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75-22

Standard Guideline for Recording and Exchanging Utility Infrastructure Data

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AMERICAN SOCIETY OF CIVIL ENGINEERS

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PREFACE

The Board of Direction approved revisions to the ASCE Rules for Standards Committees to govern the writing and maintenance of standards developed by ASCE. All such standards are developed by a consensus standard process managed by the ASCE Codes and Standards Committee (CSC). The consensus process includes balloting by a balanced standards committee and reviewing during a public comment period. All standards are updated or reaffirmed by the same process at intervals between five to ten years. Requests for formal interpretations shall be processed in accordance with Section 7 of ASCE Rules for Standards Committees, which are available at http://lawsdocbox.com/US_Government_Resources/72076943-Asce-rules-for-standards-committees.html. Errata, addenda, supplements, and interpretations, if any, for this standard can also be found at http://ascelibrary.org/.

The provisions of this standard are written in permissive language which offer the user a series of options or instructions but do not prescribe a specific course of action. Significant judgment is left to the user of this information.

This standard specifies essential elements for documenting the location and other attributes of underground and aboveground utility infrastructure, with a particular focus on the documentation of newly installed or exposed infrastructure. It was developed to complement, CI/ASCE 38-02, hereinafter referred to as ASCE 38, *Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data*, and the corresponding 2022 revision ASCE/UESI/CI 38-22, *Standard Guideline for Investigating and Documenting Existing Utilities*.

This standard is designed with both today's and tomorrow's civil engineer in mind by enabling the collection and exchange of utility infrastructure data to support a wide range of applications, including, but not limited to: preparing civil project designs that accommodate and safeguard existing utility infrastructure; and delivering construction projects on schedule and within budget. Because the standard provides guidance but is not overly prescriptive, it supports both current and emerging digital project delivery standards and practices.

This standard has been prepared in accordance with recognized engineering principles and should not be used without the user's competent knowledge for a given application. The publication of this standard by ASCE is not intended to warrant that the information contained therein is suitable for any general or specific use, and ASCE takes no position respecting the validity of patent rights. The user is advised that the determination of patent rights or risk of infringement is entirely their own responsibility.

ASCE recognizes that utility investigation and documentation of newly installed utilities are part of a larger necessary civil engineering task discipline called utility engineering (UE). The importance of UE is illustrated by the commissioning of ASCE's ninth institute, the Utility Engineering and Surveying Institute (UESI), in 2017. UE incorporates the elements affecting civil engineering projects of any kind as they relate to utilities: utility investigation; utility "as-installed" documentation; utility data exchange and visualization with appropriate metadata; conflict analytics; conflict resolution engineering including utility design, utility adjustments, protect-in-place or relocation design; asset management including accommodation policies, statutory mandates, and agreements; installation and inspection; bid and contract management; construction staging; utility-related value engineering construction; construction management; condition assessment; utility coordination between multiple parties; and pipeline, cable, and conduit project planning, design, and construction. UE uses these elements to optimize planning, design, and construction activities to control costs and mitigate risks to the project and to the public.

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The Utility Engineering Surveying Institute (UESI) and Construction Institute (CI) of ASCE gratefully acknowledge the devoted work of all the committee members who developed this standard guideline. These members represent a wide range of backgrounds and experience, including, but not limited to, utility engineering, surveying, computer-aided design (CAD), geophysics, geodetics, geographic information systems (GIS), civil infrastructure design and construction, right-of-way management, and geotechnical engineering. This standard guideline was prepared using ASCE's consensus standardization process in compliance with the ASCE Rules for Standards Committees and the procedures of the ASCE's Codes and Standards Committee (CSC). ASCE's standardization process is accredited by the American National Standards Institute (ANSI).

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CHAPTER 1
INTRODUCTION

1.1 SCOPE

The purpose of this standard guideline is to specify essential elements for recording and exchanging data about the location, size, orientation, function, ownership and other attributes of underground and aboveground utility infrastructure, with a focus on newly installed, repaired, or otherwise exposed or accessible utility infrastructure.

This standard guideline establishes minimum, optional, and conditional elements of spatial and nonspatial attribute data associated with utility infrastructure. The standard guideline also provides recommendations for effective practices to facilitate data exchange among project stakeholders. The guideline is critical to capture, document, and exchange utility data for project scoping, planning, design, construction, operation, and long-term management of utility systems as well as the management of public right-of-way and properties throughout which utility infrastructure are installed. It is also essential to facilitate the interaction among stakeholders for managing utility and other civil infrastructure.

Benefits of applying a standard guideline for utility data exchange include, but are not limited to, the following:

- Effective utility data exchange among stakeholders;
- Consistency with and support for current and emerging digital project design standards and delivery practices such as three-dimensional (3D) modeling, civil integrated management (CIM), building information modeling (BIM), and virtual design and construction (VDC);
- Enhanced damage prevention, including use of real-time augmented reality visualization technologies and global navigation satellite system (GNSS) enhanced utility locating methods which reduce risk to existing utility infrastructure;
- Standardized recording and retrieval of utility infrastructure data;
- More focused, effective utility investigations and conflict assessments; and
- Implementation of practices that result in resilient, sustainable infrastructure and more effective utility asset management.

Typical situations for application of the standard guideline include the following:

- Proposed utility infrastructure (i.e., in permit application stage);
- New construction or repair of existing utility infrastructure;
- Adjustment or relocation of existing utility infrastructure;
- Any construction activity that exposes utility infrastructure;
- Trenchless utility installation or rehabilitation of existing utility infrastructure;
- Utility infrastructure exposed during maintenance activities;
- Utility infrastructure exposed during utility investigations;
- Utility infrastructure recorded during topographic and construction "as-built" surveys;
- Utility infrastructure exposed during other engineering investigations such as geotechnical, drainage, structural, and environmental investigations; and
- Utility incident response as well as damage assessment and reporting.

This standard complements CI/ASCE 38-02, *Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data*, and the revision, ASCE/UESI/CI 38-22, *Standard Guideline for Investigating and Documenting Existing Utilities*, resulting in a more reliable, consistent, comprehensive data representation of existing utility infrastructure.

User Note: There have been many documented incidents for which existing utility infrastructure information has been inconsistent, inaccurate, or unreliable. ASCE 38 addressed this situation by defining necessary investigative measures and professionally assessed quality levels (D, C, B, and A) as indicators of the reliability of the data resulting from formal utility investigations. However, until now there has never been a standard for an "As-Installed" (often referred to as "As-Built"; see Section 1.2 definition) utility data record for which location, positional accuracy, geometry, dimensions, type, function, ownership, materials, or operational status of a utility feature are among the data documented.

The lack of a standard for utility as-installed record data has resulted in utility records that are commonly schematic drawings, not spatially tied to a common datum or coordinate system, and of inconsistent data quality, content, and formats not conducive for data exchange.

1.2 DEFINITIONS

The following definitions shall apply in this standard guideline:

As-Built. Recorded representation of the built or maintained infrastructure and shows the actual location, dimensions, geometry, and other attributes of the work as completed. For the purposes of this standard guideline, the term *As-Built* is synonymous with the term *plan-of-record* or *file-of-record*.

As-Installed. Recorded representation that may not be necessarily synonymous with the term *plan-of-record* or *file-of-record*. (Note: the term *As-Built* is not inclusive of all the recorded installation data to be exchanged. Historically, As-Built has come to mean different things for various jurisdictions, some of which are statutory. Accordingly, the