

# Electrical Design Services

## Overview

EN Engineering can provide Electrical Design Services ranging from initial feasibility studies to construction management and commissioning assistance. We utilize our years of design knowledge and in-field experience to provide you with reliable and innovative solutions that deliver reliability and cost effectiveness. We combine state-of-the-art design analysis software and CAD systems to provide optimal designs in a professional and effective format.

The EN Engineering Electrical Design Services team brings extensive industry experience in the design of electrical systems for commercial, industrial, and utility-based applications. We support a variety of market sectors with specific focus on gas & oil, electric utilities, and hazardous area manufacturing industries. We specialize in industry-specific services that require in-depth knowledge of codes, specification, and best practices to ensure that reliability and safety are at the core of every project. With an average of over thirty years of industry experience, our key team members can ensure satisfaction for your next Electrical Design Project.

EN Engineering will work with you to understand the scope of your project and the exact deliverables that you require. We will develop recommendations and solutions based on your objectives, current facilities, and budget. We will provide comprehensive, single-point-of-contact project management and help ensure that your project is implemented in the most timely and cost-efficient manner.

## Markets:

- Natural Gas Transmission
- Natural Gas Distribution
- Natural Gas Storage & Gathering
- Oil & Liquids Pipelines & Terminals
- Process & Chemicals
- Electric Power Generation
- Electric Power Utilities

## Services Overview:

- Electrical Power Distribution Systems Design
- Electrical Substation Design
- Facilities/Building Electrical Design
- Lighting Design
- Construction Management

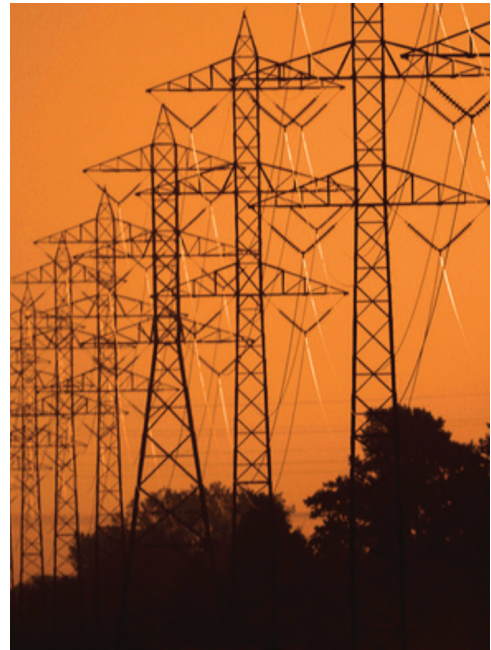


## Services – Electrical Power Distribution Systems Design

EN Engineering personnel perform Distribution System Engineering and Design for sub-transmission and distribution voltages up to 138kV. We understand that the continuity of power is paramount to power providers and their customers.

EN Engineering can evaluate your existing electrical distribution systems to ensure “fitness for service.” After review, we can work with you to establish practical solutions to extend the life of your transmission and distribution assets. When necessary, we can design replacement systems that will ensure greater reliability in an economically and environmentally friendly manner. EN Engineering is a full service engineering company with a large staff of professional engineers capable of addressing the infrastructure necessary for electrical power systems. Our broad range of engineering disciplines can address mechanical, structural, environmental, and automation engineering needs to ensure you have a complete turnkey solution.

- Site Planning & Right-of-Way Acquisition
- Economic Evaluation & Studies
- Power Usage Profiling and Cost Optimization
- Environmental Impact Studies
- Wood & Steel Poles, Structures, and Foundations
- Overhead and Underground Distribution Systems
- Software-Assisted System Analyses
  - Arc Flash Hazard
  - Analysis
  - Power Flow Analysis
  - Load Flow Studies
  - Coordination Analysis
  - Power Factor Study
  - Harmonic Mitigation
  - Short Circuit Studies
  - Utility Record Analysis
  - Sag and Tension Calculations
- System Modeling & Evaluation & Optimization
- Transmission and Distribution System Design & Recommendations
- Utility Distribution Connections
- Owners Engineer Services
- Power Quality Monitoring & Optimization



## Services - Electrical Substation Design

Effective Electric Substation Design is critical to ensuring the continuity of supply and quality of electric power. Our personnel have vast experience in design of transmission, sub-transmission, switching systems, substations and distribution systems. EN Engineering can address all facets of substation design, from permitting and site planning, to equipment procurement, and construction management for systems up to 138kV. EN Engineering can address all phases of design. From minor upgrades to completely new construction, we can effectively address your project needs on time and within budget.

### Substation Design Services Include:

- Line Diagrams and Construction Drawings
- Site Selection & Equipment Layout
- Equipment Procurement
- Construction Coordination
- Relay, Control & Metering
- Protective Systems Coordination
- Substation Automation
- SCADA Systems Design
- Grounding Systems Design

## Services - Facilities Electrical Design Services

EN Engineering offers electrical systems design services for buildings and facilities in both commercial and industrial applications. Due to our experience on both sides of the fence, EN Engineering is also uniquely poised to serve as a liaison between clients (end users) and the utility companies to ensure cost-effective project implementation in a time-efficient schedule. Additionally, we can assist with compliance of local electrical codes and design standards to ensure smooth design implementation.

### Typical Services Include:

- Low-Voltage Power Distribution Systems
- Utility Distribution Systems (Above and Below Ground)
- Electrical Control Panel Design & Fabrication
- Evaluation of Existing Systems for Code Compliance and Safety
- Outdoor and Specialty Lighting
- Onsite and Standby Generation
- Emergency & Standby Power
- Lighting Layouts
- Power Quality Analysis
- Motor & Electrical Controls
- Industrial Fire & Gas Detection Systems
- Building Alarm & Communication Systems

## Services - Lighting Design Services

EN Engineering designs lighting systems for commercial, industrial, and municipal clients. From upgrades to existing lighting systems, to complete design and installation support for new facilities, we provide the most efficient and economical system to fit the needs of your project.

Our lighting design engineers understand that well-designed facility lighting not only provides practical functionality, but is important for safety and security. Our lighting designs comply with all codes and local ordinances, and are designed to minimize problems.

### **Typical Lighting Projects Include:**

- Industrial & Commercial Building Interior Lighting
- Outdoor Facilities Lighting
- Street Lighting
- Parking Lot Lighting
- Emergency Lighting

### **Services - Construction Management Services**

EN Engineering provides complete construction management services for the projects that we design and construct. A significant element of construction management is construction inspection. EN Engineering construction management services ensure that quality is maintained throughout the construction phase of the project. We often find that this is a critical stage during the project that may determine the success of the schedule and cost of the project.

### **Construction Management Services Include:**

- Monitoring and coordination of construction contractor's activities with other subcontractors
- Coordination of third party subcontractors and construction inspection services
- Monitoring of adherence to construction standards and compliance with safety and applicable codes and standards
- Value added engineering and construction expertise to assist contractor's field crews and to help avoid problems before they occur
- Accurate and up-to-date records and reports related to project costs, schedules, permits, etc.
- Our construction management approach results in the EN Engineering team being an extension of your organization. We understand the project and business drivers that are important to our customers and we manage the project to be successful in all the key areas.
  - Site Preparation
  - Material and Equipment Supply
  - Metal Fabrication
  - Modular System Fabrication
  - Equipment Relocation and Installation
  - Structural Steel Erection
  - Electrical Wiring and Assembly
  - Contractor Payment Approvals

### **List of Industry Sectors & Applications**

- Natural Gas Transmission
- Natural Gas Storage
- Natural Gas Distribution
- Pipeline Compressors
- Electrical Distribution (Commercial, Industrial, Utility Clients)
- Medium Voltage Power Distribution System
- LNG Storage
- Oil Refining
- Packaging & Manufacturing
- Ethylene Storage & Transfer
- Butadiene Storage

### List of Industry Sectors & Applications (Cont)

- Peak Shaving Power Generation
- Standby Power Generation
- Non-Utility Power Generation
- Electrical Substations
- Motor Controls
- LNG Plants
- Liquid Products Pumping Station
- Propane — Air Plants
- Fire & Gas Detection
- On-Site Electrical Power Generation
- Hydroelectric Power Generation
- Utility Substation Automation & Control
- Oil Fired Power Plants
- Natural Gas Fired Power Plants
- Low Voltage Power Distribution System
- Building Material Manufacturing
- Rail Car Loading/Unloading
- Coal Gasification
- Butane Injection
- Bulk Loading and Conveying
- Steel Manufacturing (Mill)
- Pharmaceutical
- Chemical
- Pump Controls
- Tank Car & Truck Loading/Unloading
- Petrochemical
- Natural Gas Storage
- Liquid Petroleum Storage
- Gasoline Blending Systems
- Building Management Systems
- Gasoline Production
- Pipeline Corrosion Control
- Instrumentation & Controls

### Applicable Affiliations and Memberships

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Power Engineering Society
- IEEE Industrial Applications Group
- Society of Fire Protection Engineers (SFPE)
- International Society of Automation (ISA)
- Project Management Institute
- American Society of Mechanical Engineers (ASME)

### Contact:

EN Engineering is a full service engineering and consulting firm with offices across the United States. We have extensive experience in all facets of gas & oil, electric utilities and hazardous area manufacturing industries. Our team of professionals is well-versed in the latest electric power technologies, codes and standards and can offer a complete array of design services. We incorporate the latest design analysis software and CAD tools to provide accurate, reliable and effective solutions for your applications. We are happy to assist you with any facet of Electrical Design Services.

***For more information on our Electrical Design Services, please contact:***

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