Depth of Field Controls

For this section, the scene described in the section ‘Building an example scene for Depth of Field’ will be used to illustrate various controls. The view will be from the right view orthogonal camera in the workspace. While in that view, you will have to zoom out to see the complete scene.

With the Default camera selected, the right view will look similar to this image. You will most likely not see all the lines shown here (the color of the lines are default at white and not seen against a white background). The use of each line will be explained in detail. The labels will give you points of reference in the scene.

In order to control the depth of field (which areas are in or out of focus through the depth of the image) you have to activate the camera parameters. The main control is the Depth of Field which is a toggle and the F/Stop adjustment. The Focal Distance and F/Stop controls the point the camera is ‘focused’ and the actual depth of field.

To aid in determining what areas of the render will be in focus (the actual Depth of Field), the user has several reference lines available. As stated, the best way to use these lines is to select the camera being used in the Scene tab and view the scene from a different view port such as the right view used here.
This is a view of the Display parameters:

The above are default settings. Users may want to change the FOV color, DOF Plane Color and DOF Overlay colors, especially if you are using a white background. The actual colors are not important, though making each one a different color that contrasts the background color you use will make seeing the lines easier.

Looking at the basic lines first:

The parameter for the focal length, as you might suspect, sets the specific point the camera focuses on. The parameter for the Focal Point Scale, increases the length of the green line. To make it easier to see. The image above has set the value to maximum (200%) for this screen shot.

The next parameters are FOV (Field of View) Color, Opacity, and Length. Again, using a color other than white will allow the lines to show up on a white background. The item to look at is the Field of View, show below with the default setting of 5.
Changing the Length increases the size of the triangle in front of the camera. Using a value of 10 the image looks like this:

Viewing this in different lengths will help with seeing how the next controls fit into the scheme.

We next look at the DOF planes (using a different color again will help differentiate these lines).

If you review the discussion of F/Stop and depth of field in Camera lens terms and theory, the above screen shot makes sense.
Note that the focal point is set at 900 for this example. The area between the Near and Far planes covers the range of acceptable focus. Areas between the camera and Near plane and beyond the Far plane will be out of focus.

If it helps you to visualize what is going on, extend the Field of View by setting its value to 10. You will see that the DOF planes will fit inside the extended triangle. Shown below are the settings for F/22 (default), F/11 and F/5.
Again, the area between the DOF plane lines will be in focus.

Before we look at renders, let's look at the Camera View parameters. When each of these are toggled on, a plane corresponding to the Near and Far planes becomes visible in the Camera View (the usual camera used for creating renders).

With the Far DOF Plane on:
Everything beyond (or behind) this plane - the back row of cylinders and the backdrop - will be out of focus.

With the Near DOF Plane on...

everything in front of this plane - the front row of cylinders - will be out of focus.

Putting this all together we'll compare renders at different settings. (If you didn't make a render of the default settings while setting up this scene, you may want to do so now for your own comparison by turning off the DOF toggle and making a render.

The image below compares the default (no DOF) with the F/11. (Note: Clicking on the image will open a larger view.)
Notice that only the center row (the focal point of 900) remains sharply focused in both images. At f/11 the front row and back row (as well as the backdrop) are slightly out of focus.

Doing a render (to really exaggerate the effect) at f/5 produces:

Again, the center row stays in sharp focus and foreground/background more out of focus.

Experiment on your own with other settings for the focal point and F/Stop. You may find adding a null to your scene and setting the null at your focus point helps determine the exact spot.

Using all the controls (including the focal length of the lens) allows you to put emphasis on specific areas within your renders and gives a more realistic look to your images.