Avoiding electrical contacts on demolition sites

How to protect non-electrical workers from serious electrical hazards.

In the demolition industry, electrical incidents such as shocks and arc flashes can occur when workers think that an electrical service has been disconnected, but it in fact remains energized or "live." This hazard can exist on most demolition projects.

"The human body is highly conductive. If they're not careful, workers on industrial or residential demolition projects can easily come into contact with voltages carrying electrical currents that could seriously harm or even kill them," says Alain Leger, Manager, Powerline Apprenticeship and Training at IHSA.

"It's critical that all workplace parties establish and follow written procedures, such as those for lockout and tagging, while working near electrical conductors," he says.

Help ensure workers don't come into contact with live sources of electricity by putting these preventive measures in place:

Disconnect all electrical services

Before starting work on a jobsite, a qualified electrician must disconnect, isolate, and ensure that stored energy is discharged from all electrical services to the building or structure planned for demolition. These electrical services will be identified by the project owner and constructor (i.e., general contractor)—who must then confirm that the electrical services have been disconnected and will stay disconnected throughout the demolition.

When there is doubt about whether a service is discharged, consult a qualified third party to assist with the identification and location of all utilities.

If the entire building or structure is to be demolished, electrical services should be disconnected, isolated, or discharged at the electrical utility. If this isn't possible, contact the electrical utility to determine the location of isolation and discharge.

Take special care if the project is within an operational facility. All services that may be affected by the work must be identified, regardless of whether or not they are planned for removal. Cables for electrical services that will remain live should be supported throughout the project, to prevent their failure or breakage. If the status of any service is in question, it must be considered live and a qualified trade must be contacted to verify whether the service has been disconnected.

Follow lockout and tagging procedures

Lockout is a physical way to ensure that sources of electrical energy are isolated—and is particularly important at demolition projects where some electrical systems must be maintained as live while others are to be removed. It often involves workers using a locking device to keep a switch in the "off" position or isolating the work area entirely.

Tagging tells others that a given device is locked out, who has locked it out, and why. Tagged devices and systems must not be re-energized until those named on the tag have been contacted and the tags have been removed.

Examples of electrical energy sources on a demolition site could include panels, generators, or lighting systems. All of these must be locked out and appropriately tagged by a qualified worker. For more information, download IHSA's lockout and tagging safety talk at **ihsa.ca/safetytalks**.

Use a consistent marking system

Distinguishing between live and discharged services is a key safety issue for anyone who works near electrical equipment. However, not every Licensed Electrical Contractor or client uses the same marking system. For example, crews at one project could use red to mark live electrical services and green for disconnected services that are ready for removal. On another jobsite, the opposite colouring might be true.

Whatever marking system is used at your demolition site, it should be consistent and communicated to all workers. Electrical services that remain live must be identified as live by means of paint or flagging. When using paint, take care to only mark the services in question.

Ensure physical separation

Physical separation (also known as air-gapping) that allows for visual confirmation of the disconnection of service helps to ensure that demolition workers don't mistakenly cut into a live service. Workers should never cut into a closed system, as they are not qualified to test the conditions.

Types of electrical hazards

Electric shock/ electrocution

The passing of electric current through the body. When shocked, workers may experience involuntary physical movements, become unable to release their grip on a live conductor, come into contact with a higher-voltage conductor, lose their balance and fall, incur severe internal and external burns, or be killed.

Arc flash

A release of intense energy caused by an electric arc—a short circuit that jumps through the air from one live conductor to another or to the ground. The flash causes an explosive expansion of air and metal. An arc flash can produce a dangerous wave of pressure or sound, shrapnel, or extreme heat or light. If exposed, workers could sustain blast injuries, lung injuries, ruptured eardrums, shrapnel wounds, or severe burns. They could also be blinded or killed.

Know your responsibilities

Everyone has a role to play in controlling electrical hazards on demolition sites.

Managers must:

- Plan the demolition work and establish written procedures to make sure the work plan is followed by everyone.
- Make available all resources, such as personal protective equipment, that are needed to safely accomplish the task.
- Ensure that all work is performed safely, confirm that all workers receive appropriate training, and that safe work practices are reinforced by regular safety talks.
- Ensure all subcontractors who must work with or around electrical services understand and follow the project-specific safe work practices.

Supervisors must:

- Follow the procedures set out by management and bring up any unforeseen hazards in order to adjust procedures accordingly.
- Perform and review daily job hazard analysis procedures. This includes hazard locations with specific hazard controls.
- Ensure all potential electrical utility locates and disconnects are known.
- Advise all workers and subcontractors about the risks associated with their work tasks.
- Develop a written, site-specific rescue procedure and make it readily available at the project location.

Workers must:

- Participate in daily job hazard analysis meetings so they are able to identify any site-specific electrical utility disconnects.
- Follow all procedures and processes that have been developed and implemented related to electrical service disconnects.
- Provide all information to supervisors for developing procedures related to issues with electrical service disconnects.
- Immediately report any concerns regarding electrical systems on the site, as well as any incidents and injuries resulting from electrical service disconnects.