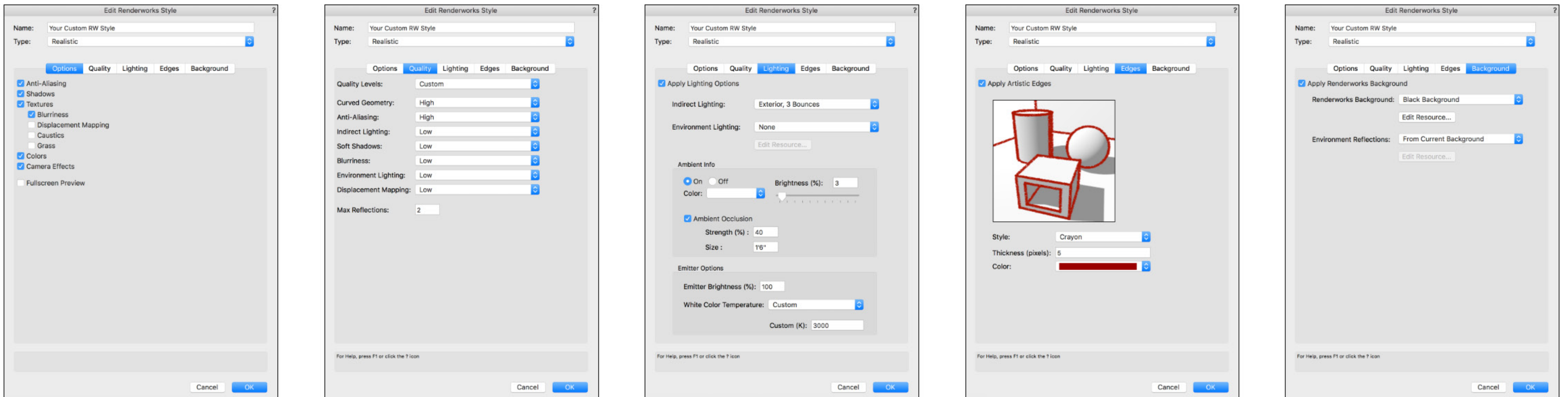


RENDERWORKS STYLES

REFERENCE GUIDE



What are Renderworks Styles?

Renderworks Styles give you **complete control over render settings**, allowing you to create better images while saving time. They give you the freedom to fine-tune settings to match your specific scene or current phase of the design process.

A RW Style is a **resource**, meaning it's an asset that's stored in the Resource Manager and can be shared across files (once you have presets you like, for example). When you edit the RW Style's definition, all viewports in that file which are using that RW Style will follow along.

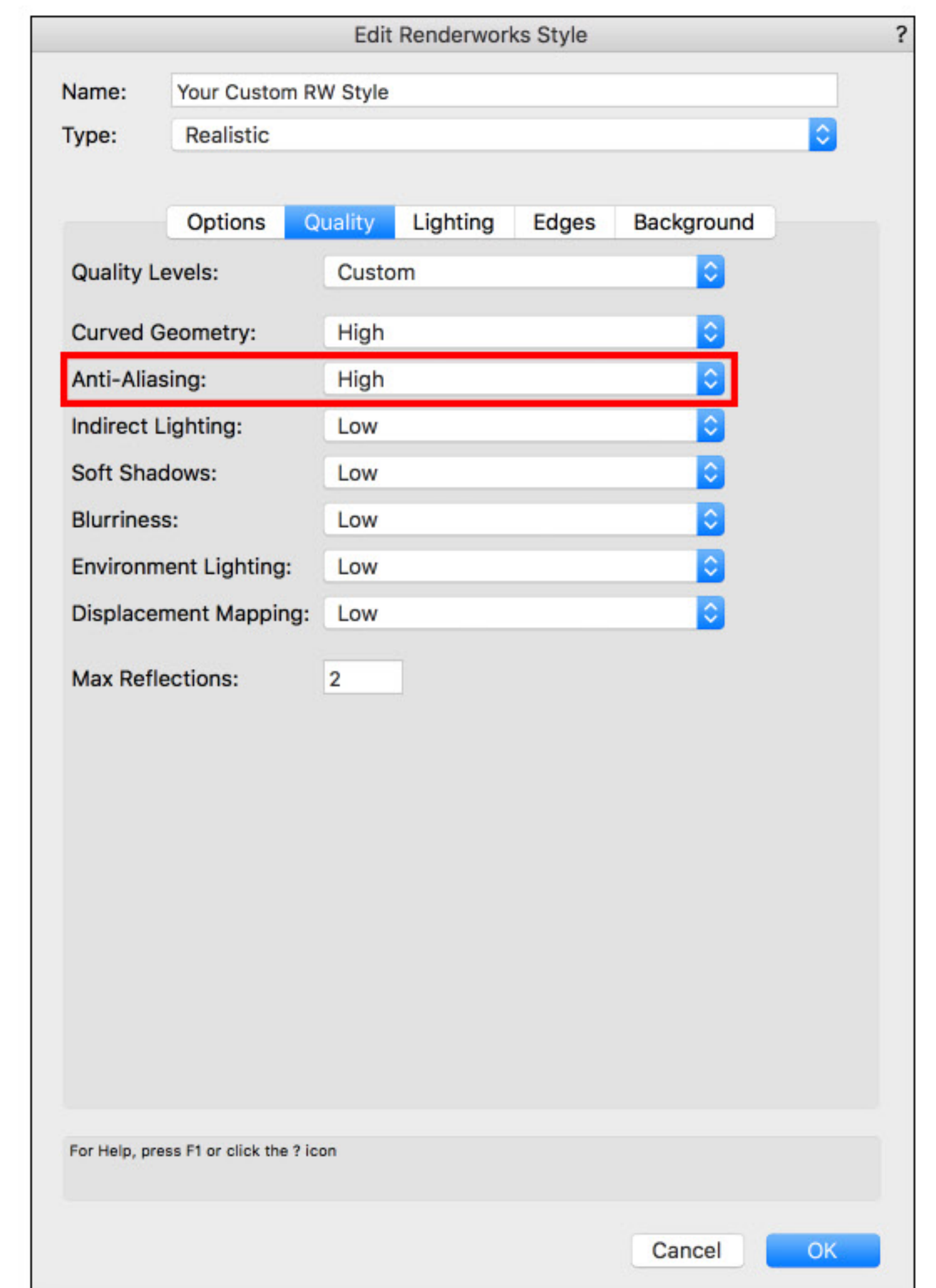
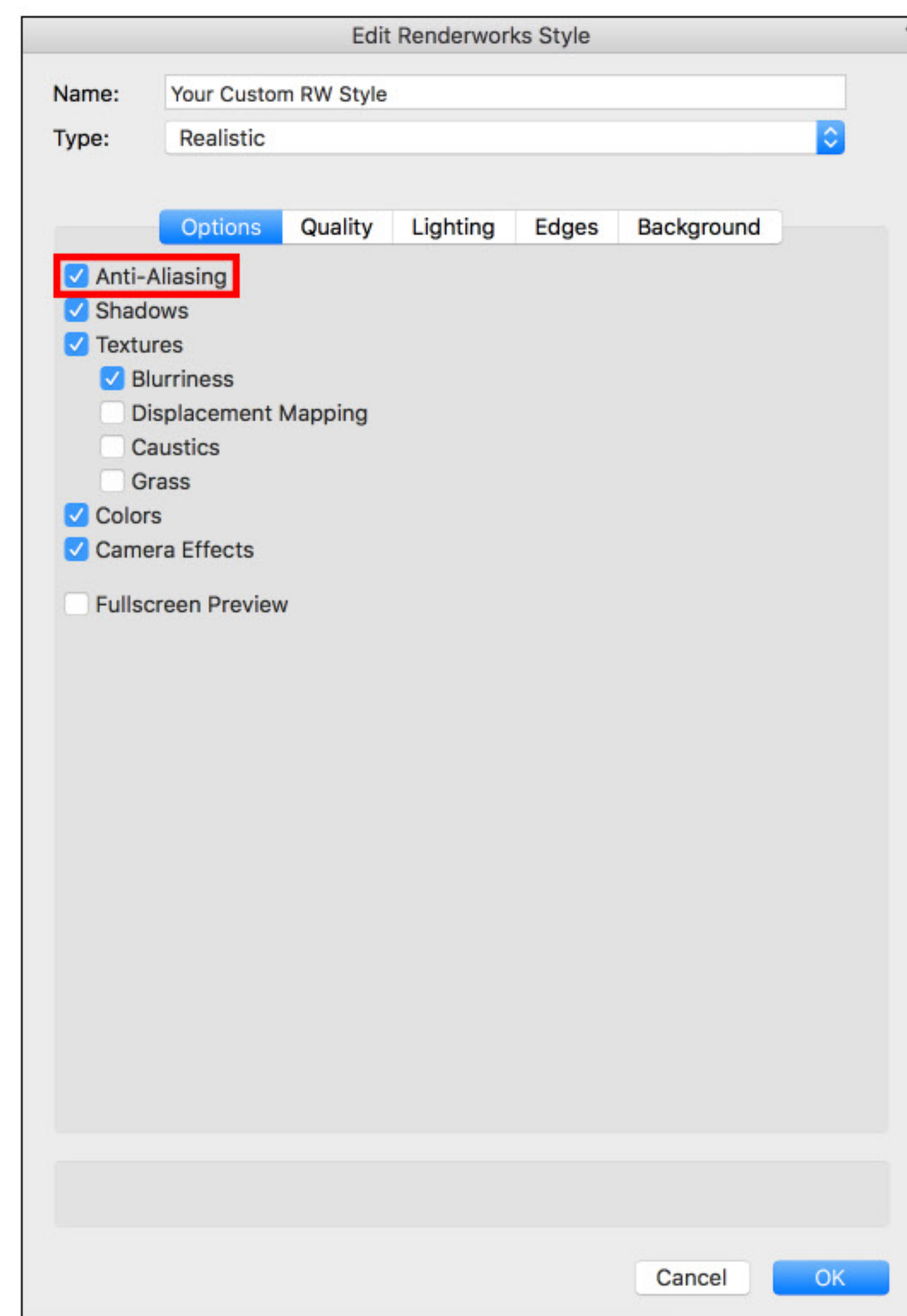
You can create a **new RW Style** from scratch by right clicking in the Resource Manager and choosing New Resource > Renderworks Style. Give it a personalized name and adjust settings as needed. You can always come back to the Resource Manager to edit your style in the future.

Another way to **edit an existing RW Style** while rendering on Sheet Layers is to simply click the "Lighting Options" button in the Viewport OIP. This opens the same RW Style dialogue box (assuming your style has the "Apply Lighting Options" box checked). The button takes you to the Lighting tab, but you can quickly switch to any other tab. Therefore the Lighting Options button can be used as a shortcut to adjust render settings as you work based on what you're doing in the moment.

This tutorial will outline the general parameters available in RW Styles, along with some recommended settings. The ideal configuration depends on the specifics of each project, so feel free to experiment. Spend time playing with each setting so that you gain an intimate understanding of what each one does.

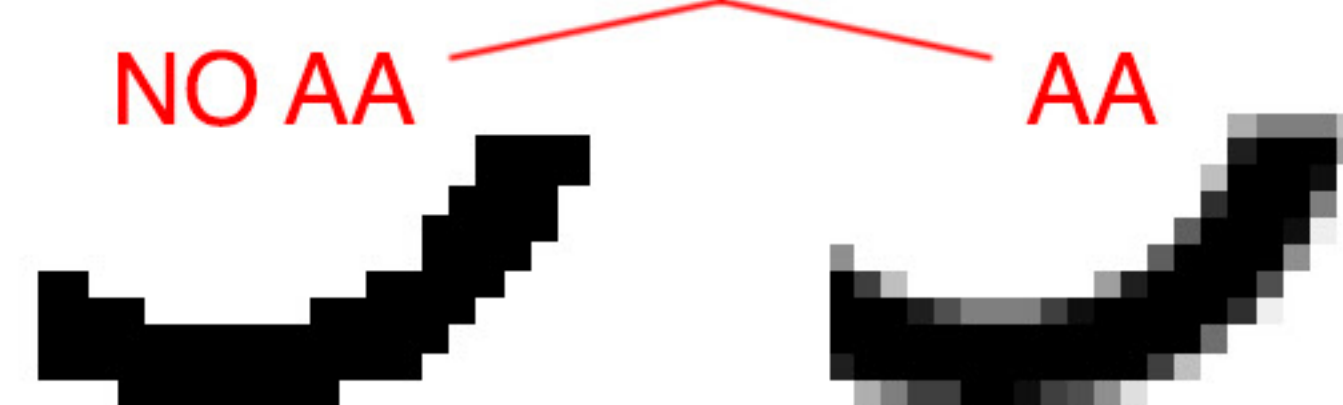


RENDERWORKS STYLES ANTI-ALIASING

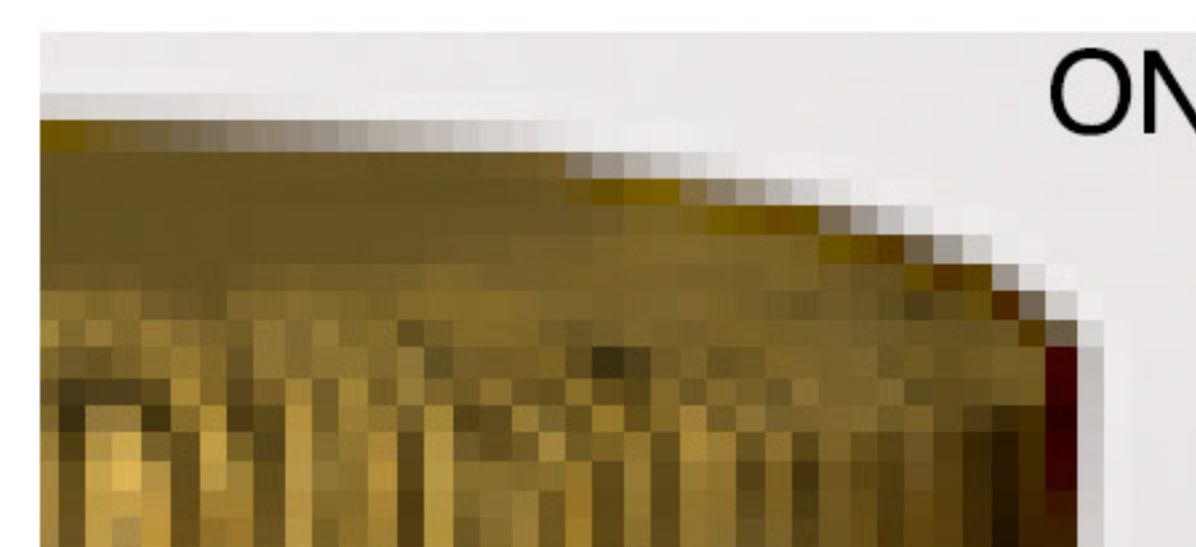
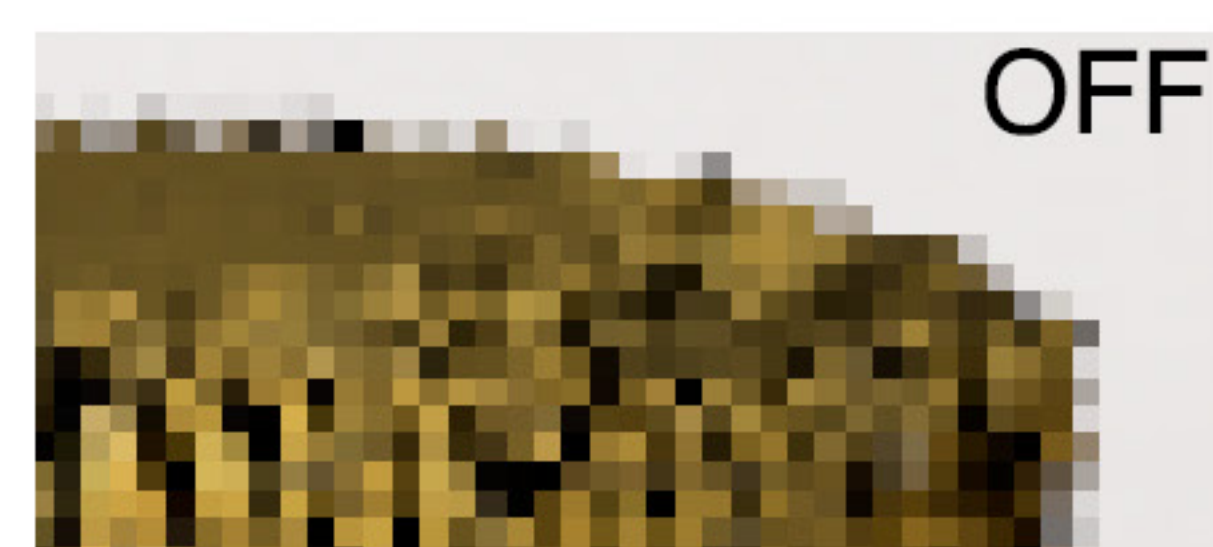


What is Anti-Aliasing (AA)?

AA smooths out the jagged edges that appear as a result of non-rectangular shapes being represented with square pixels. It appears in many forms across the digital world, such as smoothing out the edges of most text seen on computer screens.



In the world of 3D rendering, AA smooths out the edges of objects by blending the outer pixels with the background. Additionally, AA smooths out the mapping of textures onto surfaces, since the original image data must be interpolated (remapped) onto the object's 3D surface. Essentially AA smooths everything out.



Should I turn AA on or off? What about quality setting?

AA is time consuming, so renderings take longer when it's on. If you're only looking at overall composition, or general lighting levels for example, you can turn AA off, or reduce its quality to Low in order to save time.

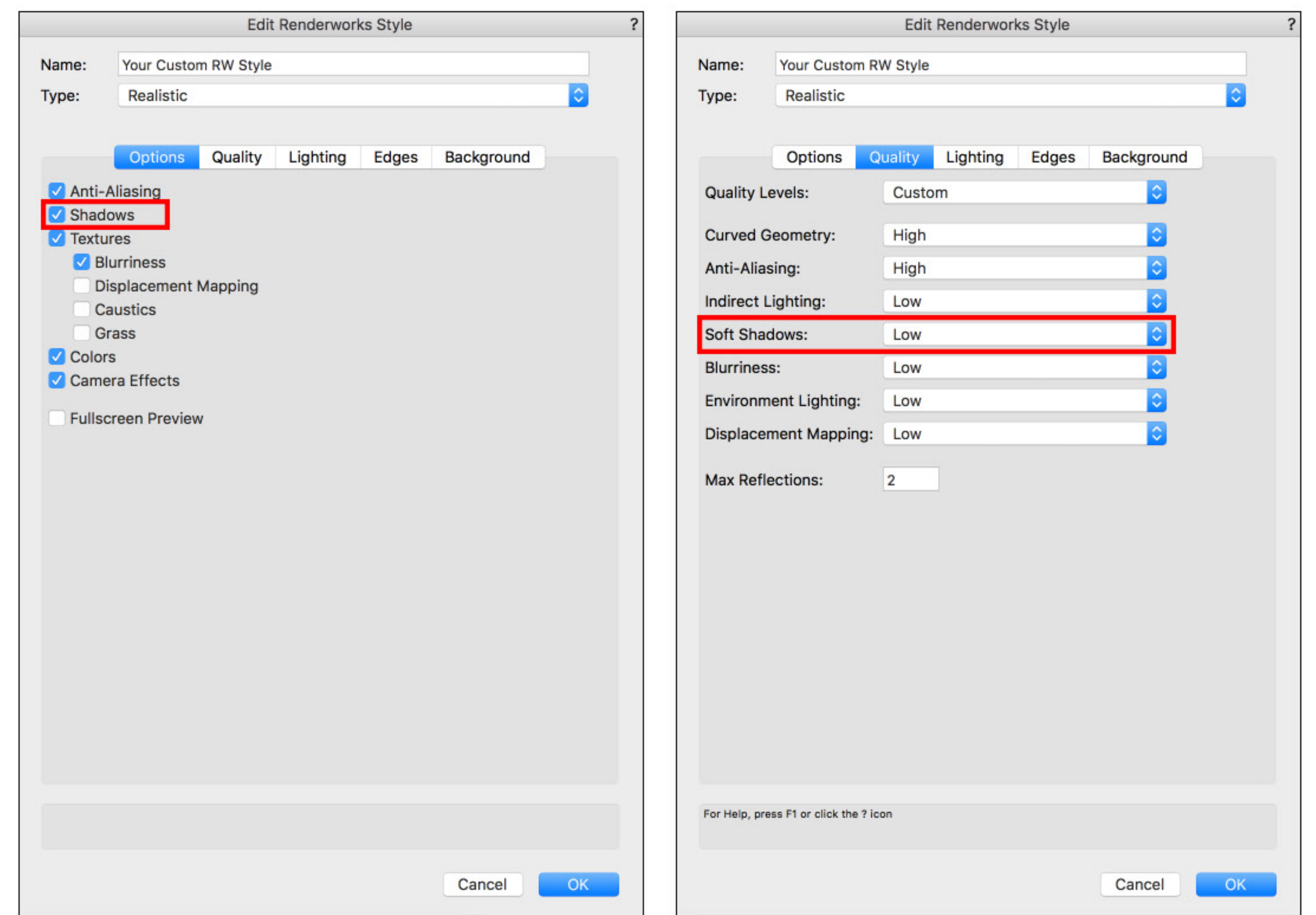
For all final renderings, AA should be ON in order to produce a realistic image. High quality is recommended. Medium might be okay if you're short on time, and Very High technically looks the best but isn't always worth the added render time.





RENDERWORKS STYLES

SHADOWS



Shadows checkbox

This setting determines whether shadows are rendered, assuming you have Lights with shadows enabled. With this setting unchecked, all Lights are rendered with no shadows.

This should usually be left checked for realistic renderings.



Soft Shadows quality setting

This setting only affects Lights which have Cast Shadows and Soft Shadows checked in the OIP. If there are no Lights using soft shadows in the file, this setting has no effect.

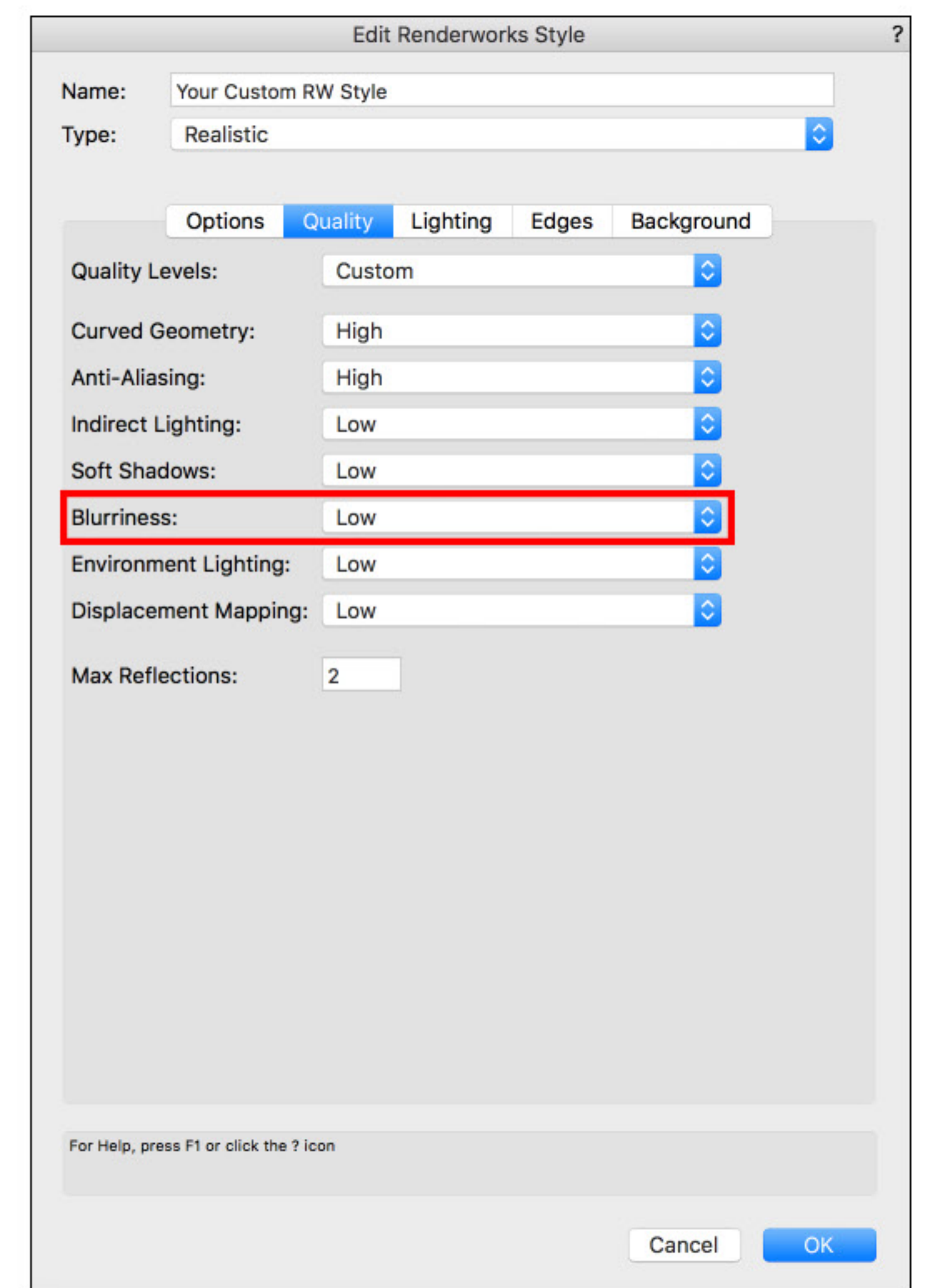
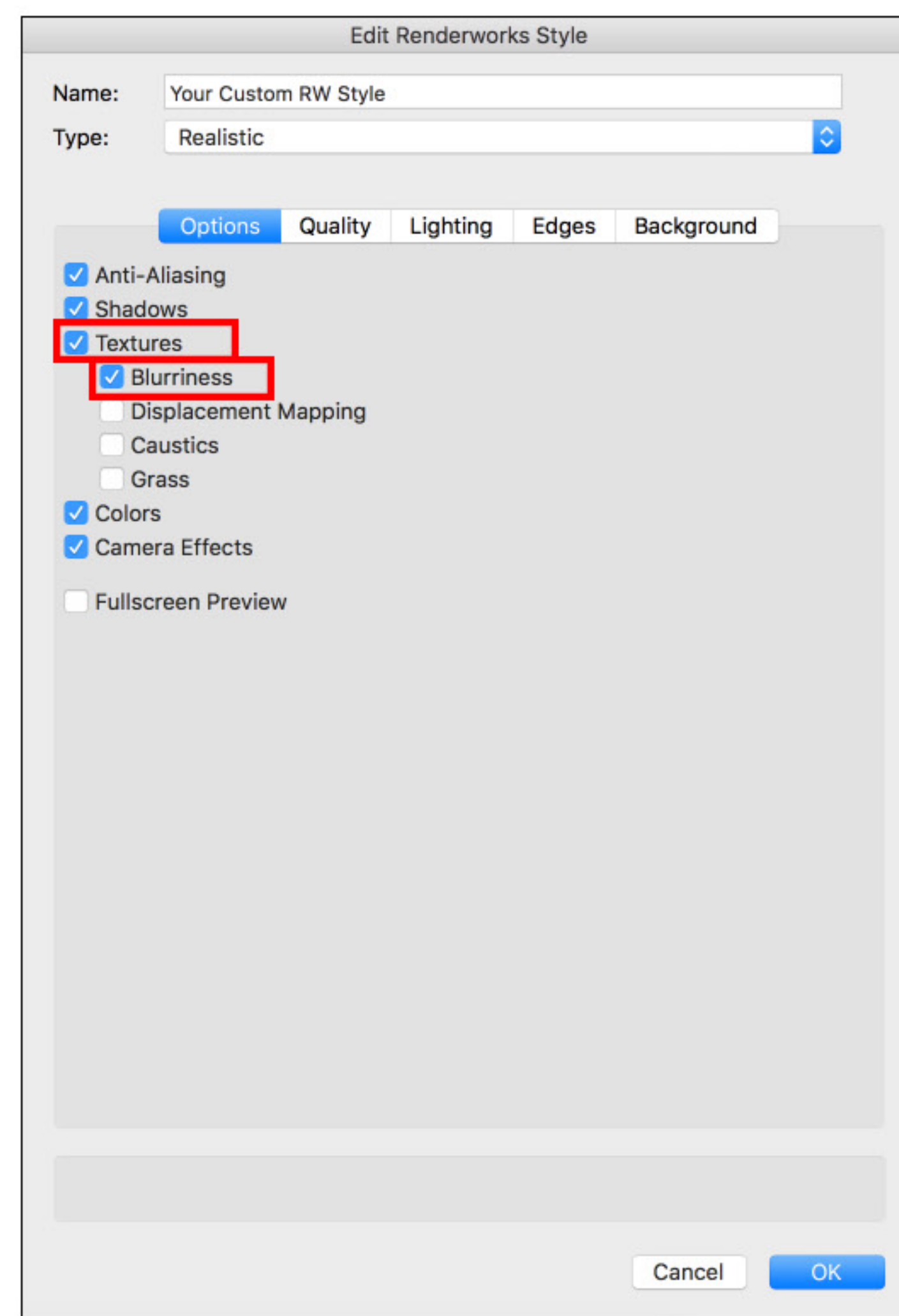
Soft shadows increase render time, but look more realistic. Only turn on a Light's Soft Shadows setting if the shadow is prominent in the rendering.

Generally the quality setting can be left on **Low**. Only turn it up if you notice soft shadows not looking smooth enough. However, the **Anti-Aliasing** setting should be increased first, as that has a more drastic affect on the smoothness of the shadows.



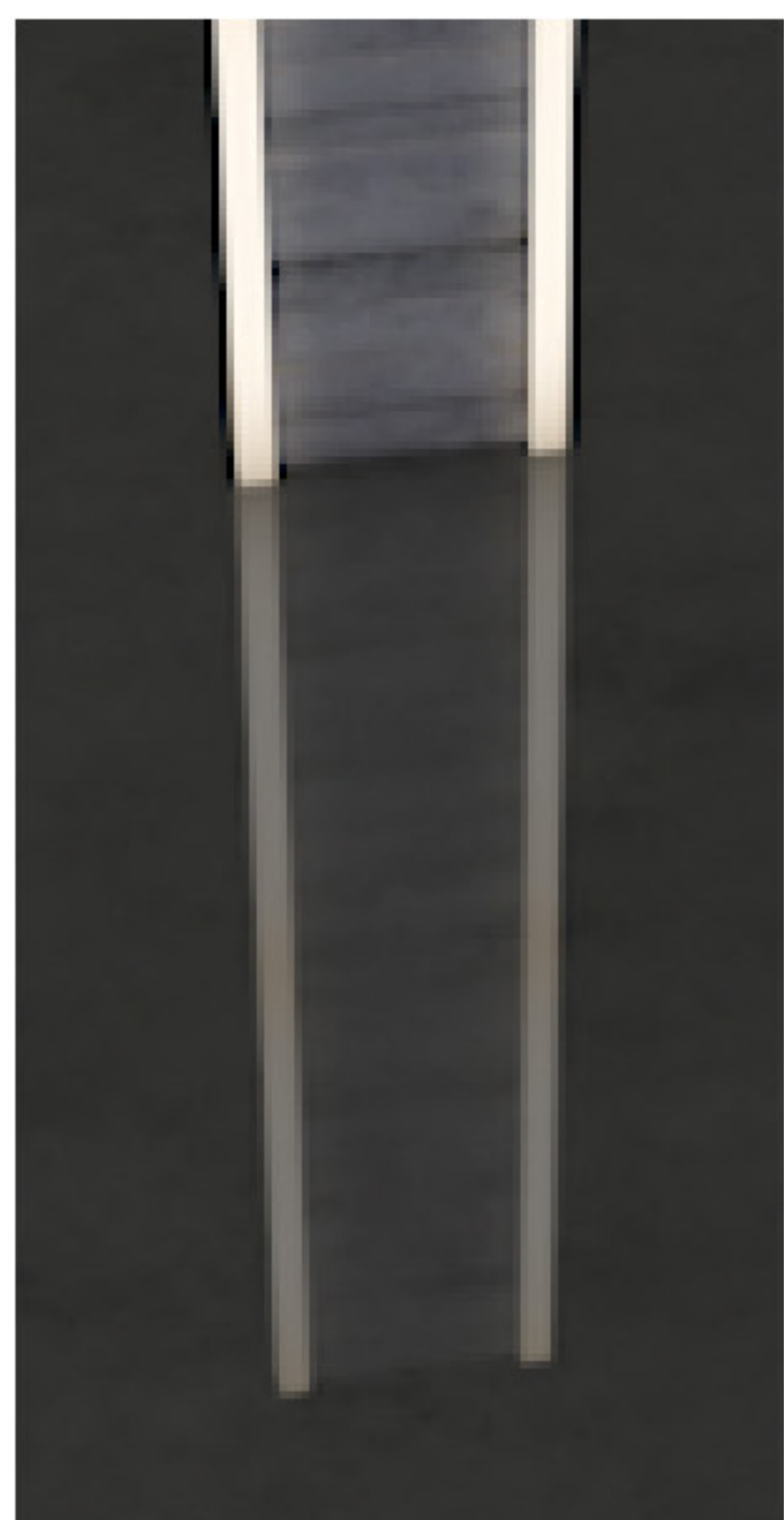
Textures checkbox

Similar to unchecking “Use Textures” under OpenGL settings, this option will render the image without any textures. This is one method to create a white model, though it also eliminates things like transparency and reflections. For example, if your rendering has glass windows, unchecking “Colors” might be a better option instead (see next page). While unchecking “Textures” will definitely reduce render times, it’s generally left on for obvious reasons.



Blurriness checkbox & quality setting

This setting determines whether blurriness will be rendered. (Blurriness is a setting that’s part of the Reflectivity and Transparency shaders of textures. Note that a low amount of blurriness does a lot; often 1-15% is plenty. Higher percentages take longer to render, but may be appropriate for some textures). If no textures with blurriness are present, this checkbox does nothing.



BLURRINESS: OFF



BLURRINESS (5%): LOW
AA: HIGH



BLURRINESS (15%): LOW
AA: HIGH



BLURRINESS (15%): LOW
AA: LOW

Blurriness is a very “expensive” element, meaning it adds a lot of render time. However, it also helps make a great jump towards realism when used effectively.

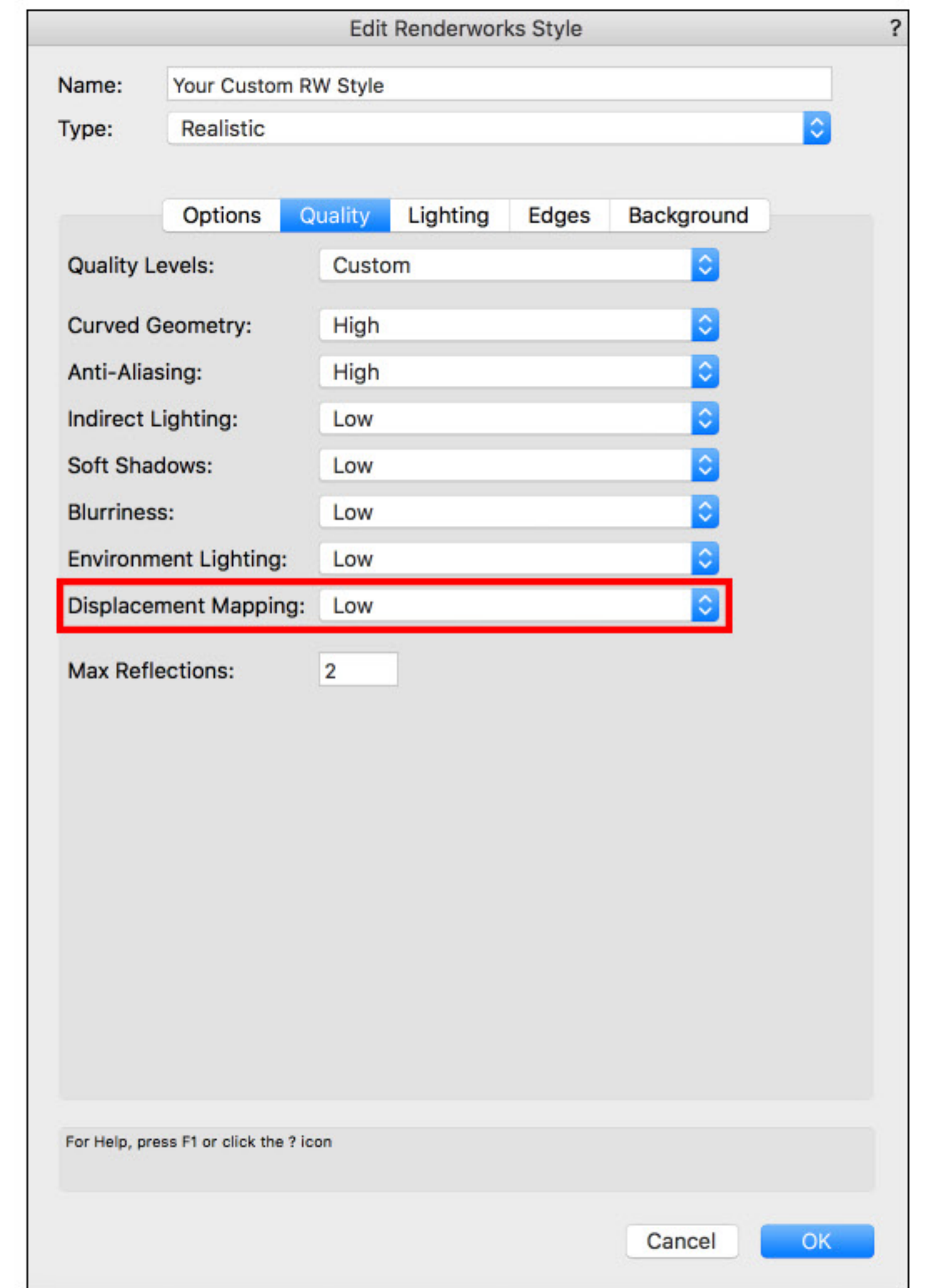
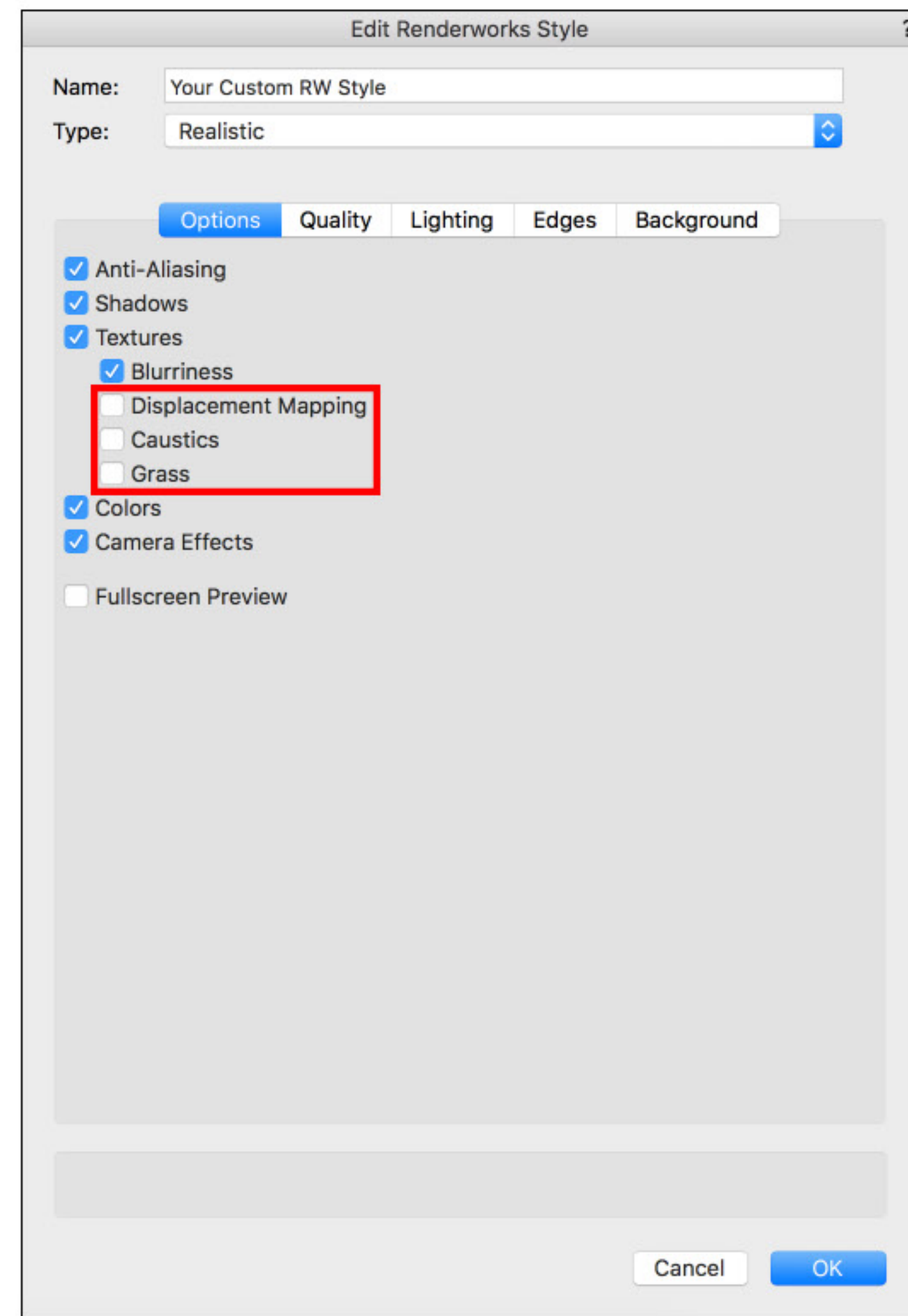
For the fastest renderings, blurriness can be left off completely. When analyzing specific blurry textures and when processing final renderings, **turn blurriness on**. Similar to the Soft Shadows quality setting, blurriness can be left on **Low** and turned up only if needed (particularly for blurred *transparency* textures such as milk plexi). Note that **the Anti-Aliasing quality should be increased first**.



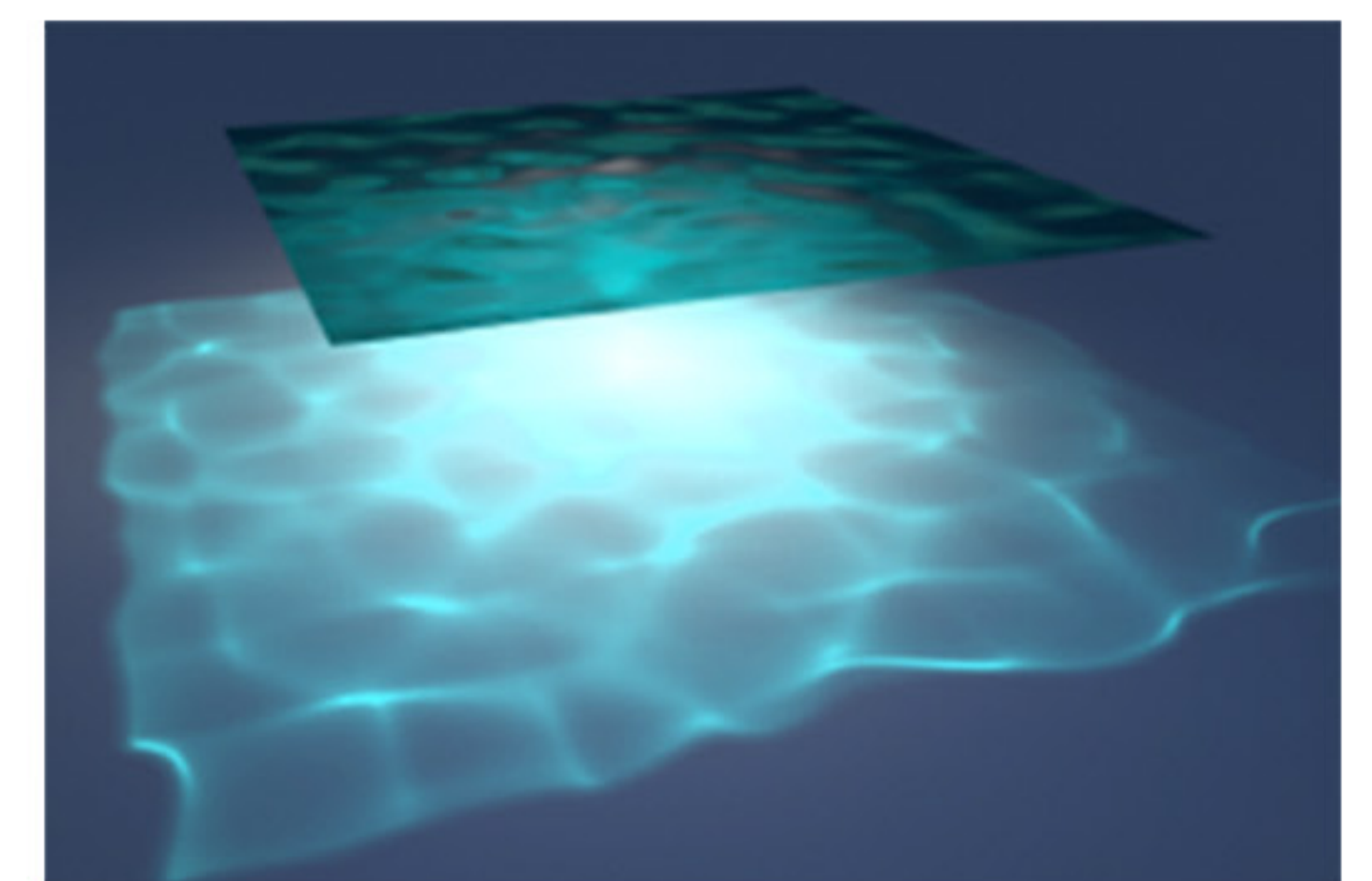
RENDERWORKS STYLES TEXTURES, CONT.

Displacement Mapping (DM)

Displacement Mapping allows surfaces to appear physically bumpy or embossed when rendered, without actually modeling the deformations. It's a setting applied within the **Bump** shader of textures. DM adds a lot of render time, which depends on various factors including the detail settings in the texture definition, the size of the object it's applied to, and the DM quality settings in the RW Style. Leave DM turned **off** unless you're specifically looking at a DM-enabled texture, or are doing final renderings.



Caustics



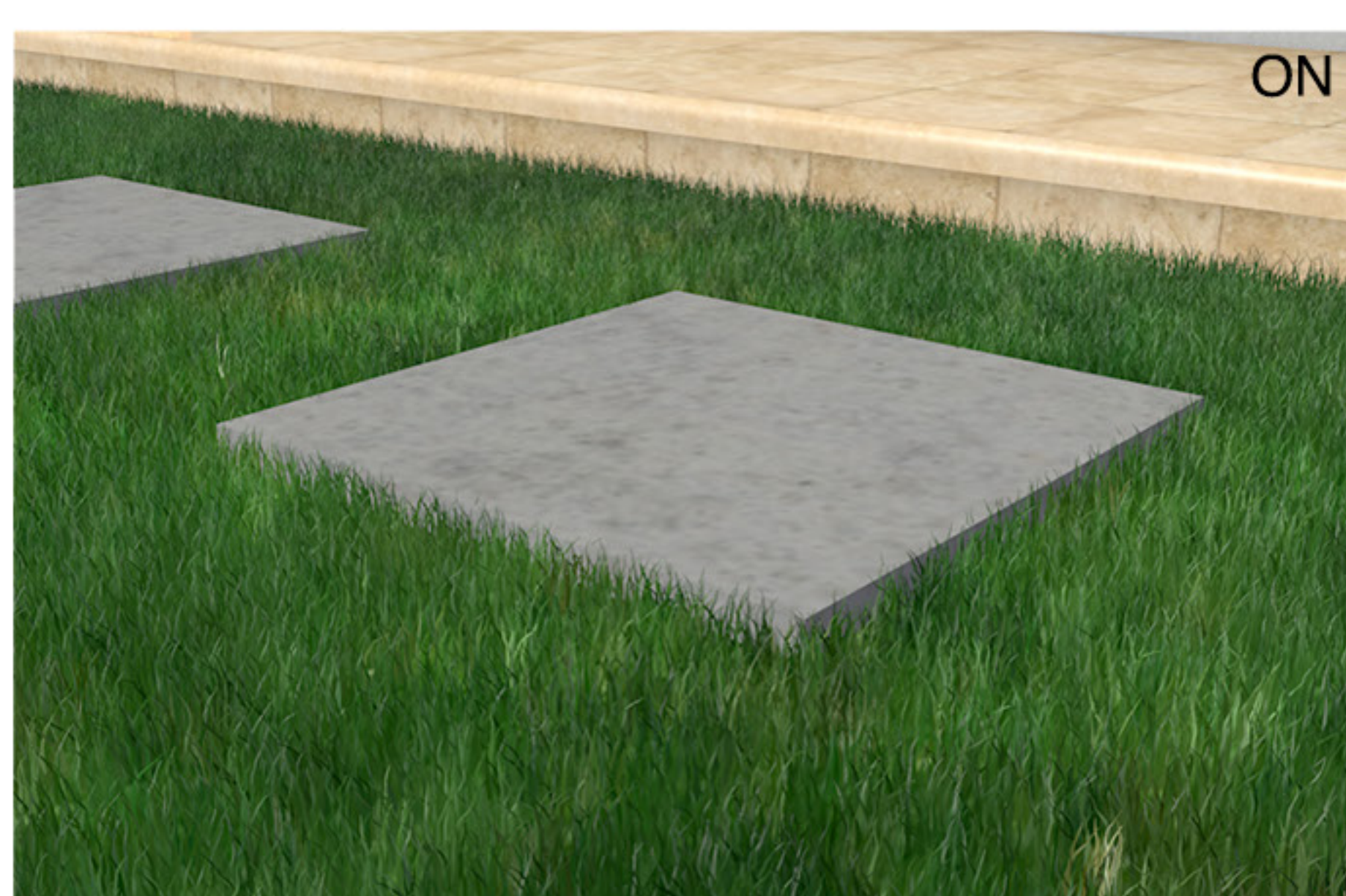
CAUSTICS

Caustics refers to physically accurate raytraced photons, usually used to create the hot spots seen when light passes through materials such as **glass or water**, refracting in such a way as to create patches of light. Caustics can also be used to show light bouncing off mirrors and hitting other surfaces.

This checkbox determines whether caustics are rendered, and only works if you have a **Light object** with Caustic Photons enabled (note that such lights are generally set around 500% brightness or more and are set to Show Caustics Only).

Grass

This checkbox determines whether grass blades are rendered. Grass is a setting within the **Color** shader of textures. When unchecked, all other aspects of grass textures will still be rendered, just without the blades. (Note that grass is also useful for rugs & fur).

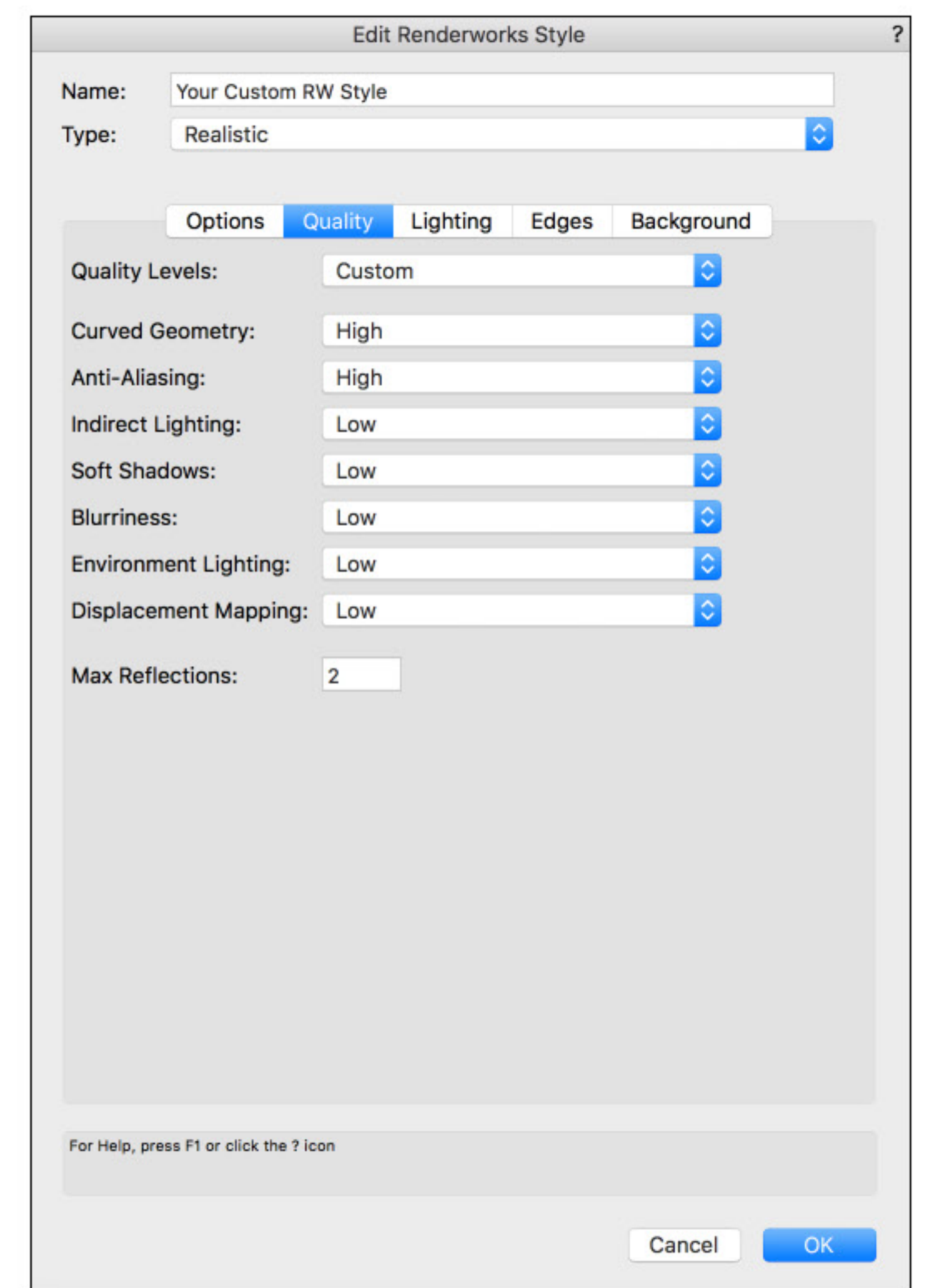
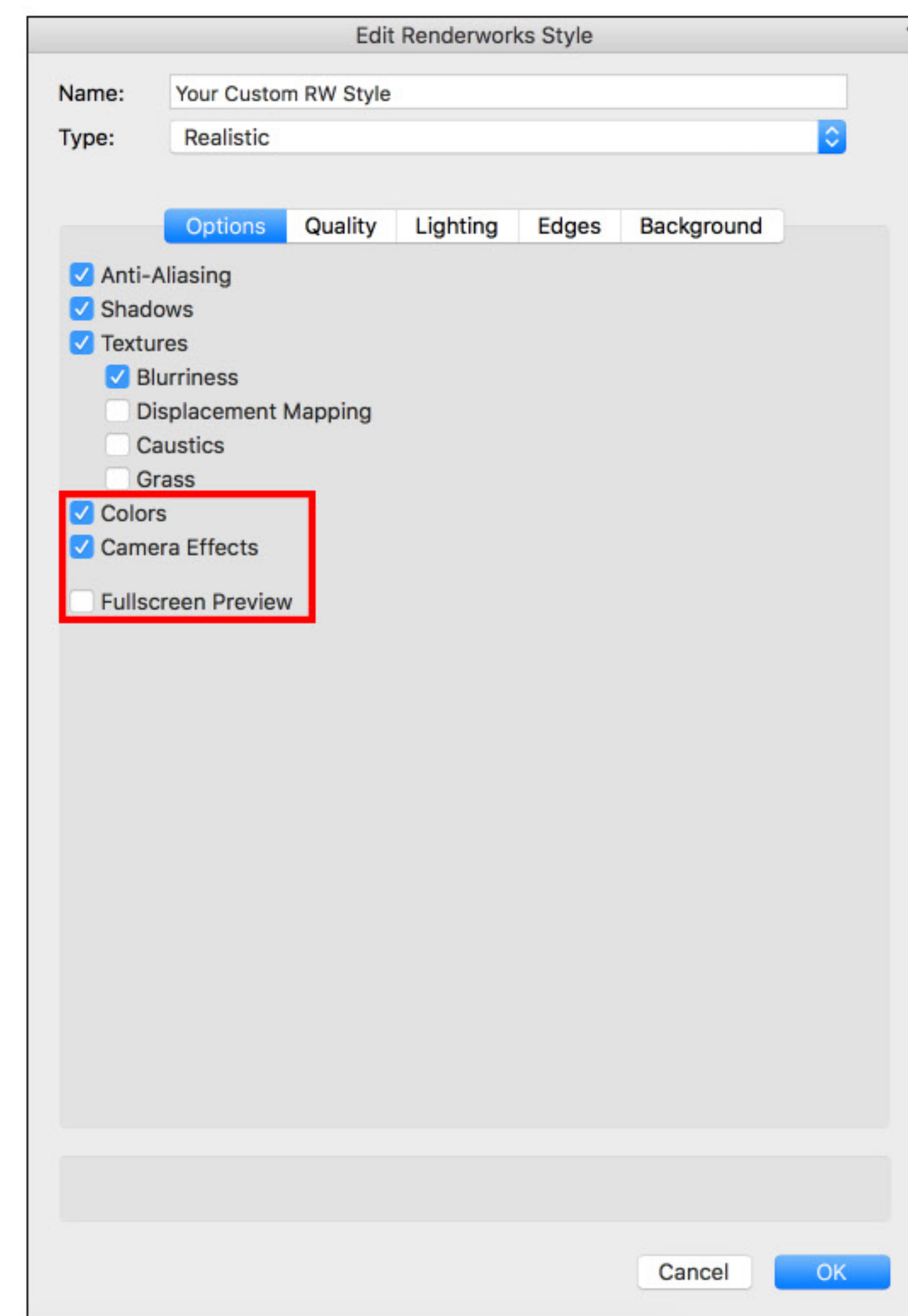




RENDERWORKS STYLES OTHER OPTIONS

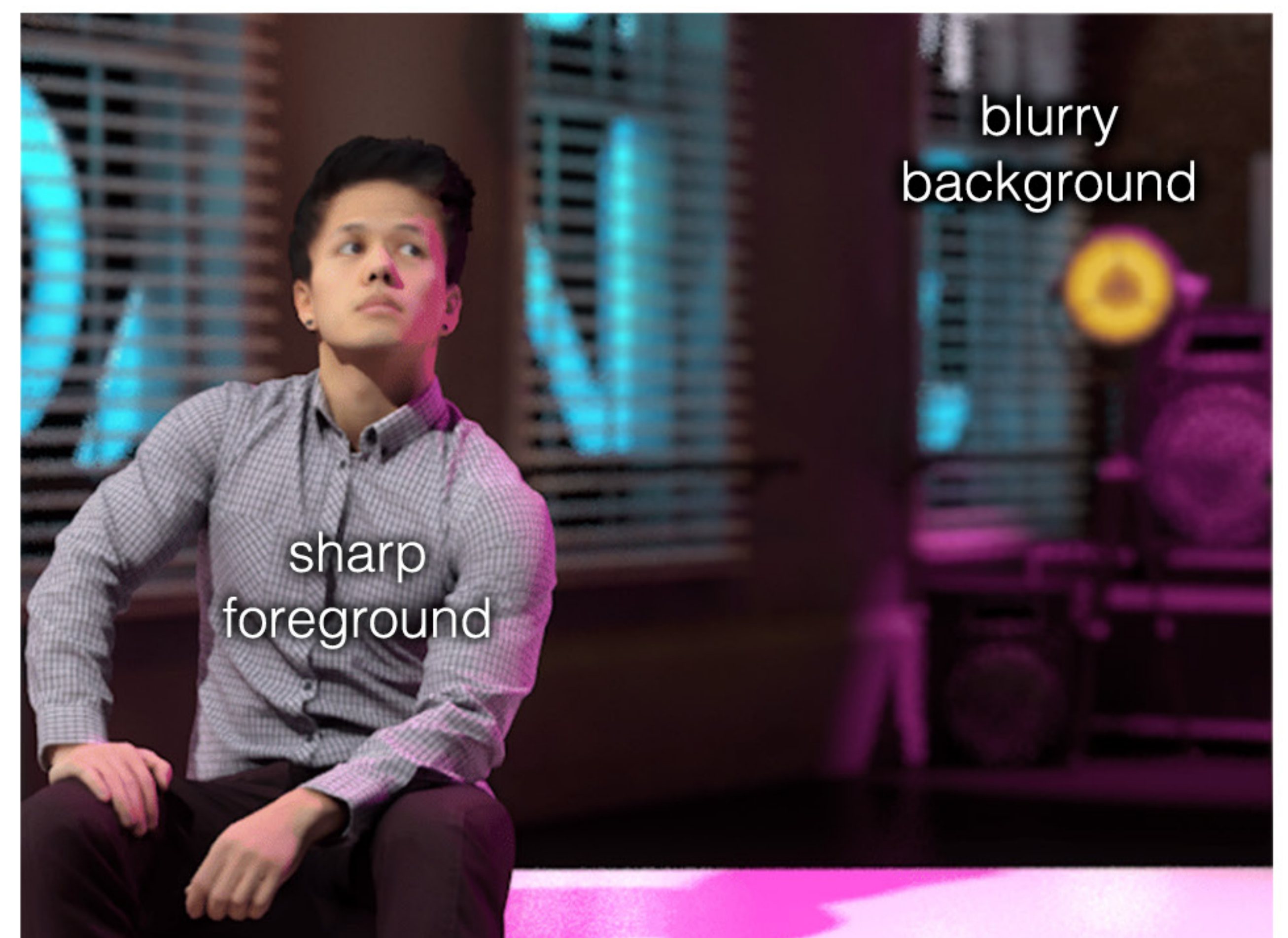
Colors checkbox

Unchecking this checkbox will render the image with a **white model effect**. All Fill colors are rendered as white (for un-textured objects), and all Color shaders are disabled (for textured objects). Unlike the “Textures” checkbox, unchecking “Colors” will still render the Reflectivity, Transparency, and Bump shaders of textures.



Camera Effects checkbox

This checkbox enables camera effects which emulate real-life cameras. These include aperture / exposure settings, bloom, vignetting, & chromatic aberration. Camera Effects are often used to show **Depth of Field** (where the background falls out of focus, for example). Note that the viewport must have an embedded Renderworks Camera with camera effects enabled.



Fullscreen Preview checkbox

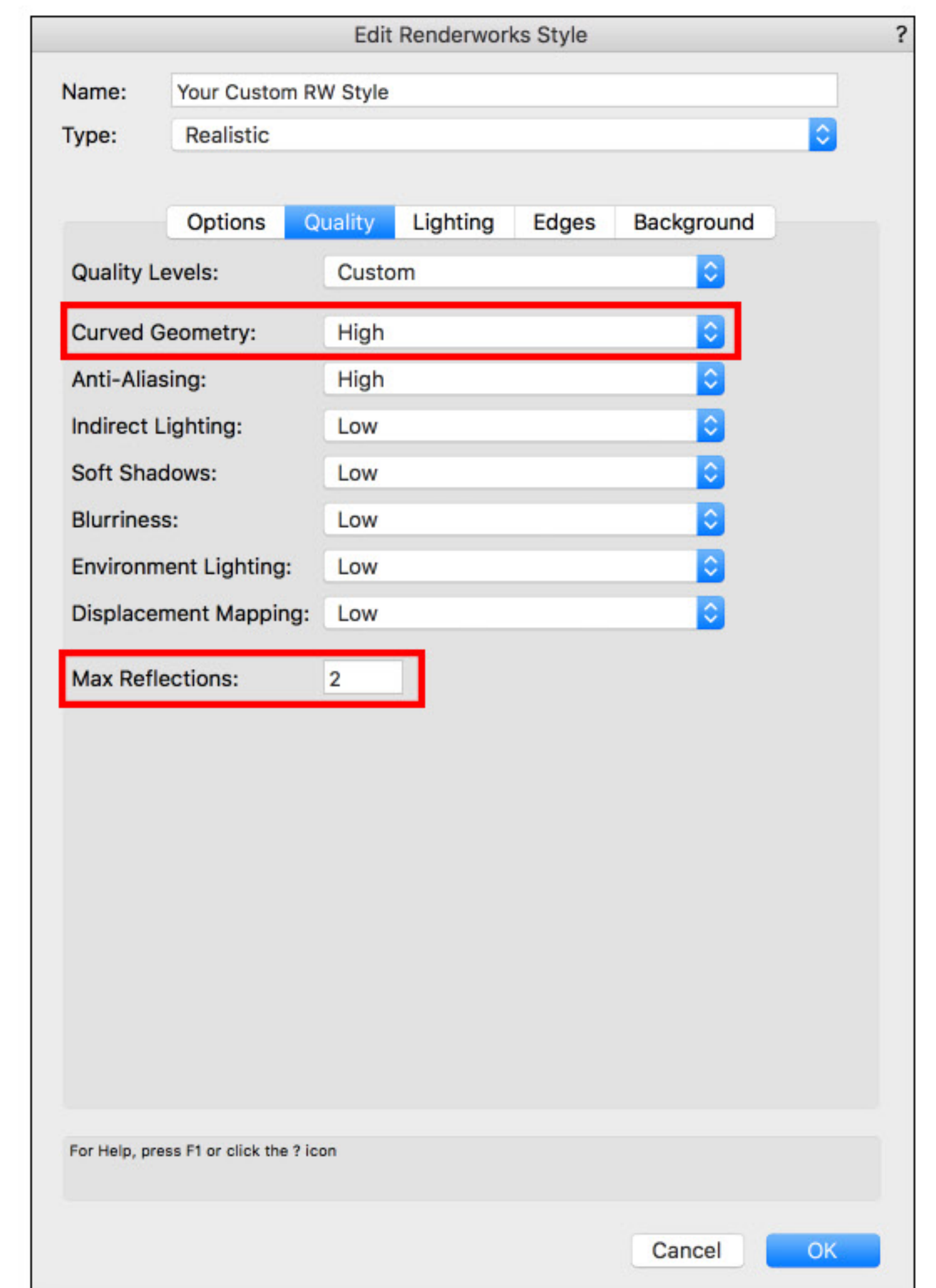
When this checkbox is enabled, the entire render will start coming into view at once, starting blurry at first then improving with subsequent passes. This function allows you to more quickly get a general sense of what the rendering will look like, so you can make judgments sooner. Conversely, when this is unchecked the viewport renders small squares starting at the center of the image and working outwards, but each square is the final state of the render.

It is personal preference whether to utilize this function, but it should only be used for test renders and not final renders, because even though you can see an overall low-quality image sooner, it actually takes slightly longer to finalize the rendering process compared to when the function is turned off. Therefore it's useful only if you're actively “watching” the render happen.



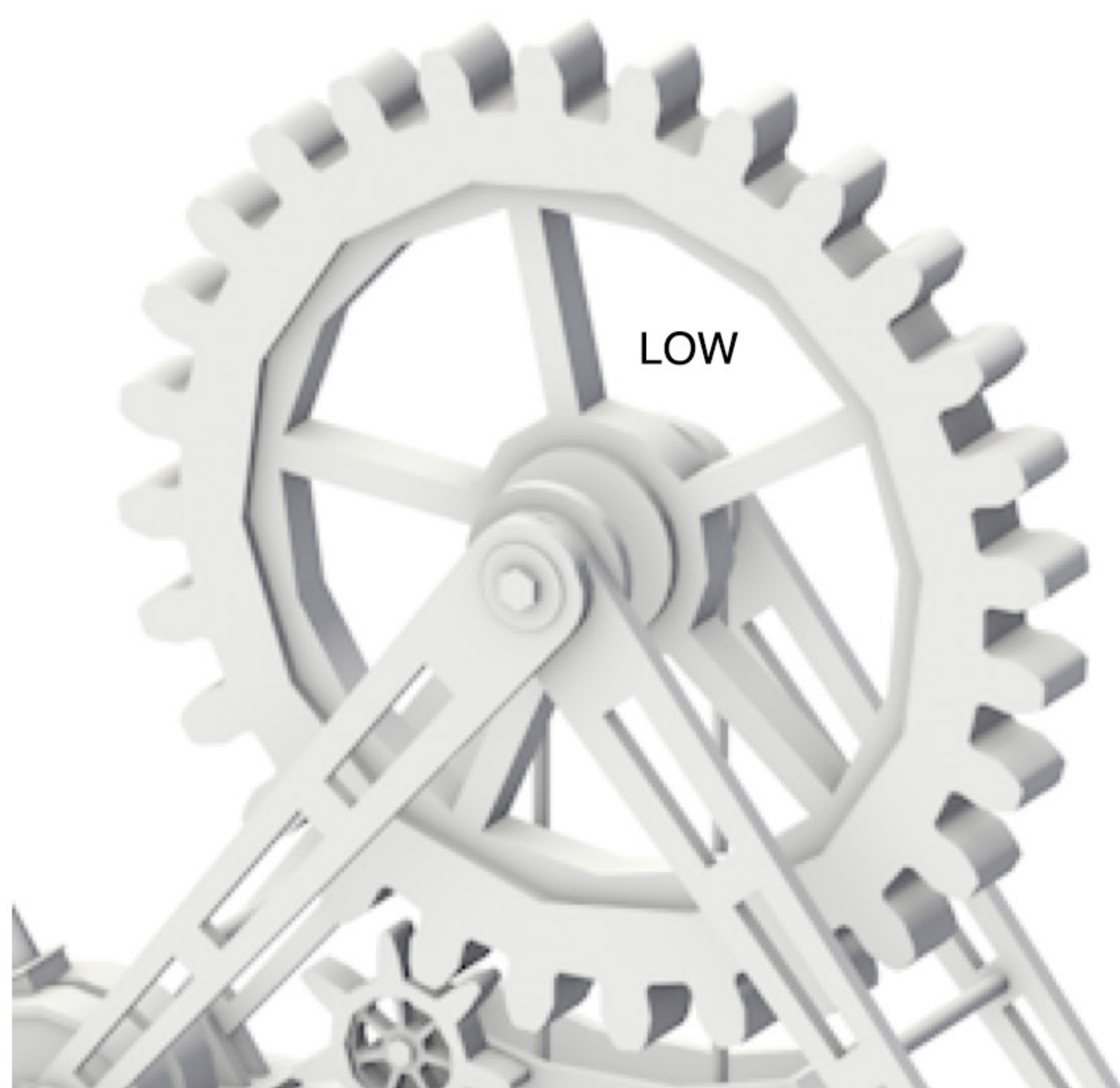
RENDERWORKS STYLES

OTHER QUALITY SETTINGS



Curved Geometry quality setting

This controls how faceted curved objects appear. Typically leave this on **High**, and turn it down only for complex renderings when you want to reduce render time. Turn it to Very High if you have large curved edges that are noticeably faceted in your rendering.



Max Reflections

This determines how many “levels” of reflection are rendered. Imagine you’re looking at a mirror. You see the reflection of another object in the room; this is “1” reflection. If that second object were another mirror, you could see it reflected in the first mirror. However, you wouldn’t see what that second mirror is reflecting unless Max Reflections is “2” or higher. If this parameter is set to “0”, even the first mirror would just appear flat and unreflective.

Note that this affects any reflective surface, not just full-on mirrors.

It’s fine to leave this at the default “3”, though you can reduce it to 2 or 1 to save some render time. Conversely, if you were rendering a Yayoi Kusama *Infinity Room*, you’d need to increase this number quite a bit to get that recursive mirror effect.

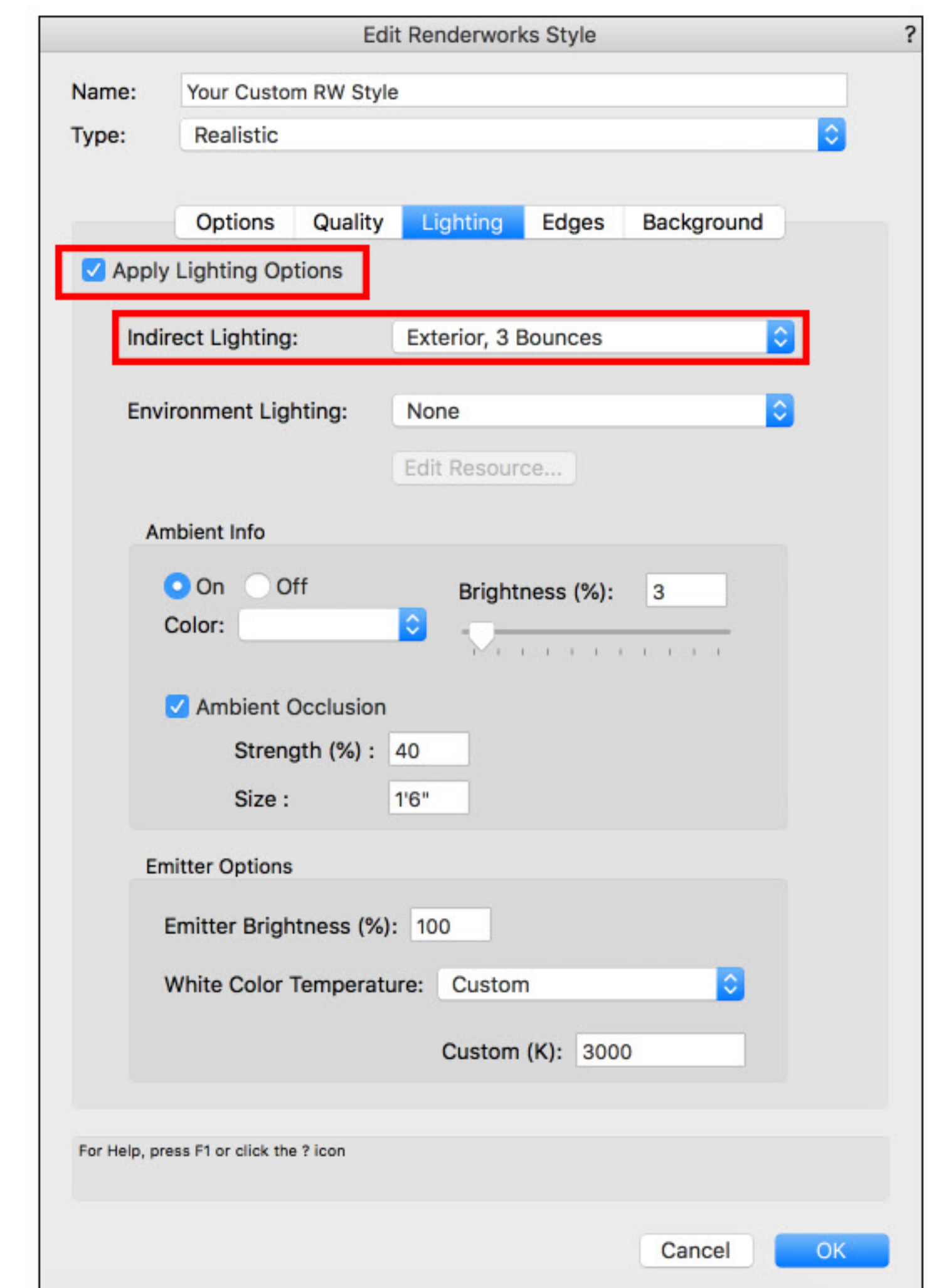
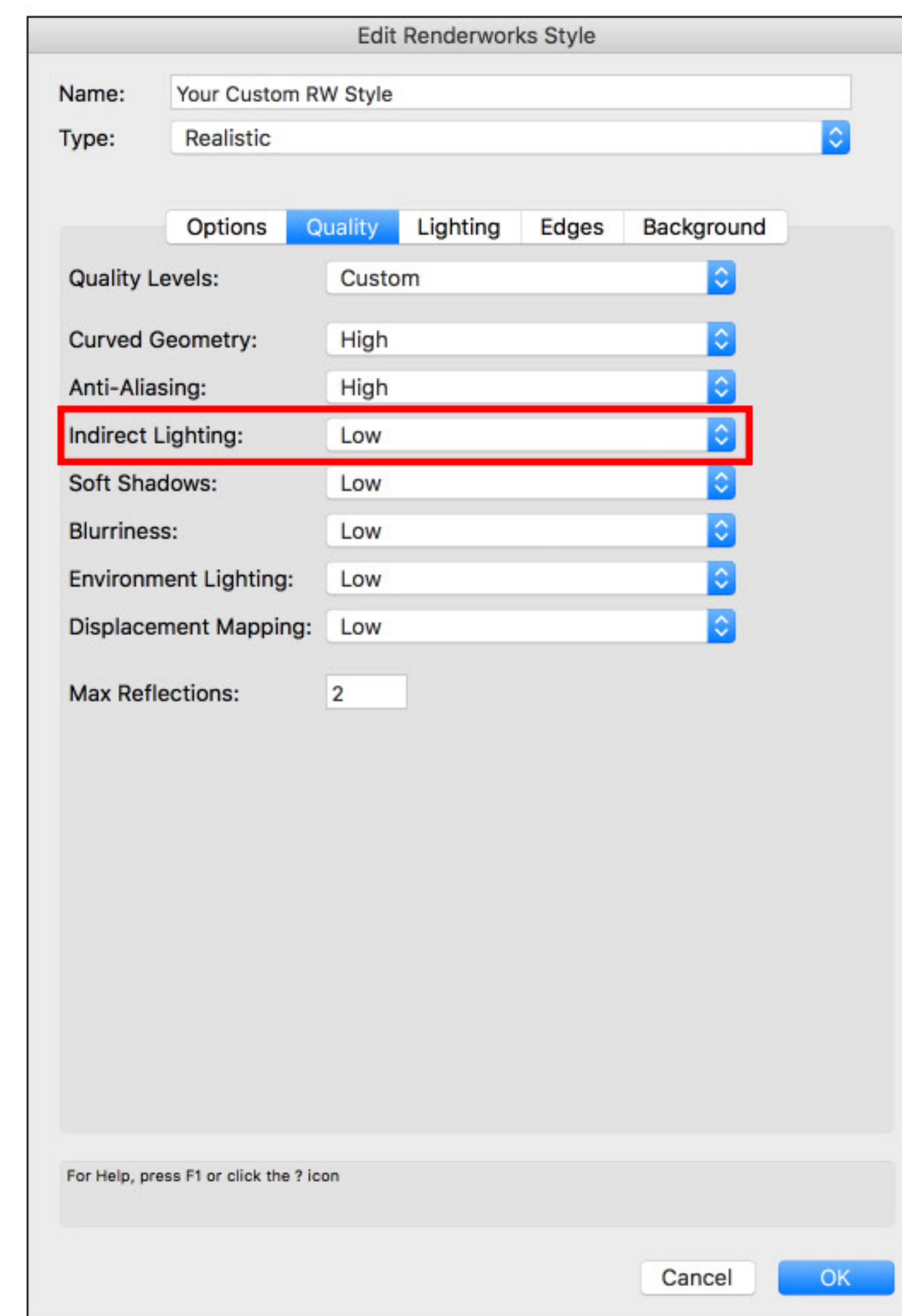


RENDERWORKS STYLES

INDIRECT LIGHTING

Apply Lighting Options?

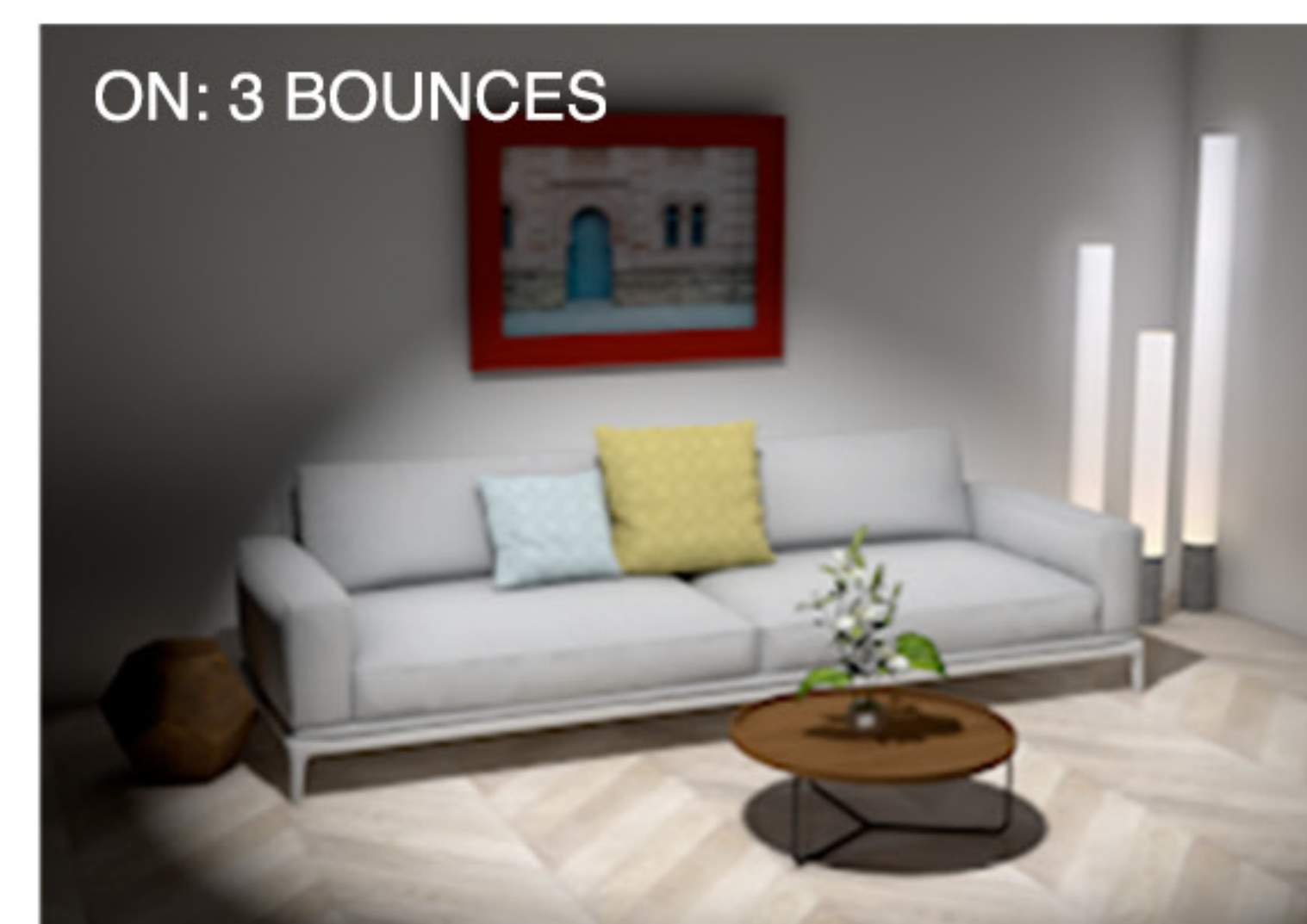
This checkbox determines whether the settings listed on the Lighting Options tab are controlled by the RW Style or are determined for each viewport separately. Usually this is **checked** so that the RW Style controls these settings for all viewports.



What is Indirect Lighting?

In Vectorworks, when you aim a Light at a surface, the “photons” hit the surface and then stop by default. These photons directly from the light source could be called “Direct Lighting” meaning they illuminate the surface but don’t bounce any further. “Indirect Lighting” is when those photons continue to bounce around the room and affect additional surfaces like they would in real life. This usually results in a much more realistic-looking render, particularly in images with shadowy areas.

While photons in real life bounce almost infinitely, in digital rendering it only takes a couple bounces to achieve a good look. In VW you can choose between 2, 3, 4, and 16 bounces (the “Exterior/Interior” names are just labels, and aren’t necessarily related to what you’re rendering). While Indirect Lighting adds render time, it’s usually worth it to render with **at least 3 bounces**. This can be increased to 4 for higher quality; 16 should be reserved only when absolutely needed (such as very dark scenes) since it adds a considerable amount of render time for only slightly better results. Additionally, textures with Glow reflectivity set to “Emit Light” need Indirect Lighting turned on in order to actually emit light. Depending on the textures and lighting in your scene, it may be appropriate to turn off Indirect Lighting, but otherwise leave it on.



Indirect Lighting quality setting

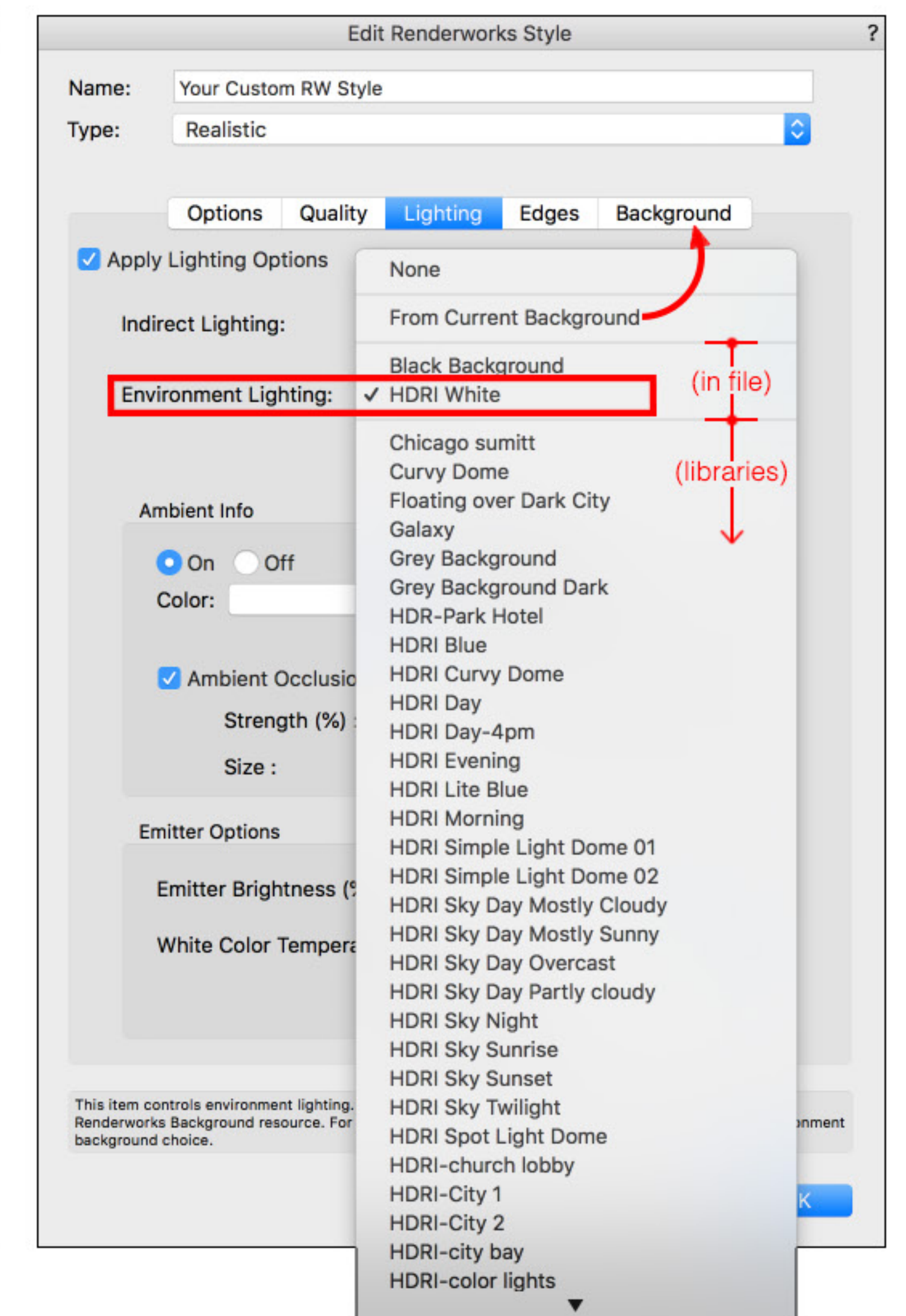
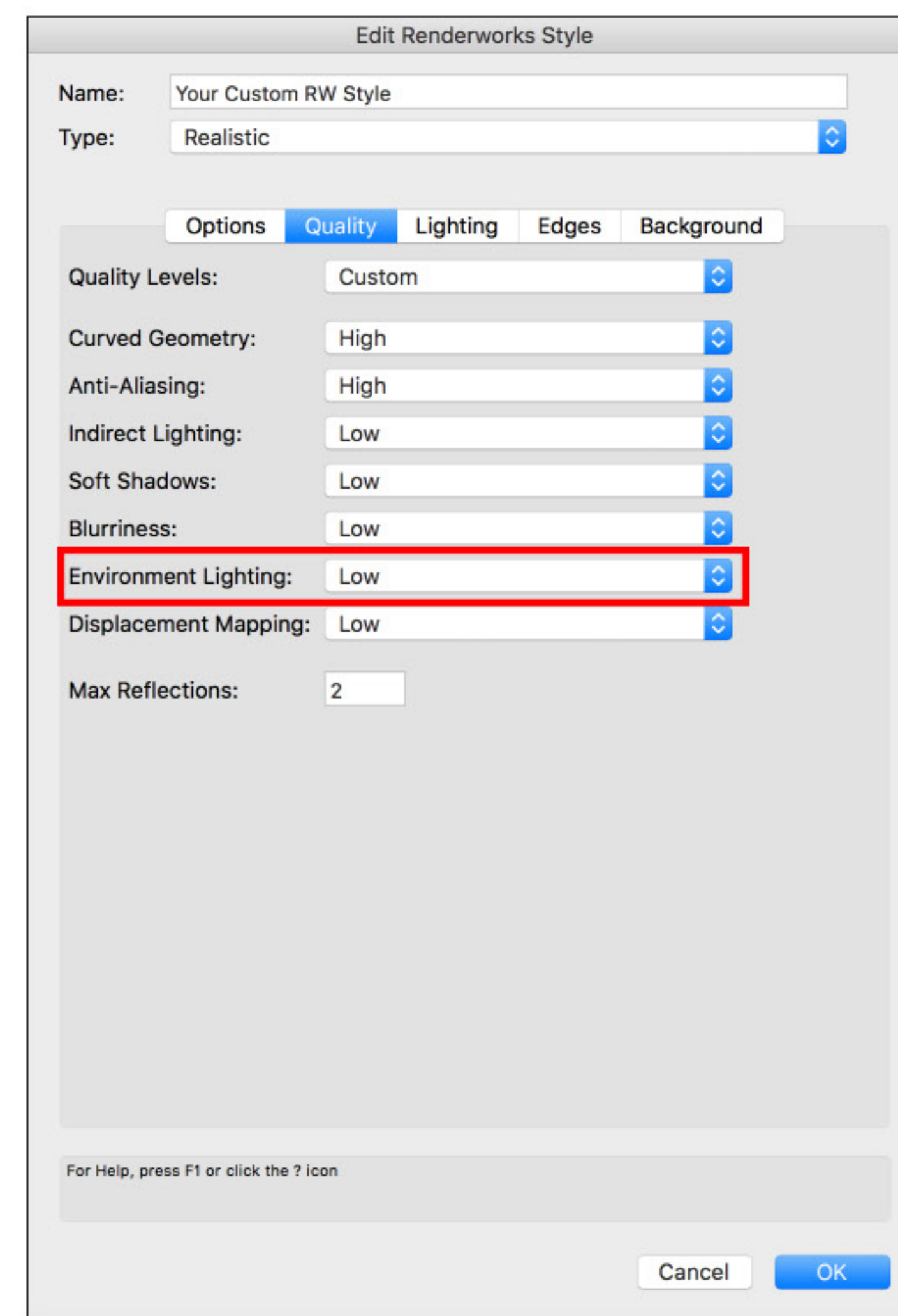
Indirect Lighting quality is determined on the Quality tab. You can usually start with this on Low and increase to Medium or High for final renderings. Increasing the quality is particularly recommended for darker renderings or when you notice splotchy lighting.



RENDERWORKS STYLES ENVIRONMENT LIGHTING



LIT SOLELY W/ HDRI-WHITE



What is Environment Lighting?

Environment Lighting allows your scene to be illuminated from a Renderworks Background, almost like a giant bounce cyc surrounding your model which shoots photons inwards towards your model. These photons bounce around (like Indirect Lighting).

Environment Lighting does not work in completely enclosed models (such as inside a windowless room with 4 walls, a floor, and ceiling). It must be an exterior model, or have no ceiling, or have openings to the outside world.

The attributes of the light produced depend on the type of RW Background (Physical Sky vs Panoramic Image, for example, which work differently). The best lighting is produced by **HDRI backgrounds**. “HDRI-White” is a good starting point to use for basic, bright illumination of a model, and is often employed for white models.

Environment Lighting can be set to match the visible RW Background as per the Background tab, or you can choose a separate one from the dropdown. You can also leave it set to “None” if you want a visible RW Background that doesn’t affect the lighting of the scene (this is common).

Environment Lighting quality setting

Start with this at **Low**. If your rendering is lit solely by Environment Lighting, you’ll probably want to turn this up to Medium or High, and also increase Anti-Aliasing quality. On the other hand, if there are additional Lights in the scene, you’ll likely be able to leave Environment Lighting set to Low, even for final renderings.

Note that this quality setting only has an effect when Indirect Lighting is turned off. When Indirect Lighting is on, the Indirect Lighting quality is used to determine Environment Lighting quality (since they both work by bouncing photons).



RENDERWORKS STYLES

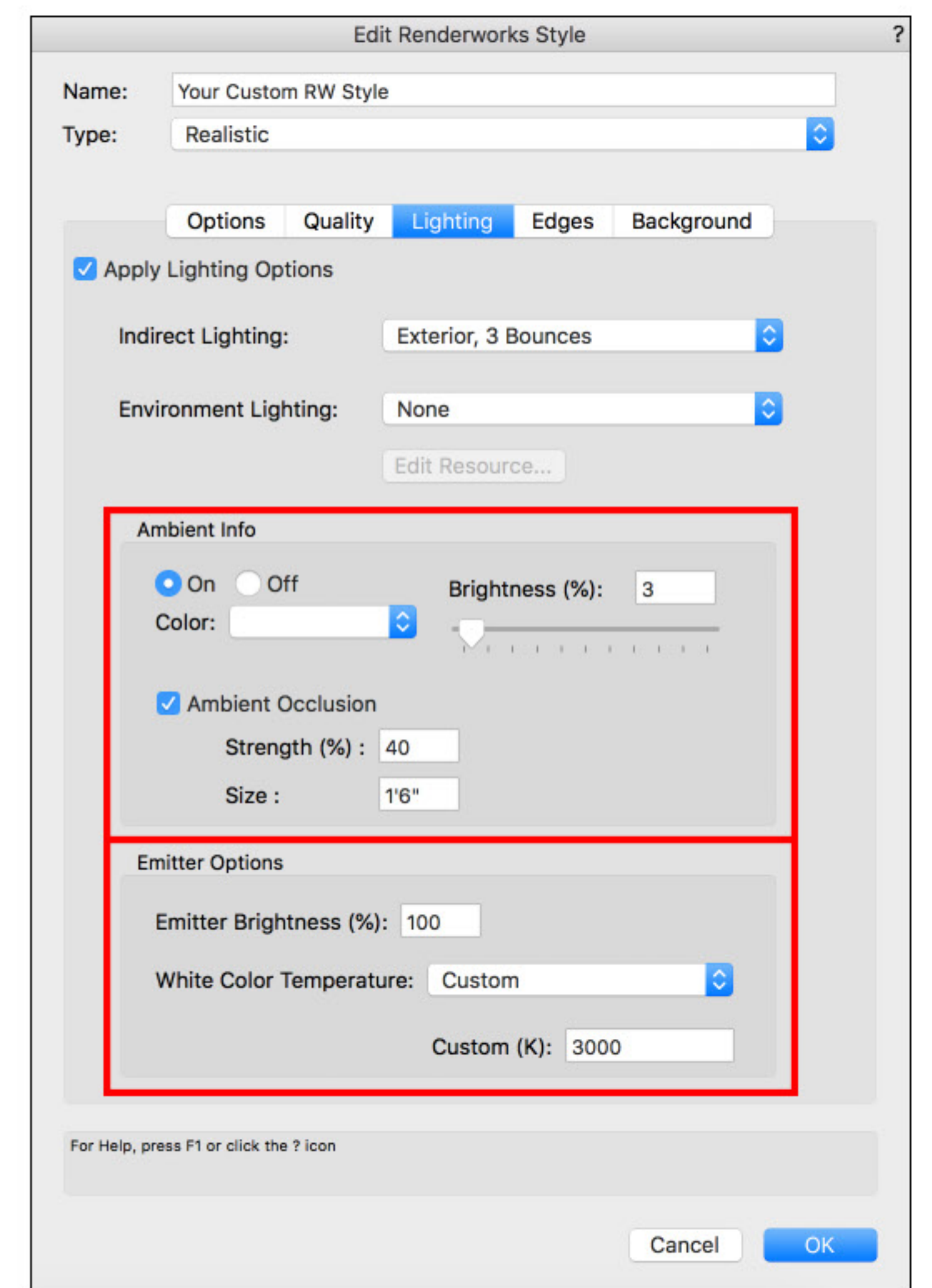
AMBIENT INFO



BRIGHTNESS 3%



BRIGHTNESS 50%



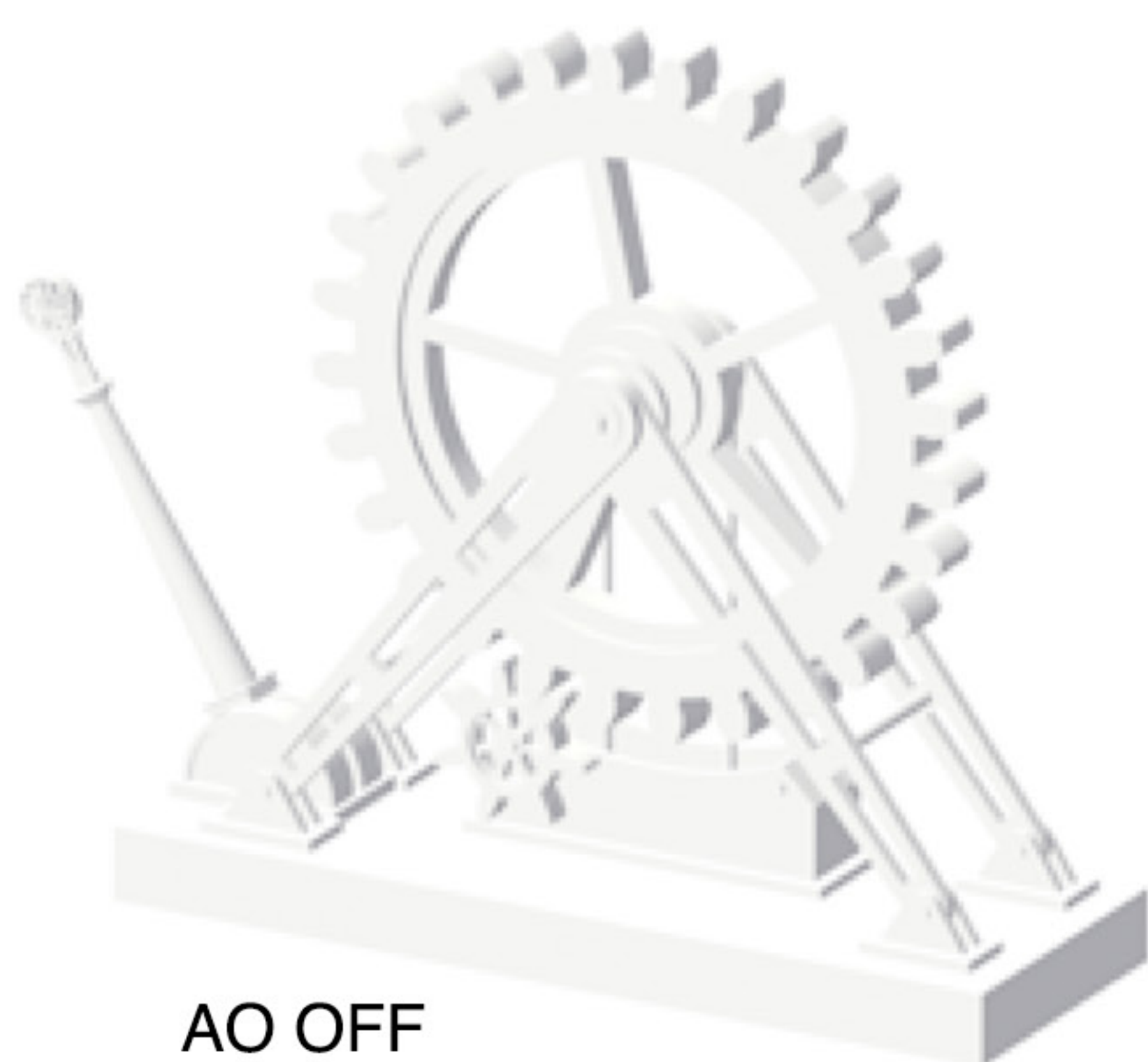
Ambient Info

Leave the button set to “On” for this section.

“Brightness” controls the smooth, all-directional fill light within the rendering. Because of its uniformity, this light fills in shadows and often creates washed out, unrealistic, digital-looking renderings. This Brightness setting is great for working/modeling in OpenGL, but generally should be **lowered to 0-5%** for Renderworks renderings (depending on your scene). Better methods for brightening a scene include adding more lights (Point lights are great for general fill), or using RW Camera Exposure.

Ambient Occlusion (AO)

Ambient Occlusion darkens corners and crevices in a rendering, artificially emulating the fact that there are fewer photons bouncing around that reach into corners. AO is a quick way to add a more realistic feeling of depth, and should be left **on**. The strength and size can be adjusted freely depending on the scale, color, and brightness of your scene. The darkness produced by AO is not the same as shadows.



AO OFF



AO ON

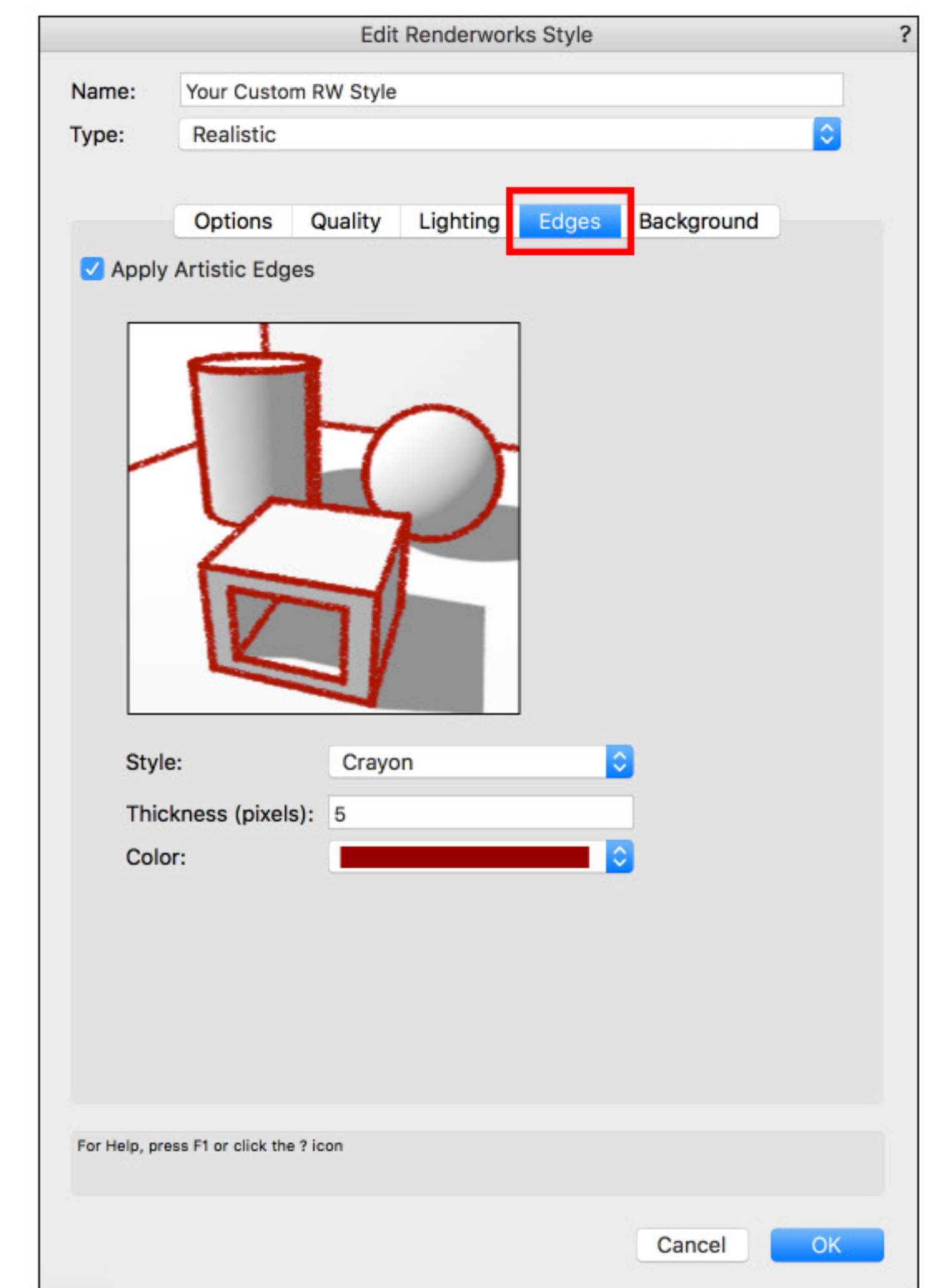
Emitter Options

This adjusts the brightness of all Light objects which have “Use Emitter” selected. Generally you can ignore this section unless you’re using the emitter.



RENDERWORKS STYLES

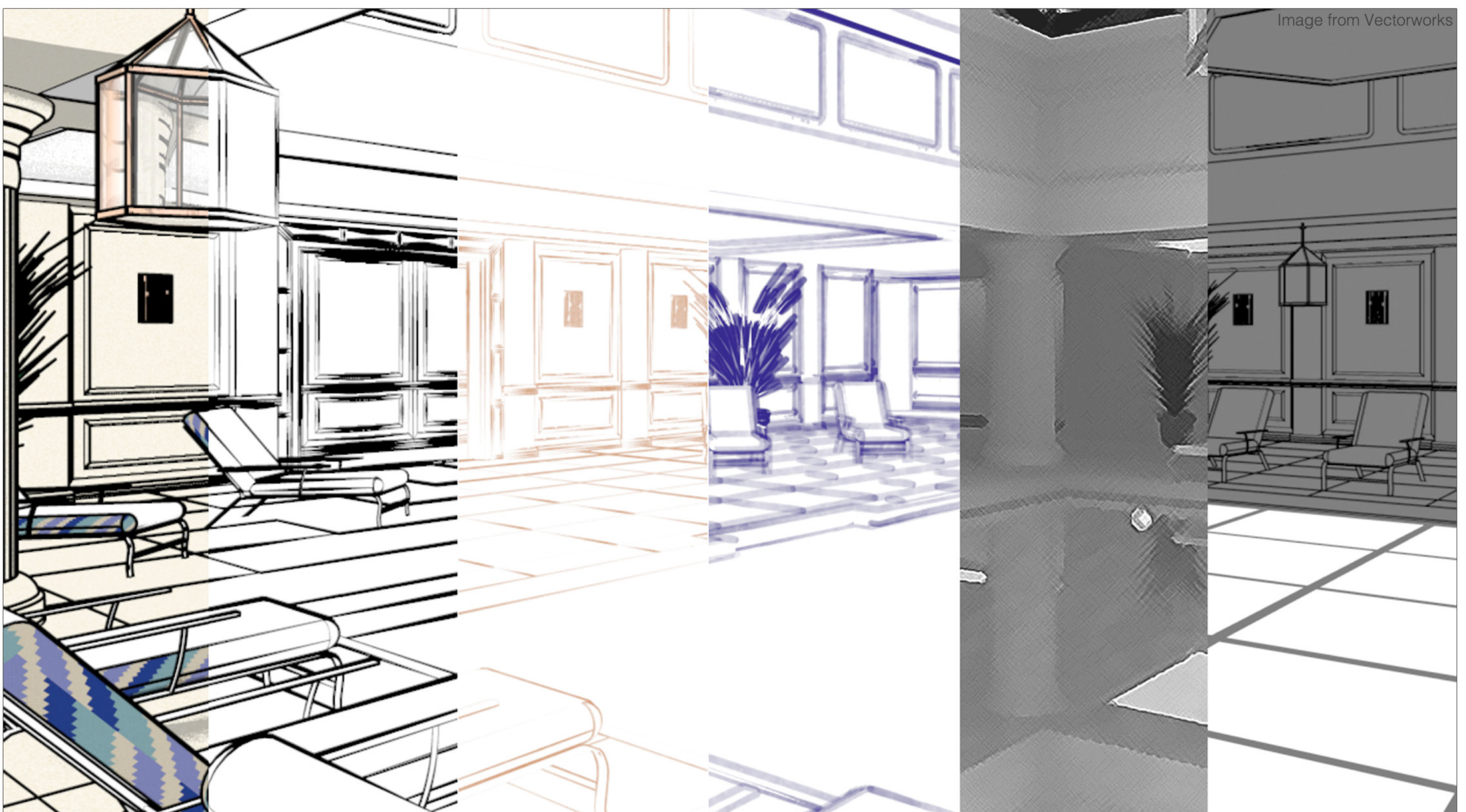
AMBIENT INFO



Edges Tab

This enables an overlay of “Artistic Edges” on top of your base rendering. Different styles can be chosen, such as Crayon, Pencil, and Watercolor, and they can be further customized with different thicknesses and colors.

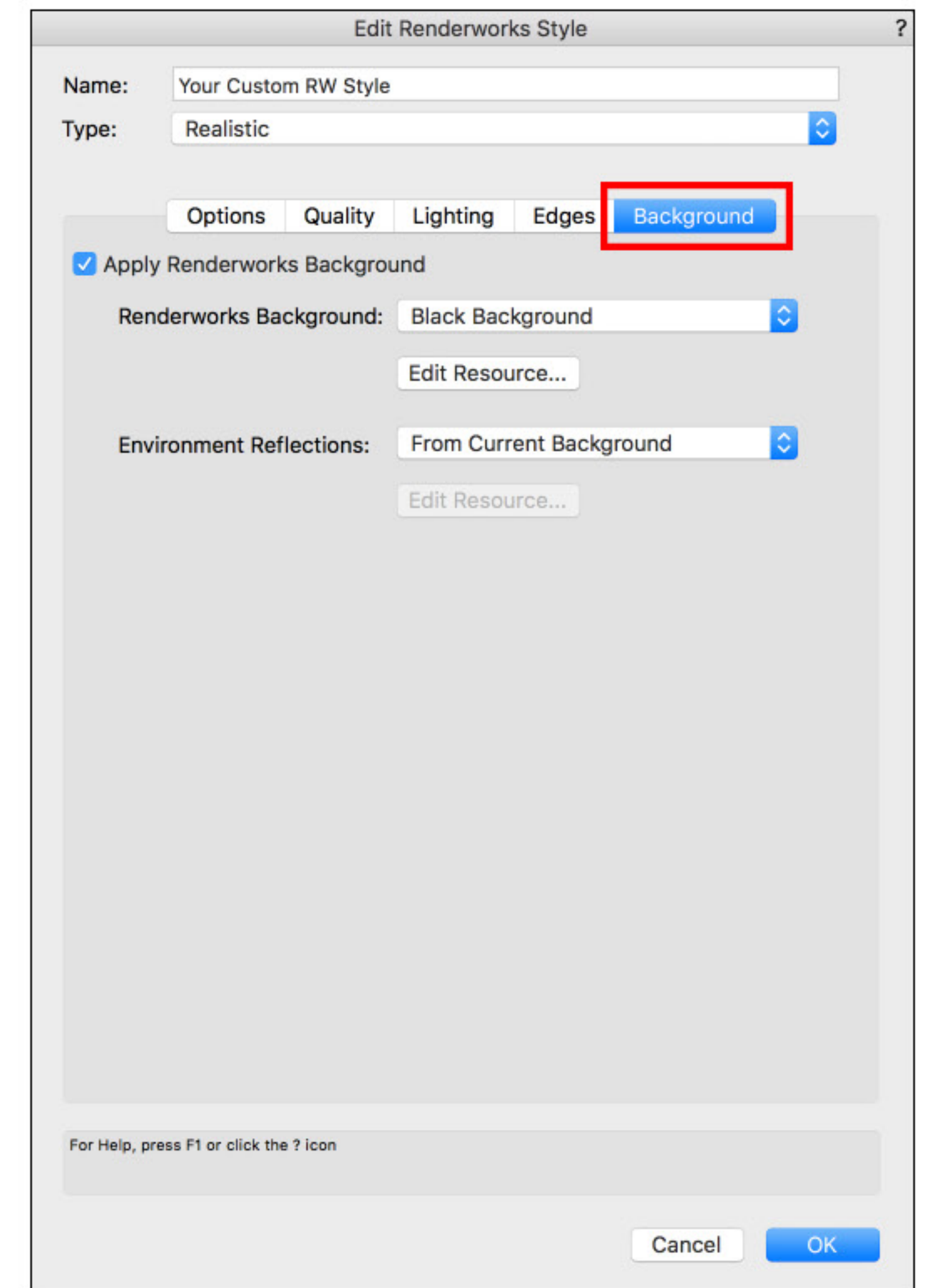
For realistic renderings this tab is ignored, but Edges can be great for sketch, concept, and development work, along with white models and other non-realistic renders.





RENDERWORKS STYLES

BACKGROUND



Apply RW Background

When checked, a RW Background can be added to all viewports utilizing that Render Style. For example, a Black Background is often used for entertainment industry renderings, and sky backgrounds are often used for exterior architectural renderings.

When unchecked, areas of the viewport with no geometry are transparent (and this alpha channel transparency can be exported into PNGs via File<Export<Export Image File). Additionally, when this is unchecked in the RW style, individual viewports can be given a RW Background in the OIP while still utilizing the other RW Style settings.



SKY BACKGROUND, ALSO REFLECTED IN POOL

Environment Reflections

By default, this is set to “From Current Background”, meaning that the RW Background is reflected in any reflective surfaces in the scene. For example, a model of a car sitting in front of a house would show reflections both of the house and the sky.

You can instead choose to have the Environment Reflections setting be different than the visible RW Background. For example, the RW Background could be set to None, but you could still employ reflections from a sky. This is useful for when you want to render an individual object with a transparent background but want to give the object something to reflect.