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ATTN: Docket ID: COE-2021-0007

Re: Development of the National Levee Safety Program (Phase 2)

## **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 Phase 2 of development of the National Levee Safety Program. The questions addressed in these comments were published in the Federal Register for comment on April 21, 2023, with the comment period closing on June 30, 2023.

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 man-made levee structures, as well as communities that sit behind levees. Programs like the National Levee Safety Program will be critical in the years ahead through the continued development of national levee safety guidelines, support for mitigation and resilience measures, and guidance to states for the establishment of state levee safety programs.

In 2021, ASCE's *Report Card for America's Infrastructure* gave the nation's levees a grade of "D". The report card makes several recommendations for improving the condition of the nation's levees. These recommendations include fully funding the National Levee Safety Program, identifying and inventorying the location and condition of levees throughout the nation in order to complete the National Levee Database, expanding public education and outreach about the risk of levee failure, utilization of risk-based design for new and existing levees, and

regulation of levee safety at the state level.<sup>1</sup> ASCE is encouraged that USACE’s implementation of the National Levee Safety Program continues to follow many of these recommendations, including through the materials discussed in the ensuing comments.

The draft and sample materials provided by the USACE for review provide effective guidance to support continued program development at the federal and state level, addressing of ongoing challenges, and ensuring availability of clear and user-friendly information to the public. ASCE believes that continued emphasis on resilience, use of modern codes and standards, and regular levee inspection, monitoring, and oversight will most effectively guide program development and enhance the overall safety of the nation’s levees.

## **Stakeholder Question Responses**

### **National Levee Safety Program**

#### *Overall Program Focus and Purpose*

1. How well do the materials being developed reflect your understanding of the direction of the National Levee Safety Program? How could the existing materials be improved to better align with the program, or what additional materials would be helpful?

The draft materials developed provide a valuable foundation for states to establish state level levee safety programs. In many places, they effectively account for the different needs levee systems nationwide face and allow for use of information and materials in a manner best suited to a state’s needs. We do recommend that there be continued focus on resilience and sustainability to ensure that the overall program is best suited to respond to the threat of climate change.

Discussions surrounding climate change should also focus on communities most affected by climate change, and thus most at risk from levee failure and flooding and engaging with those communities. This includes highlighting specific risks to communities, and accounting for tangible effects of climate change like increased levels of rainfall.

### **National Levee Safety Guidelines**

#### *National Levee Safety Guidelines Overview Fact Sheet*

1. Based on the contents of the Guidelines as summarized in the fact sheet, do you feel that the topics outlined will be covered in sufficient detail? If not, what would you change?

The fact sheet focused on the guidelines is an important and effective tool, particularly its focus on the full life-cycle of levees. ASCE strongly supports the use of Life-Cycle Cost Analysis principles in the planning and design process to best evaluate the total cost of infrastructure projects, and the inclusion of impacts associated with resiliency, sustainability, as well as regulatory, safety, and environmental costs.<sup>2</sup>

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<sup>1</sup> ASCE, *2021 Report Card for America’s Infrastructure*, Levees, <https://infrastructurereportcard.org/cat-item/levees-infrastructure/>

<sup>2</sup> ASCE Policy Statement 451- Life-Cycle Cost Analysis, <https://www.asce.org/advocacy/policy-statements/ps451---life-cycle-cost-analysis>.

ASCE does recommend that chapters 6-8 place emphasis on the use and implementation of current codes and standards, particularly as pertains to flooding. As an example, ASCE's recently updated *Minimum Design Loads and Associated Criteria for Building and Other Structures (ASCE/SEI 7-22)* includes new flood load provisions to protect against 500-year flood events, a significant improvement from previously used 100-year flood hazard. Challenges remain, given that there is no current national standard for levee design, construction, or operation, however, several states do currently have regulatory authority for the construction and safety of levees.<sup>3</sup>

2. What topics, if any, do you think should be added to the Guidelines?

Last year, ASCE provided comments on Phase 1 of the National Levee Safety Program, and we are pleased to see that many of the suggestions for National Levee Safety Guidelines are addressed in the materials provided. As materials are finalized, a continued emphasis on levee resilience should be included. This is of particular importance as climate change currently increases the risk of severe flooding due to increased levels of rainfall, rising sea levels, and more frequent and severe coastal storms, all of which place increased strain on the nation's levees.

3. Based on the draft sample of Chapter 2, please provide any recommendations regarding tone, usefulness, and content (level of detail, missing/unnecessary content).

The draft sample of Chapter 2 provides substantial detail which will be useful for educational purposes, particularly for policy makers and other state level officials. For policy makers, this level of detail can inform development of legislation to authorize state levee safety programs and allow for more effective presentation to the public. Once state programs are authorized, such materials may be useful for integrating newly established programs into already existing agency structures, ensuring that officials understand the basics of program functions and missions.

An addition that could be useful would be an index, glossary, or appendix of terms and components which provide brief definitions and page numbers where more detailed descriptions can be found. This would allow for more efficient answers to questions and provide valuable reference points.

#### *Risk and Scalability Fact Sheet*

1. Is the concept of adjusting activities based on risk as presented in the Risk and Scalability fact sheet helpful? If yes, why? If not, why not?

Adjustment of activities to meet the needs of a particular levee system can be helpful in terms prioritization of projects, and protection and conservation of resources. However, levee operators should be mindful of changing conditions which may require further adjustment of activities and assessment of new or unforeseen risks. As new data and information becomes available, risk assessments and standards will often need to be revised to take into account new

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<sup>3</sup> ASCE, *2021 Report Card for America's Infrastructure*, Levees, <https://infrastructurereportcard.org/cat-item/levees-infrastructure/>

information, as was the case with *ASCE/SEI 7-22* which includes new requirements tying flood hazard mitigation design to specific risk categories based least to greatest risk of human life.<sup>4</sup> These can then be incorporated into future project designs for new levees and levee rehabilitation, improving resiliency and mitigating flood risk.

2. In addition to the activities listed in the Risk and Scalability fact sheet, what other activities, if any, are important to be adjusted based on risk?

Mitigation activities and best practices should also be adjusted based on risk. Highest risk areas should emphasize prevention, protection, and mitigation activities. This will help to reduce costs for timely repairs and improve overall response and recovery.

#### *Climate Change Considerations for Levees Fact Sheet*

1. Does the way that climate change is being addressed in the Guidelines as described in the Climate Change fact sheet seem adequate? If not, what changes would you make?

In *Chapter 3-Engaging Communities*, we recommend placing greater emphasis on communities most impacted by climate change, and thus most affected by flooding hazards. In *Chapter 5-Managing Levee Risk*, we recommend including information about climate change as increasingly severe and unpredictable weather events continue to place greater risk on levees and should be taken into account in managing risk. Chapter 5 should also address topics such as land use planning and the need to provide reasonable accommodation for future levee modifications in order to account for the increased risk posed by climate change.

2. What other interactions/impacts from climate change should be included, if any?

Climate change has a significant effect on precipitation levels and precipitation frequency. Recently passed legislation, and investments made in the Bipartisan Infrastructure Law will allow the National Oceanic and Atmospheric Administration (NOAA) to improve precipitation data collection and ensure the best data on how precipitation is affected by climate change. These materials should account for increased or fluctuating precipitation levels by ensuring it is utilizing and incorporating the most current data as it becomes available.

#### **Levee Management Resources**

##### *Levee Management Guide Purpose and Scope Fact Sheet*

1. Based on the contents of the Levee Management Guide described in the fact sheet, what topics, if any, are missing?

This fact sheet places a strong focus on flood mitigation, emergency planning, and community engagement. This is essential to allow for effective management and determination of risk to levee systems and to communities that sit behind levees. However, the fact sheet should place a greater emphasis on continuous levee oversight, which includes monitoring and inspection.

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<sup>4</sup>ASCE, Civil Engineering Source, May 25, 2023 “New Addition to the ASCE/SEI 7-22 Standard Protects Buildings from a 500-Year Flood Event”, <https://www.asce.org/publications-and-news/civil-engineering-source/society-news/article/2023/05/25/asce-7-flood-loads-supplement>.

Operations and maintenance (O&M) manuals should also include best practices for effective monitoring and inspection.

2. What areas or topics, if any, do you believe may need more detailed procedural information (e.g., templates, step-by-step instructions, checklists, etc.)?

As indicated above, it would be beneficial to include best practices sections for various O&M activities. This will provide further effective guidance while also allowing for more flexible approaches to levee management. The fill-in-the-blank format is valuable to ensure that manuals are tailored to specific levees. However, one potential challenge we noticed falls in section 5.4 of the O&M template which recommends inserting levee foundation materials and construction materials and other equipment used. A challenge faced by levees owned and operated by local governments is that they may have been built several years ago, and as such identifying which materials and equipment are necessary may be a costly enterprise.<sup>5</sup> It would be helpful to identify this as a potential challenge, and identify where in the program materials (if at all) it discusses or suggests ways to address these challenges.

#### *Operations & Maintenance Manual/Emergency Action Plan Template Excerpts*

1. Based on the contents of each template, what, if anything, are we missing?

The Operations & Maintenance Template should provide greater attention to accounting for external and surface conditions such as seepage, structural issues due to erosion, destruction of tree roots, ground burrowing animals, and encroaching development. Additionally, Section 5.4 of the template which deals with levee closure operations should include options to address whether certain closures are intended to provide public access to waterways for recreational purposes.

2. Given the relationship and potential overlap between levee operations and emergency preparedness activities, would it be more helpful to have one template that covers all operations and maintenance and emergency activities or two separate templates with some overlapping content? Please explain your response.

According to recent estimates, less than half of the levees within USACE's portfolio have a comprehensive emergency action plan, while thirteen percent of assessed levee systems have either no flood warning plan or an out-of-date plan.<sup>6</sup> ASCE strongly recommends that these numbers be increased in order to improve the overall condition of the nation's levees. Because of this, a separate section dedicated to setting up emergency action plans should remain in place.

#### *Levee Cost Brochure*

1. Is any of the information provided in the Levee Cost Brochure Confusing or hard to understand? If so, what?

The brochure should provide further clarification as to why planning, design, and construction management costs may not be applicable to certain levee projects. As the effects of climate

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<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

change continue to become more severe, resilience measures will need to be incorporated into levee project designs on a regular basis. These projects will ultimately include new levees and rehabilitation and repair efforts.

## **State Activities**

### *State Activities Fact Sheet*

1. Are the three objectives for a state basic program the right ones?

We recommend incorporating prioritization of public safety into the “Improve Awareness and Coordination” objective. Specifically focusing on public safety when engaging the public allows for greater discussion of flood and risk management tools such as voluntary relocation of homes and businesses from flood prone areas.

2. Should any potential example activities listed for an advanced state program be included as part of the basic program or vice versa?

Mandatory safety inspections should be a requirement of any basic program, as opposed to an advanced program. ASCE supports and encourages the inclusion of mandatory safety inspections, as well as public evacuation plans, in federal and state levee safety programs.<sup>7</sup>

### *National Levee Database State Dashboards Fact Sheet*

1. Based on the example state dashboard provided on page 2 of the National Levee Database State Dashboards fact sheet, is this the most important information to display at the state level? If not, what would you change?

Noting levee age can be a useful tool, when available. The average age of the nation’s levees is 50 years old, and age can be an indicator as to a levee’s effectiveness and functionality, as well as whether the most recent engineering standards and best practices are being utilized.

## **National Levee Database**

### *National Levee Database Overview & New Public Interface Fact Sheet*

1. Do the links provided on the homepage mockup on page 3 of the National Levee Database Overview & New Public Interface fact sheet seem like the most important things to include on the opening page of the database? If not, what would you add or remove?

The links provided in the homepage mockup create easier, user-friendly access to the information contained in the database. By utilizing comments from phase 1 about most used functions, it helps to ensure that those that utilize the database most will find it to be most effective.

An important function that can be incorporated, which is similarly found on the home page of the National Inventory of Dams website, would be to allow easy searches of levee systems by a geographical categories (state, county, Congressional district, etc.). This will allow for more effective use at the state and local level, allow lawmakers to better identify how their states and

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<sup>7</sup> ASCE Policy Statement 511- National Levee Safety Program, <https://www.asce.org/advocacy/policy-statements/ps511---national-levee-safety-program>.

districts are impacted by levee safety, and help to create greater public awareness about potential risks in their area.

2. Is the short narrative Summary that describes the levee's history and the description of the Performance & Condition shown on page 4 of the National Levee Database Overview & New Public Interface fact sheet useful to include for the public? If so, why? If not, why not?

A short narrative summary on a levee's history is very useful to the public. It provides a clearer sense of the importance of specific levees in a given area, the importance of proper maintenance, and the ability to convey flood risk to communities. It can also inform state and local governments when allocating funds for improvements, repairs, and other levee projects. Additionally, it enhances federal and state agency abilities to educate and engage with the public by making the pertinent information readily available.

#### *National Levee Database State Dashboards Fact Sheet*

1. Based on the example of state dashboard provided on page 2 of the National Levee Database State Dashboards fact sheet, is the most important information to display at the state level? If not, what would you change?

Including average levee age can be an important data point to help users better understand current risks and potential future needs. Under the "Levee System Details" tab on the dashboard, it would also be useful to include information about latest assessments and inspections conducted for a particular levee. This can also be of use to local communities in assessing risk and can help to inform a number of activities including budgeting needs, seeking federal assistance, and potential development in communities behind levees.