



LANDSCAPE LIGHTING

STARNOTE 925
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Choosing and Using the Right Equipment

What is the purpose of landscape lighting? What kind of lighting is best for you? How do you choose fixtures, bulbs, wiring and transformers? The following paragraphs will answer these questions and more. Handy installation and maintenance tips are also listed to help with your project.

◆ **LIGHT UP THE LANDSCAPE**

(4 primary reasons for using landscape lighting)

◆ **COMMON USES**

(for Landscape lighting)

◆ **CHOOSING THE BEST TYPE OF LANDSCAPE LIGHTING**

◆ **The 12 volt lighting system**

◆ **The 110-volt lighting system**

◆ **CHOOSING THE RIGHT EQUIPMENT**

Price, durability, practicality

◆ **Kits**

◆ **Wiring**

◆ **FIXTURES**

Plastic, Metal, Half metal/half plastic

◆ **TRANSFORMERS**

Photocell, Timer, Photocell with Timer

◆ **BULBS**

Incandescent, Halogen, JC Type, MR-11, MR-16, Par 36

◆ **INSTALLATION TIPS AND MAINTENANCE**

◆ **Voltage Drop Chart**

LIGHT UP THE LANDSCAPE.

There are 4 primary reasons for using landscape lighting:

- Security
- Safety
- Direction
- Accent

COMMON USES: Landscape lighting is most often used for:

- **Path Lighting:** Use random and alternate spacing. Don't outline your walks and driveways like airport landing strips (the runway effect).
 - **Back Lighting:** Use against walls, trellises, or for shadowing trees.
 - **Highlighting:** Use to illuminate trees, plants, or statues.
 - **Well Lighting:** Use in lawns or rock areas. Conceals your light source.
 - **Flood Lighting:** Use to highlight trees, rocks, or buildings.
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CHOOSING THE BEST TYPE OF LANDSCAPE LIGHTING. There are two basic landscape lighting systems for residential use:

The 12 volt lighting system is better known as low-voltage lighting. Because this outdoor system is only 12 volts, home owners can install it themselves. It is safer! Low voltage presents no severe shock risk—and requires smaller trenches and less power. Though you might pay a little more for the system, since it needs special transformers, low-voltage lights and a few more wire leads, you can save on expenses by “doing it yourself”. [\(top\)](#)

The 110-volt lighting system requires a city or county permit. The finished product is checked by an inspector for code compliance. This system also uses more power. It is cheaper to install and will handle more fixtures without significant voltage drop. [\(top\)](#)

CHOOSING THE RIGHT EQUIPMENT. Consider these things when choosing lighting:

- **Price:** How much do you want to spend?
- **Durability:** How long do you want it to last?
- **Practicality:** Which lights are best for you given the budget and durability required? The next step is to determine how many lights you want and whether or not to start with a set or buy all the components individually. Sets can be less expensive, but have limited expandability. The type of lights desired can also play a role in this question, because not all light styles are available in sets.

Do you buy pre-packaged kits or build the system from individual components? While choosing the correct wiring is relatively simple, the wide range of fixtures and transformers available can cause some anxiety. You must also make a choice between incandescent and halogen bulbs. Let's explore the possibilities... [\(top\)](#)

Kits can be convenient or cause problems. For a simple, short run of lights, this might be the way to go. It offers a grouping of lights with all accessories at one low price. You have to be happy with the style of lighting offered as well as the size of the transformer. These lights could be difficult to match later if you want to add to the run and you will probably have to upgrade the transformer. The 16-Gauge wire included in the kit is almost always too light. Buy a heavier gauge wire to replace it.

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Wiring should be multi-strand which is cooler and safer to use. It comes in gauges (sizes) 16, 14, 12 and 10. Remember, the larger the number, the smaller the cable. Use 16 gauge wire for short runs only. The 12 gauge wire is best for most low-voltage runs. The 10 gauge wire is the more expensive, but is the **most effective** for extremely long runs. [\(top\)](#)

FIXTURES come in a wide variety of styles. There are three basic types:

- **Plastic** is the cheapest fixture, but biodegrades rather quickly in the sun and must be assembled.
- **Metal** is the most expensive fixture. It 's long-lasting and has a finish that effectively hides spots.
- **Half metal/half plastic** is a good compromise. It keeps your costs down and lasts considerable longer than plastic. The metal parts protect most of the plastic parts from the sun. [\(top\)](#)

TRANSFORMERS vary widely, depending on size. There are three basic types:

- **Photocell:** Automatically turns lights on at dusk; turns them off at daybreak.
- **Timer:** Must be manually set. The cheaper transformers have integrated timers that cannot be replaced. Better models have replaceable timers that are not expensive.
- **Photocell with Timer:** The most versatile type. Allows you to "automatically fix" your system. It must be located outside.

You need to select your transformer with light additions in mind. If you don't buy enough wattage now, you can't add to the system later, or you'll have to buy another transformer. Smart planning saves money. When selecting a transformer, allocate 20% of the stated wattage output for future additions.

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BULBS are available in two basic classes.

- **Incandescent.** These bulbs come in three types: Bayonet base, Wedge base, and Par-36 (an extra large bulb). They are not as hot as halogen bulbs, cool down quickly, and are cheaper to replace. They also have a shorter life span (600 to 1000 hours) than a halogen bulb.

- **Halogen.** These bulbs are much hotter and brighter than incandescent bulbs, and are slower to cool. They last longer and are well worth any difference in price. They operate best at 10.8 to 12 volts.

When handling halogen bulbs, don't touch them with your bare fingers. Oil from the skin causes overheating and rapid blowout. If bulbs are handled accidentally, use a cotton swab dipped in rubbing alcohol to remove oil. Halogens are available in several types:

- **JC Type:** Bi-Pin (2 prong, no shroud).
- **MR-11:** Used for fixtures with built-in reflectors.
- **MR-16:** Bigger bulb with larger shroud; different beam width—narrow for greater illumination at distance—wide for short, broad illumination close-up. Less costly than MR-11 because it is the "industry standard" bulb.
- **Par 36:** Larger bulb with sealed beam allows handling without worrying about touching bulb with your fingers.

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INSTALLATION TIPS AND MAINTENANCE:

Use waterproof connectors instead of the wire clips that come on the fixture. These protect against shorting out fixtures and overloading the transformer.

Always replace burned out bulbs quickly.. If not replaced they cause an extra load to be placed on other bulbs which results in bulb failure throughout the entire run.

If voltage drops below 10.8v at any fixture, a larger cable should be used. [\(top\)](#)

Voltage Drop Chart

Calculate voltage drop with this formula:

* gauge of wire has these values of Resistance "**R**" and Constant "**C**"

10 GA ->	R = .001020	->	E/R = 11,764	C = 5,800
12 GA ->	R = .001588	->	E/R = 7,547	C = 3,700
14 GA ->	R = .002525	->	E/R = 4,752	C = 2,300
16 GA ->	R = .004016	->	E/R = 2988	C = 1,500

$$\frac{\text{Watts (on cable)} \times \text{Length of wire run}}{\text{Constant of wire}} = \text{Voltage Drop on wire}$$

Voltage drop should not exceed 1 volt on a 12 v system.

* See Gardening Tip # 1021 for additional information and examples.

Multi-volt units must be used with caution. They will solve most voltage problems when used correctly. Consult our lighting experts before using these transformers.

Ask a friendly STAR Irrigation & Lighting Associate at any store for additional help in selecting and installing your landscape lighting system.

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