PIPELINE QUESTIONS ANSWERED:

PIPELINE DESIGN & CONSTRUCTION



How are pipelines designed and constructed to operate safely?

Pipelines are designed for their operating conditions, constructed with quality certified steel, assembled with qualified personnel and pass multiple inspections before operation.

Quality Certified Materials & Techniques

Pipelines are designed to fit their operating use and conditions. The steel must be certified as meeting industry and federal government quality requirements for toughness and strength. Construction personnel, such as pipe welders, must have qualification certifications, which are checked as part of the pipeline inspection.



Pipe steel for transmission pipelines must be certified as meeting quality standards and requirements.

Pipe is manufactured either by rolling hot rolled coil steel into a spiral and welding the sides of the sheet continuously to make the pipe or bending long sheets of steel lengthwise into a cylinder and then welding the seam the length of the pipe.



Spiralweld pipe is formed and welded from long rolls of steel.

Pipeline Assembly

Pipe segments typically 40’ long are transported to the construction site by train or truck and then laid out along the pipeline route.



Pipe segments laid out for connection.

Pipeline segments are welded together end to end to form the pipeline. Pipe welders must be qualified in accordance with industry standards incorporated into federal regulation. Weld types and procedures are also set by federal regulation. Welders must demonstrate their abilities in field tests before construction.



A welder joins two ends of pipe segments with a girth weld.



An assembled pipeline is lowered into place before the soil is replaced.

Construction Quality Inspections

Welds at the connection of pipe segments along the pipeline must be inspected for quality. An X-ray or ultrasonic scan ensures there are no defects in the connection.



Inspection technician scanning a weld to ensure a defect free connection.

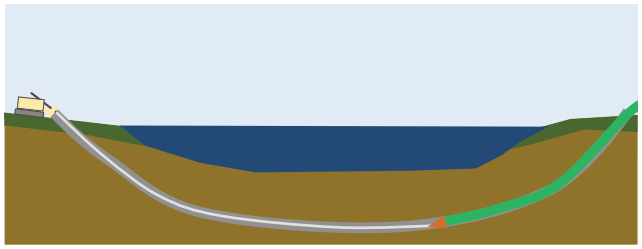
After passing inspection, weld joints receive the same anti-corrosion protective coating as the pipe body received at the pipe mill. The pipeline receives a further protection through a slight electrical current system, called cathodic protection, and installed along with the pipe that wards away corrosion.

Pre-Operation Testing

An assembled pipeline must still undergo pre-operational testing before it is allowed to go into service. Operators pump water into the pipeline and hold it at high pressure to demonstrate there are no leaks in the pipe or its weld joints. Any construction issues are repaired before the pipe is operational.

Directional Drilling to Avoid Waterbodies

Newly constructed pipelines avoid contact with major waterbodies by tunneling deep beneath them, Before a pipeline reaches a waterbody shoreline, horizontal directional drilling (HDD) can burrow the pipeline 100’ or more beneath the bottom of a waterbody, never coming into contact or close to the water itself.



New pipelines are drilled deep underneath major waterbodies to avoid contact with water resources.

Construction Site Remediation

After the pipeline is assembled, laid in its trench, inspected and tested, the pipeline is covered and topsoil replaced. In agricultural areas, land over a pipe can return to normal farming.



Before and after a pipeline construction site is remediated.