



## **EZ PERMIT STANDARDS**

### **Residential Service Equipment**

For installations made on One- or Two-Family Dwellings. This document shall be submitted with the Electrical Permit application.  
IRC, IBC, IEBC – 2021 / NEC – 2020

## **EZ Permit Standards: Residential Service Equipment**

If the proposed Residential Service Equipment installation, alteration, or repair fully meets the standards below, the project requires an EZ Electrical Permit only and does not require the submission of plans. All other projects may require a Building Permit and an Electrical Permit with the submission of plans.

The Licensed Electrical Contractor must meet the following conditions regarding the Residential Service Equipment for the Department to allow the full installation to proceed under the EZ electrical permit.

### **Conditions**

- One- or two-family dwellings three stories or less must comply with the 2021 International Residential Code (IRC), Part VIII Electrical. A basement shall be considered as a story above grade where the finished surface of the floor above the basement is more than six feet above the grade plane. More than six feet above the grade plane for more than 50% of the total building perimeter equates to a story. Where the basement is more than 12 feet above the finished ground level at any point equates to a story.
- One- or two-family dwellings four stories or more, and duplexes, must comply with the 2021 International Building Code (IBC), 2021 International Existing Building Code (IEBC), and the 2020 NEC.
- Equipment cannot be rated over 200A.
- The Electrical Contractor must coordinate the installation of any exterior equipment with other exterior utilities and in no way impede access to the property or the public ROW.
- Electrical systems and other service equipment shall be located at or above the elevation required in Section R322.2 or R322.3 (IRC – 322.1.6), with the following exception:
  - Locating electrical systems and service equipment is permitted below the elevation required in Section R322.2 or R322.3 provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the required elevation in accordance with ASCE 24. Electrical wiring systems are permitted to be located below the required elevation provided that they conform to the provisions of the electrical part of this code for wet locations.
- Any alteration to the exterior of a building located on the Philadelphia Register of Historic Places requires the approval of the Philadelphia Historical Commission.
- It should be noted that the information provided in this EZ Standard is not meant to be all-inclusive of every electrical service requirement. The intent of this document is to provide a guide for the repair and/or installation of residential service equipment that is meant to supplement, not replace any applicable code requirements.

### **Repairs**

- The work shall not make the building less conforming than it was before the repair was undertaken (2021 IEBC – 401.2).
- Existing electrical wiring and equipment undergoing repair shall be allowed to be repaired or replaced with like material (2021 IEBC – 406.1).
- Plug fuses of the Edison-base type shall be used for replacement only where there is no evidence of over fusing or tampering (NEC – 240.51(B)). Repair work will not necessarily require the replacement or upgrade of all existing plug fuses if they are in good working condition.
- All services shall be provided with a surge protective device (IRC – E3606.5 / NEC – 230.67).

### **Alterations and New Installations**

#### **General**

- A single-family dwelling shall be supplied by one service only (IRC – E3601.2 / NEC – 230.2).



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- Service conductors supplying a building or structure shall not pass through the interior of another building or structure (IRC – E3601.3 / NEC – 230.3).
- Conductors other than service conductors shall not be installed in the same service raceway or service cable in which the service conductors are installed, with the following exceptions (IRC – E3601.4 / NEC – 230.7):
  - Grounding electrode conductors or supply side bonding jumpers or conductors shall be permitted within service raceways.
  - Load management control conductors having over current protection shall be permitted within service raceways.
- Where a service raceway enters from an underground distribution system, it shall be sealed in accordance with Section E3803.6 (IRC – E3601.5 / NEC – 230.8).
- Access and working space shall be provided and maintained around all electrical equipment to permit ready and safe operation and maintenance of such equipment in accordance with Section E3405 and Figure E3405.1 (IRC – E3405.1 / NEC – 110.26).

### **Service Size and Rating**

- Ungrounded service conductors shall have an ampacity of not less than the load served. For one-family dwellings, the ampacity of the ungrounded conductors shall not be less than 100A, three-wire. For all other installations, the ampacity of the ungrounded conductors shall not be less than 60A (IRC – E3602.1 / NEC – 230.42(A), 230.79(C), 230.79(D)).
- The minimum load for ungrounded service conductors and service devices that service 100% of the dwelling unit load shall be computed in accordance with Table E3602.2. Ungrounded service conductors and service devices that serve less than 100% of the dwelling unit load shall be computed as required for feeders in accordance with Chapter 37 (IRC – E3602.2 / NEC – 220.82(A)).
- The combined rating of all individual service disconnects serving a single dwelling unit shall not be less than as specified in Section E3602.1 (IRC – 3602.3 / NEC – 230.79, 230.80).
- Systems governed by the IRC shall be three-wire, 120/240-volt, single-phase with a grounded neutral (IRC – E3602.4 / NEC – 220.82(A)). The NEC also permits 120/208-volt systems.

### **Service, Feeder and Grounding Electrode Conductor Sizing**

- Service and feeder conductors supplied by a single-phase, 120/240-volt system shall be sized in accordance with Sections E3603.1.1 through E3603.1.5 and Table E3705.1 (IRC – E3603.1).
- Ungrounded conductors for other than dwelling units shall have an ampacity of not less than 60A and shall be sized as required for feeders in Chapter 37 (IRC – E3603.2 / NEC – 230.79(D)).
- Each ungrounded service conductor shall have overload protection (IRC – E3603.3 / NEC – 230.90).
- All ungrounded branch-circuit and feeder conductors shall be protected against overcurrent by an overcurrent device installed at the point where the conductors receive their supply (IRC – E3705.5 / NEC – 240.4, 240.21).
- The grounding electrode conductors shall be sized based on the size of the service entrance conductors as required in Table E3603.4 (IRC – E3603.4 / NEC – 250.66).
- Except where the equipment is marked otherwise, conductor ampacities used in determining equipment termination provisions shall be based on Table E3705.1 (IRC – E3603.5 / NEC – 110.14(C)(1)).

### **Service Disconnect**

- Means shall be provided to disconnect all conductors in a building or structure from the service entrance conductor (IRC – E3601.6 / NEC – 230.70).
- Service disconnects shall be permanently marked as a service disconnect (IRC – E3601.6.1 / NEC – 230.70(B)).



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- The service disconnecting means shall be installed in a readily accessible location either outside of a building or inside nearest the point of the service conductors (IRC – E3601.6.2 / NEC – 230.70(A)(1)(2), 230.72(C)).
- A service with two to six separate enclosures with a single main service disconnecting means in each enclosure shall be permitted (IRC – E3601.7.1).
- A service with two to six separate panelboards with a single main service disconnecting means in each panelboard shall be permitted (IRC – E3601.7.2).

## **Emergency Disconnect**

### **Applicability**

- For all new services and upgraded services (such as 100-amp to 200-amp) an emergency disconnect is required in a readily accessible outdoor location, with the following exceptions:
  - Attached single family townhomes (by definition a townhome must be three or more attached) three stories or less. See explanatory text on Page 1 to determine the application of the IRC with respect to three-stories above the grade plane.
  - Repair or replacement in kind of an existing service supplied panelboard does not require an emergency disconnect.

### **Installation**

- Where an emergency disconnect is required, all service conductors shall terminate in disconnecting means having a short-circuit current rating equal to or greater than the available fault current, installed in a readily accessible outdoor location. If more than one disconnect is provided, they shall be grouped (IRC – E3601.8 / NEC – 230.85).
- Where list item #1 in NEC230.85 or E3601.8 list item #1 are applied, the emergency disconnect is also the service disconnect and shall be marked as follows: EMERGENCY DISCONNECT, SERVICE DISCONNECT.
- Where list item #2 in NEC 230.85 or E3601.8 list item #2 are applied, the emergency disconnect is not the service disconnect and shall be marked as follows: EMERGENCY DISCONNECT, METER DISCONNECT, NOT SERVICE EQUIPMENT. Meter disconnect switches that have a short-circuit current rating equal to or greater than the available fault current and all metal housings and service enclosures shall be grounded in accordance with Section E3908.7 and bonded in accordance with Section E3609. A meter disconnect switch shall be capable of interrupting the load served.
- Where list item #3 in NEC230.85 or E3601.8 list item #3 are applied, the emergency disconnect is not the service disconnect and other listed disconnect switches or circuit breakers that are suitable for the use as service equipment are permitted on the supply side of each service disconnect. and shall be marked as follows: EMERGENCY DISCONNECT, NOT SERVICE EQUIPMENT.
- Markings shall comply with applicable code (IRC – E3404.12 / NEC – 230.82(3), 230.85).

## **Service-Entrance Conductor**

### **Installation**

- Overhead service conductors shall be installed in accordance with applicable code (IRC – E3604 / NEC – 230.26, 230.27, 230.28).
- Other service-entrance conductors shall be installed in accordance with applicable code (IRC – E3605 / NEC – 230.32, 230.33, 230.46, 230.50, 230.51, 230.53, 230.54).

## **System Grounding**

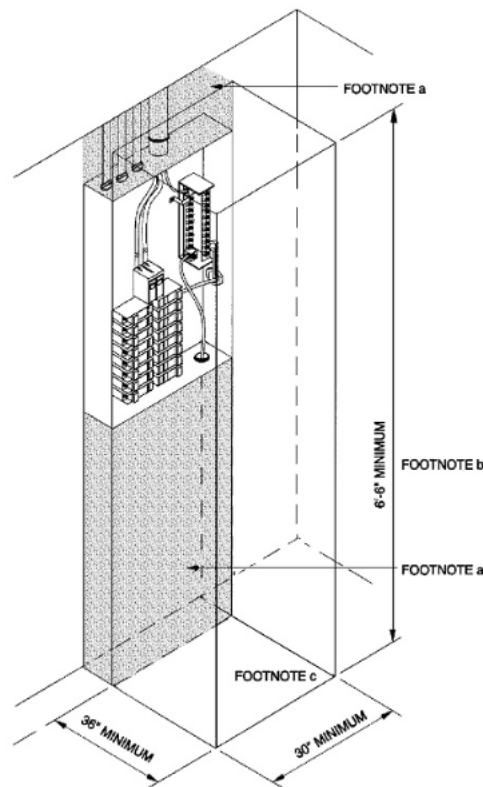
- Concrete-encased electrodes of existing buildings or structures shall not be required to be part of the grounding system where the steel reinforcing bars or rods are not accessible for use without disturbing the concrete (IRC – E3608.1 Exception / NEC – 250.50 Exception).



- The bonding jumper(s) used to connect the grounding electrodes together to form the grounding electrode system shall be installed in accordance with Sections E3610.2 and E3610.3, shall be sized in accordance with Section E3603.4, and shall be connected in the manner specified in Section E3611.1. Rebar shall not be used as a conductor to interconnect the electrodes of grounding electrode systems (IRC – E3608.2 / NEC – 250.53(C)).
- If a supplemental electrode is required it shall be installed in accordance with applicable code (IRC – E3608.4).
- Aluminum electrode shall not be permitted (IRC – E3608.5 / NEC 250.52(B)(2)).
- Metal underground gas piping shall not be used as a grounding electrode (IRC – E3608.6 / NEC – 250.52(B)(1)).
- The structures and structural reinforcing steel described in Section E4204.2, Items 1 and 2, shall not be used as a grounding electrode (IRC – E3608.7 / NEC – 250.52(B)(3)).

**Referenced Figures and Tables**

**FIGURE E3405.1<sup>a, b, c, d, e</sup> WORKING SPACE AND CLEARANCES**



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- Equipment, piping and ducts foreign to the electrical installation shall not be placed in the shaded areas extending from the floor to a height of 6 feet above the panelboard enclosure or to the structural ceiling, whichever is lower.
- The working space shall be clear and unobstructed from the floor to a height of 6.5 feet or the height of the equipment, whichever is greater.
- The working space shall not be designated for storage.
- Panelboards, service equipment and similar enclosures shall not be located in bathrooms, toilet rooms, clothes closets or over the steps of a stairway.
- Such work spaces shall be provided with artificial lighting where located indoors and shall not be controlled by automatic means only.



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**TABLE E3603.4 GROUNDING ELECTRODE CONDUCTOR SIZE<sup>a, b, c, d, e, f</sup>**

SIZE OF LARGEST UNGROUNDED SERVICE-ENTRANCE CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS (AWG/kcmil)		SIZE OF GROUNDING ELECTRODE CONDUCTOR (AWG/kcmil)	
Copper	Aluminum or copper-clad aluminum	Copper	Aluminum or copper-clad aluminum
2 or smaller	1/0 or smaller	8	6
1 or 1/0	2/0 or 3/0	6	4
2/0 or 3/0	4/0 or 250	4	2
Over 3/0 through 350	Over 250 through 500	2	1/0
Over 350 through 600	Over 500 through 900	1/0	3/0

**TABLE E3705.1 ALLOWABLE AMPACITIES**

CONDUCTOR SIZE	CONDUCTOR TEMPERATURE RATING						CONDUCTOR SIZE
	60°C	75°C	90°C	60°C	75°C	90°C	
AWG kcmil	Types TW, UF	Types RHW, THHW, THW, THWN, USE, XHHW	Types RHW-2, THHN, THHW, THW-2, THWN-2, XHHW, XHHW-2, USE-2	Types TW, UF	Types RHW, THHW, THW, THWN, USE, XHHW	Types RHW-2, THHN, THHW, THW-2, THWN-2, XHHW, XHHW-2, USE-2	AWG kcmil
	Copper			Aluminum or copper-clad aluminum			
14 <sup>a</sup>	15	20	25	—	—	—	—
12 <sup>a</sup>	20	25	30	15	20	25	12 <sup>a</sup>
10 <sup>a</sup>	30	35	40	25	30	35	10 <sup>a</sup>
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
500	320	380	430	260	310	350	500
600	350	420	475	285	340	385	600
700	385	460	520	315	375	425	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	445	800
900	435	520	585	355	425	480	900

AP \_\_\_\_\_ Licensed Electrician's Name \_\_\_\_\_  
 Licensed Electrician's Signature \_\_\_\_\_