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MicroStation V8i Training Manual 3D Level 3

The sample subject matter includes pages from Modules 15 and 17, and range from material assignments and attachment, to photo-realistic displacement maps, to photo-realistic environmental effects.

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info@micro-press.com

MICROSTATION V8i

3D LEVEL 3

Module 15

MATERIAL ASSIGNMENTS



24 Pimlico Drive
Dundas Ontario Canada
L9H 6J5
Phone 905-628-8237

MicroStation V8i Series

Module 15 of 18

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Module Information

Prerequisites:

Module 14 MicroStation 3D

Introduction:

The application of materials to the surfaces of elements in a design is an important part of the rendering process. MicroStation provides an array of material types that can be assigned to surfaces. Material definitions can be edited to create entirely new materials to suit almost any design requirement.

Objective(s):

- 15.1 Create a new design for material assignments.
- 15.2 Identify typical material options offered by MicroStation.
- 15.3 Evaluate typical material definition settings.
- 15.4 Assign materials using the color/level method.
- 15.5 Assign materials using the attributes method.
- 15.6 Assigning marble and wood.
- 15.7 External Material and Palette files.

Time:

This Module should be completed within 3 hours.

Sample from Page 15-16

15.6 ASSIGNING MARBLE and WOOD

You are going to apply a marble texture to the bowl, but I want you to experiment with two different methods of selecting the material.

Back in Section 15.3 you selected the shade material from the “curtains & lampshades.pal” palette. Use the same procedure again for the marble bowl texture:

Step 1 In the *Material Editor* click on the *Open Palette* icon and load the “marble & granite.pal” palette.

- Step 2** Select the “marble dark verde” material in the list, *copy* it to your *Table* palette, and *rename* the material “Green Marble”.
- Step 3** In the *Color* setting *apply* a green color.
- Step 4** *Attach* the material to one of the bowls (you may need to select the bowl first with the Element Selection tool).

In the *Material Editor* box adjust the *color slider* to give the bowl more of a green color than the base definition supplies (set the view to a Smooth shading). You can also increase the *Reflect* value a small amount.

Next, use a *different method* to create a material definition:

- Step 1** In the *Material Editor* box, *create* a new material in the *Table* palette called “Green Marble 2”.

This time I want you to *directly* apply a *pattern map* to the material *without* selecting a material *from* a *palette* as you did above:

- Step 2** Click on the *Pattern Map* icon’s arrow and select ON, then click on the *full* *Pattern Map* icon. (Note that the *Pattern Map* icon is not active before you do this.)

The *Open Image File* box opens and displays all the materials in MicroStation’s *Patterns* folder. Each is a .jpg graphic file that can be applied as a material. Look for a marble pattern:

- Step 3** Scroll through the pattern list to the “Marble 01.jpg” file and *click* on the *image*.

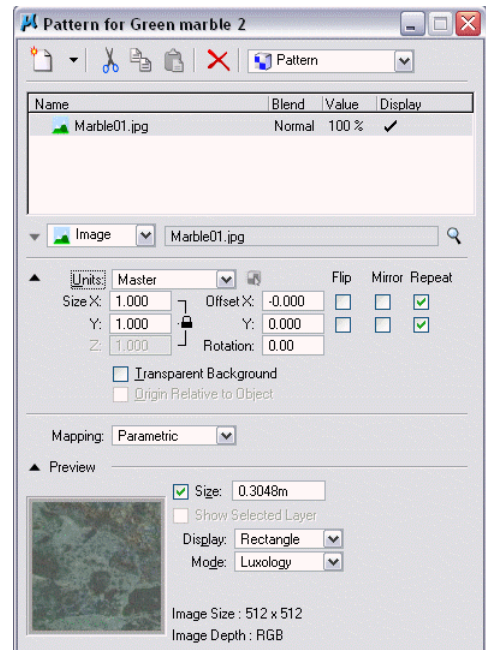
The *Pattern for* settings box displays as shown at the right.

There is no need to change any of the settings at this point.

Now make a *comparison* between the two methods you have just used. First, take a good look at the *Preview* of the “Green Marble 2” material. Then switch back to the first “Green Marble” material and click on its *Pattern Map* icon. Compare the two material *Previews*. Note that they are the same materials. *Both* materials use the same material *image*, “Marble01.jpg”.

So, it doesn’t matter which way you select the base material *pattern* for a definition, although you are essentially limited to .jpg image files using the second method. One advantage to using the palette method is that it gives you access to other material definitions that don’t use a pattern - look at the “automobile.pal” palette for example which are really just color definitions.

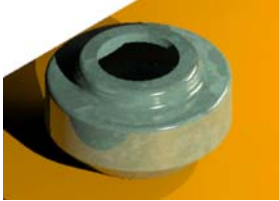
It’s also interesting if you open the *Open Image File* dialog box (Step 2 immediately above), and move up one level in the path. There you will see a range of other selections you can make for different applications.



Getting back to the bowl:

Step 4 Attach the “Green marble” material to the bowl (if necessary, make a selection set of the bowl first). Make any adjustments you feel necessary to the material definition. Render each time you change settings.

Step 5 Delete the “Green marble 2” material definition.



My bowl looks like that at the left. If you look closely at your bowl you will see the marble pattern correctly applied to all faces of the bowl. You may need to adjust your settings to achieve an acceptable pattern.

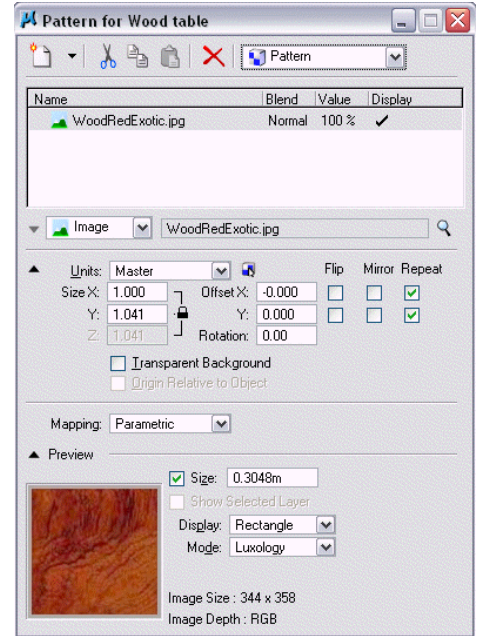
The last material to apply is for the table. I will let you do that on your own. For my table I used the “WoodRedExotic.jpg” pattern found on the default pattern path. Add a new material to the Table palette in the same way you just created the “Green marble 2” material, and load the wood pattern.



My completed table arrangement.

However, feel free to use any material you wish for your table. You may apply the material as a level/color attribute or an attached attribute. If you use level/color the material will be applied to all elements of the table. If you use attached attributes you will need to select each table component in turn. You can do this in one operation by making a selection set first (but grouped elements don't always work).

My final table arrangement looks like that at left. For those of you working from a paper manual I have posted a graphics file on Micro-Press.com's web site that shows the Luxology rendering. Go to <http://www.micro-press.com/Resources.html> and look for the V8i 3D Level 3 section and image 15-1.



MICROSTATION V8i
3D LEVEL 3

Module 17

PHOTO-REALISTIC RENDERING



24 Pimlico Drive
Dundas Ontario Canada
L9H 6J5
Phone 905-628-8237

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Module Information

Prerequisites:

Module 16 MicroStation 3D

Introduction:

This Module introduces the higher-level Luxology rendering tools and uses the residence created in the previous Module as a working model. The rendering methods are applied to both interior and exterior scenes. Environmental Maps, and view backgrounds are also covered.

Objective(s):

- 17.1 Discuss differences between Interactive and Photo-Realistic rendering.
- 17.2 Discuss general settings for interior scenes.
- 17.3 Discuss and define sunlight in interior scenes.
- 17.4 Render special material effects.
- 17.5 Discuss and define settings for exterior scenes.
- 17.6 Add environment settings to scenes.
- 17.7 Add a sun image and fog effects to exterior scenes.

Time:

This Module should be completed within 4 hours.

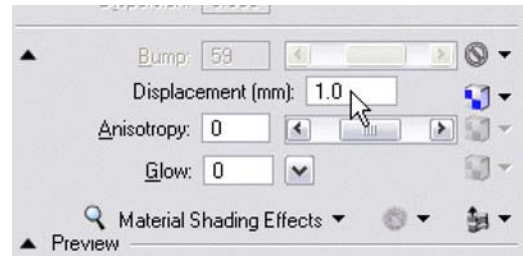
DISCUSSION:

Sample from Pages 17-10

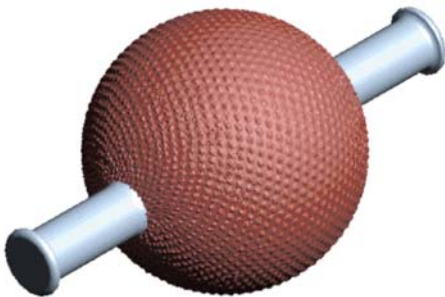
DISPLACEMENT - Material Definition

Displacement maps can also be used to generate geometry in a rendered scene. A displacement map is similar to a bump map or a pattern map and is applied to a material in much the same way. The *Displacement* value (in working units) in the *Material Editor* controls the extent of the map's displacement. You would not normally use a bump map in addition to a displacement map.

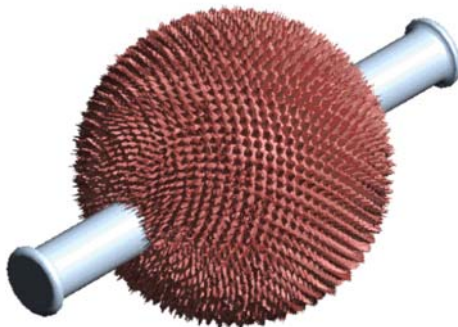
The illustrations below show the effects of different Displacement values.



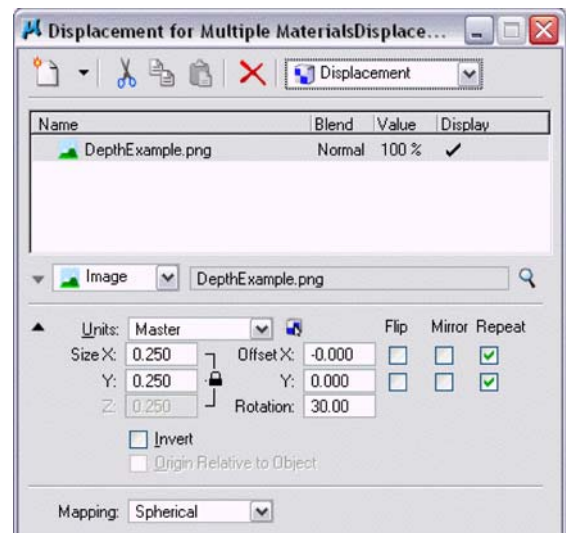
Displacement - Material Definition.



Displacement value 1



Displacement value 6



Displacement - Material Definition.


In this example the Displacement map is "DepthExample.png" found in the Bumps folder. Note that the *Mapping* setting above is *Spherical* so that the map correctly wraps the sphere. *Rotation* is set at 30° to offset the pattern. As you can see, the Displacement value displaces the map upward from the surface to create rendered geometry.

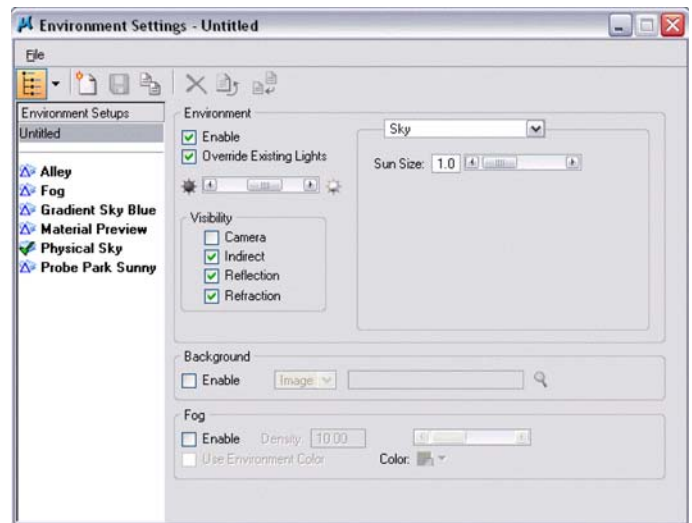
Keep in mind that displacement maps can sometimes produce unwanted artifacts which can be difficult to remedy. As you can see on the ball above, the "spikes" are a little messy in places. As a general rule you should first try using a *bump map* to achieve the effect you want, which usually provides a more stable and seamless render. If necessary, you can increase the bump *value* beyond the 100 maximum that the slider provides by directly entering a value. However, bump maps cannot generate the dramatic displacement effects shown above.

17.6 ENVIRONMENTAL SETTINGS

In Luxology you can apply an *environment* to an exterior scene, where the environment is used to *light the scene with or without* the light from installed 3D lights. Environments are also used to add backgrounds to scenes.

This is quite a complex subject but environments are important in that they can produce very creative and realistic effects in scenes. The discussion here introduces the basic concepts.

First, open the *Luxology Environment Setting* tool on the top row of icons in the Luxology preview box  by clicking on the full icon.



Environment Settings box.


Some basic concepts:

- In its simplest terms the “environment” is the space that surrounds you, whether in an enclosed room or outside in the open air. What you see is *lit* by that environment and Luxology can reproduce most aspects of an environment.
- An environment can only be applied to an *interior* scene if there are transparent or translucent openings to the exterior that allow environment light to enter the scene.
- An environment setting can be used to *indirectly* light a scene *without* the use of installed 3D lights. However, installed 3D lights can also be used to generate specific shadows in conjunction with environment lighting. In general, environment lighting gives a soft ambient light.
- In the Environment Settings box shown above, the environment *types* are on the *left*, while the *settings* for each type are on the *right*. You can add *custom* environment settings through the *File* menu. I would *strongly suggest* that you copy the default environments to different names to customize or experiment with the types and settings. If you do edit the default settings you can return to the defaults by clicking on *File/Update from library*. See the information at the end of this Section for saving settings in DGN libraries.
- You must tick the *Enable* box to have the environment light a scene, and you can choose to have the environment lighting turn off (*override*) installed 3D lights.
- The amount of environment lighting in a scene is controlled by the slider. Larger values will tend to override installed lights and their shadows.
- There are five types of environment: *Sky*, *Light Probe*, *Image*, *Image Cube*, and *Gradient*. Each have different settings and light a scene in different but subtle ways. More on this shortly.
- Depending on the scene you are creating, you may or may not want the environment to be visible as a *background*. This is controlled in the *Visibility* section where you have four selections. *Indirect*, *Reflection*, and *Refraction* control whether those light processing options are used in a render. The *Camera* option controls whether the *environment* is *visible* as a *background*. The environment is not visible if the *Camera* is off, but still lights the scene.
- At the bottom of the settings box you can have an *image* display as a background (as you did in the previous Section). If *Background* is ON, the *Camera* will be OFF in the *Visibility* box.

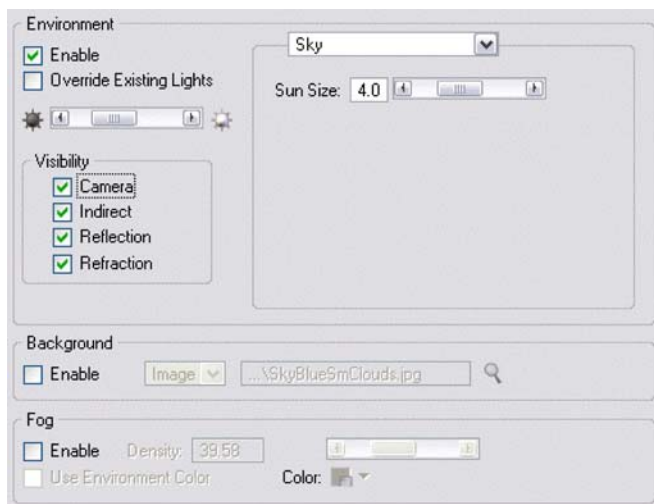
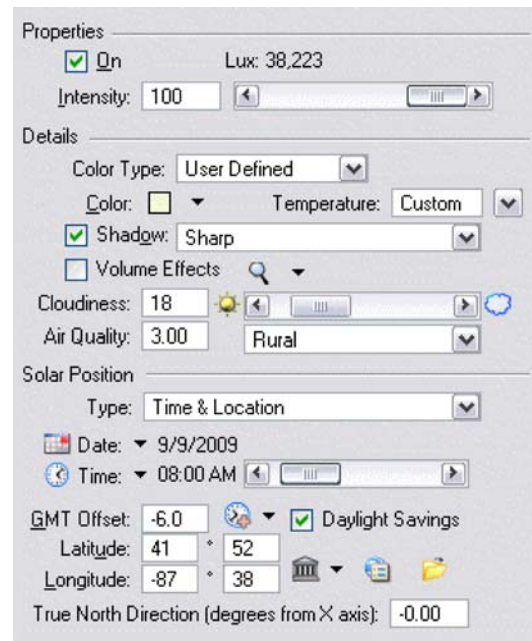
- Alternatively, you can add a background to the rendered image in the Luxology settings box.
- You can add Fog to a scene and specify its density and color (next Section).

Sample from Page 17-18 ADDING AN ENVIRONMENTAL SUN IMAGE TO A SCENE

ADDING A SUN

The environment can display a *sun image* in a render. The sun's position is set by entering a time and geographic location for the Solar light source in the Light Manager. A north direction must also be set in the design and in the image above, north is to the left, east is straight ahead, and south is to the right. You can set the north direction in the Light Manager settings box using the *Define North* tool .

My *Solar* light settings are shown at the right. Notice the slight cloudiness and the time of day. I have set the location as Chicago, Ill.



Environment settings for sun image.

The Environment settings are shown at the left. The *Sky* option must be used to display the sun image and the *Camera* must be ON. A Background cannot be added since that would turn the camera off.

Only *Solar* is ON in the *Light Manager*. Having the Directional light on as well would create conflicting shadows since it is pointing in a different direction from the sun.

The *Sun Size* is set at a value of 4 (the default is 1). It is usual to exaggerate the sun size for a better visual effect.

The rendered image is shown below.

As you would expect, the position of the sun creates sharp shadows and dark walls on the shadow sides. The scene can be softened by turning ON the *Sky Dome* “light” in the Light Manager. This will add an indirect light on all surfaces.



This is image “Mod 17-16” on the web page.

Scene lit by Solar light only and with a visible sun.