

Rancho La Paloma Ministry Center

Building Community  Changing Lives

Club Rust

ELECTRICAL PANEL SYSTEM

Version 2.4 31-May-2019

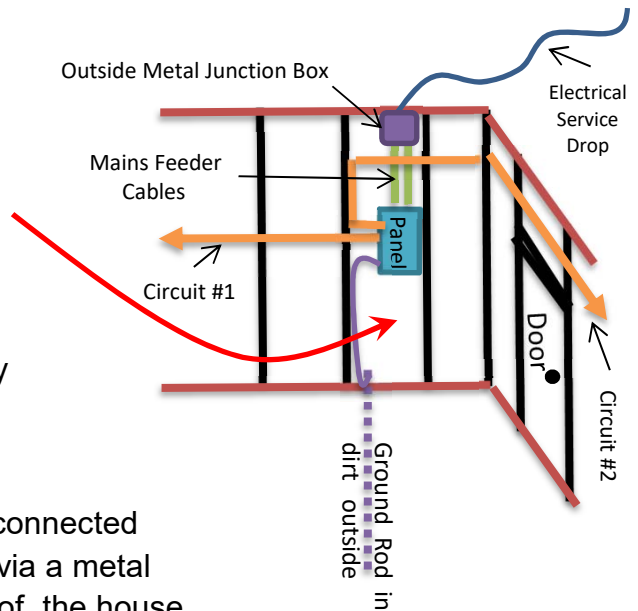
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1. Electrical Panel Location

- 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)

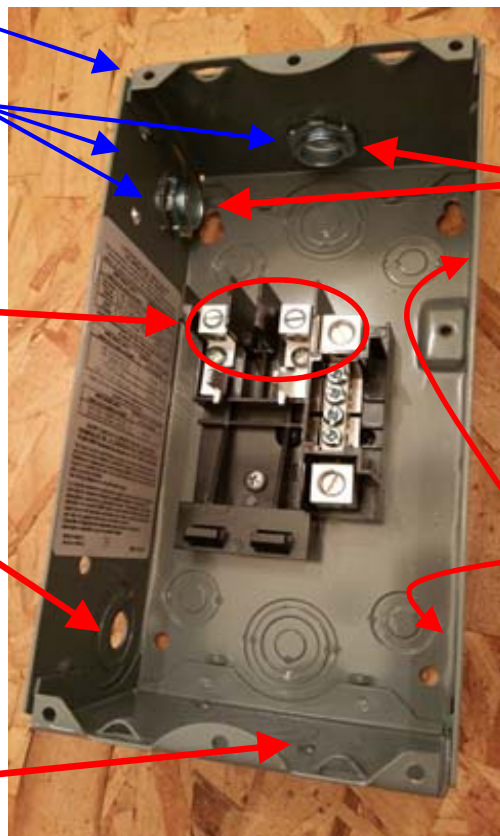
ELECTRICAL PANEL (A)

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

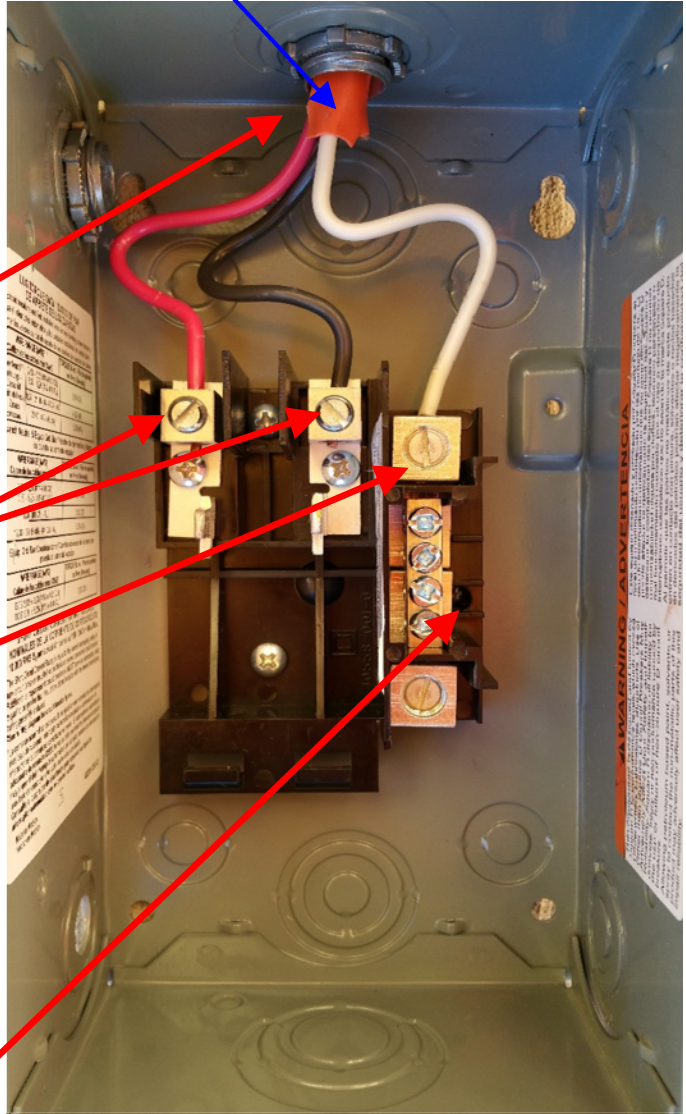
(NOTE: This step can be done ahead of time)

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)

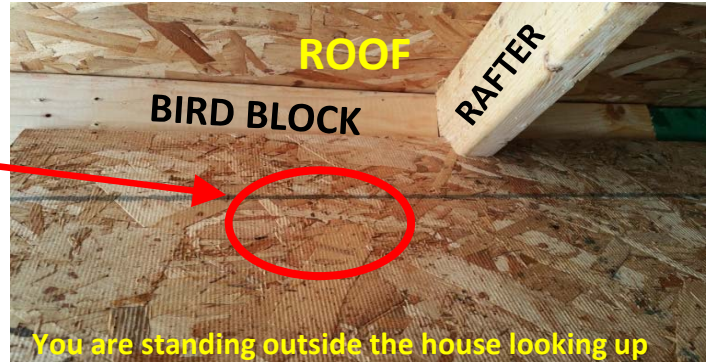
- g. Install **green ground bonding screw** and tighten. Check that it is tight, and that it protrudes from the back of the panel box.



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.

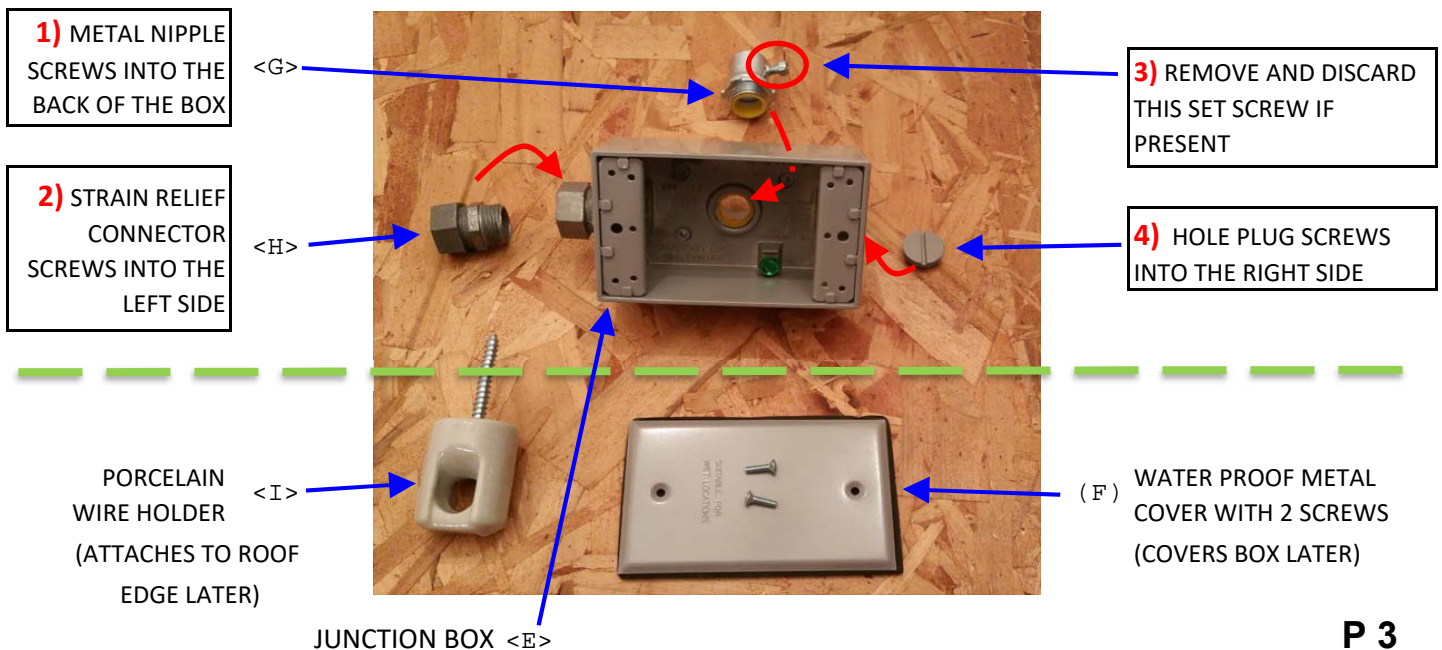
Hole height considerations: High under the eaves so box is out of the rain



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)

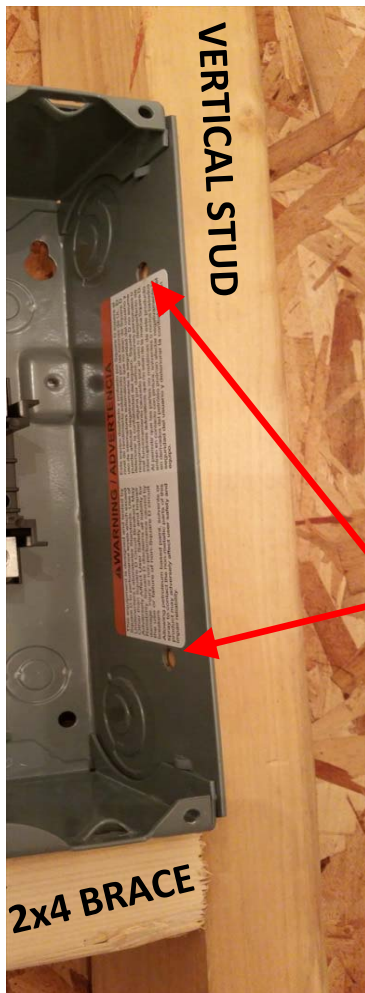


6. Mount the external Junction Box

- Drill two holes on the inside back of the metal junction box.
- Put caulk around the OUTSIDE of the metal nipple that sticks out from the back of the box to get a water resistant seal.
- 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

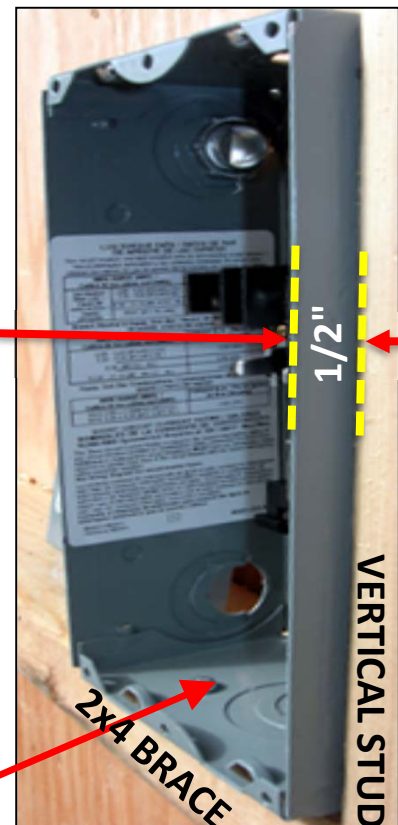


FRONT VIEW

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

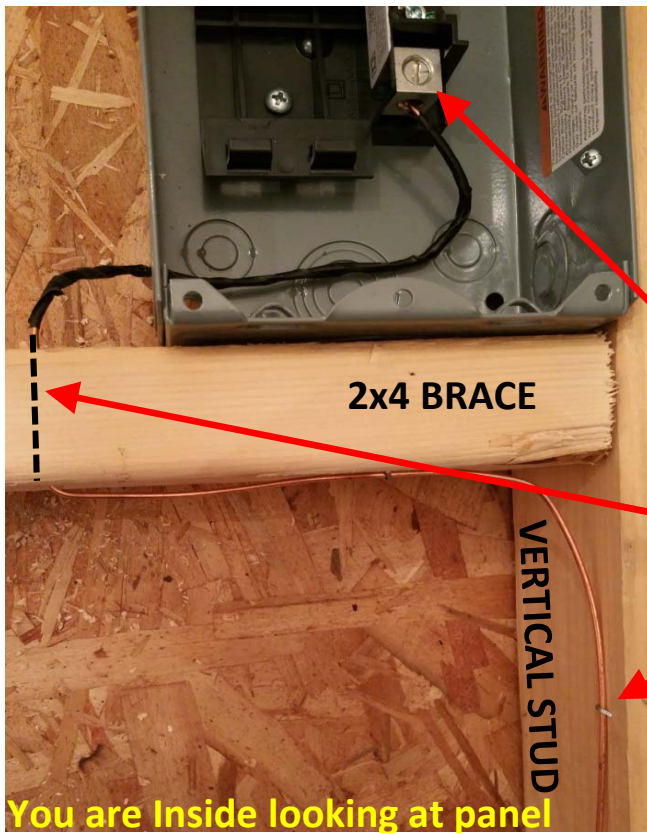
IMPORTANT:
The panel should stick out of the wall bay about 1/2" to clear the sheet rock. Panel cover will not close otherwise.

- 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.
- 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



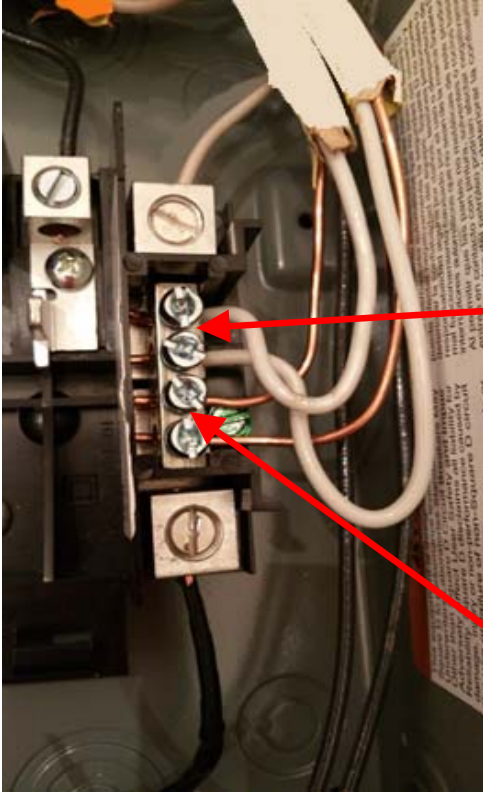
- a. Pound ground rod into ground as far as possible with a sledge hammer
Best location is other side of panel
- b. **Strip THREE lengths of # 14 wire** and braid them together, making one ground wire. Wrap tape around part inside the panel as shown.
- c. Connect ground wire to bottom large screw LUG. 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

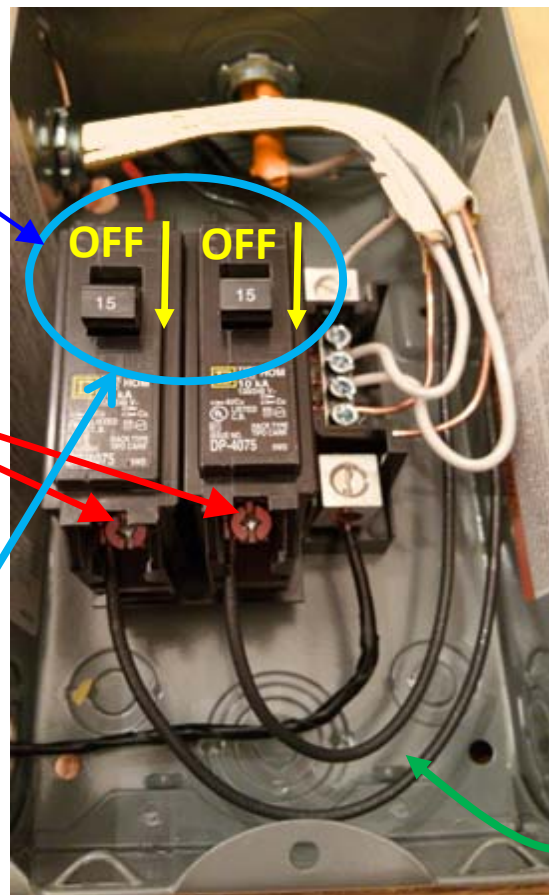
11. Connect HOT (BLACK) wires to breakers

- 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)

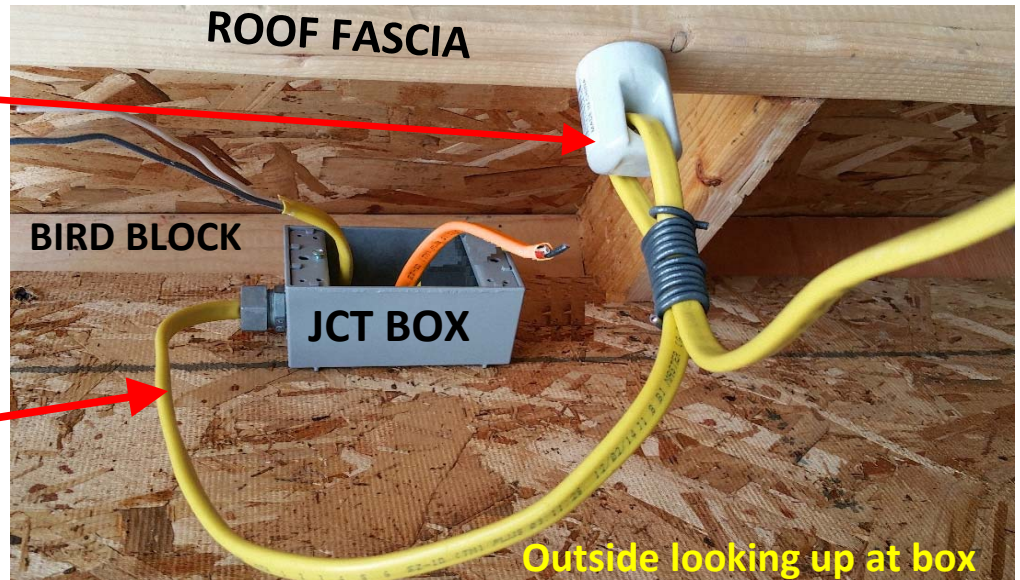
- Insert Breakers into Panel by seating bottom part first, then rocking into top metal bus contact "tooth".

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



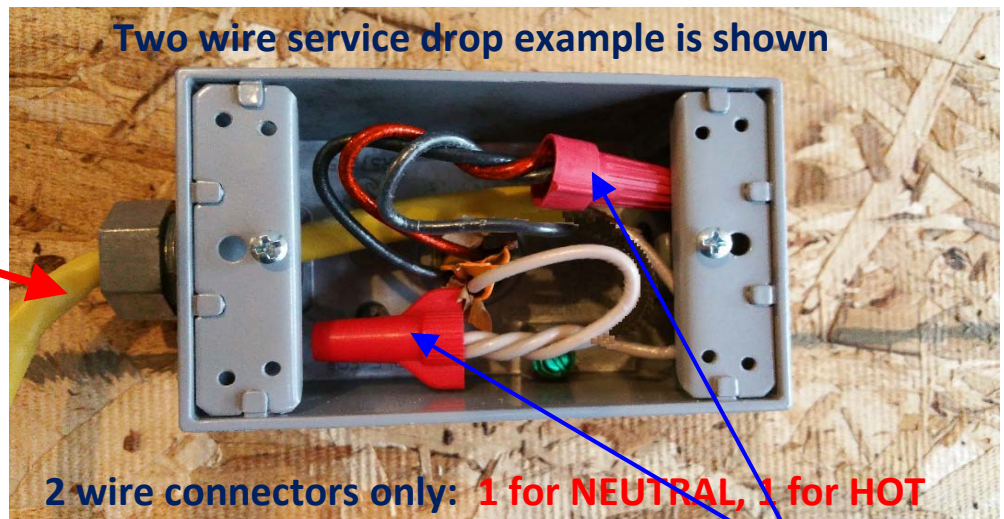
12. Run the service drop wire into Junction Box

- 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**

