

Robart
Electrical Services Ltd.



**A COMPREHENSIVE
GUIDE TO RESIDENTIAL
ELECTRICAL
FOR REALTORS**





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WHAT IS ACCEPTABLE AS A 100 AMP RESIDENTIAL SERVICE? IS IT 60 OR 100 AMPS

Main panel (Part A)



Main panel has no main breaker
Insurance says "unacceptable"



Must have 100 amp main breaker
to be a 100 amp service

Meter sockets (Part B)



Round meter box? "Not
acceptable" by local supply
authority



Square or rectangular
is acceptable for a 100 amp service

Electrical Mast (Part C)



Under soffits, reachable or low on a flat
wall, "unacceptable" by todays
electrical code (unsafe)



3800mm or 12.4' above grade
meets todays code

The information presented in this document is subject to interpretation. Please call 780 238-8195 to clarify individual situations.
The Chief Electrical Inspector for the city of Edmonton and the Insurance bureau of Canada require a 100 amp main breaker to be classified as a 100 amp service



60 OR 100 AMP ELECTRICAL SERVICE IDENTIFICATION

Robart Electrical Services Ltd. in co-operation with the city of Edmonton, Epcor meter room and the inspection group, has created a simple system for identifying the size of an electrical service in residential homes. Over the past 12 years we have offered this tool to thousands of Realtors and home inspectors, in an effort to help them deal with this problem, created by the insurance industry.

To be an upgraded 100 amp service, the following must exist:

- a 100 amp main breaker in the main electrical panel
- the meter socket must be square or rectangular
- the height of the mast above grade (3779 mm or 12'4") above your feet standing in front of the meter.



Today, according to the Insurance Bureau of Canada and the City of Edmonton, the residential services are not classified as a 100 amp service unless they meet the minimum requirement of the Canadian Electrical Code and have a 100 amp main breaker.



All of the equipment ratings and the rating of the service conductors must be rated for 100 amps in order to have a upgraded service. With the push for safety, this is now a minimum standard.

A new panel with a 100 amp breaker in the basement is not an indication of a 100 amp service. Until about 6 years ago, electricians were allowed to only change the electrical panel of a 60 amp service, installing a larger newer panel with a 100 amp main breaker. Then the city decided that this practice was no longer allowed because the new 100 amp rated panel did not correct the 60 amp wiring and equipment on the outside of the house.

60 amp round meter sockets were 2.5" deep. These were installed up to approximately 1956. The newer 100 amp rated round meter sockets were 4" deep. After discussions with an Epcor meter foreman, it was decided that because of the fact that the rating of the round meter sockets could not be verified, all round meter sockets were to be classified as 60 amp.

In approximately 1956, electricians started installing round meter sockets with 2" masts going through the soffits. These in a lot of cases these new masts only contained #4 RW90 wiring rated for 70 amps.



FEDERAL STAB-LOK PANELS CAUSE FIRES

Federal Pioneer breakers are unsafe. The Washington Post on May 9th, 2018 [wrote a column about this topic](#).



It has been a commonly known fact that FPE black bodied breakers have been known to not trip or turn off when they are overloaded. What happens next is that a high current of electricity is allowed to flow in the circuit causing overheating in the wiring located inside the wooden walls of the house. This then caused fires under certain conditions.

We have orders from many clients, for the replacement of old black FPE breakers, but there has not been any new breakers available since November 2020. Since the pandemic, companies that manufacture electrical parts, are closing with no reopening dates in site. This means that there is a lack of parts like breakers and electrical panels.



The U.S. is concerned about all FPE breakers, not just the old black ones. They recommend that the complete Federal panel be upgraded to a new manufacturer with new breakers. In my opinion, this is a good idea. Unfortunately, in some cases, it is highly unrealistic to change a complete panel. Federal and locality city bylaws, make changing a panel very costly.

Contact me at [Robart Electrical Services](#) and I will explain the options.



Robart Electrical Services has been working for years with home buyers and sellers to overcome these problems. We now have ways of correcting these problems economically and efficiently.



PANEL IN THE BATHROOM

Washroom or Bathrooms:
A bathroom is described in the Canadian Code Book as "a room containing bathing or showering facilities and that may also contain a wash basin(s) and/or water closet(s)".



The reason panels are not allowed in a bathroom, is because of the high humidity caused by showers and tubs. It will have a negative effect, over time, on the components of the panel.

A washroom is where you have a 1/2 bath with a water closet and sink without a tub or shower. It's OK to have an electrical panel in the washroom. There must also be 1 meter clearance in front and below the panel and it is advisable to have it enclosed in a wall cabinet with a door.

To relocate a panel out of a bathroom is quite the involved undertaking. The conductors from the old location must be extended to the new location and this is usually done using junction boxes. In Alberta, if you move the panel more than 10 feet from where the service conductors enter the house, you will need to install a disconnect on the outside of the house by the electrical meter. Also FYI, in Edmonton, if you do anything to an electrical service (relocate the panel) you must bring the complete service up to today's standards. This means that changing the meter socket will need to be considered. Today's sockets have an isolated neutral and this is new over the last couple of years.



ELECTRICAL PANEL IN THE WRONG PLACE

When designing the layout for a basement development in your home, there are many things that you have to take into consideration. You must always be aware of limitations and restrictions allowed by the Canadian electrical code. One thing that is a concern is the location of the electrical breaker panel. When the house was constructed, the original electrical contractor installed the electrical panel in a location that was suitable to him but it may not be necessarily in a location that will be legal by today's electrical codes.

Canadian Electrical Code rule 26-600 (1) says "*Panelboards **shall not** be located in a coal bin, clothes closet, bathrooms, stairways, high ambient rooms, dangerous or hazardous locations, nor in any similar undesirable place*".

Cloth closets: In the past years I have come across a lot of basement projects where the original electrical panel, because of design, ended up in the bedroom closet in the basement. The reason the Canadian Electrical Code frowns on this type of installation is because it has the potential to be a fire hazard.



There are a lot of flammable articles in that relatively small enclosed space. Note: In the past, the electrical inspectors have allowed the installation of an electrical panel in a closet with the following changes. The thick round wooden bar that runs from side to side in a closet used to hang coat hooks on, cannot pass above/in-front of the panel. Second there has to be vertical barriers installed on either side of the panel preventing flammable clothing from being in front of the panel. These were special arrangements made with the electrical inspectors. Best thing to do is not put the panel in the closet.





Washroom or Bathrooms: A bathroom is described in the Canadian Code Book as “a room containing bathing or showering facilities and that may also contain a wash basin(s) and/or water closet(s). The reason panels are not allowed in a bathroom, is because of the high humidity caused by showers and tubs. It will have a negative effect, over time, on the components of the panel.

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Stairways: If your home was built prior to 1960, there is a good chance the electrical panel is located on the outside wall in the back entrance. What the code rule is referring to is the placement of an electrical panel over the stairs, (the stairways). In the older homes there were usually 3 stairs leading from the back landing to the kitchen. This original location is allowed today because it is called “grandfathered”, it passed code when it was installed. Rule 26-600 (1) only applies to newly installed panels.



OLD ELECTRICAL PANELS



At the turn of the last century when electricity was relatively new to Alberta, the initial 120 volt 30 amp overhead electrical services, that came across our yards from the pole in the back alley, used to be protected by glass fuses. These first electrical residential services were sufficient to supply our lights, and the early appliances. As technology evolved and our demands became greater, electrical equipment also evolved and the invention of electrical breaker panels occurred.

Initially the first breaker panels were manufactured by Federal Pioneer or Square D. These consisted of 4 breakers in a small metal box usually located by the back door of the house. Today residential electrical panels can be 84 circuit and be supplied with 200 amps of power.



One of the most common questions I receive, comes from homeowners who are just moving into a newly purchased older home. Customers ask “Should I upgrade my old panel to a newer one?” A lot of older panels are a maximum of 16 or 24 spaces for circuits.

There are 3 ways I can reply to this question. The first is, a space saver breakers. These are breakers for specific manufacturers that take the spaces of a single breaker but have 2 handles. This means that a single space in a panel can now accommodate 2 circuits. A 24 circuit panel can now accommodate 48 circuits. This solves the problem of a lack of space.

The second possible answer, is to install a small panel (sub panel) beside the existing. This will expand the capabilities of the electrical system by providing the capability to install additional circuits. One of the problems people experience is that the sub panels are being installed with low capabilities. This means that if you’re planning a kitchen renovation, for example, and your depending on using this new sub panel, you will not have the ability to accommodate the needs of the kitchen.

The 3rd option is to replace the existing panel with a new larger one. The advantage to this scenario is that any new additional circuits you need to install will be fed from the 100 amps being supplied to your home.



EPCOR SAID IT WAS 100 AMPS



Is it a 100 amp overhead electrical service or a 60 amp service.? At Robart Electrical Services we do approximately 125 service upgrades a year and have for many years. We are called upon to help home buyers and sellers determine if their electrical service needs to be upgraded to meet the requirements of the insurance companies.

“The sellers contacted Epcor and was told her electrical service built in 1956 was a 100amp”

What Epcor is referring to is the capability of the overhead wiring existing between the power pole in the alley to the connection point on the house. This has nothing to do with the potential 60 amp meter socket on the house, or the old breaker panel by the back door or the fact that the wiring on the house is only rated at 60 amps, Epcor has no records of the home’s internal wiring.



Having said that, Epcor is absolutely correct, the electrical service capabilities is 100 amps but it is always 100 amps. The distance from the pole to the house is such that if they used 60 amp wiring, the conductors would not be strong enough to withstand the winds and snow, so the utility companies almost always put in 100 amp wiring regardless of the capabilities of the house equipment.



Some unsuspecting people today, looking at the sticker on the electrical breaker panel, might think that the 100 amp rating on the box is the service size. This is the manufacturers rating of that piece of equipment. The complete service is made up of the meter socket which is the box on the outside wall that the power meter plugs into, the size of the wires between the top of the mast where the overhead wires form the alley

attach and the meter socket, and the electrical panel. All of these together must meet the standards of the local supply authority.



ALUMINUM WIRING CAUSE FIRES

BUT...THERE IS NOTHING WRONG WITH THE ALUMINUM WIRE

If you have an existing home with aluminum wiring or are purchasing an older home with aluminum wiring, you need to be informed about the potential danger. A lot of people are scared away by the existence of aluminum wiring because of the potential threat of fire. Let me put the record straight.



The problem comes when an aluminum wire is compressed under the screw, on the side of a switch or receptacle for example. This problem is called "Cold Flow".

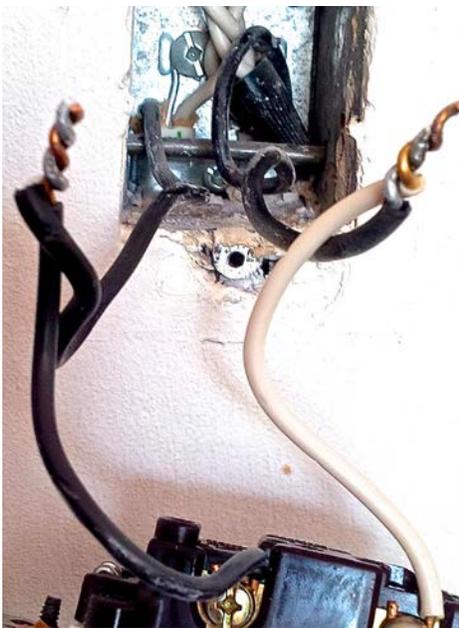
When electrical current flows through an aluminum conductor, one of the characteristics of aluminum is that it heats up. With the generation of heat comes expansion and of course when it cools you have contraction. This happens on a very small scale but over time, the action may loosen the pressure of the screw on the aluminum conductor. What happens next is Cold Flow.



If you use the plug or switch when the connection has loosened, the electrical current still tries to go through but now it starts to arc. The larger the load, (the amount of electricity need to be provided by that plug or switch) the greater the arcing and consequently the overheating. With arcing, the screw starts to heat up and eventually the plastic of the device starts to melt and soon, as we have found, fires occur. Does this occur in every situation? No, but the potential is there.

What to do, What to do...

There are a number of methods listed on the internet, to correct the problem of cold flow. The method that we have adopted, based on our last 25 years experience correcting this problem, is called Pig Tailing. We found that pig tailing is the most economical and dependable method available in North America today.



Pig tailing consists of disconnecting the aluminum wire from the old plug or switch and attaching to it, a short piece of copper wire. We use a paste compound that is coated on the wires prior to connecting that prevents oxidization. Then we attach this connection together with a Marrette or wire nut that is rated to be used for the aluminum and copper connections. We then attach the copper wire to a new plug or switch that is rated for copper.



It is always important to get a qualified and experienced person to take on this project. **If you attempt to do Pig Tailing and you do it incorrectly, you increase the risk of fire.** A lot of home owners will attempt to do their own pig tailing in an effort to save money, not a good idea. Unfortunately the fire department has seen the results.

Remember to take out an electrical permit for this project and have a city inspector check the workmanship. This is to certify that the job was done correctly and that it meets with common trade practices. I have aluminum wiring in my house and after I did pig tailing back in 1991, I have never had a problem.

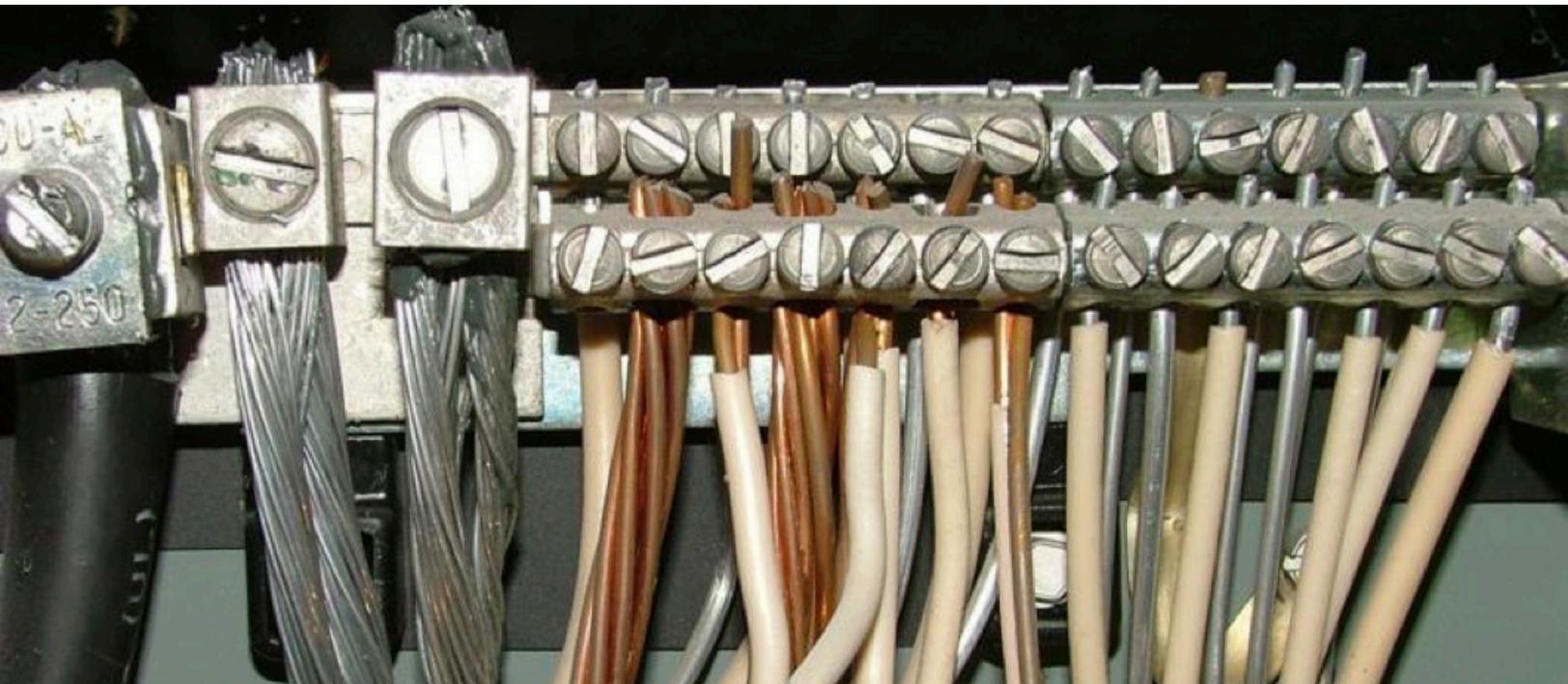
1/2 ALUMINUM AND 1/2 COPPER IN THE PANEL

Aluminum wiring was mostly used in residential wiring between 1968 and 1975 +/- . Back in those days there wasn't the economy there is today so in most cases, houses were built with unfinished basements and the main floor was wired with Aluminum. The new homes were purchased and after a few years, home owners started developing the basements. By then, aluminum wiring had come to an end, so copper was used.



Today when you open an electric panel from the 70's, you may find that half the panel is aluminum and half is copper. This is easily determined by looking at the neutral bar, where the white wires are terminated. Here, the wires have been stripped and you can see the core metal conductors and with close observation, you can see whether the conductors are silver (aluminum) or copper coloured. This is the best indicator of aluminum or copper usage.

Main service conductors, the larger ones, even today are aluminum. This is because of the enormous cost of copper today, probably 3 times that of Aluminum. For services, underground wiring between garages and the larger wiring requirements, it is always best to use aluminum. With this type of installation you still need to install the anti-oxidizing compound to the conductors before terminating them in the panel.





FINDING HOME DEVELOPMENT WITHOUT PERMITS

Item 6.1 (g) of the Alberta Real Estate Association residential purchase contract, states that the seller warrants that **“any government and local authority notices regarding the property, and lack of permits for any development on the property, known to the seller have been disclosed in writing in this contract”**.

It is the seller's obligation to let you know if there are any notices or missing permits that were never taken out for developments that were carried out on the property. Today if any work performed involves construction and alterations to a home's original structure, building and development permits are required.

The development permit is required giving you permission to proceed with the project. The building permit is required which gives you direction on what is required according to the Alberta Building Code. These permits can be applied for through your local city or county office.



As a buyer purchasing a used home, once you take possession, you are responsible for any development that may have been done in the house. This will include building, development, electrical and mechanic permit if they have not been taken out during the past construction or renovation projects. For example, if a basement development was done 10 years ago without a building, development and electrical permit, and you are asked to provide one, a lot of things come into play. 10 years ago, the codes were not the same as they are now.

When you take out permits you must pass inspections from the city based on today's rules and requirements. Rules like egress for basement bedroom windows, smoke alarms, or fire proofing of utility room ceilings, are just to name a few.

In my opinion, permits are extremely important and a legal requirement. Please be diligent and do not hesitate to contact Rob at Robart Electrical Services.



HOT TUBS

HOT TUB WITH NO PERMITS

Today in the city of Edmonton, you are required to have a building permit, a development permit, a load calculation (see below) and an electrical permit for a hot tub. If you are looking at a used home and there is an existing hot tub, the RPR you receive does not indicate anything about a hot tub. If you buy this home, you would be well advised, to get the building, development and electrical permits for this hot tub. You will of course be responsible for any code violations that may be found. Insurance companies are taking a firm stand on claims where there was permits overlooked.

It's all in the interest of your family's safety





LOAD CALCULATIONS

Hot tubs today add a considerable amount of demand on a residential electrical service. Our normal services today are rated at 100 amps and if we add a 30-60 amp hot tub, there is reason for concern. Over the last two years, the City of Edmonton have turned their focus towards monitoring how much power is being used for a normal residential service.

Before an electrical permit is granted, we are required to provide a "Load Calculation" for the addition of extra large electrical loads. A load calculation is something that is determined by a master electrician to calculate how much power is required from the service. The calculation itself takes into consideration the square footage of the house, the number of stoves, clothes dryers, air conditioners, steam generators for showers, welders or wood working equipment in the garage and of course hot tubs and car chargers.

If a calculation on a 100 amp service exceeds the rating of the incoming service power, the city will deny you permission to add the extra equipment.



Being denied an electrical permit to install a hot tub means that we need to reduce the demand on the service. Demands can be reduced in a number of ways with the intent on bringing the calculation load below the rated service amount.

One possible way to do this is to reduce the number of items causing the high calculation. For example, if you have a summer kitchen in the basement that is only used at Christmas time for additional cooking, you may want to consider removing this stove. Another possibility would be to change your electrical stove in the kitchen to gas, along with your clothes dryer instead of 240 volt electrical.

I have a device that is installed next to your electrical panel which will only allow one of two large load items to be operated at the same time. This will reduce the demand and allow you to have a hot tub on a 100 amp electrical service.



GROUND FAULT CIRCUIT INTERRUPTERS

Wikipedia defines this as: *"A device that shuts off an electric power circuit when it detects that current is flowing along an unintended path, such as through water or a person. It is used to reduce the risk of electric shock, which can cause the heart to stop or cause burns."*



In the Canadian Electrical code book, it stated that one area that GFCI protection is required, is for the 120 volt receptacle beside your bathroom sink. Now in the 70's, they were installing low voltage razor plugs in these locations. These are normally a 4" x 4" chrome plate with a small plug in the centre for charging your electric shavers. Today most people are buying a razor converter that allows you to remove the old razor plugs and install a 120 volt GFCI in it's place.

Another place where GFCI are real important is for the plug-ins on the exterior of your home.



Protection for these outlets can come in 2 forms, either a GFCI receptacle on the outside or a GFCI breaker at the electrical panel. You will know if you have a GFCI receptacle installed in your home because these are rectangular shaped with a test and reset button in the centre.



Please make sure you occasionally test these units to make sure they are still working as intended. Push the test button with your finger nail. If the reset button pops out, it's working. To reset, push the rest button back in until it clicks.

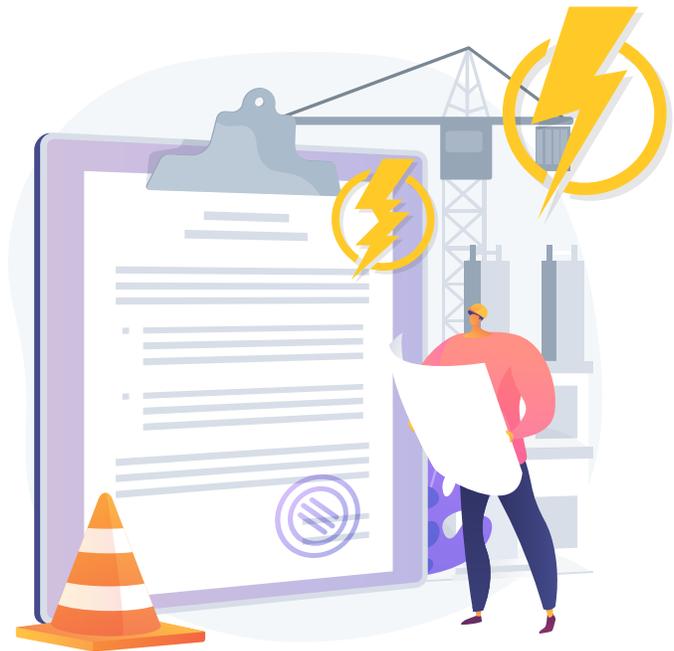
At Robart Electric we offer free advice to help with your renovations.



RESIDENTIAL ELECTRICAL PERMIT REQUIREMENTS

There are 2 ways you could have obtained an electrical permit for a basement renovation. As the home owner living in the house, you could have taken out a “Home Owners” permit stating you were doing the work your self. The second is to hire a Master electrician to do the work for you and have him take out a permit on your behalf.

The Alberta Safety Council are the people who set the guidelines and rules regarding electrical permits, and they say that if you install, alter or add to an electrical system, then an electrical permit is needed. If you’re changing a light fixture, replacing one with another, that is classified as maintenance work and a permit is not required. Where the problem comes, is because when you take out an electrical permit, you are required to have 2 inspections done by an approved city electrical inspector.





The first inspection you require is called a rough-in inspection. This is the one that is done when the basement framing is complete and you have installed all of the wiring and electrical boxes. The inspector will come down and look over the work you have done and determine if you have done the installation to meet the requirements of the Canadian electrical code.

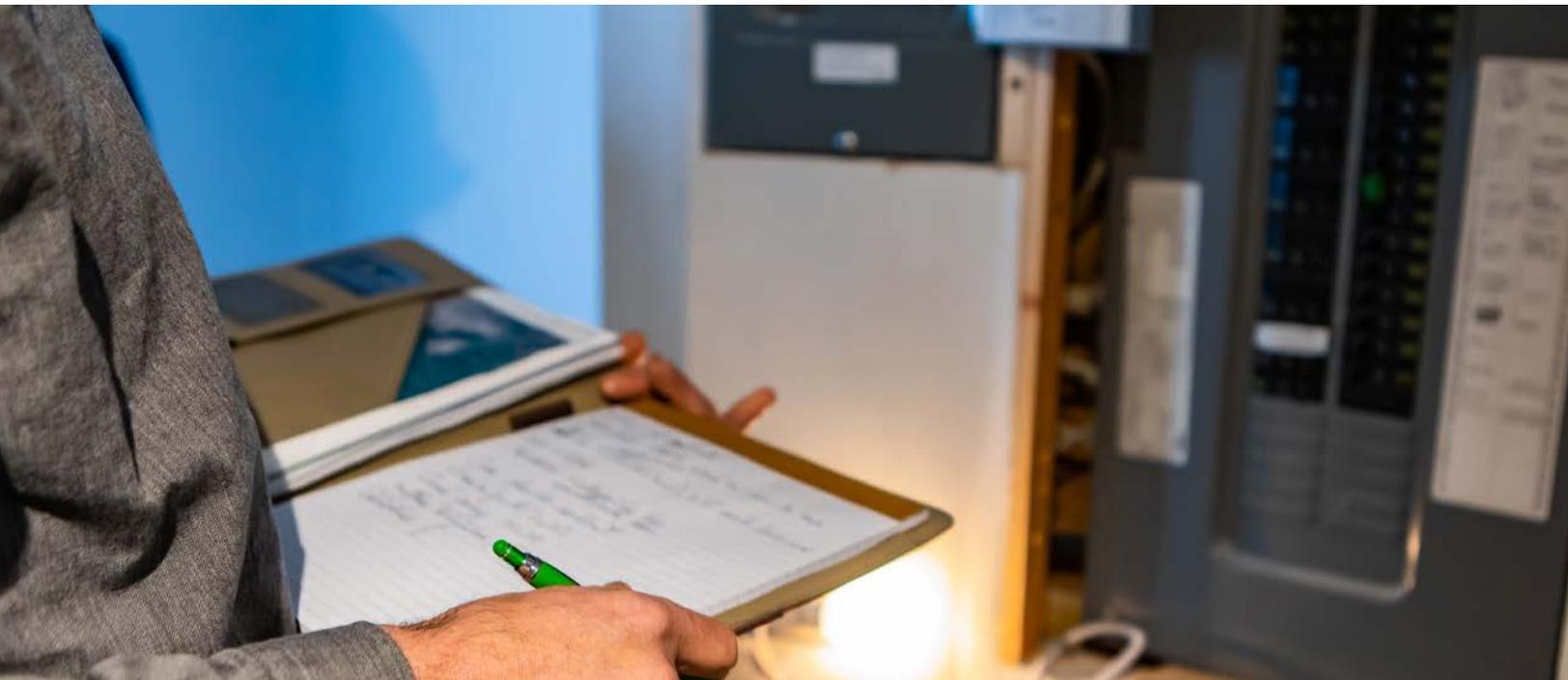
There have been lots of code change over the last 18 months that you will have to become familiar with in order to pass the inspection. Once the inspector is satisfied that you have done the work correctly, you will receive a sticker saying you passed the rough in inspection requirements.

The second inspection is called a final inspection. This one is done when the drywall has been installed, the walls are painted and the switches, plugs and light fixtures have been installed. This inspection, I feel is the most critical, because this is the part where most home owner get caught. The inspector is looking for things like tamper resistant duplex receptacles. These are special outlets that provide protection from children inserting small items into the live circuit.



Inspectors since January 1st 2016, are now looking for arc fault protection. All new receptacles except for sump pumps, refrigerators, kitchen counter plugs or bathroom GFI's now require arc fault protection. The manufactures of Arc Fault Protection recommend that lighting not be put onto arc fault protected circuits, only receptacles. They say you may get nuisance tripping if the 2 are mixed up. That means in certain situations, the breaker may turn off just because of the lighting incompatibility. If you did your own wiring, you would have found out about this because the method of wiring is now different.

If you are in a situation where the basement for example has been finished and you are now seeking an electrical permit, things change. Please [see our article here](#) or call us at 780-238-8195.





“ELECTRICAL QUOTATIONS”

A home inspector has found or you suspect a 60 amp service in an older pre 1965 listing. It is always to your advantage to have service upgrades done prior to listing the property, to remove the speed bumps associated when buyer bring in home inspectors and surprise you with the finding. I have seen that there are 2 options Realtors provide to their clients in these situations.

The first is they tell the selling client that the buyers agent is asking for \$10,000.00 off the selling price as compensation, or the second is to get a quote before negotiations for the service upgrade work to be done and save the client thousands of dollars. It all comes down to what level of service you feel comfortable of providing.



With the help of a few selling Realtors, I have created a **“Quick Quote”**.

A quick quote is a quotation complete with your clients name, the address, your contact information, a full listing of a typical scope of work and of course a range of fixed cost. This quotation has been available in as little as 8 minutes.



In a 24 month period, Robart Electrical Services Ltd. has done over 250 service upgrades so for a quick quote, I do not need to do a site visit. With some specific information, I can generate the quotation and get it to you immediately. This quote has been used by Realtors for over 10 years to take into negotiations and close deals.

Face time or Google duo is another way of getting a quotation in a very short time. If your on site and the home inspector just reported a 60 amp service, you can contact me, we can do a virtual walk through of the house and I can generate an exact quote based on what I see. This method is more exact and some Realtors feel better using this quotation to go into negotiations with.

Once the quote has been accepted by the buyer or the seller, it is necessary that we have access to the home to take pictures and measurements verify the scope of work. The price on the quote will never change, but the additional information is important.

Aluminum wiring Pig Tailing Quotations can be done with information gathered over the phone and sent directly to your phone to be used in a presentation. There is no site visit required.

The final cost will be the prices stated on the quotation, there are no hidden charges, no additional fees and no surprises.

ABOUT ROBART ELECTRICAL SERVICES



WHY CHOOSE US

- ✓ FREE ESTIMATES WITH NO SURPRISES
- ✓ CITY PERMITS WITH ALL WORK
- ✓ DONE RIGHT THE FIRST TIME
- ✓ SERVING YOU FOR OVER 35 YEARS
- ✓ 100% SATISFACTION GUARANTEE

OUR SERVICE



RESIDENTIAL SERVICES

- 60 -100 Residential Service Upgrades
- Aluminum Wiring Correction
- Panel Upgrades
- New Home Wiring
- And much more!



COMMERCIAL SERVICES

- Commercial Tenant Renovations
- Lighting Design & Upgrade
- Cat 6 Data Networking Systems
- Video security RB-6 or POE systems
- And much more!

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