

Temporary Power

GENERAL DISCUSSION

Temporary electrical wiring on a construction site requires special caution. A minor shock can be the shock of your life if it causes a serious burn or fall. Sometimes a small shock can interfere with your heartbeat or even kill you.

Whenever we install, repair, or change temporary wiring, a qualified electrician must do the work or supervise it. Don't try to reroute temporary power or add new boxes yourself.

You or a crewmember may want to add a personal story about temporary power.

Next, discuss with the crew where temporary power is used at this particular job site:

Ask the Crew these Questions

After each question, give the crew time to suggest possible answers. Use the information following each question to add points that no one mentions.

1. Even the best electrical system can deteriorate over time. If it's worn out, it might cause a shock or fire. How can we protect temporary wiring from wear and weather?

- Don't run wiring:
 - In damp or wet areas
 - Near gases or fumes that might make it deteriorate
 - In extremely hot or cold areas
 - Over sharp edges or projections that could damage it
 - On sheet metal or lath
 - At pinch points
 - Anywhere vehicles or equipment might run over it

2. What are some of the things we look for when we inspect temporary wiring?

- Can temporary wiring safely carry the amount of current required?
- Is there a circuit breaker to prevent overload?
- Are all temporary wiring installations grounded?
- Are wiring and equipment in safe condition and secured firmly?
- Do all conductors have insulation? (No bare conductors should be used.)
- Are switches labeled, showing what they control and which position is off?
- Do boxes and fittings have covers or barriers to prevent contact with live parts?
- Is temporary wiring used only for periods if less than one year (unless special state permission is obtained)? Is it removed promptly when construction is done or when the permit time expires?

3. What is a GFI grounding system and why is it important?

A GFI is a ground fault circuit interrupter. It senses ground faults (accidental electrical paths to ground) and cuts off all power in the circuit. For example, if there is a short in a power tool, the metal casing can become "live." A GFI will cut off power before you can get a serious shock.

Most 110-120 volt temporary wiring must have GFIs unless the company has an "assured equipment grounding conductor program." (This is a program where the company does regular testing of the ground on plugs, outlets, cords, and other electrical equipment. Inspection marks are placed on equipment and records are kept.)

On this site, we use: ____ GFIs ____ Grounding conductor program ____ Both

Show the crew the GFI you brought to the meeting, and/or an extension cord with inspection markings from the company's grounding conductor program.

4. What can you do to prevent shocks from your own tools and equipment?

- Make sure power tools have a 3-wire cord and are grounded. (Double-insulated tools don't need a ground.)
- Check power tools and cords daily for cracks, exposed wire, and breaks in the insulation.
- Tag faulty items and send them for repair.
- If a power tool buzzes, report it immediately and have an electrician check it out. Either the wiring or the tool itself may be defective.
- Store cords and tools neatly in a safe place to prevent damage.
- Don't touch any electrical equipment when the equipment is wet, you're wet, you're sweating, or you're standing on a wet surface. Moisture lowers your resistance. That can make your injury worse if you get a shock. Also

be careful if you're in contact with good grounding materials like metal pipes, tanks, or boilers.

5. What are some shortcuts you shouldn't take when you work with electrical cords or equipment?

- Don't remove the third prong (the ground prong) from a plug.
- Don't force plugs into receptacles that don't match. (They may be the wrong voltage; using the wrong voltage can cause a shock or fire.)
- If you use an adapter (3-prong plug to 2-hole outlet), make sure it's grounded.
- Don't use ordinary household extension cords. Use 3-wire cords intended for heavy duty. Don't run them near water, other liquids, or metal, which can carry current.
- Don't splice flexible cords together, and don't run them through walls, floors, ceilings, doors, or windows.
- Don't overload a power box. If the circuit breaker trips, there's too much plugged in.
- Don't interfere with safety lights. Never unplug them to "borrow" the outlet, and never run extra lines off the light circuits. (If you trip the breaker, the lights will go out.)

6. What should always happen before an electrician begins repair work on wiring?

- Wiring and equipment must be de-energized.
- Energy must be dissipated from devices (like capacitors) that store it.
- Wiring and equipment must be locked out or tagged out.
- All affected personnel in the area must be notified.

7. Temporary wiring is usually low voltage (under 600 volts). What kinds of injuries can you get from a low voltage electric shock?

- Fibrillation—a fast, irregular heartbeat.
- External burns.
- Falls off ladders or scaffolds.

8. What should you do if someone gets an electric shock?

- Don't touch the person until power has been disconnected.
- Call 911.
- Notify the first aid provider, clinic, or supervisor. Describe the extent of injuries.
- Give first aid or CPR if necessary, but only if you know what you're doing.

- Keep people out of the area.
- Calm and reassure the injured person. Don't move them until trained help arrives.
- Speed is critical. The highest success rate is when people are given CPR within 4 minutes and Advanced Cardiac Life Support (ACLS) within 8 minutes.

OSHA Regulations

Explain: OSHA requires most of the safety measures we've talked about. We have to take these precautions, it's the law. I have a Checklist of the OSHA regulations on temporary power. If you'd like to know more, see me after the meeting.

Company Rules

(Only if applicable.) Besides the OSHA regulations, we have some additional company rules about temporary power. Discuss company rules:

Comments from the Crew

Ask the following: Do you have any other concerns about temporary power? Do you see any problems on our job? What about other jobs you've worked on? Have you had any experience with temporary power that might help us work safer on this job?

GENERAL SAFETY REVIEW

This is a time to review all safety concerns, not just today's topic. Keep your notes on this page before, during and after the safety meeting.

Are you aware of any safety hazards from any other crews? Point out any hazards other crews are creating that this crew should know about. Tell the crew what you intend to do about those hazards.

Do we have any other safety business? Discuss any past issues or problems. Report any progress of investigations and action taken.

Have there been any accidents, near misses or complaints? Discuss any accidents, near misses, and complaints that have happened since the last safety meeting. Also recognize the safety contributions made by members of the crew.

Please remember, we want to hear from you about any health and safety issues that come up. If we don't know about problems, we can't take action to fix them.

ENDING THE MEETING

Circulate Sign-Off Form.

Assign one or more crew member(s) to help with next safety meeting.

Refer action items for follow-up.

Do you have any Safety Recommendations?

Do you have any Job Specific Topics you would like us to discuss?

Comments

SAFETY TALKS REVIEW

Hazard Communication

The company has a written Safety and Health Program that meets all OSHA requirements. It includes identification of all hazards on the site, regular inspections, accident investigation, and correction of hazardous conditions.

General

1. Only qualified person's work on electrical equipment.
2. All electrical equipment and systems are de-energized and either locked out or tagged out before anyone works on them. All affected workers are notified.

Temporary Wiring

1. Temporary wiring is not used for more than one year on a construction site unless special state permission is obtained.
2. Temporary wiring is removed immediately when construction is complete or when the time limit expires.
3. Conductors and equipment are protected from over current by circuit breakers, fuses, etc., and can safely carry the load.
4. Temporary wood poles used for wiring are a minimum of 6 inches square, or have a top diameter of at least 5 inches if round. They are at least 20 feet long and embedded at least 4 feet in the ground.

Location and Maintenance

1. Electrical equipment and wiring are in safe condition.
2. Electrical equipment and wiring are protected from physical damage and environmental deterioration.
3. Electrical equipment and wiring exposed to physical damage are properly enclosed or guarded.
4. Electrical equipment and wiring are firmly secured.

5. Energized or live parts of electrical equipment operating at 50 volts or more are protected by approved enclosures.
6. Electrical cabinets and other enclosures have appropriate warning signs.
7. Suitable access is provided to energized switches, circuit breakers, fuses, relays, and similar controls if workers must use, examine, adjust, service, or maintain them. The workspace provided around the equipment meets required minimum dimensions.
8. Wiring is kept 16 feet above vehicle routes, and 12 feet above pedestrian routes. Required clearance distances are also maintained for wiring above structures and work areas.
9. All electrical control devices clearly indicate which equipment they control, and whether they are on or off.

Grounding

1. Grounding is assured through either a ground fault circuit interrupter (GFI) system or assured equipment grounding conductor program.
2. If there is a GFI system, approved GFI devices are present on all 120-volt, AC, single-phase, 15- and 20- ampere outlets, which are not part of permanent building wiring.
3. If there is a grounding conductor program, the program is in writing and covers all 120-volt, AC, single-phase cord sets, plugs, and receptacles, which are not part of permanent building wiring. The program also includes daily visual inspection, regular testing, ID markings placed on the equipment and recordkeeping.
4. Earth returns are not used for grounding.
5. Bonding is provided where necessary to assure electrical continuity and safe electrical conduction.
6. Every receptacle is grounded.

Conductors and Cords

1. Insulated single conductors are approved types for the purpose, suitably supported, and not subject to mechanical injury.
2. No bare conductors are used for temporary wiring.
3. Multi-conductor cords and cables are hard service type or equivalent, with multi-conductor fittings.
4. Flexible cords are used only for electrical connections to (a) elevators; (b) cranes and hoists; (c) lamps, appliances, and equipment which are portable, which must be interchanged frequently, or which must be removed frequently for maintenance and repair.
5. Flexible cords are not used as a substitute for fixed wiring.

6. Flexible cords are not run through holes in walls, ceilings, or floors, or through doors or windows. They are not attached to building surfaces or concealed behind walls, ceilings, or floors.
7. Flexible cords are equipped with an attachment plug, and are energized from an approved receptacle.
8. Flexible cords are used only in continuous lengths without splices (except for repairs by a qualified electrician on No. 12 cord or larger, if the splice retains insulation).
9. Flexible cords are connected so that strain relief is provided to prevent pull from being directly transmitted to joints or terminal screws.
10. Flexible cords are not placed near water, liquids, or metal capable of transmitting current.
11. 15- and 20-amp attachment plugs have no exposed current-carrying metal parts except prongs, blades, or pins.
12. Skirted attachment plugs are used on all equipment operating at more than 300 volts.
13. Receptacles, cord connectors, and attachment plugs are constructed to be non-interchangeable: a receptacle will not accept a plug with a different voltage or current rating.

Lamps

1. Lamps are located at least 7 feet vertically or 3 feet horizontally from the work area, unless there are guards.
2. Open wire taps from permanent wiring outlet boxes to lamp holders are not more than 6 inches long.
3. Portable hand lamps using flexible cords have a handle made of molded composition or other approved material and a guard.

Electrical Tools

1. All electrical tools are grounded or double insulated.
2. All exposed metal parts of electrical power tools are grounded if they are likely to become energized.
3. All electrical power tools have appropriate switches and controls.

Portable Generators

1. The frame of a portable or vehicle-mounted low voltage generator is grounded unless the generator is single-phase, rated not more than 5 KW, and the circuit conductors of the generator are insulated.

High Voltage Temporary Power - Special Requirements

1. Temporary wiring that carries high voltage (over 600 volts) is guarded by fencing, barriers, or other means to keep out unauthorized personnel.
2. Workspace around high voltage equipment is not used as a passageway when energized parts are exposed.
3. There is adequate illumination in high voltage areas, and live parts do not endanger those working on the equipment.

Personal Protective Equipment and First Aid

1. Workers exposed to possible electric shock are provided and use suitable protective equipment or devices, such as insulated rubber gloves.
2. Workers exposed to possible electric shock or burns are provided and use approved head protection. For under 600 volts, head protection meets the requirements for Class A or B in American National Standards Institute (ANSI) standard Z 89.1 1986, Requirements for Protective Headwear for Industrial Workers. For over 600 volts, stricter requirements apply.
3. First aid equipment is available. There are personnel trained in first aid on-site. The site also has an effective communication system for contacting help.