

StoneAge Natural Low Voltage Lighting



Technical Information

As has been seen, the StoneAge lighting system is safe, economical and easy to install, however there is one draw back to any low-voltage lighting system ... **Voltage drop.**

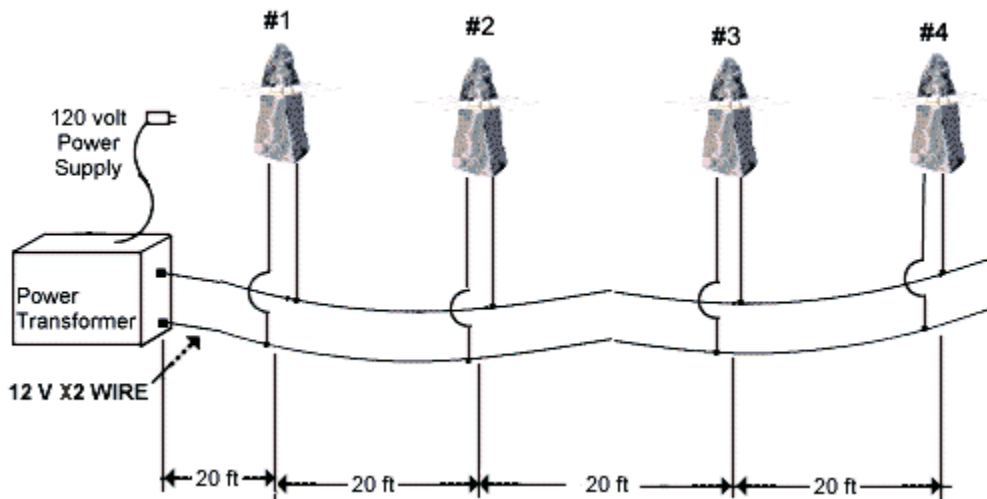
Voltage drop is the effect of loss voltage along the cable line. It is for this reason that lights at the end of the cable tend to illuminate less intensely than those closest to the power transformer. The following addresses the issue of how to set up your low voltage lighting system to maximize the light output and minimize the voltage drop.

Determining Voltage Drop

$$\text{voltage drop} = \frac{\text{total lamp Watts} \times \text{Cable Length}}{\text{Cable Constant}}$$

Once we know the size and length of the wire and the total watts, we can calculate how much voltage is lost along the cable. The smaller the size of cable, the greater the voltage drop.

| <u>Common Cable Constants</u> | |
|-------------------------------|----------------|
| Wire Size | Cable Constant |
| #10 | 11920 |
| #12 | 7500 |
| #14 | 3500 |
| #16 | 2200 |
| #18 | 1380 |



StoneAge Lighting lamps are 50 watts each. Given the above layout with:

- 4 X 50 Watt StoneAge Lights
- 12 Gauge Cable
- Cable Constant of 7500

Determining Voltage Drop (continued ...)

Voltage Loss Calculations

$$\text{volt drop at 1} = \frac{200(\text{watts}) \times 20(\text{ft})}{7500} = .53\text{V}$$

$$\text{volt drop at 2} = \frac{200(\text{watts}) \times 40(\text{ft})}{7500} = 1.06\text{V}$$

$$\text{volt drop at 3} = \frac{200(\text{watts}) \times 60(\text{ft})}{7500} = 1.6\text{V}$$

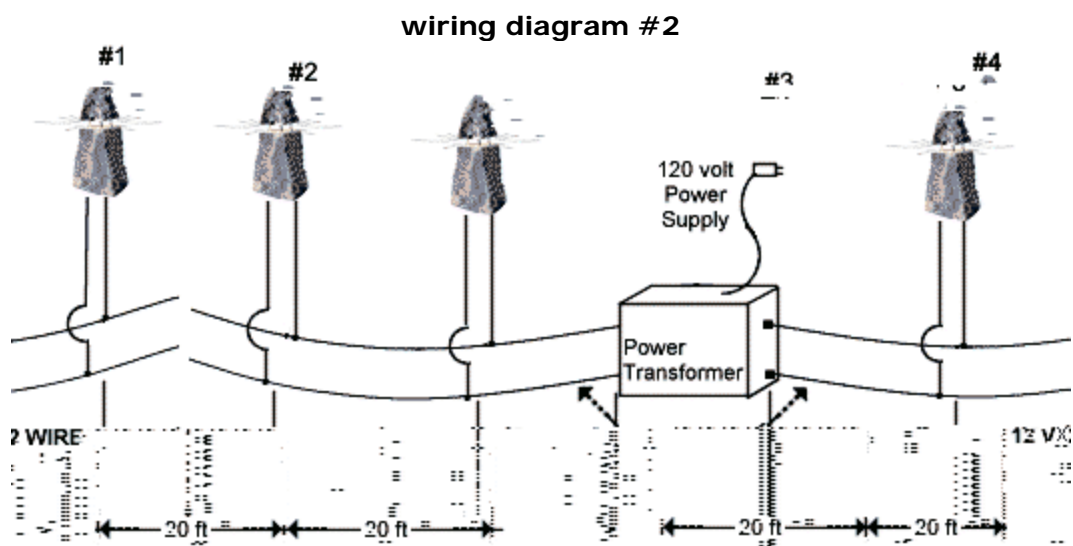
$$\text{volt drop at 4} = \frac{200(\text{watts}) \times 80(\text{ft})}{7500} = 2.13\text{V}$$

Since the voltage at the power transformer is 12 Volts, the resulting voltage applied to each StoneAge Light is:

| StoneAge Light | Initial Volts | Voltage Drop | Net Volts |
|----------------|---------------|--------------|-----------|
| 1 | 12 | .53 | 11.47 |
| 2 | 12 | 1.06 | 10.94 |
| 3 | 12 | 1.6 | 10.4 |
| 4 | 12 | 2.13 | 9.87 |

WHEN PLANNING YOUR STONEAGE GARDEN LIGHTING SYSTEM SET UP, THE VOLTAGE DROP AT ANY ONE FIXTURE SHOULD NOT EXCEED 2 VOLTS.

To improve the intensity of the further most lights, use the following set up.



Determining Voltage Drop (continued ...)

Using the set up in the above schematic increases the intensity of the further most lights. Using the same formula we see that the total voltage drop at #1 & #4 is only 0.53

$$\text{Volts Voltage Drop at \#1 or \#4} = \frac{100(\text{watts}) \times 40(\text{ft})}{7500} = 0.53\text{V}$$

Tips to Reducing Your Voltage

- For any layout, keep cable lengths to a minimum
- Use at least #12 size cable
- Whenever possible, reduce total watts per cable by adding another cable

StoneAge Lighting™ products allow you to unlock the natural beauty of those "Special Areas" that give your property personality!

Create a natural Daylight setting that springs to life when the sun goes down. The matchless beauty of StoneAge Lighting™ products allow you to easily develop a uniquely personal, stunningly beautiful setting for your Garden.

U.S. Patent #435,308