UNDERSTANDING "EFFECTIVE ZERO" LIGHTING
FOR SITE RENDERINGS AND PLANS

Overview –

Light pollution and light incursion issues are becoming increasingly important as communities become more concerned about adverse outdoor lighting affects upon property owners and nature. To address these issues, photometric engineers are using computer light simulation programs to provide predictive models for proposed lighting. In order to maintain accuracy, these models take the maximum expected ambient light into consideration, which is generally defined as full moonlight on a clear evening. This means that a zero effect of outdoor lighting on a photometric study will still take into consideration the ambient light expectation for the site.

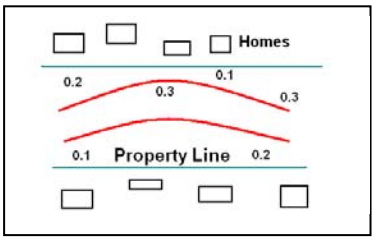
Understanding "Effective Zero" Lighting –

Depending upon the location, the maximum expected *natural* ambient light for any outdoor area will range from 0.2 lux at sea level to as much as 1.0 lux on a snow-covered mountain. The reflective nature of the area will determine luminance as it relates to the spectral output of the full moon. For example, a full moon reflecting off a body of water can increase ambient light levels measured on a white sandy beach.

A full moon reflecting off a water surface can increase ambient light measured at the water's edge

Snow is the most reflective natural surface; capable of picking up the specific moonlight spectrum; i.e. reflected solar light. When measured at increasing altitudes, moonlight tends to have a higher violet bias. This is why snow-covered mountains and fields take on an increasingly blue hue above 5,000 feet.

In addition to natural ambient light, accurate photometric studies may indicate the effects of surrounding artificial light sources such as street lighting or neighboring buildings. The combined impact of natural and ambient light will always be greater than 0.2 lux. This means that the effective range of a light source becomes zero when expected reflected levels drop to approximately 0.25 lux or less. This is generally referred to as "effective zero" since it is impossible to attain an absolute reading of zero.



When a 0.0 reading is displayed on a photometric layout, it usually means the area is beyond the data scope. Therefore, no reading is generated by the computer model. In residential areas, readings below 1.0 lux are considered ambient light. This implies that there is no net increase in light being generated by the artificial light source, even if the specific light source like a street lamp is visible.

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