1. Record Nr. UNINA9911016148903321

Autore	R. Skonberg Eric
Titolo	Pipeline Design for Installation by Horizontal Directional Drilling
Pubbl/distr/stampa	Reston : , : American Society of Civil Engineers, , 2024 ©2014
ISBN	0-7844-8571-2
Edizione	[3rd ed.]
Descrizione fisica	1 online resource (101 pages)
Collana	Manuals and Reports on Engineering Practice Series ; ; v.108
Altri autori (Persone)	M. MuindiTennyson
Disciplina	621.8/672
Soggetti	Directional drilling Pipelines - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Half Title -- Title Page -- Copyright Page -- Contents -- Contributors -- Blue-Ribbon Panel Reviewers -- Acknowledgments -- Preface -- Chapter 1 : Introduction -- Chapter 2 : Predesign Surveys -- 2.1 Introduction -- 2.2 Surface Survey -- 2.3 Subsurface Investigation -- 2.3.1 Utility Research -- 2.3.1.1 Pipe Locators. Utility lines can have both horizontal and vertical locations identified by means of surface-applied pipe locators. Pipe locators can be instruments that simply detect underground lines by means of a magnetic field application -- 2.3.1.2 Ground-Penetrating Radar. Ground-penetrating radar (GPR) utilizes radio waves to detect underground lines and surfaces. When an object is detected, the radio waves reflect back to the receiver that records the information. The data are down -- 2.3.1.3 Vacuum Excavation. Nondestructive vacuum excavation is used to physically remove soil and expose the utility lines being investigated. Unlike test pits, which are completed by means of excavation equipment such as a backhoe, vacuum excavati -- 2.3.1.4 Seismic Surveys. Seismic surveys require that a small explosive charge or impact by means of sledgehammer be initiated and detected via a series of detectors or geophones spaced along the path of the utility line. A time recorder is used to -- 2.3.2 Geotechnical Investigation -- References -- Chapter 3 : Drilled Path Design -- 3.1 Introduction -- 3.2 Penetration Angles -- 3.3 Depth of Cover -- 3.4

Elevations of Entry and Exit -- 3.5 Radius of Curvature -- 3.6 Directional Accuracy and Tolerances -- 3.7 Pilot Hole Intersect Method -- 3.8 Multiple-Line Installations -- 3.9 Utility Casings -- 3.10 Annular Seepage -- References -- Chapter 4 : Pipe Design -- 4.1 Introduction -- 4.2 Installation Loads -- 4.2.1 Tension. 4.2.1.1 Frictional Drag. Frictional drag between the pipe and the soil is determined by multiplying the bearing force that the pull section exerts against the wall of the hole by an appropriate coefficient of friction. A reasonable value for a coeff -- 4.2.1.2 Fluidic Drag. Fluidic drag between the pipe and the viscous drilling fluid is determined by multiplying the external surface area of the pipe by an appropriate fluid drag coefficient. A reasonable value for a fluidic drag coefficient is 0.0 -- 4.2.1.3 Effective Weight of Pipe. The effective weight of the pipe is the unit weight of the pull section minus the unit weight of any drilling fluid displaced by the pull section. This is typically expressed in lb/ft. The unit weight of the pull s -- 4.2.2 Bending -- 4.2.3 External Pressure -- 4.3 Operating Loads -- 4.3.1 Internal Pressure -- 4.3.2 Bending -- 4.3.3 Thermal Expansion -- 4.3.4 External Pressure -- 4.4 Pipe Material -- 4.5 Stresses in Steel Pipe -- 4.5.1 Installation Stresses -- 4.5.1.1 Tensile Stress (f t). The tension imposed on a circular pipe during installation by HDD is assumed to act through the centroid of the cross section and therefore is uniformly distributed over the cross section. The tensile stress is det -- 4.5.1.2 Bending Stress (f b). Bending stress resulting from a rigid steel pipe being forced to conform to the drilled radius of curvature can be calculated using the following equation (Young 1989): -- 4.5.1.3 External Hoop Stress (f h). Thin-walled tubular members, such as steel pipes, fail by buckling or collapse when under the influence of external hoop stress. A traditional formula established by Timoshenko for calculation of the wall th. 4.5.1.4 Combined Installation Stresses. The greatest stress condition for the pipe is typically located where the most serious combination of tensile, bending, and external hoop stresses occurs simultaneously. This is not always obvious in looking -- 4.5.2 Operating Stresses -- 4.5.2.1 Internal Hoop Stress (f h). Hoop stress caused by internal pressure is calculated in Equation (4-20) (ASME/ANSI 2010). -- 4.5.2.2 Bending Stress (f b). Bending stresses are calculated and limited as shown in Section 4.5.1.2 . -- 4.5.2.3 Thermal Stress (f e). The thermal stress resulting from changes in pipe temperature from the point in time at which the pipe is restrained by the surrounding soil to a typical operating condition is calculated in Equation (4-21) (AS -- 4.5.2.4 Combined Operating Stresses. Hoop, thermal, and bending stresses imposed on the pipe during operation should be combined and checked to evaluate the risk of failure from combined stresses. This can be accomplished by examining the maximum s -- 4.6 Stresses in a High-Density Polyethylene Pipe and Fusible Polyvinyl Chloride Pipe -- 4.6.1 Installation Stresses -- 4.6.1.1 Tension. To determine whether a given FPVC or HDPE pipe specification is sufficient to resist the tensile loads encountered during HDD installation, a pulling load analysis should first be performed to estimate the force required to pull the -- 4.6.1.2 Bending. When installing an HDPE pipe by HDD, bending stress is typically not critical. AWWA M55 (AWWA 2020) states that an HDPE pipe can be cold bent to a radius of 20 to 40 times the pipe diameter (although experience has shown that HDD. 4.6.1.3 External Pressure. Another critical issue with the installation of an HDPE pipe by HDD is the possibility of pipe collapse owing to external pressure exerted by the drilling fluid in the annulus.

Sommario/riassunto

"MOP 108, third edition, addresses the design of major pipeline or duct segments to be installed by horizontal directional drilling (HDD)"--