

<b>Procedure Title</b>	<b>Working on Electrical Equipment</b>		
<b>Date of Issue</b>	November 8, 2006	<b>Related Policy</b>	BP 3801-D
<b>Revision Dates</b>		<b>Related Forms</b>	
<b>Review Date</b>		<b>Originator</b>	System Administrative Team
<b>References</b>			

**Procedure:**

**1.0 Authority:**

- Bluewater District School Board Policy BP 3801-D Health and Safety regulates the Occupational Health and Safety requirements to ensure all students and staff has a safe environment.
- Ontario Electrical Safety Code
- Ontario Occupational Health and Safety Act and Regulations

**2.0 Definition:**

- **Qualified Person:** The Ontario Electrical Safety Code defines a qualified person as: "Qualified person means one familiar with the construction and operation of the apparatus and the hazards involved".
- **Authorized person:** is a qualified person whose duties requires him/her to approach or handle electrical circuits and equipment

**3.0 Board Requirements:**

- Only authorized persons are allowed to work on electrical circuits and equipment and troubleshoot and test permanent electrical equipment
- Ensure procedures are developed, training provided and work is performed in accordance with the Act and its Regulations and unauthorized personnel are not to work on **any** electrical equipment.
- Provide personal protective equipment as prescribed.
- Ensure all electrical installations, upgrades, and repairs are performed in accordance with the ESA Permitting Procedure.

## 4.0 Responsibilities

### 4.1 Supervisor Responsibilities:

- Assign qualified personnel to perform duties as outlined in their area of competency
- Ensure workers are qualified and compete in the work and procedures as established by the Board
- Ensure workers use PPE as prescribed

### 4.2 Licensed Electricians

- Are authorized by qualification to install, maintain, repair, troubleshoot, alter, modify and upgrade electrical systems and equipment
- Are not expected or authorized to enter electrical panels, equipment, vaults that have live electrical voltages exceeding 750 volts
- Contractors are authorized to work on electrical circuits in accordance with their qualifications for the voltages specified.

### 4.3 Data & Communication Specialists

- Are authorized by qualification to install, maintain, repair, troubleshoot, alter, modify and upgrade electrical data, communication systems, AV equipment and appliances.
- Repairs to power supplies, power connections and service cords that are related to the above equipment and appliances and are not permanently connected to the building.

**Note:** Section 2-000 of the Ontario Electrical Code does not apply to electrical equipment and installations in communication systems from the transformer or other current limiting device used at the junction of the communication systems with the electric circuit supplying the communication system.'

### 4.4 Custodial Staff

- Are authorized by training or testing to perform minor maintenance and repairs on portable electrical equipment where the supply voltage does not exceed 110 volts. Examples of such work would be the replacement of damaged plugs or supply cords.

### 4.5 Educators

- Are authorized by training to develop, construct, perform, and modify electrical circuits and related equipment for the purpose of instruction or demonstration for educational purposes
- These circuits, devices and appliances are required to be stand alone and are not a part of the building, site or facility.

**All other workers are not authorized to work on electrical circuits or equipment unless under direct supervision of one of the above.**

When working on an electrical system always consider exposed electrical parts to be "live" until you have personally ensured that they have been properly disconnected and locked/tagged out and it has been verified that the equipment is off and all components which could store a charge have been discharged.

#### Requirement:

When working on electrical circuits all work will be performed in accordance with Administrative Procedure AP- 3857 D School Equipment Tagout and Lockout Procedure and the O.H. & Safety Act and its Regulations

Section 42 (1).

This section recognizes that there are times when shutting down power may be impractical or when live inspection or testing of equipment and circuits is necessary. The use of tongs, rubber gloves, footwear, rubber mats to isolate workers from electrical shock hazards can reduce the risk when performing tasks on live circuits. The use of fire resistant clothing, face shields and eye protection can reduce the risk of electrical flash.

Work shall be performed in accordance with the O.H. & Safety Section 42 (2) and only by Licensed Electricians.

See attachment

Hazard/Risk Category	Required minimum Arc rating of PPE	Examples from NFPA 70
<b>Risk 0</b>	Up to 1.2 cal/cm <sup>2</sup>	- operating an exposed breaker up to 240 volts - using a meter switch over 1000 volts
<b>Risk 1</b>	1.3 to 4 cal/cm <sup>2</sup>	- voltage testing or installing a breaker in a live panel up to 240 volts - operating an exposed circuit breaker up to 600 volts
<b>Risk 2</b>	4.1 to 8 cal/cm <sup>2</sup>	- work on control circuits above 120 volts changing live breakers up to 600 volts - voltage testing on parts at or above 600 volts
<b>Risk 3</b>	8.1 to 25 cal/cm <sup>2</sup>	- starter "buckets" at 600 volts

### Personal Protective Clothing requirement

Risk Category	Protective Clothing Required	Examples
<b>0</b>	Non-melting, flammable materials (i.e., untreated cotton, wood, rayon, or silk, or blends of these materials) with a fabric weight at least 4.5 oz/yd <sup>2</sup> .	- 100% cotton shirt - jeans or - 100% cotton slacks
<b>1</b>	FR shirt and FR pants or FR coverall.	- Nomex clothing - FR pants - Denim jeans > 12 oz/yd <sup>2</sup>
<b>2</b>	Cotton underwear – conventional short sleeve and brief/shorts, plus FR shirt and FR pants. Face shield with side protection, chin cups	Flash suits and Flash hoods must be rated above the flash energy levels expected and meet the appropriate ASTM standard.
<b>3</b>	Cotton underwear plus FR Shirt and FR pants plus FR overall and Flash hood, or cotton underwear plus two FR coveralls and Flash hood. or Flash suit and Flash hood.	

Required Personal Protective Equipment when working on or in close proximity to exposed live electrical circuits

Voltage	Testing and Troubleshooting	Working on or in close proximity to exposed live circuits
<b>0-300 volts</b>	Insulating mats Safety glasses FR clothing	Insulating mats Safety glasses FR clothing Insulating Gloves*
<b>300-750 volts</b>	Insulating mats Safety glasses FR clothing Hard hat with Face Shield	Insulating mats Safety glasses FR clothing Insulating Gloves Safety Monitor with CPR qualifications**
<b>Over 750 volts</b>	No Activity by Board Staff Contractors follow ' <i>Rule Book, Electric Utility Operations</i> ' and ' <i>Ontario Hydro Corporate Safety Rules and Policies</i> '	No Activity by Board Staff Contractors follow ' <i>Rule Book, Electric Utility Operations</i> ' and ' <i>Ontario Hydro Corporate Safety Rules and Policies</i> '

\*The use of insulating gloves when working with de-energized circuits in energized electrical panels under 300 volts may create a higher risk than working without the specified gloves. The Electrician may evaluate the individual risks associated with the task and take alternate precautions to minimize the risk such as insulated tools or covering exposed conductors with insulating blankets. This only applies to circuits under 300 volts.

**\*\*Safety Monitor - Rescue Procedures**

A Safety Monitor may assist with the work, but not within the hazardous zone. If a worker comes into contact with electricity, the worker may not be able to remove themselves from the electrical source.

Always attempt to disconnect the source of the electricity. If the electrical source can not readily and safely be turned off, use a non-conducting object, such as a fibre glass object or a wooden pole, to remove the person from the electrical source. Emergency medical services should be called as soon as possible.

When the victim has been removed from the electrical source, check to see if the person is breathing and if they have a pulse. If necessary, administer CPR until emergency personnel arrive at the scene.

**Personal Protective Equipment Standards - Appendix 1**

**Eyewear:** CSA Standard Z94.3-00 non conducting frames with scratch resistant clear polycarbonate lenses or CR-39 plastic lenses with clear or UV 400 protection are acceptable.

**Faceshields:** Arc resistant to at least 8 cal/cm<sup>2</sup> and worn with safety glasses and permanent attached to CSA approved hard hat.

**Gloves:** ASTM D120-95 Standard Specification for Rubber Insulating Gloves marked for electrical use suitable for the voltages exposed to. Gloves may be covered with a leather protection. Leather protection will be ASTM F696-97 Standard Specification for Leather Protectors for Rubber Insulating Gloves and Mittens'.

Testing - Before first use and every 6 months

**Insulated Matting:** Standard ASTM D178-93 Standard Specification for Rubber Insulating Matting.

Testing - when there is any indication that the insulating is suspect.