

“HIDing” Light in the Landscape

By Mark Oxley,
Senior Design Consultant,
Outdoor Illumination

Mark your calendar for Friday night, March 25th. If it's a clear night, take a walk outside and enjoy the moonlit landscape... the mottled shadows on lawns and planting beds... the softly shimmering leaves of broad-leaved evergreens... the subtle textures of a blue/green color pattern. This is “moon lighting”... courtesy of a full moon!

Professional landscape lighting designers take great pains to replicate this effect. This starts with installing fixtures in trees, down lighting from 30, 40, 50 feet (or more) above the landscape. While we have often extolled the virtues of the MR-16 in tree lighting, another popular lamp choice is high intensity discharge (HID). Generally, HID lamps in landscape are either mercury vapor or metal halide.

The mercury vapor lamp generates light in the blue and green regions of the electromagnetic color spectrum (5700 degrees Kelvin), similar to natural moonlight (*1). Mercury lamps produce light by passing an electric arc through vapor. If a more neutral color is preferred, the phosphor coated outer lamp delivers an acceptable white color (4100 degrees Kelvin).

The metal halide lamp produces light by passing an electric current through mercury gas and small amounts of specific combinations of metal halides (*2). Metal halide has two color options. One can replicate the halogen color spectrum (3000 degrees Kelvin) allowing it to better integrate with MR-16 fixtures. Or, select a cooler white (4000 degrees Kelvin) for maximum impact. Combine the improved efficiency (see below) of metal halide with its potential wattage (up to 1500 watts for metal halide vs. up to 1000 watts for mercury vapor) and metal halide can deliver the most impact among HID lamps. Additionally, metal halide offers more options in beam spread. A PAR 38 metal halide lamp is available as a flood or spot. Interestingly, metal halide lamps are regarded by some as the best choice for promoting plant growth due to the spectrum of light they produce.

The HID flood delivers the broadest beam spread available - greater than a 100 degree beam spread and more than three

times the beam spread of the conventional MR-16 flood of 38 to 40 degrees. This enhanced beam spread allows for a more uniformly illuminated landscape, resulting in a more natural moonlit effect. Lamp positioning is essential. If you have a 20 foot ladder, don't bother. You need to get significant elevation to create the broad, subtle effect. Install your fixtures on limbs, not the main leader of the tree. Do not use the lowest limbs - seek out filtering and shadowing through the lower limbs by mounting on higher limbs. In winter installations, consider the density in summer of the lower canopy of the trees - you're looking for filtering, not obfuscation! “Moon lighting” is a natural format that softly illuminates broad swaths of the landscape. One or two isolated fixtures do not a moonlit night make!

Mercury vapor lamps are rated for long lamp life - up to 24,000 hours. However, mercury vapor lamps “burn down” before they “burn out”. If you notice a loss of light impact (usually after 16,000 hours) in the landscape, it may be time to replace the lamp. Metal halide lamps are rated for 6,000 to 20,000 hours of lamp life but are more efficient (75-125 lumens per watt vs. 50-60 lumens per watt for mercury vapor). Maintenance is essential on all tree mounted fixtures. We have seen way too many trees envelop wire and mounting canopies - making the fixture impossible to maintain and endangering the health of the tree.

Unlike MR-16s that operate off a remote transformer (12 or 24 volt), HID lamps are powered by a remote ballast. The ballast actually steps up voltage (from 120 volts to between 250 and 310 volts - voltage at ignition is greater than 1000 volts). The ballast does not need to be located immediately adjacent to the lamp, but it needs to be within 105 feet (using 16 gauge wire) for mercury vapor, but much closer for some metal halide lamps, depending on lamp and ballast. The ballast “fires up” the HID lamp - it takes a few moments for the lamp to be burning at full candle power. Be careful - not all mercury vapor ballasts are compatible for metal halide lamps. Further, metal halide is very sensitive to variances in voltage ratings which can potentially result in lamp failure. Ballast selection should also relate to expected temperature

conditions. Unlike in florescent sources, HID lamp output is not affected by low temperature since it produces enough heat to maintain operating temperature. One final reminder – unlike MR-16s and incandescent, HID lamps cannot be dimmed.

Regarding installation, in most cases the ballast should be located on the tree, so you will need to bring line voltage to the tree. Lines should be in conduit to a depth of 18 inches. Unfortunately, we have seen many “deadly” installations of line voltage. Either the 120 volt wire is direct - buried way too shallow (endangering humans) or the lines are trenched in a manner that jeopardizes tree roots. Any lines should be brought directly to the tree and brought directly back out in the same trench. Junctions should be made outside of the drip line – no “daisy chaining”! Further, all trenches should be hand dug or air spaded within the drip line of the tree.

While there are many considerations in designing “moonlighting”, the results can be sublime – meanwhile, we’ll see you under the moon light!