

Lowering-In and Backfilling

STD.8707

Scope

This standard provides general guidelines for lowering-in pipe and backfilling trenches.

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1.0 CODES, SPECIFICATIONS AND STANDARDS

1.1. Pipeline and Hazardous Materials Safety Administration (PHMSA)

49 CFR 192	Transportation of Natural and Other Gas by Pipeline
49 CFR 195	Transportation of Hazardous Liquids by Pipeline

1.2. American Society of Mechanical Engineers (ASME)

B31.4-2006	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
B31.8-2007	Gas Transmission and Distribution Piping Systems

1.3. Occupational Safety and Health Administration (OSHA)

29 CFR 1926.251	Materials Handling, Storage, Use, and Disposal
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2.0 LOWERING-IN PIPE

2.1. General

- (1) Holiday detection (jeeping) shall be performed just prior to lowering-in to the excavation/trench, and the coating shall be closely inspected for possible damage resulting from the lowering-in operation. Personnel should stay clear of the coil of the Holiday detector when in use to prevent electrical contact.
- (2) Lowering-in operations shall only be performed with the approval of the Company Representative. Contractor equipment shall not exceed the maximum allowable working load during lowering-in operations. Should lowering-in be performed in the absence of or without the approval of the Company Representative, Contractor may be required to raise the section of line for inspection at Contractor's expense.
- (3) Sections of the coated pipe shall not be dragged or pulled into position unless approved by Company Representative. The length of sections shall be regulated to allow handling without damaging the protective coating at stream crossings or at any other location where it may be necessary to pull or drag sections of pipe into place. The coated pipe shall be properly protected and handled in a manner to prevent damage to the pipe.

2.2. Overbends, Sidebends and Sagbends

All overbends, sidebends and sagbends shall conform to engineering design tolerances. Where no such tolerances were provided, the Contractor shall consult with Company to seek guidance prior to proceeding. All overbends, sidebends and sagbends shall be made and installed to clear the high point of the bottom of the ditch by at least 12 inches at the point of bend. At sidebends, the pipe shall be bent and lowered to lie against the outside wall at the bottom of the ditch. All sagbends shall continuously lie on firm ground at the bottom of the ditch.

2.3. Pipe Slings and Cradles

The Contractor shall provide padded slings for handling coated and wrapped pipe. The use of belting reinforced with wire cable shall not be permitted. Any safe method of lowering-in that prevents damage to the coating shall be acceptable; however, the use of cradles is preferred.

2.4. Condition of Ditch

Prior to lowering-in, the Contractor shall provide, to the satisfaction of the Company Representative, a ditch free from excess debris, large rocks and roots, welding rods, skids, or other such objects that can cause damage to the pipe and its protective coating during lowering-in operations.

2.4.1. Water in Ditch

The Contractor shall pump water from the ditch, bell holes, or other tie-in excavations prior to lowering-in such that Company Representative is able to properly inspect the final condition of the ditch.

2.4.2. Rock Ditch Padding

In all cases where rocks 2 inches and larger are encountered in the bottom of the ditch and no additional pipe coating protection is provided, or as deemed necessary by Company Representative, the Contractor shall provide padding to a minimum depth of 8 inches along the bottom of the ditch as approved by the Company.

2.5. Temporary Negative Buoyancy (Wetlands)

If warranted by the condition of the ditch, and if acceptable to the Company, the Contractor may fill sections of the pipeline with silt-free water to achieve temporary negative buoyancy during lowering-in operations.

3.0 PIPELINE SUPPORTS

3.1. General

This specification defines the general requirements necessary for the supporting of pipelines and related facilities to provide installations which remain stress-free subsequent to the backfilling operation and the consolidation of the backfill material.

3.2. Procedures

The Contractor shall construct the pipeline to lie on the bottom of the pipe trench. Additional excavation shall be made as necessary around valves and fittings to provide for continuous support of the mainline by the bottom of the trench. All bends shall be made to fit the pipe ditch.

3.3. Supports

- (1) Where pipe cannot be directly supported by the bottom of the trench, support shall be provided by sandbags or other Company approved materials. Sandbags shall be placed at points to provide stress-free support for the pipeline subsequent to backfilling. Spacing intervals for sandbag supports shall be 15 feet or less as required by the Company.
- (2) Supports comprised of materials other than sandbags shall be constructed in strict accordance with the manufacturer's instructions and at spacing intervals no greater than the appropriate maximum interval recommended by the manufacturer. Support shall be placed at points to provide a stress-free installation subsequent to backfill.
- (3) The Contractor shall not use any support method without the prior approval of the Company and without providing the Company with the manufacturer's recommended installation directions for the specific method being used.

3.4. Cased Crossings

Special supports shall be provided to the pipeline for all cased crossings. These supports shall be located under the pipeline at a minimum of 5 feet and a maximum of 8 feet from the end of the

casing and at intervals designated above throughout the boring bell hole area. The supports may be made of sandbags or other material approved by the Company.

3.5. Tie-Ins

Sections of the pipeline excavated for tie-ins shall be supported with sandbags or other approved materials at intervals indicated above. Supports shall be placed immediately after final tie-in to provide a stress-free installation subsequent to the backfilling operation.

4.0 CONCRETE COATING ROCK PROTECTION

- (1) In the event the Company supplies concrete coated pipe for use in rock ditch, the Contractor agrees that there are limitations to this product's effectiveness. Although it is not necessary to pad the pipe as required for pipe not protected by this product, care must be exercised to eliminate any ledges or irregularities in the ditch bottom, including potentially damaging loose rock. Loose rock with a diameter of 2 inches or larger shall be removed from the ditch bottom prior to lowering-in operations, and in the event pipe bends are not spaced to provide proper ditch fit, sand bags or other approved supports shall be used to avoid damage.
- (2) The Contractor shall remove and properly dispose of all plastic wrap used for protection of the pipe during shipment and as an aid to bending operations. Removal and disposal of the plastic wrap is mandatory in order to eliminate potential problems with cathodic protection.

5.0 BACKFILLING

- (1) After lowering-in has been completed but before backfilling, the ditch shall be pumped dry in upland areas and the line shall be inspected to ensure that no skids, brush, stumps, trees, boulders, or debris are in the ditch. No such materials or debris are to be backfilled into the ditch.
- (2) After the pipe has been inspected and approved by the Company Representative, after all damage to the protective coating has been repaired and after the coating on the pipe has had sufficient time to cure, the Contractor shall backfill the ditch sufficiently to prevent floating.
- (3) The Contractor shall complete the filling of the ditch to produce a trim backfill. Excavated material shall be placed in the ditch. Topsoil, where it has been segregated, shall be backfilled as close as possible to its original location. All personnel must maintain a safe distance during backfilling operations.
- (4) Rock (or like materials) two inches in diameter and larger shall not be backfilled directly onto the pipe. Where such materials are encountered, the Contractor shall haul, if necessary, sufficient earth or sand to be backfilled around and over the pipe to form a protective padding or cushion as specified in Section 7.0 or, as otherwise specified in the Scope of Work. Large rock or boulders in excess of 24 inches in diameter, width or length, shall not be backfilled into the ditch. Such rock shall be disposed of properly.
- (5) Unless specifically allowed in the construction line list or authorized in advance by Company, the Contractor shall not use soil from the right-of-way except from the spoil bank.

6.0 TRENCH BREAKER

- (1) The Contractor shall install erosion breakers in the ditch over, under, and around the pipe to provide full protection against backfill washing at various points along the pipeline. Breaker installations and spacing shall comply with the following specifications as well as Company, local, state, and Federal requirements.

- (2) Breaker materials shall include, but are not be limited to, decomposable bags, sand, foam ditch, and any other materials required to facilitate the proper placement of the breaker material in the ditch.
- (3) Breaker installations may be comprised of either a multiple sandbag configuration or by other approved methods. All breaker installations shall meet with the approval of the Company.
- (4) Breaker size is dependent on the extent and condition of the ditch in depth, width, slope, and grade. At a minimum, breakers shall extend the width and depth of the ditch.
- (5) Breakers shall be spaced along the ditch in accordance with the Company's environmental standards.

7.0 DIRT PADDING

- (1) The Contractor shall install rock-free dirt padding in areas designated by the Company. The Contractor shall not take pad dirt from any landowner without prior written approval or as may be covered in the right-of-way easement provisions or construction line list.
- (2) Topsoil shall not be used for padding the ditch.
- (3) Dirt padding shall be installed in the bottom of the ditch to a minimum depth of 8 inches prior to lowering-in the pipeline if other acceptable support for protecting the bottom of the pipe is not utilized.
- (4) A minimum of 8 inches of dirt padding shall be installed as cover on top of the line as protection prior to backfilling.
- (5) Acceptable rock-free padding material may be obtained directly from the spoil or by using a padding machine with material taken directly from the spoil. Rock-free padding material, where acceptable to Company, can be hauled in by the Contractor.

Attachment: Revision Log/Record

Revision 0.0			Publish Date: 14 Jul 11
Location of Change	Type of Change	Reason for Change	
N/A	N/A		
Revision 0.1			Publish Date: 08 Sep 11
Location of Change	Type of Change	Reason for Change	
Section 1.2	Revision	Updated references.	
Revision 0.2			Publish Date: 15 Aug 13
Location of Change	Type of Change	Reason for Change	
Section 2.1(2)	Deletion	Deleted "in the presence of and".	
Revision 1.0			Publish Date: 31 Jan 17
Location of Change	Type of Change	Reason for Change	
Section 1.3	Addition	Added reference to OSHA 29 CFR 1926.251	
Section 2.1(1)	Addition	Added phrase "to the excavation/trench" to first sentence and added second sentence "Personnel should stay clear of the coil of the Holiday detector when in use to prevent electrical contact".	
Section 2.1(2)	Addition	Added sentence "Contractor equipment shall not exceed the maximum allowable working load during lowering-in operations."	
Section 2.2	Addition	Added phrase, "side bends, and sag bends shall conform to engineering design tolerances. Where no such tolerances were provided, the Contractor shall consult with Company to seek guidance prior to proceeding. All over-bends, side bends and sag bends..."	
Section 2.3	Addition	Added the word "safe" before "method."	
Section 2.4.1	Addition	Added phrase "such that Company Representative is able to properly inspect the final condition of the ditch."	
Section 2.4.2	Addition	Added phrase "or as deemed necessary by Company Representative..."	
Section 2.4.2	Deletion	Deleted phrase "material placed evenly and continuously..."	
Section 4.0(1)	Revision	Reworded "concrete coat" to "concrete coated pipe".	

Location of Change	Type of Change	Reason for Change
Section 5.0(3)	Addition	Added sentence "All personnel must maintain a safe distance during backfilling operations."
Section 5.0(5)	Addition	Added phrase "Unless specifically allowed in the construction line list or authorized in advance by Company."
Section 5.0(5)	Deletion	Deleted sentence "The Contractor shall keep the completed backfill to within one mile of the lowered in line unless otherwise approved by the Company."
Section 6.0(2)	Addition	Added phrase "foam ditch".
Section 7.0(1)	Addition	Added phrase "or construction line list".
Section 7.0(5)	Addition	Split one sentence into two. Added phrase "where acceptable to Company".