ISSUE 001

7 Deadly Sins

of Landscape Lighting

CREATED BY Lighting Trade School

Required Voltage.

Voltage drop and wiring methods.

Words by Shane Duffy

Required Voltage:

The AC Multi Tap transformer has been the mainstay for landscape lighting for 30 years. It is still used 99.99% of the time. The Inventor of the Multi-Tap transformer Nate Mullen no longer uses or endorsees any type of AC transformers. The reason for this is that an LED lamp is an electronic device. All electronics require and demand a DC voltage.

When an LED Lamp is being powered by an AC transformer a condition happens call VA (volt amps) which means that a lamp will draw up to 50% more electricity. This does not happen on a DC system.

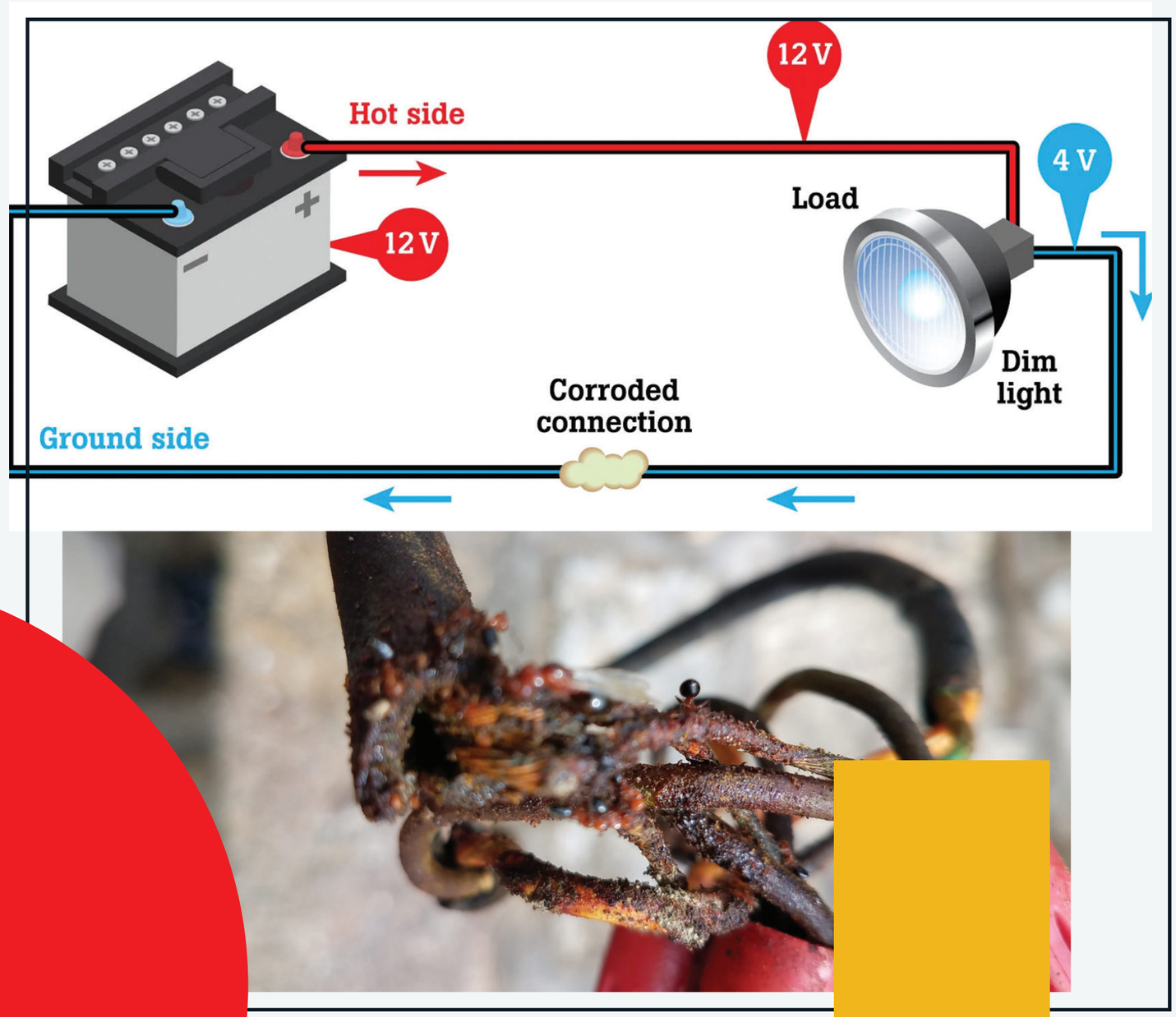
Making it far more GREEN.

Led Lamps require at a minimum:

- Constant non fluctuating voltage.
- Clean power
- DC voltage

Constant non fluctuating voltage.

Sin No. 1



Voltage Drop:

Voltage drop has always been a concern, but never taken seriously by most contractors. It has been misunderstood, and there are many myths, misconceptions and falsities out there. Many manufacturers even say that you can live with voltage drop. Well, voltage drop is not a disease, and you don't have to live with it. It's curable! Make sure that your contractor knows how to establish proper voltage to all your lamps and, specifically, to a point of connection. There are two things that need to be addressed when looking at voltage drop in a low voltage landscape lighting system. First you need to be able to get proper voltage to every single fixture in your landscape lighting and that takes a wiring method.

There is really only one way to ensure that you are getting proper voltage to your light fixtures and that's to verify and test with a digital volt meter.

Every installer, once they have their wiring method and everything hooked up and installed, needs to complete a performance test called the Critical Three. This test needs to be performed on every low volt-age landscape lighting system. By performing these three critical processes or tests, you ensure the integrity of the system.

1. Make sure you Amp all secondary wire runs to ensure proper loads.
2. Make sure you have proper voltage to your fixtures
3. Make sure you don't exceed the primary amps that the transformer is rated for.

An amp probe is the only way to verify amperage, so verify that your contractor is using an amp probe and a voltmeter. Have your contractor show and verify the voltage and amps.

Sin No. 2

Corrosive Materials

Aluminum doesn't last in harsh environments

I believe, and maybe you as a homeowner believe, that we would like to purchase something that lasts a lifetime. I view warranties as a death certificate in advance. If you buy something with a three-year warranty, you can expect to get three years of life out of it. I prefer to buy things with a lifetime warranty, as long as there is substance behind the warranty. There are companies that spring up overnight that offer lifetime warranties. Be aware of them, or better yet, run a credit report on them.

One of the big problems in outside lighting is that a lot of the manufacturers make and design products NOT to be placed in a harsh environment. Many of these products are made out of aluminum. Aluminum just doesn't last in a harsh environment. The materials that do last are brass, copper and ACM (advanced composite material). These materials are going to last thousands of years in a harsh environment, with very little required maintenance (with the exception of cleaning). Any type of debris or calcium buildup really is an aesthetic problem. Always be sure to look up the type of material, not only the warranty.

Don't stop at just the main fixture, look at the wire, power driver, connections and the socket as well. Look around your own neighborhood to see what is going on.

Sin No. 3

Moisture Migration & Wicking

Another major problem in low voltage lighting is moisture migration and wicking.

One could argue that the wire that goes from the transformer to a central point of connection, and ultimately out to all the fixtures, could be the weakest link in the system. One of the main things that contractors like to save money on is the wire. Arguably, the wire is the least expensive thing in an outdoor lighting system, but it is an item that people try to save money on because they view it as a commodity.

Well if you use inexpensive wire that is not made with 100% virgin plastic material and 100% copper, then the insulation can deteriorate, break down, and crack. We have all seen PVC crack and deteriorate. If the insulation starts to crack on the wire jacket, this is the start of deterioration. It will expose the copper. Once the copper is exposed, a process of wicking starts, which is the drawing of air and moisture under the jacket. This will start to tarnish and corrode the copper, ruining the integrity of the lighting system. Whenever you have a connection, moisture can migrate and start the process of corrosion. This goes for your sockets and fixtures as well. Make sure you buy a fixture that has dielectric grease in the sockets so that when the lamp is placed in the socket no air or moisture can penetrate and start corroding into your fixture.

The critical place to look for moisture migration is all the connection points, the socket, the connection from the fixture to the wire, and then from the connection of your wire into the transformer. If you have an existing lighting system in your yard, find a connection at the fixture and expose the wire. If it is not bright copper, but black, this is the effect of wicking and the start of total deterioration.

Make sure that wire is made from virgin insulation, sun light resistance and is Wet location approved.

Sin No. 4

Connections

Deadly Sins issue

Most connectors are not made to go in the ground, and even if they are, the process of installing a connection underground in a wet environment is difficult, and usually results in a bad connection. It's very rare that a contractor even does it or performs it well. Be very leery about that. It's ideal to never have a connection in the ground and then you will never have to worry about it. The smart way to do it is always have your connection into some type of J-box or hub, and not buried in the ground. Many manufacturers offer a two foot lead forcing the contractor to put a connection in the ground. Not only does this cost more money up front, but it is absolutely problematic in a very short period of time.

You could probably walk up and down any neighborhood in the United States, pick up a fixture in a yard, grab the connection two feet from the fixture, pull the wires out and you can bet that the wires will be tarnished black. This will impede the flow of electricity and will cause voltage drop to the fixture. One of the key things in any type of Silicone is an insulator and it doesn't help the conductivity of the voltage. Dielectric is specifically made for the con-ductivity of electricity between the wires that are joined together via the connector. It is also used to seal out moisture. When you seal out moisture, you prevent air from contacting the copper and air and moisture lead to the start of corrosion. connection is the use of dielectric grease, not silicone.

If connections are at the fixture make sure they are secured to the fixtures' water tight connections.

Sin No. 5

Glare, Light, or Light Pollution

There is nothing worse! You can have the best lighting design in the world, but if the contractor doesn't minimize the glare, either directly from the lamp or the incident light produced from the lamp, your lighting portrait will be ruined. One fixture out of ten, one fixture out of one hundred, one fixture out of one thousand, can ruin the look of your lighting portrait, thus ruining your nighttime viewing.

It's critical to have proper placement which will come in the design, another deadly sin coming up, but it's critical to buy fixtures with adjustable shrouds, hex louvers, and different types of lenses. All of these different optical devices can be used to control and reduce glare and minimize the amount of light leakage coming from a fixture.

Glare is the number one spoiler of a lighting portrait.

Glare Removed

Glare

Constant non fluctuating voltage.

Sin No. 6

Lighting Design

This is clearly one of the most misunderstood requirements of proper lighting.

A landscaper goes to a two hour seminar and thinks he is a lighting designer if not an expert. I personally have been doing lighting for thirty years, and I am still not an expert. How can you become an expert in two hours?

Even though a guy may have a certificate, what you may not realize is that he went to a class and fell asleep, but just by sitting there all day he got a certificate for his work and for his lighting presentation portfolio. He presents himself as a lighting expert. The best way to determine if someone has a clue about outdoor lighting is obviously to look at his portfolio and his pictures. Make sure the pictures are his jobs, not some photos he took off of a website or borrowed from someone. Make sure they are his jobs. Go out and view his work, get referrals, or better yet, make him do a live demo, putting real fixtures in real locations so you can walk around and see the lights for yourself.

The critical place to look for moisture If you have ever purchased art, you would not buy a blank canvas from an artist. Even though the artist is saying, “don’t worry Mr. and Mrs. Homeowner, this is going to be unbelievable, you’re going to love it. Surely you can imagine blah, blah, blah.” All these wonderful things on this canvas even though you’re looking at a blank canvas. Of course you can’t visualize this until you actually see with your own eyes what the artist is going to put on that canvas. Lighting is the same way. Looking at dots on a piece of paper doesn’t do outdoor lighting justice.

One of the big misconceptions in outdoor lighting is if someone comes up and says, “Hey, I’m going to bid this job” and they give you a piece of paper with dots on a plan and say it’s 40 lights. Well, a competitor is going to come in and say, I can do the identical job with 36 lights. This is im-possible if the lighting was done correctly on the first bid.

Nobody can come and minimize the lighting, take lights out, and achieve the same effect. That’s impossible. It just does not happen. The other thing that happens with designs is most people are very afraid of the quan-tity of fixtures. They equate the quantity of fixtures with lighting being too bright, too overwhelming.

The problem is that it actually takes more light to produce less light. To illustrate, imagine taking a flashlight and shining it on a wall - it’s a very hot spot. If you add a whole bunch of flashlights and introduce beam spreads so that they are very cohesive and tied together, it’s going to minimize the lighting and not be so hot. If you place just a few lights on a large yard, it’s going to be hot. Proper design takes a quantity of fixtures to make it cohesive, so it is not a very bright and hot portrait. Good design is critical.

Understanding the light only does three things when lighting a surface:

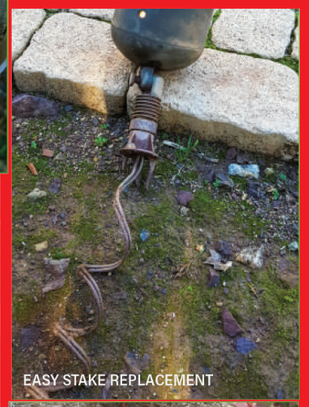
- It gets absorbed.
- It reflects.
- It translucent

Designing your lighting portraits always has to be designed from the viewpoints. Knowing these simple items dictates the fixture quantity and placement.

Images by Jason Rhodes


BROKEN KNUCKLES


DIRTY & BROKEN LENSES


EASY STAKE REPLACEMENT

Future Considerations

Deadly Sins issue

Every system should be installed with the premise that it's going to be able to change and adapt to future concerns. Every landscape is very dynamic, so a system needs to be put in with adequate flexibility to be able to move the fixtures around. This is why all fixtures need to have adequate extra wire so they can be relocated in the future.

Items for future considerations:

- Maintenance contracts
- Cleaning of the fixtures
- Designing the system for expansion of fixtures on power driver and wire
- Use fixtures that have a replaceable lamp. (Interrogated fixture you throw away)

Now, when we talk about maintenance there are a lot of contractors promoting an LED or energy conservation light fixture that has a long-life lamp. They will tell you that you're going to save a tremendous amount of money on your maintenance because of the long lamp life. That is not true, because a light bulb could last forever, but you still have to come back and maintain your system on a yearly basis, at the very least to be able to clean and adjust your light fixtures. The lenses are susceptible to calcium, and other mineral deposits from irrigation and fertilizer. Landscapers often get mulch on the fixtures when they mulch.

Deadly Sins Issue

7 Deadly Sins

Of Landscape Lighting