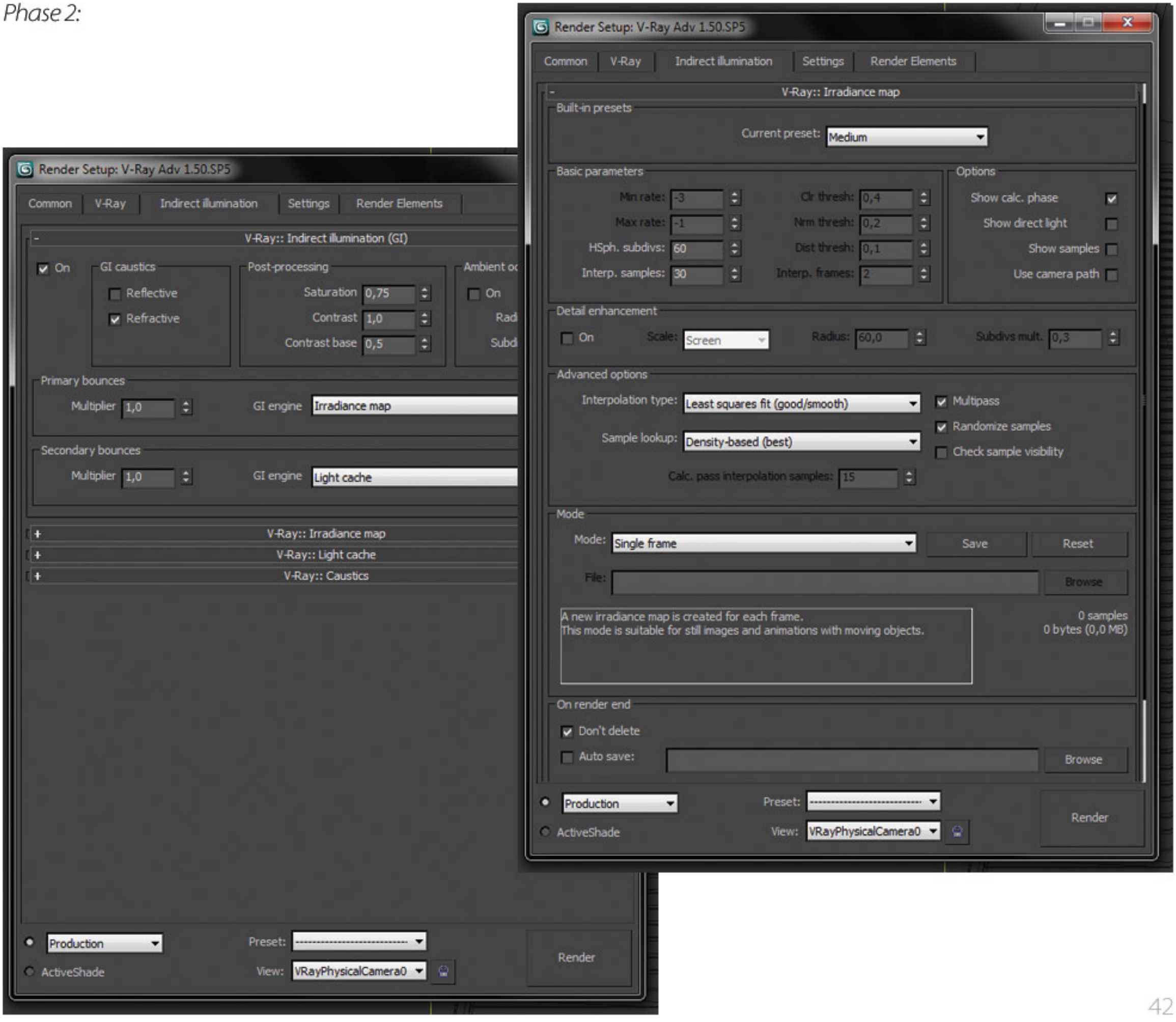
... and these parameters.

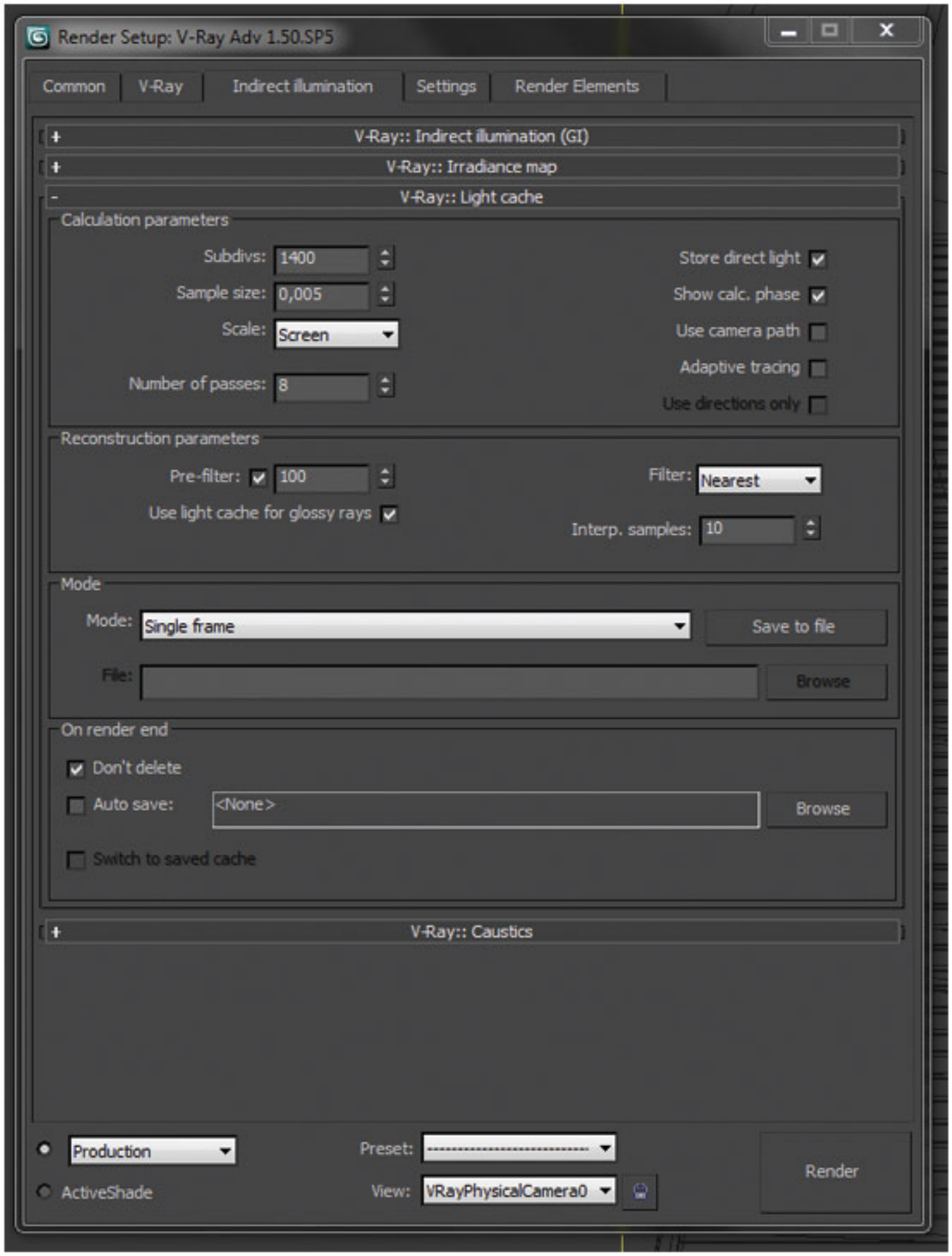


Last step is *Render Setup (V Ray Render Parameters).*
Phase 1:

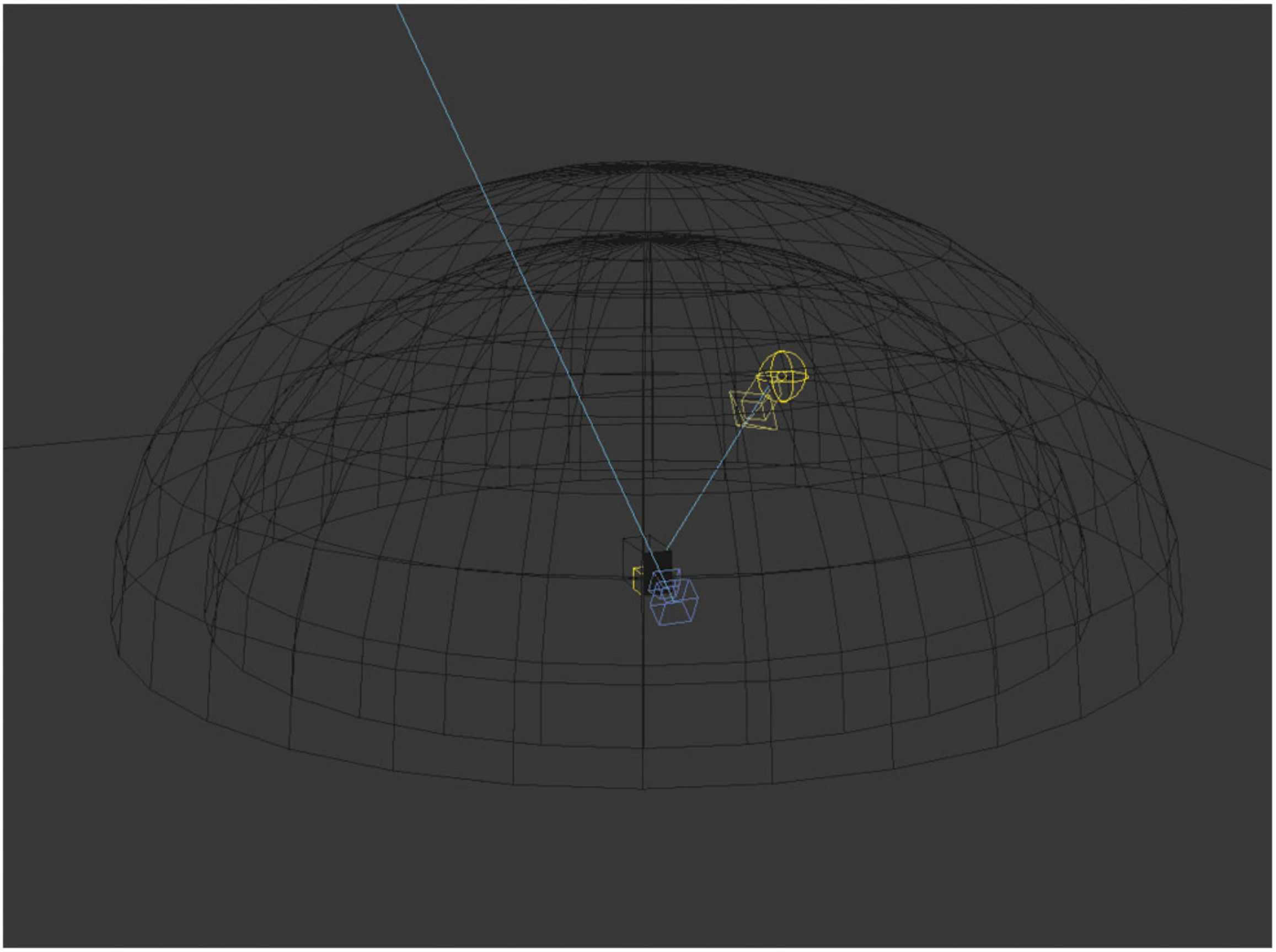


Phase 2:

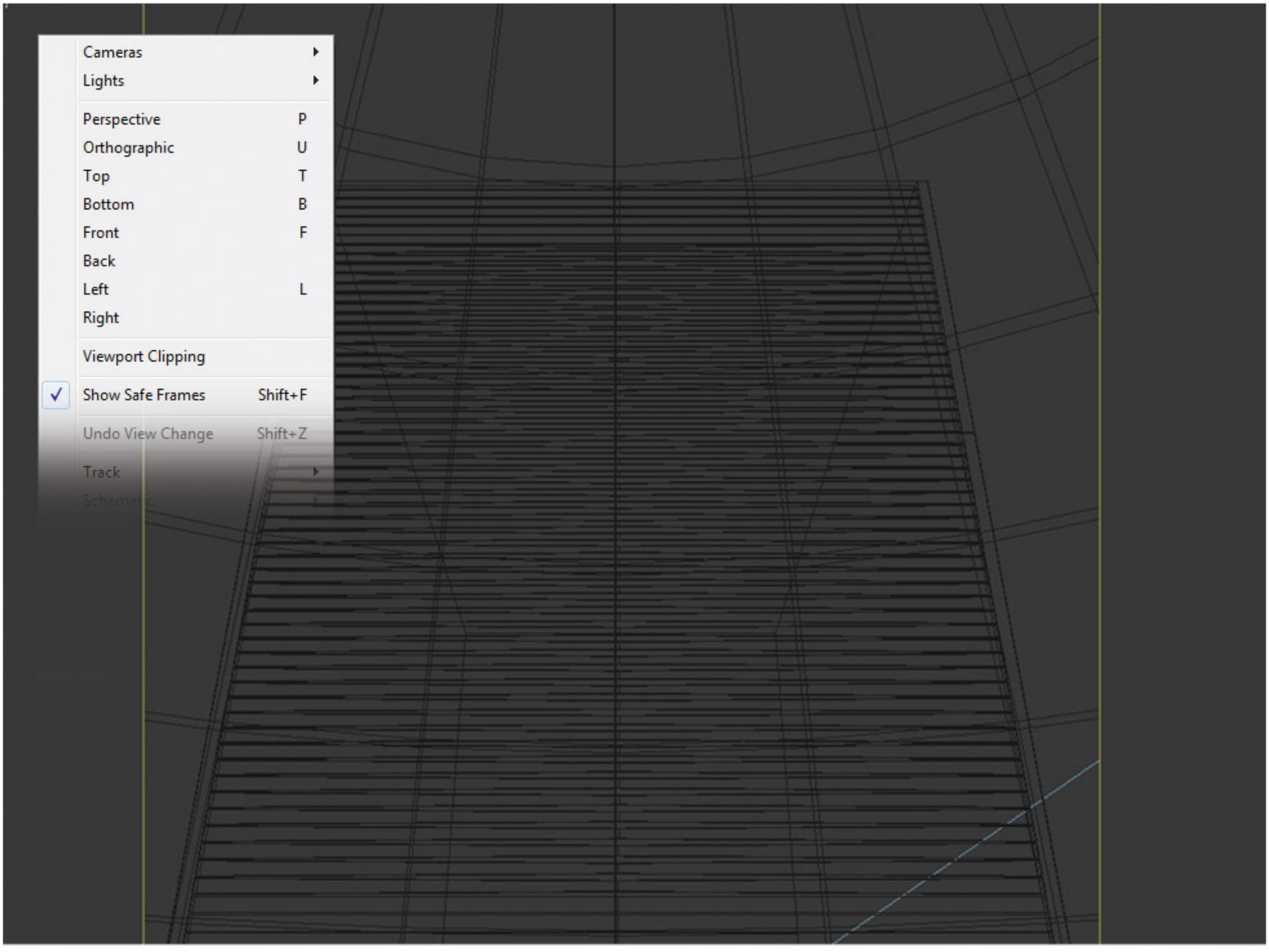

Render Setup: V-Ray Adv 1.50.SP5
Common
V-Ray
Indirect illumination
Settings
Render Elements
V-Ray:: Indirect illumination (GI)
On
GI caustics
Reflective
Refractive
Post-processing
Saturation 0,75
Contrast 1,0
Contrast base 0,5
Ambient oc
On
Rad
Subd
Primary bounces
Multiplier 1,0
GI engine Irradiance map
Secondary bounces
Multiplier 1,0
GI engine Light cache
V-Ray:: Irradiance map
V-Ray:: Light cache
V-Ray:: Caustics
Production
ActiveShade
Preset:
View: VRayPhysicalCamera0
Render
Render Setup: V-Ray Adv 1.50.SP5
Common
V-Ray
Indirect illumination
Settings
Render Elements
V-Ray:: Irradiance map
Built-in presets
Current preset: Medium
Basic parameters
Min rate: -3
Max rate: -1
HSph. subdivs: 60
Interp. samples: 30
Clr thresh: 0,4
Nrm thresh: 0,2
Dist thresh: 0,1
Interp. frames: 2
Options
Show calc. phase
Show direct light
Show samples
Use camera path
Detail enhancement
On
Scale: Screen
Radius: 60,0
Subdivs mult. 0,3
Advanced options
Interpolation type: Least squares fit (good/smooth)
Sample lookup: Density-based (best)
Calc. pass interpolation samples: 15
Multipass
Randomize samples
Check sample visibility
Mode
Mode: Single frame
Save
Reset
File:
Browse
A new irradiance map is created for each frame.
This mode is suitable for still images and animations with moving objects.
0 samples
0 bytes (0,0 MB)
On render end
Don't delete
Auto save:
Browse
Production
ActiveShade
Preset:
View: VRayPhysicalCamera0
Render


Render Setup: V-Ray Adv 1.50.SP5
Common
V-Ray
Indirect illumination
Settings
Render Elements
V-Ray:: Indirect illumination (GI)
V-Ray:: Irradiance map
V-Ray:: Light cache
Calculation parameters
Subdivs: 1400
Sample size: 0,005
Scale: Screen
Number of passes: 8
Store direct light
Show calc. phase
Use camera path
Adaptive tracing
Use directions only
Reconstruction parameters
Pre-filter: 100
Use light cache for glossy rays
Filter: Nearest
Interp. samples: 10
Mode
Mode: Single frame
Save to file
File:
Browse
On render end
Don't delete
Auto save: <None>
Browse
Switch to saved cache
V-Ray:: Caustics
Production
ActiveShade
Preset:
View: VRayPhysicalCamera0
Render

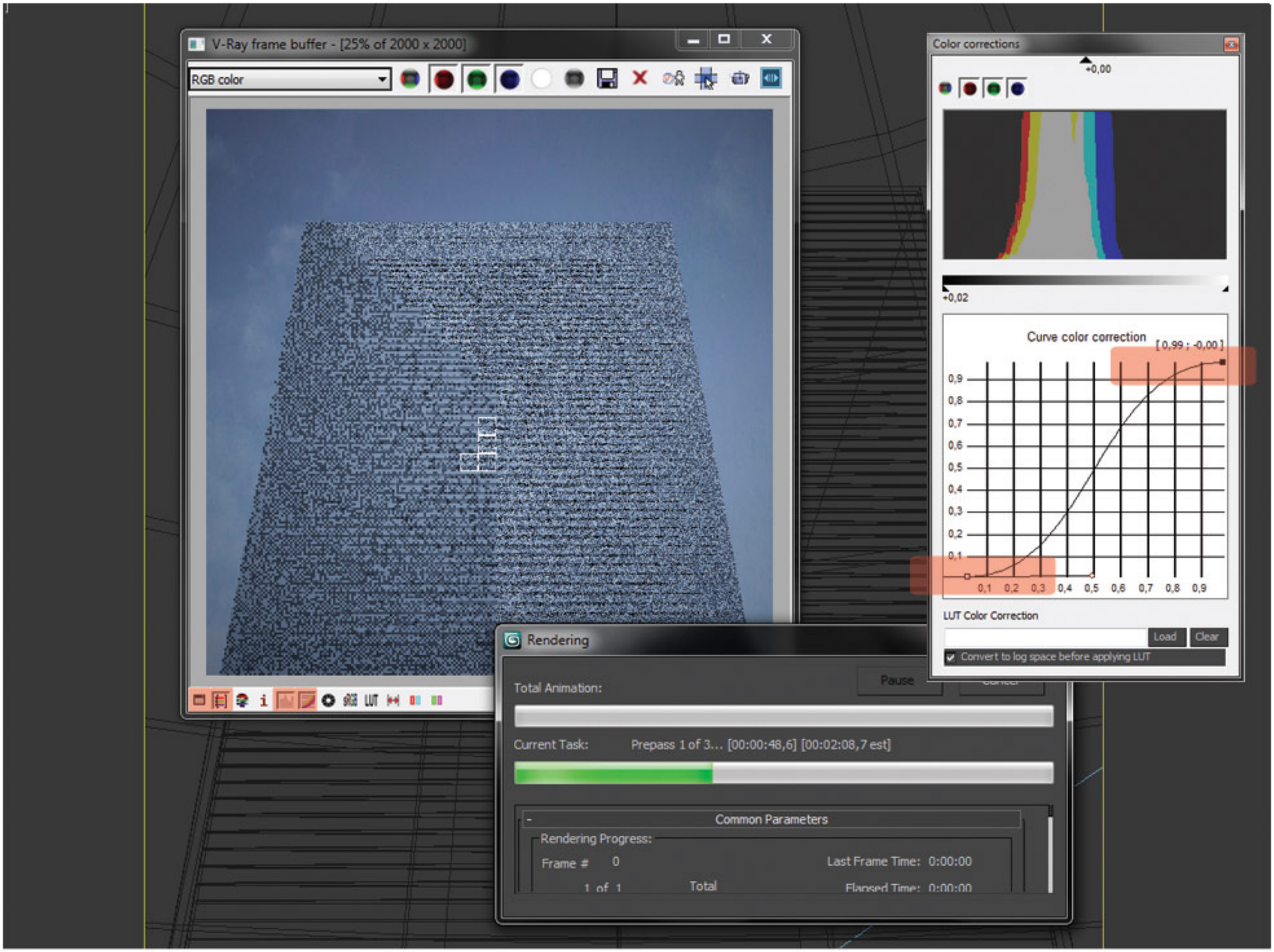
Scene should look like this...



Bring camera in this position.
In the upper left corner of the *Viewport* you can find *Show Safe Frames* (or just Shift + F) (that is yellow frame on the picture bellow). With this frame you can see how picture will look like when rendering starts.

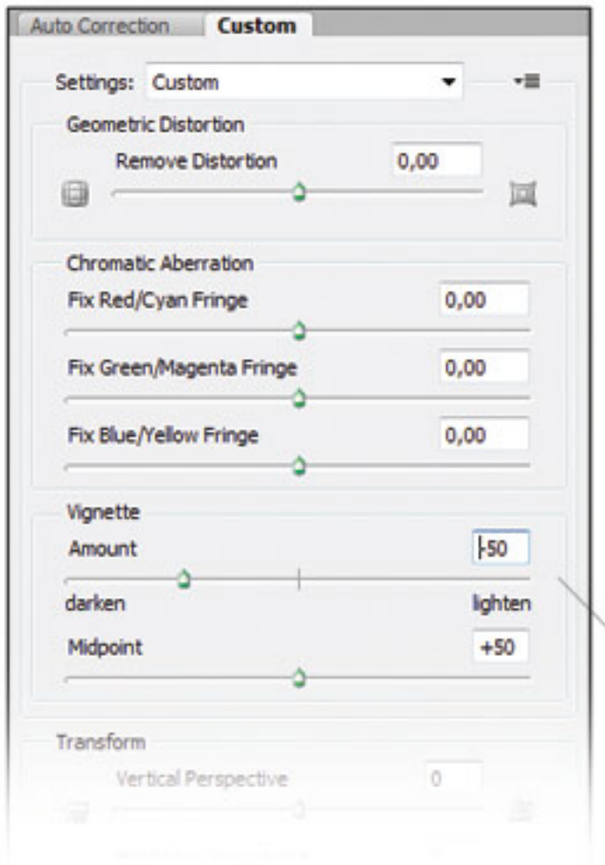


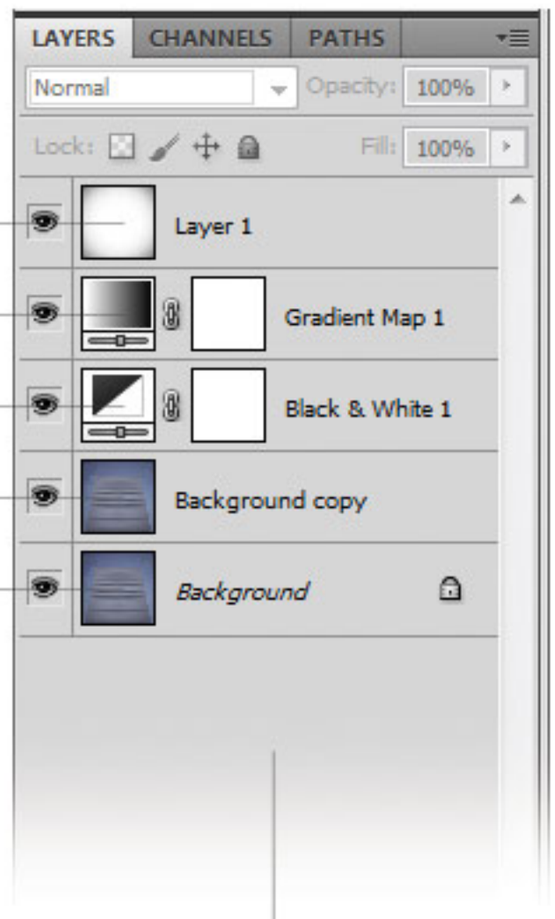
Press *Render Production* Button (or F9) and see what is happening.
Also, the image is already modified with *Color Corection Control* (last marked icon on the left).



Postproduction

We will try to do a few things that would improve the render. There is a two versions. With full color and without it. (With second one, in black and white, we will try to highlight the shadow on the facade that is being made by horizontal elements.)





layer5: layer filed with white colour / Filter / Lens Corection / Vignette -50 / Multiply

layer4: Adjustment layer / Gradient Map / Gradient Editor Black & White / Opacity50%

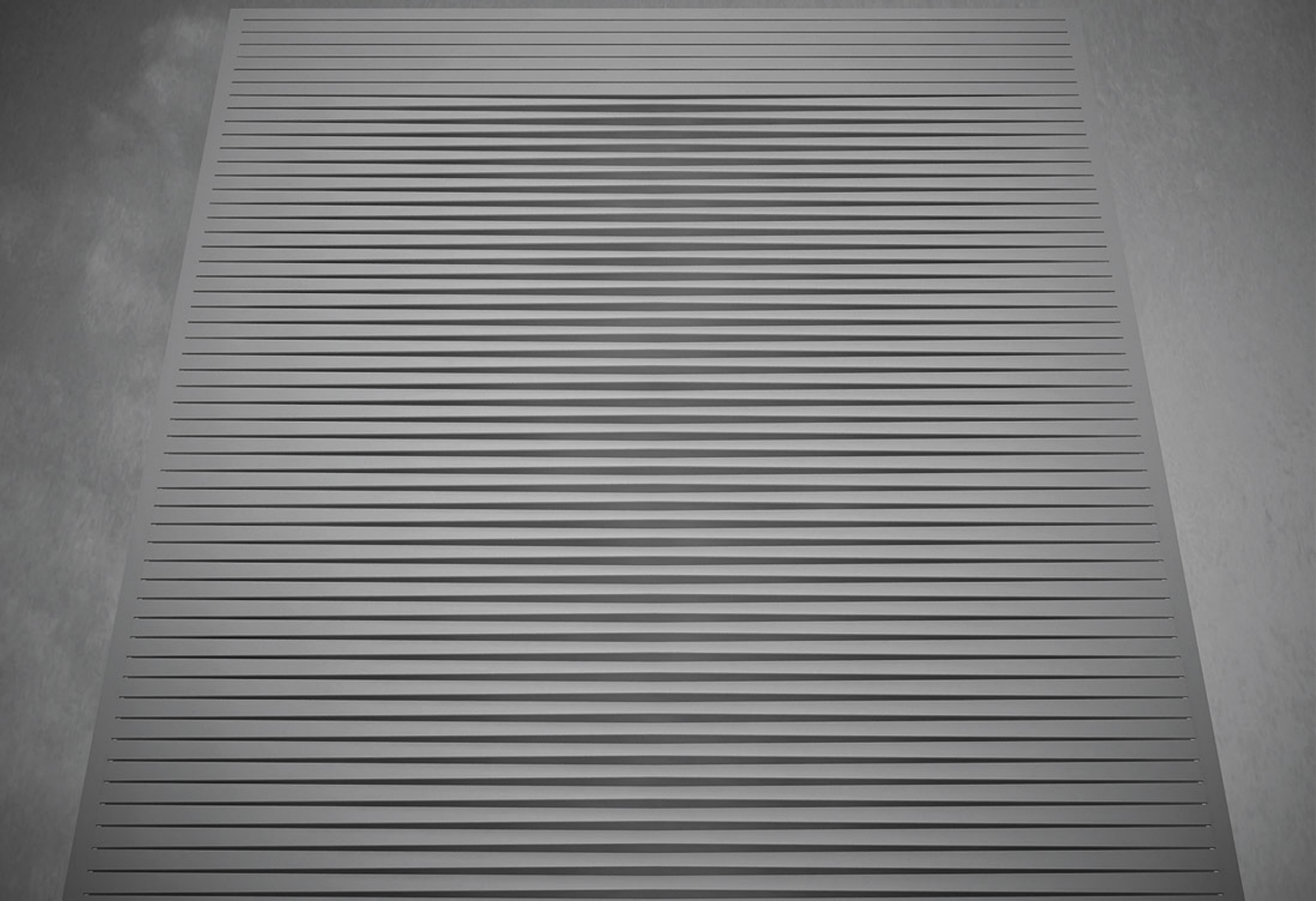
layer3: Adjustment layer / Black & White

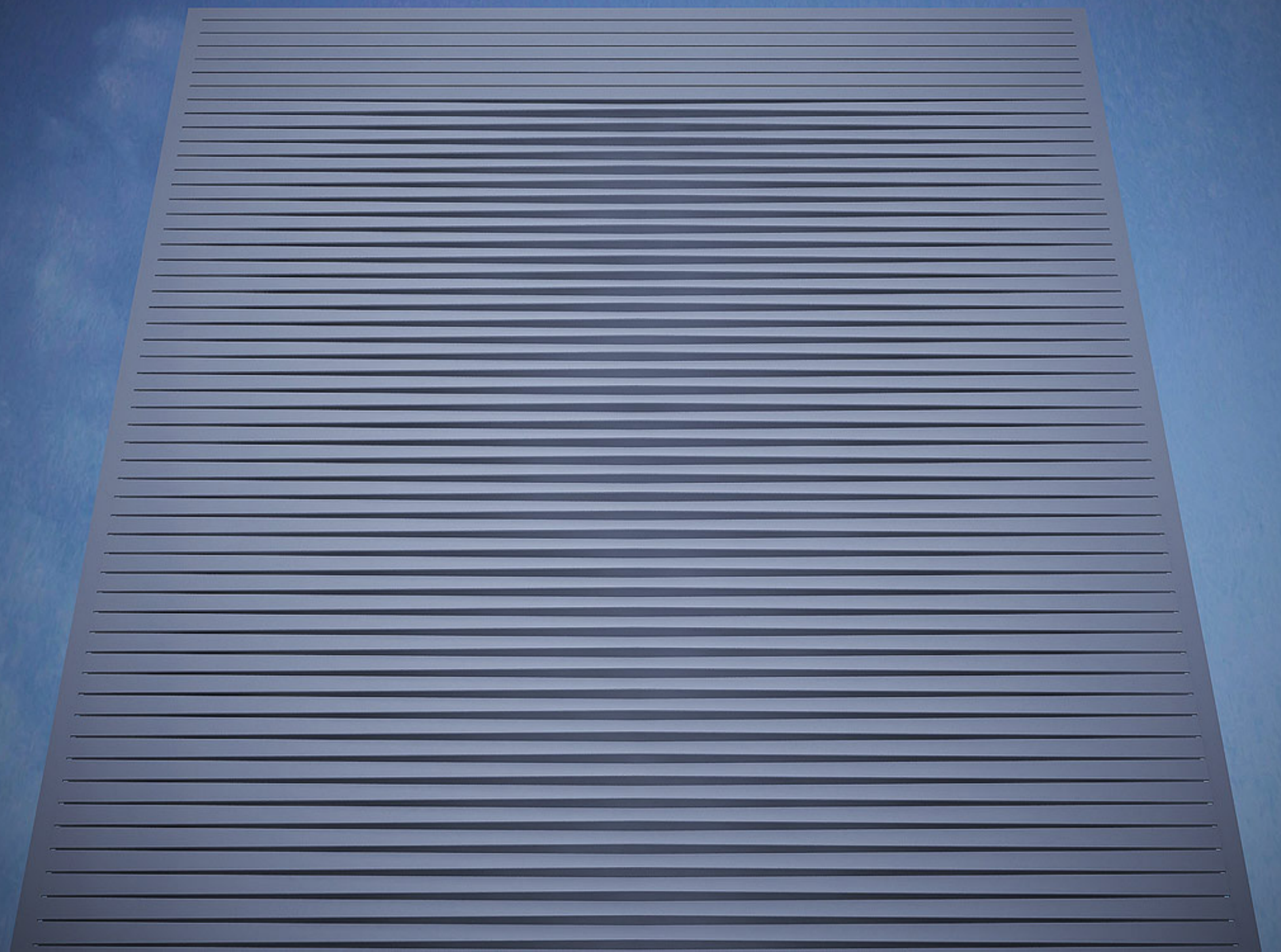
layer2: Render Copy / Overlay / Opacity50%

layer1: Render inserted

Layers Bar / Photoshop

After we finished working in Photoshop, there is still one small thing that adds a very nice effect. First, reduce the image size by 20% (Image/Image Size). Than Filter/Sharpen/Sharpen. Now, image is clearer.





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