

Transmission line construction process

There are several steps needed prior to poles being installed. The process can vary depending on the size of the line, soil conditions, terrain and other variables.

1. Soil surveys and property staking:

Field survey and soil information must be obtained to finalize design. A soil boring is typically taken every mile to determine the mechanical properties of the soil. Right-of-way agents request access to the property and coordinate between the soil boring contractor and the property owner. The soil boring locations are staked and existing underground utilities are located prior to borings. Once final pole locations are determined, they are staked and reviewed in the field.

2. Construction access and tree clearing:

Before construction starts, Xcel Energy construction personnel will identify access routes to the right-of-way. The access is typically 25 to 30 feet wide and is needed so large equipment including a drill rig, concrete trucks and a crane can be delivered to the right-of-way. Matting is sometimes put down in wet or soft areas to prevent compaction, minimize soil disturbance and improve site safety.



3. Equipment mobilization and material delivery:

A crane, drill rig, concrete truck, boom trucks, trailers, structures, steel casing and rebar cages are some of the equipment and materials that may be moved into the right-of-way for construction.

4. Foundation construction:

Construction crews will begin drilling for structure foundations. Two types of foundations are typically going to be used for the project. Reinforced concrete drilled pier foundations typically range from 6 to 9 feet in diameter and are drilled 20 to 40 feet deep. Once the drilling is complete, an anchor bolt cage with reinforcing steel is placed in the hole and concrete is poured. Drilled pier foundations typically take one to two days to complete unless rock is encountered. Direct embed foundations typically range from 3 to 5 feet in diameter and are 10 to 20 feet deep. Once the hole is drilled the pole base section is placed in the hole and then backfilled. Direct embedded foundations typically take 2 to 4 hours to complete.



5. Erection of the structure:

High voltage transmission structures are usually steel poles. The poles are assembled at the foundation site and set in place with the use of cranes and other heavy equipment. A pole can be assembled and set in place in one day.



6. Stringing conductor:

After all structures are erected in an area, the next step is to install conductor (wire). Conductor is pulled from one structure to the next through a pulley system temporarily placed on the structures. After a section of conductor is pulled through a series of structures, the conductor is attached to insulators, which are attached to the structure and the pulleys are removed. Trucks, heavy equipment and sometimes helicopters are used in this process. In some cases, conductor is connected using implosive connectors that create a flash and loud boom. Other equipment including bird diverters, spacers and galloping devices are also installed.



7. Land restoration:

Following construction, the right-of-way is cleaned up and restored. This work may include fence repair, rut removal, decompaction, disking, tilling, seeding and possible wetland restoration. If damage occurred to crops or other non-restorable property during construction, Xcel Energy right-of-way agents will work with the landowner to reimburse damages.

