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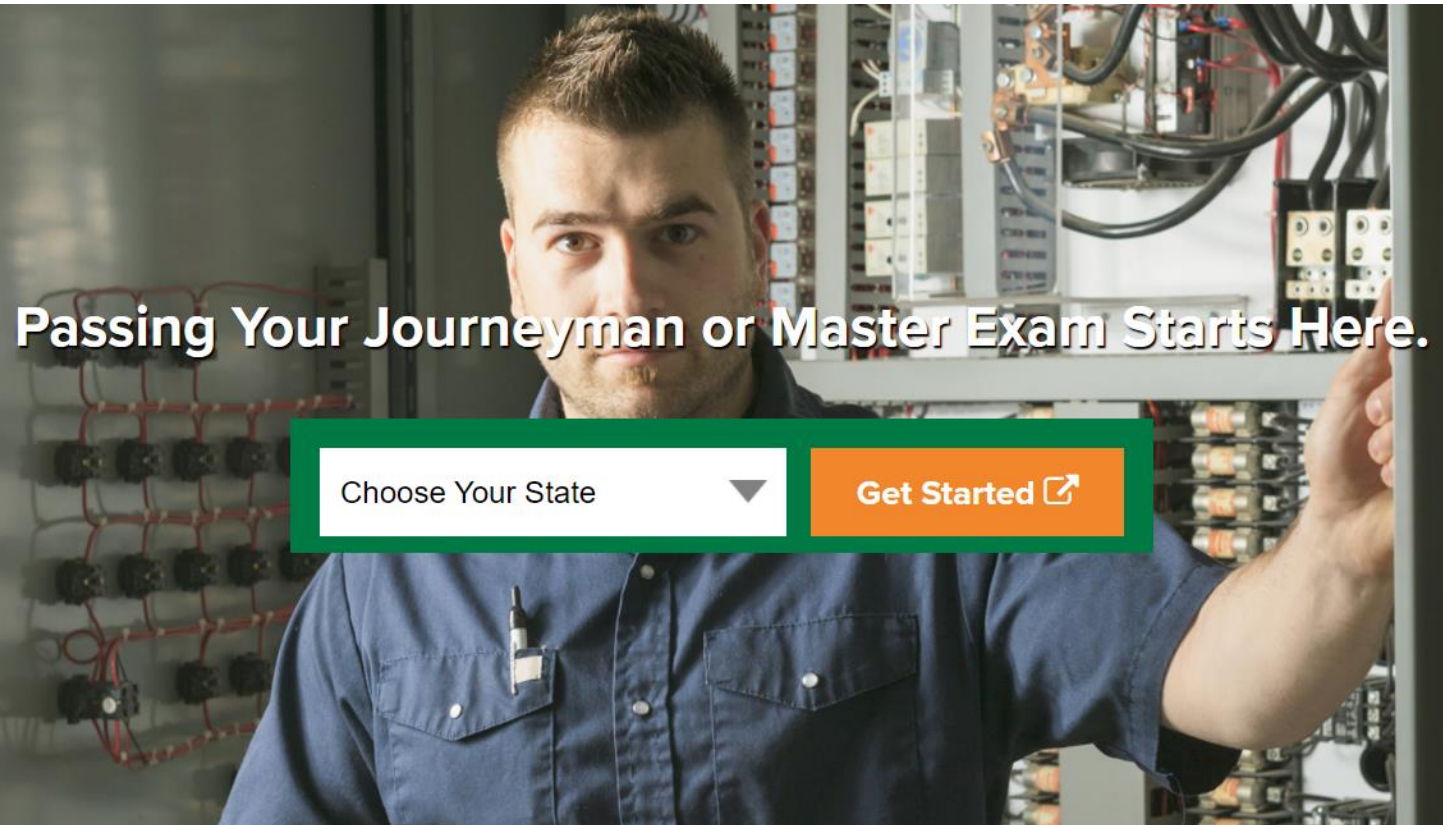
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1(800)443-5233



support@jadelearning.com

Welcome Iowa Electricians!

What Does Iowa Require?

18-Hours of Continuing Education Required

- The Iowa electrician must complete no less than 18 Continuing Education Units (CEUs) in each three-year license cycle.
- No less than 6 of those 18 CEUs must focus on the most recent Iowa electrical code.
- JADE Learning's two-hour VILT sessions satisfy ALL of Iowa's requirements for electrical continuing education.
9 VILT sessions provides you all 18 hours.



2020 NEC Changes

Important Changes from the 2020 NEC

6:00 PM Eastern Time

5 PM in Iowa

5:40 PM – 6:00 PM	Registration / Check In
6:00 PM – 7:00 PM	NEC Chapter 3 <i>with poll questions</i>
7:00 PM – 7:10 PM	Break
7:10 PM – 7:55 PM	NEC Chapter 3 (Continued) <i>with poll questions</i>
7:55 PM – 8:00 PM	Questions for the instructor?

2020 NEC Changes

Important Changes from the 2020 NEC

Instructor: Jerry Durham

Quick Summary

- Stay attentive to the VILT session, your activity is being monitored.
- Incorrect answers to Poll Questions **do not count against you**, however, participation in each Poll Question is mandatory to receive course credit.
- If you have trouble hearing or need assistance, let us know.
- Make sure JADE Learning has your CORRECT electrical license number.
- Be sure to show the instructor your ID during check-in at the beginning of each session.
- You will be emailed a copy of your certificate within 2 business days.
- You must complete a short survey at the end of class to receive credit from the state. Your instructor will provide the link and answer any questions.

Questions? Concerns?

Call the JADE Learning office at 1-800-443-5233

2020 NEC Changes

Important Changes from the 2020 NEC

Instructor: Jerry Durham

Common reasons for not seeing your CE units posted (yet) on the Iowa website:

- The electrician didn't provide the correct electrical license number to JADE Learning.
- The electrician didn't use their correct name during the class. Make sure your displayed name during the training session is your legal name.
- The electrician didn't complete and submit the survey at the end of class. Iowa does not give continuing education credit until the survey is completed at the end of each class.
- We can fix any of these issues—DON'T WORRY- JUST LET US KNOW!

Thank you!

Questions? Concerns?

Call the JADE Learning office at 1-800-443-5233

Iowa



2020 NEC Changes CHAPTER 3

- 2-Hours Credit

Welcome Iowa



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2020 NEC CHANGES

Chapter 3

What is Chapter 3 of the NEC?

WIRING METHODS AND MATERIALS

Chapter 3 of the 2020 NEC covers: *Wiring Methods and Materials*. Beginning with Article 300: ***General Requirements***.

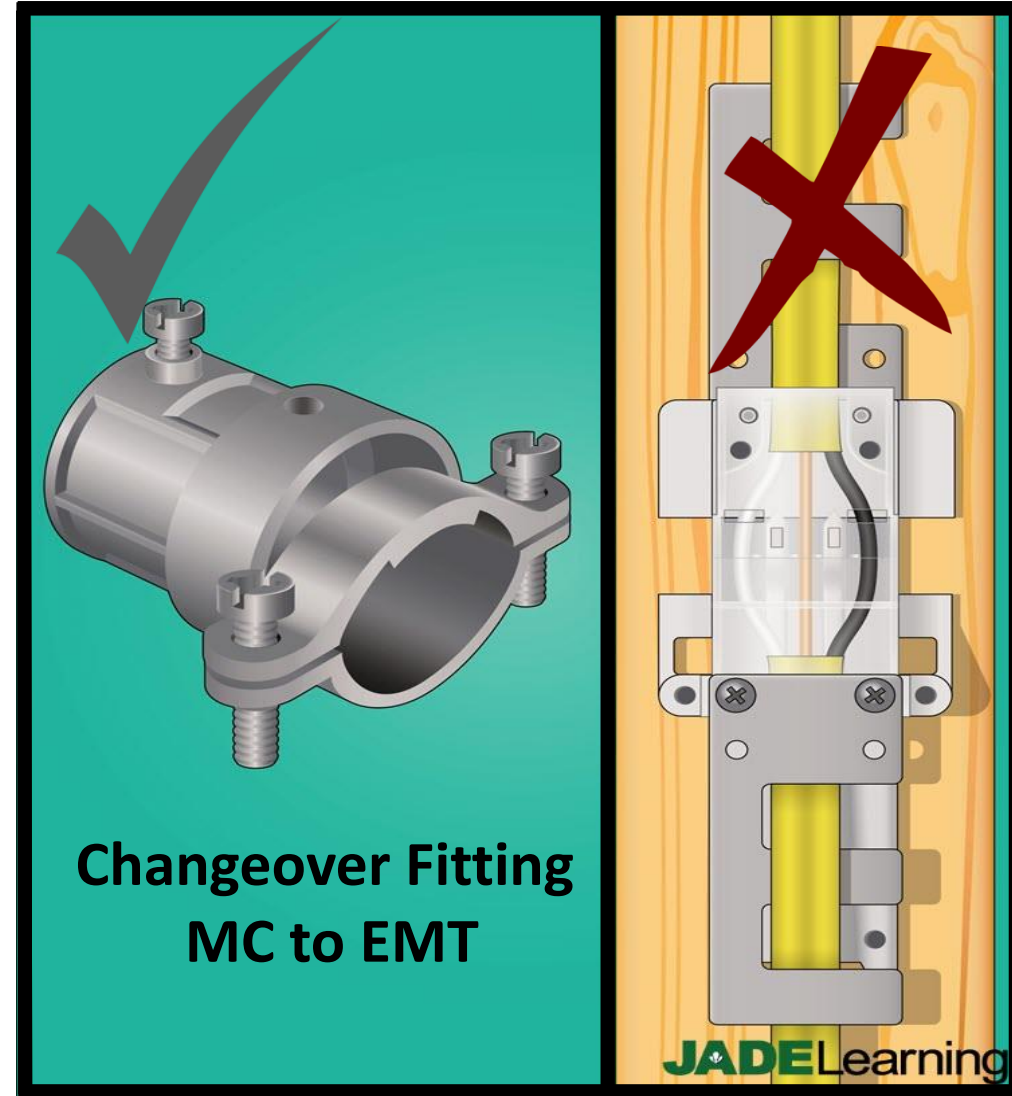
Chapter 3 address material and installation requirements with regard to:

- Conductors
- Enclosures
- Types of cables
- Types of raceways
- Cable and conductor support systems (Cable Trays)
- Open wiring types including low voltage above drop ceilings

300.15(F) Boxes, Conduit Bodies, or Fittings – Where Required. Fitting.

NEW FOR 2020 NEC-

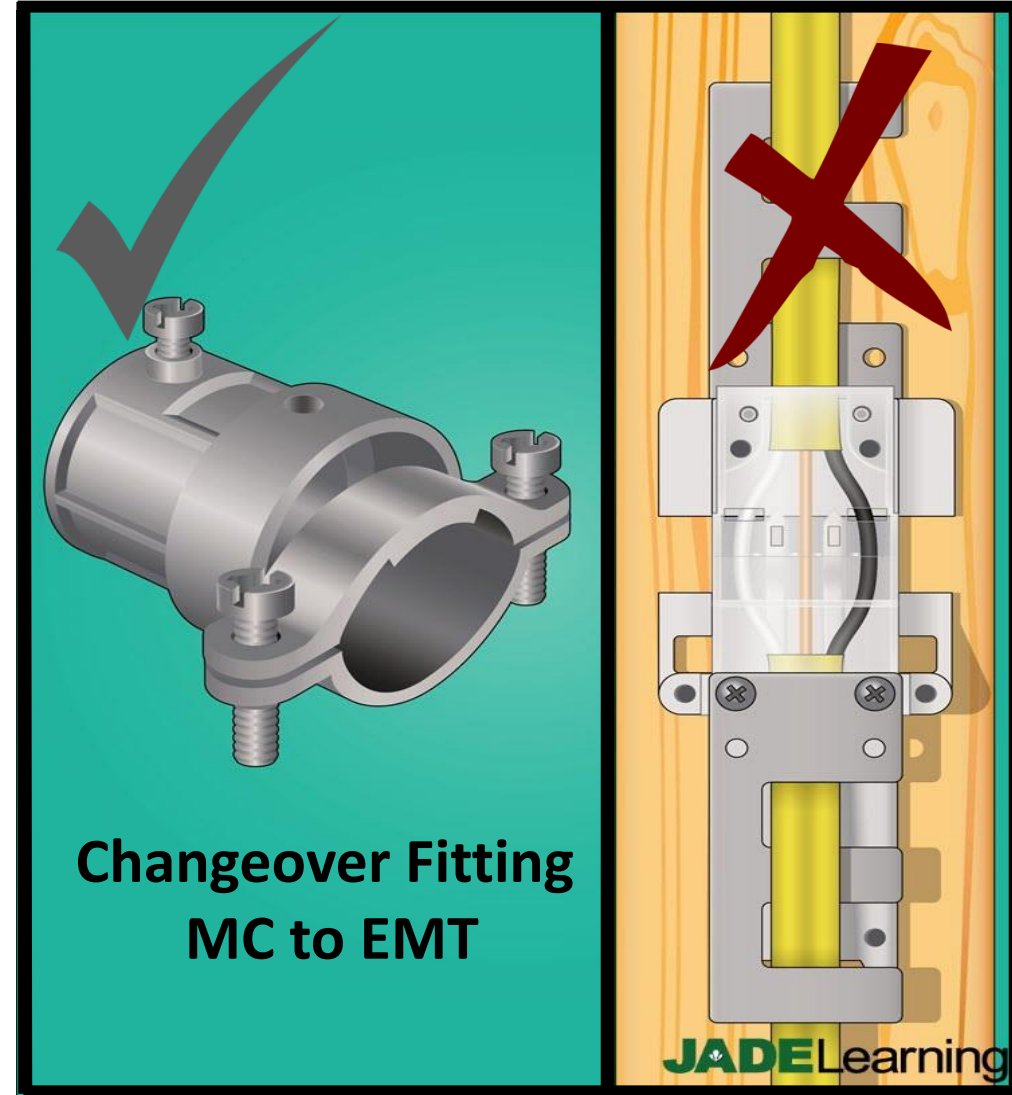
Section 300.15(F) of the 2020 NEC states:
A fitting identified for the use shall be permitted in lieu of a box or conduit body where conductors are not spliced or terminated within the fitting. The fitting shall be accessible after installation, unless listed for concealed installation.



300.15(F) Boxes, Conduit Bodies, or Fittings – Where Required. Fitting.

Section 300.15(F) of the 2020 NEC states:
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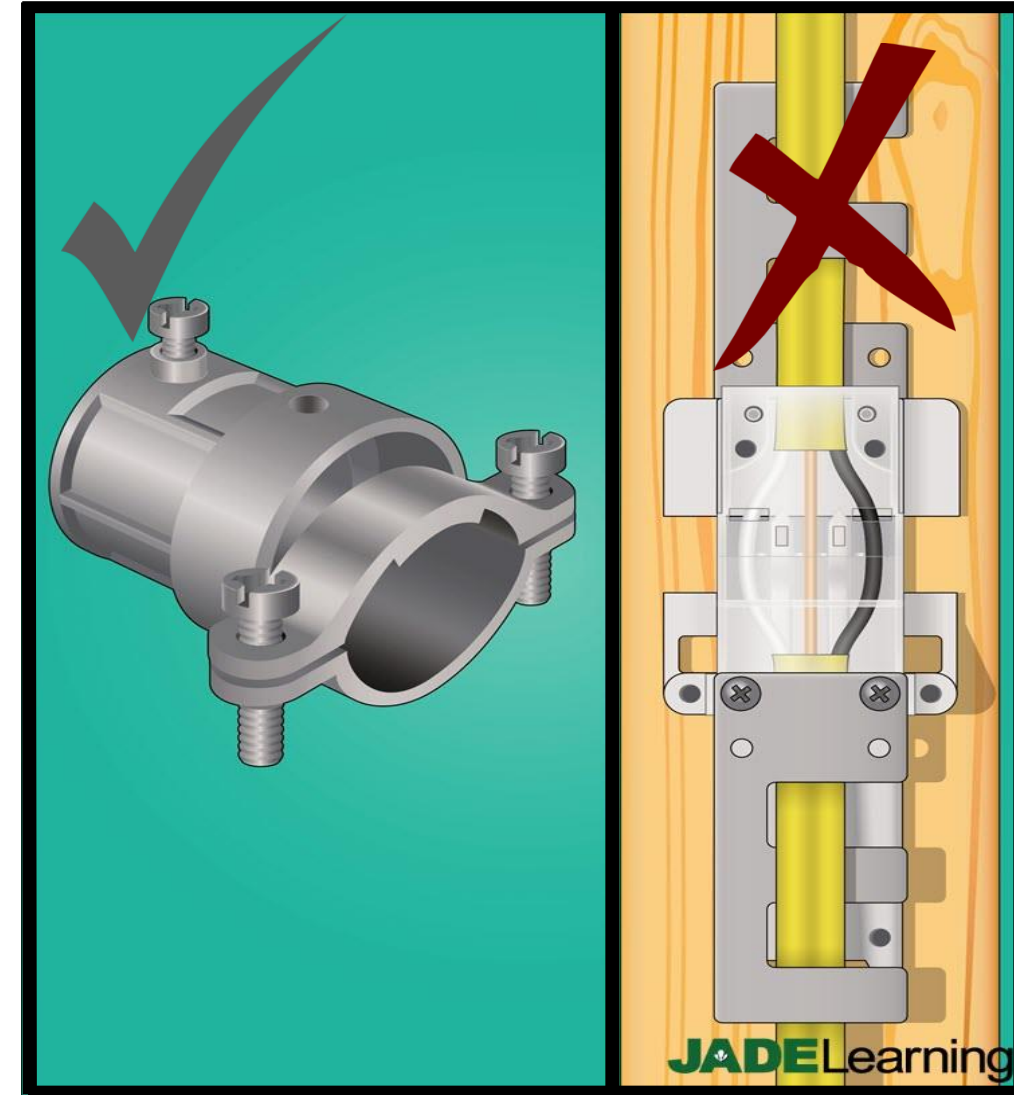
In the 2017 NEC, these types of fittings were required to be accessible after installation (never concealed).



300.15(F) Boxes, Conduit Bodies, or Fittings – Where Required. Fitting.

Can the “fitting” marked with a red “X” in this image be used in place of a junction box according to Code section 300.15(F)?

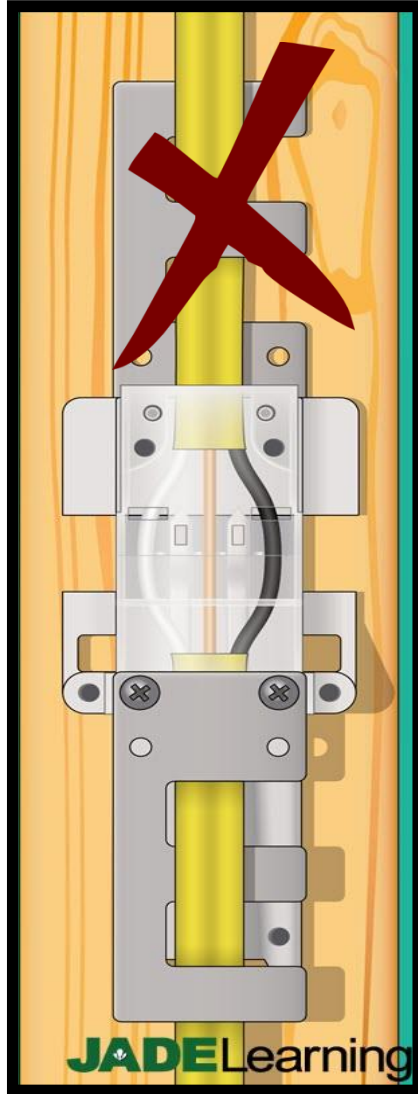
LET’S TAKE A LOOK:



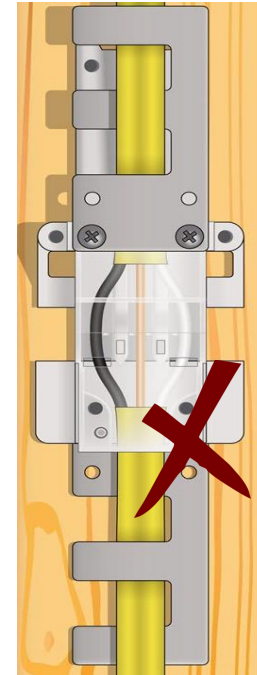
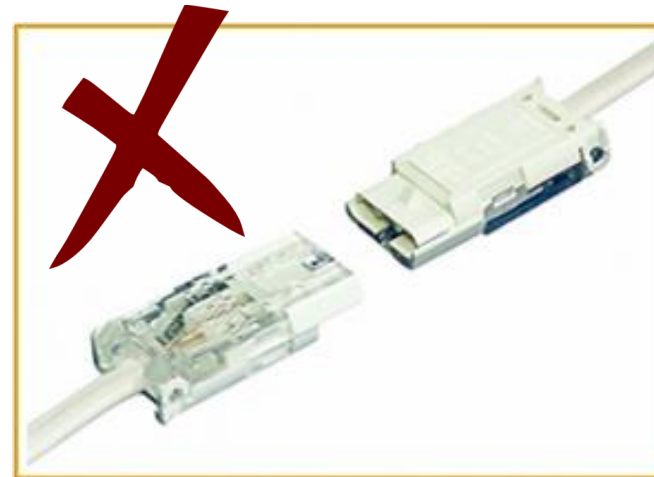
Section 300.15(F) of the 2020 NEC

told us: A fitting identified for the use shall be permitted in lieu of a box or conduit body where conductors are not spliced or terminated within the fitting. The fitting shall be accessible after installation, unless listed for concealed installation.

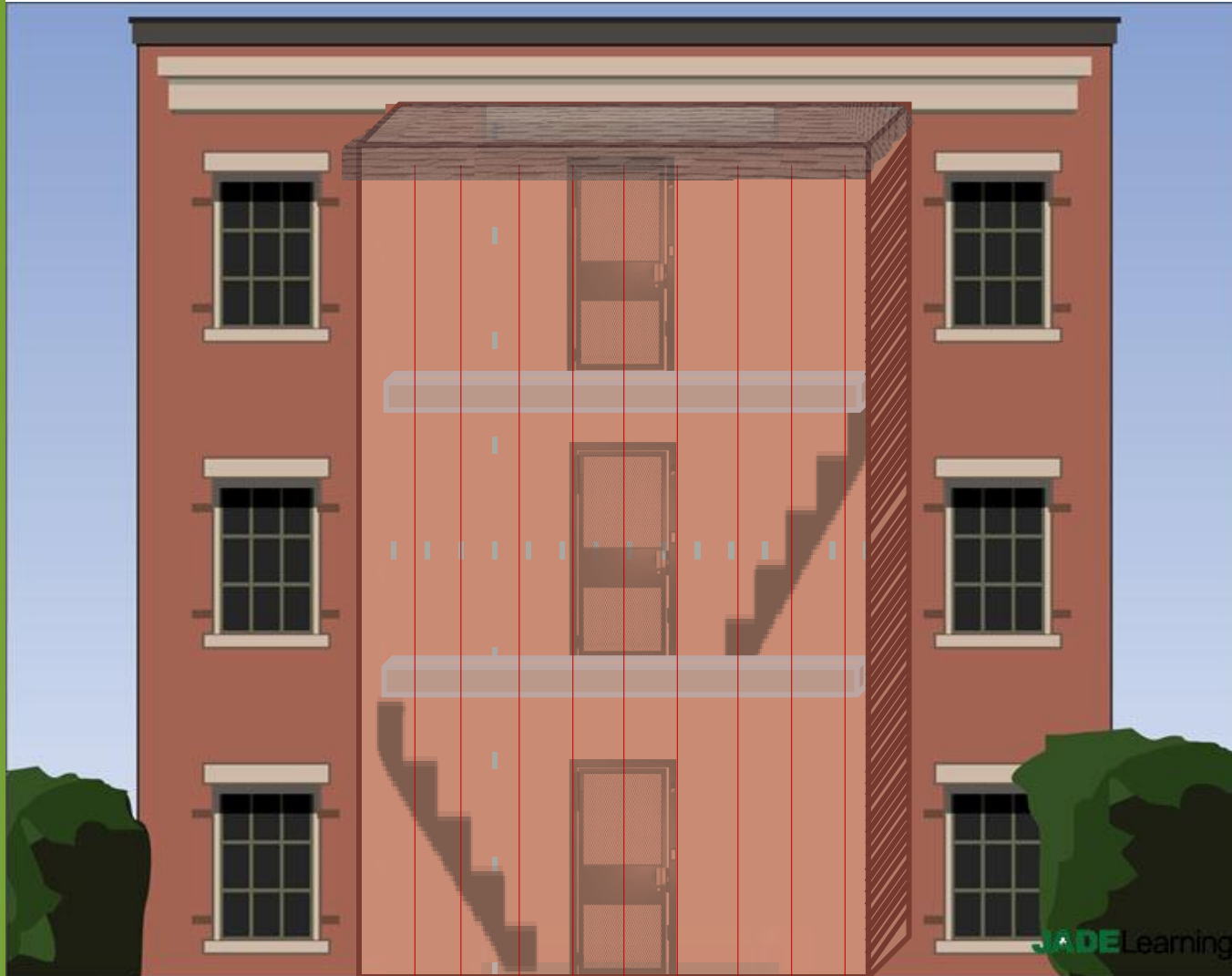
300.15(F) Boxes, Conduit Bodies, or Fittings – Where Required. Fitting.



This “INTERCONNECTOR” fitting contains a wire splice - **NO GOOD!**



300.25 Exit Enclosures (Stair Towers).



**BRAND NEW for the 2020 NEC is
Code section 300.25:**

Where an exit enclosure is required to be separated from the building, only electrical wiring methods serving equipment permitted by the authority having jurisdiction in the exit enclosure shall be installed in that exit enclosure.

300.45 Danger Signs.

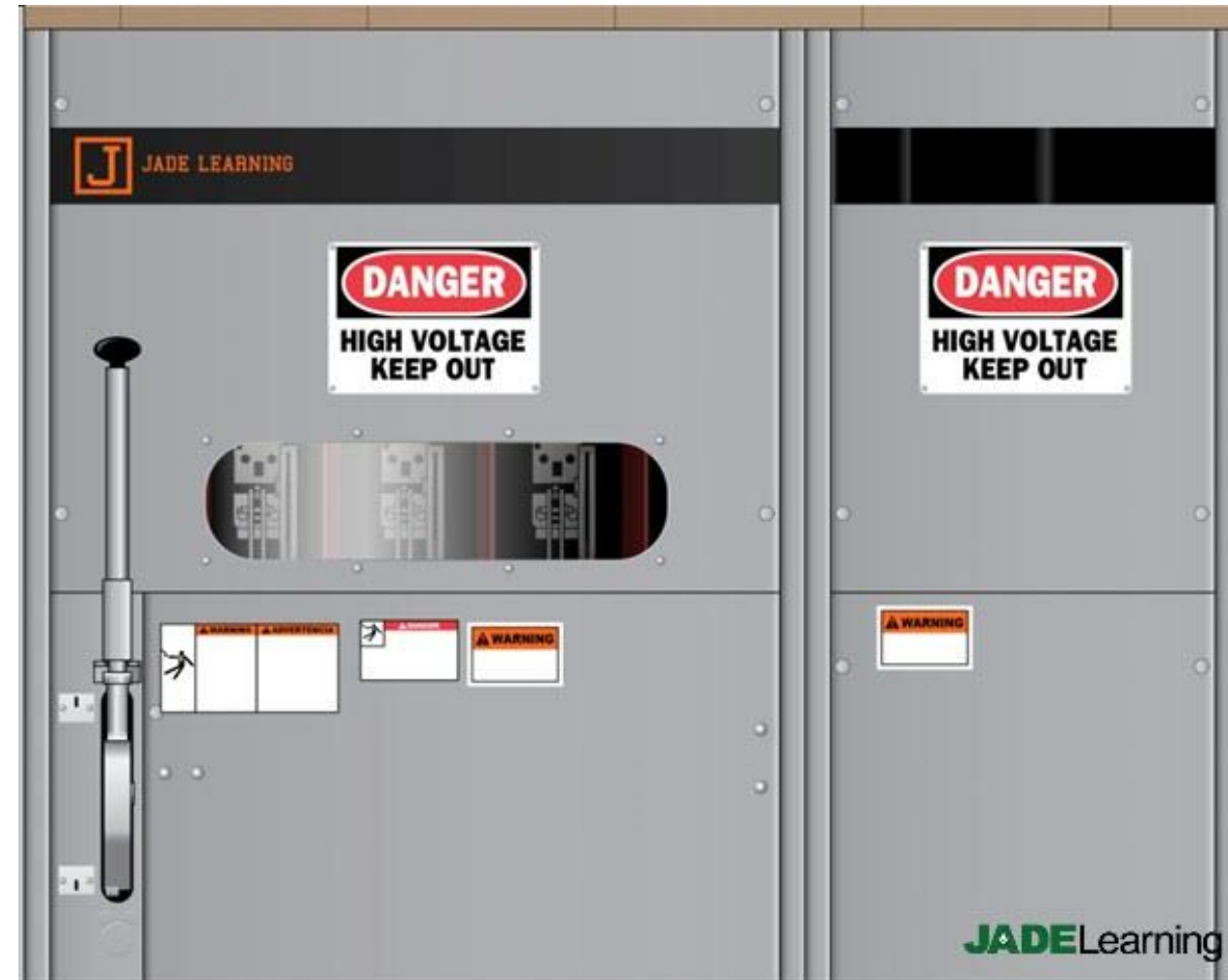
SYSTEMS OVER 1000-VOLTS REQUIRE DANGER SIGNS:

NEWLY REVISED FOR 2020 NEC- The Code now says “DANGER” instead of Warning.

Section 300.45 states:

Danger Signs. *Danger signs shall be conspicuously posted at points of access to conductors in all raceway systems and cable systems. The sign(s) shall meet the requirements in 110.21(B), shall be readily visible, and shall state the following:*

DANGER—HIGH VOLTAGE—KEEP OUT



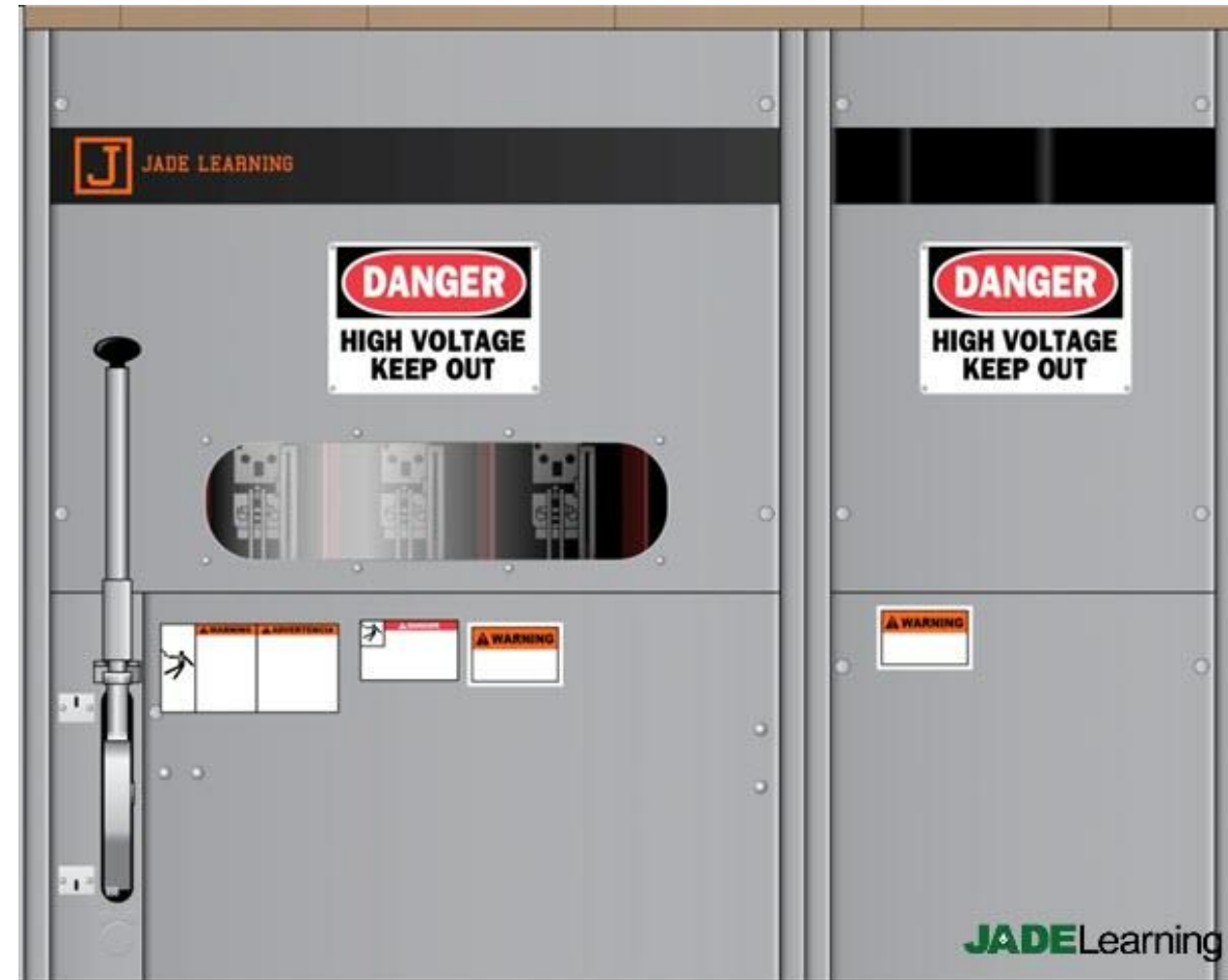
300.45 Danger Signs.

SYSTEMS OVER 1000-VOLTS REQUIRE DANGER SIGNS:

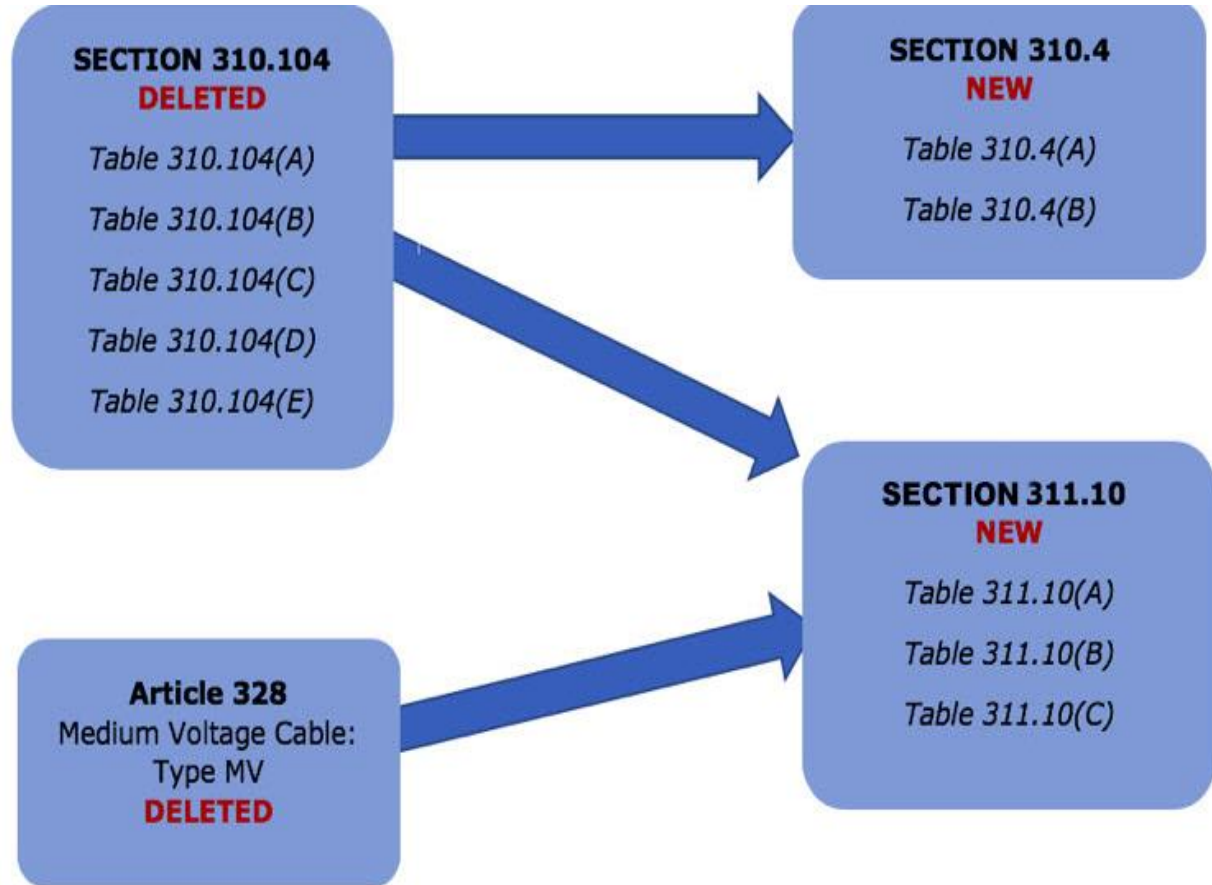
In the 2020 NEC: “Warning” signs are now referred to as “***Danger***” signs which aligns with sign requirements from other classification systems such as OSHA.

OSHA Classifications:

1. **Warning means:** If sign is not heeded, it can cause death or serious injury.
2. **Danger means:** If sign is not heeded, it will cause death or serious injury.



310.4 Conductor Constructions and Applications.



New for 2020 NEC:

Section 310.104 *Conductor Constructions & Applications* has been eliminated and its content (Code text) was divided between two brand-new Code sections:

310.4: Conductor Constructions and Applications.

&

311.10: Medium Voltage Conductors and Cable.

Table 310.12 Dwelling Unit Service and Main Power Feeder Conductors.

NEW FOR 2020 NEC-

The 83% Table for sizing dwelling unit service conductors and feeders is back in the 2020 NEC!

Previously known as Table 310.15(B)(7), it has returned as Table 310.12 in the new 2020 NEC!

TABLE 310.12 SINGLE-PHASE DWELLING SERVICES AND FEEDERS		
SERVICE OR FEEDER RATING (AMPERES)	CONDUCTOR (AWG or kcmil)	
	COPPER	ALUMINUM OR COPPER-CLAD ALUMINUM
100	4	2
110	3	1
125	2	1/0
150	1	2/0
175	1/0	3/0
200	2/0	4/0
225	3/0	250
250	4/0	300
300	250	350
350	350	500
400	400	600

Note: If no adjustment of correction factors are required, this table shall be permitted to be applied.

310.15 Ampacity Tables.

TABLE
310.16

Ampacities of Insulated Conductors with Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth (Directly Buried)

Temperature Rating of Conductor [See Table 310.4(A).]

Size AWG or kcmil	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	Size AWG or kcmil
	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, XHWN, USE, ZW	Types TBS, SA, SIS, FEP, FEPB, MI, PFA, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE-2, XHH, XHHW, XHHW-2, XHWN, XHWN-2, XHHN, Z, ZW-2	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, XHWN, USE	Types TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, XHWN, XHWN-2, XHHN	
	COPPER			ALUMINUM OR COPPER-CLAD ALUMINUM			
18 *	—	—	14	—	—	—	—
16 *	—	—	18	—	—	—	—
14*	15	20	25	—	—	—	—
12*	20	25	30	15	20	25	12*
10*	30	35	40	25	30	35	10*
8	40	50	55	35	40	45	8
6	55	65	75	40	50	55	6
4	70	85	95	55	65	75	4
3	85	100	115	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	145	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	195	230	260	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400

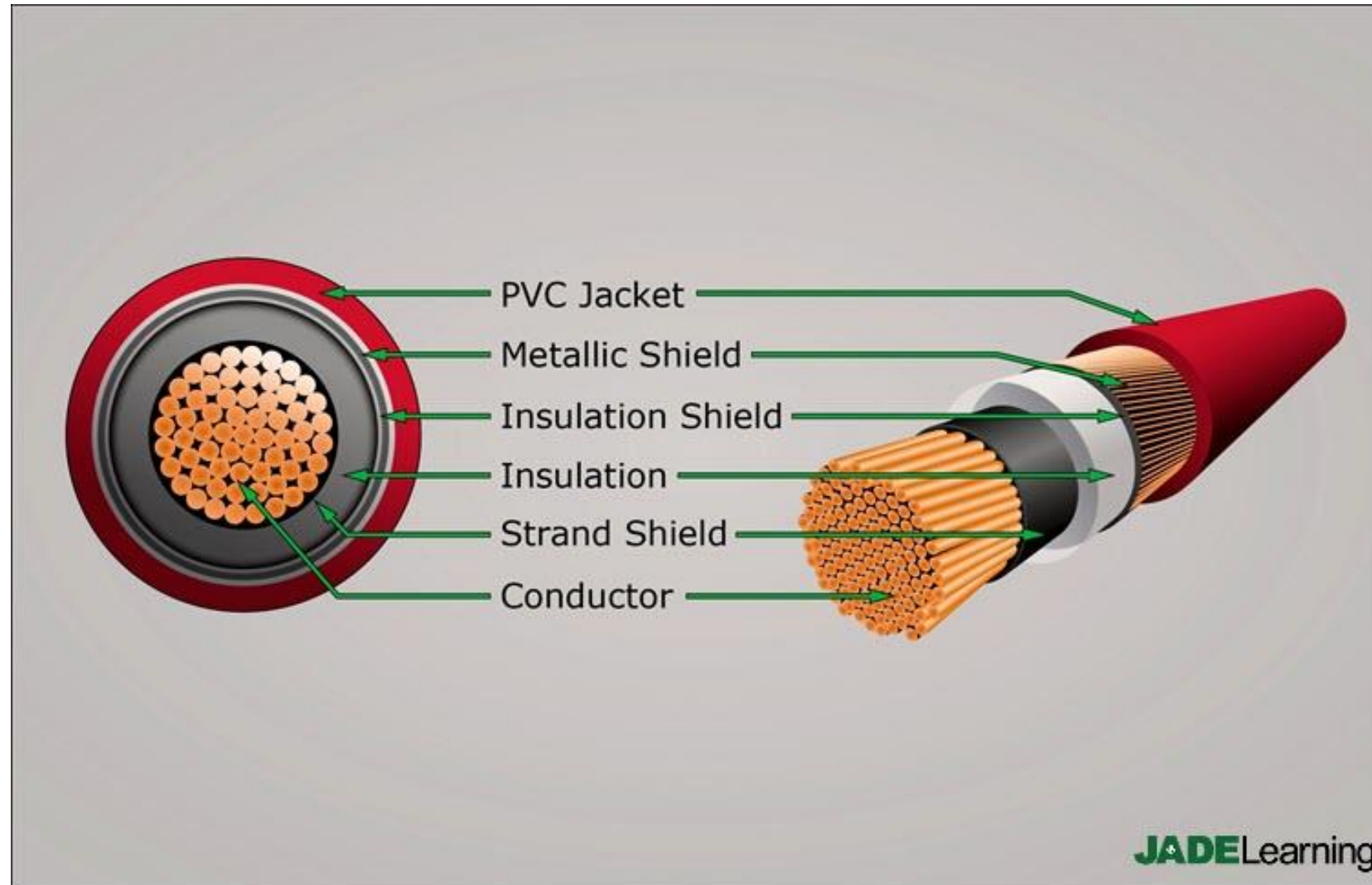
*Section 240.4(D) shall be referenced for conductor overcurrent protection limitations, except as modified elsewhere in the Code.

NEW FOR 2020 NEC-

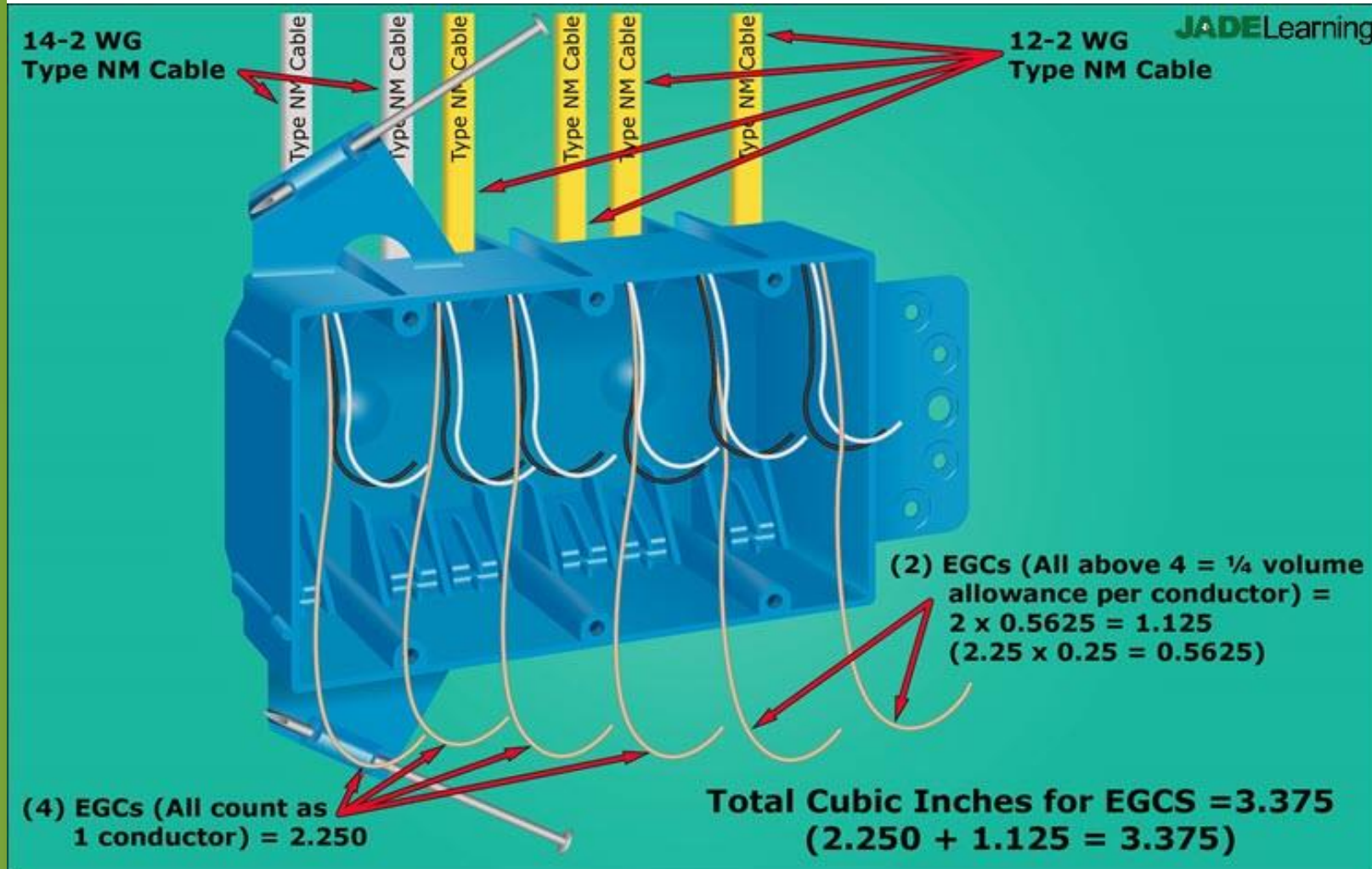
- Table 310.15(B)(16), the electrician's favorite wire ampacity Table has been restored to its original home: Table 310.16!
- Section 310.15 in the 2020 NEC now contains all of the conductor ampacity ***DERATING TABLES***.

311 Medium Voltage Conductors and Cables.

- Article 311 is brand-new for the 2020 Code cycle.
- Medium voltage rules throughout the NEC moved to new Article 311.
- Medium voltage in this Article is 2,001 volts to 35,000 volts.



314.16(B)(5) Equipment Grounding Conductor Fill.



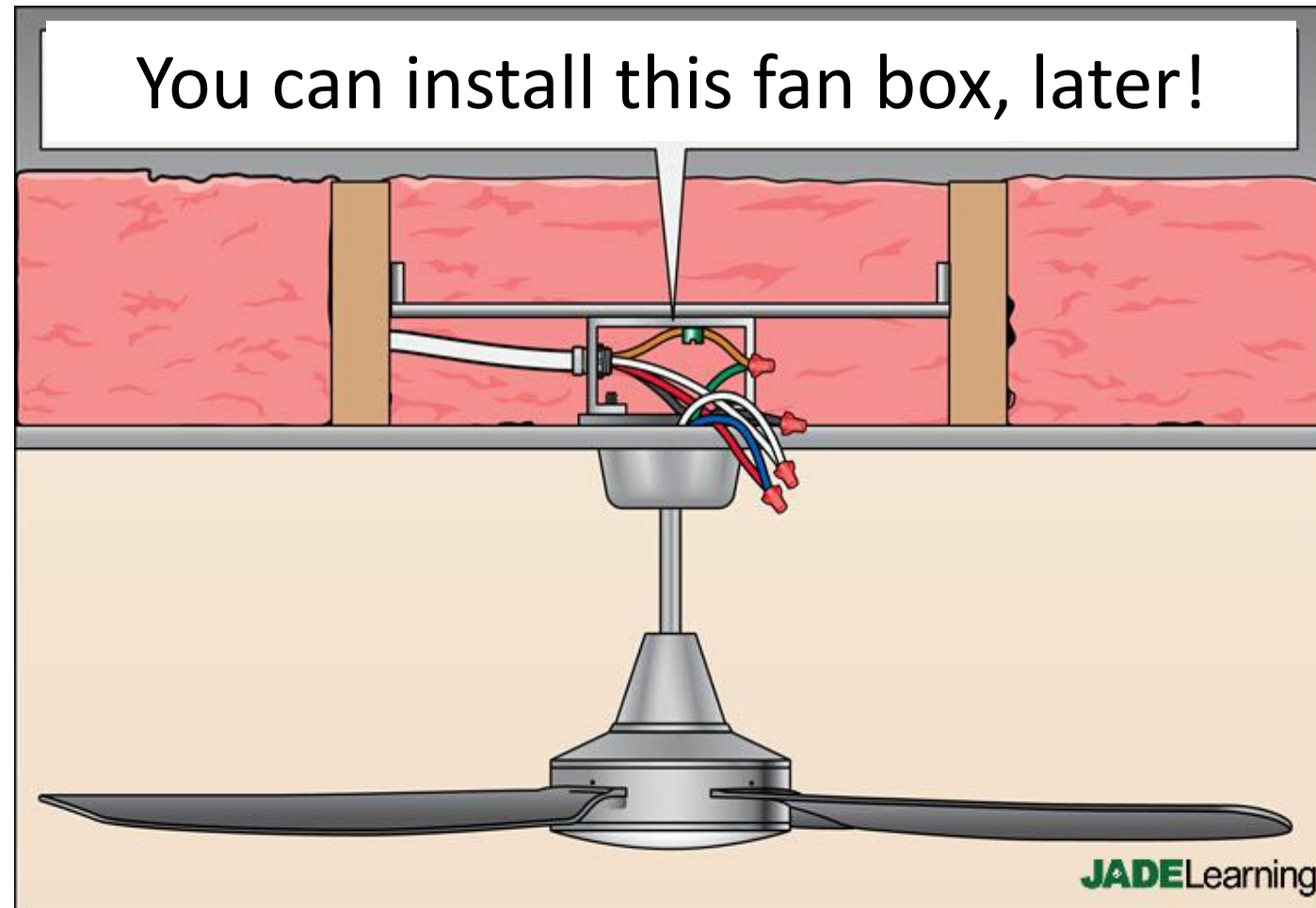
NEW FOR 2020 NEC-

- There are new EGC fill-count instructions in the 2020 NEC, they state:
- If more than 4 EGCs are in a box, a $\frac{1}{4}$ volume allowance is made for **each additional EGC that enters the box** based on the largest EGC in that box.

314.27(C) Boxes at Ceiling-Suspended Paddle Fan Outlets.

NEW FOR 2020 NEC-

- The 2020 NEC makes an allowance for installing a listed ceiling fan-box (capable of carrying a ceiling fan's weight) at a later date, after the initial installation, but:
- Structural members capable of supporting a future fan-box must be accessible in the ceiling(s) of any habitable rooms where this is done.



314.29 Boxes, Conduit Bodies, Handhole Enclosures to be Accessible.

NEW FOR 2020 NEC - Better organization for enclosure accessibility rules.

Inside Buildings:

Boxes and conduit bodies shall be installed so that the contained wiring can be accessed without removing any part of the building or structure.



Underground:

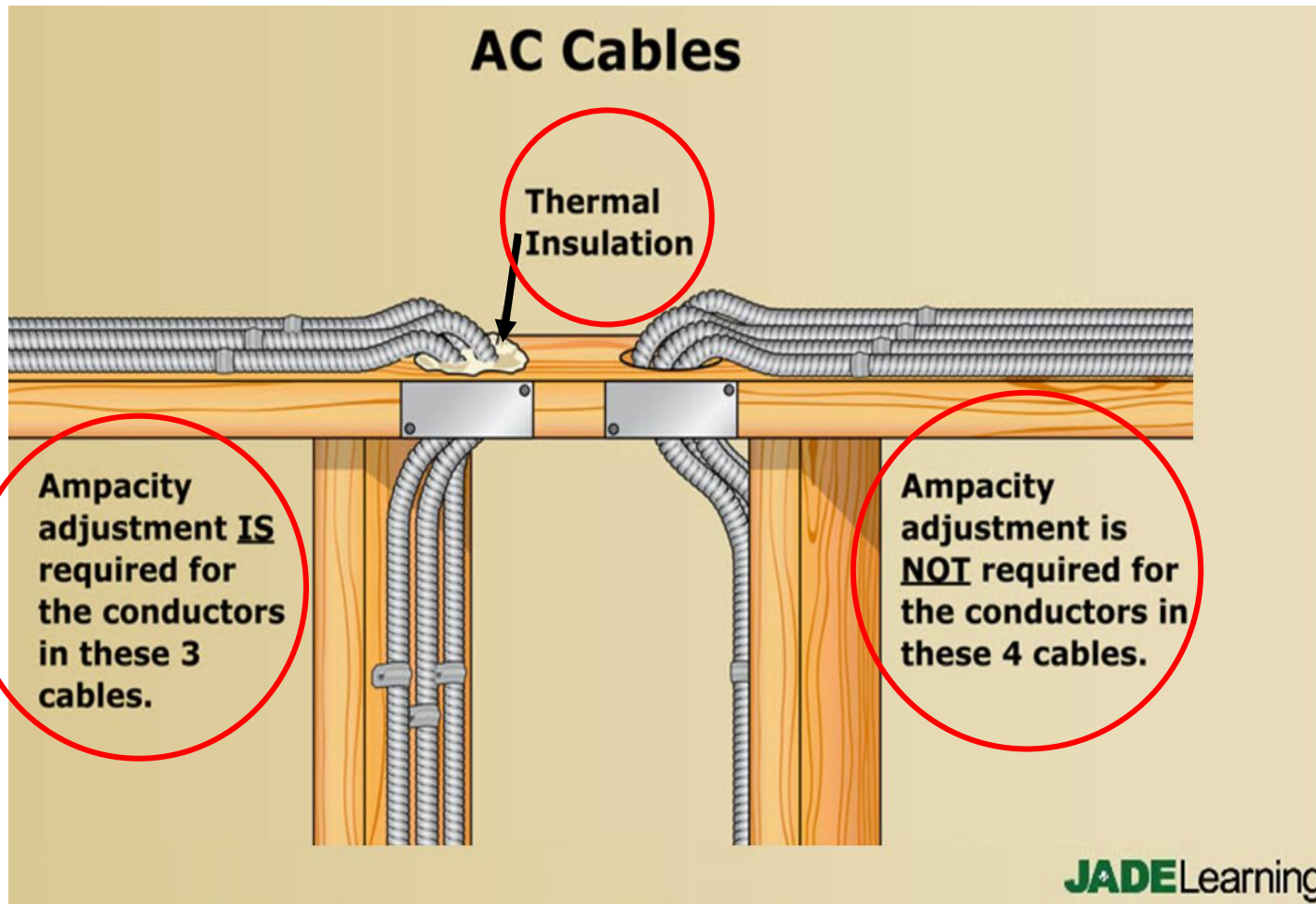
Underground boxes and handhole enclosures shall be installed so that they are accessible without excavating the sidewalks, paving, earth, or other substance that is to be used to establish the finished grade.

320.80(A) Ampacity. Thermal Insulation.

NEW FOR 2020 NEC-

In the 2020 NEC, AC-Cables (armored cables) may require derating according to Table 310.15(C)(1) if more than 2 AC-Cables containing 2 or more current-carrying conductors each are bundled so they cannot displace their heat.

The installation of “*thermal insulation, caulk, or sealing foam and an air gap is not maintained*” becomes the deciding factor in this new 2020 Code cycle.



330.104 Conductors.

NEW FOR 2020 NEC-

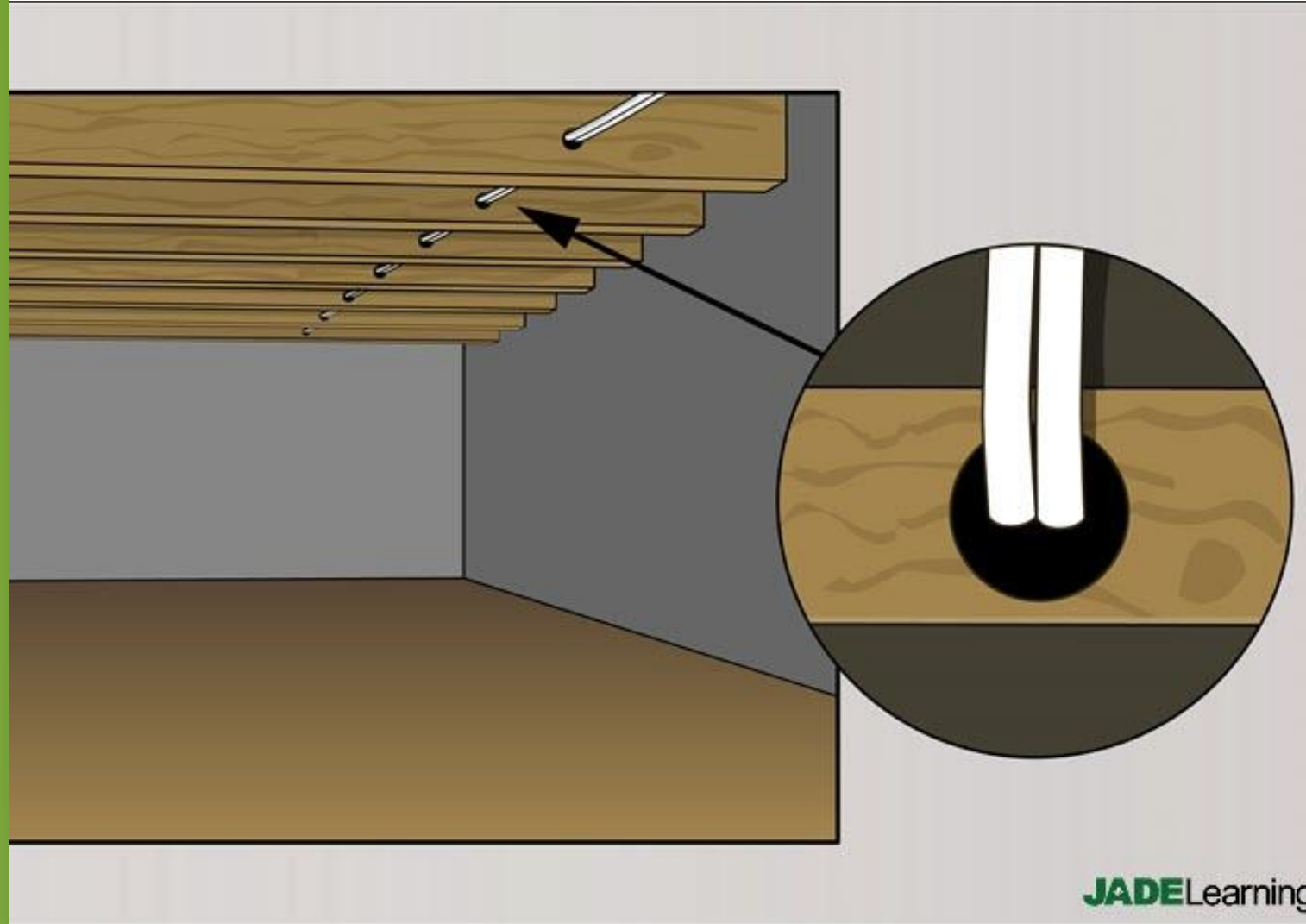
- Section 330.104 has been revised to make a clear distinction between MC Cables used as **control and signal** conductors versus MC Cable used as normal **branch circuit** conductors for power and lighting.
- Minimum conductor sizes are different depending on the use of the MC Cable.



Ungrounded, Grounded, and Equipment Grounding Conductors		
Copper, Nickel, or Nickel-Coated Copper	Aluminum	Copper-Clad Aluminum
No. 14 AWG	No. 12 AWG	No. 12 AWG

Control and Signal Conductors		
Copper, Nickel, or Nickel-Coated Copper	Aluminum	Copper-Clad Aluminum
No. 18 AWG	No. 12 AWG	No. 14 AWG

334 Nonmetallic-Sheathed Cable: Types NM and NMC.



NEW FOR 2020 NEC-

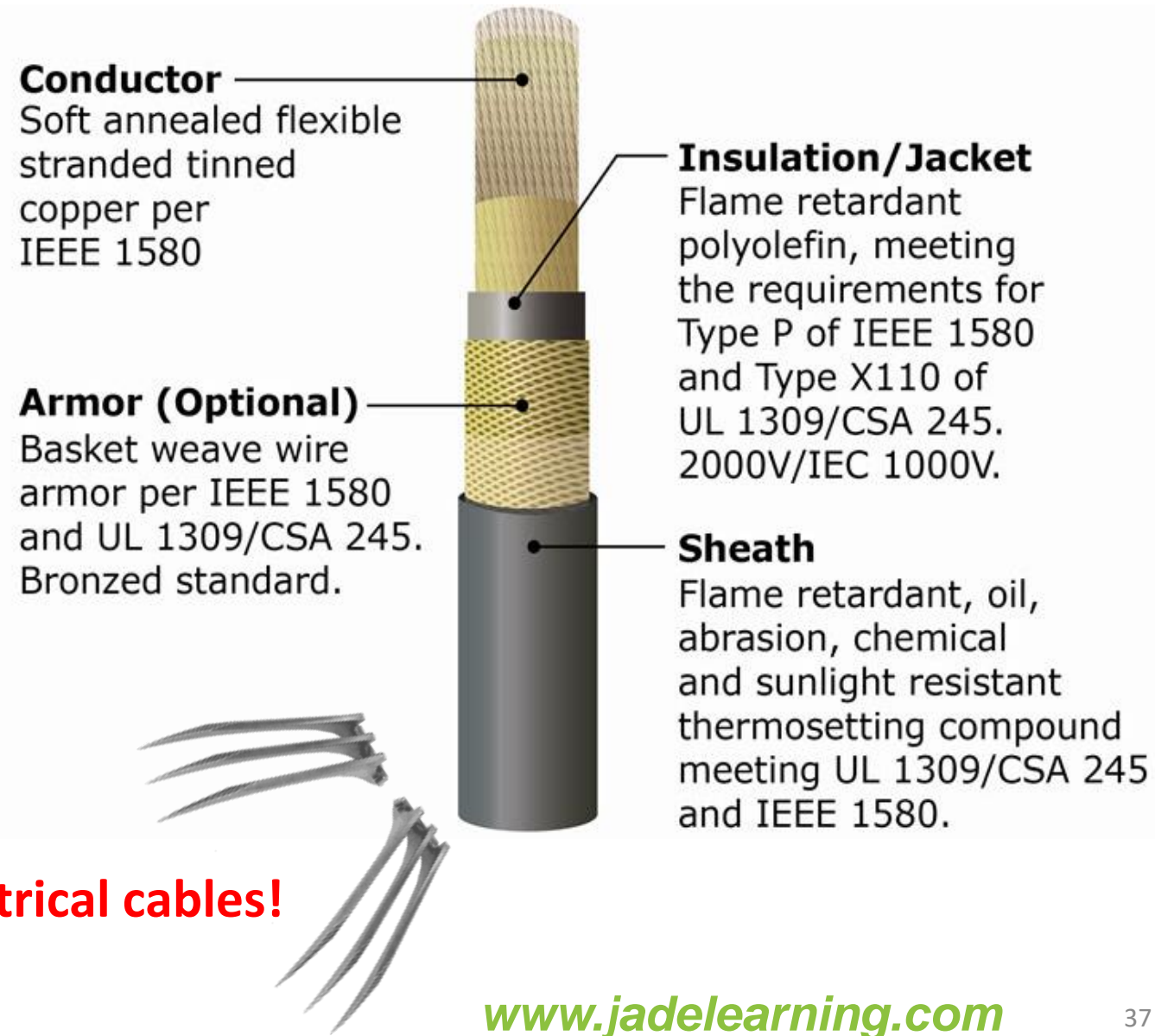
- References to Type NMS Cable were removed from Article 334 in the 2020 NEC.
- NMS cable consists of insulated power or control conductors but has not been available for years!

337 Type P Cable.

NEW FOR 2020 NEC-

- **Type P Cable** is a new addition to the 2020 NEC.
- It can withstand various chemicals, abrasives, vibration and extreme temperatures.
- It has been used for decades on offshore drilling rigs.

Type P Cable is the Adamantium of electrical cables!



342.10(E) Severe Physical Damage.

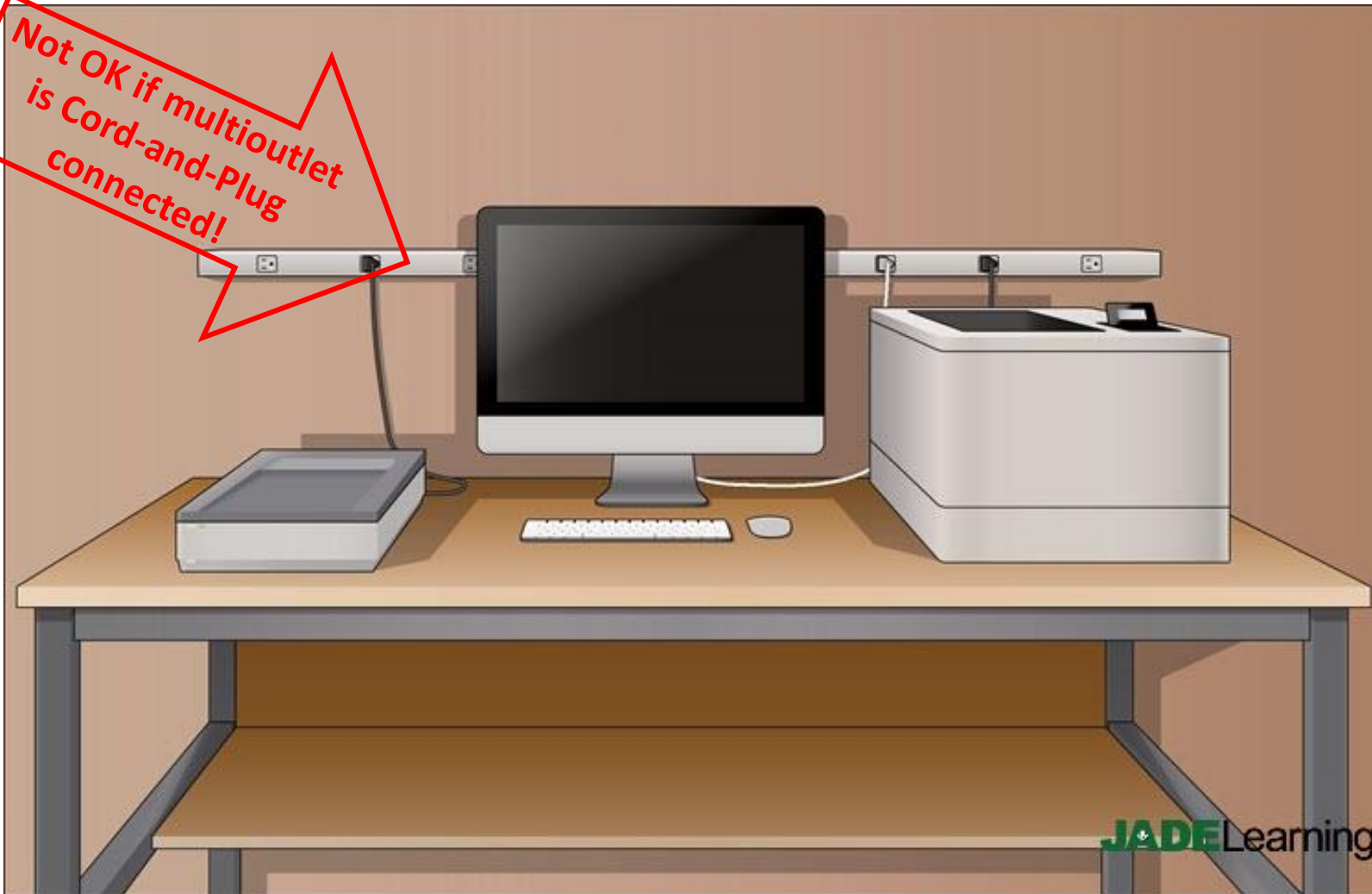
NEW FOR 2020 NEC-

- New for the 2020 NEC: Section 342.10(E) now permits **Intermediate Metal Conduit (IMC)** to be used in locations subject to severe physical damage.
- In the 2017 NEC, IMC was not expressly permitted for use where severe physical damage could occur.



380.12(7) Multioutlet Assembly. Uses Not Permitted.

Not OK if multioutlet
is Cord-and-Plug
connected!



NEW FOR 2020 NEC-

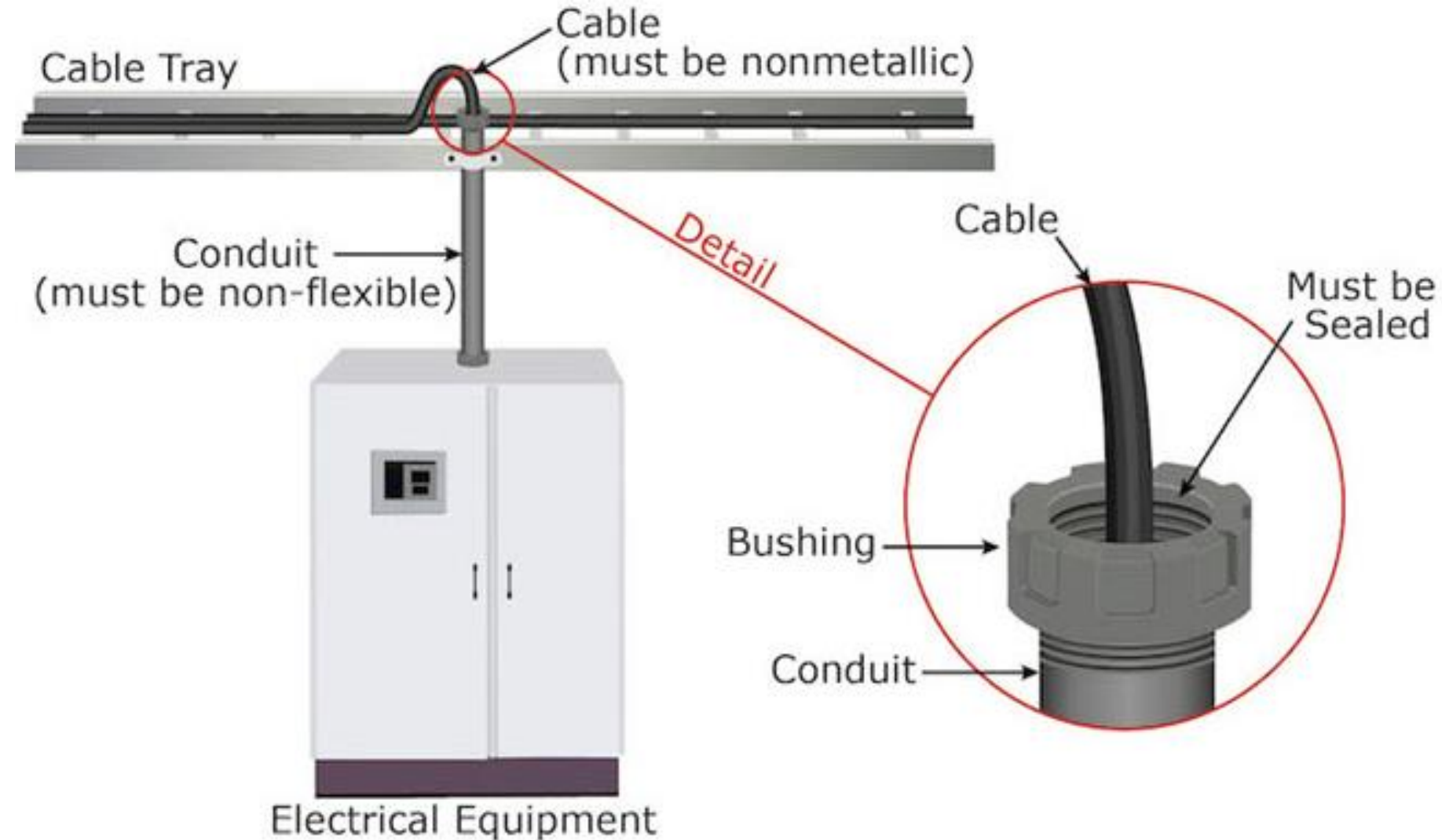
New to the 2020 Code cycle, multioutlet assemblies cannot be installed where cord and plug connected.

392.46 Bushed Conduit or Tubing.

NEW FOR 2020 NEC-

Section 392.46 has been expanded to clarify acceptable methods for transitioning from:

- (1) A cable tray to conduit, and
- (2) A cable tray to equipment.



THANK YOU FOR ATTENDING!

Questions?

For additional instructor support, please contact
instructor@jadelearning.com

For questions about your continuing education, please
contact registrar@jadelearning.com