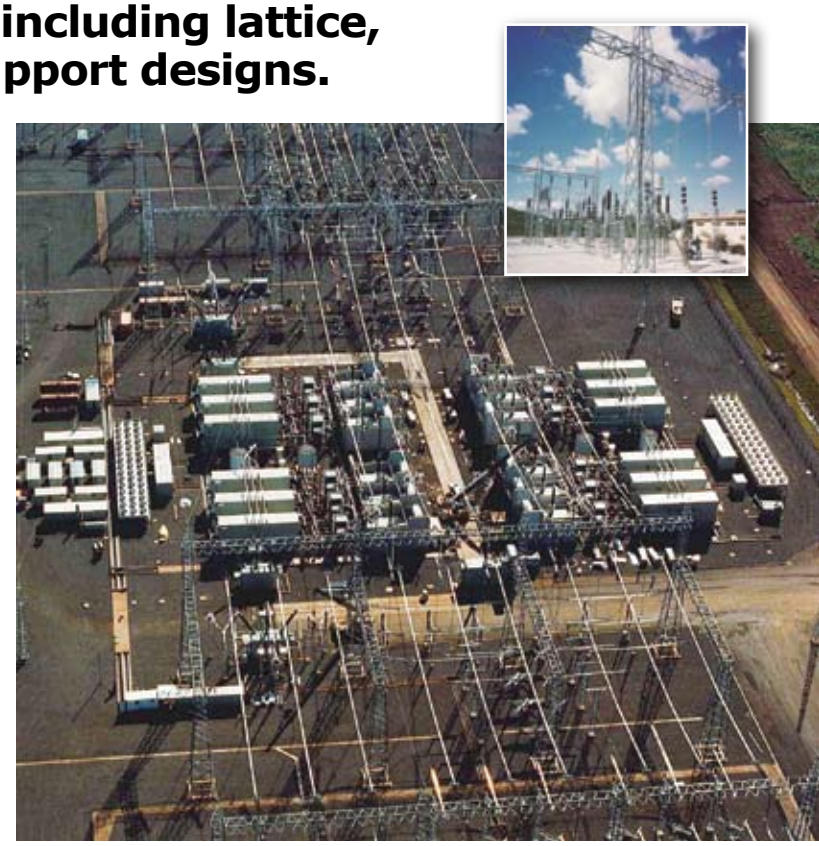
Substation Structures

SAE TOWERS

SAE Towers manufactures a wide variety of outdoor electrical substation structures, including lattice, tubular and wide-flange steel support designs.



We are the industry's most complete in-house resource for transmission structures and related services. With key resources situated at strategic locations in the Americas, we are ready to provide the substation structures you require. Our in-house design, detailing, prototyping, testing, manufacturing and supply capabilities give us unmatched ability to provide your Optimized Transmission Structure Solution.

Based on your requirements, we can design and manufacture complete substation structures or specified sub-assemblies:

- Terminal Structures
- Transformer Supports
- CCVT Supports
- Insulator Pedestals
- Multiple Dead End Towers
- Disconnect Switch Supports
- Circuit Switch Supports
- Arrestor Stands

Substantial experience and knowledge regarding the use of substation structures are essential to successful design and manufacture. Fabrication of substation structure elements often utilizes complex full or partial welding, processes we have successfully performed repeatedly through the years. We specialize in structures requiring pre-qualified and specialized welding. From in-service deflection limits to special grounding requirements, we also understand the critical needs of transmission line termination structures, designing and manufacturing to your unique specifications.

Our integrated design and manufacturing technology streamlines the work flow from AutoCad shop drawings to CNC-driven fabrication, resulting in accelerated cycle time, higher quality levels and increased production rates. As the largest purchaser of steel angles for lattice towers in the Americas, we have established key global relationships with the top raw material suppliers, including US steel mills, improving supply chain integrity and on-time delivery.

In-House Design Capability and Experience

State-of-the-art design technology systems coupled with the most experienced in-house staff of engineers in the Americas means that your design work will be done right, on time and with an eye toward quality, reliability and constructability. Our engineers understand today's construction methods and design accordingly. They have the tools, training and experience to generate designs that consider the full scope and complexity of your project requirements.

We utilize the latest versions of PLS-CADD, PLS-POLE, TOWER and AutoCAD. Our extensive database archives successful designs of all types going back more than 40 years. For new substation structure designs, we use the concepts of ASCE's *Substation Structure Design Guide (MOP 113)* as well as ANSI's *Recommended Practices of Seismic Design of Substations (IEEE-693)*.

We build prototypes for most of the substation structures we manufacture, verifying proper fit under the supervision of our engineering staff.

Manufacturing Quality and Capacity

Our transmission structure manufacturing plants are located in Monterrey, Mexico and Belo Horizonte, Brazil. Our quality-driven processes produce high levels of output and reliability. These facilities encompass approximately 475,000 square feet and conform to AISC fabricating procedures. Capable of producing in excess of 100,000 tons annually, both plants have achieved several coveted quality, safety and environmental certifications.

Both of our plants have earned the following certifications:

- Quality Management Systems *ISO 9001:2000*
- Environmental Management Systems *ISO 14001:2004*
- Occupational Health & Safety Management Systems *OHSAS 18001:2007*

BUREAU VERITAS

Additional sales, engineering design and customer service operations are located at corporate headquarters in Houston, Texas.

Quality. Reliability. Timely Delivery.

Belo Horizonte, Brazil

Our manufacturing plant in Brazil is located near Belo Horizonte in Betim, Minas Gerais. The site covers 35 acres and features 377,000 square feet of production space plus 29,100 square feet of engineering and administrative offices. Pre-assembly and quality assurance of prototypes is performed in a dedicated yard measuring 42,000 square feet. It was specifically designed employing a U-shaped production process flow in order to maximize efficiency and shorten total cycle time.

The plant utilizes 13 CNC angle punch lines, six CNC plate machines, aluminum casting equipment, radial drilling, mechanical presses, oxy cutters and semi-automatic hot-dip galvanizing systems including dulling/deglaring tanks. The facility pioneered the application of a unique galvanizing process that utilizes a continuous conveyor to advance the material through a long narrow kettle.

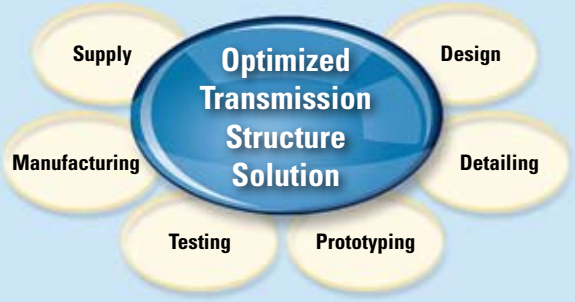
Monterrey, Mexico

Our plant in Mexico is located within easy access of US markets in Monterrey, Nuevo Leon, approximately 120 miles south of Laredo, Texas. The 15-acre site includes 98,200 square feet of production space plus 6,500 square feet of engineering and administrative offices. A yard encompassing 84,200 square feet is dedicated to the pre-assembly and quality assurance of prototypes. The Monterrey facility has full access to global and US steel suppliers, allowing for ready availability of both structural angles and plate conforming to ASTM A36, ASTM A572, ASTM A588 and ASTM A871 specifications as well as other special grades as required.

Modern manufacturing processes include eight CNC angle punch and drill lines along with three CNC plate machines, four light-duty punch machines, one 1,500-ton press brake, two 250-ton vertical presses, plasma and oxy cutters, milling machines, plate shears and submerged arc welding equipment.

Hot-dip galvanizing is carried out in house in one of the most modern facilities in North America. The main kettle measures 5 feet (w) x 8 feet (d) x 41 feet (l) and is supported by eight pickling tanks, one flux, one rinse, one quench and three dulling/deglaring tanks.

Big or small, simple or complex—we make it easier for you to get your substation structure project done on time and on budget. Our Optimized Transmission Structure Solution is your gateway to field-fit constructability, cost effectiveness, weight efficiency, shorter and simpler transaction cycles, improved maintainability and long-term reliability.



SAE Towers

The largest steel lattice producer in the Americas providing Optimized Transmission Structure Solutions through world-class in-house capabilities.

- *Field-Fit Constructability*
- *Cost Effectiveness*
- *Weight Efficiency*
- *Shorter/Simpler Transaction Cycles*
- *Improved Live Line Maintainability*
- *Long Term Reliability*

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