Direct Steerable Pipe Thrusting

Other Titles of Interest

Pipeline Design for Installation by Horizontal Directional Drilling, Second Edition, edited by Eric R. Skonberg and Tennyson M. Muindi (ASCE/Pipelines Division 2014). MOP 108 addresses the design of major pipeline or duct segments to be installed by horizontal directional drilling (HDD) (ISBN 978-0-7844-1350-0).

Pipe Ramming, Second Edition, by the Pipe Ramming Task Force of the Trenchless Installation of Pipelines (TIP) Committee; edited by Glenn M. Boyce (ASCE/UESI 2020). MOP 115 presents the latest and best practices for the design and construction of road and railroad crossings using pipe ramming technologies (ISBN 978-0-7844-1560-3).

Pilot Tube and Other Guided Boring Methods, by the Task Committee on Pilot Tube and Other Guided Boring Methods (ASCE/UESI 2017). MOP 133 provides a detailed description of the pilot tube and guided boring methods with chapters on project planning, site and geotechnical assessment, shaft design, pipe characteristics and design, contract documents, and construction aspects (ISBN 978-0-7844-1474-3).

Standard Design and Construction Guidelines for Microtunneling, Standard ASCE/CI 36-15. This standard covers the planning, design, materials, and construction for this trenchless method of installing pipelines (ISBN 978-0-7844-1363-0).

Horizontal Auger Boring Projects, by the Horizontal Auger Boring Task Force (ASCE/UESI 2017). MOP 106 covers the horizontal auger boring method, providing the instructions for a safe, productive, and efficient installation of pipelines for road crossings (ISBN 978-0-7844-1458-3).

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Direct Steerable Pipe Thrusting

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PREFACE

This manual of practice was prepared by the Task Committee on Direct Steerable Pipe Thrusting (DSPT) of the ASCE Committee on Trenchless Installation of Pipelines (TIPS), as part of the Utility Engineering & Surveying Institute (UESI). The manual describes the current Direct Steerable Pipe Thrusting method used by engineers and construction professionals in designing and installing pipelines using the DSPT method.

This manual of practice has been created by a group of engineers, contractors, equipment manufacturers, pipeline owners, and academics fully knowledgeable of the method and its use. This manual considers many of the advances that have occurred since the initial development of the technology. However, the task committee acknowledges that DSPT continues to evolve and contractor and equipment capabilities continue to develop.

Sections of this manual of practice have been written assuming that the reader may be unfamiliar with DSPT methodology. No document can encompass all issues on a particular DSPT project. Improvements in best practices and technology continue to advance so that future use of this manual on any project must consider not only the specific characteristics of the particular project but also further improvements in best practices and technology.

The stakeholders of a pipeline trenchless project are encouraged to consider all trenchless methods before concluding that the DSPT method is the most suitable construction method available. Manuals and reports on engineering practice have been written by ASCE and are available for different construction methods. If the engineer responsible for the pipeline project does not have a strong background in trenchless design, an engineering firm that specializes in trenchless designs should be consulted.

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CHAPTER 1
INTRODUCTION AND HISTORY

1.1 INTRODUCTION

Pipelines of various types, sizes, and purposes are routinely installed below the ground surface in every community around the world. The most common method of pipeline installation is open cut, also known as trenching. However, open-cut installation results in obvious and sometimes significant unwanted ground disturbance. Consequently, numerous trenchless methods of pipeline installation have been developed to reduce surface impacts and public inconvenience (Table 1-1).

Direct steerable pipe thrusting (DSPT) was developed to fill a need for a pipeline installation in ground conditions challenging to other trenchless methods. Direct steerable pipe thrusting is a relatively recent innovation in the trenchless industry combining some of the characteristics of horizontal directional drilling (HDD) and conventional microtunneling. Direct Pipe, developed by Herrenknecht AG (Herrenknecht) in Germany, was the first commercially available system to fall into the DSPT category of trenchless technology. As described in Section 1.2, the first Direct Pipe installation was completed in Germany in 2007; as of 2022, more than 200 installations have been completed worldwide. This Manual of Practice (MOP) reflects the current state of industry development.

1.1.1 Definition of Direct Steerable Pipe Thrusting

Direct steerable pipe thrusting is a near-surface launched, thrusted microtunnel method of pipeline installation that can install a steel pipe in a single pass along both horizontal and vertical curves.