(o) All 110-volt, 15- or 20-amp circuits shall be grounded, except temporary lighting circuits. Do not wire outlet receptacles into lighting circuits unless they are grounded.
(p) Never troubleshoot on live circuits unless necessary to perform task. See Section 7 Lock-out/Tag-out.
(q) Always replace covers on electrical equipment after troubleshooting is completed.
(r) **DO NOT OPEN THE MAINLINE DISCONNECT SWITCH COVER**. If power is not being supplied to the elevator controller (e.g. open mainline fuses, etc.), advise the building owner to correct the condition. This is not the elevator company's responsibility.
(s) Keep electric cabinet doors closed when system is energized, whenever possible.
(t) A ground fault circuit interrupter (GFCI) is required when using portable power tools and drop lights. GFCIs should be tested prior to each use.

5.2 Meter Usage Safety Checklist

- ❑ Use Category III multimeters.
- ❑ Follow the manufacturer's safety procedures for the meter used.
- ❑ Be certain the meter is in good operating condition. Notify your supervisor immediately if the meter is damaged.
- ❑ The meter used must meet accepted safety standards for the environment it will be used in.
- ❑ Use a meter with fused current inputs and be sure to check the fuses before taking measurements.
- ❑ Inspect test leads for physical damage before making measurements. If damaged, replace them before proceeding.
- ❑ Use the meter to check continuity of the test leads.
- ❑ Use only test leads that have shrouded connectors and finger guards.
- ❑ Use only meters with recessed input jacks.
- ❑ Select the proper function and range for your measurement and double check before proceeding.

- ❑ Be aware of high-current and high-voltage situations and use the appropriate equipment, such as high-voltage probes and high-current clamps.
- ❑ Always disconnect the "hot" (red) test lead first.
- ❑ Use a meter that has overload protection on the ohm function.
- ❑ When measuring current without a current clamp, turn the power off before connecting into the circuit.

5.3 Energized Circuit Troubleshooting Checklist

Work on de-energized circuits and use lockout/tagout procedures whenever possible.

(a) On live circuits, use personal protective equipment (PPE).
- ❑ Use insulated tools.
- ❑ Wear nonconductive safety glasses or a face shield.
- ❑ Wear rubber insulated gloves with leather protectors rated for the voltage present. Where danger from electric shock extends to arms wear rated rubber sleeves in addition to gloves.
- ❑ Remove watches, jewelry or other metal objects.
- ❑ Stand on an insulated mat or use safety shoes with electrically rated soles.
- ❑ Wear long-sleeved natural-fiber or FR-rated shirts and pants, long-sleeved FR-rated coveralls or other company-approved arc-flash-hazard protection. (Check with your company procedures for specific uniform requirements.)

(b) When taking measurements on live circuits:
- ❑ Hook on the ground clip first, and then make contact with the hot lead. Remove the hot lead first and the ground lead last.
- ❑ Hang or rest the meter if possible. Try to avoid holding it in your hands to minimize personal exposure to the effects of transients.

- ❑ Use the three-point test method, especially when checking to see if a circuit is dead. First, test a known live circuit. Second, test the target circuit. Third, test the live circuit again. This verifies that your meter worked properly before and after the measurement.
- ❑ Use the old electrician's trick of keeping one hand in your pocket. This lessens the chance of a closed circuit across your chest and through your heart.