ENGINEERING AND CONSTRUCTION BULLETIN

US Army Corps of Engineers

No. 2011-4 **Issuing Office:** CECW-CE **Issued:** 4 Feb 2011 **Expires:** 4 Feb 2013

Subject: Current Criteria for Design or Evaluation of I-Walls

Applicability: Guidance

1. The purpose of this ECB is to provide the current status on interim guidance for design of new I-Walls or evaluation of existing I-Walls over six feet high as measured on the protected side.

2. Background:

Investigations of the flood risk management systems in Louisiana identified possible deficiencies in guidance used to design or evaluate I-Walls. The deficiencies are related to the development of a gap that can form under flood loading between sheet piles and the soil on the flooded side of the wall. Several I-Wall failures were attributed to the formation of this gap.

3. Design of new I-Walls:

Engineer Circular 1110-2-6066, Design of I-Walls, (EC 6066), dated 31 October 2010 has been issued. EC 6066 consolidates the findings and lessons-learned from studies performed after Hurricane Katrina and other recent storms into interim guidance pending publication of a final Engineer Manual (EM). The coverage in EC 6066 reflects the results of the Interagency Performance Evaluation Team (IPET) studies, subsequent R&D investigations, and other guidance which has been issued piecemeal. During FY 11, the interim guidance in EC 6066 will be seamlessly coordinated with the results of ongoing R&D investigations and the development of I-Wall evaluation criteria. The final guidance will incorporate both design and evaluation of I-Walls. Mandatory requirements for improving the robustness and resilience of I-wall systems are summarized in each chapter, and are applied in an example (Appendix N) for an inland I-wall.

4. Evaluation of Existing I-walls:

Phase I: HQUSACE issued guidance regarding the identified deficiencies in a memorandum to MSCs dated 23 May 2006. The compilation of data and site inspections required in that

memorandum was considered the first step of a multi-phase approach to evaluating existing USACE I-walls throughout the nation.

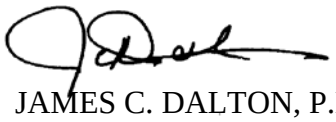
Phase II: Additional interim guidance was issued on 13 October 2006 to help districts evaluate and identify projects that may be at risk of poor performance. This effort resulted in the identification of over 50 projects with potential performance concerns. Most of the projects not meeting the criteria of the Phase II guidance failed to meet factors of safety for rotational stability or the check for minimum embedment ratio (embedment depth divided by stem height) of 2.5.

Phase III: Guidance is currently being developed for the detailed evaluation of I-walls. It is being developed from research of I-wall behavior and limit states that expands on the knowledge gained from the performance of the New Orleans and Southeast Louisiana Hurricane Protection projects. Additional numerical model studies have been performed of I-wall sections and soil types representing typical projects across the nation. Previous full scale load tests were used to calibrate some of these studies. Analysis criteria are being developed from this research using risk and reliability analysis to determine factors of safety that provide appropriate levels of performance. Under the current schedule, a draft of the evaluation criteria will be made available by 31 March 2011. If an analysis is conducted before this document is published, interim guidance can be obtained by contacting the POCs listed in paragraph 6 below.

5. The documents described in this ECB are posted on the TEN website:

https://ten.usace.army.mil/TechExNet.aspx?p=s&a=COPS;13

6. Points of contact for EC 1110-2-6066 are David Sullivan, CELRH-EC-DS, 304-399-5721, and John Clarkson, CELRH-EC-DS, 304-399-5217. Points of contact for Phase I, II and III Evaluation criteria are Kent Hokens, CEMVP-EC-D, 651-290-5584, and Neil Schwanz, CEMVP-EC-D, 651-290-5653. The HQ Technical Proponent is Peter Rossbach, CECW-CE, 202-761-4352.



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