Name: _____ Date: _____

Reading: Walt Disney Concert Hall Case Study

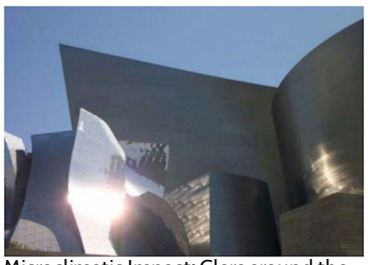
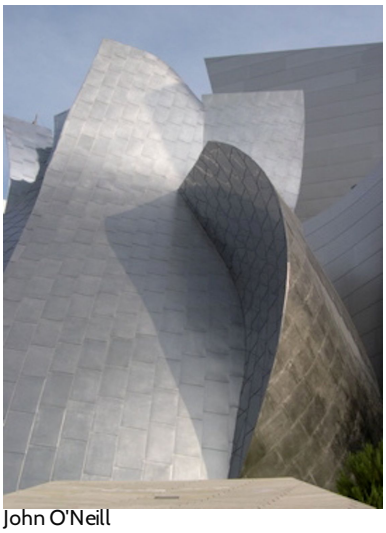
The issue

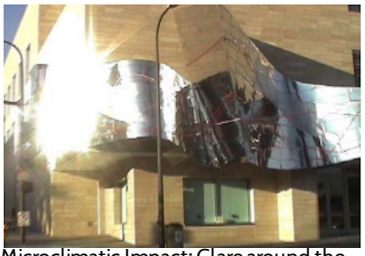
In 2003, the Walt Disney Concert Hall in Los Angeles, CA, opened to the public. The concert hall is made from stainless steel with smooth curving walls. Soon after the concert hall opened, people from nearby neighborhoods started to complain about the glare from the building. Drivers also reported that they were being blinded by light reflecting off the building.

Giuseppe Milo. CCBY 3.0

The solution

The architects identified that the parts of the building causing the glare were coated in polished steel. The rest of the building used brushed steel. To fix the problem, they considered multiple options. The best option was to sandblast the surface of the polished steel to make it rough. Before sanding, the workers could see their reflections when they looked at the polished steel. After sanding, the building looked dull gray, like the non-shiny side of aluminum foil. The sandblasting solved the problem, and the Walt Disney Concert Hall received no more complaints.

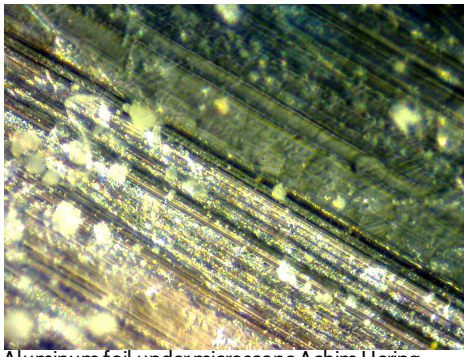
Images of the building before sanding	Image of the building after sanding
 Microclimatic Impact: Glare around the Walt Disney Concert Hall, by Marc Schiler and Elizabeth Valmont. Used with permission.	 John O'Neill



Microclimatic Impact: Glare around the Walt Disney Concert Hall, by Marc Schiler and Elizabeth Valmont. Used with permission.

Why did sanding the surface of the building reduce the glare?

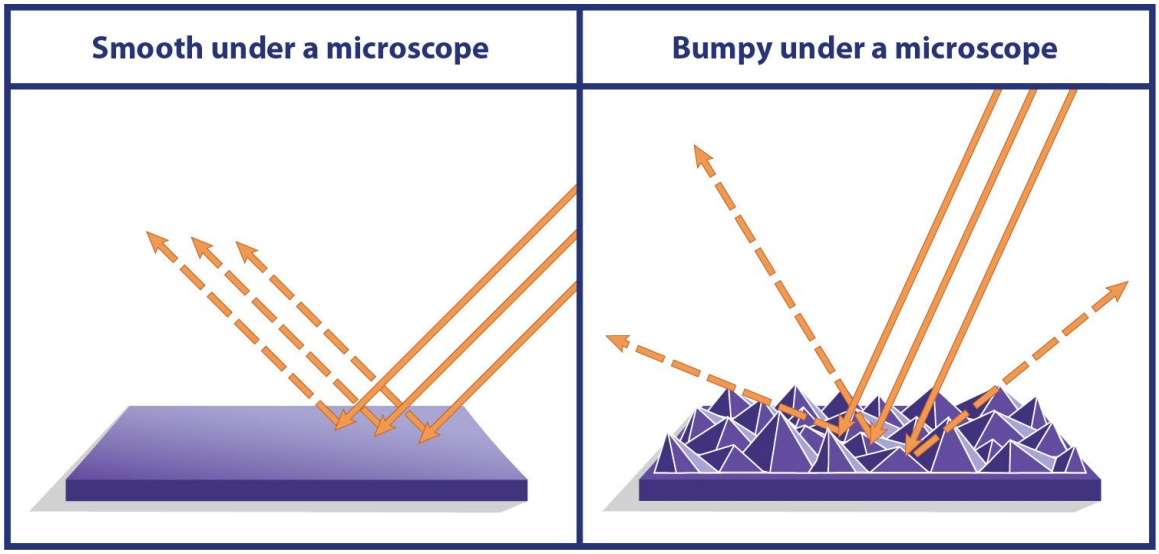
We need to zoom in to a microscopic scale to answer this question. While we can see some differences with our eyes, looking under a microscope reveals new structures. For example, when we look closer at aluminum foil under a microscope, the surface is not completely smooth.



Aluminum foil under microscope Achim Hering. CCBY 3.0

Before sanding, the surface of the building's polished stainless steel was very smooth under a microscope. After sanding, the surface still looks smooth to our eyes, but under a microscope, the surface is rough.

When light shines on any surface, it always reflects off the surface in a V shape. If the surface of an object is very smooth at the microscopic scale, all the light reflects in the same direction. This is why you see a glare when light shines on really polished materials. If the surface is rough, light reflects in all different directions. This type of reflection is called *scattering*. Many objects that appear smooth to our eyes actually have rough surfaces when examined under a microscope. This is why you do not see a glare coming off most unpolished objects even though light reflects off them to your eyes.


Smooth under a microscope
Bumpy under a microscope