

# Rancho La Paloma Ministry Center

*Building Community*  *Changing Lives*

# Club Rust

## ELECTRICAL PANEL SYSTEM

Version 2.4 31-May-2019

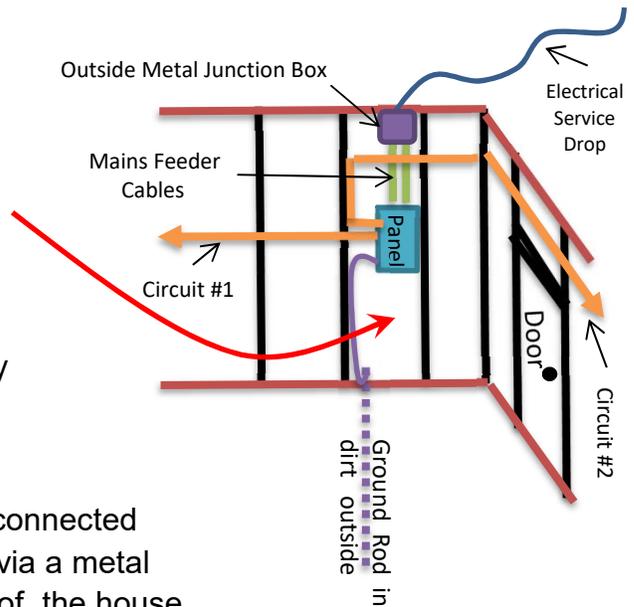
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# 1. Electrical Panel Location

- A. When possible, the preferred location for the electrical panel (light blue rectangle) is in the **second framing bay** of the wall perpendicular to the front door wall, behind the door swing.
- B. You might need to pick a different spot for the panel if the Electrical Service Drop (Blue Wavy line) can't get to that location (ie: it comes in on the other side of the house, for example)
- C. The electrical service drop (blue wavy line) is connected to the panel feeder cables (TWO green lines) via a metal junction box (purple square) mounted outside of the house just below the eaves.
- D. The bottom of the electrical panel should be about 5 feet above the floor.
- E. Ground rod (dashed purple line) is on the outside, on the other side of the wall from the panel. A ground wire (purple line) is run INSIDE the wall bay, exiting about an inch above the sill plate to connect to the rod.



# 2. Prepare Electrical Panel

(NOTE: This step can be done ahead of time)

ELECTRICAL PANEL (A)

NM SCREW CONNECTORS (C)

a. Orient the panel so that the 3 BIG screws are up, and the 4 small screws are on the right side

b. knockout smallest hole bottom left of panel for ground wire connection to ground rod

c. Drill 1/8" hole here. This anchors the panel to 2x4 brace underneath the panel

c. Knockout TWO 1/2" holes in the TOP and the top LEFT of the panel, Install 2 NM screw connectors.

d. Knockout the two small mounting holes in the RIGHT side of the panel. Holes will be used to mount panel to vertical stud using screws

### 3. Install the TWO Mains Feeder Cables into Panel

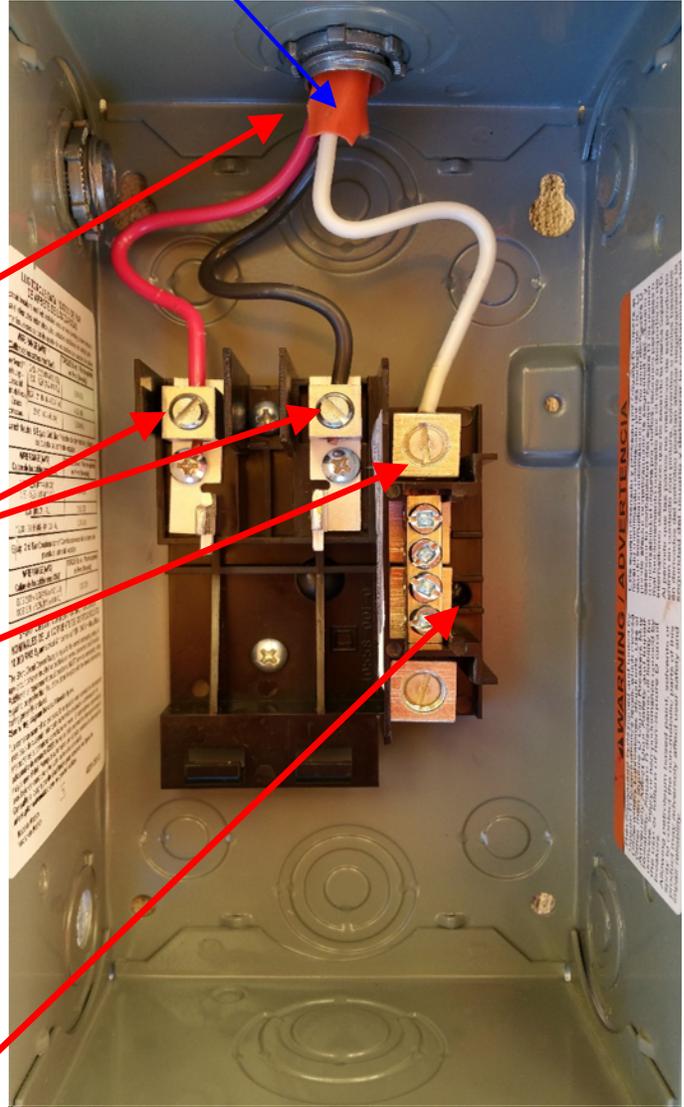
(NOTE: This step can be done ahead of time)

MAINS FEED CABLES (D)

- a. Locate the **ORANGE, 30 Amp** mains feeder cables, and strip 6 inches of the orange jacket off. (Only need 10 Ft)
- b. Cut off the Copper ground wires, They should NOT be used.
- c. Run the **ORANGE** wire into the NM connector, clamp down both screws
- d. Strip white, Black and Red wires
- e. Connect **RED** and **BLACK** wires to each breaker base LUG connection
- f. Connect **WHITE NEUTRAL** wire to the **NEUTRAL** lug connection

Max of 1/16" stripped wire should be visible on either side of the lug connector. (This ensures you are not clamping down on insulation)

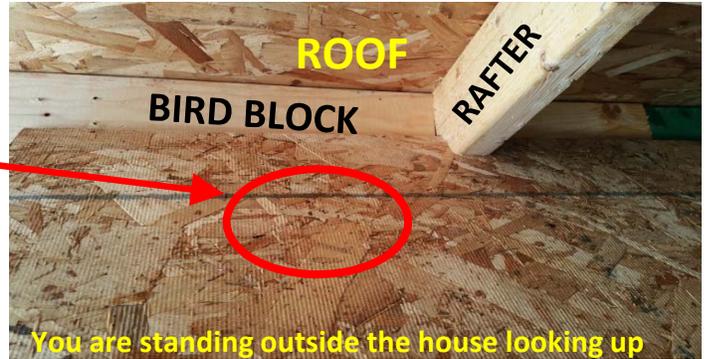
- g. Install **green ground bonding screw** and tighten. Check that it is tight, and that it protrudes from the back of the panel box.



## 4. Picking a spot for the External Junction Box

- a. The junction box goes on the OUTSIDE of the same bay where the electrical panel is going to go, a few inches below the TOP PLATE.

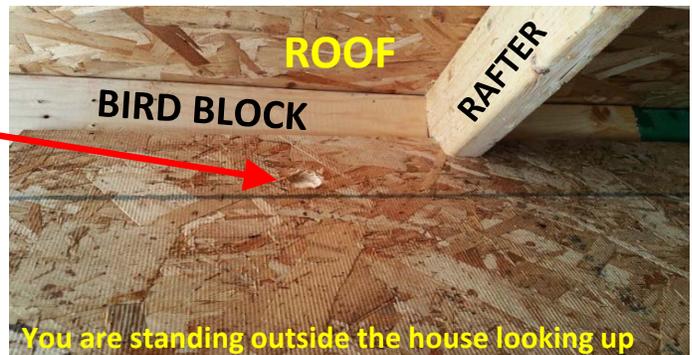
This junction box connects the two mains feed wires from the electrical panel to the aerial wire coming to this corner of the house.



**BEFORE DRILLING ANY HOLES**, check to make sure that the aerial service drop will reach this corner of the house - No obstructions / structures in the way - and not going OVER the new house roof.

- b. If the aerial cable route looks good, you can pick a spot to **drill a 1" hole**. Nipple from back of box goes here.

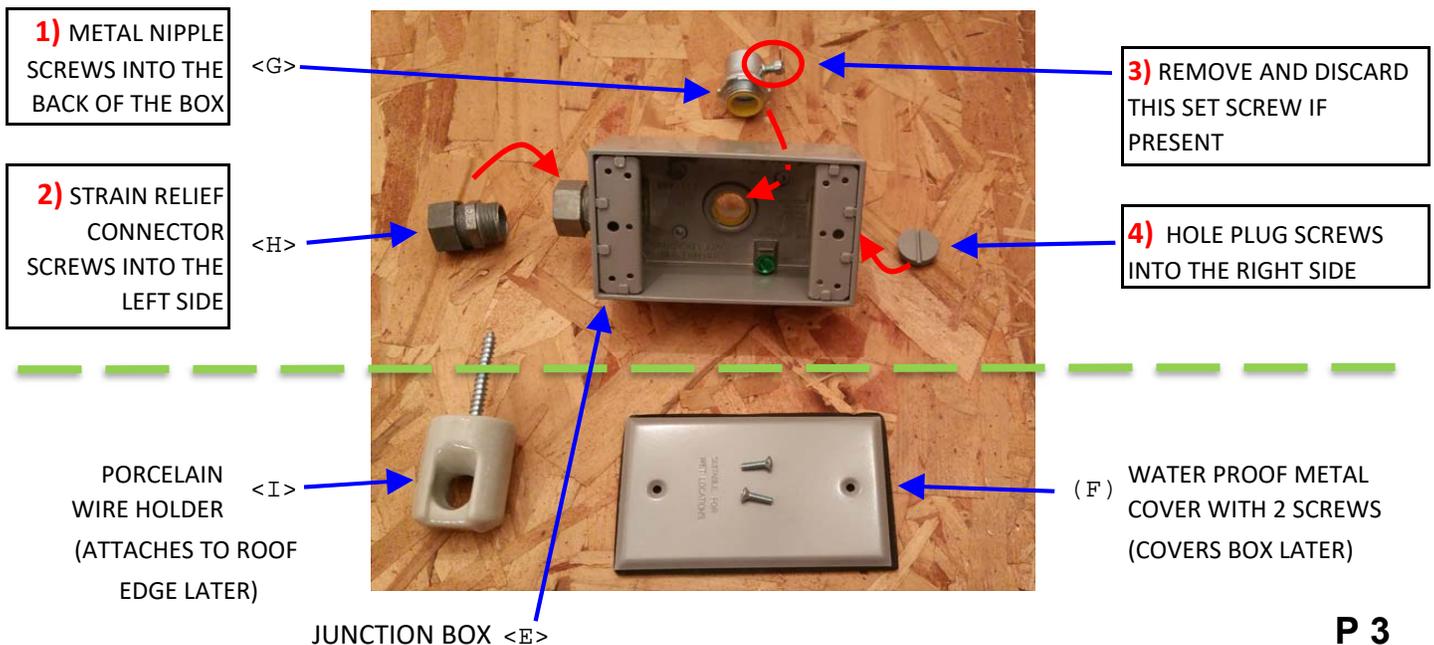
Hole height considerations: High under the eaves so box is out of the rain



**IF YOU DECIDE TO PLACE BOX ON GABLE END WALLS ABOVE TOP PLATE, USE NAIL PLATE PROTECTION OVER WIRE PATH BOTH SIDES**

## 5. Junction Box parts - Locate and assemble:

(NOTE: This step can be done ahead of time)



## 6. Mount the external Junction Box

- a. Drill two holes on the inside back of the metal junction box.
- b. Put caulk around the OUTSIDE of the metal nipple that sticks out from the back of the box to get a water resistant seal.
- c. Using two #10 screws, mount the junction box horizontally, with the metal nipple on the back protruding into the wall.



## 7. Mount the electrical panel

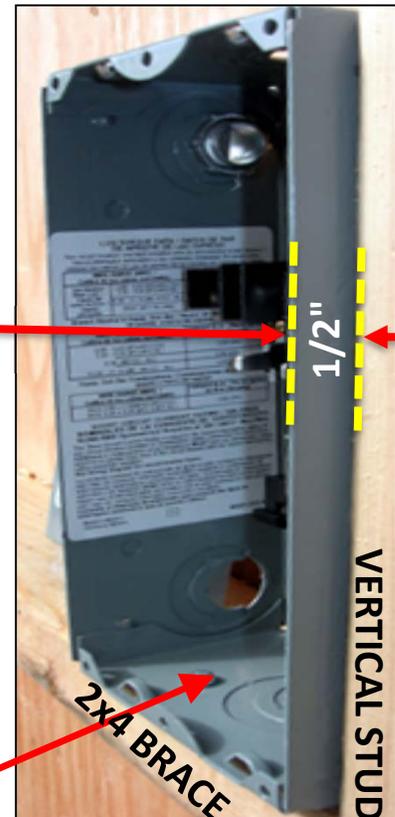


FRONT VIEW

- a. Install a 2x4 Horizontal brace in the wall bay about 5 feet above floor level.

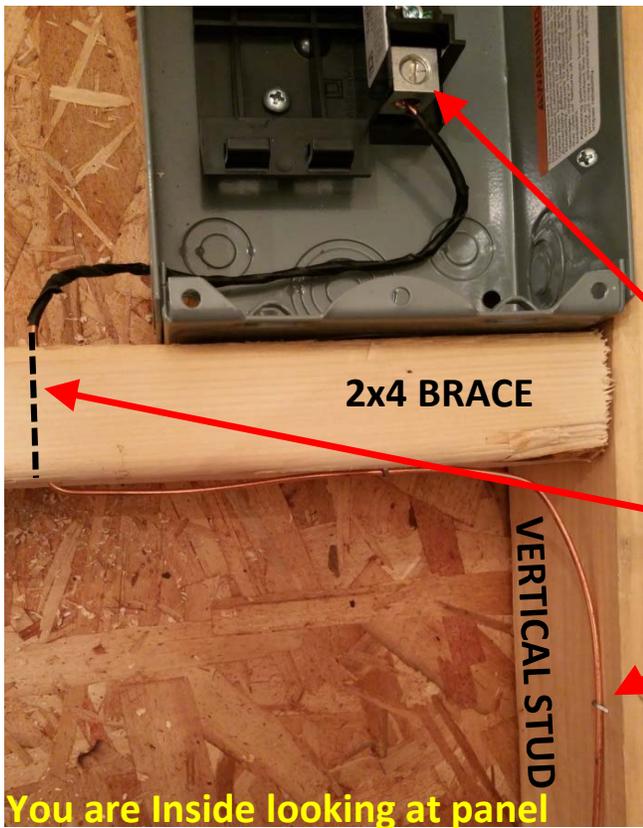
**IMPORTANT:**  
The panel should stick out of the wall bay about 1/2" to clear the sheet rock. Panel cover will not close otherwise.

- b. attach right side of panel with two #10 screws into vertical stud. Note that screws go in at a 45 degree angle, as holes are too close to wood edge.
- c. attach bottom of panel with one #10 screw into the 2x4 brace. Screw may need to enter brace at 45 degrees.



SIDE VIEW

## 8. Install ground wire and Rod



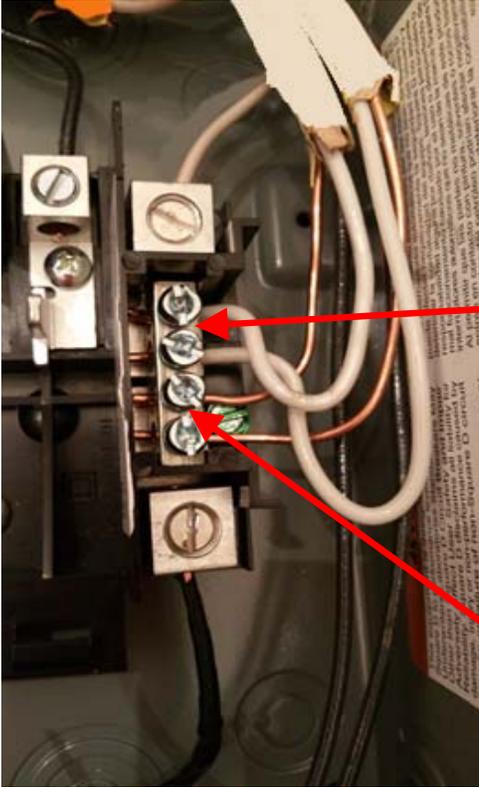
- a. Pound ground rod into ground as far as possible with a sledge hammer  
Best location is other side of panel
- b. **Strip THREE lengths of # 14 wire** and braid them together, making one ground wire. Wrap tape around part inside the panel as shown.
- c. Connect ground wire to bottom large screw LUG. Other end of wire goes to the grounding rod outside the house.
- d. Drill a hole into the 2x4 horizontal brace so the ground wire can pass
- e. Use wire Staples to attach wire to studs
- f. Drill a small hole for wire exit about 1" above sill. Caulk for waterproofing.
- g. Connect ground wire to Ground Rod with supplied brass clamp connector.

## 9. Run mains feed cables to Junction Box

- a. Feed the ORANGE mains cable up through the wall bay, and into the metal nipple protruding from the junction box
- b. Attach the cable to the wall studs every 2 feet using wire staples
- c. The ORANGE MAINS cable can dangle outside from the junction box for now. You only need about 8" of wire in the external junction box to make your connections.



## 10. Connect NEUTRAL (white) and ground wires



- Thread the two house circuits through the NM screw down connector (see photo below for route). Clamp down using screws.
- Strip neutral (WHITE) wires, and connect to the top two terminals

**IMPORTANT:** Leave long enough black wires to reach the breakers

Max of 1/16" stripped wire should be visible on either side of the lug connector. (This ensures you are not clamping down on insulation)

- Connect the two Ground (COPPER) wires to the next two small terminals as shown in this picture

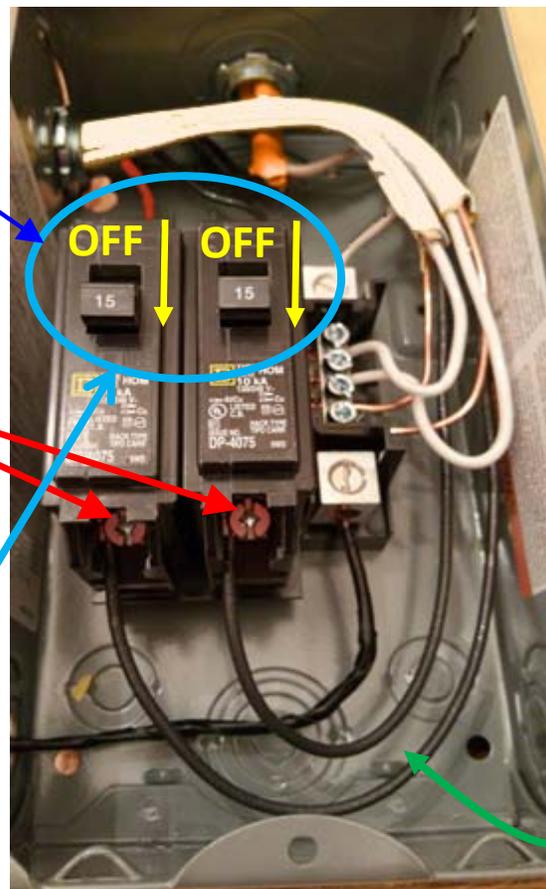
## 11. Connect HOT (BLACK) wires to breakers

- Strip the hot (BLACK) wires.
- Connect Each Black Wire from the house circuits to a 15 Amp breaker terminal

Max of 1/16" stripped wire should be visible on either side of the lug connector. (This ensures you are not clamping down on insulation)

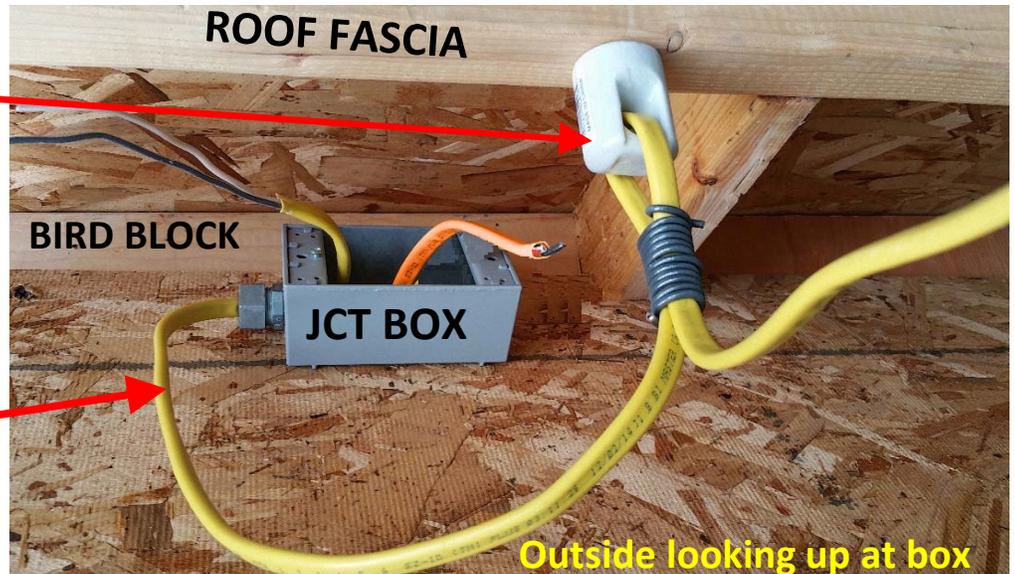
- Insert Breakers into Panel by seating bottom part first, then rocking into top metal bus contact "tooth".

- TURN BOTH BREAKERS OFF - FLIP THE SWITCHES DOWN**



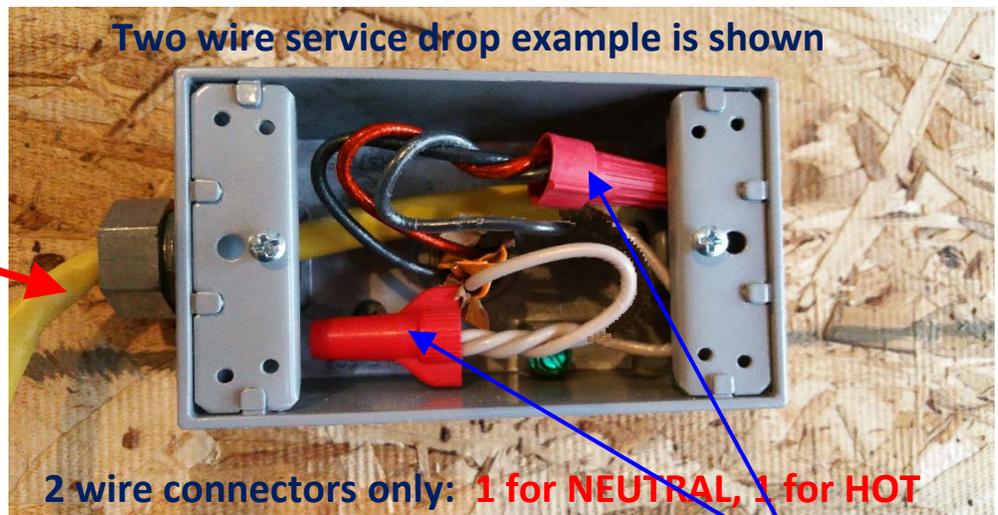
## 12. Run the service drop wire into Junction Box

- a. Pre-drill a hole, and attach the ceramic insulator/strain relief into the roof fascia.



- b. Run the service drop cable through the insulator, secure it with a length of insulated wire
- c. Run the end of the wire through the grommet on the water resistant entry into the J-box.  
(It might help to loosen the exterior hex nut, run the wire in, then re-tighten as necessary)

## 13. Connect Service Drop Wire to House Mains Feed



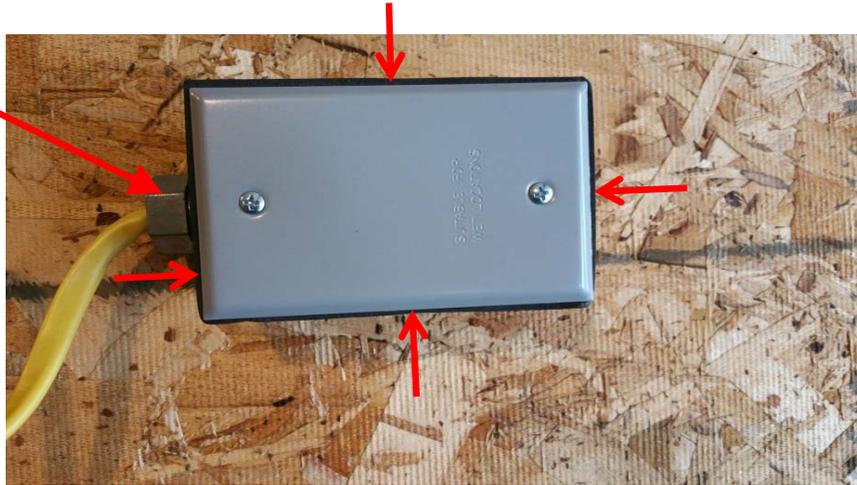
- a. Strip and Trim the two cables in the junction box. You should cut off any bare copper wires (ground). None are used.

<J> WIRE NUTS

- I** IF 2 WIRE SERVICE (110 Volts - MOST COMMON): Using **2** wire nuts, connect service drop **NEUTRAL** wire and WHITE (neutral) mains feed (2 wires total). Connect service drop **HOT** wire to **BLACK AND RED** house mains feed wires (3 wires total).
- II** IF 3 WIRE SERVICE (240 Volts - NOT SHOWN IN PHOTO) Using 3 wire nuts, connect service drop NEUTRAL to WHITE NEUTRAL. Connect EACH of the Service drop HOT wires SEPERATELY to the **RED** and then to the **BLACK** house mains wires.

# 14. Install external Junction Box Cover

- a. Check that the large hex nut is tight. This ensures it is water tight.
- b. Check that the water proof rubber gasket is visible around all edges of the cover before tightening it.



- c. Using the two screws provided, tighten down the cover to the Junction Box

# 15. Install Panel Cover

- a. For safety reasons, it is IMPORTANT that the cover to the panel be installed even if the sheetrock is not hung on the walls yet.
- b. Secure the cover with the four screws provided.
- c. Remove the cover when ready to hang the sheetrock

USE ELECTRICAL TAPE TO TAPE A SECTION OF A BLACK TRASH BAG TO KEEP DEBRIS OUT OF THE PANEL

- d. When done, remove the black trash bag and reinstall the cover on the panel.
- e. **DONE! TEST ALL OUTLETS AND SWITCHES**
- f. **REPORT ALL PROBLEMS / ISSUES**

