

## Civil Engineering **Technologist** Body of Knowledge



PREPARED BY Civil Engineering Technologist Body of Knowledge Task Committee



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Sponsored by Committee on Civil Engineering Technologists of the Committee on Advancing the Profession of the American Society of Civil Engineers

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Preface v Acknowledgments ix List of Acronyms xi Executive Summary xiii

# The Civil Engineering Technologist..1 Overview 1 ASCE Background 2 International Perspective 3 US Perspective 4

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3.	Guidance for Technologists and Employers
4.	Conclusion25
A.	CET-BoK Foundational Outcomes27
B.	CET-BoK Specialty Outcomes61
C.	Charge to the Civil Engineering Technologist Body of Knowledge Task Committee95
D.	Modeling on Bloom's Taxonomy 99
E.	Recommended Further Reading 101
Inde	ex 105

ASCE has engaged in an effort to explore the opportunities and challenges involving technologists within the civil engineering field for more than 10 years. Since 2008, this effort has included three ASCE Boardlevel task committees, leading to establishment of a standing committee within the Committee on Advancing the Profession (CAP).

Progress on this effort has been slow because it has required exploration of areas unfamiliar to most ASCE members, not clearly understood within the civil engineering industry, and not well aligned with the engineering education accreditation body, ABET. While there are well-written and clear international agreements for accreditation of engineering technologists, the existing US workforce does not fit well into the international categories, nor has US industry indicated a significant need or desire for such recognized technologist categories. Thus, the international categories have proven a difficult fit at a practical level.

It is also worth noting that the titles "technologist" and "paraprofessional" are not well received within the US civil engineering and construction industries. Individuals do perform work as civil engineering technologists, but they use other titles. One interesting observation from the various ASCE efforts is that many graduates from four-year programs accredited through the ABET Engineering Technology Accreditation Commission (ETAC) pursue professional engineer (P.E.) licenses. Depending on their state regulations, many obtain P.E. licenses at or shortly after the same point in their career as graduates of programs accredited by ABET through the Engineering Accreditation Commission (AC). The reasons for this education and career path vary by state, but it was a surprising discovery. Finally, the National Society of Professional Engineers has maintained an engineering technologist certification program through the National Institute for Certification in Engineering Technologies (NICET) for several decades. While this is a general engineering technologist certification not specific to any engineering discipline, it does not receive a large number of applications. NICET has provided input to ASCE's effort since 2008.

In its efforts to date ASCE has identified two areas of opportunity to continue initiatives related to technologists. The first is to provide benefits for technologists who graduate from four-year ABET/ETAC-accredited programs. These may benefit from better defined career paths through outlines of typical career progressions, development of a body of knowledge, a credential, and possibly affiliation with ASCE. There is not a large population of civil engineering technologist four-year program graduates, but there are many hundreds each year. A second effort would be to provide similar benefits to graduates of civil engineering programs who desire an alternative career path to P.E. licensure. The target audience would include graduates of ABET/EAC accredited programs and could provide a potential pool in the thousands, depending on the value a civil engineering technologist (CET) credential might offer.

As mentioned, ASCE's technologist committees had difficulty defining the problem to be solved. Given the significant division within the higher education community concerning the goals of civil engineering technology program graduates (i.e., pursue licensure or not), lack of recognition of CETs within the workforce, and the lack of correlation of the US workforce with technologists as described by international agreements, ASCE's Committee on the Civil Engineering Technologist (CCET) realized a better definition of a CET practicing in the United States was needed before work could proceed on a credential, specific education requirements, or career paths.

The Civil Engineering Technologist Body of Knowledge (CET-BoK) included in this report is the result of eight years of information gathering and debate in an area where there is no ASCE or other professional consensus concerning the content. The international agreement was informative but was developed for accreditation purposes. It is not aligned with US practice and not sufficiently specific to inform at a body-of-knowledge level. While many topics within the CET-BoK are modeled

on the excellent work of ASCE's *Civil Engineering Body of Knowledge for the 21st Century* (CEBOK), the included concepts are original thought of the committee in consultation with members of academia, industry, and ASCE staff. The intended outcome of this effort was to develop a document to first, and most importantly, seek consensus on what areas a CET might work in and second determine whether the overall approach of combined foundational and specialty outcomes is a workable approach for a body of knowledge.

The CET-BoK Task Committee acknowledges that greater detail could have been explored in this version of the body of knowledge but knew it could not be considered a definitive work at this stage. The goal was to develop a workable CET-BoK for use by the CCET Credentialing Subcommittee and CAP to generate feedback and through an iterative process refine the CET-BoK. Unlike the CEBOK, which had a credential (i.e., license) in existence to reference, this effort required the capture or codification of specifics so all other efforts could start. This is that starting point.

ASCE looks forward to your comments, which may be submitted to professional@asce.org.

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## ASCE thanks these members for their research and contribution of time and expertise to author this work.

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