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ATTN: Docket ID: COE-2021-0007

Re: Draft National Levee Safety Guidelines

Introduction

The American Society of Civil Engineers (ASCE) is pleased to offer the following comments to the U.S. Army Corps of Engineers (USACE) on its proposed National Levee Safety Guidelines, a key component of the National Levee Safety Program. Draft guidelines were published in the Federal Register for comment, with the comment period closing on August 31, 2024.

Founded in 1852, ASCE is the nation's oldest civil engineering organization. Representing more than 150,000 civil engineers from private practice, government, industry, and academia, ASCE is dedicated to the advancement of the science and practice of engineering. ASCE has been actively involved in creating standards for the design and construction of the built environment, and the development of best practices for effective levee management. We support the creation of safety and mitigation programs at all levels, and the development of modern, resilient infrastructure.

Modern infrastructure must be designed and built to withstand present day risks, and development must also account for future risks. Climate change continues to produce more significant challenges to infrastructure systems like the nation's levees. These risks include increased levels of rainfall and drought, extreme shifts in temperature, and increasingly strong winds and storms. These challenges pose increased risk to earthen and manmade levee structures, as well as communities that sit behind levees. As a core component of the National Levee Safety Program, the proposed National Levee Safety Guidelines provide for the first time a set of best practices and recommendations for safe operation, maintenance, and management of the nation's levee systems. A majority of the nation's levees are regulated at the state level, with no single regulatory regime or governing standard for uniform levee management. National guidelines provide states with a framework for approaching levee management in a manner that accounts for changes in climate and the impact it has on aging infrastructure, while also allowing for an approach that allows states to implement safety measures that best fit their own needs.

The draft guidelines put forward by USACE for review are an important step in the development of the National Levee Safety Program. ASCE believes that continued emphasis on resilience, use of modern codes and standards, and regular levee inspection, monitoring, and oversight over the course of a levee's entire lifecycle will most effectively guide program development and enhance the overall safety of the nation's levees.

Resilience

ASCE supports initiatives that increase infrastructure resilience against natural and human induced hazards, as well as approaches to planning, design, construction, financing, and operation and maintenance which increase or maintain resiliency.¹ We support the efforts of USACE to emphasize levee resilience in its draft National Levee Safety Guidelines, particularly in relation to climate change. The draft guidelines emphasize resilience in the first chapter on “Managing Flood Risk”, and its eighth chapter on “Constructing a Levee.” A continued focus on resilience is a critical way to ensure the safety and performance of the nation’s levees.

Climate change is producing more intense and frequent rain events, and the resulting rise in water levels increases the strain on the nation’s levees. Measures to improve resiliency will help to protect floodplains, reduce the risk of seepage, and reduce the risk of flooding in levied communities. ASCE encourages continued emphasis on infrastructure resilience as guidelines are finalized.

Codes and Standards

One of the more significant challenges to levee safety is that there is no current national standard for levee design, construction, or operation. While several states do currently have regulatory authority for the construction and safety of levees, the nation’s levees have an average age of 60 years, meaning that many levees were built using standards that are less rigorous than current best practices.² In this area, guidelines may be expanded to include discussion of residual risk as a result of levees overtopping when flooding exceeds design capacity, despite overall levee condition. Given there is no national standard for levee design, addressing residual risks may prove crucial to informing levee management decisions.

In comments provided to USACE on June 30, 2023³, ASCE recommended that National Levee Safety Guidelines emphasize the use of current codes and standards when applicable, particularly as pertains to mitigating and reducing flood risk. We are encouraged by USACE’s specific utilization of ASCE’s most recently updated version of *Minimum Design Loads and Associated Criteria for Building and Other Structures* (ASCE/SEI 7-22), a specific ASCE recommendation, to craft guidelines surrounding flood risk mitigation. ASCE/SEI 7-22 includes flood load provisions to protect against 500-year flood events, which is an improvement from previously used 100-year flood hazard. Codes and standards are a valuable tool to help assess risk to levees, particularly those associated with rainfall and climate change, and will help to ensure levees can withstand the increasingly severe effects of climate change and thus enhance levee performance.

¹ ASCE Policy Statement 500, *Resilient Infrastructure Initiatives*, February 15, 2023.

² ASCE, 2021 Report Card for America’s Infrastructure, Levees, <https://infrastructurereportcard.org/cat-item/levees-infrastructure/>

³ American Society of Civil Engineers, “Public Comments to U.S. Army Corps of Engineers on the National Levee Safety Program, Phase 2,” June 30, 2023, <https://www.asce.org/-/media/asce-images-and-files/advocacy/documents/2023-06-30-asce-comments-national-levee-safety-program-phase-2.pdf>.

Life-Cycle Cost Analysis

In our June 2023 comments, ASCE recommended that future National Levee Safety Guidelines provide proper analysis of costs over a levee's lifecycle. ASCE strongly supports appropriate use of Lifecycle Cost Analysis principles to evaluate the total cost of projects.⁴ Lifecycle cost analysis provides a measure of costs associated with infrastructure projects and the inclusion of impacts associated with infrastructure resilience, sustainability, as well as regulatory, safety, and environmental costs. The draft guidelines consider the various effects on all phases of a levee's life-cycle, including design and construction.

Chapter 4 of the draft guidelines provides a discussion of the needs and associated risks to levees throughout their life-cycle. This chapter of the proposed guidelines provides a rundown of routine activities associated with levee management, as well as associated costs. These activities include proper operation and maintenance, inspection and monitoring, risk assessment, and data management. The guidelines note that levees change over time due to factors such as climate change and encourage off-cycle inspections to properly assess the risk to levees. When safety issues are detected during routine activities, the guidelines also suggest a set of non-routine activities to evaluate the safety issue, determine if action is justified, and identify structural alternatives (for example, construction or repair), and non-structural alternatives (for example, enhanced emergency planning). Identifying safety issues and employing alternative approaches is another key principle of life-cycle cost analysis which is supported by ASCE.⁵ In this regard, one area where the guidelines may be expanded would be by addressing other types of hazards which undermine levee performance. The guidelines effectively outline the risks posed by flooding to the structural integrity of levees and to communities that sit behind levees. However, other hazards such as drought affect parts of the country at a level in which flooding affects other regions. Drought leads to drying out of soil composing levees' earthen embankments, leading to weakening of structural integrity, and often causing land subsistence which produces problems such as sinkholes due to the removal of ground water from soil. Future updates to these guidelines could benefit from more in depth discussion of these other types of hazards. ASCE thanks USACE for incorporating ASCE's recommendation for use of life-cycle cost analysis principles and encourages these principles to remain included in any final guidelines.

Conclusion

ASCE thanks the U.S. Army Corps of Engineers for the opportunity to provide comment on its draft National Levee Safety Guidelines. The continued development of the National Levee Safety Program remains a top priority for ASCE in the coming years. Ensuring the availability of an adaptable set of guiding principles and best practices will assist states in standing up their own levee safety programs, promote resilience in the face of climate change, and provide greater safety to Americans who live and work behind levees.

If ASCE can be of any further assistance, please do not hesitate to contact Matthew McGinn with our Government Relations team at mmcginn@asce.org or at (202) 789-7852.

⁴ ASCE Policy Statement 451, *Life-Cycle Cost Analysis*, July 18, 2024, <https://www.asce.org/advocacy/policy-statements/ps451---life-cycle-cost-analysis>.

⁵ Ibid.