Steel Structures

ᐊᐧᐅᓂᑲᓂᔭᑊ Wataynikaneyap Power

The Chiefs passed a resolution in August 2019 at a Shareholder's meeting supporting the shift to steel structures for the majority of the line. Updates were provided to government agencies, the Independent Electricity System Operator, the Ontario Energy Board and the few private land holders along the line. Necessary approvals were in place by August 23, 2019 and Valard was instructed to proceed with the steel structures for construction.

The key differences are:

Increased Forest Fire & Extreme Weather Protection

During the summer of 2019, fires either touched or threatened the project footprint 6 times near Pikangikum, Pickle Lake, North Caribou Lake, and Keewaywin. Steel structures improve resistance to fire damage. They also improve capability to withstand high winds, ice build-up and damage from woodpeckers. This all increases the reliability of electricity supply to the communities.

More Employment Near Communities

Steel Structures are assembled during construction in a yard near communities then airlifted into place on the line clearing. This creates an opportunity for more employment near communities to assemble the structures..

This photo represents a sample assembly yard (Valard Construction)

Wataynikaneyap has committed to replanting coniferous trees in the assembly yards after use!

Cost Savings

Historically, steel structures have been more expensive than wood which is why steel wasn't initially seen as the first choice. But because of the advantages of installing in the tough Northern terrain combined with recent reductions in global steel prices, steel actually has a small cost advantage which benefits all owner Communities.

Less Structures, Less Impact to the Land

Steel structures are stronger than wood poles, last longer, and aren't treated with a preservative. The increased strength of steel means less structures are needed to support the line. There is an overall reduction of 2900 structures, which also reduces the amount of travel required on the line corridor (and noise from machinery) during construction. The design life of a steel structure is about 80 years, 20-30 years longer than for wood. Less travel over the land to install and replace structures means reduced impact of weather-related delays over the construction period, and reduced impact to the land from construction traffic. Removing wood preservative also reduces risk to the land and water.

Roads and Line Construction

One main difference with steel towers is that supporting guy wires extend to the edge of the line clearing. For this reason, future community-built roads won't fit within the line clearing. Future community roads can be beside the line clearing and can cross the line clearing as close to 90 degrees as possible. If your community is planning a future road near the line please contact us to coordinate.

Photos by Valard Construction

How are they installed?

Right of Way

The first step is to clear a path for the construction of the transmission line. This is known as the Right of Way, or ROW. This stage may consist of logging, mulching and clearing of debris, as well as building roadways to the site.

1

Geomatics & Survey

Survey crews stake or flag the locations for the towers using predetermined GPS coordinates. The crew will also determine if the planned tower location is actually viable for installation.

2

Material Delivery

Materials are stored and sorted in material yards offsite, and will be delivered to site as they are required.

3

Foundations & Anchors

There are two main types of towers that may be built: self-supporting and guyed. Self-supporting towers require foundations for each leg of the tower, while guyed towers require one foundation for the tower, and multiple anchors for the guy wires. After they are set, foundations and anchors are tested to ensure that they can bear the loads from the tower.

4

Tower Assembly

5

The steel towers are assembled on the ground or in a laydown yard near the tower site. Each part of the tower is built separately and then connected together on site.

Tower Erection

6

Towers are set into place either with cranes or with helicopters, depending on the design of the tower. Some towers are erected as one piece, others are done in multiple pieces. Towers are then secured to the foundation.

Stringing

7

Stringing refers to hanging and fastening the conductor wire to the towers. This can be done with cranes or helicopters.

Reclamation

8

After construction but before the line is energized, the sites will be returned as close as possible to their original ground conditions. This may include, but certainly isn't limited to, removal of debris, erosion control, and revegetation.

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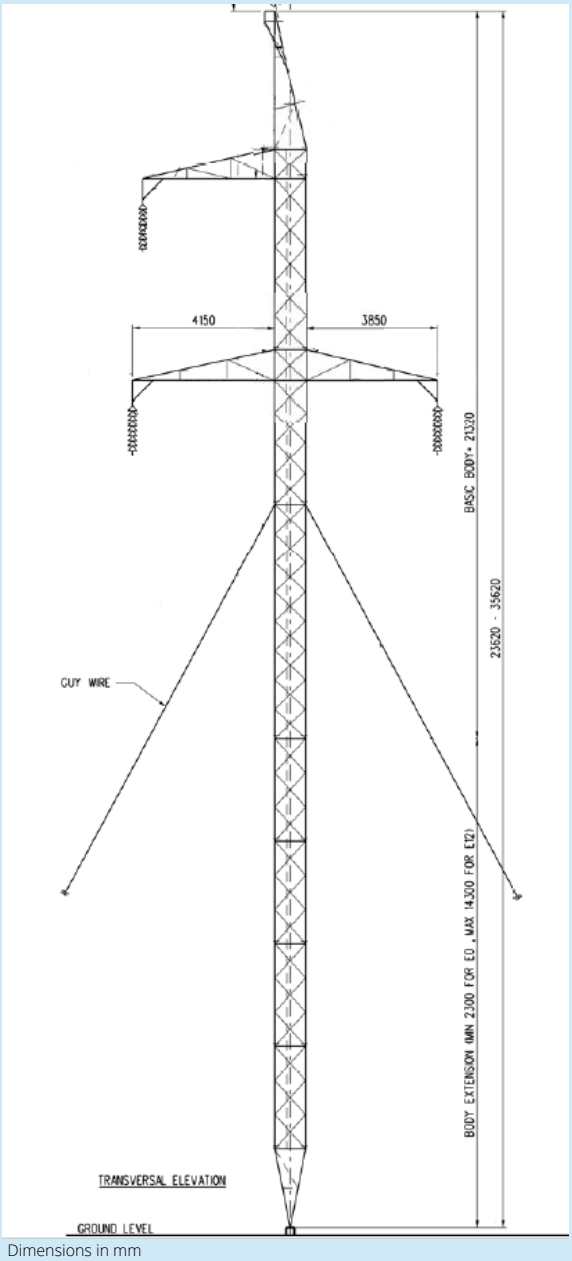
Visual example of a steel structure being used for the project

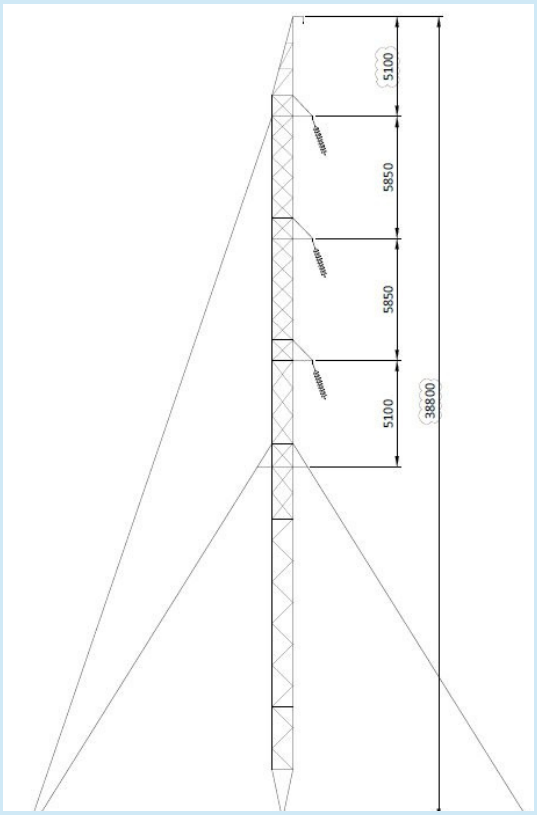
115kV Structures

Tangent Structure

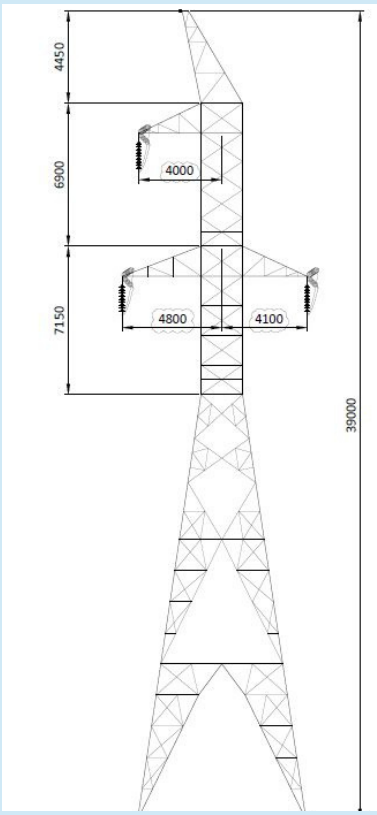


Dimensions in mm

Medium Angle Structure



Heavy Angle/Free-Standing Structure



Tangent Structures (left) are used in straight sections of line and will be the most common structure type. Height extensions shown in the lower section of the tower are optional depending on terrain.
Medium Angle Structures (middle) are generally use from 0-30 degree bends in the line. Shown here is the tallest version of this structure, shorter versions may be used.
Heavy Angle/Free-standing Structures (right) can be used for 0-90 degree bends in the line, and/or in locations where there is no room for guy wires. Shown here is the tallest version of this structure, shorter versions may be used.

44kV and 25kV sections of line will still use wooden poles.