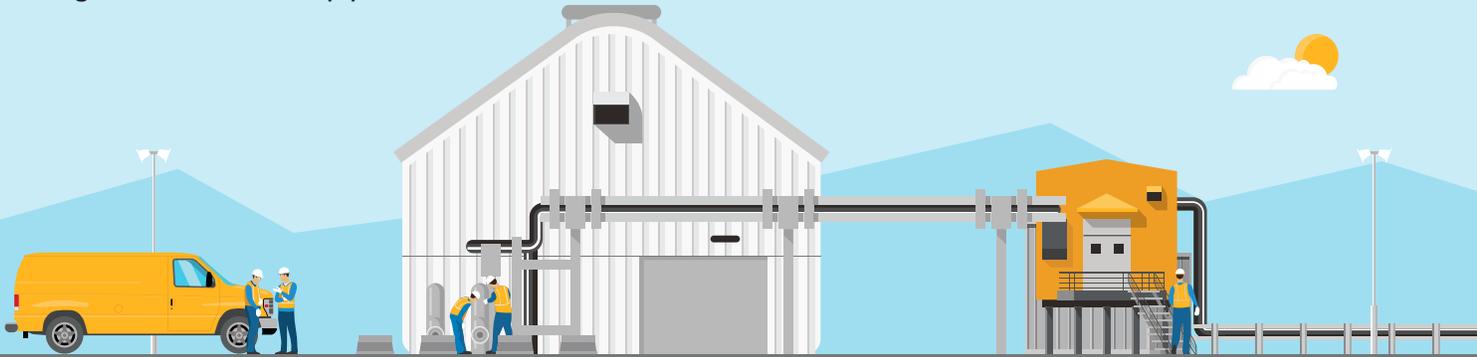


How we construct a pump station

Pump stations are located along our liquids pipelines to keep product moving through the pipeline. The location of these stations is determined by topography, the product being transported, and the operating conditions of the pipeline.



1 Surveying and contouring the site

Boundaries and elevations are determined by surveying. Soil conditions are carefully analyzed and the site is contoured to achieve proper drainage and required elevations.



2 Access roads and containment areas

Access roads are built to enter the site and ensure it can be maintained by Operations. Containment areas are included to secure both oil and excessive rainfall.



3 Creating a solid foundation

Concrete or steel piles are driven or screwed into the ground, providing a solid foundation for the equipment, buildings and piping. The design of the foundation is dependent on the geotechnical and engineering studies.



4 Concrete

Concrete with reinforced bar is used for the perimeter walls of the building shelter, pump blocks, and floor slab inside the building.

**5**

Building shelter

A steel or fabric pump shelter is constructed, which houses all of the pumps, motors, instrumentation, sump tank, and the majority of the facility piping. The shelter also provides noise mitigation.

**6**

Leak detection

The facility is equipped with instrumentation used by a leak detection system to monitor the operating pipeline. The leak detection system reads these signals to create a real-time understanding of how the products in the pipeline are moving. The building shelter has a trenched floor equipped with a level sensor and the site is graded to contain a potential release within the facility, like a giant bathtub, and to protect the surrounding environment.

**7**

Piping and structural steel

Piping and structural steel platforms are fabricated and coated offsite where possible. The piping is then assembled in the station by bolted connections or field welds. It is hydrotested to ensure the design of the system is achieved. Structural steel is mainly used for platforms to allow access to the equipment within the building.

**8**

Mechanical equipment

Pumps and motors are installed inside the pump shelter on concrete foundations. The piping is fitted to the pumps with very strict tolerances to ensure no stress from the piping is transferred to the pump nozzles. Valves are also installed to allow for control and isolation of the equipment and station.

**9**

Modular electrical buildings

Electrical buildings are constructed for Enbridge offsite. Electrical cable is installed between the buildings and the pump station. Each pump station has dedicated substation equipment that steps down the voltage from the utility provider.

**10**

Commissioning and project completion

The pump station is commissioned and quality audit completed, making the facilities ready for safe operation.