GROUNDLINE

CAPABILITY STATEMENT

Established in 2004, **GROUNDLINE** is a global consultancy providing Transmission and Distribution Overhead Lines and EHV Underground Cable Engineering Services to contractors and network operators.

In a nutshell, we're power engineers.

Transmission & Distribution Engineering

We have experience in all aspects of the power industry; from 11kV to 500kV+ overhead lines and EHV underground cabling, survey, inspections and design of new builds to refurbishments, condition assessments to asset management, construction design and verifications to project management - we've done, and can do, it all.

Our team have worked around the world, in incredibly diverse and difficult environments; from remote dry deserts to extreme ice and snow regions and wet rain forests, built up environments to cyclone-prone regions - no matter what your challenge, we understand what's required.

Over the last 16 years, our business has grown exponentially. We credit our success to one thing - our team. We have a rock-solid reputation for being great to work with; we build long-term relationships with, and make things as easy as possible for, our customers. We take a practical approach to what we do; looking beyond spreadsheets, software, and calculations.

We're not only great at what we do; we're also dedicated to improving our industry and society as a whole. Groundline is a global leader in providing overhead and underground solutions and systems suitable for all environments. We've invested significantly in research and development, and our customers benefit from this via our clever innovations in seismic and specialist conductor technologies.

Transmission & Distribution Engineering

Groundline provides overhead line and EHV underground cable transmission and distribution design solutions.

We've honed our skills in some of the most challenging environments in the world, and use this knowledge and expertise to provide the best solutions to our customers.

Our engineering services include:

Overhead Line Design

- Line route selection:
  - » Optimum structure spotting
  - » Constructibility (heavy vehicle access, construction lay down areas, machine setup sites)
  - » Environmental constraints (allowable easement widths, vegetation clearance, existing buildings and infrastructure, landowner and heritage constraints).
- Line route survey (ground-based, Unmanned Aerial Vehicle (UAV))
- Front-End Engineering Design (FEED) for tenders.
- Conductor and earth wire selection
- Electrical design aspects for structural geometry (conductor spacings, earth wire shield angles)
- Insulation coordination studies and outage performance design
- Insulation design
- Earthing design.
- PLS-CADD modeling:
  - » Line design optimization (optimum spotting design including conductor tensions, structure heights and weights, foundations, cost analysis)
- Line design upgrades:
  - » Increasing ground clearances
  - » Reconductoring
  - » Optical Ground Wire (OPGW) installations
  - » Line cut ins and augmentations
- Wind and solar generation connections:
  - » Reticulation and termination designs
- Conductor vibration and galloping designs
- Construction documentation:
  - » Line schedules
  - » Construction staking schedules
  - » Material lists
  - » Stringing schedules
  - » Damper placement charts.

EHV Cable Design

- Cable Design up to 400kV:
  - » Customized high-voltage cable design for specific industrial, tunnels, aviation, utility, generation, transmission and renewable energy applications (wind bess Solar)
  - » Design optimization for power transmission efficiency
  - » Cable system earthing and bonding designs
- System Engineering:
  - » Detailed system studies for voltage levels, load requirements, and fault tolerance capability.
  - » Cable route planning and route optimization, including city, urban Rural and agricultural underground installations.
  - » Engineering of overhead, submarine connectivity to land fall, and underground cable systems.
- Testing and Certification
  - » Facilitate high-voltage testing arrangements for performance validation (impulse, dielectric, and thermal modeling).
  - » Compliance with IEC, IEEE, Cigre, client's and local standards.
  - » Quality assurance and reliability assessment through design and installation life-cycle

CAD & Drafting

- Cable Trench Layouts
- Joint bay positioning and routing
- Cable crossing section diagrams
- Cable & Overhead termination and approach layout drawings
- Plan and profile drawings
- Structural steel installation general arrangements
- Fabrication details, material lists and bolt lists
- Route and access maps
- Set and insulator designs
- Foundation general arrangements and setting level diagrams
- Cable and Overhead Line schedules and asset records.

Structural Design

- Structural designs using:
  - » Power Line Systems suite
  - » SPACE GASS.
- Structural loadings (in accordance with industry standards and asset owners' requirements):
  - » Load trees and charts
  - » Structural geometry designs based on electrical, operational and maintenance requirements.
- Lattice tower designs and optimization:
  - » Guyed or self-supporting
  - » Detailed designs and modification and strengthening designs for existing structures
  - » New structure designs and optimizations
  - » Tower bracings
  - » Tower dimensions
  - » Optimization curves
  - » Structure detailing and connection designs, including fabrication drawings
  - » Optimization for cost and weight.
- Pole structure designs:
  - » Wood, steel, concrete, composite, fibre reinforced and stobie.
  - » Guyed or self-supporting (including multi-pole structures
  - » Detailed design checks and modification/ strengthening design for existing structures
  - » New structure design and optimization
- Structure procurement specifications:
  - » Load trees and charts
  - » Structural outlines and geometry
  - » Key connection and attachment plate design requirements
- Full scale structure prototyping and load testings.

Foundation Design

- Designs for lattice tower, guyed tower, direct embedded and base plate connected poles
- Foundation designs for difficult terrain and environments:
  - » Pad and chimney
  - » Long pile (belled and unbelled)
  - » Rock anchor
  - » Large pad.
- Integrity & As-built assessments of existing piled foundations using Transient Dynamic Response (TDR) technology
- Management of geotechnical investigations
- Foundation upgrades and strengthening.

Verification & Design Assurance

Groundline understand the importance of independent verification and working with the designers o ensure a safe, code compliant, constructible design that will remain long after we have gone.

Independent verifications and peer reviews, carried out by a third-party expert, reduce the risk of costly mistakes and oversights.

This is where Groundline comes in.

You can rest assured knowing with our global reach and ongoing investment in training and up skilling, we have a comprehensive understanding of your local standards and will bring international best practice to bear on your project.

Site Engineering & construction support

We’re confident our site knowledge and experience in unmatched.

Construction and maintenance is in our blood. We started on the ground, and use the expertise and knowledge gained in the work we do today.

We provide robust and accurate operational support:

- Pulling Calculation Checks
- Engineering field checks
- Rigging load calculations
- Structural capacity checks
- Plant and equipment compliance checks
- Stringing and sagging management:
  - » Stringing and sagging methodologies
  - » Optimum conductor utilization
  - » Machine site setup and loading checks
  - » Conductor running tensions
  - » Critical observation spans
  - » Uplift support
  - » Procedural and quality assurance documentation
- As-built verifications and documentation
- Line route survey and staking
- Structure set-out pegging
- Lattice tower stub setting and pole base plate engineering support and site assistance
- Structural assessments:
  - » Construction loadings
  - » Maintenance loadings
  - » Maintenance and construction electrical clearance checks.
  - » Stringing schedules
  - » Damper placement charts.

Asset management

Groundline can help you understand the condition of your assets and help you translate that into an understanding of your risk, to ensure you have a safe, reliable, cost-effective network that meets your customers’ needs.

We support the industry’s move away from simple age and condition-related assessments towards a more holistic approach, in keeping with the ISO 55000 standard for Asset Management. We believe the best results are achieved when asset management practices encompass asset reliability, asset classes and an understanding of the network as a whole.

We understand the challenges our customers face with obtaining quality data about their assets, and in translating that data into useful information. We’re also mindful of changing consumer behaviours in relation to electricity, so we’ve designed products and our asset management services with these challenges in mind

Desktop assessments and studies

Our desktop assessments and studies determine the condition of your assets and identify potential electrical infringements to vegetation or changes in land use or building developments. Depending on your requirements, they may be supplemented with, or informed by, site-based inspections and tests.

- Feeder and circuit desktop reviews
- Environmental studies
- High-definition photographic inspections and data capture
  - » Ground-based photography
  - » Aerial inspections using helicopters and Unmanned Aerial Vehicles (UAV).

Asset inspections and testing

Groundline seeks to understand our customers’ asset strategies so we can help deliver on them. We provide quality data and data interpretations, using non-destructive testing methods as much as possible.

- Transient Dynamic Response (TDR) testing and analysis of foundations
- Earth impedance testing of transmission line structures
- Wood pole testing using our THOR pole tester

Products

THOR

Are you still using drills and spades to test the condition and integrity of your timber pole assets?

Digging and drilling into otherwise sound poles is not only time-consuming, it’s also damaging and dangerous. We’ve developed a better, non-invasive way of testing poles that saves time and money.

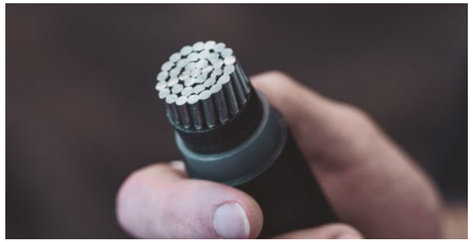
We call it THOR.

Fast and easy to use, THOR gives operators the ability to test a timber pole in under a minute. It can be used by in-house teams or contractors after just a few training days.

Thor uses seismic methodology paired with cloud hosting to provide instant, accurate and securely stored pole condition data. While THOR provides a real-time engineering assessment to the operator, it also retains its result and all associated testing data to the test’s geographic location. This data is held in the easy-to-use THOR pole portal, which the asset owner, contractor or operator can access.

The THOR pole portal provides full audit functionality. Aiding network operators to get a full picture of their networks, allowing them to easily develop then deliver on their asset management strategies.

Refer to the THOR page on our website for additional information or contact us to arrange a demonstration.



Covered Conductor

Looking for improvements in network safety and reliability?

In 2016, Groundline worked with Swedish cable manufacturing experts Amokabel to develop a cost-effective and resilient covered conductor that provides advanced power supply protection.

Its ground breaking technology eliminates the risk of outages or wildfires caused by objects touching power lines.

It can be installed at a cost comparable to bare conductor and is faster, cheaper and a lot easier to install than alternate methods of power line wildfire mitigation.

It’s a no-brainer.

Covered conductor is available in three sizes and materials and comes complete with associated hardware to replace existing bare open wire overhead conductor:

- 25mm ACS
- 62mm ACSR
- 159mm AAAC.

Our Values

People First

Collaborate, support and respect each other.

Challenge

Question the status quo and embrace diversity.

Communication

Be clear, concise and listen.

Smart

Innovative solutions by clever people.

Nimble

Be flexible, adaptive, and continuously improve.

Certifications and accreditations

Groundline holds the following certifications and accreditations:

- ISO 14001 Environmental Accreditation
- ISO 9001 Quality Accreditation
- ISO 45001 Health and Safety Accreditation
- Achilles UVDB Category B2 Accredited (Safety,Health, Quality, Environmental and Corporate Social Responsibility)
- CM3 OHS/WHS Certification.

United States
New Zealand
Australia
United Kingdom

Get in touch

groundlineengineering.com