Northland Reliability Project

Typical structure

Similar to other 345 kilovolt (kV) transmission lines recently built in Minnesota, the Northland Reliability Project will typically use a single-pole steel structure with three phases of wires on each side of the structure. This design is proven to withstand high winds and provide capacity to support the development of a reliable, resilient and flexible energy grid.

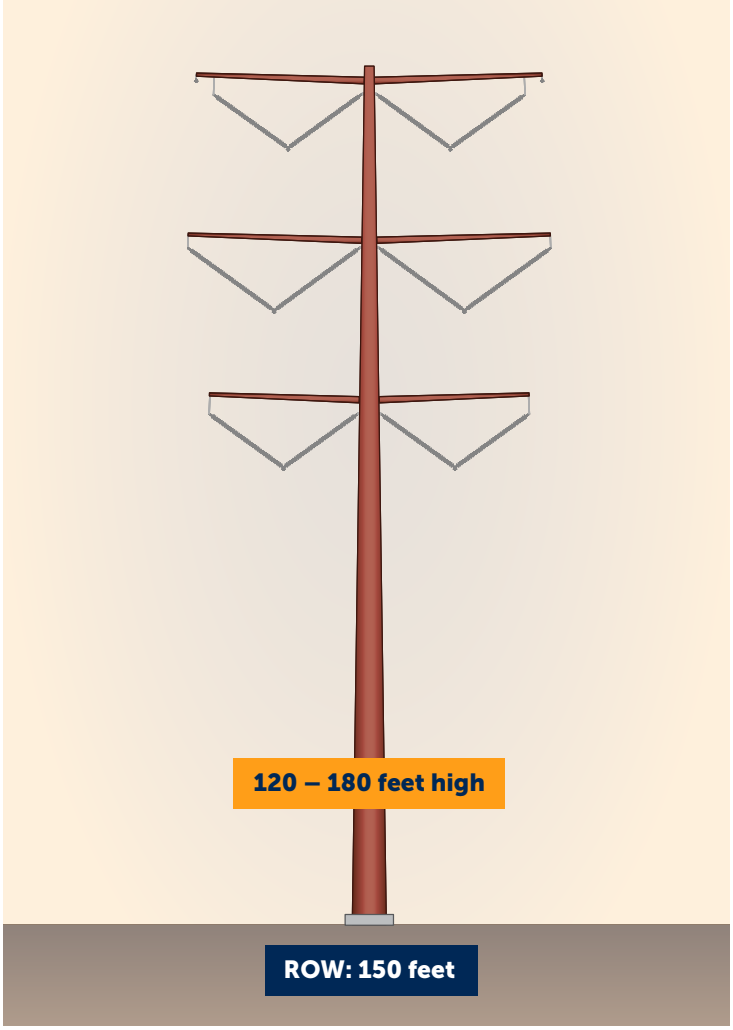
Single-pole structure by the numbers

TYPICAL HEIGHT: 120 – 180 ft

TYPICAL SPAN: 800' to 1,000' or 5 – 7 structures per mile

TYPICAL FOUNDATION: concrete

TYPICAL RIGHT-OF-WAY: 150-feet (opportunity to overlap ROW with adjacent structures)



Frequently asked questions

What makes these structures the best option for this project?

The benefits to this structure design include a reduced footprint due to the single pole structure and reducing right-of-way needs by vertically stacking the circuits using a V-string wire design. This structure reduces impacts to landowners when compared to alternative structure designs, such as lattice towers or H-frame structures.

How deep will the foundations be?

New steel pole structures will generally be installed on concrete foundations. Actual depth of the foundation depends on soil conditions established during the initial survey and soil testing phases.

Will any substations be built or upgraded?

In addition to the transmission line work for this project, Minnesota Power and Great River Energy are:

- Expanding the existing Iron Range Substation (located east of Grand Rapids) by approximately 15 acres entirely on Minnesota Power-owned property and extending the existing fence line on the southeast side.
- Expanding the Benton County Substation (located east of St. Cloud) by approximately 8.5 acres entirely on Great River Energy-owned property (likely to the west).
- Installing a new Cuyuna Series Compensation Station in Crow Wing County near the existing Riverton Substation.

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connect@northlandreliabilityproject.com
218-864-6059

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Will other structures be used on the project?

Yes, less common structure types, including a 2-pole design, may be used where necessary to accommodate a variety of factors such as turning angles, height restrictions near airports, environmental needs, permitting needs, topography, or when needed for construction activities.

How many 2-pole structures are anticipated for the project?

The final route and engineering will determine the final structures. At this time we anticipate approximately 10 percent of the structures for the Project could be the 2-pole dead-end structures.

Will 2-pole structures be the same height as typical structures?

Yes, we anticipate the 2-pole structures will be the same typical height (120 - 180 feet), typical span (800' to 1,000' or 5 - 7 structures per mile) and typical right-of-way (150 feet). Because these structures are designed for more robust loading conditions, they will have a larger concrete foundation.

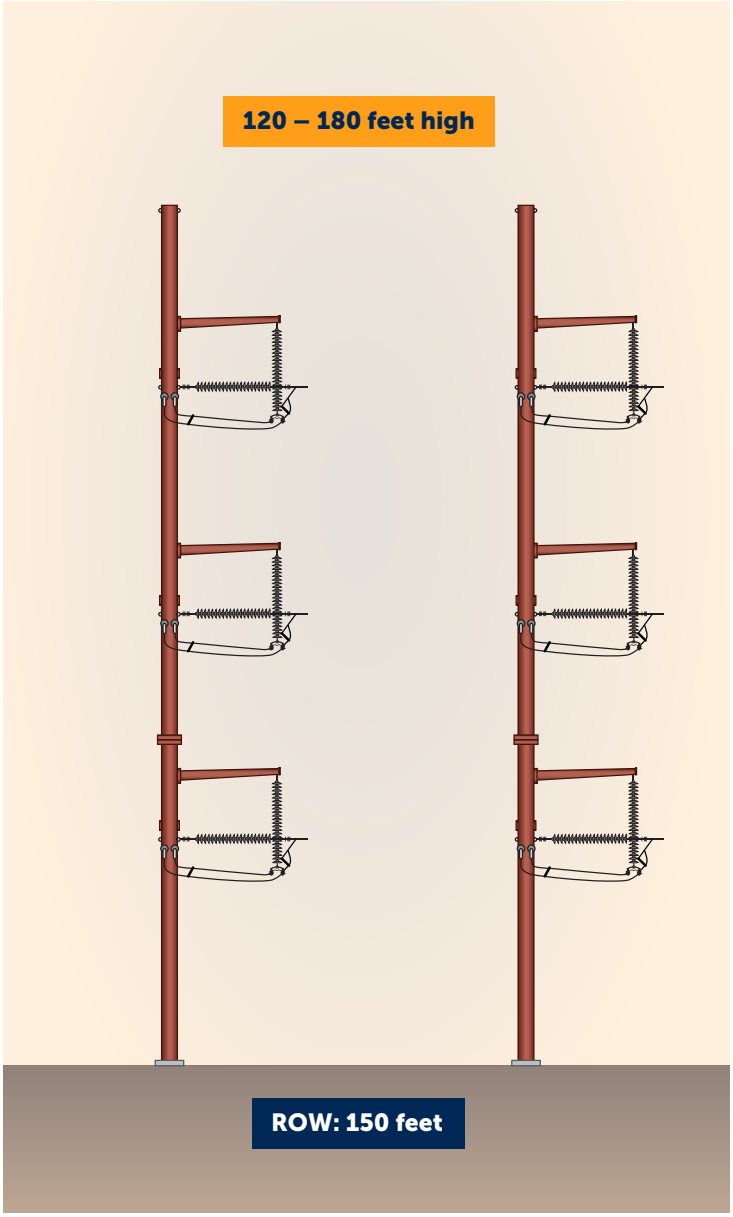
2-pole structure by the numbers

TYPICAL HEIGHT: 120 – 180 ft

TYPICAL SPAN: 800' to 1,000' or 5 – 7 structures per mile

TYPICAL FOUNDATION: concrete

TYPICAL RIGHT-OF-WAY: 150-feet (opportunity to overlap ROW with adjacent structures)



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