

# BAYOU BRIDGE

## PIPELINE

## SAFETY PRACTICES AND DESIGN

At Energy Transfer and with the Bayou Bridge Pipeline, safety is our top priority. Our goal is to provide safe and reliable transportation of multiple grades of crude oil for our customers. Using advanced technology and a proven safety design, the project will utilize safety features that are standard for all pipeline projects and will meet all regulation requirements.

### Some of these safety measures include, but are not limited to:

- A Control Operations Center will monitor the pipeline 24 hours a day, 7 days a week.
- Bayou Bridge supports statewide local One-Call Centers to identify underground utilities for third parties working in the area.
- A SCADA (Supervisory Control And Data Acquisition) system will be installed that provides real-time data acquisition, monitoring and control of key operating points such as pressures, temperatures, flows and equipment status, including alarming of any conditions outside established parameters, and the capability to remotely control and shut-in the pipeline during abnormal operating conditions.
- The pipeline will employ the latest technologically advanced leak detection system and will utilize a Computational Pipeline Monitoring (CPM) system to continually monitor the pipeline for potential leaks using multiple parameters and computational algorithms.
- Bayou Bridge will develop a robust and continuously review an updated Facility Response Plan to ensure effective response to abnormal operating conditions. This plan will be submitted to the Pipeline And Hazardous Materials Safety Administration (PHMSA) for review and approval and will be, at a minimum, reviewed annually.
- Bayou Bridge will execute strategic contracts with private Oil Spill Removal Organizations to provide immediate spill response support and equipment in the rare event of a release.
- Bayou Bridge will provide annual landowner/stakeholder outreach and implementation of a Public Awareness Program.

**Once in operation, Bayou Bridge is committed to ensuring the long-term integrity and safety of the pipeline. Below are just a few of the many measures in which we will voluntarily exceed the required regulations to ensure the protection of the pipeline and the safety of the communities along the route.**

DOT Part 195 Requirements	Bayou Bridge Standard	Benefit of Exceeding Requirement
<b>Pipeline Coverage and Separation Distances</b>		
The minimum clearance required between the pipe and a drain tile is 2 inches.	Bayou Bridge will provide a minimum clearance of 24 inches between the pipe and any drain tiles present.	The additional coverage will help mitigate the potential of third-party damage during tile repairs and soil cultivating activities.
The code requires that the pipe is buried below the level of cultivation or to a depth of 30 inches, whichever is deeper.	Bayou Bridge will provide a minimum cover (from the top of the pipe to ground level) of 48 inches in cultivated areas.	
The minimum cover required at public road drainage ditch crossings is 36 inches.	Bayou Bridge will provide a minimum cover (from the top of the pipe to ground level) of 60 inches at public road drainage ditches.	The additional coverage provides protection from potential third-party damage.
The minimum required coverage in industrial, commercial and residential areas is 36 inches.	Bayou Bridge will provide a minimum (from the top of the pipe to ground level) of 48 inches through industrial, commercial and residential areas.	
The code requires the pipeline be covered a minimum of 48 inches through waterbody crossings of inland bodies of water with a width of at least 100 feet.	Bayou Bridge will provide a minimum of 60 inches of cover at waterbody crossings.	

# SAFETY PRACTICES AND DESIGN IN EXCESS OF REGULATORY REQUIREMENTS

DOT Part 195 Requirements	Bayou Bridge Standard	Benefit of Exceeding Requirement
<b>Pipeline Strength</b>		
The requirement states that the pipe must be specifically engineered for its purpose.	<p>Bayou Bridge pipe is specified to API 5L, PLS-2 standards which mandate additional metallurgical requirements, factory inspections and record retention. Additionally, the longitudinal seam of all pipe has been 100% examined by nondestructive testing (NDT).</p> <p>All pipe mills were inspected for their quality assurance and quality testing programs prior to being allowed to bid as a contractor for the project.</p>	The higher quality of pipe standards increases the resistance to third-party damage, shipping damage and overall pipe body cleanliness and weldability.
Inspection is required at the job site during installation.	For Bayou Bridge, inspectors were placed in each pipe mill while the pipe was being produced, and inspection is carried out all the way through installation.	This additional inspection ensures full compliance with quality control measures and additional safety and serviceability.
The requirement states that the pipe must be designed using a 0.72 design factor.	Bayou Bridge will employ heavier pipe wall thickness (0.60 design) at all public road, waterway, railroad crossings and for all above-ground sections, such as mainline valve sites and pump stations.	Implementing a design factor of 0.60 with thicker pipe wall provides additional pipe strength above the minimum requirements.
<b>Pipeline Valves</b>		
There is no code that requires we install motorized actuators.	All mainline valves will have motorized actuators that enable the valves to be remotely and quickly closed to isolate pipeline segments.	The motorized actuators help to remotely isolate the pipeline by valve section and help reduce the time to respond if there should be a need. They will also qualify as Emergency Flow Restriction Devices (EFRD), which help to project against back-flow during shut-down or isolation conditions.
<b>Pipeline Integrity Testing</b>		
The code requires that we perform nondestructive testing (NDT), by either radiographic or ultrasonic methods, for 10% of the girth welds made by each welder each day.	NDT will be performed on 100% of all mainline girth welds.	This helps to validate the welding, which ensures their integrity and the strength of the pipeline.
The requirement states that the line must be tested using water, or hydrotested, for 4 hours at 125% of the Maximum Allowable Operation Pressure (MAOP), and an additional 4 hours at 110% MAOP.	Bayou Bridge will hydrotest for at least 8 hours at 125% MAOP.	This helps to establish test criteria above and beyond what is required and provides additional safety for the operation of the pipeline.
The requirement states that the valves must be tested using water, or hydrotested, for 4 hours at 125% of the Maximum Allowable Operation Pressure (MAOP), and an additional 4 hours at 110% MAOP.	Bayou Bridge will hydrotest all valves and above-ground equipment for at least 8 hours at 125% MAOP.	
The requirement states that the pipeline Cathodic Protection System must be activated within 1 year after the pipeline begins operation.	Bayou Bridge will activate a Cathodic Protection System in stages along the route as the pipeline is backfilled and completed.	This system helps to prevent corrosion and prevent the pipeline from reacting to other elements in the environment.
<b>Operations</b>		
The code requires inspection of the right-of-way during operations.	Bayou Bridge right-of-way will be inspected by aerial means once every 7 days, weather permitting.	The aerial view provides visual information and provides increased awareness of activities taking place along the pipeline route.