

## HV SWITCHYARD DESIGN

Welcon Technologies can design 132kV, 66kV, 22kV and 11kV outdoor switchyards for Power Authorities and heavy industry clients.

These design services include:

### PRIMARY SYSTEMS

Primary System Layout & Design of:

- Transformer bays, cap banks, harmonic filters, Circuit Breakers, CTs/VTs sizing and selection.
- Operating and Equipment single line diagrams.
- Switchyard layouts and GAs.
- Equipment and bus clearances.
- Busbar systems – rigid and flexible.
- Lightning protection (air terminations & OHEW).
- Soil resistivity testing.
- Earth grid design and step/touch potential calculations.
- Power cable sizing & in-ground duct design.
- Insulation coordination.

### SECONDARY SYSTEMS

Concept Development and Detailed Design of:

- Protection and Metering diagrams.
- Inter-tripping schemes.
- X & Y protection systems.
- DC control schematics.
- AC schematics and termination diagrams.
- Protection and metering panel design.
- Calculation of fault levels and relay settings.

### AUXILIARY SYSTEMS

Design and Drawings for:

- 415/240VAC distribution systems with auto-changeover switching.
- DC tripping system and battery banks/chargers.
- Emergency generators.
- Fire detection systems.
- Outdoor floodlighting and indoor/emergency lighting.
- Uninterruptable power supplies.



### SCADA & COMMUNICATIONS

Design of:

- Communication networks for high speed tripping and programming interfaces.
- RTU cabinets for SCADA control and monitoring.
- I/O lists, I/O schematics, cabinets layouts and termination diagrams.
- Communication cabinets and tower design.
- Security and camera surveillance systems.
- Fibre optic cabling for video, voice and data.

### CIVIL & HYDRAULICS

Design management of:

- Site layouts and levels for optimising the site.
- Roads, access ways, kerbing and drainage.
- High vehicle access for maintenance.
- Soil testing and modelling.
- Transformer bunds, oil containment facilities.

### STRUCTURAL

Design management of:

- Structural design of equipment footings.
- Design of support structures – electrical equipment, landing structures, lightning towers and lighting poles.
- Architectural design of buildings – environs, visual & acoustic.
- Structural design of buildings, blast walls and security fencing.

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