


Unit 3) Modeling Building Placement, Size, and Layout for Sustainability Exercise: Plant Shade Cover of Hardscape

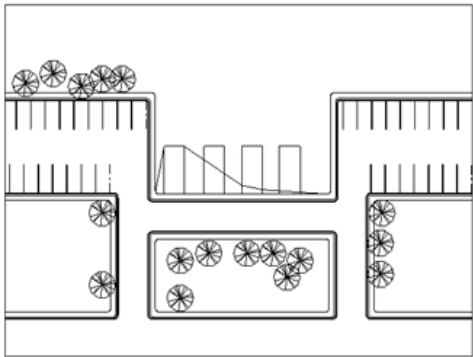
Plant Shade Cover of Hardscape Various Methods

Analysis type:	Software required:	Starting Point Dataset:
 Visual Analysis	Revit® Architecture 2008	<i>Unit 3_i_Start.rvt</i>

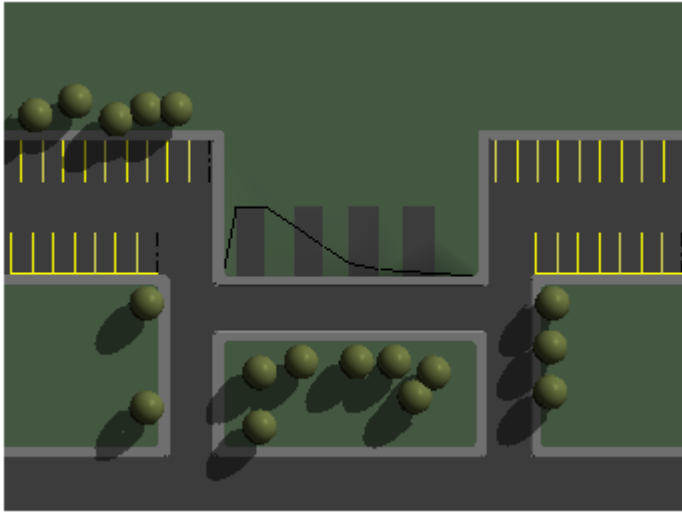
Site hardscape (concrete, paving, etc...) acts as a heat sink, storing solar energy and contributing to the heat island phenomena found in most cities. Shading the hardscape can help minimize this effect.

This exercise provides three methods for analyzing how shade from nearby trees falls on the hardscape:

- Rendering a 3D view from above to show shadow on the site.
- Editing a plant family to show an approximation of the area shaded by the plant.
- Editing a plant family to add a solid element that casts a shadow with Revit Architecture software's Advanced Model Graphics shadow function.

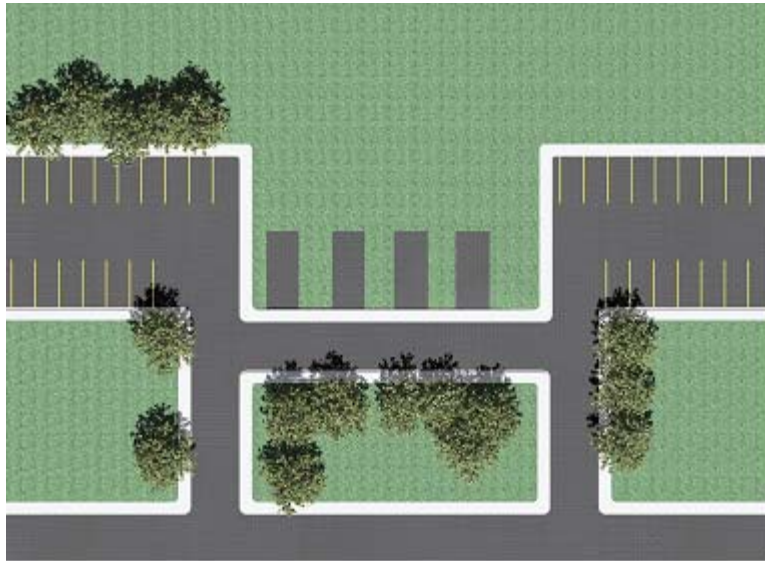


Before: Sample dataset site plan



After: A color-filled area plan that shows how nearby trees cast shadows on the hardscape

render them, they do cast shadows. You cannot render a floor plan view, but you can set a 3D view to be viewed from above and render this view instead.



Duplicate the 3D view and rename it “TOP.” To view it from above, click View menu > Orient> TOP. Use the Rendering Design Bar to raytrace the top view.

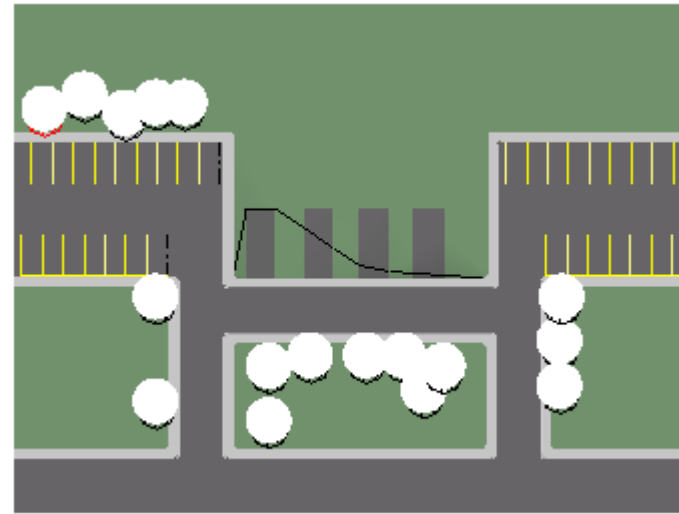
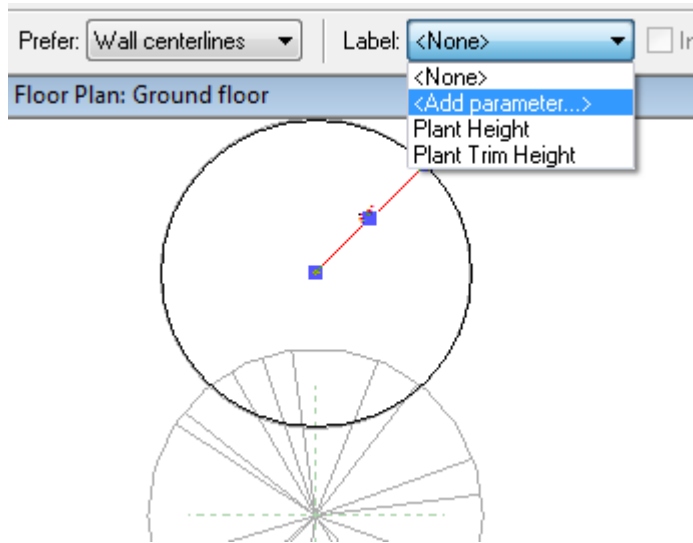
TIP

- To save time, make sure the 3D view's scale is set to 1/8" or smaller before you render.
- If you need to translate this into actual numbers, capture the rendering and drop it onto a sheet. Then follow the steps outlined in the Unit 2 exercise to prepare a new area scheme and plan. Drag and drop this new area plan on top of the image you placed on the sheet earlier. Refer to the figure below to for help in drawing the hardscape areas and the portions of the hardscape covered by shade in the rendered view. The complete project has the two views on top of each other in Sheet A901 Hardscape Shading. In this case, the site was not made visible in the area plan because it is available below the area plan on the sheet. To draw the area lines with reference to the shadows in the captured image, you must first activate the area plan view on the sheet.
- You can change the scale of the captured rendering by adjusting the view properties or by making the view active on the sheet and grip stretching it.

2

Edit the Tree's Plant Family to Create a Masking Area

To visualize the site without rendering the shaded area of a tree in any floor plan view that includes the default site plan, you can edit the plant family placement using either a solid element or a masking element to represent the shaded area visually.



Under Floor Plans > Site view, click on one of the trees. Click Edit Family from the options bar. In a plan view of the family, add a masking region. Click the Circle shape template on the options bar and draw a circle. Click the modify tool and click the circle you just drew. Turn on the center mark in the circles properties dialog box.

Make the temporary dimension of the circle permanent and assign it to a new Type parameter, Shadow Radius. Load the family into the project and change the radius to 15 feet. Adjust the location of the shadow by editing the family again and moving the masking region.

Notes

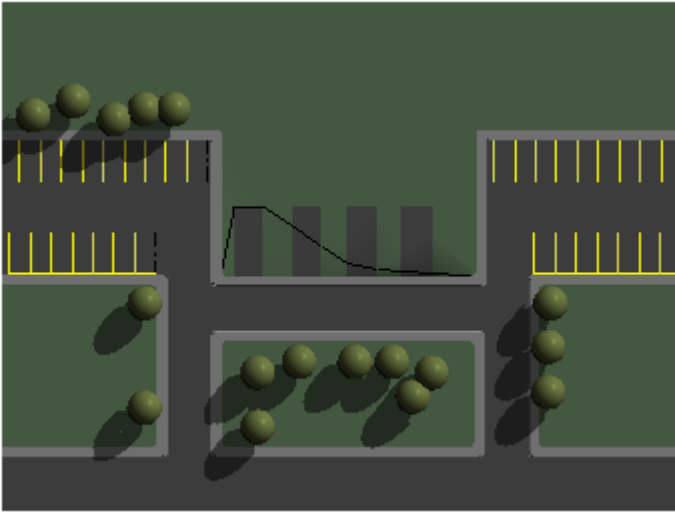
You can get carried away with this process if you want by linking the radius of the masking region to the Plant Height parameter so that as the tree grows, the shadow masking region also grows. You would then also need to consider another parameter: moving the center point of the masking region away from the insertion point as the tree grows taller. As a final touch, you could create a Shape coefficient parameter to drive the radius of the masking region as a percentage of height based on the individual tree species and its average overall shape. We leave these and other permutations for you to explore. For more information about complex and formula-based parameters, refer to chapters 11 and 16 of the Revit Architecture Educational Curriculum (available at www.autodesk.com/edcommunity).

It is a good idea to create a subcategory in the family such as Plant Shading, and assign the masking region to the Plant Shading subcategory. This enables you to turn the masking regions off with the visibility graphics overrides for the view. For more information on graphics override, please refer to chapter 7, exercise 7A in the Revit Architecture Education Curriculum.

3

Edit the Tree's Plant Family to Create a Solid for Revit Architecture Shade Mode

Yet another way to visualize the shaded area of a tree in any floor plan view, including the default site plan, is to add a mass element to the tree family. This process closely resembles the process outlined in the previous step.



The starting point dataset already has a tree family called “3D_Lollipop.” Pick one of the trees in the site plan. Right-click the selected tree. Click All Instances. Then, select the 3D_Lollipop tree type from the options bar Type list. Set the advanced model graphics to Cast Shadows. The mass element of the tree appears on the ground plane.

You can edit this tree family to study how the solid portion of the tree was created. Another idea is to use a thin solid element instead of the masking object in the previous section. In this way, you could apply a translucent material to the shaded region instead of the hard mask of the mask object.

Revit Architecture software provides many different ways for you to approach shade and shadow. Exercise complete.