

How to create

A low-voltage landscape lighting plan

The three main components



A. Low-voltage transformer

- The power supply for your system
- Usually mounted near or on the house that is plugged into a regular outdoor-rated GFCI electrical outlet.

** Avoid mounting the transformer in shady areas, this could interfere with the "dusk-to-dawn" photoelectric cell.*

** Should be installed at least 36" (3 feet) off the ground.*



B. Landscape lighting fixtures

- Integrated LED spot lights, path lights, and bollards.
- Powered by the transformer

** When you choose lights, add up the total wattage they consume. You'll need this number for choosing other parts of your landscape lighting system.*



C. Landscape lighting wire

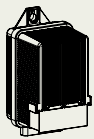
- The wire connecting the transformer to the light fixtures.
- Rated according to the size of its conductor (gauge)

** A 12-gauge wire is larger and can handle more wattage than a 14-gauge wire.*

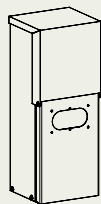
** Selecting the right wire size is important and will prevent any issues down the road.*

** See wire gauge charts on page 4*

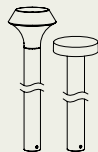
Transformers



60W

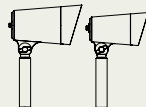


300W



Path lights

These fixtures aren't limited to paths. When mounted in gardens, they provide a gentle glow that lights a small surrounding area of plants, rock, or mulch.



Spot lights

Use spotlights to make trees, plants, shrubbery, or a home's architectural features stand out.



Bollards

Use these lights to enhance the look of your yard while making walkways obvious at night.

Landscape wire



Versatile 12, 14, and 16 gauge low-voltage wire for spot lights, path lights, and bollards.



Mix it up! Different types of fixtures can be connected together.

The four steps for an LED landscape lighting installation

1. Map out a plan

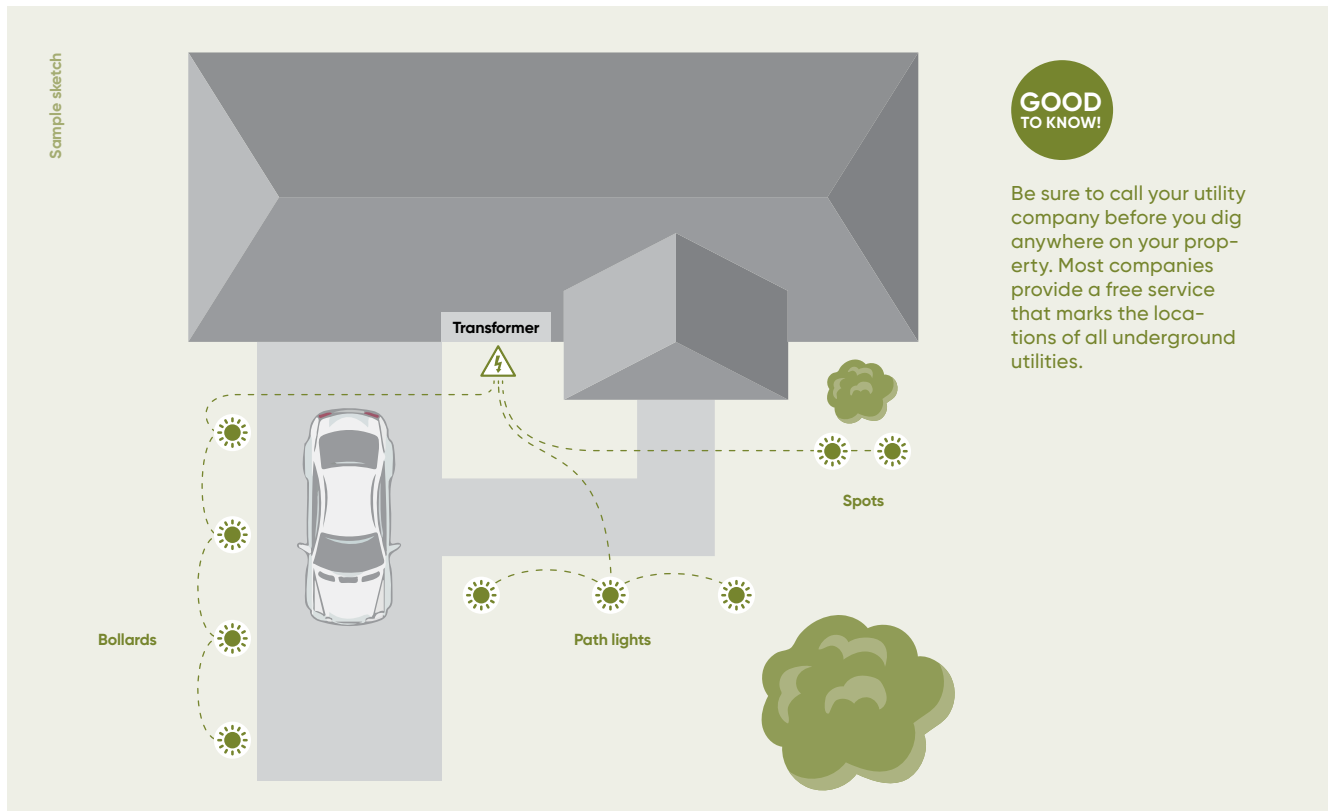
- Start your layout by creating a sketch of your property.
- Be accurate with dimensions to help estimate distances for wire runs.
- Try sketching and measuring as you walk around the property marking where each fixture will be placed.

2. Set fixture locations

- Mark their locations with small flags on your property and indicate their placement on your sketch.
- Measure distances between fixtures and write them down on your layout.

3. Choose a power supply

- To figure out which power supply is best, consider two things: the total wattage of the lights that you're purchasing and if you anticipate adding lights in the future.
- When you add up the wattage of all lights, you'll have a good idea of how powerful your transformer needs to be. However, the total wattage of your lights should be 20 percent less than the transformer's rated wattage.
- Once you've selected the right transformer, the best placement is usually next to the house in a hidden location, as close as possible to the fixtures.



4. Wiring

Now you need to provide power to the fixtures. The length of runs helps determine what gauge of wire to buy. As a general rule, try to keep the runs under 50 feet with a maximum of 8 fixtures per run. Lower loads per run means lower voltage drop.

What is Voltage Drop?

Voltage decreases as it moves through a run of wire and a series of lights. This means that, because each light is receiving a little less than the one before it, lights can appear dimmer toward the end of a series. A small loss is OK, but anything more than a 1.5-volt drop should be corrected.

Checklist

Before you get ready to install your lights, make sure you have all the tools and accessories required. Below is a basic list of what you might need.

- Landscape lights
- Transformer
- Wire
- Waterproof junction box to protect connections
- Flat-blade shovel or edger
- Wire cutters
- Wire strippers
- Voltage meter
- Tape measure
- Hardware to install transformer on house or post



Check your LED fixtures' voltage requirements. This plan is for use as a guide only to help you begin your lighting project. We strongly recommend checking the actual voltage at each fixture with a volt-meter before burying and finalizing your project.

Minimize voltage drop, and wasting wire, by using one of the wiring methods below:



Daisy Chain

Connects all fixtures in a linear fashion, where the first fixture connects to the transformer.

Tip:

Use the Daisy Chain method when fixtures are not grouped and can be easily connected in a chain.



T-Method

Similar to the Daisy Chain method, except the transformer connects to the middle of the chain.

Tip:

Use the T-Method when you built a Daisy Chain in the field and want to connect it to the transformer from the middle of the chain - at whatever point saves you the most wire.



Hub Method

All fixtures run through a hub junction and are connected to a single line from the transformer, ensuring each fixture receives an equal share of voltage.

Tip:

Use the Hub Method when fixtures are grouped in a small area such as in a garden bed.

Low Voltage Landscape Wire Gauge Charts - 60W Transformer/12V output

12V

Watts

Distance (feet)

	10	20	30	40	50	60				
10	16	16	16	16	16	16				
20	16	16	16	16	16	16				
30	16	16	16	16	16	16				
40	16	16	16	16	16	16				
50	16	16	16	16	16	14				
60	16	16	16	16	14	14				
70	16	16	16	14	14	12				
80	16	16	16	14	14	12				
90	16	16	14	14	12	12				
100	16	16	14	14	12	12				
110	16	16	14	12	12	12				
120	16	16	14	12	12	12				
130	16	16	14	12	12	12				
140	16	14	12	12	12					
150	16	14	12	12	12					
160	16	14	12	12	12					
170	16	14	12	12	12					
180	16	14	12	12	12					
190	16	14	12	12	12					
200	16	14	12	12	12					
210	14	12	12	12	12					
220	14	12	12							
230	14	12	12							
240	14	12	12							
250	14	12	12							

16 AWG
14 AWG
12 AWG

Low Voltage Landscape Wire Gauge Charts - 300W Transformer/12V output

		12V																								
Watts		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	
Distance (feet)	10	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	12	12	12	12	12	
	20	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	12	12	12	12	12
	30	16	16	16	16	16	16	16	16	16	14	14	14	14	14	12	12	12	12	12	12	12	12	12	12	12
	40	16	16	16	16	16	16	14	14	14	12	12	12	12	12	12	12	12	12	12						
	50	16	16	16	16	16	14	14	14	14	12	12	12	12	12	12										
	60	16	16	16	16	14	14	12	12	12	12	12	12	12	12											
	70	16	16	16	14	14	12	12	12	12	12	12	12	12												
	80	16	16	16	14	14	12	12	12	12	12	12	12													
	90	16	16	14	14	12	12	12	12	12																
	100	16	16	14	14	12	12	12	12																	
	110	16	16	14	12	12	12	12																		
	120	16	16	14	12	12	12	12																		
	130	16	16	14	12	12	12																			
	140	16	14	12	12	12																				
	150	16	14	12	12	12																				
	160	16	14	12	12	12																				
	170	16	14	12	12																					
	180	16	14	12	12																					
	190	16	14	12	12																					
	200	16	14	12	12																					
	210	14	12	12	12																					
	220	14	12	12																						
	230	14	12	12																						
	240	14	12	12																						
	250	14	12	12																						

16 AWG
14 AWG
12 AWG

Low Voltage Landscape Wire Gauge Charts - 300W Transformer/13V output

		13V																								
Watts		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	
Distance (feet)	10	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	12	12	12	12	
	20	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	12	12	12	12
	30	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	12	12	12	12
	40	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	12	12	12	12	12	12			
	50	16	16	16	16	16	16	16	16	16	14	14	14	14	12	12	12	12	12							
	60	16	16	16	16	16	14	14	14	14	14	14	12	12	12	12										
	70	16	16	16	16	16	14	14	14	14	14	14	12	12	12	12										
	80	16	16	16	16	16	14	14	14	14	14	12	12	12	12											
	90	16	16	16	16	14	14	14	14	12	12	12	12	12												
	100	16	16	16	16	14	14	14	12	12	12	12														
	110	16	16	16	14	14	14	12	12	12																
	120	16	16	16	14	14	14	12	12	12																
	130	16	16	16	14	14	12	12																		
	140	16	16	14	14	14	12	12																		
	150	16	16	14	14	12	12																			
	160	16	16	14	14	12	12																			
	170	16	16	14	12	12	12																			
	180	16	16	14	12	12																				
	190	16	16	14	12	12																				
	200	16	14	14	12	12																				
	210	16	14	12	12	12																				
	220	16	14	12	12	12																				
	230	14	14	12	12																					
	240	14	14	12	12																					
	250	14	14	12	12																					

16 AWG
14 AWG
12 AWG

Low Voltage Landscape Wire Gauge Charts - 300W Transformer/14V output

		14V																									
Watts		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240		
Distance (feet)	10	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	12	12			
	20	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	12	12	
	30	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	14	12	12
	40	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	12	12	12	12	12	12	
	50	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	12	12	12	12					
	60	16	16	16	16	16	16	16	14	14	14	14	14	14	14	12	12	12	12								
	70	16	16	16	16	16	16	14	14	14	14	14	14	14	12	12	12										
	80	16	16	16	16	16	14	14	14	14	14	14	14	12	12	12	12										
	90	16	16	16	16	14	14	14	14	14	14	12	12	12													
	100	16	16	16	16	14	14	14	14	14	12	12	12														
	110	16	16	16	16	14	14	14	14	14	12	12	12														
	120	16	16	16	14	14	14	14	12	12	12	12															
	130	16	16	16	14	14	14	14	12	12	12																
	140	16	16	16	14	14	14	12	12																		
	150	16	16	14	14	14	14	12																			
	160	16	16	14	14	14	14	12																			
	170	16	16	14	14	14	12	12																			
	180	16	16	14	14	14	12	12																			
	190	16	14	14	14	14	12	12																			
	200	16	14	14	14	14	12																				
	210	16	14	14	14	12	12																				
	220	14	14	14	14	12	12																				
	230	14	14	14	14	12	12																				
	240	14	14	14	14	12	12																				
	250	14	14	14	14	12	12																				

16 AWG
14 AWG
12 AWG

Low Voltage Landscape Wire Gauge Charts - 300W Transformer/15V output

		15V																								
Watts		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	
Distance (feet)	10	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	12	
	20	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	14	12
	30	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	14	14	14	14	14	14	12
	40	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	14	12	12	12	12	12	12	12
	50	16	16	16	16	16	16	16	16	16	16	16	14	14	14	14	14	14	12	12	12	12	12	12	12	
	60	16	16	16	16	16	16	16	16	14	14	14	14	12	12	12	12	12	12							
	70	16	16	16	16	16	16	14	14	14	14	14	12	12	12	12	12	12								
	80	16	16	16	16	16	16	14	14	14	14	14	12	12	12	12	12									
	90	16	16	16	16	16	14	14	14	14	12	12	12	12												
	100	16	16	16	16	16	14	14	14	14	12	12	12													
	110	16	16	16	16	14	14	14	14	12	12	12														
	120	16	16	16	16	14	14	14	14	12	12	12														
	130	16	16	16	16	14	14	14	12	12	12															
	140	16	16	16	14	14	14	12	12	12																
	150	16	16	16	14	14	14	12	12	12																
	160	16	16	16	14	14	14	12	12																	
	170	16	16	16	14	14	14	12	12																	
	180	16	16	14	14	14	12	12	12																	
	190	16	16	14	14	14	12	12																		
	200	16	16	14	14	14	12	12																		
	210	16	14	14	14	14	12	12																		
	220	16	14	14	14	12	12	12																		
	230	14	14	14	14	12	12	12																		
	240	14	14	14	14	12	12	12																		
	250	14	14	14	14	12	12	12																		

16 AWG
14 AWG
12 AWG