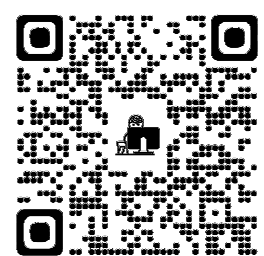


## FLOOR AND SITE PLAN:

## SITE PLAN CHECKLIST:

- A DIMENSIONED (OR SCALED) DRAWING THAT INCLUDES THE FOLLOWING:
  - DRAW THE PROPERTY LINES WITH DIMENSIONS (LOT WIDTH X DEPTH)
  - SHOW ALL BUILDINGS ON THE PROPERTY. THIS INCLUDES THE HOUSE AND OTHER ABOVE GRADE STRUCTURES LIKE: PATIO COVERS, TRASH ENCLOSURES, BBQ, FIRE PITS, ETC.
  - SHOW POOLS, SPAS, AND OTHER DECORATIVE WATER FEATURES.
  - SHOW ALL EASEMENTS & SETBACKS FROM ULTIMATE PROPERTY LINES AND THE DISTANCES BETWEEN BUILDINGS AND OTHER STRUCTURES.
  - SHOW DRIVEWAYS
  - SHOW STREETS, WITH STREET NAMES, AND SIDEWALKS ADJACENT TO THE PROPERTY
  - SHOW ORIENTATION WITH A NORTH ARROW
  - SHOW FENCE LOCATIONS WITH HEIGHTS AND TYPE (WOOD, VINYL, BLOCK WALL)
  - EXISTING PANEL LOCATION AND PROPOSED PANEL LOCATION.
  - EDISON POWER POLE OR VAULT LOCATION
  - PATH OF THE WIRE FROM THE EDISON CONNECTION POINT TO THE NEW PANEL
  - INDICATE IF THE SERVICE IS ABOVE OR UNDERGROUND.
  - HEIGHT OF THE ROOF AT THE PROPOSED LOCATION AND ANY INTERMEDIATE ROOFS IF THE SERVICE LINE IS TO TRAVEL OVER THEM.
  - THE LOCATION OF ANY EXISTING SUBPANELS



## WARNINGS & DISCLOSURES:

THE CITY OF COSTA MESA PROVIDES THESE STANDARD PLANS FOR A LIMITED NUMBER OF PERMITS AND A NARROWLY DEFINED SCOPE OF WORK. BY USING THESE STANDARDS, THE PERMIT HOLDER AGREES TO THE FOLLOWING TERMS:

- THE PLANS MUST BE SUBMITTED EXACTLY AS PROVIDED BY THE CITY, WITHOUT ALTERATION OR MODIFICATION. ANY UNAUTHORIZED CHANGES, INCOMPLETE SECTIONS, OR DOCTORED INFORMATION INVALIDATE THE PLANS & PERMIT.
- THESE PLANS MAY ONLY BE USED FOR THE SPECIFIC PROJECT AND SCOPE ASSOCIATED WITH THE CURRENT PERMIT APPLICATION. USE FOR ANY OTHER PURPOSE, INCLUDING PROJECTS OUTSIDE OF COSTA MESA, IS PROHIBITED.
- ALL INTELLECTUAL PROPERTY RELATED TO THESE PLANS REMAINS THE PROPERTY OF THE CITY OF COSTA MESA.
- FAILURE TO ADHERE TO THE PROVIDED STANDARDS, OR SUBMISSION OF INCOMPLETE OR INCORRECT INFORMATION, WILL RESULT IN DELAYS; AND MAY REQUIRE ADDITIONAL DOCUMENTATION, SUBMITTAL OF NEW APPLICATION(S), VOIDING OF THE PERMIT, AND/OR LEAD TO CODE ENFORCEMENT ACTIONS, INCLUDING CITATIONS AND FINES.

BY PROCEEDING, THE APPLICANT ACKNOWLEDGES THESE TERMS AND AGREES TO COMPLY FULLY WITH THE CITY OF COSTA MESA'S RESIDENTIAL RE-ROOF STANDARD DETAILS, SPECIFICATIONS, LIMITATIONS, AND REQUIREMENTS.

SIGNATURE: \_\_\_\_\_

## SPECIFIC PROJECT INFORMATION:

ALL MATERIALS, EQUIPMENT, INSTALLATION, AND WORK SHALL COMPLY WITH THE LATEST VERSION OF THE:

- 2022 CALIFORNIA BUILDING CODE (CBC)
- 2022 CALIFORNIA RESIDENTIAL CODE (CRC)
- 2022 CALIFORNIA MECHANICAL CODE (CMC)
- 2022 CALIFORNIA ELECTRICAL CODE (CEC)
- 2022 CALIFORNIA PLUMBING CODE (CPC)
- CALIFORNIA FIRE CODE (CFC),
- CALIFORNIA ENERGY CODE (T24),
- CALIFORNIA GREEN CODE (CALGREEN),
- CITY OF COSTA MESA MUNICIPAL CODE.

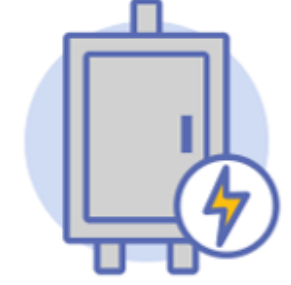
### SCOPE OF WORK:

1. EXISTING ELECTRICAL PANEL TO BE REPLACED: \_\_\_\_\_ AMPS
2. NEW ELECTRICAL PANEL: \_\_\_\_\_ AMPS
3. INSTALLATION LOCATION IS (CHECK ONE):  
INTERIOR: \_\_\_\_\_ GARAGE: \_\_\_\_\_ CARPORT: \_\_\_\_\_ EXTERIOR: \_\_\_\_\_

## GENERAL REQUIREMENTS:

- A. GENERAL NOTES**
1. THE REPLACEMENT PANEL LOCATION SHALL BE APPROVED BY BOTH THE CITY OF COSTA MESA AND THE UTILITY COMPANY.
  2. SOUTHERN CALIFORNIA EDISON (SCE) SERVICE PLANNER SHALL BE CONTACTED PRIOR TO STARTING WORK FOR THEIR REQUIREMENTS AND TO SET UP THE JOB COORDINATION AND/OR METER SPOT.
  3. IF REPLACEMENT OF THE UNDERGROUND SERVICE CONDUIT IS REQUIRED, THIS CONDUIT SHALL BE INSPECTED BY THE UTILITY COMPANY.
  4. ALL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE CALIFORNIA ELECTRICAL CODE AND THE SCE ELECTRICAL SERVICE REQUIREMENTS (ESR). IN SITUATIONS WHERE THOSE STANDARDS CONFLICT, THE MORE RESTRICTIVE STANDARD, AS DETERMINED BY THE CITY (AHJ), SHALL APPLY.
  5. ALL EQUIPMENT SHALL BE LISTED AND MARKED/LABELED AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS (CEC 110.28)
  6. ELECTRICAL PANELS AND EQUIPMENT MUST BE HOUSED IN APPROPRIATE ENCLOSURES RATED FOR THE TYPE OF INSTALLATION AND POTENTIAL ENVIRONMENTAL CONDITIONS, INCLUDING PROTECTION FROM MOISTURE, DUST, AND PHYSICAL DAMAGE. (CFC 605.5)
  7. ELECTRICAL EQUIPMENT SHALL BE PROTECTED AGAINST PHYSICAL DAMAGE, WHICH INCLUDES INSTALLING GUARDS, BARRIERS, OR ENCLOSURES WHERE NECESSARY. THIS REQUIREMENT IS INTENDED TO PREVENT ACCIDENTAL CONTACT AND POTENTIAL ELECTRICAL HAZARDS. (CFC 605.5.1)
- B. PANEL LOCATION AND REQUIRED CLEARANCE**
8. MAIN ELECTRICAL PANELS AND BREAKERS (AKA OVERCURRENT PROTECTION DEVICES (OCPDS)) SHALL BE PROPERLY LABELED AND INSTALLED IN LOCATIONS THAT ARE READILY ACCESSIBLE SO THAT FIREFIGHTERS AND EMERGENCY PERSONNEL CAN EASILY IDENTIFY AND OPERATE IT. (CEC 240.24(A), CFC 605.1.1)
  9. READILY ACCESSIBLE IS DEFINED AS: THE ABILITY TO REACH SOMETHING QUICKLY FOR MAINTENANCE, INSPECTION, OR OPERATION WITHOUT THE NEED FOR TOOLS, CLIMBING, OR REMOVING OBSTACLES. IN OTHER WORDS, TO REACH A DEVICE REQUIRED TO BE READILY ACCESSIBLE CANNOT REQUIRE THE USE OF LADDERS, TOOLS, OR THE MOVING OF EQUIPMENT OR STORED GOODS.
  10. CLEAR ACCESS SHALL BE MAINTAINED TO ELECTRICAL PANELS TO FACILITATE RAPID SHUTDOWN AND DISCONNECT OPERATIONS BY EMERGENCY PERSONNEL DURING FIRES OR OTHER EMERGENCIES. (CFC 605.10.1)
  11. ELECTRICAL PANELS SHALL NOT BE BLOCKED OR OBSTRUCTED BY STORAGE, EQUIPMENT, OR BUILDING ELEMENTS TO MAINTAIN IMMEDIATE ACCESS FOR EMERGENCY RESPONDERS. ACCESS TO ELECTRICAL PANELS MUST BE MAINTAINED AT ALL TIMES. (CFC 605.3.1)
  12. PANELS SHALL BE INSTALLED IN A VERTICAL POSITION. (240.33)
  13. A CLEAR WORKING SPACE OF AT LEAST 30 INCHES (762 MM) WIDE, 36 INCHES (914 MM) DEEP, AND 78 INCHES (1981 MM) HIGH SHALL BE MAINTAINED IN FRONT OF ELECTRICAL PANELS TO PROVIDE SUFFICIENT ROOM FOR SAFE OPERATION, MAINTENANCE, AND EMERGENCY ACCESS. (CFC 605.3.1)
  14. PANELS SHALL BE MOUNTED SO THAT THE CENTER OF THE METER IS LOCATED BETWEEN 4" MIN AND 6'-3" MAX ABOVE THE GROUND (SCE-ESR)
  15. THE MAXIMUM HEIGHT OF ANY BREAKER HANDLE SHALL NOT BE OVER 6 FEET 7 INCHES ABOVE THE FINISHED FLOOR. (240.24(A))
  16. PER CEC 240.24, PANELS SHALL NOT BE INSTALLED:
    - a. OVER THE STEPS OF A STAIRWAY.
    - b. WHERE THEY ARE SUBJECT TO PHYSICAL DAMAGE.
    - c. IN BATHROOMS.
    - d. IN CLOTHES CLOSETS OR IN OTHER AREAS WHERE EASILY IGNITABLE MATERIALS ARE PRESENT OR STORED.
    - e. IN A FACE-UP POSITION. (408.43)
- C. PANELS OR ENCLOSURES (CABINETS)**
17. ENCLOSURES SHALL BE INSTALLED FLUSH TO THE FINISH SURFACE IN COMBUSTIBLE (WOOD-FRAME) WALLS. (CEC 312.3)
  18. THE MAXIMUM SETBACK IN A NONCOMBUSTIBLE WALL (E.G., STEEL STUDS) IS ¼ INCH. (CEC 312.3)
  19. THE MAXIMUM PLASTER GAP AT THE SIDE OF A FLUSH MOUNT PANEL SHALL BE ¼ INCH. (CEC 312.4)
  20. ALL OPEN KNOCKOUTS (KOS) SHALL BE PROPERLY FILLED, EXCEPT FOR MANUFACTURER HOLES SUCH AS THOSE FOR MOUNTING. (110.12(A))
- D. COVERS AND CIRCUIT DIRECTORIES**
21. EACH PANEL SUPPLIED BY A FEEDER SHALL BE PROVIDED WITH A DURABLE LABEL (NOT HANDWRITTEN) INDICATING WHERE THE POWER ORIGINATES IF IN A DIFFERENT LOCATION THAN THE PANEL. (CEC 408.4(B))
  22. PANELS SHALL HAVE A DEAD-FRONT COVER. (CEC 408.3B)
  23. CIRCUIT DIRECTORIES SHALL DISTINGUISH EACH CIRCUIT FROM ALL OTHERS. (CEC 408.4(A))
  24. LABEL SPARE POSITIONS THAT CONTAIN UNUSED OVERCURRENT PROTECTION DEVICES (OCPDS). (CEC 408.4(A))
  25. FILL PLATES SHALL BE INSTALLED IN ANY MISSING TWIST-OUTS THAT DO NOT HAVE BREAKERS INSTALLED. (CEC 110.12(A))
- E. OVERCURRENT PROTECTION DEVICES (OCPDS)**
26. BREAKERS SHALL BE LISTED OR CLASSIFIED AND INSTALLED ACCORDING TO THE APPROVED MANUFACTURER INSTRUCTIONS FOR THE PANEL. (CEC 110.3(B))
  27. BACK-FED BREAKERS SHALL BE SECURED IN PLACE (CEC 408.36(D))
    - a. EXCEPTION: OUTPUT CIRCUITS FROM LISTED UTILITY INTERACTIVE INVERTERS, WHICH MAY NOT REQUIRE ADDITIONAL SECURING FOR BACK-FED BREAKERS. (CEC 705.12(E))
  28. BREAKERS SHALL INDICATE WHETHER THEY ARE IN THE 'ON' OR 'OFF' POSITION. (CEC 240.8.1)
  29. IF A BREAKER OPERATES VERTICALLY, THE 'UP' POSITION SHALL INDICATE 'ON'. (CEC 240.8.1)
- FOR RECEPTACLES ON A SHARED YOKE OR MOUNTING STRAP, EITHER A 2-POLE BREAKER OR 2 SINGLE-POLE BREAKERS WITH APPROVED HANDLE TIES SHALL BE USED. (CEC 210.7)
- F. PANEL WIRING**
30. ONLY ONE WIRE SHALL BE ALLOWED PER TERMINAL UNLESS THE TERMINAL IS SPECIFICALLY IDENTIFIED FOR MORE THAN ONE WIRE. (110.14(A)) (CEC 408.41 AND 408.41 EXCEPTION 1)
  31. EQUIPMENT GROUNDING CONDUCTORS (EGCS) AND NEUTRALS MAY NOT SHARE THE SAME TERMINAL, EVEN IN SERVICE EQUIPMENT WHERE ALLOWED ON THE SAME TERMINAL BAR. (CEC 408.4.1)
  32. TORQUE ALL BREAKERS AND TERMINALS ACCORDING TO APPROVED MANUFACTURER INSTRUCTIONS. (CEC 110.3(B))
  33. ANTI-OXIDANT SHALL BE APPLIED ON ALUMINUM CONDUCTORS AS REQUIRED IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTALLATION INSTRUCTIONS (CEC 110.1.4)
  34. EACH CABLE SHALL BE SECURED TO THE CABINET OR ENCLOSURE. (CEC 312.5(C))
  35. CONDUCTORS INSIDE CABINETS SHALL NOT BE CROWDED TO ALLOW PROPER HEAT DISSIPATION AND TO PREVENT OVERHEATING. (CEC 312.7)
  36. SPICES AND TAPS WITHIN CABINETS SHALL NOT FILL MORE THAN 40% OF THE AVAILABLE SPACE, AND ALL CONDUCTORS TOGETHER SHALL NOT EXCEED 75% OF THE GROSS-SECTIONAL AREA. (CEC 312.8)
  37. POWER-MONITORING OR ENERGY MANAGEMENT EQUIPMENT AND CONDUCTORS SHALL BE ACCEPTABLE WITHIN AN ENCLOSURE IF LISTED AND MEETING THE ABOVE FILL REQUIREMENTS. (CEC 312.8(B))
  38. FEED-THROUGH CONDUCTORS SHALL BE ALLOWED TO PASS THROUGH THE PANEL IF A WARNING LABEL IS APPLIED TO THE ENCLOSURE IDENTIFYING THE POWER SOURCE. (CEC 312.8(A)(3))
  39. WIRE BENDING SPACE IN SWITCHBOARDS AND PANELS SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFIC REQUIREMENTS OUTLINED IN SECTION 312.6. (CEC 408.3(G))
- G. NEUTRAL CONDUCTORS AND EGCS**
40. NEUTRAL, EGCS, AND ENCLOSURE SHALL BE BONDED IN SERVICE PANELS. (CEC 250.24(B))
  41. NEUTRALS SHALL NOT BE BONDED IN SUBPANELS. (CEC 250.24(A)(5))
  42. GROUND WIRES SHALL NOT BE TERMINATED ON THE NEUTRAL BAR IN SUBPANELS. (CEC 250.24(A)(5))
  43. THE CONTINUITY OF NEUTRALS SHALL NOT DEPEND ON THE ENCLOSURES THEY ARE WITHIN. (CEC 200.2(B))
  44. A NEUTRAL SHALL NOT SERVE MORE THAN ONE CIRCUIT OR MWBC CIRCUIT. (CEC 200.4(A))
  45. NEUTRAL CONDUCTORS SHALL BE FACTORY-APPLIED WHITE OR GRAY, WITH CONDUCTORS SIZED #4 AWG OR GREATER ALLOWED TO HAVE WHITE OR GRAY TAPE ENCRICLING THE ENDS. (CEC 200.4(A) AND 200.4(B))
  46. WHITE CONDUCTORS SHALL NOT BE ALLOWED ON UNGROUNDED CONDUCTORS (CEC 200.7(A))
    - a. EXCEPTION: WHITE CONDUCTORS OF A CABLE ASSEMBLY ARE ACCEPTABLE AS UNGROUNDED CONDUCTORS IF TAPED (NOT WHITE, GRAY, OR GREEN) ENCRICLING THE ENDS. (CEC 200.7(C))
  47. GROUNDING TERMINAL BARS SHALL BE REQUIRED IF WIRE EGCS ARE PRESENT IN THE PANEL. (CEC 408.40)
  48. OVERCURRENT PROTECTION DEVICES (OCPDS) SHALL NOT BE ALLOWED IN SERIES WITH THE NEUTRAL, EXCEPT WHEN OCPD SIMULTANEOUSLY OPENS ALL OTHER CONDUCTORS OF THE CIRCUIT OR WHERE REQUIRED FOR MOTOR OVERLOAD PROTECTION. (CEC 240.22)

# CITY OF COSTA MESA



## RESIDENTIAL PANEL UPGRADE STANDARD

## PERMIT LIMITATIONS:

1. THIS PERMIT FORM IS FOR USE WITH DETACHED SINGLE-FAMILY RESIDENCES ONLY.
2. THIS PERMIT FORM SHALL NOT BE USED FOR WORK BEYOND THE SCOPE OF THE CODE ENFORCEMENT DEMOLITION
3. THIS PERMIT FORM SHALL NOT BE USED FOR RE-BUILDING STRUCTURES
4. THE PERMIT FORM SHALL NOT BE USED FOR ADDITION OF STRUCTURAL WALLS OR SUPPORTS

FOR OFFICE USE ONLY:

PERMIT #:

ISSUED:

PROJECT NAME:

PROJECT ADDRESS:

COSTA MESA, CA

## CITY REQUIREMENTS:

1. JOB PLACARD SHALL BE POSTED ON THE SITE, IN A LOCATION READILY VISIBLE FROM THE STREET.
2. ALL COMPANIES & CONTRACTORS WORKING OR OPERATING WITHIN THE CITY OF COSTA MESA MUST HAVE A VALID CITY OF COSTA MESA BUSINESS LICENSE. (BUSINESS LICENSES CAN BE APPLIED FOR ONLINE WITH TESSA)
3. OVERSIZED LOAD PERMITS ARE REQUIRED FOR:
  - SINGLE TRUCKS EXCEEDING 8'-6" W X 40' L X 14.
  - COMBINATION TRUCKS EXCEEDING 8'-6" W X 75' L X 14.
4. (OVERSIZED LOAD PERMITS CAN BE APPLIED FOR ONLINE WITH TESSA)
5. A PRELIMINARY PUBLIC WORKS INSPECTION IS REQUIRED PRIOR TO THE COMMENCEMENT OF ANY WORK.
6. A FINAL PUBLIC WORKS INSPECTION IS REQUIRED IMMEDIATELY PRIOR TO THE FINAL BUILDING INSPECTION.
7. ANY DAMAGE TO THE EXISTING PUBLIC IMPROVEMENTS (E.G. SIDEWALKS, CURB & GUTTER, STREET PAVING, LANDSCAPING, ETC.) THAT OCCURRED TO THE AREA SURROUNDING THE SITE DURING THE COURSE OF CONSTRUCTION SHALL BE REPAIRED PER THE CITY STANDARDS AT THE PROPERTY OWNERS EXPENSE.
8. AN ENCROACHMENT PERMIT IS REQUIRED FOR ANY AND ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY (SEPARATE APPLICATION REQUIRED)

### CONSTRUCTION WORKING HOURS:

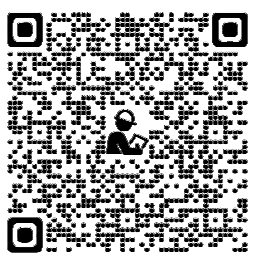
- MONDAY THROUGH FRIDAY, 7AM TO 7PM
- SATURDAYS, 9AM THROUGH 6PM
- CONSTRUCTION WORK IS NOT ALLOWED ON SUNDAYS OR THE FOLLOWING SPECIFIED FEDERAL HOLIDAYS: NEW YEAR'S DAY, MEMORIAL DAY, INDEPENDENCE DAY, LABOR DAY, THANKSGIVING DAY, AND CHRISTMAS DAY.
- VIOLATORS WILL BE CITED AND POTENTIALLY FINED.

## INSPECTIONS:

- 76 - STRUC - EXTERIOR LATHING & SIDING
- 110 - ELEC - ROUGH WIRING
- 414 - ELEC - FINAL ELECTRICAL

\* AFTER BOOKING THIS INSPECTION, LOG INTO TESSA TO UPLOAD THE SUPPORTING DOCUMENTATION TO THIS INSPECTION ITEM BEFORE THE INSPECTOR ARRIVES.

TO BOOK AND INSPECTION, VIEW THE INSPECTION SCHEDULE, OR SEE INSPECTION RESULTS, VISIT TESSA



FORM NUMBER:  
**CBEP-1**

(RELEASE: 09-2024)

TABLES:

2022 CEC Table 312.6(A) Minimum Wire-Bending Space at Terminals and Minimum Width of Wiring Gutters. Table with columns for Wire Size (AWG or kcmil) and Wires per Terminal (1-5).

Notes: 1. Bending space at terminals shall be measured in a straight line from the end of the lug or wire connector in the direction that... 2. This column shall be permitted to be used to determine the minimum wire-bending space for compact stranded aluminum conductors in sizes up to 1000 kcmil and manufactured using AA-8000 series electrical grade aluminum alloy conductor material in accordance with 310.3(B). The minimum width of the wire gutter space shall be determined using the all other conductors value in this table.

TABLES:

2022 CEC Table 250.102(C)(1) Grounded Conductor, Main Bonding Jumper, System Bonding Jumper, and Supply-Side Bonding Jumper for Alternating-Current Systems. Table with columns for Size of Largest Ungrounded Conductor or Equivalent Area for Parallel Conductors (AWG/kcmil) and Size of Grounded Conductor or Bonding Jumper\* (AWG/kcmil).

Notes: 1. If the ungrounded supply conductors are larger than 1100 kcmil copper or 1750 kcmil aluminum, the grounded conductor or bonding jumper shall have an area not less than 121/2 percent of the area of the largest ungrounded supply conductor or equivalent area for parallel supply conductors... 2. If the ungrounded supply conductors are larger than 1100 kcmil copper or 1750 kcmil aluminum and if the ungrounded supply conductors and the bonding jumper are of different materials... 3. If multiple sets of service-entrance conductors are used as permitted in 230.40, Exception No. 2, or if multiple sets of ungrounded supply conductors are installed for a separately derived system... 4. If there are no service-entrance conductors, the supply conductor size shall be determined by the equivalent size of the largest service-entrance conductor required for the load to be served.

\*For the purposes of applying this table and its notes, the term bonding jumper refers to main bonding jumpers, system bonding jumpers, and supply-side bonding jumpers.

2022 CEC Table 312.6(B) Minimum Wire-Bending Space at Terminals. Table with columns for Wire Size (AWG or kcmil) and Wires per Terminal (1, 2, 3, 4 or More).

Notes: 1. Bending space at terminals shall be measured in a straight line from the end of the lug or wire connector in a direction perpendicular to the enclosure wall. 2. For removable end lay-in wire terminals intended for only one wire, bending space shall be permitted to be reduced by the following number of millimeters (inches): (a) 12.7 mm (1/2 in.) (b) 25.4 mm (1 in.) (c) 38.1 mm (1 1/2 in.) (d) 50.8 mm (2 in.) (e) 76.2 mm (3 in.) 3. This column shall be permitted to determine the required wire-bending space for compact stranded aluminum conductors in sizes up to...

2022 CEC Table 250.122 Minimum Size Equipment Grounding Conductors for Grounding Raceway and Equipment. Table with columns for Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of Equipment, Conduit, etc., Not Exceeding (Amps) and Size (AWG or kcmil).

Note: Where necessary to comply with 250.4(A)(5) or (B)(4), the equipment grounding conductor shall be sized larger than given in this table.

GENERAL REQUIREMENTS:

- 102. THE MAIN BONDING JUMPER SHALL CONNECT THE ENCLOSURE, SERVICE NEUTRAL, AND EQUIPMENT GROUNDS. (CEC 250.24(B))
103. LIGHTNING PROTECTION SYSTEMS SHALL BE BONDED TO THE GROUNDING ELECTRODE SYSTEM (GES). (CEC 250.106)
R. BONDING OTHER ENCLOSURES
104. METAL ENCLOSURES OF CONDUCTORS, DEVICES, AND EQUIPMENT TO THE EQUIPMENT GROUNDING CONDUCTOR (EGC) SHALL BE BONDED (CEC 250.84)
a. EXCEPTIONS: SHORT SECTIONS OF PROTECTIVE METAL RACEWAYS ARE EXEMPT WHEN ISOLATED BY AT LEAST 18 INCHES OF SOIL COVER OR 2 INCHES OF CONCRETE. (CEC 250.86 EXCEPTION NO. 2)
105. METAL RACEWAYS, CABLE ARMOR, CABLE SHEATH, ENCLOSURES, FRAMES, AND FITTINGS THAT SERVE AS EGCS SHALL BE BONDED (CEC 250.96(A))
106. NONCONDUCTIVE COATINGS SHALL BE REMOVED BEFORE ADDING BONDING JUMPERS OR USE APPROPRIATE FITTINGS THAT MAKE SUCH REMOVAL UNNECESSARY. (CEC 250.96(A))
107. STRUCTURAL METAL BUILDING FRAMES SHALL BE BONDED USING BONDING JUMPERS SIZED PER THE PROVIDED BONDING JUMPER TABLE (CEC TABLE 250.102(C)(1)). BOND TO THE SERVICE ENCLOSURE, GROUNDED SERVICE CONDUCTOR, OR GEC USING SUFFICIENT SIZE BONDING JUMPER, OR DISCONNECTING MEANS FOR BUILDINGS SUPPLIED BY A FEEDER. (CEC 250.104(C))
S. BONDING OF PIPING SYSTEMS
108. WATER PIPE BONDING SHALL BE SIZED PER BONDING JUMPER TABLE (CEC TABLE 250.102(C)(1)) PROVIDED WITHIN THIS DOCUMENT
109. ANY METAL PIPING SYSTEM CAPABLE OF BECOMING ENERGIZED, INCLUDING GAS, METAL DUCTS, ETC. SHALL BE BONDED (CEC 250.104(B))
T. INTERSYSTEM BONDING
110. THE INTERSYSTEM BONDING TERMINATION (IBT) DEVICE SHALL BE EXTERNAL TO THE SERVICE EQUIPMENT AND AT DISCONNECTING MEANS OF SEPARATE BUILDINGS. (CEC 250.94(A)(1))
111. IBT MAY BE AN ALUMINUM OR COPPER BUSBAR WITH A MINIMUM SIZE OF 1/4 INCH THICK BY 2 INCHES WIDE BY SUFFICIENT LENGTH FOR LEAST THREE TERMINALS FOR COMMUNICATION SYSTEMS. (CEC 250.94(B))
112. IBT SHALL BE ACCESSIBLE FOR CONNECTION AND INSPECTION. (CEC 250.94(A)(1))
113. IBT SHALL NOT INTERFERE WITH OPENING THE ENCLOSURE COVER. (CEC 250.94(A)(3))
114. IBT SHALL BE MOUNTED TO THE METER OR SERVICE ENCLOSURE OR NONFLEXIBLE METAL SERVICE RACEWAY, OR CONNECT WITH #6 COPPER FROM THE IBT TO ONE OF THESE ENCLOSURES. (CEC 250.94(A)(4))
115. IBT SHALL BE MOUNTED TO DISCONNECTING MEANS FOR OTHER BUILDINGS OR CONNECT WITH #6 COPPER FROM IBT TO DISCONNECTING MEANS. (CEC 250.94(A)(5))
116. IBT SHALL BE LISTED AS GROUNDING AND BONDING EQUIPMENT. (CEC 250.94(A)(6))
U. PURPOSE AND ROUTING
117. A GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL NOT BE USED AS AN EQUIPMENT GROUNDING CONDUCTOR (EGC). (CEC 250.121(A))
a. EXCEPTION: WHERE THE GEC COMPLIES WITH BOTH THE GROUNDING AND BONDING REQUIREMENTS AND CARRIES NO OBJECTIONABLE CURRENT. (CEC 250.121 EXCEPTION)
118. METAL BUILDING FRAMES OR STRUCTURES SHALL NOT BE PERMITTED TO SERVE AS EGCS. (CEC 250.121(B))
119. EGCS SHALL RUN WITH THE OTHER CONDUCTORS OF THE CIRCUIT THEY SERVE, WITH EXCEPTION FOR THE REPLACEMENT OF NON-GROUNDING RECEPTACLES. (CEC 250.134(C))
V. TYPES AND IDENTIFICATION OF EQUIPMENT GROUNDING CONNECTORS (EGCS)
120. WIRE EGCS MAY BE COPPER, ALUMINUM, OR COPPER-CLAD ALUMINUM, SOLID OR STRANDED, BARE, COVERED, OR INSULATED. (CEC 250.118(1))
121. CONDUCTORS SIZED #6 AWG OR SMALLER SHALL BE FACTORY INSULATED WITH GREEN (OR GREEN WITH YELLOW STRIPES) INSULATION. (CEC 250.119)
122. CONDUCTORS SIZED #4 AWG OR LARGER SHALL BE IDENTIFIED WITH GREEN TAPE OR LABELS ENCIRCLING THE CONDUCTOR AT EACH END AND AT EVERY ACCESSIBLE POINT. (CEC 250.119(A))
123. GREEN SHALL NEVER BE ALLOWED FOR NEUTRAL OR UNGROUNDING CONDUCTORS. (CEC 250.119)
124. COPPER, ALUMINUM, OR COPPER-CLAD ALUMINUM CONDUCTORS, RIGID METAL CONDUIT (RMC), INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL METALLIC TUBING (EMT), AC CABLE ARMOR, AND ELECTRICALLY CONTINUOUS RACEWAYS AND SURFACE METAL RACEWAYS SHALL BE ACCEPTABLE AS EGCS (CEC 250.118(2))
125. RACEWAYS AND CABLE ARMOR AS EGC SHALL MEET THE FOLLOWING REQUIREMENTS:
a. RACEWAYS AND CABLE ARMOR USED AS EGCS SHALL HAVE APPROVED FITTINGS; ALL JOINTS, FITTINGS, AND CONNECTIONS SHALL BE MADE TIGHT. (CEC 250.120(A))
b. FLEXIBLE METAL CONDUIT (FMC) SHALL BE ACCEPTABLE AS AN EGC WITH LISTED FITTINGS FOR CIRCUITS WITH A MAXIMUM OF 20A OCPD. THE MAXIMUM LENGTH OF FMC OR LFMC IN THE SAME FAULT-CURRENT PATH IS 6 FEET, WITH A MAXIMUM TRADE SIZE OF 1 1/4 INCHES AND NO VIBRATION OR FLEXIBILITY AFTER INSTALLATION. (CEC 250.118(5))
c. FLEXIBLE METAL CONDUIT (LFMC) SHALL BE LIQUID-TIGHT AND IS ACCEPTABLE AS AN EGC FOR CIRCUITS WITH UP TO 60A OCPD, ALLOWABLE IN TRADE SIZES FROM 3/4 TO 1 1/4 INCHES. (CEC 250.118(6))
W. SIZE OF EGCS
126. EGCS SHALL BE SIZED PER THE PROVIDED SIZE OF EQUIPMENT GROUNDING CONDUCTORS TABLE (CEC TABLE 250.122) BASED ON THE MAXIMUM RATING OF OVERCURRENT PROTECTION DEVICES (OCPD). (CEC 250.122(A))
127. WHEN MULTIPLE CIRCUITS ARE IN THE SAME RACEWAY, A SINGLE EGC SHALL BE ACCEPTABLE BASED ON THE LARGEST OCPD OF CONDUCTORS IN THE RACEWAY. (CEC 250.122(C))
WHERE UNGROUNDED CONDUCTORS ARE INCREASED IN SIZE FOR REASONS OTHER THAN DERATING, EGCS SHALL BE INCREASED PROPORTIONALLY. (CEC 250.122(B))
X. USE OF GROUNDED CONDUCTOR FOR EQUIPMENT GROUNDING
128. GROUNDED CONDUCTORS MAY CONNECT TO NONCURRENT-CARRYING METAL PARTS OF EQUIPMENT ON THE SUPPLY SIDE OR WITHIN THE SERVICE DISCONNECTING MEANS. (CEC 250.142(A))
129. GROUNDING LOAD-SIDE EQUIPMENT TO GROUNDED CONDUCTOR SHALL NOT BE ACCEPTABLE, WITH EXCEPTIONS FOR EXISTING RANGES AND DRYERS WITH MINIMUM #10 COPPER OR #8 ALUMINUM IF THE NEUTRAL IS INSULATED OR PART OF SERVICE ENTRANCE CABLE AND ORIGINATES AT SERVICE EQUIPMENT. (CEC 250.142(B))
Y. FIREFIGHTER ACCESS REQUIREMENTS FOR ELECTRICAL PANELS (CALIFORNIA FIRE CODE):
130. MARKING AND LABELING OF ELECTRICAL PANELS (CFC SECTION 605.3):
a. ELECTRICAL PANELS, SWITCHBOARDS, AND PANELBOARDS SHALL BE CLEARLY MARKED TO IDENTIFY THE VOLTAGE, CURRENT, WATTAGE, AND POWER CHARACTERISTICS. LABELS MUST BE DURABLE, PERMANENT, AND MADE OF MATERIALS THAT ARE REFLECTIVE AND WEATHER-RESISTANT. (CFC 605.3)
b. PANEL AND CIRCUIT DIRECTORY:
• ELECTRICAL PANELS SHALL INCLUDE A CIRCUIT DIRECTORY, LABEL, OR APPROVED EQUIVALENT IDENTIFYING EACH CIRCUIT'S PURPOSE, LOCATION, AND SPECIFIC LOADS IT SERVES. THIS HELPS ENSURE THAT EMERGENCY RESPONDERS AND BUILDING OCCUPANTS CAN QUICKLY IDENTIFY CIRCUITS IN EMERGENCIES. (CFC 605.3.1)
• IN GROUP R (RESIDENTIAL) OCCUPANCIES, ELECTRICAL PANELS AND DISCONNECTS MUST BE LOCATED IN READILY ACCESSIBLE LOCATIONS AND BE PROPERLY LABELED TO INDICATE THEIR PURPOSE AND THE AREAS SERVED. (CFC 605.10)
131. LOCKABLE ELECTRICAL PANELS AND DISCONNECTS (CFC SECTION 605.6):
a. ELECTRICAL PANELS WITH DISCONNECT SWITCHES SHALL BE CAPABLE OF BEING LOCKED IN THE "OFF" POSITION. THIS ENSURES THAT DURING FIREFIGHTING OPERATIONS OR MAINTENANCE, THE POWER CAN BE SAFELY DE-ENERGIZED. (CFC 605.6)
b. WHEN DISCONNECT SWITCHES OR PANELS ARE LOCKED, THEY MUST BE CLEARLY LABELED WITH THE WORDS "EMERGENCY DISCONNECT" OR SIMILAR LANGUAGE TO INDICATE THEIR FUNCTION TO EMERGENCY RESPONDERS. (CFC 605.6.1)
Z. WATERPROOFING AND FLASHING
132. STUCCO LATH REPAIR SHALL REQUIRE INSPECTION FOR PROPER FLASHING AND STUCCO WIRE. MINIMUM 4" VERTICAL LAP AND 2" HORIZONTAL LAP ON STUCCO LATH PAPER SHALL BE REQUIRED.

GENERAL REQUIREMENTS:

- H. MULTIWIRE BRANCH CIRCUITS (MWBC)
49. UNGROUNDED CONDUCTORS SHALL HAVE VOLTAGE POTENTIAL BETWEEN THEM, I.E., THEY SHALL ORIGINATE FROM THE SAME POLE. (CEC 100)
50. ALL MWBC CONDUCTORS SHALL ORIGINATE FROM THE SAME PANEL. (CEC 210.4(A))
51. EACH NEUTRAL SHALL BE IDENTIFIED OR GROUPED WITH UNGROUNDED CONDUCTORS OF THE CIRCUIT WHEN PASSING THROUGH A BOX WITHOUT A LOOP OR SPLICE. (CEC 200.4(B))
52. EACH NEUTRAL SHALL BE IDENTIFIED OR GROUPED WITH ITS ASSOCIATED UNGROUNDED CONDUCTORS IN A BOX WITHOUT LOOPS OR SPLICES. (CEC 200.4(B)(2))
53. THE CONTINUITY OF A NEUTRAL SHALL NOT DEPEND ON A CONNECTED DEVICE. PIGTAIL FROM NEUTRAL TO DEVICES IN A BOX; NOT FEED THROUGH. (CEC 300.13(B))
• ALL MWBCS SHALL REQUIRE A SINGLE-HANDLE BREAKER. EXCEPTION - INDIVIDUAL SINGLE-POLE BREAKERS WITH AN APPROVED HANDLE THE SHALL BE ACCEPTABLE FOR MULTIWIRE CIRCUITS THAT SERVE ONLY LINE-TO-NEUTRAL LOADS. (CEC 210.4(B) & 240.15(B)(1))
I. GROUNDING & BONDING
54. ALL ELECTRODES THAT ARE AVAILABLE ON THE PREMISES SHALL BE BONDED TOGETHER AND UTILIZED TO FORM THE CONTINUOUS GROUNDING ELECTRODE SYSTEM (GES). (CEC 250.50)
55. MINIMUM SPACING OF 6 FEET SHALL BE REQUIRED (16 FEET PREFERRED) BETWEEN ALL ELECTRODES ON THE PREMISE. (CEC 250.53(A)(3))
56. METAL UNDERGROUND GAS PIPING SYSTEMS, ALUMINUM ELECTRODES, AND POOL OR SPA SHELL BONDING GRIDS SHALL NOT BE PERMITTED AS GROUNDING ELECTRODES. (CEC 250.52(B))
57. LOCAL METAL UNDERGROUND SYSTEMS, SUCH AS TANKS, SHALL NOT BE UTILIZED AS GROUNDING ELECTRODES. (CEC 250.52(A)(8))
58. WATER PIPE ELECTRODES
a. UNDERGROUND METAL WATER PIPES MAY BE USED AS AN ELECTRODE IF THE PIPING HAS AT LEAST 10 FEET IN LENGTH IN CONTACT WITH SOIL. (CEC 250.52(A)(1))
b. BOND SHALL BE PROVIDED AROUND WATER METERS, FILTERS, PRESSURE REGULATORS, AND SIMILAR EQUIPMENT TO ENSURE CONTINUITY OF THE GROUNDING PATH. (CEC 250.53(D)(1))
c. THE WATER PIPE ELECTRODE SHALL NOT BE THE SOLE ELECTRODE; IT SHALL BE SUPPLEMENTED BY ANOTHER TYPE OF GROUNDING ELECTRODE. (CEC 250.53(D)(2))
59. ROD AND PLATE ELECTRODES
a. COPPER-CLAD RODS SHALL BE AT LEAST 1/4 INCH IN DIAMETER UNLESS OTHERWISE LISTED. (CEC 250.52(A)(5))
b. RODS SHALL HAVE A MINIMUM OF 8 FEET IN CONTACT WITH SOIL. (CEC 250.52(A)(5))
c. RODS SHALL BE DRIVEN VERTICALLY AND FULLY BURY GRADE. (CEC 250.53(A)(4))
d. ROD ENDS AND CLAMPS ABOVE GROUND SHALL HAVE PROTECTION AGAINST PHYSICAL DAMAGE. (CEC 250.53(A)(4))
e. FERROUS PLATES SHALL BE A MINIMUM OF 1/4 INCH THICK AND HAVE AT LEAST 2 SQUARE FEET IN CONTACT WITH THE SOIL. (CEC 250.52(A)(7))
f. PLATE ELECTRODES SHALL BE BURIED A MINIMUM OF 30 INCHES BELOW THE SURFACE OF THE EARTH. (CEC 250.53(A)(5))
60. CONCRETE-ENCASED ELECTRODE (UFER)
a. UFER SHALL BE 20 FEET OF UNCOUPLED REBAR OR BARE COPPER WIRE WITH A MINIMUM OF 2 INCHES OF CONCRETE ENCASEMENT IN FOOTINGS OR PIERS IN DIRECT EARTH CONTACT. (CEC 250.52(A)(3))
• MINIMUM SIZE FOR REBAR SHALL BE #4 OR COPPER WIRE #4. (CEC 250.52(A)(3))
61. METAL IN-GROUND SUPPORT STRUCTURES
a. METAL SUPPORT STRUCTURES SHALL HAVE AT LEAST 10 FEET OF VERTICAL CONTACT IN DIRECT CONTACT WITH EARTH, WITH OR WITHOUT CONCRETE ENCASEMENT. (CEC 250.52(A)(4))
62. GROUND RING
a. GROUND RING SHALL ENCIrcLE THE BUILDING OR STRUCTURE AND SHALL BE IN DIRECT CONTACT WITH EARTH. (CEC 250.52(A)(4))
b. GROUND RING SHALL BE MINIMUM OF #2 AWG COPPER WITH A MINIMUM OF 20 FEET IN LENGTH IN DIRECT CONTACT WITH THE EARTH. (CEC 250.52(A)(4))
c. GROUND RING SHALL BE A MINIMUM 30 INCHES BELOW THE SURFACE OF THE EARTH. (CEC 250.53(F))
J. SUPPLEMENTAL ELECTRODES
63. SUPPLEMENTAL ELECTRODES (AKA 2ND GROUND ROD) ARE REQUIRED.
a. EXCEPTION: IF A CERTIFIED 3RD PARTY TEST REPORT IS SUBMITTED VERIFYING RESISTANCE TO GROUND OF THE SINGLE ROD OR PLATE ELECTRODE DOES NOT EXCEEDS 25 OHMS. (CEC 250.53(A)(2))
64. SUPPLEMENTAL ELECTRODE BOND SHALL BE MADE TO ONE OF THE FOLLOWING: (CEC 250.53(A)(3))
a. A ROD, PIPE, OR PLATE ELECTRODE.
b. A GROUNDING ELECTRODE CONDUCTOR.
c. A GROUNDED SERVICE CONDUCTOR.
d. A GROUNDED SERVICE ENCLOSURE.
K. GROUNDING ELECTRODE CONDUCTORS (GECs)
65. GEC SHALL BE SIZED PER SERVICE CONDUCTOR SIZE. (CEC 250.66)
a. WHERE GEC OR BONDING JUMPER IS CONNECTING ONLY TO SINGLE OR MULTIPLE ROD, OR PLATE ELECTRODES, OR ANY COMBINATION OF THOSE OPTIONS, AND DO NOT EXTEND ON TO OTHER TYPES OF ELECTRODES, #6 COPPER OR #4 ALUMINUM SHALL BE THE LARGEST SIZE REQUIRED. (CEC 250.66(A))
b. WHERE THE GEC ENDS AT A UFER (CONCRETE-ENCASED ELECTRODE), #4 COPPER SHALL BE THE LARGEST SIZE REQUIRED (CEC 250.66(B))
c. WHERE THE GEC ENDS IN A GROUND RING, #2 COPPER SHALL BE THE LARGEST SIZE REQUIRED (CEC 250.66(C))
66. GEC SHALL BE SIZED PER LARGEST REQUIRED SIZE AMONG ALL ELECTRODES WITHIN THE GES. (CEC 250.66)
67. BONDING CONDUCTORS SHALL BE THE SIZE OF GES AS PER SIZE OF EQUIPMENT GROUNDING CONNECTORS TABLE (CEC TABLE 250.122) WITHIN THIS DOCUMENT. (CEC 250.53(C))
L. GEC CONNECTION LOCATIONS - GENERAL
68. THE GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL CONNECT EQUIPMENT GROUNDING CONDUCTORS (EGCS), SERVICE EQUIPMENT, AND NEUTRAL TO THE GROUNDING ELECTRODES. (CEC 250.24(D))
69. THE GEC SHALL CONNECT TO THE SERVICE NEUTRAL AT ANY ACCESSIBLE POINT FROM THE LOAD END OF THE SERVICE DROP TO THE NEUTRAL BUS IN THE SERVICE DISCONNECT. (CEC 250.24(A)(1))
70. SPLICES SHALL NOT BE ALLOWED BETWEEN THE SERVICE AND THE GEC, WITH EXCEPTIONS FOR LISTED IRREVERSIBLE COMPRESSION CONNECTORS OR EXOTHERMIC WELDING. (CEC 250.64(C))
71. ALL GEC CONNECTIONS SHALL BE ACCESSIBLE, EXCEPT WHERE CONNECTIONS ARE BURIED OR ENCASED IN CONCRETE. (CEC 250.68(A) AND 250.68(A) EXCEPTION 1)
M. GEC CONNECTIONS TO ELECTRODES
72. GEC MAY CONNECT TO ANY GROUNDING ELECTRODE SYSTEM (GES) ELECTRODE WHERE OTHER ELECTRODES ARE INTERCONNECTED BY BONDING JUMPERS TO FORM THE GES. (CEC 250.64(F)(1))
73. INDIVIDUAL GECS MAY CONNECT TO ELECTRODES WITHIN THE GES. (CEC 250.64(F)(2))
74. GECS MAY CONNECT TO A COMMON BUS THAT IS SECURELY FASTENED, ACCESSIBLE, AND AT LEAST 1/4 INCH THICK AND 2 INCHES WIDE. (CEC 250.64(F)(3))
75. METAL STRUCTURAL FRAMING SHALL BE ACCEPTABLE TO INTERCONNECT GECS. HOLD-DOWN ANCHOR BOLTS OF METAL STRUCTURAL COLUMNS CAN BE USED AS CONNECTION POINTS. (CEC 250.68(C)(2))
76. UFER BAR EXTENDED THROUGH THE FOUNDATION SHALL BE ALLOWED AS A CONNECTION POINT FOR THE GEC IF ACCESSIBLE AND NOT SUBJECT TO CORROSION. (CEC 250.68(C)(3))
77. UFER SHALL NOT BE CONSIDERED AN ACCEPTABLE MEANS FOR INTERCONNECTION OF GECS. (CEC 250.68(C)(3) NOTE 19)
N. CONNECTION METHODS
78. BURIED CLAMPS SHALL BE LISTED AND LABELED FOR DIRECT BURIAL (MARKED "DB"). (CEC 250.70)
79. COPPER WATER TUBING CLAMPS SHALL BE LISTED AND LABELED FOR TUBING. (CEC 250.70)
80. UFER CLAMPS SHALL BE LISTED AND LABELED FOR REBAR AND ENCASEMENT. (CEC 250.70)
81. MAXIMUM OF ONE CONDUCTOR PER CLAMP SHALL BE ALLOWED UNLESS THE CLAMP IS LISTED FOR MORE CONNECTIONS. (CEC 250.70)
82. CONNECTIONS DEPENDENT ON SOLDER ALONE SHALL NOT BE USED. (CEC 250.8(B))
83. NONCONDUCTIVE COATINGS (E.G., PAINT, ENAMEL, LACQUER) SHALL BE REMOVED FROM CONTACT SURFACES TO ENSURE ELECTRICAL CONTINUITY. (CEC 250.12, 250.96)
O. PROTECTION REQUIREMENTS
84. RACEWAY OR ARMOR SHALL BE PROVIDED FOR #8 GEC (CEC 250.64(B)(3))
85. PROTECTIONS OF GEC SHALL BE PROVIDED UNLESS #8 GECS ARE NOT EXPOSED TO DAMAGE (CEC 250.64(B)(1))
86. GECS SUBJECT TO PHYSICAL DAMAGE REQUIRE PROTECTION WITH RMC, IMC, PVC 80, RTRC, EMT, OR CABLE ARMOR. (CEC 250.64(B)(2))
87. EACH END OF FERROUS RACEWAYS ENCLOSING GECS SHALL HAVE BOND TO THE ENCLOSURE, ELECTRODE, OR TO THE GEC. (CEC 250.64(E)(1))
88. BONDING METHODS SHALL BE THE SAME AS FOR SUPPLY-SIDE BONDING. (CEC 250.64(E)(2))
89. BONDING JUMPER SHALL BE THE SAME SIZE AS THE ENCLOSED GEC. (CEC 250.64(E)(3))
90. CLAMPS AND OTHER FITTINGS SHALL BE PROTECTED FROM PHYSICAL DAMAGE BY LOCATION OR ENCLOSURES IF NOT APPROVED FOR APPLICATIONS WITHOUT PROTECTION. (CEC 250.92(B))
P. BONDING AND EQUIPMENT GROUNDING METHODS
91. PERMITTED CONNECTION METHODS GECS, EGCS AND BONDING JUMPERS SHALL INCLUDE LISTED PRESSURE CONNECTORS, TERMINAL BARS, EXOTHERMIC WELDING, MACHINE SCREWS ENGAGING AT LEAST 2 THREADS OR SECURED WITH A NUT, THREAD-FORMING MACHINE SCREWS WITH AT LEAST 2 THREADS IN THE ENCLOSURE, AND CONNECTIONS THAT ARE PART OF A LISTED ASSEMBLY. (CEC 250.8(A))
92. SHEET METAL OR DRYWALL SCREWS SHALL NOT BE PERMITTED FOR BONDING CONNECTIONS. (CEC 250.8(A))
93. CONNECTIONS SHALL NOT DEPEND SOLELY ON SOLDER FOR CONTINUITY. (CEC 250.8(B))
94. NONCONDUCTIVE COATINGS (E.G., PAINT) SHALL BE REMOVED FROM CONTACT SURFACES TO ENSURE ELECTRICAL CONTINUITY. (CEC 250.12)
Q. SUPPLY-SIDE BONDING
95. ALL SERVICE EQUIPMENT, RACEWAYS, CABLE ARMOR, AND ENCLOSURES THAT CONTAIN SERVICE CONDUCTORS SHALL BE BONDED. (CEC 250.92(A))
96. THREADED COUPLINGS OR LISTED THREADED HUBS MADE WRENCH-TIGHT SHALL BE ACCEPTABLE FOR BONDING SERVICE CONDUITS. (CEC 250.92(B)(2))
97. STANDARD LOCKNUTS SHALL NOT BE ACCEPTABLE FOR USE ON THE SUPPLY-SIDE OF SERVICE. (CEC 250.92(B)(2))
98. BONDING LOCKNUTS SHALL BE ACCEPTABLE WHERE NO REMAINING CONCENTRIC KNOCKOUTS ARE PRESENT. (CEC 250.92(B)(4))
99. JUMPERS AROUND IMPAIRED CONNECTIONS (CONCENTRIC KNOCKOUTS OR REDUCING WASHERS) SHALL BE REQUIRED ON THE SUPPLY-SIDE OF SERVICE. (CEC 250.92(B)(2))
100. THE SERVICE NEUTRAL MAY BOND SUPPLY-SIDE EQUIPMENT. (CEC 250.142(A))
101. SUPPLY-SIDE BONDING JUMPERS SHALL BE SIZED PER THE BONDING JUMPER SIZING CHART WITHIN THIS DOCUMENT (CEC 250.102(C))

RESIDENTIAL PANEL UPGRADE STANDARD

FOR OFFICE USE ONLY:
PERMIT #:
ISSUED:

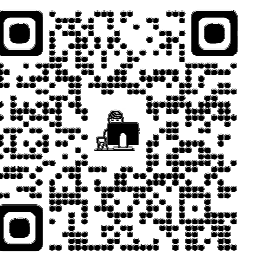
PROJECT NAME:
PROJECT ADDRESS:
COSTA MESA, CA

OWNER INFO NAME:
PHONE:
EMAIL:
CONTRACTOR INFO NAME:
PHONE:
EMAIL:
LICENSE: EXPIRATION:
PLAN PREPARER INFO NAME:
PHONE:
EMAIL:
EMERGENCY CONTACT INFO NAME:
PHONE:
ROLE/RELATION TO PROPERTY:
TENANT INFO (IF APPLICABLE) NAME:
PHONE:
EMAIL:

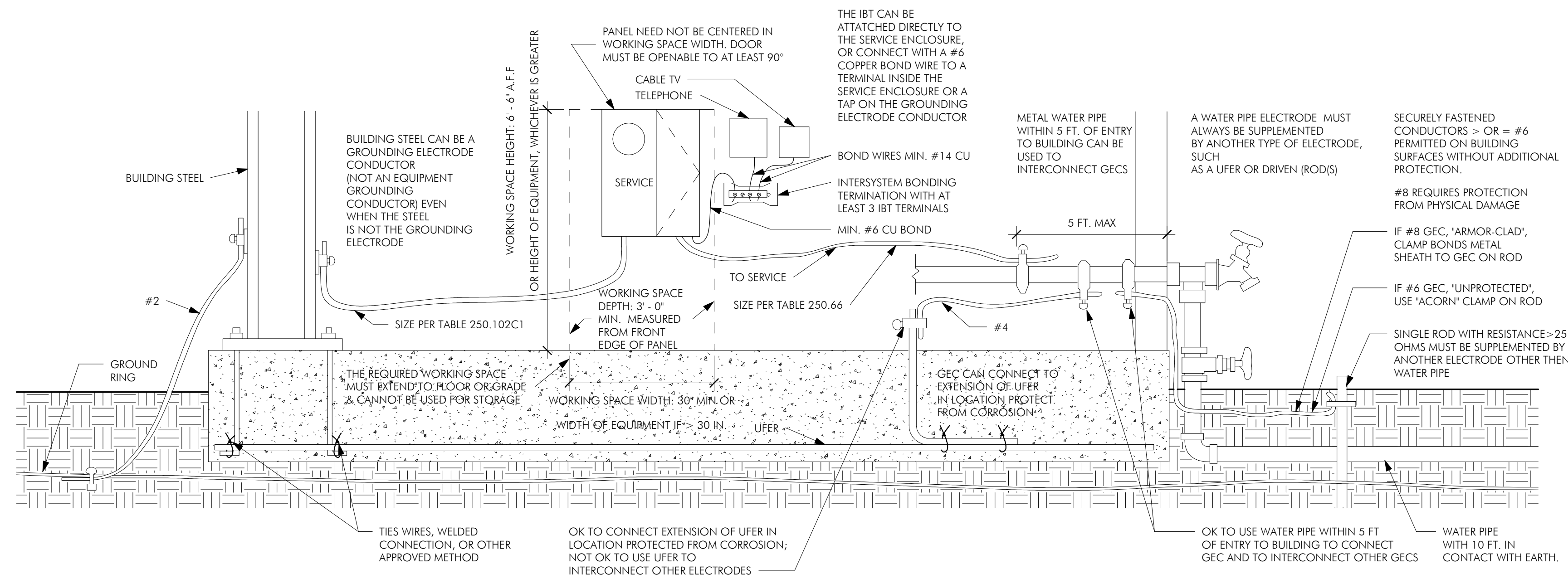


FORM NUMBER: CBEP-2

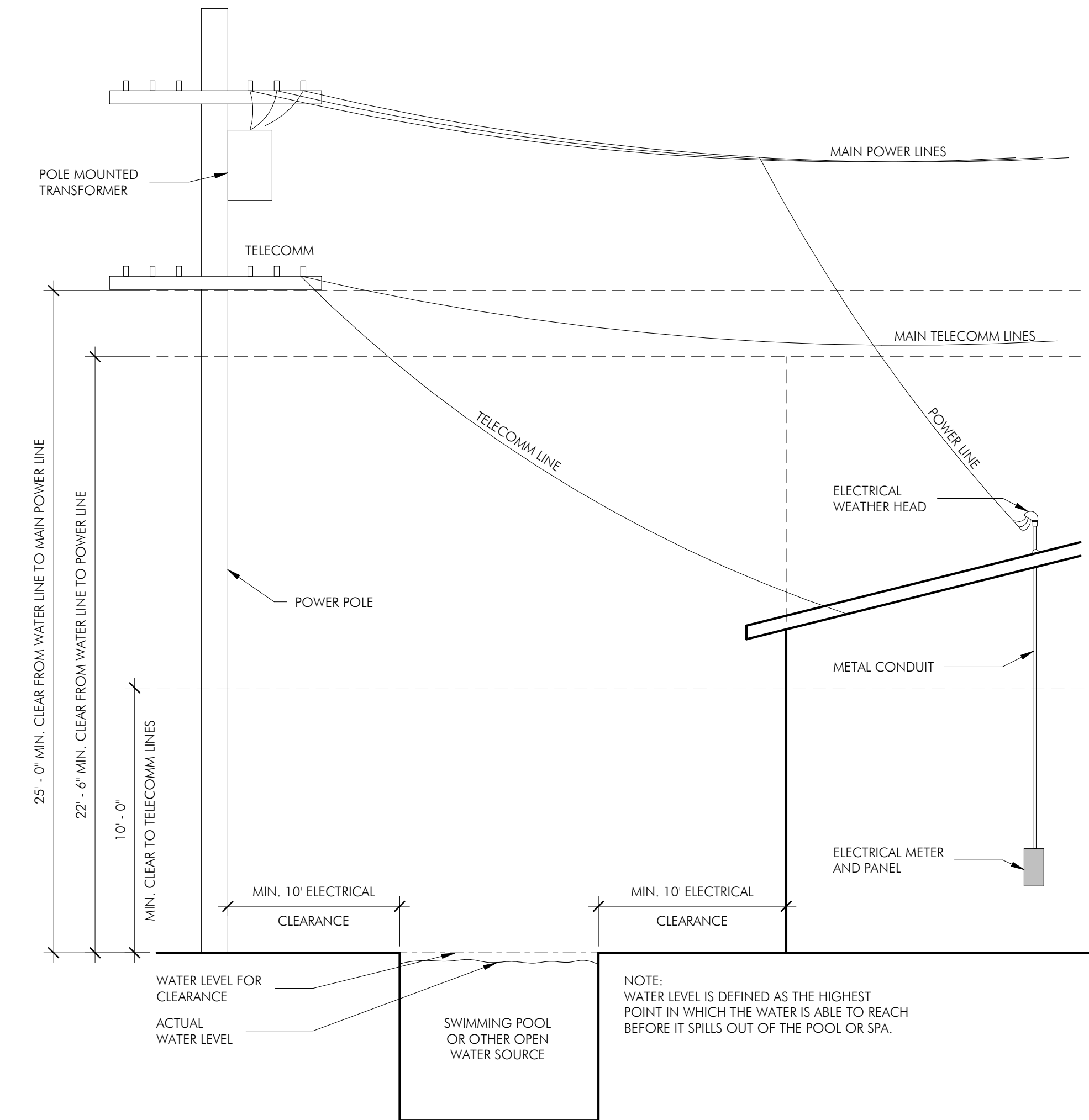
(RELEASE: 09-2024)



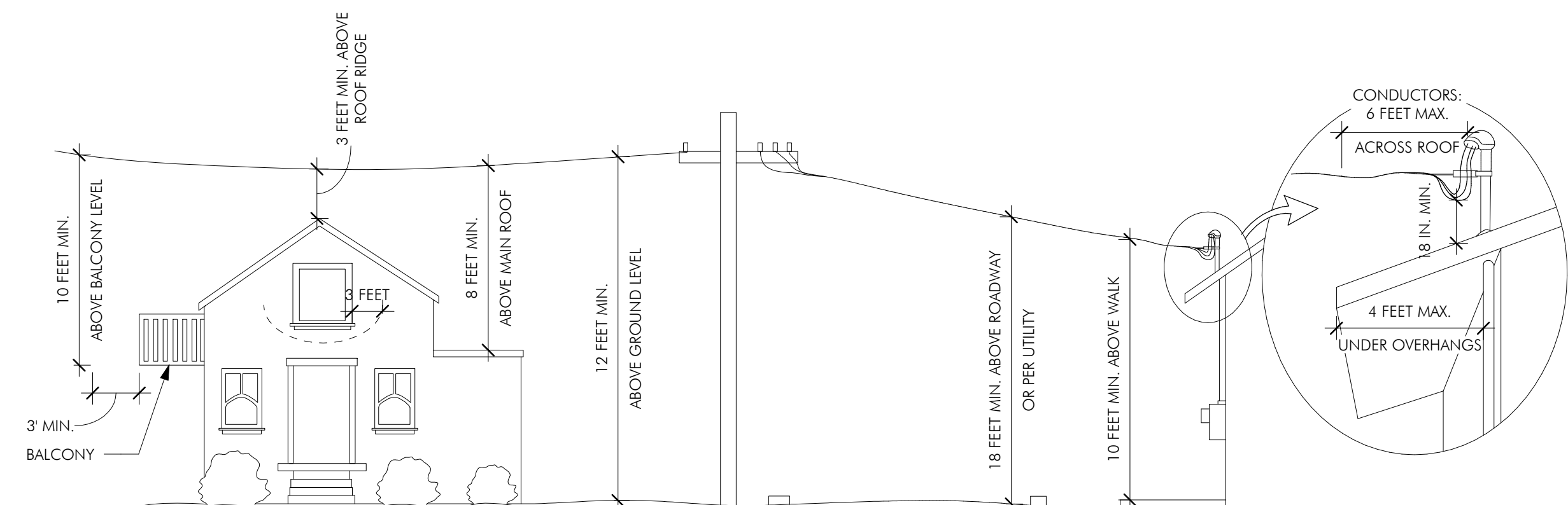
# GROUNDING ELECTRODES & GROUNDING ELECTRODE CONDUCTORS:



# OPEN WATER ELECTRICAL CLEARANCES:



# OVERHEAD LINE CLEARANCE DETAIL:



**RESIDENTIAL PANEL UPGRADE STANDARD**

FOR OFFICE USE ONLY:  
 PERMIT #:  
 ISSUED:

**PROJECT NAME: COSTA MESA, CA  
 PROJECT ADDRESS:**

OWNER INFO  
 NAME:

PHONE:

EMAIL:

CONTRACTOR INFO  
 NAME:

PHONE:

EMAIL:

LICENSE: EXPIRATION:

PLAN PREPARER INFO  
 NAME:

PHONE:

EMAIL:

EMERGENCY CONTACT INFO  
 NAME:

PHONE:

ROLE/RELATION TO PROPERTY:

TENANT INFO (IF APPLICABLE)  
 NAME:

PHONE:

EMAIL:



**FORM NUMBER:  
 CBEP-3**

(RELEASE: 09-2024)

