Revision History

Revision 1 – 8/20/2018

Purpose and Scope

Santa Barbara County Education Office is committed to providing a safe and healthy work environment and to protecting employees from injury or death caused by uncontrolled electrical hazards in the workplace. The purpose of Santa Barbara County Education Office Electrical Safety Program is to establish work policies, practices and procedures to train employees in basic electrical hazard recognition and safe work practices. This program applies to qualified and non-qualified employees who are exposed to electricity as part of their job.

Program Responsibilities

Management. Along with providing financial and leadership support, the management of Santa Barbara County Education Office will assist the Program Administrator, supervisors and employees with complying with this policy.

Program Administrator. The Program Administrator is responsible for:

- Identifying work tasks that need to be performed by a qualified employee
- Conducting electrical safety inspections
- Correcting electrical safety hazards as soon as possible
- Ensuring all new electrical equipment and components comply with this program
- Reviewing this program annually and revising if necessary
- Maintaining a list of all qualified employees (***Appendix C***)
- Conducting training for employees

Supervisors. Supervisors are responsible for:

- Conducting periodic work inspections using the form in ***Appendix B***
- Ensuring employees are provided with and use the appropriate PPE
- Ensuring employees comply with all aspects of the Electrical Safety Program
- Testing electrical hand tools every three months with an ohmmeter

Employees. An employee will only work on electrical equipment if he/she is a qualified worker, meaning he/she has been trained and authorized to perform work on deenergized electrical equipment and components. Employees are responsible for:

- Wearing the appropriate PPE when working with or around electrical equipment
- Reporting electrical safety hazards to their supervisor of the Program Administrator

- Following the safe work practices outlined in this program
- Visually inspecting electrical equipment, tools and cords before each use
- Completing all required training

Employee Training

Qualified Workers. At a minimum, qualified workers must be trained on the following:

- The hazards associated with electrical equipment
- Electrical safety practices and procedures (lockout/tagout) for doing deenergized work
- Safe work practices that must be followed when working around or with electrical tools or equipment
- How to distinguish exposed live parts from other parts of electrical equipment
- How to properly inspect and use the appropriate PPE
- The location of the electrical breaker panels and fuse boxes

Unqualified Workers. Unqualified workers will receive general electrical safety awareness training on how to recognize, evaluate and avoid electrical hazards and training on all Santa Barbara County Education Office electrical safety practices.

Training will occur before an employee begins work in a new area and when an employee does not comply with safe work practices. Retraining will occur every 3 years. Training will be documented in ***Appendix A***.

Work Practices

All electrical equipment will have the manufacturer's name, trademark or other descriptive marking which identifies the organization responsible for the product. The equipment will also have its operating voltage, current, wattage or other rating clearly marked on it.

Qualified employees will use lockout/tagout procedures on all electrical equipment while completing maintenance work. Lockout/tagout procedures are found in Santa Barbara County Education Office IIPP Lockout/Tagout section F. If the equipment cannot be deenergized because it would introduce an additional or increased hazard, or it is infeasible due to the design or its operational limitations (i.e. emergency alarm systems), Santa Barbara County Education Office will hire a qualified electrical contractor to perform the work. No work will be performed on energized equipment by Santa Barbara County Education Office employees.

ESTABLISHING AND VERIFYING AN ELECTRICALLY SAFE WORK CONDITION

• The 2018 version of 70E has reorganized the requirements of the lockout/tagout program and its principles, equipment and procedures in article 120.1 thru 120.4.

• Article 120.5 then explains the process for establishing and verifying an electrically safe work condition. An electrically safe work condition is defined as "a state in which an electrical conductor or circuit part has been disconnected from energized parts, locked and tagged in accordance to established standards, tested to ensure the absence of voltage and temporarily grounded for personnel protection if determined necessary."

• To create an electrically safe working condition, first determine all possible sources of electrical supply to the equipment.

• Next, disconnect any active loads.

• Then open the disconnecting device for each source of electrical supply.

• Visually verify if possible, that all blades of disconnecting devices are fully open, and that draw-out type circuit breakers are withdrawn to the fully disconnected position.

• Next, release any stored electrical energy such as that found in capacitors and release or block any stored mechanical energy such as springs under tension or items that could be impacted by gravity.

• Then apply company approved locks and tags to the open disconnecting devices in accordance with your facility's lockout tagout procedures.

• Finally, no electrical lockout is complete without testing for the absence of voltage and applying grounds when necessary.

• It's critical that testing for an absence of voltage be done using an adequately rated test instrument.

• For voltages over 1,000 volts, a non-contact test instrument is permitted.

• The test instrument must be verified to be working properly by measuring a known voltage source immediately prior to voltage testing.

• When testing to confirm an absence of voltage, test each phase conductor or circuit part both phase to ground and to phase, for all phases.

• Once voltage testing is complete, immediately verify the test instrument again on a known voltage source.

• Until you have verified the existence of an electrically safe work condition and all other provisions of Article 120 have been met, the electrical conductors and circuit parts are not considered to be in an electrically safe condition and all safe work practices applicable to the circuit voltage and energy level must be used.

• Once the electrical conductors and circuit parts are verified to be in an electrically safe work condition, then no electrical hazards exist.

• This means that shock and arc-flash protection are no longer necessary and may be removed. This also means that other workers who are not qualified electrical workers may enter the area as needed.

Extension Cords and Power Strips

Employees must be aware of the hazards associated with the misuse of extension cords and power strips. All power strips must be UL listed and used according to the manufacture's guidelines.

Choosing an Appropriate Extension Cord. Santa Barbara County Education Office has a variety of extension cords available for employee use. Employees will select an extension cord that can handle the electricity requirement for any connected tools or equipment. All employees will adhere to the following guidelines when choosing an appropriate extension cord.

- **Lights and fans (1-13 amperage rating).** Employees may use a 25'-100' long extension cord with 16-gauge wire, or a 150' cord with 14-gauge wire.
- **Small electrical hand-held tools, such as drills and sanders (14-15 amperage rating).** May use a 25'-100' long extension cord with 14-gauge wire, or a 150' cord with 12-10-gauge wire.
- **Large electrical tools such as shop vacuums, circular saws, table saw and space heaters (16-20 amperage rating).** May use a 25'-100' long extension cord with 12-10-gauge wire. Do not use an extension cord longer than 100 feet with large electrical tools.

* All extension cords used for construction or outdoor maintenance work will be equipped with, or connected to, a ground fault circuit interrupter (GFCI).

If an employee is unsure which size of extension cord he/she should use, contact a supervisor or the Program Administrator.

Safe Work Practices for Extension Cords and Power Strips. The following safe work practices will always be followed by all employees when using an extension cord or power strip.

- No employee will plug in or unplug a power strip or extension cord with wet hands.
- Power strips will only be used in office settings.
- Grounding prongs will never be removed from the end of any extension cord or power strip. No strip or cord with a missing grounding prong shall be plugged into outlets.
- All extension cords and power strips will be inspected before use. If any defects are found, the cord or strip will be removed from service.

- All power strips and extension cords will be tested using an ohm meter every 3 months.
- When extension cords or power strips are used, they will not be:
    - Run through holes in walls, ceilings or floors
    - Run through doorways or windows without appropriate protection
    - Used in areas where vehicles, forklifts or other equipment could drive over the cord
    - Fastened with staples or hung in a way that could damage the insulation
    - Used for more than 30 days

If it is necessary to run an extension cord through a doorway (for example, work completed outdoors with no outlet), the cord will be protected using high contrast tape or coverings and will not be left out overnight. Employees must get approval from the Program Administrator before an extension cord can be used in this manner.

Ground Fault Circuit Interrupters

Ground fault circuit interrupters (GFCIs) protect Santa Barbara County Education Office employees who use electrically-powered tools and equipment from electrical shocks, especially when working in wet environments. GFCIs are required for electrically-powered equipment and tools in the following conditions:

- When used at locations where employees are likely to contact water or conductive liquids, such as outdoors, bathrooms, kitchens or any other area with potential exposure to water
- When used at construction or renovation sites
- When used for portable lighting in wet or other conductive locations (such as inside boilers or tanks)

  (NFPA 70E Article 110.6)

Additional Safety Precautions

The following additional safety precautions shall be adhered to at all times.

- If a circuit breaker trips or blows a fuse more than once, it shall be investigated and corrected by a qualified employee or contractor before being cleared for continued use.
- All areas with electrical equipment shall be properly illuminated.
- Housekeeping duties will not be performed in an area if there is a possibility of contact with an electrical hazard unless there are protective shields, barriers or if insulated materials are used to protect the employee.

- Safety signs that warn employees about any electrical hazards shall be displayed prominently when a hazard is present.

Personal Protective Equipment (PPE)

Employees working in areas where electrical hazards are present will be provided with and shall use PPE that is designed for the specific part of the body to be protected and for the work being performed. Employees are required to adhere to the following procedures for PPE use:

- All PPE must be inspected prior to each day's use and immediately following any incident.
- Non-conductive head protection will be worn if there is danger of electrical burns or shock from contact with electricity.
- When working on electrical equipment or wiring, employees will:
    - **Not** wear conductive articles of clothing or jewelry
    - Wear non-melting clothing such as cotton
    - Wear electrical-rated boots
    - Wear non-conductive gloves

Appendix A—Electrical Safety Program Training Record

Print Name	Sign Name

Print Instructor's Name	
Instructor's Signature	
Instructor's Title	
Date of Training	

Appendix B – Electrical Hazards Inspection

Supervisors at Santa Barbara County Education Office will use this form to periodically inspect their employees' work practices. Any issues found during these inspections shall be addressed immediately.

Is lockout/tagout used before performing any maintenance on electrical equipment?	**Yes**	**No**	**N/A**
Have all employees received training and has it been documented?	**Yes**	**No**	**N/A**
Do all cords have the grounding prong?	**Yes**	**No**	**N/A**
Are tools being stored in a clean, dry place?	**Yes**	**No**	**N/A**
Are employees using and carrying tools properly?	**Yes**	**No**	**N/A**
Are insulated tools used?	**Yes**	**No**	**N/A**
Do all electrical tools have a grounding prong?	**Yes**	**No**	**N/A**
Are tools and power cords inspected prior to use?	**Yes**	**No**	**N/A**
Is the correct extension cord used?	**Yes**	**No**	**N/A**
Do extension cords remain in use for less than 30 days?	**Yes**	**No**	**N/A**
Are all extension cords and equipment cords run or protected so as to prevent damage to the cord's insulation?	**Yes**	**No**	**N/A**
Is the area around electrical panels and boxes kept clear?	**Yes**	**No**	**N/A**
Are all electrical receptacles and cover plates kept in good condition?	**Yes**	**No**	**N/A**
Are areas with electrical equipment properly illuminated?	**Yes**	**No**	**N/A**
Are all electrical control devices properly labeled?	**Yes**	**No**	**N/A**
Are there safety signs warning employees about electrical hazards?	**Yes**	**No**	**N/A**
Are employees wearing proper clothing? (Non-conductive, no	**Yes**	**No**	**N/A**

jewelry, etc.)			
Are GFCIs used in wet locations?	**Yes**	**No**	**N/A**
Are all electrical distribution panels, breakers, disconnects, switches and junction boxes completely enclosed?	**Yes**	**No**	**N/A**
Are all live parts of electrical equipment operating at 50 volts or more guarded to prevent contact?	**Yes**	**No**	**N/A**
Are fiberglass ladders used when working near electrical hazards?	**Yes**	**No**	**N/A**
Are safe work distances maintained when working around power lines?	**Yes**	**No**	**N/A**
Is the One Call Center called at least 48 hours before any digging?	**Yes**	**No**	**N/A**
Is an 18 inch clearance maintained on either side of paint or flags indicating underground power lines?	**Yes**	**No**	**N/A**
What was done to address issues?			

Supervisor Name:	
Supervisor Signature:	
Date:	

Appendix C – List of Qualified Employees

Name of Qualified Employee	Date of Qualification