

250 Unique Steel Structure Designs Help Empower Massive Transmission Project

An enormous undertaking, Northeast Utilities' 345-kV Middletown-Norwalk Bulk Power Project required construction of 150 miles of both overhead and underground transmissions lines. This included 45 miles of new overhead lines, 48 miles of new underground lines, and 57 miles of reconstructed overhead lines. In addition, two new substations and three existing substations were built or modified.

Complicating the project was the route: 69 miles through 18 municipalities along the densely populated I-95 corridor in southwest Connecticut. Planning for the \$1.1 billion project began in mid-2004, and it was energized in December 2008 — one year ahead of schedule and \$95 million under budget.

The project's huge scope — with various sections in different stages of planning, permitting, construction, and installation all at the same time — required flexibility, communication, and commitment on the part of each of the 62 prime contractors and vendors. Trinity Meyer Utility Structures was proud to be selected as the sole supplier of steel structures.

“The existing ROW necessitated using structures with a smaller footprint, which made steel poles the logical choice,” said Project Engineer Peter Novak. “Of the 45 miles of overhead lines, about half of the route was in an area with an existing lattice structure and 2 H-frame structures. All of these structures were removed and replaced by two steel monopoles.”

Of the approximate 750 structures, 250 were unique designs. With more than 7,000 homeowners and businesses affected along the route, the project design had to address various public concerns, ranging from aesthetics to EMF mitigation. Municipalities chose between weathering steel and galvanized structures, and structure design changes were common. In addition, lower poles were used where resident views were an issue.

For many community groups, EMF was a major concern, and higher poles were used in these areas. One engineering solution offered poles with six arms, which enabled a split-phasing technique to drastically reduce EMF levels. The utility also agreed to enhance beautification efforts by planting trees and flowers in areas where the right-of-way passed through the back yards of homes.

With a project of this magnitude, controlling every aspect of cost was critical to the project's success. "We were able to reduce Total Installed Cost by working with Trinity Meyer Utility Structures to design structures that could use smaller foundations," said Novak. "By reducing the foundation diameter, we could drill smaller holes and use less concrete." This required a smaller diameter of the pole shaft as well, so thicker plates were used on the structures and anchor bolt cages to achieve optimal strength. The cost to strengthen the structures was more than offset by the savings in the foundation costs, thus reducing the overall Total Installed Cost," Novak noted.

Expertise in every facet of a transmission project of any size is critical, especially when utility and community must share the land harmoniously. "This project is a shining example of our commitment to preserve these unique areas and continue a tradition of environmental stewardship and enhanced electric reliability," said Laurie E. Aylsworth, Vice President of Transmission Projects, Engineering & Maintenance for Northeast Utilities. "Working with experienced, reliable suppliers like [Trinity Meyer Utility Structures] play an important role in meeting that commitment."

Trinity Meyer custom-designed structures provide cost-effective, engineered solutions for carrying high-voltage transmission lines. Our steel structures are reliable, easy to install, and can withstand severe conditions. They can be produced on a fast-track schedule, meeting customer requirements to get much needed transmission lines restored in the shortest time possible.