



# Pipeline Design *for* Installation *by* Horizontal Directional Drilling

*Second  
Edition*

Horizontal Directional Drilling  
Design Guideline Task Committee

**Edited by**

Eric R. Skonberg, P.E.  
Tennyson M. Muindi, P.E.

**ASCE**

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Prepared by  
the Horizontal Directional Drilling Design Guideline Task Committee  
of the Technical Committee on Trenchless Installation of Pipelines of  
the Pipeline Division of the American Society of Civil Engineers

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Published by the American Society of Civil Engineers

## Library of Congress Cataloging-in-Publication Data

Pipeline design for installation by horizontal directional drilling / prepared by the Horizontal Directional Drilling Design Guideline Task Committee of the Technical Committee on Trenchless Installation of Pipelines of the Pipeline Division of the American Society of Civil Engineers ; edited by Eric R. Skonberg, P.E., Tennyson M. Muindi, P.E.—Second edition.

pages cm—(ASCE manuals and reports on engineering practice ; no. 108)

Includes index.

ISBN 978-0-7844-1350-0 (print : alk. paper)—ISBN 978-0-7844-7837-0 (ebook) 1. Directional drilling. 2. Pipelines—Design and construction. I. Skonberg, Eric R. II. Muindi, Tennyson M. III. American Society of Civil Engineers. Horizontal Directional Drilling Design Guideline Task Committee.

TN871.2.P52 2014

621.8'672—dc23

2014009672

Published by American Society of Civil Engineers  
1801 Alexander Bell Drive  
Reston, Virginia, 20191-4382  
[www.asce.org/bookstore](http://www.asce.org/bookstore) | [ascelibrary.org](http://ascelibrary.org)

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*Errata:* Errata, if any, can be found at <http://dx.doi.org/10.1061/9780784413500>.

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ISBN 978-0-7844-1350-0 (paper)  
ISBN 978-0-7844-7837-0 (PDF)  
Manufactured in the United States of America.

21 20 19 18 17 16 15 14 1 2 3 4 5

**Cover photo credit:** County of San Luis Obispo, California. Project lead John Hollenbeck.

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# CHAPTER 1

## INTRODUCTION

### 1.1 SCOPE

This manual of practice addresses the design of major pipeline or duct segments to be installed by horizontal directional drilling (HDD). Generally speaking, major pipeline segments are greater than 500 ft in length and greater than 4 in. in diameter. They are installed by medium to large HDD drilling rigs (midi- to maxi-HDD drilling rigs). The design practices described in this manual are not generally applicable to small trenchless segments of pipe, duct, or cable installed by “mini-HDD” drilling rigs.

Horizontal directional drilling is a trenchless excavation method that is accomplished in three phases. The first phase consists of drilling a small-diameter pilot hole along a designed directional path. The second phase consists of enlarging the pilot hole to a diameter suitable for installation of the pipe. The third phase consists of pulling the pipe into the enlarged hole. Horizontal directional drilling is accomplished using a specialized horizontal drilling rig with ancillary tools and equipment.

This manual has been prepared to serve as a guide for design engineers and presumes that the user has knowledge of the HDD installation process and pipeline design methods. Topics covered are limited to those related to HDD installation. Other sources of information and design methods should be consulted for guidance on designing the pipeline to satisfy service requirements. This manual is not a general design handbook for pipelines, and it is not meant to replace sound engineering judgment. Users of this manual should recognize that HDD installations are complicated civil engineering works and that only experienced professional engineers should undertake their design.