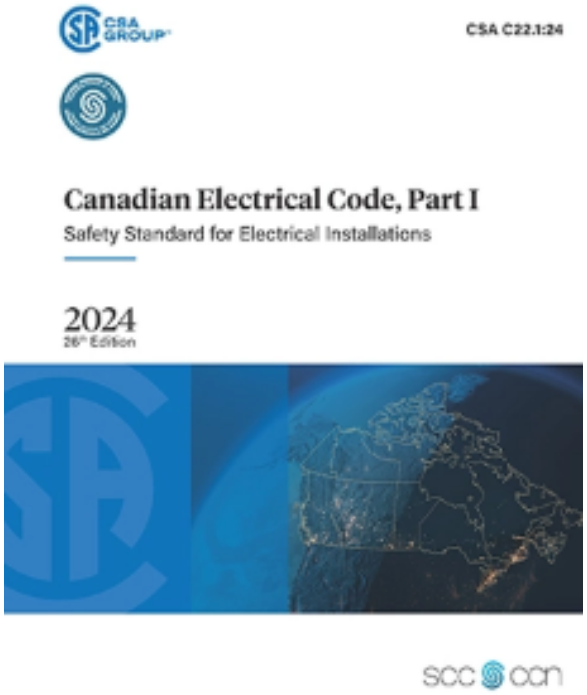


- 26th edition Adobe document

In this document, pages these mean:

O = online

R = real

E.g. “Pg O: 40/R: 34" means ”Online: Page 40" or Real/physical book: Page 34

Sections

- 0 Object, Scope, and Definitions
- 2 General Rules: Pg 74
    - Equipment Markings: Pg

    - Rules specify the required markings on electrical equipment, including ratings, approvals, and warning labels.
    - Maintenance:
    - The section includes guidelines for maintaining electrical installations and equipment to ensure ongoing safety and performance.
    - Enclosures:
    - Requirements for enclosures, such as boxes and conduits, to protect equipment and wiring from damage or environmental conditions.
    - Specific Conditions:
    - Rules may address situations like using rebuilt equipment, substituting equipment, and voltage to ground in dwelling units.
    -
    -

- 4 Conductors - Services and Service Equipment: Pg 826
- 8 Circuit Loading and Demand Factors: Pg 96
- 10 Grounding and Bonding: Pg 104
- 12 Wiring Methods: Pg 114
- 14 Protection and Control: Pg 163
- 16 Class 1 and Class 2 Circuits: Pg 172
- 18 Hazardous Locations: Pg 179
- 20 Flammable Liquids: Pg 193
- 22 Corrosive Liquids: Pg 204
- 24 Patient Care Areas: Pg 210

- 26 Installation of Electrical Equipment: Pg 217
- 28 Motors and Generators: Pg 238
- 30 Installation of Lighting Equipment: Pg 251
- 32 Fire Alarm Systems: Pg 264
- 34 Signs and Outline Lighting: Pg 267
- 36 High Voltage Installations: Pg 271
- 38 Elevators, Dumbwaiters, Material Lifts: Pg 280
- 40 Electric Cranes and Hoists: Pg 289
- 42 Electric Welders: Pg 291
- 44 Theatre Installations: Pg 294
- 46 Emergency power systems, unit equipment: Pg 298
- 48 Deleted
- 50 Deleted
- 52 Diagnostics Imaging Installations: Pg 302
- 54 Community Antenna Distribution: Pg 304
- 56 Optical Fiber Cables: Pg 312
- 58 Passenger Ropeways and similar equipment: Pg 314
- 60 Electrical Communications Systems: Pg 319
- 62 Fixed Electric Heating Systems: Pg 327
- 64 Renewable Energy Systems: Pg 338
- 66 Amusement parks, midways, carnivals: Pg 366
- 68 Pools, tubs, and spas: Pg 370
- 70 Electrical requirements for factory built structures: Pg 377
- 72 Mobile home and recreational vehicle parks: Pg 383
- 74 Airport Installations: Pg 385
- 76 Temporary Wiring: Pg 387
- 78 Marinas, yacht clubs, marine wharves: Pg 389

- 80 Cathodic Protection: Pg 392
- 82 Deleted
- 84 Interconnection of electric power production sources: Pg 394
- 86 Electric vehicle charging systems: Pg 396

Table toc

All table overview: Pg 399

Ampacities

- T1 - single copper conductor: Pg 403
- T2 - double copper conductor : Pg 405
- T3 - single aluminium conductor : Pg 407
- T4 - double aluminium conductor: Pg 409

- T5A: Pg 411 - correction factors of T1 to 4, and 60 (ampacity correction factors of ambient temperatures above 30 °C)
- T5B: Pg 412 - correction factors of T1 and 3 (with 2 to 4 single insulated conductors and spaced -25% of largest cable diameter
- T5C: Pg 412 - *ampacity* correction factors of T2 and 4
- T5D: Pg 412 - current rating correction factors when spacings are maintained (in ventilated and ladder-type cable trays)
- T6A: Pg 413 - dimensions of single Class B R90XLPE, RW75XLPE, RW90XLPE, and RPV90 unjacketed 600 V insulated conductors for calculating conduit and tubing fill
- T6H: Pg 427 - dimensions of single Class B RPV90 jacketed 1000 V insulated conductors for calculating conduit and tubing fill

- T6I: Pg 429 - dimensions of single Class B RPV90 jacketed 2000 V insulated conductors for calculating conduit and tubing fill
- T6J: Pg 432 - dimensions of single Class B TW, TW75 insulated conductors for calculating conduit and tubing fill
- T6K: Pg 434 - Dimensions of single Class C TWN75, T90 NYLON insulated conductors for calculating conduit and tubing fill
- T8: Pg 435 - max allowed percent conduit and tubing fill
- T9A: Pg 436 - internal diameter and cross-sectional areas of many trade conduit and tubing
- T9G: Pg 442 - internal diameter and max conductor cross-sectional areas allowable fill at 40% for many trade conduit and tubing for 3+ conductors/multi-conductor cables - often for EMT
- T10A-C *deleted*: Pg 444 - use T6
- T13: Pg 466 - ampacity rating/setting of overcurrent devices protecting conductors/circuit breaker
- T14: Pg 467 - watts per square metre and demand factors for services and feeders of many occupancy (banks, church, garage)
- T16: Pg 469 - minimum size of field-installed system bonding jumpers/conductors
- T17: Pg 470
- T18: Pg 471-474
- T19: Pg 475 - conditions of use for insulated conductors and cables aside flexible cords, portable power cables, and equipment wires (for RPVU90, RWU90)
- T23: Pg 484 - number of insulated conductors in boxes size
- T43: Pg 495 - minimum conductor size for field-assembled grounding electrodes
- T51:

- Diagram 1 - 26-744: Pg 522
- Diagram 2: Pg 523
- Receptacles Section 0, 26-700 (Pg -230) to 26-712, 26-720 to 26-724, 26-744, 76-016

Figure 1

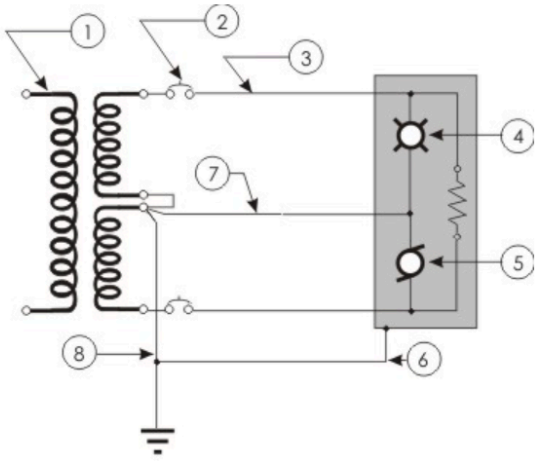
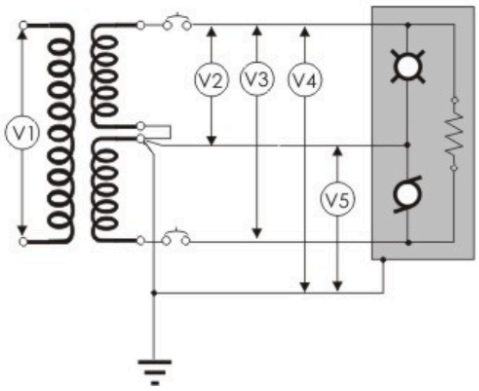


Figure 2



Week 3 single phase

Secondary is 120/240 V in Figure 1: Identify 1 to 8.

Find the conductor color in Figure 2.

Find the voltage readings

- What will Figure 2's voltmeter V3 read? **240** V
- What will Figure 2's voltmeter V4 read? **120** V
- What Figure 2's voltmeter V5 read? **0** V
- What's Figure 1's device 2? circuit breaker
- What will Figure 2's voltmeter V1 read? **1000+** V
- What will Figure 2's voltmeter V2 read? **120** V

Week 5 PI - Section 14

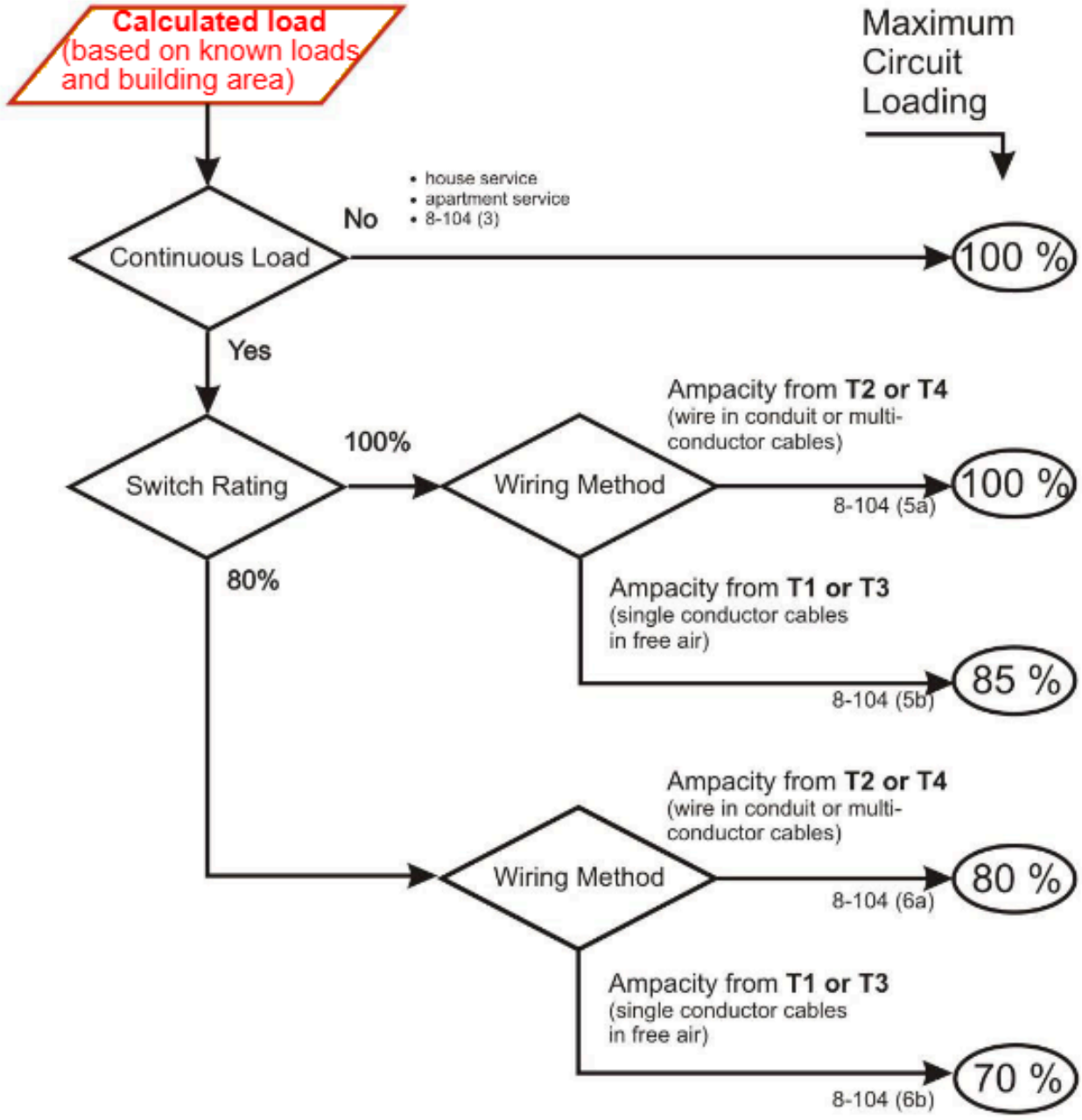
Overcurrent protection

- What's the max voltage of a manual general-use ac switch? 277 V
- What's the minimum ampacity of a conductor protected by a 250 A fuse? 266 A
- What type(s) of fuses are only for short circuit protection? Section 14: Class C, HRCII-MISC
- What's the current rating of manually operated general-use 347 V AC switches? **15** A
- A 125 A fuse opens in 4.5 seconds of a 1000 A load. How long it takes to open with a 900 A load? a bit over 4.5 s
- Often what's the max overcurrent device size to protect a 30 A receptacle? 30 A
- What's the minimum rating for a 125 V, 4-way, general-use ac/dc switch? 5 A

Week 9: 8-104 – Résultats

Week 9 content

Calculated load table:



- A panelboard is fed with 2/0, R90, copper conductors in conduit and protected by a 200 A fuse.

What's the circuit's max continuous load?
200<225 A = continuous → no switch rating → wiring method: multi conductor and in conduit → 80% → T2: 2/0 = 00 + R90 → 195 → T13 → 200 → 200x0.8 = 160, how to get **156 A**?

- What's the circuit's ampere rating? T3 → **195** A
- What's its max non-continuous load? **195** A
- The switch with fuse is rated continuous 100% rating. What's the circuit's max continuous load? **195** A

Week 12 House Wiring - Part 1

House wiring

- Which can be on a general purpose branch circuit?
  - central vacuum system
  - hallway receptacle
- When must a jumper on a receptacle's live side be broken? on split receptacles
- A kitchen counter's 2 m part has a sink on 1 end and a stove on its other end. What's the receptacle's minimum arrangement? 1 GFCI protected 5 - 20R and 1 split receptacle
- A permanent island in a kitchen is 400 mm by 1200 mm. What is the minimum electrical installation? 26-722: at least 1 receptacle (5-15R split or 5-20R) per permanent island counter space of a continuous long dimension of 600+ mm and short dimension of 300+ mm–this permanent island is 400x1200 meets the requiments—**1 of 2 split receptacles on a circuit**
- Which of these is true of receptacles in bathrooms
  - must be CSA configuration 5-2C0R
  - must be protected by an arc-fault circuit interrupter
  - cannot be 500 mm of a bathtub (26-720, g))

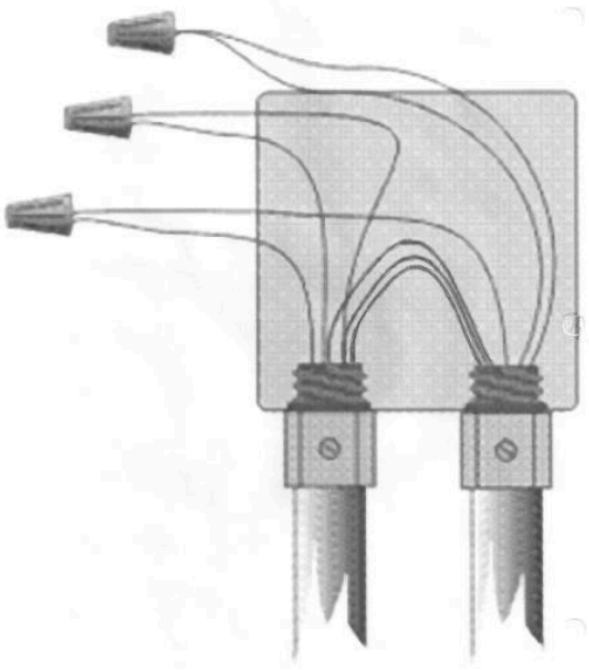
- Which of these needs arc-fault protection?
    - receptacles on kitchen counter
    - smoke/carbon monoxide alarm
    - a living room receptacle
- When can a receptacle be placed in a cupboard?
    - **for a microwave oven** (26-720 h) i) - Pg 232)

Week 12 House Wiring - Part 2 Review for Midterm

-

ELE8913 - W2024 Codes and Regulations Review for Final Exam

- A panelboard is fed by 4/0 AWG, R75, aluminum single conductors in conduit and protected by a 200 A fuse. What is the max non-continuous load on the circuit? T3 → **180 A?**
- What size of rigid PVC conduit is for three 2/0 conductors and nine 3 AWG conductors. All conductors are TW75. **63** mm
- Five 5, TWU, 2 AWG conductors are placed in a 41 mm PVC conduit. Is this correct according to CSA? not big enough
- What size of device box is for six 12 AWG insulated conductors, 3 wire connectors and a receptacle? T23: 6 conductors → 3 connector = 1 conductor → 1 receptacle = 2 conductors → 6 + 1 + 2 = 9 total conductors → 9 conductors + device + 12 AWG → 4” x 2-3/8” x 1-7/8”

-  What is this graphic's square box minimum size to accommodate the arrangement? Conductors are 12 AWG. T23: 3 marrettes = 1 conductor → 9 conductor → 9 + 1 = 10 total conductors → 10 conductors + square + 12 AWG → no 10 conductors in the part of the table → so answer is for to 12 conductors: **4 x 1 ½**
-
- 3/0 R90 XLPE, 1000 V unjacketed conductors in a 53 mm conduit pass into a pull box. and enter the box opposite a removable cover. What is the calculated distance from cover to wall? 149 mm
- There are 2 - 1 AWG TW75 conductors in a 35 mm conduit and 2/0 TW75 conductors in a 53 mm conduit will pass through a pull box. They will enter the box opposite a removable cover. What's the calculated distance from wall to cover? 141.2 mm

Week 13

- When can a receptacle controlled by a switch replace a switched luminaire? bedrooms and living rooms
- What's the minimum electrical installation if a 400x1200mm permanent island in a kitchen?
    - a duplex receptacle on a general purpose circuit
    - a duplex receptacle on a separate circuit
    - a 20 A T-slot receptacle on a general purpose circuit
    - 1 of 2 split receptacles on a circuit
- Which need arc-fault protection?
    - living room receptacle
    - smoke/carbon monoxide alarm
    - receptacle for electric range

Week 13, attempt 3#

Week 13 Services I

- What is the minimum clearance of service conductors above street? 6-112, 3) a) - Pg 173: **5.5** m
- Where must the service head be?
    - max 300 mm above support for attachment
    - min 150 mm above support for attachment (6-116, a), i)): Pg 90)
- Where can service equipment be?
    - in a bathroom
    - cloth closet (6-206 - Pg 91)

- Which of these is an acceptable wiring method for services? 6-302
- Who decides what space is for meters? the supply authority
- When it's permissible to splice an underground service cable? for repairs
- How much conductor is left for connection for service head? **750** mm
- What is the minimum clearance for service conductors across driveways to residential garages? **4** m
- Which of these is true of receptacles in bathrooms?
    - must be within 1 m of a wash basin (26-720, f))
    - must be protected by arc-fault circuit interrupter
-

Code Practice All Sections CEC 2021

- What percentage of the basement area is used for calculating the ampacity of service or feeder conductors in a single dwelling home if the basement is 2.2m high? 8-110 (c) **75%**
- Are overcurrent devices and disconnecting means for mobile homes required to be installed in weatherproof enclosures? 72-106 (2) **Yes if installed outdoors**
- The spraying equipment for a spray booth shall be interlocked with what? 20-304 Spray booth ventilation
- The minimum clearance between a fence and enclosures containing live parts shall be? 26-302 (2) 1.1 m
- In an area at an airport not accessible to the public, suitable direct buried cables must be installed at a depth not less than **what** in stony rocky ground? 74-004 (3) (b) 450 mm
- How many 120 v duplex receptacles are needed in an elevator hoistway pit? 38-024 (4) at least one
- What is the minimum distance that shall be maintained between conductors of a community antenna distribution circuit on buildings and lighting conductors? 54-604 (1) (300 mm) not 60-510 54-400 is for inside the building (50 mm)
- A separate disconnecting means shall be provided for each electric vehicle charging equipment rated at _____ or more than _____? 86-304 (1) 60 A 150 V to ground
- (**F/T?**) Motor disconnecting means for air conditioning and refrigeration equipment shall be located within sight of and within 9 M of the equipment. 28-604 (5) False: must be 3 M

- How are time delay and low melting point fuses marked? 14-200 (2) Low melting “P” Time Delay “D”

Code Practice 0 to 16 & 26 CEC 2021

1. (**T/F?**) The code is not intended as a design specification nor as an instruction manual for untrained persons. Section 0 - Object
2. Where would you use a Type 4 enclosure? 2-400 (1) (d) see also Table 65
3. Plug fuses shall not be rated at more than how many amps? 14 208 (1) 30 A
4. When using neutral supported cables what is the maximum span allowed? 12-318 (c) not more than 38 m
5. (**T/F?**) The lighting fixtures and the garage door operator may connect to the branch circuit supping the garage/carport’s receptacles. 26-656 (h) True
6. Can sectional boxes be embedded in concrete? 12-3008 (2) No
7. A plate electrode shall be buried at a minimum depth of? 10-102 (2) (c) (i) no less than 600 mm below grade
8. A single dwelling has an area of 78 m² could a 60 amp be installed? 8-200 (1) (b) (ii) yes 14400 w / 240 volt = 60 amps
9. What is the ampacity of 12/3 SOW cable? 4-016 (1) (a) and Table 12 25 amps 12/3 has only 2 current conductors the 3rd conductor is an insulated green conductor
10. (T/F?) The consumer’s service head location shall be below the support for the attachment of the service conductors by a minimum of 150 mm or a maximum of 300 mm? 6-116 (i) the consumer’s service head shall be above not below. So it is a false statement

Week 2 - General Part II

- The max voltage to ground in a small dwelling unit is 2-110: **150** V
- What does a shock's severity depend on: current in amps, path and duration
- A big apartment's max voltage to ground in a dwelling unit is **347** V
- A receptacle cover's function is? to **stop direct contact**
- A house's max voltage to ground is? **120** V
- Conductor(s) fuses are connected to? to **live conductors**
- **Grounding electrode** is the rod/plate/pipe connecting the electrical system to ground.
- Insulated gloves protect electrical workers by? increase electrical path resistance through a **worker**.
- A warning sign is used for doors to electrical equipment vaults.
- To transfer power, which is true?
    - Using lower voltage, current go up.
    - If you use a lower voltage the current must go down.
    - Systems that use higher voltage have larger conductors.
- **2400-8000** V often supplies a house's transformer.
- **240** V supplies a house's heavy loads.

Week 3 single phase

Figure 1

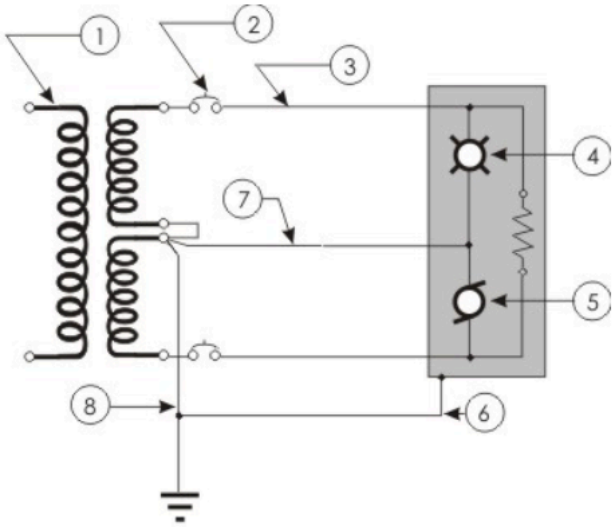
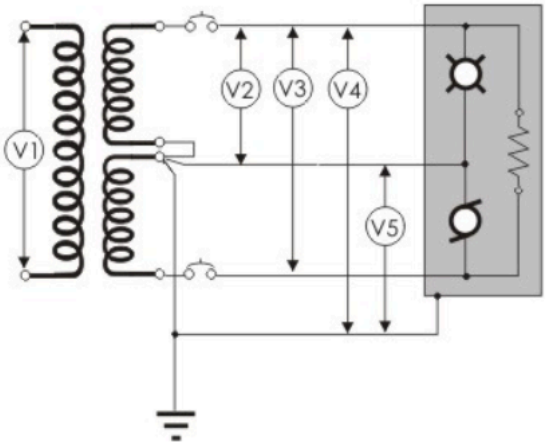


Figure 2



- What's Figure 1's device 4? lamp
- What's Figure 1's device 7? grounded conductor
- What's Figure 1's device 1? high voltage (primary) winding
- What's an acceptable colour for Figure 1's conductor 8? green/bare
- What's an acceptable color for Figure 1's conductor 7? neutral
- What's an acceptable color for Figure 1's conductor 3? red
- What's a word for Figure 1's item 6? bonding conductor

- What's Figure 1's item 3? live conductor
- What's Figure 1's item 8? grounding conductor
- What's Figure 1's item 5? motor
- What's the right color for Figure 1's conductor 6? green/bare

Week 3 Part I - Section 10 - TBA

- What's the min length of field assembled electrode? **1000+** V
- Which of these is true of in-situ grounding electrodes?

Week 4 PI - Section 4

Week 4 Conductors Tables Ampacity Derating T5A T5C

- What's the ampacity of a 2 conductor, 10 AWG, aluminum, AC-90 cable? T4: 10 AWG + 90° → **35** A
- A 4 conductor (3 lives and 1 bond) armoured cable has aluminum, 1 AWG conductors with 90°C insulation. What's the ampacity of the cable? 4-1 (bond not count) = 3 conductors → we have 3 conductors so we still use T4: 1 AWG + 90° **115** A
- What's a single conductor's ampacity installed in free air, 750 kcmil, aluminum, cable R90 °C and properly installed? T3: 750 kcmil + 90°C → **700** A
- An installation must have 1000 A. What's the minimum size of R90 copper, single conductor cable installed in free air that can be used?

  T1: 90°C + 1000 A → **1000** kcmil
- A 4 conductor (3 lives and 1 bond) armoured cable has copper, 2 AWG conductors with 90°C insulation. What's the cable's ampacity? **130** A

- A feeder uses a 3 conductor, 3 AWG, copper 60°C cable. What's its ampacity? T2: 3 AWG + 60°C → **85** A
- What's the ampacity of a properly installed single conductor installed in free air, 500 kcmil, aluminum, cable R90°C? T3 → **545** A
- What's the ampacity of a properly installed single conductor installed in free air, 350 kcmil, aluminum, cable R75°C? T3 → **395** A
- What's a properly installed single conductor's ampacity installed in free air, 350 kcmil, aluminum, cable R90°C? T3: 350 kmcil + 9 → **445** A
- An old feeder is marked "500 MCM - 75°C". The conductors are copper and in a conduit. What's the ampacity of the feeder? T2 → **380** A

Week 5 PI - Section 14

Overcurrent protection

- What's the max size of fuse protecting a conductor of 190 A? T13 → **200** A
- Which is true?
    - overcurrent devices can never be connected in parallel
    - overcurrent devices rated under 750 V can connected in parallel
    - factory assembled, semiconductor fuses can sometimes connect in parallel
- What's the max rating of standard cartridge fuses? 600 A - 600 V
- Which is true?

    - circuit breakers must be black
    - circuit breakers cannot be manufactured in sizes greater than 100 amps
    - circuit breakers must have a ground fault sensing mechanism
    - circuit breakers must indicate as opened/closed
- What max breaker size protects a panelboard R125 A without motors connected? T13 → **125** A
- Which is true?
    - a 30 A fuse can protect 12 AWG copper cable
    - a 15 A circuit breaker can protect 16 AWG copper equipment wire
    - 12 AWG aluminium cable can be protected by a 20 A fuse
- If non-interchangeable fuse holders are used, which can be done?
    - a 20 A fuse substituted for a 30 A fuse ()
    - a 20 A fuse substituted for a 15 A fuse

Week 5 PII - Overcurrent

- Push a circuit breaker handle to the centre of the panel, it moves but springs back. What is the breaker's condition? tripped
- Push a breaker handle to the centre, it doesn't move. What is the breaker's condition? closed
- Push a breaker handle away from the centre, it doesn't move. What is the breaker's condition? open
- Which is true?
    - 2 single pole breakers can feed a 240 V load
    - 1 single pole breakers can feed a 240 V load

    - 2 single pole breakers can feed 2 - 120 V circuits sharing a neutral
- Which is an arcing fault's trait?
    - the current is always much higher that the normal circuit current
    - current flows outside a normal circuit
- What limits current in a series arc fault? load
- How does an arc fault circuit interrupter recognize an arc? fast-changing current
- What mechanism works a circuit breaker in short circuit conditions? electromagnet
- What mechanism works a circuit breaker in overload conditions? bimetal spring

Week 12 House Wiring - Part 2

Review for Midterm

- What materials are to be used as grounding conductors? **aluminum/copper**
- What is the minimum size of a copper bonding conductor for 220A? T16 → **4** AWG
- What is the minimum size of aluminum bonding conductor for 220 A? T16 → **2** AWG
- What is the minimum ampacity of a conductor protected by a 150 A fuse? T13 → **126** A
- 2 batteries are in series with 3 V. What is the total voltage measure across them? 3+3 = **6**V

- What word is used in CEC when discussing lights? Section 0: **luminaire**
- What are the 3 grounding electrodes types allowed by CEC and the rule for it? 10-102: **manufactured grounding electrodes**, **field-assembled grounding electrodes**, **in-situ grounding electrodes** forming part of existing infrastructure.
- Overcurrent devices must be placed in grounded or ungrounded conductors? **ungrounded** (live/hot wires)
- What overcurrent device type is used for motors? time-delay
- If an overcurrent device trips in 12 cycles, how long it took to open? 1-cycle: in a 60 Hz system, time = 1/frequency = 1/60 = 16.67 ms, so 12 cycles = 12 x 16.67 ms = **200 ms** = **0.2 s**
- All overcurrent devices have “inverse-time” traits. What does this tell of overcurrent devices? time amount taken to open a circuit depends on current: **higher current**, **faster** O/C device **opens**
- What section of CEC is for overcurrent protection? Section 14

Midterm Winter 2024

- What’s the min size of aluminum bonding conductor for a circuit protected by a 100 A circuit breaker?
  T16 → **6**
- What's the ampacity of a 4/0 AWG aluminum conductor in conduit of 75°C insulation? The conduit has 3 conductors.
  T4: 4/0 or 0000 + 75 → **180 A**
- What's the ampacity of a 250 kcmil aluminum single conductor properly spaced cable with 75°C insulation?
  T3 → **315**

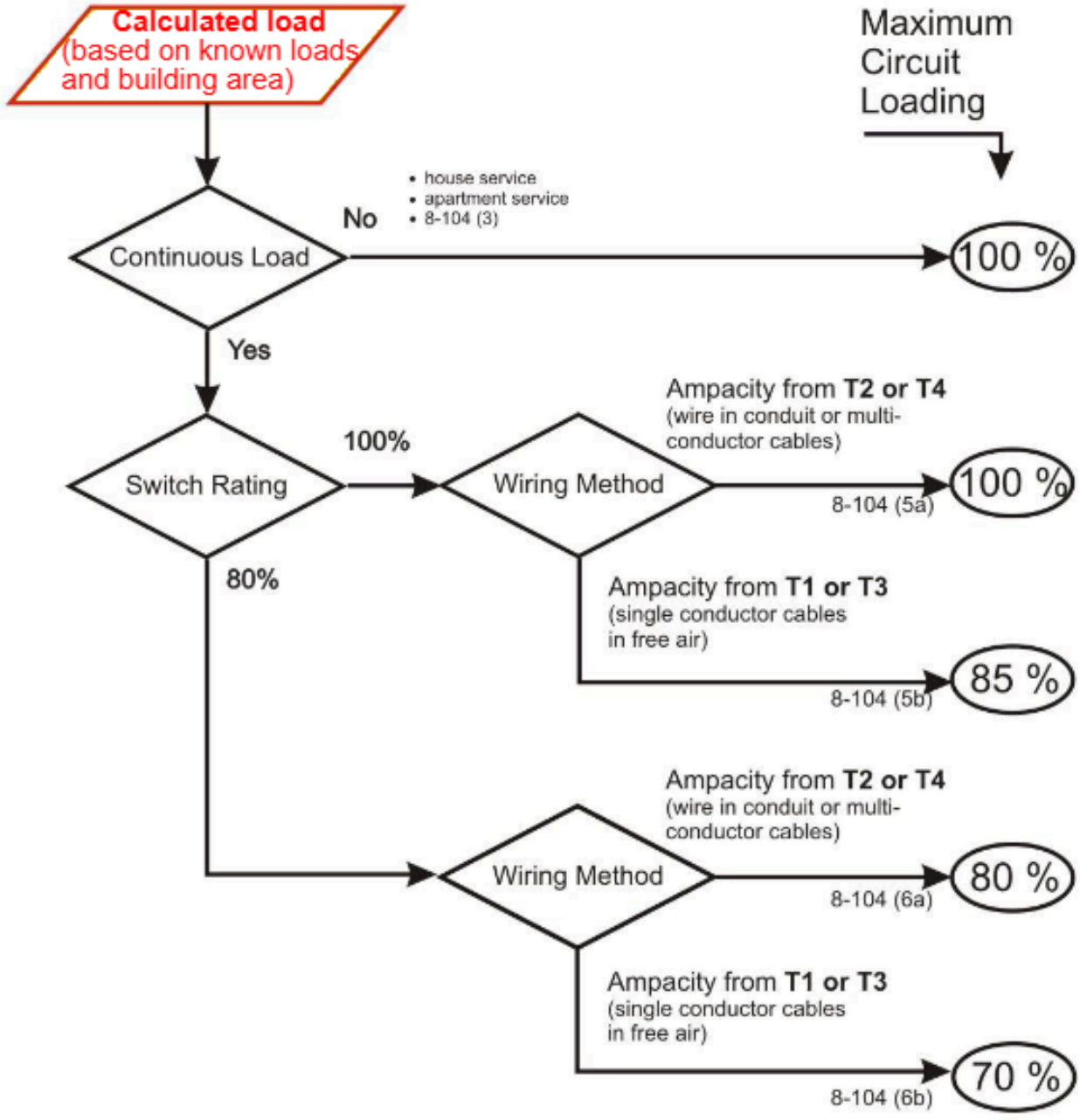
- A conduit contains 8 conductors. They need 55 A with 90°C insulation. The system is balanced and 2 are neutrals. What's the minimum size of copper conductor?
  8 - 6 = 2 → T5C → 0.8 → T2: we use 75 → 75 x 0.8 = 60 = **6 AWG**
- What's the max distance between supports for 53 mm electrical metallic tubing (EMT)?
  → Index: EMT → 12-1010 → 1C → **3 m**
- A conduit contains 28 conductors. They are 10 AWG copper with 90°C insulation. The system is balanced and 7 are neutrals. What's the ampacity of each conductor?
  System is balanced, no need to derate...? → T2 → 40x0.7 = 28 A
- Aluminum single conductors are run through the ceiling of a boiler room. The ceiling temperature is 40 °C. The conductor insulation is R90C. The cables are installed correctly. What's the minimum size of cable if 242 A is needed?
  T5A: 40° ambient + 90°C rating → 0.91 → 0.91 x 270 = 245.7 A
- The feeder of a panel needs 178 A. A copper 3-conductor, AC-90 cable is used. What size to use? T2 → 00 AWG
- What's the ampacity of a 3 conductor, 8 AWG, aluminum, NMD-90 cable? T4 → 45 A
- What's the ampacity of a 3 conductor, 8 AWG, copper, NMD-90 cable? T4 → 55 A
- Which of the following is true?
  - circuit breakers must indicate if they are open or closed
  - circuit breakers must include a ground fault sensing mechanism
  - circuit breakers must be black
  - circuit breakers cannot be manufactured in sizes greater than 100 A

- Which of the following is true?
  - 12 AWG aluminium cable can be protected by 20 A fuse
  - 12 AWG copper cable can be protected by 30 A fuse
  - 16 AWG copper equipment wire can be protected by 15 amp circuit breaker
  - 16 AWG copper equipment wire can be protected by a 20 A fuse
- *In general*, What's the max size of overcurrent device that can protect a 30 amp rated receptacle? T13 → **30 A**
- What's the max rating of standard cartridge fuses? 600 A - 600 V
- When non-interchangeable fuse holders are used, which of the following could be done?
  - a 30 A fuse substituted for a 20 A fuse
  - a 20 A fuse substituted for a 30 A fuse
  - a 30 A fuse substituted for a 15 A fuse
- What condition is always characterized by excess current in the normal current path? **overload**
- What condition is always characterized by above normal current flow on the bonding or grounding path? **ground fault**
- What's the ampacity of a 4/0 AWG aluminum, single conductor cable with 60 degree C insulation? The cables are properly spaced.
  T3: 4/0 = 0000 + 60° insulation → **235 A**
- What's the ampacity of a 250 kcmil copper, single conductor cable with 90 degree C insulation? The cables are properly spaced. T1 → **455 A**
- What does the term "low voltage" mean for AC circuits in the Code? 31 V to 1000 V inclusive
- What's the max voltage-to-ground for a dwelling? **150 V**

- A 125 A fuse opens in 6 cycles. How long would it take to open?
  time per cycle = 1/frequency = 1/60 = 0.01667 s = 16.67 ms → 6 x .01667 ms = 100 ms
- Which of the following is true of electrical non-metallic tubing?
  - cannot be used to support equipment
  - it must be fastened within 750 mm of each coupling
  - mechanical protection is never needed
  - it can be used in installations at up to 90°C
- What de-rating factor is used when there are 26 power conductors in a conduit? T5C → **0.6** or **60%**
- Conductors of 90 degree C insulation are installed in an area of 75 °C ambient temperature. What correction factor should used to compute ampacity? T5A → **0.5**
- What's a bonding path's trait?
  - low impedance
  - made of copper
  - insulated
- What's the min depth a plate grounding electrode must be buried in normal conditions? 600 mm
- When must circuits of under 25 V be grounded?
  - supplied from a transformer energized at over 150 volts
  - supplied from batteries
  - installed in non-metallic conduit
  - inside buildings

Week 9: 8-104 – Résultats

Use “calculated load table”:



- A panelboard is fed with 1 AWG, R90, single conductor copper cables in free air and protected by a 200 A fuse. The switch has the fuse rated continuous operation at 100% its rating. What's the ampere rating of the circuit? T1 → 1 AWG + R90 → 220 → but limited by 200 fuse→ **200 A**
    - The switch with the fuse is rated continuous operation at 100% of its rating. What's the ampere rating of the circuit? 200/1 → still **200** A
- What's the ampere rating of a branch circuit that has conductors R310 A protected by a 300 A circuit breaker? limited at 300 by breaker → 300 A
- Which of the following is a continuous load as defined by section 8?
    - a machine drawing 100 amps and has controls that ensure it runs only 1 hour out of 3
    - an apartment feeder
    - a school service (Section 8: Pg 96)
- What's the ampere rating of a branch circuit that has conductors R310 A protected by a 350 A circuit breaker? limited at **310 A**
- A panelboard is fed with 1 AWG, R90, single conductor copper cables in free air and protected by 200 A fuse. What's the circuit's max continuous load? T1: R90 + 1 AWG → 220 A → limited at 200 A → T13 → **150**-**154** A

Week 11 - Pull Boxes

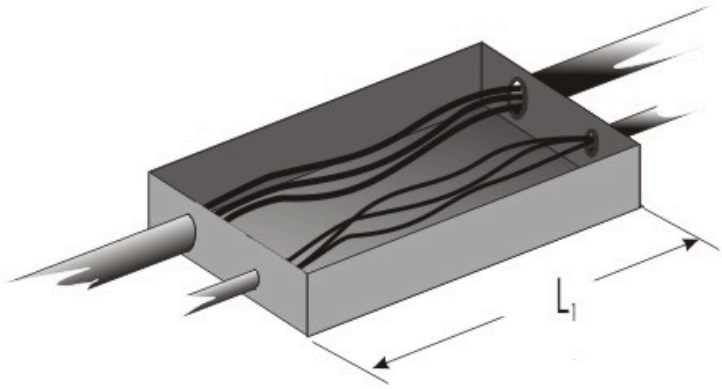


Figure 1

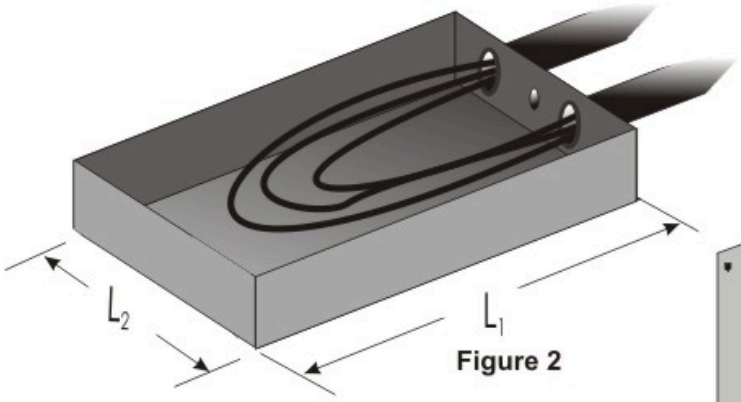


Figure 2

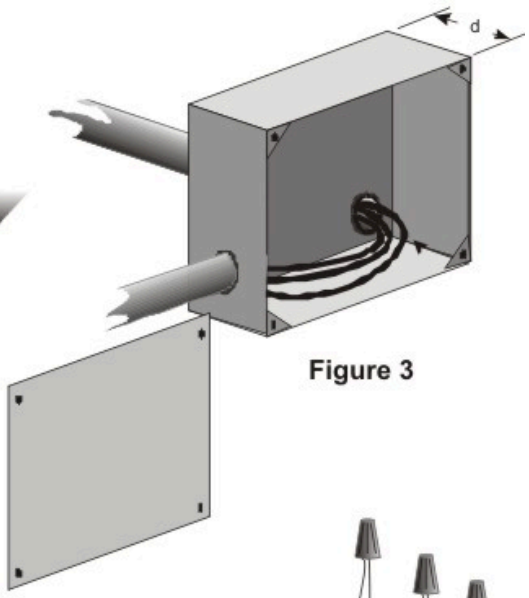


Figure 3

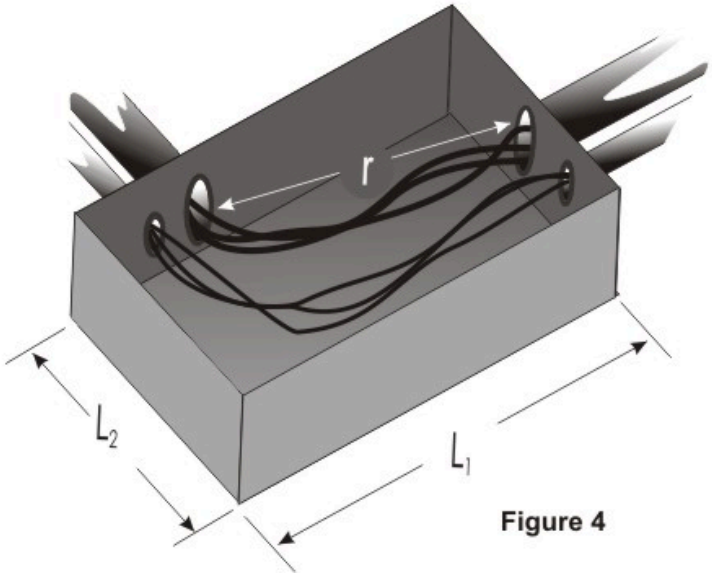


Figure 4

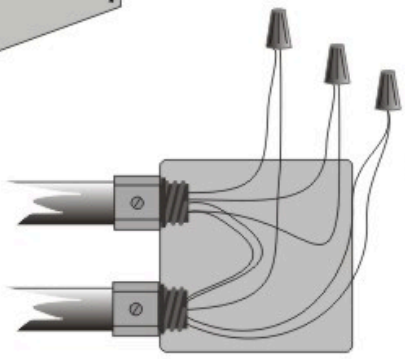


Figure 5

- Figure 4 has a 63 mm conduit with four 250 kcmil T90 Nylon conductors and a 35 mm conduit with four 3 - AWG T90 Nylon conductors.
    - What is the L2's minimum dimension? 63x6 + 35 = 413 mm
    - What is the minimum distance between the 35 mm conduit entering and the 35 mm conduit leaving the box? r = 35x6 = **210** mm
- What's Figure 2's pull box 's L1 dimension if its conduits are 63mm? 63x6 + 63 = **441** mm
- How many conductors of Figure 5's wire connectors equivalent to? 3 wire connection = 1 conductor
- How many conductors are in Figure 5 to size the box? 2 wire conductors = 1 conductor → 1 + 8 wires = 9 conductors
- Figure 2's pull box conduits are 63 mm. What's its L2 minimum dimension? 63x6 + 63 + 63 + 12.5x2 = 529 mm
- How many conductors are Figure 5's wire conductors equivalent to? 1
- Figure 2's both conduit are 63 mm. What's the minimum distance between the 2 circuits? 63x6 = **378** mm
- Figure 2's pull box's both conduits are 63mm. What's the minimum dimension of L2? $L_1 + d_1 + d_2 + 2c$ = 63x6 + 63 + 63 + 12.5x2 = **529** mm
- What's the diameter of a 250 kcmil T90 Nylon conductor? T6K: 1 conductor + 250 → **18.04** mm
- Figure 2's pull box has both conduits at 63 mm. What's the minimum dimension L1? 63x6 + 63 = **441** mm
- What's the minimum dimension of L1 in Figure 1 if the larger conduit is 63 mm? straight wire multiple by 8: 63x8 = **504** mm

- If Figure 5's conductors are all 10 AWG, what's the box's minimum size? T23: 10 AWG + 9 wire → **4 inch square - 1 - 1/2 deep**

Week 12 House Wiring - Part 1

House wiring

- The living room's wall space is broken up by 2 doorways and a fireplace. 1 wall is a metre long, one is 2.7 m long, another one is 4.1 m long. How many receptacles are needed? 1 used wall space is ~900 mm = 1+2.7+4.1 - 0.09x3 = 7.53 m space available → 7.53/1.8 ≈ **4** receptacles
- Receptacles are never installed facing up in kitchen counters.
- 900 mm is the max distance between the kitchen sink and the closest receptacle.
- What's the min circuit for a 5-20R (T-slot) receptacle? 12 AWG copper conductors and a 20 A overcurrent device
- When is a wall "finished" in the CEC? if it has drywall to in 450 mm of the floor
- Which of these is true of receptacles in bathrooms? must be in 1 m of a wash basin

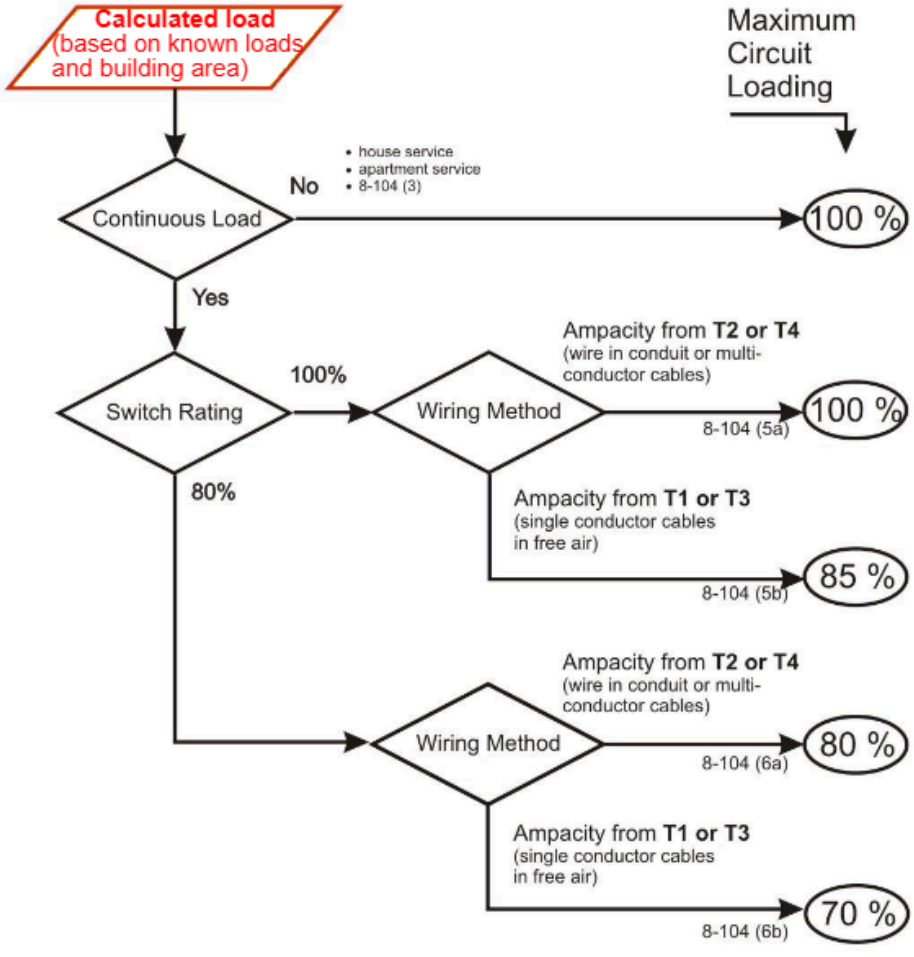
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- What is the minimum size of copper bonding conductor for 200 A service? T16 for minimum size of field installed system bonding conductors/jumpers: 200 A + Wire, Copper → **6 AWG**
- What is the minimum size of aluminum bonding conductor for 200 A service? T16 (for minimum size of field installed system

bonding conductors/jumpers): 200 A + Wire, Aluminum→ **4 AWG**

- What is the current carrying capacity of a 4 AWG copper conductor at R90º insulation in a 3-conductor cable? 3 copper conductor → T2 → **95 A**
    - What is the conductor's current if it goes into a 45° ambient temperature area? T2 can't work yet as given ambient temperature (45°) is above the limit of hte table (30°), use T5A: R90 + 45° ambient → 0.87 → 0.87x95 → **82.65** A
- A conduit has 5 aluminum, 2 AWG R90 conductors. What is the max amount of current each conductor carries? T4: R90 + 2 AWG → 100 → T5C: 5 conductors → 0.8 correction factor→ 0.8x100 A → **80 A**
- A conduit has 5 single conductors. They're 2 AWG copper of R75 insulation. 1 is a bonding conductor and 1 a neutral. The system is balanced. What is the ampacity per conductor? Neutral and bonding don't count: 5-2=3 → T2 → **115 A**
- What size of aluminum 2 single conducting aluminum wires, correctly spaced, of R75 insulation can be used to carry 80 A in at 65°C? T3 can't work yet as 65°C is above its limit, use T5A → R75 + 65°C → 0.47 → 80/0.47 = 170 → T3: 170 A + R75 → **1/0** AWG
- What is the ampere rating of a branch circuit with conductors rated 340 A protected by a 350 A circuit breaker? 340 rating doesnt reach 350 A → **340** A

- A panelboard is fed with 1 AWG, R75, 3 copper conductors in conduit and protected by a 125 A fuse. What is the max *non*-continuous load on the circuit? non-continuous → 100% circuit loading → T2: 1 AWG + R75 → 130 A → breaker limits at 125 A → **125 A**
- A panelboard is fed with 3/0, R75, 3 copper conductors in conduit and protected by a 200 A fuse. The switch with the fuse is rated continuous operation at 100% its rating.
    - What is the max continuous load on the circuit? T2: R75 + 3/0 → **200 A**
- A panelboard is fed with 1 AWG, R75, aluminum single conductors, properly spaced and protected by a 175 A fuse. What is the max continuous load on the circuit? T3 → 155 A → calculated load table: continuous? yes → no switch rating → 80% → wiring method: single conductor → 70% → 155x0.7 = **108.5** A
- A panelboard is fed with 1 AWG, R75, 3 copper conductors in conduit and protected by a 125 A fuse. What is the *max continuous* load on the circuit? T2: 1 AWG + R75 → 130 → Calculated load table: continuous → no switch rating → 80% → wiring method: multiconductor → 80% → limited at 125 by fuse →125x0.8 = **100 A**
- A panelboard is fed with 4/0 AWG, R75, aluminum single conductors in conduit and protected by a 200 A fuse. The switch with the fuse is rated 100% continuous operation of its rating. What's the circuit's max *continuous* load? in conduit → T4: R75 + 4/0 → **180**

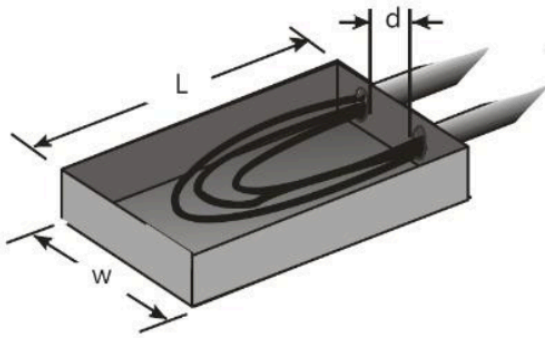
- A load needs 50 A.
    - What is a copper cable conductor's size at R75 insulation needed to feed the load? single copper conductor → T1: 50 A + R75 → **10** AWG**
    - If a 50 A circuit breaker protects the circuit, what's this circuit's ampacity rating circuit? limited at 50 A → **50 A**
- 

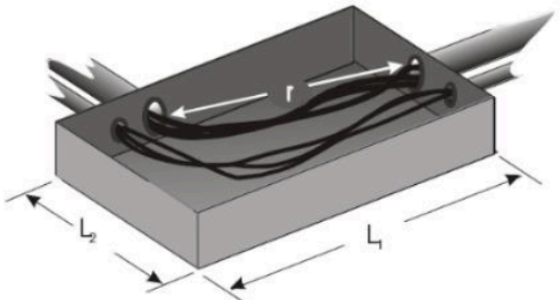
A Non-continuous load needs 50 A.
    - What is a copper cable conductor's size at R75 insulation rating needed to feed this load? non-continuous → 100% max loading → 50 A → T1? **8 AWG**

    - If a 50 A circuit breaker protects the circuit, what is its ampacity rating? limited at 50 A → **50 A**
- A 10 AWG aluminum conductor at R90⁰ insulation in a 3-conductor cable can carry 35 A. What size of circuit break can protect the circuit? 14-104, 2), e) - 166: 10 AWG aluminium → **25** A
- What size must a single copper conductor R90 be to carry 75 A at 50°C? T1 can't work yet 50°C is above its limit, use T5A: 50°C + R90 → 0.82 → 75/0.82 = 91 A → T1: 91 A + R90 → **6 AWG**
- What is a 6 AWG copper conductor's ampacity at R90⁰ insulation in a 3-conductor cable? T2 → **75** A
    - What minimum OC size to protect the circuit? T13: 75 A → **80** A

      What is the circuit's ampacity rating? doesn't change: **75** A
- What EMT conduit size is for three 2/0 T90 nylon conductors? T6K for Nylon: 2/0 + 3 conductors → 432 mm^2 → T9G for diameter: 432 mm^2 + areas of EMT + 40% area (2nd last row) → **41** mm
- What is the ampacity of a 1 AWG copper conductor of R90⁰ insulation in a 3-conductor cable? T2: R90 + 1 AWG → **145** A
- What is the minimum OC (overcurrent) size to protect a circuit of 1 AWG copper conductor of R90⁰ insulation in a 3-conductor cable? T13: 145 A → **150** A
    - What's the circuit's ampere rating? stays the same: **145 A**
- A pull box has a 53 and 78 mm conduit enter 1 side and conductors run out its opposite side in the same conduits size. What is the box's minimum length? 78x8 = **624** mm

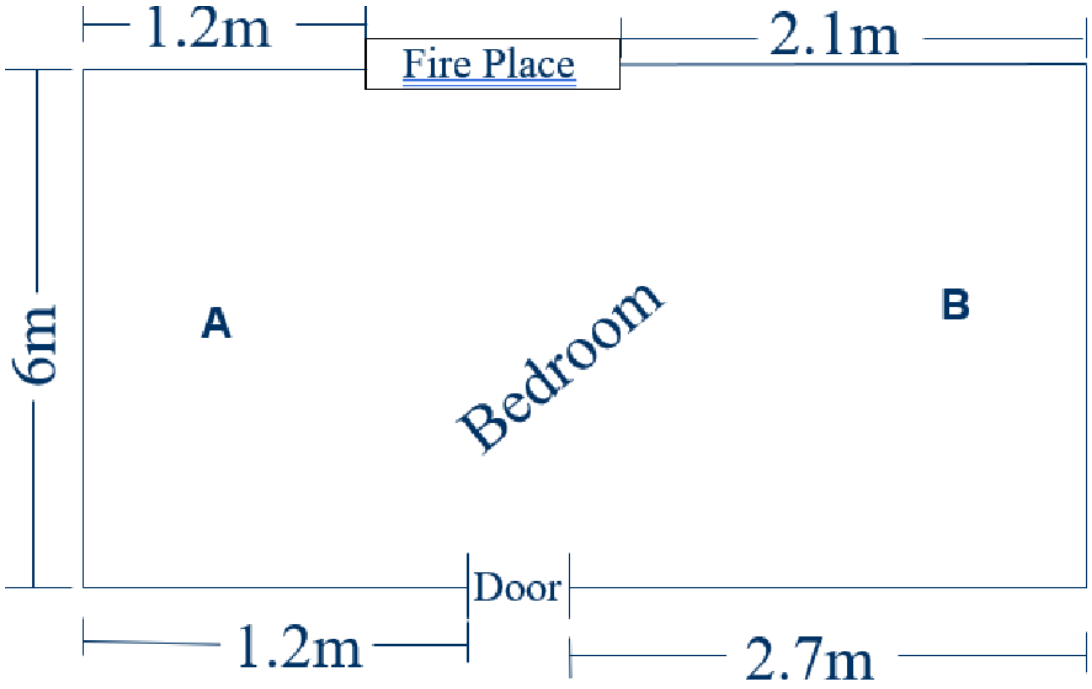
- A pull box has a 41mm and a 35 mm conduit enter one side of a pull box. The conductors run out the opposite side of the box in the same size of conduits. What is the minimum length of box? 41x8=328 mm



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A “U” pull box has a 78 mm conduit going in.
    - What is its “L” minimum dimension? 78x6 + 78 = **546** mmWhat is the minimum dimension of ‘d’? 78x6 = **468** mm
    - What is the box’s minimum width “W”? **W** = 6d + 2c (or 2x12.5) + d_1 + d_2 = 78x6 + 2x12.5 + 78 + 78 = **649** mm
- A “U” pull box has a 53 mm conduit going in.

    - What is the minimum dimension “L”? 53x6 + 53 = **371** mm
    - What is the minimum dimension for “d”? 53x6 = **318** mm
    - What is the box’s minimum width “W”? 53x6 + 2x12.5 + 53 + 53 = **449** mm
- An angle pull box has a 53 and 78 mm conduit going in.
    - What is the minimum dimension L1? 78x6 + 53 = **521** mm
    - What’s the minimum dimension ‘*r*’? see that ‘r’ is the big conduit’s distance, so: 6 x $d_{largest}$ = 53x6 = **468** mm
- What is the max receptacle number for a general purpose 15 A circuit? 8-304: **12** outlets references: How Many Outlets Are on a 15 Amp Circuit?, Guide CEC 26th Edition Section 8
- On a kitchen counter, what’s the max distance a receptacle must be installed from a sink in the kitchen? 26-722, d), iii) - Pg 233: **900** mm
    - What receptacle type must this be? **GFCI**
- What’s the max distance a receptacle must be installed from a sink in the bathroom? 26-704 - Pg 231 (maybe useful): **1-1.5** m
- On a kitchen counter, no point on the counter must be no more than? 900 mm
- On kitchen counters, receptacles can be split or? 26-654, d) - Pg 229: Pg 220: **5-20R (T-Slot 20)** (split is 5-15R)
- At no point in a hallway in a dwelling unit must be no more than from a duplex receptacle? 26-722 - Pg 233, e): **4.5** m
- Which house rooms won’t need overhead light and in what conditions? Living room and bedrooms → have a switched receptacle

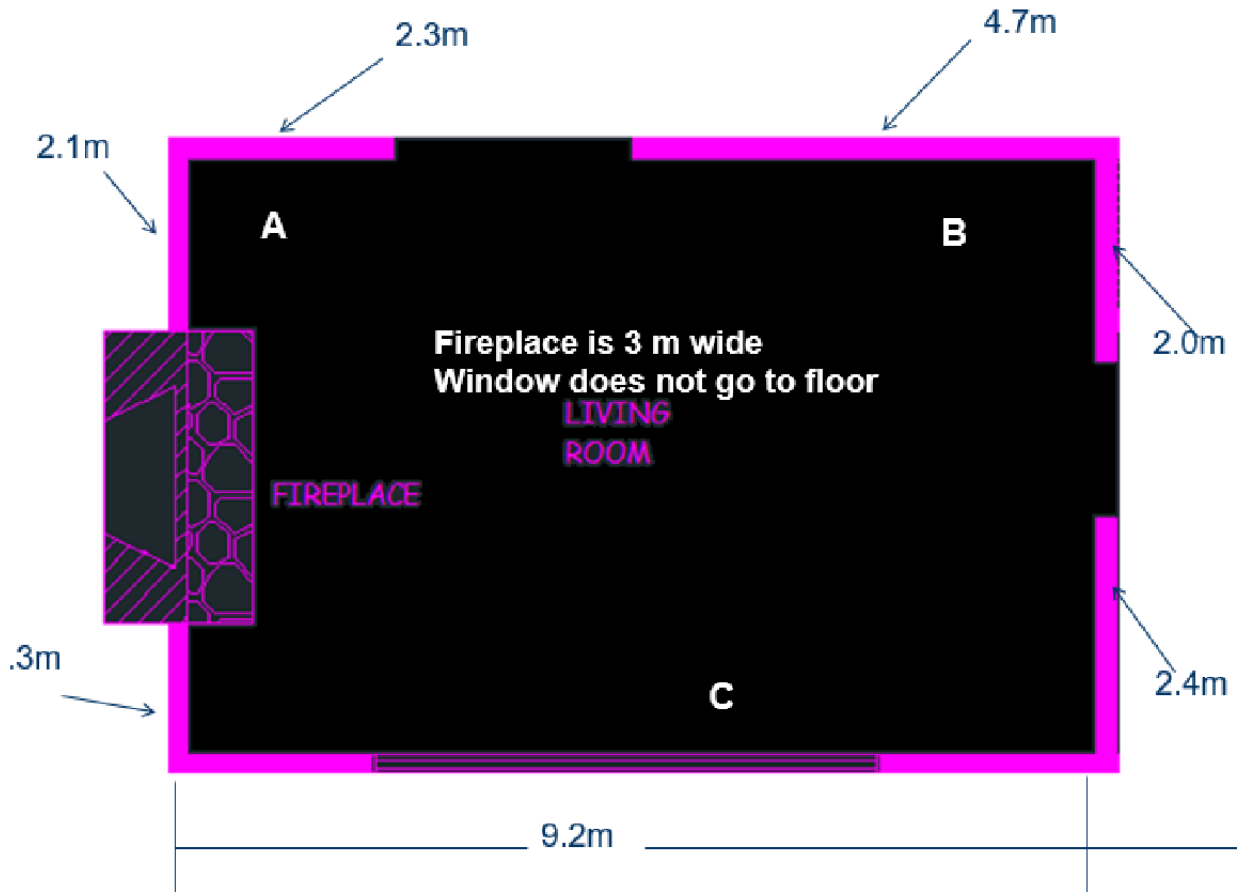
- How many luminaires are for an 18x22 m unfinished basement? 14
- When is a 3-way switched light needed? 4+ risers
- Receptacles installed within 1.5 meters of sinks must have what protection type? GFCI
- 

  The door is an outswing (opens outward). In this bedroom, how many receptacles are for:

Rule 26-722 a) - Pg: A receptacle must be 1.8 m after a door.

  - **A** → 1st receptacle is in 1.8 m after door
    - 8.4 - 1.8 = 6.6 → 2nd receptacle
    - 6.6/3.6 = 1.8 → 3rd receptacle
    - **3** (or ~4)
  - **B** → 2.7 + 6 + 2.1 = 10.8
  - 10.8 - 1.8 = 9
  - 9/3.6 = 2.5

- 3 or 4



- For this living room (NTS), how many receptacles are needed for:
  - A → (2.3 + 2.1) - 1.8
    - 2.6 is under 3.6 = 2
  - B → (2 + 4.7)/3.6 = 1.86 or 2
  - C → (3 + 9.2 + 2.4)/3.6 = 4

What is the CSA clearance for overhead supply conductors above finish grade normally only accessed by pedestrians? 3.5 m

Week 13

- What's needed for a circuit for an electric range? 26-744 6# Pg 234
- Which is true of receptacles in bathrooms?
  - must be CSA configuration 5-20R
  - cannot be within 1 m of a bathtub
  - must be protected by an arc-fault circuit interrupter
  - **can't be within 500 mm a bathtub** (26-720 General)
- A clothes dryer is rated 19 A at 240 V. What is the right receptacle for this? 26-744, 2# - Pg 234: **14-30R** (don't use Diagram 1 - Pg 516)
- When is a wall "finished" in CEC? 26-720, a), i) - Pg 232: if it has drywall within ~450 mm on floor
- How is a recessed luminaire designed for installation in a cavity filled with thermal insulation and permitted to be in direct contact with combustible? 30-002 - Pg 251: **Type IC**
- When can a receptacle be placed in a cupboard?
  - if protected by a GFCI
  - **for a microwave oven** (26-720 h) i) - Pg 232)
- Which of these is true for power to heating equipment rated at 117 kW?
  - **a disconnecting means is needed** (26-806, 5# - Pg 235)
  - must be fed from multiple branch circuits
  - 12 AWG copper conductors are needed
- What size must a 3" by 2" device box be to accommodate five 14 AWG insulated conductors and 4 wire connectors. T23: 5 conductors → 4 connectors (marrette) = 2 conductors → 2 + 5 =

7 total conductors → 7 conductors + device + 14 AWG → no 7 conductor in the part of the table, moved to 8 conductors → **3 x 2 x 2 ½**

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Week 13 Services II

- What's the minimum conductor size of copper grounding conductor for a 100 A service? **6** AWG: reference: [1] Which Size AWG Wire Should You Use For 100 Amp Service?
- What's the minimum conductor size of aluminum grounding conductor for a 100 A service? **4** AWG [1]
- What's Figure 1's No 2? an **LB fitting**

Week 13, attempt 2#

- What standard tells how fuel burner safety controls are installed? 26-804: **CSA C22.2 No. 3.**
- When can receptacles be installed facing up in the kitchen counter? never
- When must a jumper on the receptacle's live side be broken? on split receptacles
- When are 3-way switches and a luminaire needed? stairways of 4+ rises
- A receptacle's wiring is GFCI protected by an upstream GFCI. Where does the wiring connect? GFCI's load terminals
- Which of these is true of receptacles in bathrooms? must be within 1 m of a wash basin
- How thick does lumber have to be to secure the support for the point of attachment? 6-112, 7) - Pg 90: **38 mm**

T1

Table 1
Ampacities for single copper conductors, bare, covered, or insulated, rated not more than 5000 V and unshielded, in free air (based on an ambient temperature of 30 °C*)

(See Rules 4-004, 4-006, 26-142, 42-008, and 42-016, and Tables 5A, 5B, and 19.)

Size, AWG or kcmil	Ampacity†					
	60 °C†	75 °C†	90 °C†,§	110 °C† (See Note 3)	125 °C† (See Note 3)	200 °C† (See Note 3)
14**	25	30	35	40	40	50
12**	30	35	40	45	45	55
10**	40	50	55	65	65	80
8	60	70	80	90	95	115
6	80	95	105	120	130	155
4	105	125	140	160	170	205
3	120	145	165	185	195	240
2	140	170	190	215	230	280
1	165	195	220	245	265	320
0	195	230	260	290	310	375
00	220	265	300	335	355	435
000	260	310	350	390	420	510
0000	300	360	405	455	485	590
250	340	405	455	510	545	—
300	370	445	500	560	600	—
350	425	505	570	640	680	—
400	455	545	615	690	735	—
500	520	620	700	785	835	—
600	580	690	780	870	930	—
700	630	755	850	955	1020	—
750	655	785	885	990	1060	—
800	680	815	920	1030	1100	—
900	730	870	980	1100	1175	—
1000	785	935	1055	1180	1260	—
1250	890	1065	1200	1345	—	—
1500	985	1175	1325	1485	—	—
1750	1070	1280	1445	1620	—	—
2000	1160	1385	1560	1750	—	—
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7

T2

Table 2
Ampacities for not more than three insulated copper conductors, rated not more than 5000 V and unshielded, in raceway or cable (based on an ambient temperature of 30 °C*)

(See Rules 4-004, 26-142, 42-008, and 42-016, and Tables 5A, 5C, 19, and D3.)

Size, AWG or kcmil	Ampacity†,††					
	60 °C‡	75 °C‡	90 °C‡**	110 °C‡ See Note	125 °C‡ See Note	200 °C‡ See Note
14§	15	20	25	25	30	35
12§	20	25	30	30	35	40
10§	30	35	40	45	45	60
8	40	50	55	65	65	80
6	55	65	75	80	90	110
4	70	85	95	105	115	140
3	85	100	115	125	135	165
2	95	115	130	145	155	190
1	110	130	145	165	175	215
0	125	150	170	190	200	245
00	145	175	195	220	235	290
000	165	200	225	255	270	330
0000	195	230	260	290	310	380
250	215	255	290	320	345	—
300	240	285	320	360	385	—
350	260	310	350	390	420	—
400	280	335	380	425	450	—
500	320	380	430	480	510	—
600	350	420	475	530	565	—
700	385	460	520	580	620	—
750	400	475	535	600	640	—
800	410	490	555	620	660	—
900	435	520	585	655	700	—
1000	455	545	615	690	735	—
1250	495	590	665	745	—	—
1500	525	625	705	790	—	—
1750	545	650	735	820	—	—
2000	555	665	750	840	—	—
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7

T3

Table 3
Ampacities for single aluminum conductors, bare, covered, or insulated, rated not more than 5000 V and unshielded, in free air (based on an ambient temperature of 30 °C*)

(See Rules 4-004, 26-142, 42-008, and 42-016, and Tables 5A, 5B, and 19.)

Size, AWG or kcmil	Ampacity†					
	60 °C‡	75 °C‡	90 °C‡	110 °C‡ (See Note 3)	125 °C‡ (See Note 3)	200 °C‡ (See Note 3)
12§	25	30	35	40	40	50
10§	35	40	45	50	55	65
8	45	55	60	70	75	90
6	65	75	85	95	100	125
4	85	100	115	125	135	165
3	95	115	130	145	155	190
2	115	135	150	170	180	220
1	130	155	175	195	210	255
0	150	180	205	225	245	295
00	175	210	235	265	285	345
000	200	240	270	305	325	395
0000	235	280	315	355	375	460
250	265	315	355	400	425	—
300	295	350	395	440	470	—
350	330	395	445	500	535	—
400	355	425	480	535	575	—
500	405	485	545	615	655	—
600	455	545	615	690	735	—
700	500	595	670	750	800	—
750	520	620	700	785	835	—
800	540	645	725	815	870	—
900	585	700	790	885	945	—
1000	630	750	845	950	1010	—
1250	715	855	965	1080	—	—
1500	795	950	1070	1200	—	—
1750	880	1050	1185	1325	—	—
2000	965	1150	1295	1455	—	—
Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**

T4

Table 4
Ampacities for not more than three insulated aluminum conductors, rated not more than 5000 V and unshielded, in raceway or cable (based on an ambient temperature of 30 °C*)

(See Rules 4-004, 26-142, 42-008, and 42-016, and Tables 5A and 5C.)

Size, AWG or kcmil	Ampacity†,§					
	60 °C‡	75 °C‡	90 °C‡	110 °C‡ See Note	125 °C‡ See Note	200 °C‡ See Note
12**	15	20	25	25	25	35
10**	25	30	35	40	40	50
8	35	40	45	50	55	65
6	40	50	55	65	70	80
4	55	65	75	80	90	105
3	65	75	85	95	100	125
2	75	90	100	115	120	150
1	85	100	115	125	135	165
0	100	120	135	150	160	195
00	115	135	150	170	180	220
000	130	155	175	195	210	255
0000	150	180	205	225	245	295
250	170	205	230	260	275	—
300	195	230	260	290	310	—
350	210	250	280	315	335	—
400	225	270	305	340	365	—
500	260	310	350	390	420	—
600	285	340	385	430	460	—
700	315	375	425	475	505	—
750	320	385	435	485	520	—
800	330	395	445	500	535	—
900	355	425	480	535	575	—
1000	375	445	500	560	600	—
1250	405	485	545	615	—	—
1500	435	520	585	655	—	—
1750	455	545	615	690	—	—
2000	470	560	630	710	—	—
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7

T5A

Table 5A
Correction factors applying to Tables 1, 2, 3, 4, and 60 (ampacity correction factors for ambient temperatures above 30 °C)

[See Rules 4-004 7) and 16-330, and Tables 1 to 4, 57, 58, and 60.]

Ambient temper-ature, °C	Correction factor								
	Insulation temperature rating, °C†								
	60	75	90	105*	110*	125*	150*	200*	250*
35	0.91	0.94	0.96	0.97	0.97	0.97	0.98	0.99	0.99
40	0.82	0.88	0.91	0.93	0.94	0.95	0.96	0.97	0.98
45	0.71	0.82	0.87	0.89	0.90	0.92	0.94	0.95	0.97
50	0.58	0.75	0.82	0.86	0.87	0.89	0.91	0.94	0.95
55	0.41	0.67	0.76	0.82	0.83	0.86	0.89	0.92	0.94
60	—	0.58	0.71	0.77	0.79	0.83	0.87	0.91	0.93
65	—	0.47	0.65	0.73	0.75	0.79	0.84	0.89	0.92
70	—	0.33	0.58	0.68	0.71	0.76	0.82	0.87	0.90
75	—	—	0.50	0.63	0.66	0.73	0.79	0.86	0.89
80	—	—	0.41	0.58	0.61	0.69	0.76	0.84	0.88
90	—	—	—	0.45	0.50	0.61	0.71	0.80	0.85
100	—	—	—	0.26	0.35	0.51	0.65	0.77	0.83
110	—	—	—	—	—	0.40	0.58	0.73	0.80
120	—	—	—	—	—	0.23	0.50	0.69	0.77
130	—	—	—	—	—	—	0.41	0.64	0.74
140	—	—	—	—	—	—	0.29	0.59	0.71
Col. 1	**Col. 2**	**Col. 3**	**Col. 4**	**Col. 5**	**Col. 6**	**Col. 7**	**Col. 8**	**Col. 9**	**Col. 10**

T5B, T5C, T5D

Table 5B
Correction factors for Tables 1 and 3 (where from two to four single insulated conductors are present and spaced less than 25% of the largest cable diameter)
(See Rule 4-004 and Tables 1 and 3.)

Number of conductors	Correction factors
2	0.90
3	0.85
4	0.80

Notes:

1) *Where four insulated conductors form a three-phase-with-neutral system, the values for three insulated conductors shall be permitted to be used. Where three conductors form a single-phase, 3-wire system, the values for two insulated conductors shall be permitted to be used.*
2) *Where more than four insulated conductors are in contact, the ratings for conductors in raceways shall be used.*

Table 5C
Ampacity correction factors for Tables 2 and 4
(See Rule 4-004 and Tables 2 and 4.)

Number of insulated conductors	Ampacity correction factor
1–3	1.00
4–6	0.80
7–24	0.70
25–42	0.60
43 and up	0.50

Table 5D
Current rating correction factors where spacings are maintained (in ventilated and ladder-type cable trays)
(See Rule 4-004 and Table 12E.)

Number of insulated conductors or cables horizontally	1	2	3	4	5	6
Number vertically (layers)						
1	1.00	0.93	0.87	0.84	0.83	0.82
2	0.89	0.83	0.79	0.76	0.75	0.74

T6A