TORONTO ELECTRICAL REPAIR

Panels & Breakers

Panel upgrades, breaker replacement, fuse box conversion, sub-panels, and load calculations for GTA homes

15 Expert Answers from Electric IQ

torontoelectricalrepair.com/construction-brain

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Q1

What's the cost difference between a main breaker panel and a main lug panel for a garage sub-panel installation?

For a garage sub-panel installation in the GTA, you'll want a main lug panel, which typically costs $50-150 less than a main breaker panel of the same size. Main lug panels are the correct and code-compliant choice for sub-panels since the main breaker protection is already provided at your house's main panel.

Main Lug vs Main Breaker Panel Costs: A 60A main lug sub-panel runs $200-400 for the equipment, while a 60A main breaker panel costs $250-550. For a 100A sub-panel, expect $300-500 for main lug versus $400-650 for main breaker. The price difference reflects the additional main breaker hardware and mechanisms in the main breaker version.

Why Main Lug is Correct for Garage Sub-Panels: Main lug panels receive power through lugs (connection points) rather than a built-in main breaker. This is exactly what you want for a sub-panel because the overcurrent protection comes from the feeder breaker in your main house panel. Installing a main breaker panel as a sub-panel creates redundant protection and violates Ontario Electrical Safety Code requirements for proper grounding and bonding in sub-panel installations.

Complete Garage Sub-Panel Installation Costs: The panel itself is just one component. A complete 60A garage sub-panel installation in the GTA typically runs $1,200-2,000, including the main lug panel ($200-400), 8/3 or 6/3 copper wire for the feeder circuit ($3-8 per foot depending on run length), 60A breaker for your main panel ($25-40), conduit and fittings for underground or overhead run ($2-5 per foot), grounding electrode and wire, ESA permit ($150-250), and labour for trenching, wire pulling, and connections.

GTA-Specific Considerations: Many Toronto-area garages are detached and require underground wiring, which means TECK cable or wire in PVC conduit buried 18 inches deep. Frost heave from our freeze-thaw cycles can shift underground conduit over time, so proper installation with expansion fittings is crucial. If you're planning EV charger installation in the garage, size the sub-panel for future expansion — a 100A sub-panel provides capacity for a Level 2 EV charger (40-50A) plus garage outlets, lighting, and workshop equipment.

When You Need Professional Help: Sub-panel installation requires an ESA permit and licensed electrician. The work involves calculating load requirements, sizing the feeder circuit properly, installing correct grounding and bonding, coordinating with Toronto Hydro if service entrance modifications are needed, and ensuring all connections meet code requirements. Improper sub-panel installation can create serious safety hazards including electrocution risk and fire hazards from incorrect grounding.

Need help finding a licensed electrician for your garage sub-panel project? Toronto Electrical Repair can match you with local professionals through the Toronto Construction Network for free estimates.

Q2

How much does it cost to replace a 100 amp panel with a 200 amp panel in a Scarborough semi-detached home?

A 100A to 200A panel upgrade in a Scarborough semi-detached home typically costs $2,000-$5,000, with most projects falling in the $2,500-$3,500 range. The final cost depends primarily on whether your existing service entrance cable and meter base can support 200A or need replacement as well.

Panel-Only Upgrade ($2,000-$3,000) If your home already has 200A-rated service entrance cable running from Toronto Hydro's transformer to your meter base, and the meter base itself is rated for 200A, your electrician can simply replace the panel box and main breaker. This scenario is common in Scarborough homes built in the 1970s-80s where the original installation included 200A service entrance infrastructure but only a 100A panel. The work involves disconnecting power at the meter (coordinated with Toronto Hydro), removing the old panel, installing the new 200A panel box, transferring all existing circuits to appropriately-sized breakers, and reconnecting the main feed.

Full Service Upgrade ($3,500-$5,000) Many Scarborough semi-detached homes from the 1950s-70s have 100A service entrance cable that cannot safely carry 200A. In these cases, Toronto Hydro must install new service entrance cable from the street transformer to your meter base, your electrician installs a new 200A-rated meter base and panel, and the entire service entrance gets upgraded. This work requires Toronto Hydro coordination for disconnection and reconnection, which can add 2-4 weeks to the project timeline and $500-$1,000 to the cost.

GTA-Specific Considerations for Semi-Detached Homes Scarborough's semi-detached housing stock presents unique challenges that can affect pricing. Many of these homes share a service entrance location with the adjacent unit, requiring careful coordination with neighbors and sometimes shared costs for utility upgrades. The narrow side yards typical in Scarborough semis can make meter base access challenging, potentially requiring additional conduit work or service entrance relocation. Winter scheduling is particularly important — Toronto Hydro prioritizes emergency service calls during ice storms, so non-emergency service upgrades can face delays from December through March.

What's Included in the Cost The quoted range includes the 200A panel box ($300-$800 depending on brand and number of circuits), all necessary breakers including AFCI breakers for bedroom circuits as required by current Ontario Electrical Safety Code ($200-$600 for a typical home), ESA permit and inspection ($150-$300), labour for panel installation and circuit transfer (6-10 hours), and basic circuit labeling. If your home has knob-and-tube wiring or aluminum branch circuits, expect additional costs for bringing those circuits up to current code standards.

Additional Costs to Consider GFCI outlets may need installation in bathrooms, kitchens, and outdoor locations if not already present ($200-$350 per outlet). Smoke detector circuits might require upgrading to hardwired

interconnected units ($300-$800 for a typical semi). If you're planning an EV charger installation, discuss the wiring route during the panel upgrade to potentially save on future installation costs.

ESA Permit and Timeline Your licensed electrician will pull the ESA permit before starting work. The upgrade typically takes one full day, with power restored the same day in most cases. ESA inspection occurs within 3-7 business days of completion. Keep the ESA certificate permanently with your home records — it's required documentation for insurance and resale.

Why 200A Makes Sense in Scarborough Most Scarborough semis are 1,200-1,800 square feet with electric heating, central air conditioning, and modern appliance loads. A 200A panel provides capacity for EV charger installation (40-50A), hot tub addition (40-60A), basement suite electrical (60-100A sub-panel), and future electrical expansion without overloading. Given Toronto's ice storm history, many homeowners also add generator transfer switches, which require adequate panel capacity.

Need help finding a licensed electrician for your panel upgrade? Toronto Electrical Repair can match you with local professionals who specialize in service upgrades in Scarborough's semi-detached housing stock.

Q3

Why does my electrician say I need to move my panel away from the bathroom wall in my Brampton home?

Your electrician is correct — electrical panels cannot be installed directly adjacent to bathroom walls due to moisture and accessibility concerns under the Ontario Electrical Safety Code. This is a safety requirement that protects both the electrical system and anyone working on it.

Moisture and Safety Concerns

Bathrooms generate significant moisture from showers, baths, and daily use, and this humidity can migrate through walls and affect electrical equipment. Even though your panel is technically outside the bathroom, moisture can penetrate drywall, especially in older Brampton homes where vapor barriers may be inadequate or damaged. When moisture reaches electrical connections inside a panel, it causes corrosion, arcing, and potential fire hazards. The combination of electricity and moisture is particularly dangerous for anyone working on the panel — a damp environment increases the risk of electrical shock or electrocution.

The Ontario Electrical Safety Code requires electrical panels to be installed in dry locations with adequate clearance from moisture sources. While the code doesn't specify an exact distance from bathroom walls, ESA inspectors typically require panels to be relocated if they're directly adjacent to bathroom walls, especially in older

homes where moisture control may be compromised.

Brampton Housing Stock Context

Many Brampton homes built in the 1970s-1990s have panels located in basements or utility rooms that happen to be adjacent to basement bathrooms or powder rooms. These installations were often done before current moisture control standards, and the original electrical work may not have considered long-term moisture migration. In split-level homes common throughout Brampton, panels are frequently located in basement utility areas that share walls with half-baths or laundry rooms with utility sinks.

Relocation Requirements and Costs

Moving a panel typically involves installing a new panel in an approved location and running new service entrance cable from the meter base. The new location must provide adequate working clearance (36 inches in front, 30 inches wide, 78 inches high), be easily accessible, and be in a dry location away from moisture sources. **Panel relocation in the GTA typically costs $3,000-$6,000**, including the new panel, service entrance cable, ESA permit, and coordination with your local utility for temporary disconnection.

Your electrician will need to pull an ESA permit for this work, and an inspector will verify the new location meets code requirements before energizing the system. The old panel location will need to be properly sealed and any wall penetrations repaired.

Timing and Practical Considerations

This type of work requires utility coordination for disconnection and reconnection, so plan for a full day without power. If you're planning any basement renovations, this is an ideal time to relocate the panel to a more convenient and code-compliant location. Many Brampton homeowners use panel relocation as an opportunity to upgrade from 100A to 200A service, especially if they're considering EV charger installation or other high-demand electrical additions.

Need help finding a licensed electrician for your panel relocation? Toronto Electrical Repair can match you with local professionals familiar with Brampton's housing stock and ESA requirements.

Q4

What's a realistic budget for adding a sub-panel in my finished basement in Mississauga?

A sub-panel installation in a finished Mississauga basement typically costs $1,500-$3,000, depending on the panel size, distance from your main panel, and whether drywall needs to be opened for the feeder cable run.

The cost breaks down into several key components. The **sub-panel itself** runs $200-$500 for a 60-100A panel box with breakers. A 60A sub-panel handles 8-12 circuits and works well for basement family rooms, home offices, and workshop areas. A 100A sub-panel supports 16-20 circuits and makes sense if you're planning extensive basement electrical including multiple outlets, lighting circuits, and potential future additions like a basement kitchen or separate apartment.

Feeder cable installation is typically the largest cost component at $800-$1,500. Your electrician needs to run appropriately sized cable from your main panel to the sub-panel location — usually 6/3 copper cable for a 60A sub-panel or 4/3 copper cable for a 100A sub-panel. In a finished basement, this often means opening drywall to access ceiling joists or walls for the cable run. The distance matters significantly — a sub-panel 20 feet from your main panel costs less than one 60 feet away due to cable length and labour time.

ESA permit and inspection adds $150-$250 to the project. Sub-panel installation requires an ESA permit since you're adding new circuits to your electrical system. The inspector verifies proper wire sizing, grounding, bonding, and panel labelling. **Labour costs** in Mississauga run $85-$120 per hour, with most sub-panel installations taking 6-10 hours depending on complexity.

Your **existing main panel capacity** affects the project significantly. If your main panel is already near capacity, adding a large sub-panel may require a main panel upgrade first, adding $2,000-$4,000 to the total cost. A licensed electrician performs a load calculation to determine if your current service can handle the additional circuits.

Finished basement considerations in Mississauga's typical 1970s-1990s housing stock include working around existing drywall, flooring, and drop ceilings. Opening and patching drywall adds $200-$500 to the project. If your basement has a suspended ceiling, cable routing is easier and less expensive. Concrete block foundation walls common in this era may require special mounting hardware for the sub-panel.

Additional costs might include upgrading your main panel's grounding system if it doesn't meet current code requirements ($200-$400), installing additional circuits from the sub-panel to new outlets or fixtures ($150-$300 per circuit), and any drywall repair and painting after cable installation ($300-$800 depending on extent).

Timing considerations for Mississauga homeowners include winter heating load impacts — if your main panel is already heavily loaded during peak heating season, adding a sub-panel without upgrading the main service could

cause issues. Spring and fall are ideal times for this work when electrical demand is lower.

The project typically takes 1-2 days to complete. Your electrician installs the sub-panel, runs the feeder cable, makes connections at both panels, and schedules the ESA inspection. Power to affected circuits is off during connection work, usually 2-4 hours total.

When planning your budget, add 10-15% contingency for unexpected issues like discovering aluminum wiring in older Mississauga homes, needing additional grounding upgrades, or finding that your main panel requires updating to support the sub-panel safely.

Need help finding a licensed electrician for your sub-panel project? Toronto Electrical Repair can match you with local Mississauga electricians who specialize in residential panel work and basement electrical upgrades.

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Q5

How much clearance does Ontario code require in front of an electrical panel and what counts as a violation?

Ontario Electrical Safety Code requires a minimum of 1 metre (39 inches) of clear working space directly in front of electrical panels, with no obstructions that would prevent safe access or emergency operation.

The **working space requirements** are strictly enforced during ESA inspections because electricians need safe access to diagnose problems, reset breakers, and perform emergency shutoffs. This 1-metre clearance must extend the full width and height of the panel — you can't have just a narrow pathway to reach the panel door.

What specifically counts as a violation:

- Storage boxes, furniture, or equipment placed within 1 metre of the panel face
- Laundry baskets, cleaning supplies, or seasonal storage in front of basement panels
- Water heaters, furnaces, or other mechanical equipment installed too close to the panel
- Shelving units that extend into the clearance zone, even if there's a walkway underneath
- Hanging clothes lines or storage hooks that could interfere with panel access
- Any permanent or semi-permanent obstruction that would prevent an electrician from safely working on the panel

Additional clearance requirements include adequate headroom (minimum 2 metres above the working space) and sufficient width (minimum 75 cm, but the working space must be at least as wide as the panel). The floor in front of the panel must be level and firm — you can't have the panel mounted above stairs or an uneven surface.

Common GTA violations include basement panels blocked by storage in older Toronto homes, condo utility rooms where water heaters are installed too close to panels, and garage panels obstructed by seasonal storage or workbenches. During home inspections and ESA permit work, these violations must be corrected before the electrical work can pass inspection.

Practical implications for homeowners: if you're planning electrical work requiring an ESA permit, clear the area around your panel before the electrician arrives. If your panel currently violates clearance requirements, this will need to be addressed as part of any permitted electrical work. Moving a water heater or relocating storage is often less expensive than relocating the entire electrical panel to meet code requirements.

Emergency access considerations are critical — during power outages, electrical emergencies, or ice storms (common in the GTA), you need immediate access to your panel to shut off power or reset breakers. A blocked panel during an emergency could prevent you from safely de-energizing circuits during flooding, appliance malfunctions, or other hazardous situations.

Need help finding a licensed electrician to assess your panel clearance or perform electrical work? Toronto Electrical Repair can match you with local professionals through the Toronto Construction Network.

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Q6

How long does a 200 amp panel upgrade take to complete?

A typical 200 amp panel upgrade in a GTA home takes one full day, usually six to ten hours of on-site work, though the total timeline from permit to final inspection can stretch to two or three weeks. The actual electrical work is usually completed in a single visit, but the process involves more than just swapping equipment.

The timeline starts before your electrician ever picks up a tool. They will need to apply for an ESA permit, which can be done online and is usually issued within a day or two. If your service entrance cable and meter base also need replacement to support the full 200 amp capacity, your electrician will coordinate with Toronto Hydro to schedule a temporary disconnect. Toronto Hydro typically requires five to ten business days' notice for a planned disconnect, and this scheduling step is often the longest part of the process. During peak summer months when panel upgrades and EV charger installations are in high demand, Toronto Hydro wait times can stretch even longer.

On the day of the upgrade, your electrician will shut off power to your home, remove the old panel, install the new 200 amp panel, reconnect all existing circuits, label everything clearly, and restore power. If the meter base and service entrance cable are also being replaced, the work may extend into a second day. Homes built before 1975 in neighbourhoods like Scarborough, North York, and Etobicoke often have undersized service entrance cables that cannot carry 200 amps, meaning the cable from the meter to the panel must be upgraded as well. This adds two to four hours to the job.

After the work is complete, your electrician notifies the ESA for inspection. In the GTA, ESA inspectors typically schedule visits within three to seven business days, though during busy periods this can take up to two weeks. You can use your electrical system normally while waiting for inspection. The total cost for a full 200 amp upgrade in the GTA runs $2,000 to $5,000, with the higher end reflecting homes that need a complete service entrance replacement. If you are planning a panel upgrade, Toronto Electrical Repair can match you with a licensed electrician for free to assess your specific situation and provide a detailed quote.

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Q7

What is a sub-panel and when would my home need one?

A sub-panel is a secondary electrical panel that draws power from your main panel and distributes it to circuits in a specific area of your home, such as a detached garage, basement suite, workshop, or addition. You would need one whenever you are adding significant electrical capacity to an area that is far from your main panel or when your main panel is physically full but still has available amperage.

Sub-panels are extremely common in GTA homes undergoing renovations or additions. If you are finishing a basement in a Mississauga or Brampton home and need six to ten new circuits for lighting, outlets, a bathroom fan, and a dedicated circuit for a space heater or mini-split, running all those circuits individually back to the main panel would be impractical and expensive. Instead, your electrician runs a single large feeder cable from the main panel to a sub-panel located in or near the basement, then runs all the new circuits from there. This saves on wire, reduces the number of long runs through your home, and keeps everything organized.

The same logic applies to detached garages and workshops. Many homeowners across Vaughan, Markham, and Richmond Hill want dedicated power for woodworking tools, EV chargers, or workshop lighting. A 60 amp or 100 amp sub-panel in the garage, fed by a properly sized feeder cable from the main panel, gives you room for multiple circuits without overloading anything. For a detached structure, the feeder cable typically runs underground in approved conduit, and your electrician will ensure proper grounding and bonding at the sub-panel location as required by the Ontario Electrical Safety Code.

One critical point that many homeowners miss is that your main panel must have enough spare capacity to support the sub-panel. If your main panel is rated at 100 amps and is already carrying a heavy load, adding a 60 amp sub-panel could push you past your service capacity. Your electrician will perform a load calculation to determine whether your existing service can handle the additional demand or whether you need a main panel upgrade first. In the GTA, a sub-panel installation typically costs $1,200 to $2,500, not including the main panel upgrade if one is needed. An ESA permit is required for all sub-panel installations. If you are planning an addition, garage conversion, or basement finish, Toronto Electrical Repair can match you with a licensed electrician who can assess your panel capacity and recommend the right approach.

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Q8

How much does it cost to replace a fuse box with a breaker panel in Toronto?

Converting a fuse box to a modern circuit breaker panel in the GTA typically costs $2,500 to $4,500, depending on whether the service entrance and meter base also need upgrading. This is one of the most common electrical projects in older Toronto neighbourhoods, and it is almost always worth the investment for safety, convenience, and insurance compliance.

Fuse boxes are found in homes built before the mid-1960s, particularly in established Toronto neighbourhoods like the Annex, Cabbagetown, Riverdale, High Park, Leslieville, and the older parts of Scarborough and Etobicoke. Most of these fuse boxes are rated at 60 amps, which was adequate when homes had a few lights, a refrigerator, and maybe a window air conditioner. Today, with central air conditioning, multiple kitchen appliances, home offices, EV chargers, and entertainment systems, 60 amps is dangerously insufficient. The fuse box itself is also a concern because homeowners often install higher-rated fuses to stop them from blowing, which allows wires to carry more current than they are rated for and creates a hidden fire hazard inside the walls.

The conversion process involves removing the old fuse box and installing a new 200 amp breaker panel in its place. In most cases, the service entrance cable running from the meter to the panel also needs replacement because the original cable is only rated for 60 or 100 amps. Your electrician will coordinate with Toronto Hydro for a temporary disconnect, which typically requires five to ten business days' advance notice. The meter base on the exterior of your home may also need replacement if it is the original equipment. A straightforward fuse box to breaker panel swap where the service entrance is already adequate runs $2,500 to $3,000. When the full service entrance, meter base, and panel all need replacement, the cost rises to $3,500 to $4,500.

An ESA permit is mandatory for this work, and the cost of the permit is typically included in your electrician's quote. Many Ontario insurance companies now require fuse box replacement as a condition of coverage, so this upgrade may actually save you money on premiums or prevent policy cancellation. The entire project usually takes one day of on-site work. If your home still has a fuse box, Toronto Electrical Repair can match you with a licensed electrician for a free estimate through the Toronto Construction Network at torontoconstructionnetwork.com/directory?trade=electrical.

Q9

What is a load calculation and why does my electrician need to do one?

A load calculation is a detailed assessment of how much electrical demand your home places on its panel and service entrance, and your electrician needs to do one before any major electrical addition to ensure your system can safely handle the new load. Without a load calculation, adding a high-draw circuit like an EV charger, hot tub, or electric range could push your panel past its rated capacity, causing chronic breaker trips or creating a fire hazard.

The calculation follows a specific method outlined in the Ontario Electrical Safety Code. Your electrician adds up the wattage of every electrical load in your home, including general lighting and outlets, kitchen circuits, laundry circuits, heating and cooling equipment, water heater, dryer, range, and any other fixed appliances. The code applies demand factors that account for the fact that not everything runs simultaneously. For example, your oven and your air conditioner rarely operate at the same time at full capacity. After applying these demand factors, the result is your home's calculated electrical demand in amps. This number is then compared against your panel's rated capacity.

In practical terms, load calculations matter most for GTA homeowners in three common scenarios. The first is EV charger installation. A Level 2 charger draws 40 to 50 amps continuously, which is a massive load to add to any panel. If your home has 100 amp service and your calculated demand is already at 80 amps, you cannot safely add a 40 amp EV charger without upgrading to 200 amp service first. The second scenario is adding central air conditioning to a home that previously had window units. A central AC system draws 20 to 30 amps, and in post-war homes across Scarborough, North York, and the inner suburbs with 100 amp panels, this addition often requires careful analysis. The third scenario is basement apartments or suites, which are increasingly popular across the GTA. Adding a full kitchen, bathroom, and living space with its own electrical demands requires a formal load calculation to determine whether a sub-panel can be fed from the existing service or whether a service upgrade is needed.

A load calculation typically costs $150 to $300 as a standalone service, though most electricians include it in their quote for panel upgrade or major circuit work. The ESA may require documentation of the load calculation as part of the permit process for major additions. If you are planning any significant electrical addition, Toronto Electrical Repair can match you with a licensed electrician who will perform a proper load calculation before recommending any work.

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Q10

Are Zinsco or Sylvania panels dangerous like Federal Pacific panels?

Yes, Zinsco and Sylvania panels share similar safety concerns as Federal Pacific panels, and if your GTA home has one, you should have it professionally assessed by a licensed electrician. While Federal Pacific Stab-Lok panels get the most attention due to extensive fire loss documentation, Zinsco panels (also sold under the Sylvania and GTE-Sylvania brands) have a well-documented history of breaker failures that can lead to overheating and fire.

The core problem with Zinsco panels is in the breaker-to-bus connection. Over time, the breakers can fuse to the bus bar, making them unable to trip when they should. When a breaker fails to trip during an overload or short circuit, the wiring continues to carry dangerous levels of current, generating extreme heat inside your walls. The plastic bus bar insulation in many Zinsco panels is also prone to melting and deforming under heat, which compounds the problem. Unlike a properly functioning modern panel where a breaker trips and cuts power within milliseconds, a failed Zinsco breaker simply allows the overcurrent to continue until something gives — often with catastrophic results.

These panels were installed primarily from the 1960s through the early 1980s, which means they appear in GTA homes built during the post-war suburban expansion. You will find them in bungalows and split-levels across Scarborough, Etobicoke, North York, and the inner ring suburbs of Mississauga and Brampton. The panel face may say "Zinsco," "Sylvania," "GTE-Sylvania," or "Magnetrip." If you open the panel door and see colour-coded breaker handles — typically red, blue, green, or tan instead of the standard black — that is a strong indicator of a Zinsco panel.

The recommended course of action is straightforward: replace the panel. Unlike some older panels where individual breakers can be swapped for modern equivalents, Zinsco breakers are no longer manufactured, and aftermarket replacements are not considered reliable by most electricians. A full panel replacement with a modern 200 amp Siemens, Square D, or Eaton panel typically costs $2,000 to $4,500 in the GTA, depending on whether the service entrance also needs upgrading. An ESA permit and inspection are required. Many Ontario insurance companies now flag Zinsco and Federal Pacific panels during home inspections and may require replacement as a condition of coverage. If you suspect your home has a Zinsco or Sylvania panel, Toronto Electrical Repair can match you with a licensed electrician for a free assessment.

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Q11

Can I replace a single breaker in my panel myself?

No, you should not replace a breaker yourself. Working inside an electrical panel is one of the most dangerous tasks in residential electrical work, and in Ontario, panel work should always be performed by a licensed electrician. Even with the main breaker turned off, the service entrance cables feeding the panel remain live at 240 volts and carry the full amperage of your service — touching these cables or the bus bars they connect to can cause instant electrocution.

This is a point that catches many homeowners off guard. When you turn off the main breaker in your panel, it disconnects power to all the branch circuit breakers below it, but the lugs at the top of the panel where the service entrance cables connect remain energized. These lugs and the short section of bus bar above the main breaker carry full utility power at all times. The only way to fully de-energize a residential panel is for Toronto Hydro to pull the meter or disconnect power at the transformer — neither of which is something a homeowner can do.

Beyond the immediate electrocution risk, there are practical reasons to have a professional handle breaker replacement. A breaker that has failed may indicate an underlying problem — a short circuit in the wiring, a damaged bus bar connection, or an overloaded circuit that needs to be split. Simply swapping the breaker without diagnosing the root cause can mask a serious hazard. Your electrician will also ensure the replacement breaker is the correct brand and type for your panel. Breakers are not interchangeable between manufacturers — installing a Square D breaker in a Siemens panel, for example, may appear to fit but will not make proper contact with the bus bar, creating a dangerous connection point that can arc and overheat.

The cost of having a licensed electrician replace a single breaker is modest — typically $150 to $300 including the service call, diagnosis, and the breaker itself. A standard breaker costs $8 to $15, an AFCI breaker runs $30 to $50, and a GFCI breaker is $35 to $55. If your electrician discovers that the breaker was tripping due to an underlying wiring issue, the repair cost will depend on the problem. An ESA permit is generally not required for a like-for-like breaker replacement, but if the electrician discovers code violations or additional work is needed, a permit may apply. If you have a breaker that needs replacing, Toronto Electrical Repair can match you

with a licensed electrician who can diagnose the issue and handle the replacement safely.

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Q12

Should I upgrade my panel before a kitchen renovation?

In most cases, yes — a kitchen renovation is one of the best times to assess and likely upgrade your electrical panel, especially if your GTA home has 100 amp service or an older panel with limited space. Modern kitchens are the most electrically demanding rooms in a home, and a renovation is your opportunity to bring everything up to current Ontario Electrical Safety Code requirements.

A modern kitchen requires a surprising number of dedicated circuits. The Ontario Electrical Safety Code mandates at least two 20 amp small appliance circuits for countertop outlets, plus dedicated circuits for the refrigerator, dishwasher, microwave, range hood, and garburator. If you have an electric range, that requires a dedicated 40 or 50 amp circuit with heavy-gauge 8/3 or 6/3 NMD90 wire. A wall oven and separate cooktop each need their own dedicated circuits. Under-cabinet lighting, a kitchen island with outlets, and a built-in coffee station or wine fridge all add circuits. By the time you tally everything, a properly wired modern kitchen can require ten to fifteen circuits — and that is before you account for the rest of the house.

In post-war homes across Scarborough, North York, Etobicoke, and the inner suburbs, the existing panel often has 100 amp service with a mix of 15 and 20 amp circuits. Many of these panels were installed with 20 to 24 circuit spaces, and after decades of additions — a central AC circuit here, a basement circuit there — they are physically full. You cannot add the ten new kitchen circuits you need because there is nowhere to put them. Even if you use tandem breakers where the panel allows them, you may still run out of space or exceed the panel's rated capacity.

The cost calculation usually makes a combined approach the smartest move. A panel upgrade to 200 amps runs $2,000 to $5,000, and the kitchen electrical rough-in will cost $3,000 to $8,000 depending on the number of circuits, the complexity of the wiring runs, and whether walls are open or closed. Doing both at the same time saves money because the electrician is already on site, the walls are already open, and you only need one ESA permit and inspection for the combined scope. Trying to squeeze new kitchen circuits into an already-full panel often leads to problems during inspection, and you may end up paying for a panel upgrade anyway.

Your electrician will perform a load calculation to determine definitively whether an upgrade is needed. If you are planning a kitchen renovation, Toronto Electrical Repair can match you with a licensed electrician who can evaluate your panel capacity and plan the electrical scope alongside your contractor.

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Q13

What happens during an ESA inspection of a new panel installation?

During an ESA inspection of a new panel installation, a certified inspector visits your home to verify that all work complies with the Ontario Electrical Safety Code, checking everything from wire sizing and connections to proper grounding, labelling, and breaker ratings. The inspection typically takes 30 to 60 minutes for a panel upgrade, and you or your electrician should be present in case the inspector has questions.

The inspection process begins after your electrician notifies the ESA that the work is complete and ready for review. In the GTA, inspectors typically schedule visits within three to seven business days of notification, though during peak renovation season in summer, wait times can extend to two weeks. You can use your electrical system normally while waiting for the inspection — the panel is fully functional once your electrician completes the installation.

When the inspector arrives, they will examine several specific elements. They start with the service entrance, checking that the meter base, service entrance cable, and weatherhead are properly installed and secured. At the panel itself, they verify that the panel is the correct size for the service, that all breakers are properly rated for their circuits, and that wire gauges match breaker ratings — 14 gauge wire on 15 amp breakers, 12 gauge on 20 amp, and so on. They check that all connections are properly torqued, that no wires show damage or improper stripping, and that the panel has adequate working clearance in front of it as required by code. Grounding and bonding receive close attention — the inspector verifies the ground wire connection to the grounding electrode (water pipe, ground rod, or Ufer ground), the bonding of the neutral bus to the panel enclosure at the main panel only, and proper separation of neutral and ground buses at any sub-panels.

The inspector also checks that all circuits are clearly and accurately labelled. This is a code requirement that many electricians rush through, and it is one of the most common reasons for inspection corrections. Each breaker must be labelled to identify which area or device it serves. The inspector may test a few circuits to verify accuracy.

If everything passes, the ESA issues a Certificate of Inspection, which you should keep permanently with your home records. This certificate proves the work was done legally and to code, which matters for insurance coverage and at resale. If the inspector finds deficiencies, they will issue a deficiency notice listing what needs correction. Your electrician fixes the issues and schedules a re-inspection, usually at no additional ESA fee for the first re-inspection. Common deficiencies include missing circuit labels, improper bonding, insufficient working clearance, or missing AFCI protection on bedroom circuits. If you need a panel installation or upgrade, Toronto Electrical Repair can match you with a licensed electrician who handles the full process including ESA permits and inspection coordination.

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Q14

Why are tandem breakers not allowed in every panel slot?

Tandem breakers — also called half-size, twin, or duplex breakers — fit two circuits into a single panel slot, but they are only allowed in specific slots designated by the panel manufacturer because of how the internal bus bar is designed. Installing tandem breakers in non-approved slots violates the Ontario Electrical Safety Code and can create unsafe conditions that an ESA inspector will flag.

The reason comes down to the physical design of the panel's bus bar. Inside your electrical panel, a bus bar runs vertically, and each breaker slot connects to the bar at a specific point. Tandem breakers require a slightly different connection geometry than full-size breakers — they use a split jaw that allows two breakers to share a single bus bar connection point. Panel manufacturers engineer specific slots to accept this split connection safely, and they mark these approved positions on the panel's labelling diagram, usually found on the inside of the panel door. If you look at the diagram, you will see which positions accept tandem breakers and which accept only full-size single breakers.

Installing a tandem breaker in a slot not designed for it creates several problems. The breaker may not seat properly on the bus bar, leading to a loose connection that generates heat and can arc. Over time, this arcing damages the bus bar itself, potentially requiring full panel replacement rather than a simple breaker swap. The panel's total circuit capacity is also calculated based on specific positions being occupied by specific breaker types — overloading the panel with tandem breakers beyond its rated capacity can exceed the thermal limits of the enclosure and wiring.

This matters particularly for GTA homeowners because tandem breakers are often used as a workaround when a panel is physically full. In many 1970s and 1980s homes across Mississauga, Brampton, Markham, and

Vaughan, the original 100 amp panel has 20 or 24 spaces, and decades of additions have filled every slot. When a homeowner or contractor needs to add a circuit for an EV charger, hot tub, or basement renovation, tandem breakers seem like a quick fix. But if the panel only allows tandems in four slots and those are already used, the right solution is a panel upgrade — not forcing tandem breakers into non-approved positions.

A licensed electrician will check your panel's labelling diagram to determine how many tandem positions are available and whether they are already occupied. If your panel is genuinely full with no room for approved tandems, a panel upgrade or sub-panel installation is the proper path forward. In the GTA, upgrading to a larger 200 amp panel with 40 or more circuit spaces costs $2,000 to $5,000 and solves the capacity problem permanently. Browse electricians in the Toronto Construction Network directory at torontoconstructionnetwork.com/directory?trade=electrical to find a licensed professional who can evaluate your panel.

Q15

How do I know if my home's electrical panel has been recalled?

The most reliable way to determine if your panel has been recalled or flagged for safety concerns is to have a licensed electrician inspect it, but you can also check the brand name and model on the panel door or interior label yourself. Several panel brands installed in GTA homes from the 1950s through the 1980s are now considered hazardous, and identifying yours is an important first step.

The most commonly flagged panel brands in Ontario homes are **Federal Pacific Stab-Lok**, which has extensive documentation of breakers failing to trip during overloads, and **Zinsco** (also sold as Sylvania and GTE-Sylvania), which has similar breaker failure issues due to breakers fusing to the bus bar. Both brands were widely installed across the GTA during the post-war building boom and suburban expansion. If you live in a home built between 1950 and 1985 in neighbourhoods across Scarborough, North York, Etobicoke, or the inner suburbs, there is a reasonable chance your panel could be one of these brands.

To check your panel, open the panel door — this is the outer cover with the circuit directory on it, not the inner dead front cover that exposes the breakers. Look for a manufacturer name, logo, or model number on the door or on a label inside. Federal Pacific panels typically say "Federal Pacific Electric" or "FPE" and have the distinctive orange Stab-Lok breaker handles. Zinsco panels often have colour-coded breaker handles in red, blue, green, or tan. If you see the name "Challenger" on your panel, these also had recall issues with certain breaker models, though the problems were less widespread than Federal Pacific or Zinsco.

Beyond specific brand recalls, any panel manufactured before 1990 may have age-related issues that compromise safety. Bus bar connections loosen over time, breaker mechanisms wear out, and internal insulation degrades. Older panels also lack modern safety features like AFCI protection, which is now required on bedroom circuits under the Ontario Electrical Safety Code.

From a practical standpoint, if your home has a Federal Pacific, Zinsco, or Sylvania panel, the universal recommendation from electricians and insurance professionals is full replacement. Replacement breakers for these panels are either unavailable or unreliable, and no amount of maintenance can fix the fundamental design flaws. Many Ontario insurance companies now require replacement of these panels as a condition of coverage, and home inspectors routinely flag them during real estate transactions. A full panel replacement in the GTA costs $2,000 to $4,500 depending on whether the service entrance also needs upgrading, and an ESA permit is required. If you are unsure about your panel's safety, Toronto Electrical Repair can match you with a licensed electrician for a free assessment of your panel's condition and brand.

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