

# TRANSMISSION LINES AND STRUCTURES

## CONSIDERATIONS FOR THE ROCKDALE TO WEST MIDDLETON TRANSMISSION LINE PROJECT

In building new transmission lines, we use wood or steel structures depending on the conditions of the land and surrounding areas, the price of steel, the height needed for the poles and other factors. We use a variety of structure designs that are considered more aesthetically acceptable and leave a smaller footprint than past designs. The actual design will depend on the characteristics of the route, which has not been determined. However, we are likely to propose either single steel poles or H-frame structures such as the ones pictured below. Actual poles and design may vary slightly based on engineering considerations.



Single steel poles for 345-kilovolt transmission lines are typically 110 to 120 feet tall.



H-frame structures 345-kilovolt lines are typically 90 to 100 feet tall. These structures require wider right-of-way and have higher electric and magnetic field readings within the right-of-way due to the horizontal configuration of the wires.

### Line design considerations

The design of a transmission line and where the wires are placed in relation to each other affects the height of the pole, the distance between the poles and right-of-way width needed below the line. The width of a right-of-way also depends on the voltage of the line and the height of the structures, but can be 75 to 150 feet tall or more.

There are typically trade-offs involved in line design. For example, taller poles can be placed further apart, requiring fewer of them. Poles that are shorter may blend better into the landscape, but more are needed and they may be placed closer together.

Decisions about pole height and design are site specific. Pole height may be a primary concern near airports, requiring shorter poles possibly wider right-of-way and smaller spans (distance between poles). In a more developed area, a narrow right-of-way may be a primary concern, allowing for taller poles that are spaced farther apart.

Most people are familiar with the steel, self-supporting lattice-style structures, many of which were built during the 1950s and 1960s. The lattice structure is very strong, relatively light and could be erected without the need for heavy equipment and major access roads. However, they take a lot of time to design and build. The base foundations require a large area of land on which to stand, which often interferes with agriculture. Lattice-style transmission structures, although still in operation today, are generally not used in new construction.



Lattice towers are generally not used in new construction.