

What I Wish I Knew Before Starting an EV Charger Installation

More Than Just a Plug and Play Job

When I started working on electric vehicle infrastructure a few years ago, I thought the biggest challenge would be the voltage math. I was wrong. The real complexity of an EV Charger Installation is not the copper or the conduit. It is the site survey, the load calculation, and the conversation you have with the homeowner about their panel before you even open a toolbox.

I have seen contractors burn through profit because they treated a Level 2 install like adding a dryer outlet. They show up, find a full panel, and then have to charge the customer for a service upgrade they never mentioned. That is not just bad business. It is a failure of the whole process. A good EV Charger Installation starts with looking at the main breaker and asking: what else is running in this house?

The Load Calculation Trap

You have a 200-amp panel. The house has air conditioning, a pool pump, an electric oven, and a dryer. Now you want to add a 60-amp circuit for a charger. That is not just adding a circuit. That is potentially exceeding the service rating. Many installers skip the formal load calculation because it takes time. They land the wires, close the panel, and hope the main breaker does not trip when the AC kicks on while the car is charging. I have been on service calls where that exact scenario was the complaint. The charger was fine. The panel was overloaded.

So I learned to do a proper load calculation on every job. I count the continuous loads, apply demand factors from the National Electrical Code, and determine if the existing service can handle the additional load. If it cannot, I have to talk to the customer about a service upgrade, a load management device, or a smaller charger. That conversation is easier when you have the numbers in front of you, not when you are standing in front of an open panel with a screwdriver in your hand.

[View the location on Google Maps](#)

Permits and Inspections Are Not Optional

I have worked in areas where permits are rarely pulled for a water heater swap or a ceiling fan. But an [EV Charger Installation](#) is different. It is a dedicated circuit with a continuous high load. The inspector wants to see that the ground path is solid, the torque values on the breaker terminals are correct, and the bonding is proper. I have had inspections where the only issue

was a missing bonding jumper in the charger unit. That is a five-minute fix, but if you did not open the unit, you would never know.

Skipping the permit might save you a hundred dollars and a day of waiting. But if that charger starts a fire, the insurance company will look for the permit. If it is missing, you are on your own. I have seen installers lose their license over that. It is not worth the risk.

Hardwired vs. Plug-In: Which One Matters

Most modern Level 2 chargers come in two flavors: a hardwired unit and a plug-in unit with a NEMA 14-50 plug. I have installed both. The plug-in version is faster to install, but it introduces a point of failure at the receptacle. The hardwired version is cleaner, but it requires a larger junction box and more care with the cable termination. I prefer hardwired for outdoor installations because the cord connection is inside the unit, not exposed in a weatherproof box that can be left open or damaged.

There is also the question of the neutral wire. Many chargers do not need a neutral. If you run a 14-50 receptacle, you are pulling four wires: two hots, a neutral, and a ground. But if you hardwire the charger, you can pull three wires and eliminate the neutral. That saves wire cost and conduit fill. It is a small detail, but on a big job, it adds up.

Conduit vs. MC Cable: The Real Tradeoff

I have used both methods. MC cable is fast to pull and easy to terminate. But in a garage, it can look sloppy if you run it exposed along the wall. Conduit takes more time to bend and mount, but it looks professional and protects the conductors from physical damage. I had a job where the homeowner had a workshop in the garage with heavy shelving. We ran EMT conduit along the ceiling and dropped down to the charger location. It took an extra half day, but the final look was worth it. The homeowner was happy, and the inspector passed it on the first look.

I also learned that the type of conduit matters. PVC is cheap and easy to glue, but it expands and contracts with temperature changes. In a hot garage, I have seen PVC pull apart at the glue joints. I use rigid metal or intermediate metal conduit for long runs in unconditioned spaces. It costs more, but it does not fail that way.

Load Management: The Smart Installer's Tool

Not every panel can handle a full 60-amp charger. That is where load management comes in. Devices like the DCC-10 or the NeoCharge panel can monitor the house load and throttle the charger down when the AC or the dryer is running. I have installed these on several homes where the service was maxed out. The customer gets a faster charge when the house is quiet

and a slower charge when the house is busy. It costs less than a service upgrade, and it works well.

The trick is to set it up correctly. I always verify that the current transformers are clamped on the correct conductors and that the communication wiring is secure. I had one job where the CT was loose, and the charger kept tripping off. The customer thought the charger was broken. It was just a bad connection on the monitoring device. A quick fix, but it took a service call to find it.

Grounding and Bonding: The Part You Cannot Skip

I have seen installers land the ground wire on the charger and call it done. But the ground path matters. If the panel is bonded to the water pipe and that pipe gets replaced with plastic, the ground path is broken. I always verify the ground electrode system before I start work. If the house has a plastic water line, I make sure there is a ground rod or a concrete-encased electrode. I also check that the bonding jumper at the panel is intact. A missing bond in the panel can turn the whole enclosure into a shock hazard.

For the charger itself, I follow the manufacturer's torque specifications. I use a torque wrench on the lugs. I have seen lugs that were hand-tightened and then vibrated loose over a year. That creates resistance, which creates heat, which can melt the terminal. It is a simple step that takes two minutes, and it saves you from a callback.

Working With the Utility

Some utilities require a separate meter for an EV charger. Others allow a time-of-use rate on a sub-meter. I have worked with utilities that were slow to approve the interconnection, and I have worked with utilities that had a same-day approval. The smart move is to call the utility before you schedule the job. Ask about their process, the required paperwork, and the timeline. I have had jobs where the charger was installed and the customer could not use it for two weeks because the utility had not turned on the separate meter. That is a bad customer experience.

I also check if the utility offers a rebate. Many utilities will pay a portion of the installation cost if you use a licensed electrician and a qualified charger. I help the customer fill out the paperwork before I leave. It builds trust and it makes the job more competitive for the customer.

The Code Cycle Catch

NEC 625 covers EV charging infrastructure. It changes every three years. The 2023 code introduced new requirements for load management and arc-fault protection. I keep a copy of

the current code in my truck and I review the relevant sections before every job. I have seen inspectors enforce the local amendments as well. Some jurisdictions require a ground-fault protector on every EV circuit. Others do not. I check the local code before I bid the job.

A lot of homeowners do not realize that the code has changed. They see a YouTube video of someone installing a charger in an hour and they expect the same. I have to explain that the code requires a dedicated circuit, a specific breaker type, and sometimes a disconnect. It is not a one-hour job if it is done right.

Final Thoughts From the Field

I have done this work in many homes and I have learned something on every job. The biggest lesson is that preparation matters more than speed. A proper site survey, a solid load calculation, and a clear conversation with the customer will save you more time than rushing through the install. Charging a car is not like charging a phone. It is a real electrical load that demands respect and attention to detail.

If you are considering an EV Charger Installation for your home, I recommend working with someone who asks questions before they give you a price. Someone who looks at your panel, asks about your daily driving, and explains the options. That is the sign of a good installer. I work with Simply Wired Electrical, located at 1821 SW 23rd Terrace, Fort Lauderdale, FL 33312, reachable at +19544660475, and I am happy to answer your questions about the process.