



EDITION 9

VOLUME 1

6 STEPS OF THE FORMAL ENGINEERING PROCESS WITH 6 TOOLS TO DESIGN EV CHARGING & INFRASTRUCTURE CABLES

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ENGINEERING PROCESS



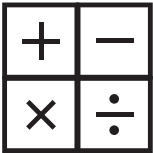
PROJECT TIMELINE & OVERVIEW

Comprehensive overview of overall project scopes, timeline, and deliverables with stakeholders and clients.



TECHNICAL SPECIFICATIONS

Review technical specifications, codes, industry standards, end user requirements, system limitations, and property vs. performance evaluations, such as dry vs. damp vs. wet locations vs. hazardous locations.



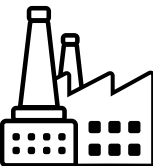
ELECTRICAL CALCULATIONS

Conduct electrical calculations to meet power (kW), system voltage (volts), and current (amps) requirements to create the most cost-effective EV solution.



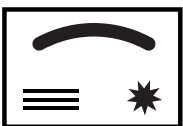
CABLE SIZING & DESIGNS

Size copper or aluminum conductors; select dielectric insulation types, optional cable components, shielding designs, overall jacketing materials, preferred colors, required markings or print legends.



MANUFACTURING COMPLIANCE

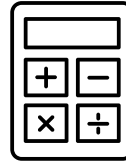
Determine manufacturing tolerances for conductor diameter, insulation & jacket thickness, and maximum cable diameter based on designs, standards, specifications, final assemblies, connectors, accessories, and raceways.



TESTING, VALIDATIONS, & APPROVALS

Validate proposals via in-house testing or through a nationally recognized testing laboratory (NRTL), manufacturing plant audits, qualification & certification document submittals, and secure formal customer approvals.

6 ENGINEERING TOOLS



POWER CONVERSIONS

Conduct electrical conversions to meet power (kW) requirements, current carrying capacity (amps), and system voltage ratings.



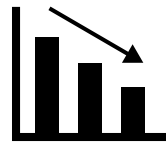
MAXIMUM AMPACITY MODELING

Utilize multiple software to model different operating conditions, environmental parameters, installation methods, and cable routings to achieve maximum ampacity without overheating or thermal runaway events.



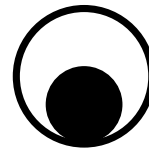
ELECTRICAL & SHORT CIRCUIT CALCULATIONS

Conduct short circuit calculations or provide conductor burndown curves. Supply advanced electrical data including impedances, DC/AC resistance, charging current, capacitance, reactance, insulation resistance, and dielectric losses for system modeling.



VOLTAGE DROP VALIDATIONS

Verify conductor sizing vs. installation lengths vs. percentage of voltage drop to ensure the long-term functionality and performance of the electrical equipment.



CONDUIT FILL RATIO & NEC COMPLIANCE

Confirm conduit fill ratios, jamming probability, below grade to above ground transitions, couplers/connector recommendations, and NEC code compliances.



ROUTING & CABLE PULLING SUPPORT

Deliver full cable pulling calculations, alternative routing support, determine maximum pulling tensions, sidewall bearing pressure, and minimum bending radius for all cable products.