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Pipelines
for Water Conveyance and Drainage

Edited by

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Pipelines for Water Conveyance and Drainage

Prepared by
the Task Committee on Pipelines for Water Conveyance and Drainage of
the Irrigation Delivery and Drainage Systems Committee of
the Irrigation and Drainage Council of
the Environmental and Water Resources Institute of
the American Society of Civil Engineers

Edited by
Roger W. Beieler, P.E.

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PREFACE

This manual, ***Pipelines for Water Conveyance and Drainage***, includes a discussion of twenty topics for various pipe materials. The topics discussed include industry standards, available pipe sizes, standard lengths, allowable internal pressures, external load capabilities, protective linings, protective coatings, joints, fittings, hydraulic resistance factor, allowable leakage rates, repair methods, installation requirements, backfill requirements, special considerations, industry groups, and reference materials.

The need for a concise listing and description of the most commonly used types of pipe for water conveyance and drainage purposes was recognized by ASCE members in the late 1990s. Several new pipe materials were being introduced and new standards for these materials were being developed. Many of the new materials offered several advantages compared to the materials currently available, including reduced cost, longer life, improved flow characteristics, and ease of installation. In addition, manufacturers of existing pipe materials often modified and improved their products to make them more competitive.

The pipe materials discussed herein include concrete pipe, steel pipe, ductile iron pipe, polyvinyl chloride (PVC) pipe, molecularly oriented PVC pipe, high density polyethylene (HDPE) pipe, polyethylene profile wall pipe, PVC and polypropylene profile wall pipe, corrugated polyethylene pipe, vitrified clay pipe, clay drain tile, fiberglass pipe, and corrugated metal pipe. The intent of the manual is to provide design engineers, utility managers, educators, and planners a concise listing and description of the most commonly used types of pipe for water conveyance and drainage purposes.

Acknowledgments

Many individuals donated time and effort to prepare this manual since the need for such a manual was recognized in the late 1990s. The ASCE