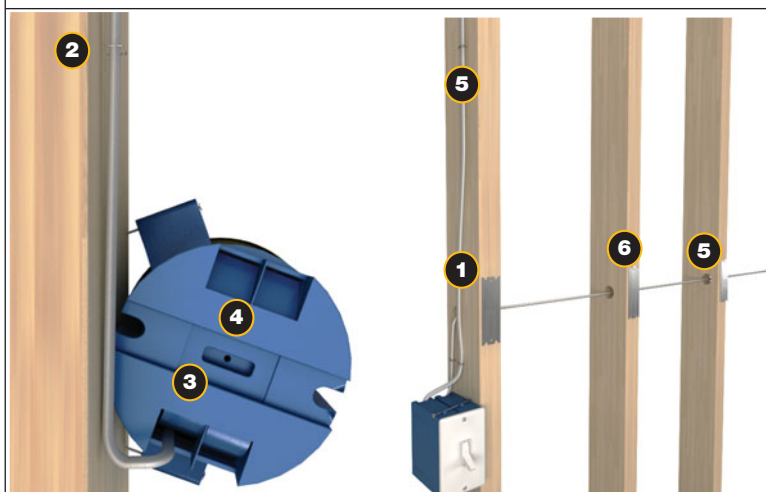


BASIC WIRING REQUIREMENTS AND TECHNIQUES

Cables and Outlet Boxes Installation

CABLES AND OUTLET BOXES INSTALLATION

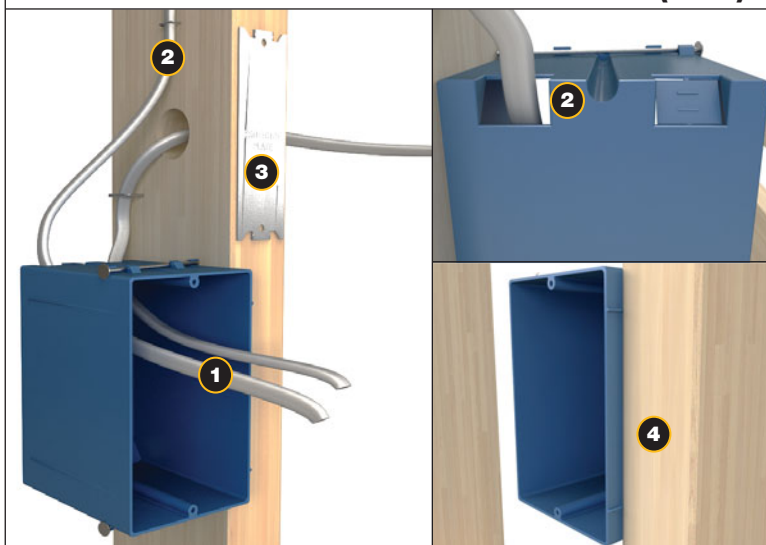


No.	Code	Description
1	334.30	Flat cables must be stapled on the flat side. Do NOT staple flat cables on the edge.
2	334.30	Cable must be secured within 12" of the outlet box.
3	314.17(C)	Cables must be secured to the outlet box. Do NOT remove built-in cable clamps.
4	314.27(A)	Outlet boxes must be listed for support of lighting fixtures. (Typically round boxes.)
5	334.30 & 334.30(A)	Cables must be secured every 4' 6". Cables routed horizontally through bored holes in framing members do NOT require additional support.
6	334.80 & 338.10(B) (4)(a)	When 3 or more NM or SE cables are installed in contact with insulation without maintaining spacing or pass through the same opening in wood framing members that are to be caulked or sealed, the allowable ampacity of each conductor must be adjusted in accordance with NEC Table 310.15(B)(2)(A).

YOU SHOULD KNOW: NEC 220.14(J)

- Code does not mandate a maximum number of receptacle outlets on residential circuits. However, typically 8–10 devices (*lights, receptacles and smoke detectors*) are installed on each branch circuit. Appliances and higher wattage lighting fixtures (*such as chandeliers*) should be installed on individual circuits.

CABLES AND OUTLET BOXES INSTALLATION (cont.)




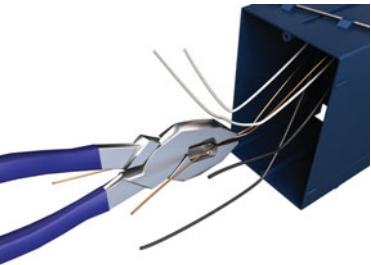
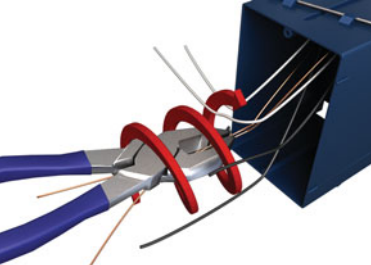
No.	Code	Description
1	300.14	At least 6" of free conductor must be left at each outlet box. <i>(Applies to all boxes.)</i>
2	314.17(C) Exception	Cable must be secured within 8" of (2" × 4") (single) nonmetallic boxes since cable clamps typically are not provided for these boxes.
3	300.4	Steel plates must be provided to protect cables routed closer than 1¼" from the edge of wood framing members.
4	314.20	Boxes should be mounted flush with finished surface. Most boxes feature built-in depth gauges for easy installation.

YOU SHOULD KNOW: NEC 314.20 & 314.21

- If the box is recessed (not flush) in a combustible wall, listed box extenders must be used. Boxes installed in noncombustible walls must not be recessed more than ¼".
- Drywall and plaster around boxes utilizing flush type covers must be repaired so that there are no gaps greater than ⅛" at the edges of the box.

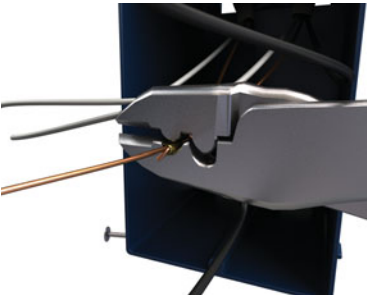
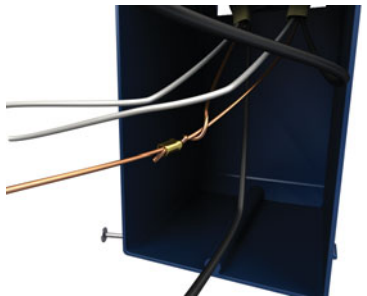
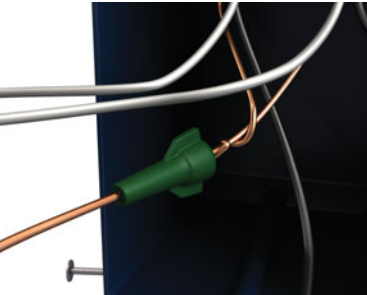
ROUGHING IN RECEPTACLE OUTLETS

HOW IT WORKS

Step	Directions	
1	<p>Remove outer sheathing from NM cable. Leave at least 1/4" of sheathing inside of the outlet box.</p> <p>314.17(C)</p> <p>Leave at least 6" of free conductor at each outlet box.</p> <p>300.14</p>	 An illustration showing a blue outlet box mounted on a wooden wall. A yellow-handled wire stripper is being used to strip the outer sheathing of a white NM cable. The stripped conductors are visible inside the box.
2	<p>Make a V with the grounding conductors and grab with the tip of side cutting pliers.</p>	 An illustration showing side cutting pliers being used to cut a V-shaped notch into the grounding conductors (one blue, one orange) that are protruding from the outlet box.
3	<p>Twist pliers clockwise, 4-5 times, while slightly pulling on the grounding conductors to make a neat connection.</p>	 An illustration showing side cutting pliers being used to twist the grounding conductors (one blue, one orange) together. Red curved arrows indicate the clockwise twisting motion.

If using crimp sleeves follow steps 4 and 5.

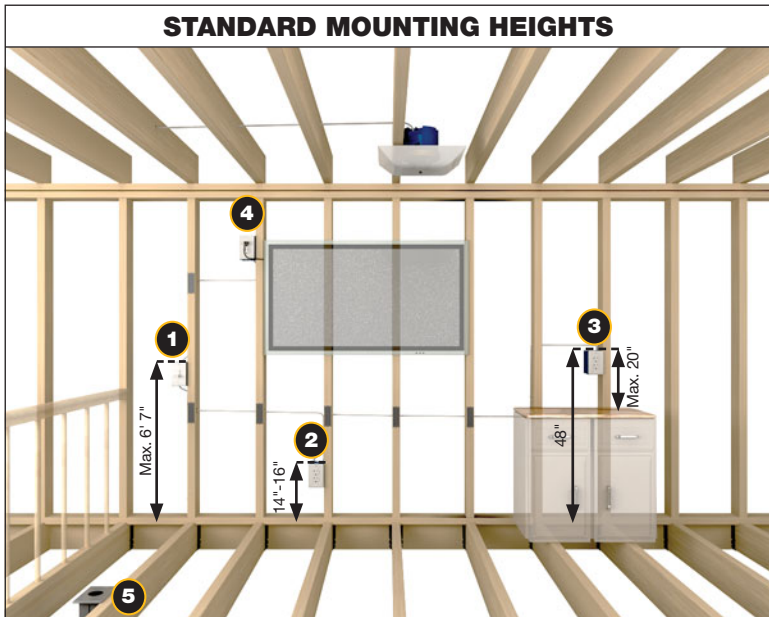
If using grounding wire connectors skip to step 6.

ROUGHING IN RECEPTACLE OUTLETS (cont.)		
HOW IT WORKS		
Step	Directions	
4	If using a crimp sleeve, install sleeve over grounding conductors and crimp with a crimping tool. If only one device is installed, the remaining grounding conductors may be cut off after the crimp sleeve. If multiple devices are installed in the box, leave as many grounding conductors as there are devices.	
5	With the grounding conductors properly connected, the device is ready to be installed.	
6	If using a grounding wire connector, cut off any grounding conductors that will not be used before installing the connector. With the grounding conductors properly connected the device is ready to be installed.	

Step 6 is not necessary if using crimp sleeves.

BASIC WIRING REQUIREMENTS AND TECHNIQUES

Standard Mounting Heights



No.	Code	Description
1	404.8(A)	Switches are typically mounted 48" from the floor to the top of the box but should never be more than 6' 7".
2	N/A	Receptacles are typically installed 14"-16" from the floor to the top of the box. (Many electricians use a hammer to place.)
3	210.52(C)(5)	Receptacles for countertops are typically placed 48" from the top of the floor to the top of the box. No more than 20" above countertop to count as required outlets.
4	210.52	Receptacle may be mounted to any height but may not be counted as required receptacles if located more than 5' 6" above the floor.
5	314.27(C) & 210.52(A)(2)	Fixed railings must be counted as wall space. If no area is available for wall mounted receptacles, listed floor boxes and covers must be used. (See page 37 for more details.)

YOU SHOULD KNOW:

- Lights are typically centered over the room or area where lighting is desired.