

# Electrical power lines

---

Every year in B.C., some 100 injuries from electrical contacts result in wage-loss claims (including deaths) to the workers' compensation system.

## Overhead high-voltage electricity

Builders must identify the location and voltage of all overhead electrical conductors at a worksite. Remember to count transformers as conductors.

- During land clearing there may be a danger of trees being felled or pushed into overhead power lines.
- When any work activity takes place near energized overhead high-voltage lines, the following procedures must be followed:
- Determine what activities may take place in proximity to overhead high-voltage lines.
- Determine the voltage of the overhead lines through the authority controlling the system, for example, B.C. Hydro.
- Ensure that the following minimum clearance can be maintained at all times:

### Minimum distances

Voltage (Phase to Phase)	Minimum Distance	
	(Metres)	(Feet)
751 V to 75 kV	3	10
Over 75 kV to 250 kV	4.5	15
Over 250 kV to 550 kV	6	20



- Do not use a tape measure or stick to physically measure the distance from an energized power line. Estimate the distance from the ground and, if in doubt, provide for more clearance.

If the minimum distance from the electrical conductor cannot be maintained, and movement by a worker or equipment may result in entering these minimum distances:

- STOP work immediately.
- Call the power authority controlling the electrical system and arrange for a worksite meeting to decide whether the energized electrical conductors can be:
  - De-energized
  - Effectively guarded
  - Displaced or rerouted

- 
- Get assurance in writing (form 30M33) from the power authority indicating which of the three actions they will take and when it will be done. A form 30M33 is available from the local electrical utility, or any WorkSafeBC office (see the end of this book for a listing of WorkSafeBC offices).
  - Keep written assurances on the worksite and inform all workers who will be directly affected by the power authority actions.
    - Designate a qualified safety-watcher who can monitor equipment and material movement and give an instant STOP signal to the equipment operator when the equipment or load is too close to the electrical conductor.
    - Make sure equipment, work tools, or loads do NOT contact the electrical guarding.

**In the event of contact**, equipment operators and workers on the site must be aware of the possible energized ground around the machine and use extreme caution. Once part of a machine makes contact with a live power line, anything in contact with the machine will be energized for some distance around the machine, especially the ground around it. The point or points where the electrical flow reaches the ground will have the highest voltage, which drops off gradually as you move further away. This entire area of energized ground is the danger zone. Caution: wet ground will make the danger zone much larger and safe escape may be more difficult.

- *If you are on the machine* when it makes contact and you are not in danger, stay on the machine. If you are in danger, then leave by keeping your feet together and making a short

jump from the machine. The goal is to ensure that your entire body clears the machine and that you land on your feet without stumbling. If possible, stand still without touching the machine and keep your feet together until someone turns off the power.

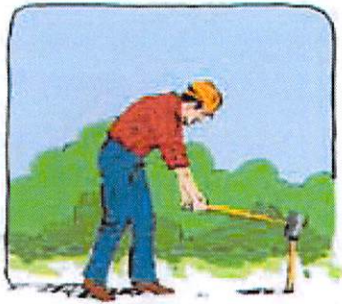
- *If you are near the machine* and possibly within the danger zone, do not move. Stay where you are until someone turns off the power.
- *If you must move away* from the area, hop or shuffle away without moving your feet more than a couple of inches at a time. Keep your feet together to ensure that you do not straddle two zones with different voltages that would allow the electrical flow to take a new path (your body). Once you are well out of the danger zone, warn others to stay out of the danger zone or leave someone to guard the area, and then contact the power authority to shut off the power.

## **Overhead low-voltage electricity**

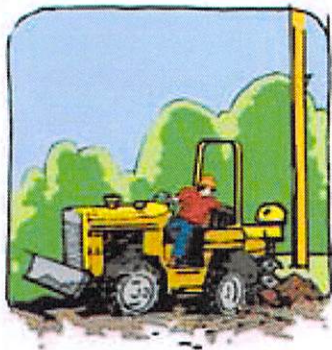
Many workers are injured from contacting energized low-voltage wires (750 volts or less). Generally, workers suffer burns and physical injuries from shock. Employers must develop safe work procedures for working near low-voltage wires. There is no established minimum distance for working around low-voltage electricity.

## **Underground electrical hazards**

- Driving ground rods or any other long metal objects into the ground can be especially dangerous around buried lines. Always check the cable location with your local power authority before starting.



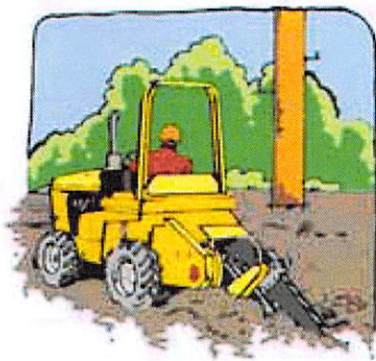
- Fence post holes may be deep enough to reach underground power lines. Make sure you know the location of any underground cables before digging your holes.
- Pay attention to “Danger – High Voltage” signs. They mean that high-voltage equipment is enclosed inside and that everyone must keep clear.
- Before trenching, find out if there are any buried cables in the area and precisely where they are located.



The temporary supply box used during construction can be an electrical hazard. It consists of several outlets used by several sub-contractors. It is important that the temporary supply box is under strict control and has a lock-up cover to prevent tampering by others.



Temporary lighting needs special attention to ensure that wires are not trapped in doorways, where the wire could be pinched and the protective shield damaged. Replace any missing or burned-out bulbs to ensure there are no exposed connections and that the level of lighting is adequate for safe working conditions.



Do not hold on to metal water pipes or other grounded conductors when using electric power tools. A damaged cord or defective tool could make you part of the circuit, causing a shock or electrocution.