BD ELECTRICAL & SOLAR

WHOLE-HOME ENERGY MANAGEMENT SYSTEM

Location: Middleborough, Massachusetts

Project Overview

BD Electrical & Solar designed and installed a complete home energy management system for this Middleborough, Massachusetts residence, integrating rooftop solar, a custom pole-mounted solar array, Tesla Powerwall battery storage, EV charging, and SPAN smart electrical controls into one coordinated system.

Rather than treating solar, battery storage, EV charging, and electrical distribution as separate upgrades, the system was designed as a unified energy platform for the property.

The result gives the homeowner greater control over how electricity is generated, stored, distributed, and used throughout the home.

The System

The project combines:

- Rooftop solar PV
- Custom three-pole ground-mounted solar array
- Tesla Powerwall battery storage
- Tesla energy management and backup controls
- SPAN smart electrical panel
- Level 2 EV charging
- Whole-home energy monitoring
- Utility interconnection
- Sitework, excavation, foundations, and underground electrical infrastructure

508-617-0800 info@bdesc.net bdelectrical.services

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Solar Designed Around the Property

Available roof space alone did not provide the solar capacity desired for the property.
BD combined rooftop solar with a large pole-mounted array located elsewhere on the site, allowing substantially more solar generation while making productive use of available land.
The ground-mounted portion required extensive site preparation and structural work. BD excavated and constructed reinforced concrete foundations for the steel support columns before assembling the elevated solar structure.
The result is a permanent, purpose-built solar installation designed around the property rather than forcing the entire system onto the home's roof.

Battery Storage & Backup Power

Tesla Powerwalls provide energy storage and backup capability for the home.
Excess solar energy can be stored rather than immediately exported, giving the homeowner the ability to use solar-generated electricity later when production decreases or during a utility outage.
The battery system is integrated with the home's solar generation and electrical distribution equipment, allowing the different components to operate together rather than as independent systems.

Intelligent Electrical Control with SPAN

A SPAN smart electrical panel adds another layer of control. Instead of only monitoring energy at the solar and battery level, SPAN provides visibility and control at the individual circuit level. The homeowner can see where electricity is being consumed and manage loads throughout the home.
During an outage, this becomes particularly valuable. Available battery energy can be prioritized toward important loads while less critical circuits can be managed to extend available backup duration.

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Solar + Storage + EV Charging

EV charging was incorporated directly into the home's energy strategy.
With solar generation, battery storage, smart electrical controls, and EV charging operating within the same property, electricity can move through a coordinated system:
Solar generates it.
Powerwalls store it.
SPAN manages it.
The home and EV use it.
The utility grid remains part of the system, but it is no longer the property's only source of electricity.

Built as an Energy System

Projects like this require coordination across several disciplines.
BD handled the solar installation, energy storage, electrical distribution, controls, EV charging, underground electrical work, structural foundations, equipment installation, utility interconnection, and commissioning.
That integrated approach is important because modern home electrification increasingly connects systems that were historically designed independently.
Solar affects storage. Storage affects backup loads. EV charging affects electrical demand. Smart panels determine how available power is distributed.
Designing those components together creates a more capable system.

The Results

The completed Middleborough project brings solar generation, battery storage, intelligent electrical distribution, EV charging, and backup power together under one energy management strategy.
It represents the direction residential electrical systems are moving: homes that do more than consume electricity from the grid.
They generate it, store it, manage it, and decide where it goes.

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