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INFORMATION
About your Underground (lateral) Electrical Service Entrance Upgrade and Xcel Energies

Thanks for considering Don's Electric for your underground service entrance upgrade. I've put together some information here to help you understand what's involved in upgrading your service, and what's involved in dealing with your power company, Xcel Energies.

The underground line that comes to your house generally comes from a pedestal which is located in your back yard or your neighbor's yard. This line is owned and maintained by Xcel. If you're needing to relocate your service entrance in order to build an addition or for some other reason, you should meet with your electrician first to discuss what might be involved. It also might be necessary to meet with Xcel to determine what they might have to do and what costs might be involved. Since all situations are unique it's best to go over things to determine exactly what will need to be done, with your electrician and Xcel. Your electrician can arrange a meeting for you with the Xcel representative on a day that will work for you.

If the new service is going to be located back in the same place then meeting with Xcel usually isn't necessary. In order to do a service entrance upgrade the entire service entrance needs to be brought up to today's Codes, regardless of when the house was built. This doesn't mean the whole house needs to be brought up to Code, just the meter socket, panel, and grounding system that are part of the service entrance. This work should only be done by a qualified and licensed electrical contractor, and he needs to obtain a permit from the City building department where you live.

Selecting the right contractor for the job is very important. Doing a service entrance upgrade without a permit can pose a number of problems. First of all it's illegal. Secondly you'd have no cooperation from Xcel, and if they discovered the work had been done improperly they could disconnect your service. If the electrician was unlicensed to begin with, and you ran into an issue that you couldn't resolve, then neither the building department nor the Colorado State Electrical Board would be able to help very much. You'd be back to square one, and you could end up having to do the work all over again. Another problem you could run into is an electrician who buys a permit from a licensed contractor. The licensed contractor then becomes liable. Unless you're dealing directly yourself with this licensed contractor, it might be more difficult to get him to cooperate or help, since you're not his customer; and if you did have a problem, it would be easier for the electrician to "walk away," since it wasn't his permit anyway. The third problem is where an electrician asks you to purchase your own "homeowner's permit" so he can do the work. In that situation you're responsible for his work, and that doesn't seem like a good idea. The best, and really the only way, is to hire a licensed and insured electrical contractor, and have him pull his own permit in his company's name. Anything less than that is a risk not worth taking. Finally, even a good licensed contractor might try to sell you a service upgrade even if you don't need it, or convince you falsely that you do. If you're unsure it's better to get a second opinion, and hire the one you feel comfortable with, even if he's not the lowest priced. Remember that your service entrance is the heart of your electrical system, and it provides protection for all the wiring in the house. Improperly done work, especially by someone who's not licensed or legally liable, is not a very good path to be on. Your contractor should be licensed and insured, give you a written bid or estimate describing what will be done and what the costs will be, what all's involved, and someone you can feel comfortable with.

Once you decide to go ahead with the service upgrade the electrician will contact Xcel to begin the paperwork that will be needed for them. Xcel will then email (or mail if you prefer) a form to you that you'll need to fill out and sign. This form describes what they'll be doing and approximately what the cost will be. It usually runs about $180.00 for the work they'll need to do, unless a relocation is needed. You can sign and email or mail this form back to them at the address on the form. After they process the form they'll contact you or the electrician to try and arrange a date that will work for everyone. Once this date is

scheduled they'll come out in the morning to do their work, and that day the electrician will do the upgrade.

The electrician will also call Xcel to obtain a "closed loop authorization." This is an authorization number from Xcel to allow the electrician to pull to meter. The electrician will be installing jumpers in the meter socket, and not the actual meter. This is a requirement of Xcel. The old meter will be left there and attached to the meter socket, but not installed. Later, after all the work is done and the building department has inspected it, they'll then "release" the service back to Xcel. They do this on the morning after the inspection. Once Xcel gets this release, they'll schedule to return and re-install the meter, or usually they'll install a brand new meter. The closed loop authorization allows Xcel to know what day the meter was removed, and they'll know what day the new meter was installed. They'll then estimate your bill for that time period when you were without a meter, and that estimate is based on past usage.

On the day the service upgrade is done, Xcel will disconnect the power to your house at the pedestal in the morning, usually between 8:00 and 9:00. With the power disconnected, the electrician will remove the old service equipment and install the new. Once he's far enough along, he'll call Xcel and they'll return to reconnect the power. Then the electrician will finish the bulk of the work. The upgrade will normally require two days. The first day will be the main outdoor work, the new meter socket and panel, reconnecting all the existing house circuits; and on the second day finishing up and installing the grounding system. You shouldn't be without power overnight, though in some cases because of time constraints it might be necessary to leave some lines disconnected, provided they aren't critical. Normally, however, all the circuits can be reconnected during the first day.

What the electrician will do is install a new meter socket that meets today's standards, is up to Code, and meets the requirements of Xcel. He'll also replace the panel with a new one that will have a main breaker and space for all the individual breakers that feed the house circuits. He'll also install new wiring between the meter socket and the panel. He'll then install the circuit breakers and reconnect all the existing house circuits. It's important to note that sometimes the new equipment may be in a slightly different configuration than the old, and may not completely cover the area where the old equipment was. You may have to do some repainting to cover those old spots. Sometimes, if lap siding or some other type of siding was installed around the old equipment, and not behind it, the new equipment may not cover all those gaps. The electrician should help you determine what might be involved regarding this type of thing so you'll know what to expect, as each situation is different. Normally the electrician would not do the repairs to the siding or repainting that might be needed. You would have to do that or hire a carpenter or painter.

It's also important to note that upgrading the service won't necessarily fix problems that you might have inside the house, such as an overloaded circuit. Sometimes, with the old service, two circuits might be connected to one breaker. In the new service each of these circuits would have their own breaker, and this might alleviate that problem. Often it's not easy to know until the new service is completed and all the circuits are reconnected. If there is a problem, such as an overloaded circuit, the electrician should consult with you and help you decide what might need to be done in that situation.

The other part of the service upgrade is grounding. The new service must be grounded according to today's standards. This includes the installation of two ground rods at or near the service. The ground rods are 8 feet long and 5/8 inches in diameter, and are covered with a conductive coating. They're driven all the way down into the ground, and the two must be at least six feet apart. They usually have to be about 6 inches away from the house in order to miss the footing in the foundation. The electrician should consult with you to determine the best location. Sometimes there's no choice but to install them where there's concrete such as a patio or sidewalk. In such a case he would drill a hole through the concrete to insert the ground rod. The rod would be driven all the way in so it won't stick up afterward. However if going through concrete can be avoided it should be, and the rods should be installed in the dirt next to the house. A #6 copper ground wire is run from the panel to the first ground rod and then onto the second one, and attached with a ground rod clamp. The wire will probably be exposed on the house but should be done neatly. Sometimes there are alternative ways the wire can be run.

Another grounding wire needs to be run for the water pipe system. This wire is sized based on the size of the service entrance. A 100, 125, or 150-amp system would take a #6 copper wire, and a 200-amp system would take a #4 copper wire, slightly larger. This wire must be continuous and run from the panel to a point on the water piping system that is within 5 feet of where the system enters the house. The grounding wire will be attached to the water pipe on both sides of the main shutoff valve. The

entrance is usually on the street side in the basement or crawlspace. Most building departments used to have an exception to this rule if the basement was finished, and if running the wire meant cutting into the drywall. However they've done away with this exception now and the wire always has to be run to where the water pipe enters the house, even if cutting into the drywall is needed. If the basement is unfinished, or if there's a crawlspace, then this won't be a problem. If it's a finished basement though it may be possible to fish the wire through the floor joists most of the way, to avoid cutting as much as possible. Even then some cutting will probably be needed. Another alternative in some houses is to run the wire through the attic and then down along the outside of the house, and into the basement where the water pipe is. Usually the service entrance is on the back of the house and the water pipe entry is on the front. This reduces the need for cutting also. Your electrician should go over this with you prior so you can know and decide what will be best in your situation. Patching and refinishing of the drywall is normally not done by the electrician, but would need to be done by you or a carpenter you would hire.

Also most building departments, but not all, require a bonding connection between the water pipe system and the gas piping system. This can be done anywhere and is usually done at the water heater, since both piping systems are in close proximity there and it's usually accessible. This is just a copper wire, sized like the main grounding wire, one end attached to the water pipe and the other attached to the gas pipe.

The electrician will also install an "inter-system bonding device," also known as a "ground bridge" just below the main panel. This is a small device that attaches to the grounding wire (usually the one that's going down to the ground rods), and has provisions for other wires also attaching to it to form a bond. The phone, cable TV and dish grounding wires should all attach to this device. That way there's a single bonding point where all the grounds of the different systems come together, and this is required by Code.

After the new service entrance is installed the electrician will identify all the house circuits. Usually the configuration and order in the new panel will be different from the old. This usually requires going through the house and shutting off individual circuits to see where they go, so a proper list can be made. The new panel schedule will be on the panel.

After the work is done the electrician will order an inspection from the building department, and they'll normally come out the day after he calls it in. This will have to be a day that will work for you, when you can be home for the inspector, as he will need to get in the house to inspect the grounding connections. The inspection needs to be done within seven days of completing the work if at all possible because of Xcel requirements, though in some situations that length can be extended if needed. You can also find out about what time the inspector will come, though they won't allow you to schedule him. Denver will give you a 3-hour time window, and Aurora will give you a 30-minute call ahead when they're coming. Other cities have similar provisions.

As I said earlier, once the City passes the work they'll release it back to Xcel on the following day. If there's a problem, the City will tell you or leave a notice of what corrections have to be made. The electrician will make the corrections and then order a re-inspection, unless the City isn't requiring a re-inspection. After it passes they'll then release it. When Xcel comes to install the new meter, they won't need to get in the house; but if you have a locked gate or dog they may leave a note asking you to call to arrange for a time when they'll be able to get to the meter socket. Your power may be off for 15 minutes or so when they install the new meter, but most of the time they can do it without shutting off the power at all.

It's also important to note that because of high demand, it's been taking some time for Xcel to get out to install the meters, and can sometimes take up to 4 or 5 months. You'll be on an estimated bill during that time. We also have problems occasionally where they have a paperwork mixup and don't get the release for some reason. While this is infrequent, they may leave a notice at your house. If that happens you should contact the electrician immediately so he can get on resolving this issue. It's usually not the fault of the electrician or even the building department, but he can have the City release it again and that usually takes care of it. Also if you feel that your estimated bills were too high you can contact Xcel to see about resolving that, and they're usually pretty good about it as they've had a number of instances recently where this has occurred. It would be nice if Xcel were perfect, but they're not, so we all have to do the best we can.

Hopefully this information has been helpful. If you have any other questions please contact me, and thanks for considering me for your wiring needs.

Sincerely,
Don Natelborg
Owner, Don's Electric
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