

PART 1 - GENERAL**1.1 DESCRIPTION**

Directional Drill Assist is a process utilized to assist difficult or immovable directional drill pullbacks of steel or HDPE product pipes. This process is used when product pullback has become immovable due to bore hole collapse, excessive weight of product pipe, loss of drilling fluids, long lengths of product pipe to be pulled or other conditions. Time is of the essence when the product pipe pullback becomes immovable or pulling pressures reach the capacity of the HDD rig. Effective design and engineering practice may require the necessary Directional Drill Assist equipment be on site during HDD pullback operations.

- A.** The work includes utilization of Pipe Ramming technology to assist Horizontal Directional Drill Pullback operations when the product pipe becomes stuck or difficult to move or the capacity of the HDD rig has been exceeded. The pullback assist technique works directly on getting the product pipe installed by adding a pipe rammer to the rear of the product pipe and working in tandem with the HDD rig to complete the pullback installation.
- B.** For the purpose of this section, pipe ramming is defined as the trenchless installation of a pipe or casing by pushing the pipe using a pneumatically powered driving device.
- C.** Set up of the pipe ramming machine of a suitable capacity to drive the product pipe to its required destination or until pulling pressures are returned to normal.
- D.** The Engineer/Contractor shall have the option to select the necessary steps for product pipe installation, subject to approval by the Construction Manager.
- E.** Contingency Planning: When a bore is to be salvaged, time is of the essence. All necessary HDD Assist equipment shall be available on site or on short notice basis from the manufacturer. As required, technical assistance will be provided on site by qualified and experienced personnel of the HDD Assist equipment manufacturer. Delays in implementing this procedure may result in a failed bore.

1.2 DEFINITIONS

- A.** Pipe Ramming: A non-steerable system of propelling the stuck product pipe towards the Horizontal Directional Drilling Rig by driving the product pipe with a pneumatically powered rammer.
- B.** Segmented Ram Cones: Size specific ramming accessories that adapt the rammer to the product pipe to ensure a tight fit and transfer of energy from the rammer to the product pipe without damaging the product pipe.
- C.** HDPE/Steel Adapter: Fabricated steel adapter sleeve that connects to the HDPE pipe on one end and allows Segmented Ram Cones to be fitted to the other to connect the rammer to HDPE product pipe.
- D.** Turnbuckle Tensioner and Chains: Device that positively connects the pipe rammer to the steel or HDPE product pipe to prevent the rammer from uncoupling from the product pipe.
- E.** Ramming Tool Support: Method of supporting the weight of the ramming tool and maintaining axial alignment of the tool to the product pipe. This can be accomplished in some cases by allowing the product pipe and tool assembly to lay on the ground surface. It may also require the use of a tractor side boom or excavator and nylon slings to support larger rammer tools or in the case of an elevated approach angle on the product pipe.
- F.** Sacrificial Coupon or Pipe Section: When assisting the pullback of a high-pressure gas product pipe, it may be beneficial to utilize a section of the product pipe as a sacrificed coupon. This section would be removed from the product pipe upon completion of the pullback assist.

1.3 SUBMITTALS

- A. Submit for approval complete working drawings showing details of the proposed method of construction and the sequence of operations to be performed during construction.
1. A detailed description of the pipe ramming assist procedure including construction techniques and methods in conformance with contract documents.
 2. Manufacturer's literature describing in detail the pipe ramming system to be used. Detailed description of projects on which this system has been successfully used including the names, addresses, and telephone numbers of owner's representatives for these projects as well as length, diameter and product pipe used on these projects.
 3. Complete information on Contractor's safety plan for personnel conducting the pipe ramming assist operations and installation.
 4. Keep and maintain at the construction site a complete set of field drawings for recording as built conditions. It shall have marked or noted thereon all field information, properly dated, recording as built conditions. This set of field drawings shall be kept up to date.
 5. Written documentation summarizing the qualifications of the project superintendent, operators, and site safety representative.
- B. Submit a log of the pipe ramming assist operations. As a minimum the log shall consist of the following:
1. The position of the pipe in relation to the design line and grade
 2. The date, starting time, and finish time of the pipe ramming assist
 3. Advance rates
 4. Compressor pressure and output
 5. Drill rig pulling pressure and forces prior to assist, during the assist, and upon completion of the assist with the rammer
 6. Linear distance the rammer assist was required during pullback
 7. Detailed description of model and size of directional drill on project
 8. Detailed description of model and size of pipe rammer on project
- C. Submit a separate log tracking pipe lubricant used in gallons, its viscosity, and pumping pressure.
- D. The Construction Manager will base the review of submitted details and data with consideration of requirements for the completed work, utilities, and the possibility of unnecessary details in the execution of the work to be constructed under this contract.
- E. Equipment and installation methods shall be adequate to preserve the quality of the pipe and the project.
- F. The end of the product pipe, where the HDD Assist Equipment is to be connected, may need to be sufficiently reinforced to maintain its integrity. Welding steel bands to the outside and/or inside of steel pipe or fabrication of a steel adapter for other pipe materials such as HDPE will keep the product pipe from splitting. The HDD Assist Equipment manufacturer shall be consulted to determine proper design of this reinforcement