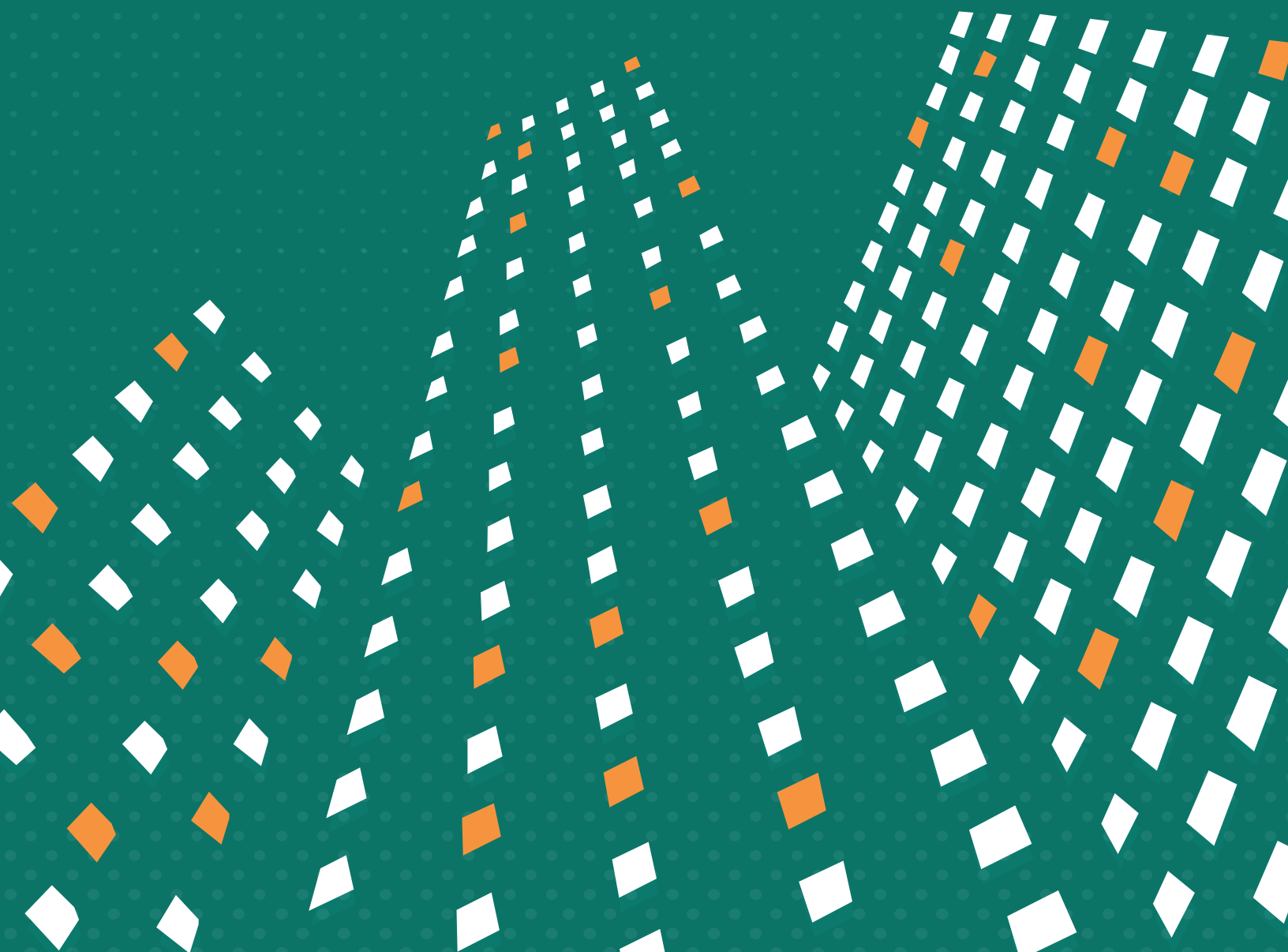
Electrical Safety Authority

GUIDE TO

Multi-Residential Electrical Maintenance



GUIDE TO

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According to a 2017 Federation of Rental-Housing Providers of Ontario (FRPO) report, 85 per cent of purpose-built rentals in Ontario are more than 35 years old. As buildings age, having a maintenance plan in place becomes increasingly important. Buildings naturally deteriorate, as do critical systems, such as electrical, plumbing and HVAC.

In 2018, there were several multi-unit residential building system failures in Ontario and some led to tenant displacements and significant financial burdens for building owners. Taking a proactive approach to maintenance can lower the risk of a critical incident, and ultimately lower costs to owners.

It is important to recognize the other building maintenance issues, such as leaking pipes or roofs, that could have a profound effect on the building's electrical system.

As a property owner or manager of a multi-unit residential building, you have a regulatory obligation, under the Ontario Electrical Safety Code, to conduct regular maintenance and repairs of all electrical distribution systems to ensure they are in safe and proper working order.

The Electrical Safety Authority (ESA) understands that developing a comprehensive maintenance plan can be challenging. To help begin the process, we have prepared this guide to help get started. This guide is not meant to replace working with a qualified professional. It is intended as a resource to ensure you have the necessary information to initiate maintenance planning.

Creating a Maintenance Plan

1 Hire a Qualified Professional

One of the most critical steps you can take in building a maintenance plan is ensuring that you consult with experts to understand the complex integrated systems that keep your building running safely. For the electrical component of the plan, that means working with a Licensed Electrical Contractor (LEC) or engineer with relevant experience in maintenance planning practices. Keep in mind that experience means more than the number of years they've been in the industry. It includes the understanding of practices that are informed by the use of standards such as CSA Z463 Maintenance of Electrical Systems.

2 Develop a Plan that Considers:

a Building Complexity

Specific services may include deployment of diagnostic testing (such as infrared and insulation resistance testing), emergency generators or site security and servicing of large switchgear.

b Building Age

There have been many changes to the Ontario Electrical Safety Code over the years, meaning that the type of wiring and equipment in a 30-year-old building could be different than that of a 50-year-old building. Depending on the maintenance practices that have previously been used, there may be deterioration of the electrical equipment as a result of age.

c Equipment Manufacturers' Service Manuals

Each piece of equipment in your building should have an associated service guide that details the recommended frequency and scope of maintenance.

When preparing to develop your plan, gather records of previous maintenance and repairs done on each piece of equipment so that your Licensed Electrical Contractor (LEC) or maintenance planning professional can compare the work against the recommendations in the service manual.

When creating the maintenance plan, it is important to understand the recommended frequency and scope of the work required to ensure that equipment will remain safe and reliable. Ensure there is a clear maintenance schedule for each piece of equipment, as well as plans for more significant repairs over time.

Note: As electrical equipment ages, consideration should be given to replacement upgrading for the following reasons:

- Aged equipment repairs can be very costly
- Replacement components may be difficult or impossible to source
- As with any mechanical system, the equipment may just reach the end of its life cycle
- Maintenance cost of older equipment may be better spent on new equipment
- Upgrading will allow the system to enjoy newer technology, products and safety features such as ground fault and arc fault protection as well as better monitoring

d Applicable Standards

There are also a number of standards that will help you and those assisting you to develop a comprehensive maintenance plan including:

- **CSA Z463-18 Maintenance of electrical systems**
- **ANSI/NETA MTS-2007 Standard for Maintenance Testing Specifications for Electrical Distribution Equipment and Systems**
- **NFPA 70B Recommended Practice for Electrical Equipment Maintenance**

Note: These standards should be used and referenced by individuals familiar with maintenance planning and the use of the standard.

While this guide focuses on the electrical maintenance plan, the breakdown of any single system can impact other systems and cause their eventual failure. It's important to develop a comprehensive maintenance plan that includes all building systems to ensure that your building continues to operate safely and reliably.

Executing Your Maintenance Plan

Once you've created a maintenance plan, it's time to begin conducting regular maintenance and repair. The evolution of your plan will depend on your installation complexity, building condition and previous maintenance and repair. **Below are some key requirements to keep in mind as you execute your maintenance plan:**

1 Hiring a Licensed Electrical Contractor (LEC) to Perform Maintenance

Where a property owner or manager does not directly employ maintenance staff who are competent to undertake the work under a maintenance plan, the owner or manager will be required to hire a LEC. ESA recommends you ask key questions to ensure they are capable of undertaking the required work:

Q. Do you have experience performing electrical maintenance of the critical electrical equipment found in these types of residential buildings?

Q. What is your ECRA/ESA license number and can you provide three references where you performed similar maintenance work?

Q. Are you familiar with and trained on electrical maintenance standards, such as CSA Z463 or equivalent, and what they require?

Q. Can you provide me with options which include cost/benefits of maintenance compared to replacement?

Q. Does your company have the appropriate resources including test equipment to undertake the complex tasks associated with ensuring the safety and reliability of the electrical infrastructure?

Q. Are you prepared for unexpected events including sourcing replacement parts for the existing electrical equipment?

2 Notification of Work

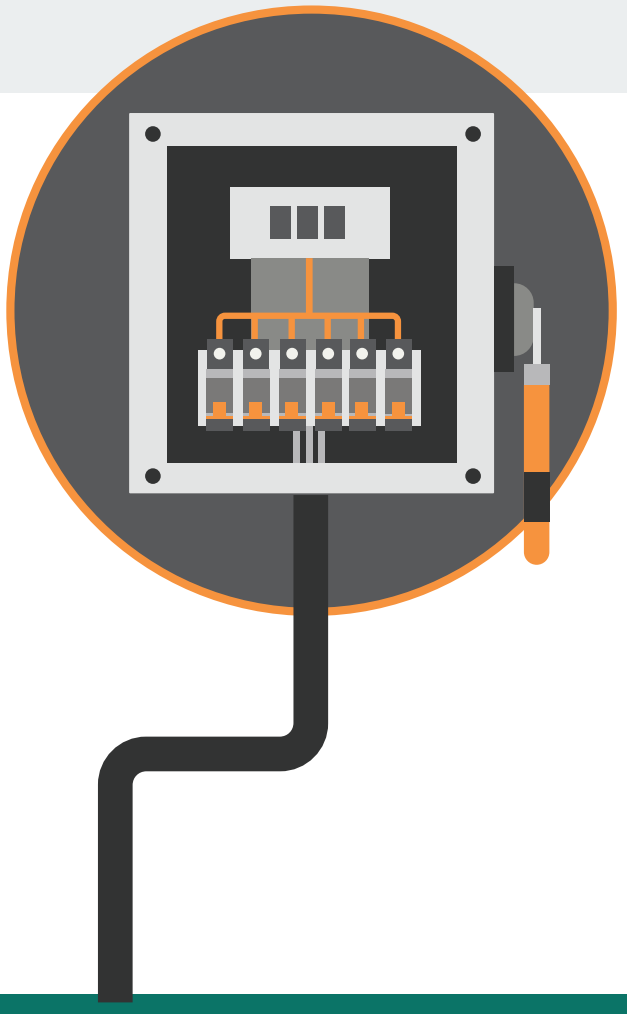
Always file the necessary notifications of work with ESA and request inspection of electrical work. You may also wish to inform municipal officials of any potential outages related to maintenance. Where an inspection is required, be prepared to supply ESA with records, including recent electrical maintenance and repairs, testing results and any identified and/or outstanding electrical deficiencies.

3 Regular Testing

Most maintenance and repair work is inspected visually, which will not detect some potentially dangerous problems. ESA recommends periodically performing insulation resistance and infrared tests, which can identify electrical issues not visible to the naked eye that can be addressed during regular maintenance. Periodic operation of electrical equipment is important to identify where repair or replacement is required (i.e. switches, circuit breakers, etc.).

4 Shutting Down Power

The Ontario Electrical Safety Code requires that no repairs or alterations be carried out on energized (live) equipment, except where complete disconnection of the equipment is not feasible. However, there are instances where testing can only be done energized including non-contact diagnostics such as infrared imaging. Where the main service of a building needs to be disconnected, a planned power outage to all or parts of the building will need to be coordinated by the property owner with the residents, local utility company and the Licensed Electrical Contractor who is doing the assessment. It is also important to contact your municipal government to inform them of the shutdown.



5 Educating Tenants

Improve the overall safety of your building by ensuring tenants know what their electrical safety responsibilities are, including:

- Ensuring they follow safe practices within their home, including not tampering with the electrical wiring in their unit, throwing out frayed cords or overloading the circuit by plugging in too many devices. Extension cords must be rated to carry the current of the appliances they connect.

! Tenants should not complete any repairs without consulting you.

6 ESA Programs

ESA's Continuous Safety Services (CSS) program offers services designed to increase electrical safety and compliance in facilities and support the requirements of the Ontario Electrical Safety Code.

The program offers:

✓ Facility Review

An ESA electrical inspector will conduct a visual inspection of your electrical system.

✓ Periodic Inspections

The CSS program offers regular inspections of electrical work in conjunction with maintenance activities. You will receive detailed inspection reports, which identify and prioritize electrical concerns (defects) that require action.

✓ Code Advice & Training

Members of the CSS program receive information and guidance on electrical safety and Code issues from a dedicated electrical inspector backed by a team of technical experts. Members also receive access to a number of general and technical electrical training workshops.

For further information on the CSS program or to apply to become a member of the program, please call **1-877-854-0079** or email at **CSS.ContactUs@electricalsafety.on.ca**

Important:

Under the Ontario Electrical Safety Code, property owners are responsible for ensuring that their electrical systems and equipment are maintained and compliant with the requirements of the Code. This guide provides information about considerations that may be of assistance in developing a strategy to meet this requirement.

This guide should not be interpreted as an exhaustive summary of the requirements of the Code and does not constitute legal or technical advice for any particular property, or at all. Every property is different and owners should ensure that they obtain professional advice, including from a Licensed Electrical Contractor, to create a maintenance plan that is appropriate for their property, taking into account factors such as the age of the system, the type of equipment, the frequency and type of past maintenance, etc.