OTTAWA ELECTRICAL

Wiring & Rewiring

Knob and tube, aluminum wiring, rewiring, and wire sizing

6 Expert Answers from Construction Brain

electricalottawa.ca/construction-brain

Table of Contents

Q1

How much does it cost to rewire a 1,500 sq ft house in Ottawa?

Rewiring a 1,500 square foot house in Ottawa typically costs between $8,000 and $15,000, depending on the complexity of the job, accessibility of wiring routes, and specific electrical needs of your home.

The wide price range reflects several factors that significantly impact the final cost. **Accessibility is the biggest variable** - if your home has an unfinished basement and accessible attic space, the job will be on the lower end of the range. However, if walls need to be opened extensively or if you're dealing with challenging layouts like concrete block construction or multiple stories with limited access, costs can reach the higher end.

What's included in a full rewire covers replacing all the old wiring throughout the house, installing a new electrical panel (usually upgraded to 200 amps), adding sufficient outlets to meet current Ontario Electrical Safety Code requirements, and ensuring all circuits have proper GFCI and AFCI protection where required. Most 1,500 sq ft homes need 15-25 new circuits to properly serve modern electrical loads, including dedicated circuits for major appliances, kitchen countertop outlets, and bathroom requirements.

ESA permits and inspections are mandatory for rewiring work in Ontario, adding approximately $500-800 to your project cost. Your licensed electrician will pull the necessary permits before starting work, and ESA will conduct inspections at rough-in and final stages. This isn't optional - unpermitted electrical work can void your home insurance and create serious safety and resale issues.

The timeline typically runs 3-7 days for most homes, depending on complexity and whether drywall repairs are needed. If you're combining the rewire with a renovation where walls are already open, you'll save significantly on labor costs. However, if the house is finished and lived-in, expect some drywall patching and repainting after the electrical work is complete.

Special considerations that increase costs include knob and tube removal (which requires extra care and often asbestos precautions), aluminum wiring replacement, or upgrading the main service entrance if your current service is inadequate. Homes built before 1950 often have additional challenges that can push costs toward the higher end of the range.

For a detailed estimate on your specific 1,500 sq ft home, Electrical Ottawa offers free consultations where we can assess your current wiring, discuss your electrical needs, and provide an accurate quote based on your home's unique characteristics and your family's electrical requirements.

Q2

Is aluminum wiring in my 1970s house dangerous?

Yes, aluminum wiring from the 1970s poses significant fire and safety risks and should be addressed by a licensed electrician. While not immediately dangerous if undisturbed, aluminum wiring has caused numerous house fires due to its tendency to overheat at connection points.

Why Aluminum Wiring is Problematic

Aluminum wiring was widely used in Canadian homes from 1965-1975 as a cheaper alternative to copper. However, aluminum has several dangerous characteristics that weren't fully understood at the time. It expands and contracts more than copper when heated, causing connections to loosen over time. Aluminum also oxidizes when exposed to air, creating a resistive coating that generates heat. Most problematically, aluminum is incompatible with standard electrical devices designed for copper wiring, leading to arcing and overheating at outlets, switches, and junction boxes.

The **Consumer Product Safety Commission** identified aluminum wiring as a fire hazard, finding homes with aluminum wiring are 55 times more likely to have electrical fires than those with copper wiring. In Ontario, many insurance companies now require disclosure of aluminum wiring and may charge higher premiums or refuse coverage entirely.

Signs Your Aluminum Wiring May Be Failing

Watch for warning signs including warm or hot outlet covers, flickering lights, burning smells near electrical devices, outlets or switches that don't work intermittently, and scorch marks around outlets or panel connections. If you notice any of these symptoms, **shut off the affected circuit immediately and call a licensed electrician** - these are signs of dangerous overheating that could cause a fire.

Solutions for Aluminum Wiring in Ottawa

The **Ontario Electrical Safety Code** requires specific methods for dealing with aluminum wiring. Complete rewiring with copper is the gold standard solution, typically costing $8,000-$15,000 for a 1,500 square foot home. However, there are approved repair methods that are more affordable. **COPALUM crimp connectors** can safely join aluminum wire to copper pigtails at each device, costing $150-$300 per outlet or switch. **AlumiConn wire nuts** are another ESA-approved method for specific applications.

ESA Permit Requirements

Any aluminum wiring remediation work requires an **ESA permit and inspection**. Only licensed electricians can perform this work legally in Ontario. The electrician will assess your specific situation, determine the best repair method, and ensure all work meets current code requirements. Insurance companies typically require documentation that aluminum wiring has been professionally addressed.

Immediate Safety Steps

While planning your aluminum wiring solution, avoid overloading circuits, don't use extension cords as permanent solutions, and have any warm outlets or switches inspected immediately. **Never attempt DIY repairs on aluminum wiring** - improper connections are extremely dangerous and will void your insurance coverage.

For a comprehensive assessment of your aluminum wiring and ESA-compliant repair options, Electrical Ottawa's licensed electricians can provide a detailed evaluation and quote for bringing your 1970s home up to current safety standards.

Q3

Can I use 14 gauge wire on a 20 amp circuit?

No, you cannot use 14 AWG wire on a 20-amp circuit. This violates the Ontario Electrical Safety Code and creates a serious fire hazard because the wire cannot safely carry the current that the breaker allows.

Under the Ontario Electrical Safety Code, **14 AWG wire is rated for maximum 15 amps**, while **12 AWG wire is required for 20-amp circuits**. The wire gauge must match or exceed the circuit breaker rating to prevent overheating. When you put 14 AWG wire on a 20-amp breaker, the wire becomes the weak link - it can overheat and start a fire before the breaker trips to protect it.

This is a fundamental electrical safety principle: the **protective device (breaker) must protect the conductor (wire)**. A 20-amp breaker won't trip until current exceeds 20 amps, but 14 AWG wire starts overheating around 15 amps. That 5-amp gap is where fires start. The wire insulation breaks down from heat, creating arcing and potentially igniting surrounding materials.

ESA inspectors will fail any installation where wire gauge doesn't match the breaker rating. This isn't just about passing inspection - it's about preventing house fires. Insurance companies may also deny claims if they discover code violations contributed to electrical fires.

If you have an existing 20-amp circuit that needs more capacity, the proper solution is to **upgrade the wire to 12 AWG throughout the entire circuit run** - from the panel to every outlet and switch. You cannot mix wire gauges on the same circuit. Alternatively, if you only need 15 amps of capacity, you could downgrade the breaker to 15 amps, but this reduces the circuit's usefulness.

This type of work requires an ESA permit and licensed electrician in Ontario. Homeowners cannot legally modify circuit wiring or breaker ratings. The electrician will ensure proper wire sizing, connections, and that the work

passes ESA inspection.

For electrical work in Ottawa, Electrical Ottawa connects you with ESA-licensed electricians who understand Ontario code requirements and will ensure your circuits are safe and compliant.

Q4

What are the signs of faulty electrical wiring?

Faulty electrical wiring shows several warning signs that Ottawa homeowners should never ignore - from flickering lights and burning smells to frequently tripping breakers and warm outlets. These symptoms often indicate serious safety hazards that require immediate attention from an ESA-licensed electrician.

Visual and Physical Warning Signs

The most obvious indicators of wiring problems are things you can see and feel. **Flickering or dimming lights** when appliances turn on suggests your circuits are overloaded or connections are loose. **Warm or hot outlets and switch plates** indicate dangerous resistance in the wiring that can cause fires. **Scorch marks around outlets** or **discolored wall plates** show that arcing has already occurred - this is a fire hazard requiring immediate professional attention.

Burning smells are perhaps the most serious warning sign. If you smell something burning but can't identify the source, it could be overheating wires inside your walls. In Ottawa's older homes, this is particularly common with **knob and tube wiring** that's been covered with insulation, creating a dangerous fire risk that insurance companies often won't cover.

Electrical Performance Issues

Your home's electrical system will tell you when it's struggling. **Frequently tripping breakers** or **blown fuses** indicate circuits are overloaded or there's a short circuit somewhere. While occasional tripping during heavy usage is normal, constant trips suggest your wiring can't handle your electrical demands safely.

Mild electrical shocks from appliances or outlets point to grounding issues or damaged wiring. In Ontario's climate, this is especially dangerous in areas with moisture like kitchens, bathrooms, and basements where GFCI protection is required by the Ontario Electrical Safety Code.

Age-Related Wiring Hazards

Ottawa homes built before 1970 often have **knob and tube wiring**, which becomes dangerous when insulation is added around it. Homes from the 1960s-1980s may have **aluminum wiring**, which expands and contracts differently than copper, leading to loose connections and fire risks. **Federal Pacific or Zinsco panels** from this era are known fire hazards that fail to trip during overloads.

When to Call for Emergency Service

Some signs require immediate action. **Strong burning smells** mean you should shut off your main breaker and leave the home if the smell is overwhelming. **Sparking outlets** should be avoided entirely - shut off that circuit

immediately. **Any visible wire damage** or **exposed conductors** are electrocution hazards requiring emergency electrical service.

For Ottawa homeowners experiencing these warning signs, don't wait for the problem to worsen. Electrical fires cause millions in damage annually, and faulty wiring kills. Contact Electrical Ottawa for a comprehensive electrical safety inspection - we'll identify hazards and provide solutions that meet ESA requirements and protect your family's safety.

Q5

How do I know if my house wiring is up to code?

Your house wiring may not be up to current Ontario Electrical Safety Code standards, especially if it's over 20 years old or has never been updated. Most homes built before 2000 will have some code deficiencies by today's standards, though they may have been compliant when originally installed.

The most reliable way to determine if your wiring meets current OESC requirements is to have a licensed electrician perform a comprehensive electrical inspection. They'll check your panel, circuits, outlets, and safety devices against current ESA standards. This inspection typically costs $200-400 in Ottawa and provides a detailed report of any code violations or safety concerns.

Common code deficiencies in older Ottawa homes include missing GFCI protection within 1.5 meters of sinks, lack of AFCI protection in bedrooms, insufficient grounding, outdated panels (especially Federal Pacific or Zinsco brands), and inadequate circuit capacity for modern electrical loads. Homes with knob and tube wiring or aluminum branch circuits will definitely need updates to meet current safety standards.

Key areas ESA inspectors focus on include proper GFCI protection in bathrooms, kitchens, garages, and outdoor areas, adequate panel clearances (1 meter in front, specific side clearances), proper grounding throughout the home, and tamper-resistant outlets in newer installations. If you're planning renovations, any new work must meet current code regardless of your home's age.

Signs your wiring needs attention include frequently tripping breakers, flickering lights, warm outlets or switch plates, burning smells, or any sparking. Federal Pacific or Zinsco panels should be replaced immediately due to fire risks, and knob and tube wiring with insulation creates serious fire hazards.

Insurance companies increasingly require electrical inspections for homes over 40 years old, and some won't insure homes with knob and tube or aluminum wiring without upgrades. If you're buying or selling a home, an electrical inspection can prevent costly surprises and ensure safety compliance.

For your specific situation, contact a licensed electrician from Electrical Ottawa for a thorough assessment. They can identify code violations, prioritize safety concerns, and provide estimates for bringing your electrical system up to current OESC standards. Remember, electrical work in Ontario requires ESA permits and inspections - this isn't a DIY assessment.

Q6

How often should electrical wiring be replaced in an old house?

Electrical wiring doesn't have a fixed replacement schedule, but most residential wiring lasts 40-70 years depending on the type and conditions. However, homes built before 1980 in Ottawa often need attention due to outdated wiring systems that don't meet current safety standards.

The timeline for replacement largely depends on what type of wiring your home has. **Knob and tube wiring**, common in Ottawa homes built before 1950, should be replaced immediately as it's a serious fire hazard, especially when combined with modern insulation. Many insurance companies won't cover homes with active knob and tube wiring. **Aluminum wiring** from the 1960s-70s is also problematic due to fire risks from loose connections and should be remediated or replaced.

Modern copper wiring installed from the 1980s onward typically lasts 50-70 years with proper maintenance. However, even newer wiring may need upgrading if your electrical panel is outdated (like Federal Pacific or Zinsco panels), if you're adding major appliances like EV chargers, or if you're experiencing frequent breaker trips.

Warning signs that indicate immediate replacement needs include: burning smells, flickering lights, outlets that spark or feel warm, frequent breaker trips, or visible damage to wiring. In Ottawa's climate, basement moisture can accelerate wiring deterioration, particularly in older homes with poor moisture control.

Under the Ontario Electrical Safety Code, any major rewiring requires ESA permits and inspections. A licensed electrician should evaluate your wiring if your home is over 40 years old, especially before major renovations or if you're experiencing electrical issues. The cost for whole-home rewiring in Ottawa typically ranges from $8,000-$15,000 for a 1,500 square foot home, but partial updates focusing on problem areas can be more affordable.

Rather than waiting for a predetermined timeline, have your electrical system inspected every 10-15 years by a licensed electrician, or immediately if you notice any warning signs. This proactive approach ensures safety while avoiding unnecessary full replacements when targeted updates might suffice.

For a professional assessment of your home's electrical system, Electrical Ottawa's ESA-licensed electricians can evaluate your wiring and recommend the most cost-effective approach to ensure your family's safety.

Disclaimer: This guide is provided for informational purposes only by Ottawa Electrical. It does not constitute professional advice. Always consult qualified, licensed contractors and your local building authority before starting any construction or renovation project. Information is current as of March 15, 2026 and may change. Visit **electricalottawa.ca** for the latest answers.