

A VERY SHORT GUIDE TO NFPA 70E

MEMORANDUM OF UNDERSTANDING NO. 5 FOR JOINT SUBMISSION TO THE CITY COUNCIL REGARDING THE INSPECTORS UNIT June 23, 2019 through June 30, 2022

ARTICLE 4.1 SAFETY Section IV

“In addition to the CAL/OSHA training, a minimum of twenty (20) hours of safety training shall be provided per calendar year including NFPA 70E training for Electrical Inspectors and Sr. Electrical Inspectors.” The course content (i.e. syllabus) shall be related to job duties.

To comply with MCIA MOU5 and Cal OSHA §3203. Injury and Illness Prevention Program (a) (7) Provide training and instruction the following tasks are commonly performed by MCIA MOU5 electrical and senior electrical inspectors.

- 1) Review contract documents for all electrical components to be installed in the contract
- 2) Review all related submittals from the Electrical Contractor (EC)
- 3) Review EC work plan and associated work authorization forms
- 4) MCIA MOU5 electrical inspectors shall attend all EC pre-work safety meetings to understand all hazards associated with the contractor’s work schedule.
- 5) Provide shop inspection of all fabricated components
- 6) Review EC Lock Out – Tag Out plan
- 7) Verify the EC has established the restricted area for Hazardous Category work
- 8) Verify that the EC has a PPE safety plan for hot work
- 9) Confirm that the EC has properly de-energized power when required to do so
- 10) Inspect only properly de-energized and grounded component
- 11) Report all non-compliances to the owner or General Contractor promptly

TASKS THAT MOU5 MCIA ELECTRICAL/(SR) INSPECTORS WILL NOT PERFORM

- 1) MCIA MOU5 electrical inspectors shall never authorize Energized Electrical Systems Work Permits
- 2) MCIA MOU5 electrical inspectors are prohibited from entering any area where an energized electrical conductor or circuit hazards may create workplace injuries and fatalities due to a shock, electrocution, arc flash, and arc blast.
- 3) MCIA MOU5 electrical inspectors shall not enter any Work Permit area without acknowledgement from the electrical contractor or owner.



[PP 08/16/2020 - 08/29/2020] BCA IIPP Tailgate Topic Review

Scope

NFPA 70E-2018 is entitled Standard for Electrical Safety in the Workplace. It is related to the National Electrical Code (NFPA standard 70) as follows:

- The National Electrical Code (NEC) describes how to design and install electrical systems but not how to actually perform the work.
- NFPA 70E describes safe work practices for electrical construction and maintenance but not how to design or install electrical systems.
- The two documents (NEC and NFPA 70E) have identical scopes and many of the same definition. They both cover “inside” wiring in buildings and similar structures. Neither of them covers utility (line) construction.

Construction sites are workplaces. The NEC covers safety of electrical installations, and NFPA 70E covers electrical safety in workplaces. While it technically applies to all workplaces (libraries, schools, hospitals, supermarkets, law offices, etc.), NFPA 70E is enforced most often on construction sites and at industrial plants. Anywhere that electrical construction and maintenance work happen is a workplace.

Enforcement

- The NEC [NFPA 70] is adopted for regulatory use by states, cities and counties. It is enforced by electrical inspectors.
- NFPA 70E is not adopted for regulatory use. Instead, customers, who require electrical contractors to follow NFPA 70E safety practices while working on their property, enforce it.

NFPA 70E Covers Electrical Hazards Only

NFPA 70E describes how to protect electrical workers from three kinds of electrical hazards:

- Electric shock and electrocution
- Arc-flash (electrical fireball)
- Arc-blast (electrical explosion at high energy levels)

The NFPA 70E standard doesn't cover other construction hazards such as fall protection, safe use of ladders and scaffolds, hazardous substances, and respirators. These other subjects are covered by OSHA construction safety regulations.

Four-Step Safety Strategy

NFPA 70E outlines a four-step approach to electrical safety:

- 1) PLAN THE WORK. Have a written plan for performing the live work safely.
- 2) LIVE WORK PERMIT. Have the customer sign an Energized Electrical Work Permit.
 - a. **Attached: Energized Electrical Work Authorization Form**
- 3) TURN OFF THE POWER. Work de-energized, whenever possible. This isn't always feasible. When it is working on or near exposed live conductors and parts, NFPA 70E requires the following:
- 4) USE PERSONAL PROTECTIVE EQUIPMENT (PPE). This includes flame-resistant (FR) clothing, insulated tools, face shields, and flash suits.

1. Plan the Work

Only qualified personnel shall be allowed to perform maintenance work and they shall be required to complete a Job Safety Analysis (JSA) before commencing work. As per the article 110.1 of new NFPA 70E 2018 edition, it is clearly mentioned that;

"A qualified person will also need to complete a Job Safety Analysis (JSA) before work or troubleshooting is performed. That JSA would require such "qualified person" to:

- Identify all tasks associated with the performance of the job
- Identify all specific hazards with each task
- Determine the severity and likelihood of unintentional injury for each task
- Identify what control measures can be used to reduce injuries

Electrical contractor shall establish Arc Flash and Shock Boundaries –Approach Limits. There are three of these:

- Arc Flash boundary
- Limited approach boundary
- Restricted approach boundary

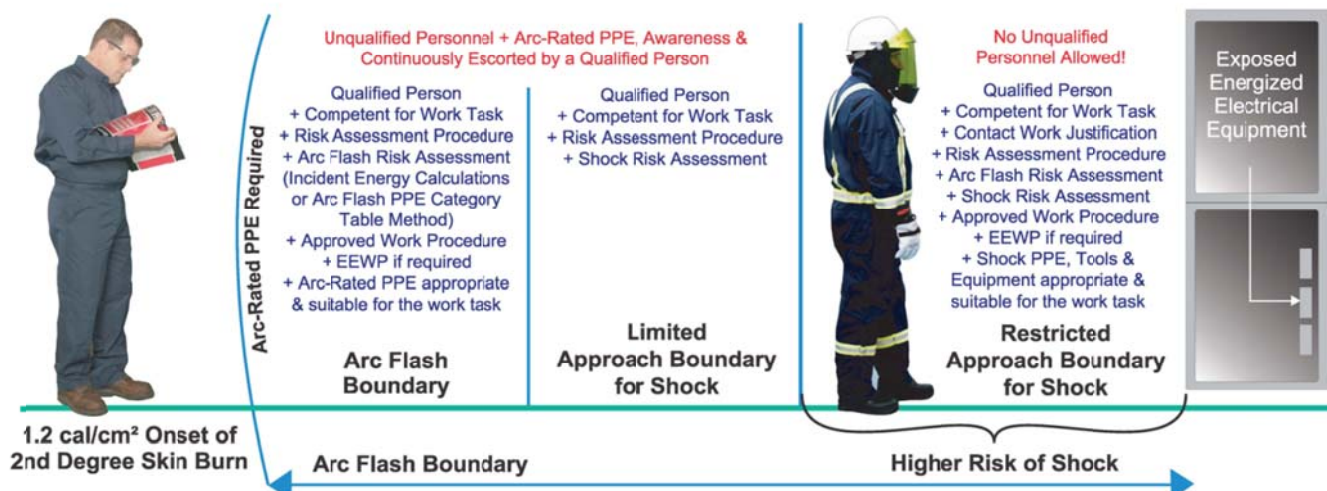
Only qualified persons can enter the restricted approach boundary. Entering the prohibited approach boundary is considered the same as touching live parts. These boundaries are for shock protection only; they determine when electrical workers must use voltage-rated (rubber) gloves and voltage-rated (fiberglass) tools.

Determine Arc Flash Boundary (AFB). The default flash protection boundary for systems operating at 600 volts is 48 inches. A qualified person who works closer than 48 inches to live parts must wear personal protective clothing (PPE) including flame-resistant (FR) clothing. This PPE is for arc-flash and arch-blast protection, not protection against electric shock. NFPA 70E 2018 establishes 2 new methods that can be used to select PPE or by using NFPA 70E 2018 Table 130.59(C)

Determine Hazard/Risk Category (HRC). NFPA 70E has several tables that help electrical workers select the correct type of PPE to wear, based upon the task they are performing live. There are five different HRCs: 0, 1, 2, 3 and 4. **The contractor shall prohibit all unauthorized personnel to enter the area with signage or barriers.**

Boundaries for Arc Flash and Shock - Approach Limits

Based on CSA Z462-2015 and NFPA 70E-2015 Standard Editions



BCA INSPECTORS ARE PROHIBITED FROM ENTERING THE ARC FLASH BOUNDARY WHEN THE COMPONENTS ARE ENERGIZED

2. Safety Practices When Working Live/Live Work Permit

When working “live” around exposed energized parts, NFPA 70E requires the following:

Live Work Permit. Have the customer sign an Energized Electrical Work Permit. This describes the work to be performed and why it must be performed live. Live work must be authorized by the customer, engineers, or other person in charge. Minimum requirements

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|--------------------------------------|-------------------------------|
| 1) Location – Date – Expiration | 5) Risk assessment |
| 2) Work to be Performed | 6) Job Hazard Analysis |
| 3) Personnel | 7) PPE requirements |
| 4) Justification not to de-energized | 8) Safety – Stand-by Observer |

3. Turn Off the Power

NFPA 70E describes three methods of turning off electrical power and verifying that it stays off while work is being performed. Some people call this Lockout/Tagout, but that’s actually only part of the process. Lock, Block, Tag & Test all circuits of 50 volts or more. The following are the two methods¹:

1. Simple lockout/tagout LOTO
2. Complex lockout/tagout LOTO or LOBO

4. Use Personal Protective Equipment

Use Appropriate PPE. Workers must wear PPE specified by the tables in NFPA 70E whenever they are within the Flash Protection Boundary whether or not they are actually touching the live equipment. BCA Inspectors shall consult with the EC-QP for what PPE is required for the work that requires inspection.

ABSOLUTELY NO POLYESTER CLOTHING ALLOWED

REQUIRED
Hard Hat
Leather boots
Leather gloves
Hearing Protection
Safety Glasses



¹ Section 120.2(C)(2) (Form of Control) (Revision)
 The 2012 edition removes individual employee control as one of three forms of control of hazardous electrical energy