**Lighting Types & Techniques**

**UP LIGHT**
Architectural and landscape elements become visually dramatic features when illuminated from below. Uplighting is the most common technique used to accent key focal points in the landscape and to create shadows on walls.

**DOWN LIGHT**
Downlighting is illuminating an object or surface from above. Downlighting can be used to highlight specific garden elements and functional areas. Also used for illuminating large spaces for safety, security or recreational purposes.

**AREA LIGHT**
Area lighting is used to enhance flower beds and also safely illuminate pathways. Area lights are often staggered and alternating from one side to another when used on a pathway.

**LEDGE LIGHT**
Hardscape lighting enhances the colors and shapes of the hardscape area being lit. Most commonly used areas are block walls, seating areas or barbeques.

**HANGING LIGHT**
In the garden, a hanging light can be used to create the shadowing patterns of a moonlit night. This type of lighting is a subtle and natural effect, often using cool bluish LED lamps to create the look of natural moonlight.

**What Fixtures to Use**

**Odyssey Series:** Big Bang, Pulsar, Nova, Apollo  
**Knights Series:** Bishop, Oxford, Valor, Guardian  
**Elements Series:** Nucleus, Transmittance

**Odyssey Series:** Lunar, Quasar1, Comet  
**Knights Series:** Conquest, Crusader  
**Elements Series:** Nucleus, Photon  
(Particle Base needed)

**Odyssey Series:** Centaurus, Mercury, Saturn  
**Knights Series:** Lancer, Illuminator, Cambridge  
**Elements Series:** Proton, Neutron, Fission

**Odyssey Series:** Apollo Star, Nova  
**Knights Series:** Noble, Windsor, Monarch  
**Elements Series:** Nucleus, Photon

**Odyssey Series:** Islander, Vanguard, Voyager  
**Knights Series:** Londoner, Sovereign  
**Elements Series:** Iso, Ion

**Odyssey Series:** Starburst, Stellar, Nova  
**Knights Series:** Windsor, Monarch  
**Elements Series:** Transmittance
**Things to Know**

**Critical Three**

1. **Test Primary Amperage:**
   A. Use a true RMS Amp Clamp to measure 120 VAC amperage.

   B. 120 VAC Amp table:
   - 150W...........1.5 Amps
   - 200W...........1.7 Amps
   - 300W...........2.5 Amps
   - 360W...........3.0 Amps
   - 500W...........4.2 Amps
   - 600W...........5.0 Amps
   - 840W...........7.0 Amps
   - 1120W.........9.3 Amps

2. **Test Secondary Amperage:**
   A. Use a true RMS Amp Clamp to measure 120 VAC amperage.

   B. NEC states not to exceed 80% of rated electrical rating.

   C. Wire table:
   - Wire Size        Max. Amps        Max. VA @80%
   - 14 AWG            16 Amp                192
   - 12 AWG             20 Amp                240
   - 10 AWG             24 Amp                288

3. **Test Secondary Voltage at HUB:**
   A. Test and adjust voltage at the transformer until point of connection (POC) voltage is at 12 VAC +/- .5 VAC.

**Ohm’s Law**

\[ \text{Amps} = \frac{\text{Watts}}{\text{Volts}} \]
\[ \text{Watts} = \text{Volts} \times \text{Amps} \]

**Volt Amps**

Calculate Volt Amps with this formula:

\[ \text{Lamp Watts} \times 1.5 = \text{VA} \]

Why do Volt Amps matter? Volt Amps are the blend of LED chips and driver draw. This value represents true lamp watt draw.

**Voltage Drop**

3 amps or 36 VA will drop 1 volt over 100 feet

**Design Services**

The SDSP Program is a free design service ULS offers to landscape architects and lighting contactors.
- Complimentary design services
- Details and specifications included
- Wiring design and value engineering included

Example wiring design plan