

-  Exterior Lighting Systems shall be installed in accordance with NECA/IESNA 501-2006, Standard for Installing Exterior Lighting Systems (ANSI)
-  It is highly recommended for your own safety that Beckstones' electrical installation is done by a professional licensed electrician.
-  Make sure all power to wiring enclosure is turned off. Read these installation instructions thoroughly before beginning.
-  Never attempt electrical installations unless you are familiar with the equipment and the codes governing their installation and operation.
-  The installation shall be protected by ground fault circuit interrupter of a class a type.

1 Check Materials and Tools

Materials

Beckstones _____ pcs.
(Beckstones for immersed conditions (min. 1.5 ft. Unit low voltage cable) are available upon request.
Pavers _____ pcs.
Connectors _____ pcs.
HeatShrink End Caps _____ pcs.
Cable _____ ft.

Main low voltage cable shall be SPT-3, SPT-2 W, underground low energy circuit cable, or wire that is intended for wet locations, is sunlight resistant, and is intended for direct burial.

LED-Power Supply 12V dc _____ pcs.
IP68 Enclosure Box (if needed) _____ pcs.
Cable/Twist Ties (if needed) _____ pcs.

Tools

Wire Stripper for 18AWG _____ pcs.
Electronic Heat Gun with Reflectors (Steinel 07461; 07051) (adjustable to 400°C/750°F) _____ pcs.
Mallet _____ pcs.
Exterior extension cord for Heatgun _____ ft.

Make sure all materials were stored in **dry conditions**. All electrical components can be assembled under dry conditions only. (no rain/no standing water)

2 Prepare Site



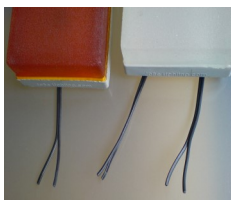
Remove pavers or concrete in renovation projects, if needed.
Remove soil or gravel for the main 12V dc power line for your project.

3 Unreel Main Low Voltage Cable



Turn power off. Unreel the 12V dc power supply line from the power source along your intended Beckstone installation. Provide enough slack to be able to effortlessly loop the cable under each Beckstone. The unit low voltage cable shall be protected by routing in close proximity to Beckstone and not be buried except for a maximum 6 inches (15.2 cm) in order to connect to the main low voltage cable. Use appropriate rodent protection! To prevent Beckstone

from fade-out, each supply line should not extend beyond 300 ft. from power supply to last Beckstone, because Beckstone fade out then. Up to 50 Beckstone can be installed with one 12 V dc power supply line. Beckstones STYLE 6x3 and STYLE 6x4.5 have 2 LEDs; so you can install max. 25 pcs. with one 12 V dc power supply.

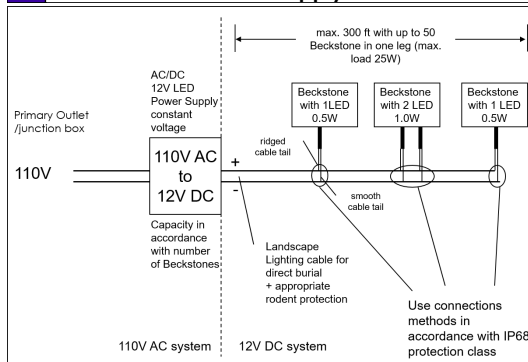


Installation (visit www.jobe-lighting.com for current version)



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4 Assemble LED-Power Supply



Unplug the power supply from the primary circuit before start of assembling the 12V dc power line. Power supplies can be placed indoors or outdoors. Be sure, that the transformer is installed according to it's rated IP class. If needed, an IP 67/68 enclosure box outdoors can be used. The enclosure box has to be chosen in accordance to the power supply manufacturer's requirements. Test the power supply with a voltmeter for polarity, if needed. For long installations split the load up to the recommended installation length in two or more directions. Place the power supply in the center to reduce the voltage drop effect. (See voltage drop chart on system drawing to select the right cable for your installation)

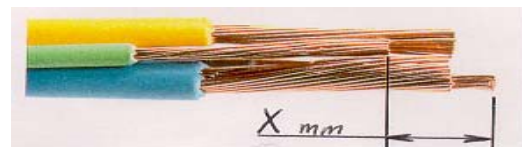
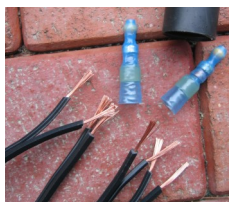
5 Wires Preparation

Install Beckstones parallel. (no daisy-chain installation)

a. Cut the cable at the place where the first Beckstone shall be installed. Leave enough cable length for burial installation and assembling the connection.

b. Remove 15 mm (0.59 inch) of the insulation coating from the Beckstone cable and also 15 mm from your 12 V dc power supply cable.

c. Sort the conductors. (**Polarity ridge on one leg for positive circuit identification**) (see photo right)



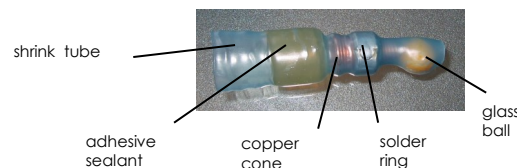
d. Align the stripped ends visually. The maximum acceptable misalignment of the wire ends is 7 mm (0.17 inch) (see photo above). For easier assembling you can tie the cables together at their outer sheath with a cable tie.



Warning— Exchanging of the conductors +/- can destroy the LEDs, when power is turned on. Double-check before you proceed to the next step!

6 Assembly and Termination

Soldersleeve Device



a. Slightly twist all the conductors together in order to prevent foldback of the strands during the Soldersleeve device insertion. Turn clockwise as indicated below.

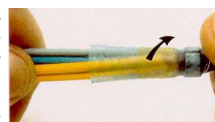
Correct



Incorrect



b. Slide and slightly rotate the Soldersleeve Device onto the conductors, until the conductors meet the front end of the copper coil. Push firmly and screw the device in a clockwise direction with approximately one full turn.



c. Equip the hot air gun with the reflector (Steinel 074616) and then allow it to warm up until the operating temperature (820 °F/440 °C) is reached.



d. Heat each assembly separately. Position the device assembly so that the solder preform is located in the middle of the reflector.



e. Direct the heat to the solder preform until the sleeve shrinks, and the solder preform melts and flows into the turns of the conical copper coil. After the solder ring has completely disappeared, continue heating for 6 seconds.

Total installation time: 46-88 seconds (depending on installation conditions)

f. Check that the heat-shrinkable sleeve has shrunk correctly on the wires. Heat the adhesive insert until it melts and flows through the wires.

g. Allow the assembly to cool down before handling.

i. Inspection

- The conductors must be aligned as indicated in section 5 (wire prep.).
- The Soldersleeve device must cover totally all the stripped lengths.
- The solder preform must be completely melted and have flowed through the helical coil.
- The solder must be visible among the strands of the conductor, at the end of the copper coil.
- Visible remnant of the solder preform indicates an underheated termination.
- A discolored dark brown sleeve and wire insulation melted indicate an overheated termination.
- The tubing must be completely recovered in the termination area.
- It is acceptable to have the tubing slightly flared at the end where the conductor insulation is exposed, in order to prevent damage to the jacket.
- The Soldersleeve device must not be split or cut.
- There must be no wire strands poking through the sleeve.
- The tubing and the wire insulation should not exhibit signs of mechanical damage or overheating such as cuts, melting, charring.
- A slight browning of the sleeve is acceptable during the installation process since this does not affect the product performance.

Repair (If Necessary)

- * Repair of an Underheated Termination: Reheat the underheated termination to obtain proper solder flow (See paragraph 5-e).
- * Repair of an Overheated Termination: Cut the wires at the sleeve limit and install a new device in accordance with the section 5 and 6.

7 Function Test

Test the function of your installation after each single Beckstone connector assembly.

a. Does Beckstone light up?
LED does not light up—> Cut the connection off and test Beckstone directly at the main power supply 12 V DC connection. Check or redo the connection, if the LED is still not working exchange Beckstone.

b. Do you have enough current at your point of installation? The minimum requirement voltage is 9V. —> Run a new primary supply line to this point and use an additional power supply with enclosure box from there according to section 4.

8 Heatshrink Endcap



a. Put the watertight assembled legs all the way into the heatshrinkable endcap. The endcap has an adhesive sealant, that will melt during shrinking.

b. Make sure that the endcap can not slide off during shrinking. Push it against a fire retardant piece while shrinking at 300°F/150 °C.

c. Wait until the reflector nozzle has cooled down before switching the reflectors. Be careful not to change heated nozzle with unprotected hands. Switch the reflector to Steinel 39mm (07051)

c. Start shrinking at the tip of the endcap. Continue shrinking to the open end until the endcap does not shrink anymore.

d. The adhesive sealant flows to the open end. Make sure that all cables are sealed and that there are no gaps left. Turn the endcap with the cables while shrinking, if needed.

Electrical Installation Result



9 Paving

Option 1: Assemble before paving



Cover the connection with gravel and sand. Make sure the cable will not be damaged by your further procedures. Pave further on and put in the Beckstones where you like it. Use a **mallet** to level Beckstone.

- Make sure that the supply line is covered with sand and is not laying under the edge of surrounding pavers.
- Put a loop of supply line close to every Beckstone for occasional maintenance reasons.
- Use a soft rubber plate under your vibrating plate for compaction of your installation. Continue with steps in „Option 4“.

Option 2: Laying in Concrete



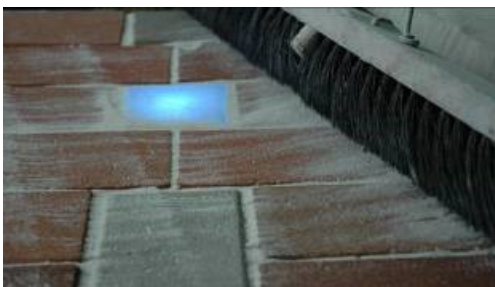
a. Beckstones can also be used in concrete installations. After assembling the electrical connection, you can set Beckstone in like the surrounding pavers.

b. To protect the cable against bending concrete lead the supply line in an empty conduit in the concrete installation or along the side of the concrete installation. Cover it with sand.

Option 3: Embedding in Concrete

Please see our installation hints for concrete paths and drive-ways at jobelighting.com

10 Jointing



Jointing with Sand and Gravel

The most common jointing method is the usage of sand or gravel. Caused by rain and irrigation appliances the sand sinks in the first couple of month. Repeat sweeping sand into the joints until they are filled again. Take special care about the Beckstone joints because the cable installation sometimes produces little hollows under the stone and the sand may rinses in there. Level the Beckstone when the bed was not compacted properly by pouring some sand into the joints while you are levering the Beckstone carefully to the right height. Doing so will make your Beckstone installation more enjoyable over years and protect them from damages.

Jointing with Mortar

Beckstones is capable to take non-intensive traffic with a sand joint. Jointing with mortar is an additional protection from damages, when the whole pave stone installation is done with mortar joints. However the larger joints in mortar installation can lever the Beckstone uneven while jointing with tools. Stabilize the Beckstone before you start over with the large tools for pave stone jointing. When you are done with mortar jointing all Beckstones must be cleaned from cement remnants. If you use Beckstone "STYLE", take special care about the pearly surface. It should not be covered with cement because it is made for taking dust. So it blends perfectly to the environment. Cover the surface and edges with tape if needed.

Synthetic Drain Joint

Alternatively usage of polymeric jointing sand and synthetic drain mortar also works with Beckstones. The procedure is the same like it is described in the mortar jointing section. If you are not sure about removing the synthetic remnants, cover the Beckstone and its edges with tape. If you have doubts do not risk tests with the surface of Beckstones.

11 Hints—Maintenance—Usage

Service after first rain/water contact

Beckstone STYLE has a pearly surface texture. This texture takes dust from its environment to blend in perfectly. After the first heavy rains you might see some white resin particles on the Beckstone surface. Remove them with a brush or take some sand to rub it off.

Drive-over capability/Surface Texture

You can drive over Beckstone with soft rubber tire vehicles (no snow-chains). Do not hit Beckstone with metal tools, hard things. Do not place any kind of stands on Beckstone. Glossy chippings can be limited by matting with sand paper.

Turn off during daytime

Avoid operation of LEDs in direct sunlight, —> This will improve the lifetime of your installation. Use timer or day-light sensor.

Service

Damaged Beckstones have to be removed completely and be replaced with a new piece.

? Questions

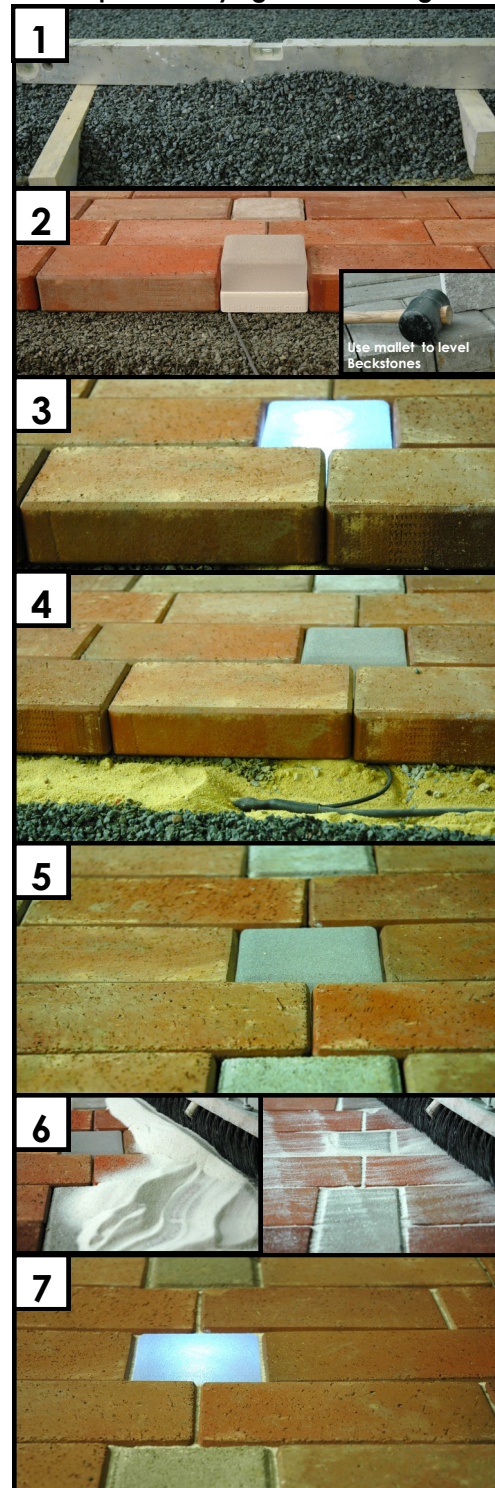
Check the FAQ on www.jobelighting.com or contact us regarding your installation questions.

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Attention: We can not cover all building situations in this installation guide. We are not responsible for any damages and losses resulting from improper installation of Beckstones, re-installation, removal, etc.; of Beckstone. It is recommended that Beckstone is installed by a trusted professional

Option 4: Laying in sand and gravel



Option 5:

Laying along

