



Substation Design Services

Keentel Engineering

At Keentel Engineering, we provide end-to-end **substation design services** to support the safe, reliable, and efficient delivery of electric power. With more than 30 years of engineering expertise, our team specializes in **high-voltage (HV)** and **medium-voltage (MV)** substations for utilities, renewable energy projects, and industrial facilities.

Our Substation Design Capabilities

Conceptual & Preliminary Design

- Feasibility studies and site selection.
- Load flow and short-circuit studies.
- Preliminary single-line diagrams (SLDs).
- Cost estimation and design optimization.

Detailed Engineering & Design

- HV and MV substation layouts (AIS & GIS).
- Electrical equipment specifications (transformers, circuit breakers, relays, busbars).
- Grounding system design per IEEE/NEC standards.
- Protection and control (P&C) schemes, relay coordination, and SCADA integration.
- Cable sizing, conduit routing, and panel design.

System Studies & Compliance

- Arc flash, protection coordination, and reliability studies.
- NERC, IEEE, IEC, and NEC standard compliance.
- Integration of renewable resources (solar, wind, BESS) into the grid.
- Geomagnetic disturbance (GMD) and transient stability impact studies.
- Load Flow & Short Circuit Analysis



Construction & Commissioning Support

- Issued-for-construction (IFC) drawings.
- Vendor and contractor coordination.
- Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT).
- Commissioning plans, energization support, and as-built documentation.

Why Choose Keentel Engineering?

- **Proven Experience:** Over three decades of delivering HV/MV projects across utilities and industrial clients.
- **Compliance Expertise:** Deep knowledge of NERC PRC, IEEE, IEC, and NEC requirements.
- **Innovation-Driven:** Advanced tools such as PLS-CADD, ETAP, PSSE, and PSCAD to deliver accurate designs.
- **Tailored Solutions:** From greenfield substations to brownfield upgrades, we customize each design to client needs.