

**CERTIFICATION OF  
TEXAS CITY HURRICANE-FLOOD PROTECTION LEVEE SYSTEM**

*in accordance with*

**44 CFR 65.10**

**Galveston County, Texas**

**EXECUTIVE SUMMARY**

The County of Galveston, Texas retained Huitt-Zollars, Inc. (Huitt-Zollars) to provide professional engineering services to conduct engineering investigations and analyses on the Texas City Hurricane-Flood Protection (TCHFP) Levee System to determine if this coastal levee meets the certification requirements contained in Title 44 of the Code of Federal Regulations, Section 65.10 (44 CFR 65.10). The following report and exhibits demonstrate that the TCHFP Levee, with the exception of approximately a one hundred sixty (160') foot reach of crest elevation between Interstate Highway 45 main lanes and frontage road, meets the requirements contained in 44 CFR 65.10, is operated in accordance with approved Operations Manuals, and has been properly maintained in accordance with approved Maintenance Manuals.

The TCHFP Levee System was designed and constructed by the U.S. Army Corps of Engineers, Galveston District between 1962 and 1987. Since completion, the levee has been operated and maintained by Galveston County in accordance with the approved Operation and Maintenance Manuals. The levee protects portions of Galveston County (Cities of Texas City and LaMarque and the surrounding areas) from flooding caused by storm surges from hurricanes. Since its construction, only minimal damage to the levee has occurred, including Hurricane Ike in September 2008, whose stillwater storm surge reached elevations of 11.9 feet. Following each event, the levee was repaired to its pre-storm condition by Galveston County and the U.S. Army Corps of Engineers under Public Law 84-99 – Flood Control & Coastal Emergencies (FCCE) (33 U.S.C. 701n). The majority of these repairs included repair of minor toe erosion of the levee in short reaches.

The engineering investigations and analyses addressed the Design Criteria in subparagraph (b) of 44 CFR 65.10, including:

**Freeboard** – Based on storm surge and wave runup data developed by Taylor Engineering, Inc. under separate contract to FEMA and as modified by Huitt-Zollars hydraulic studies, historical surveys provided by Galveston County, and recent surveys conducted by Huitt-Zollars as contained in Chapter 1, the TCHFP Levee meets the freeboard requirements of 44 CFR 65.10 except at Interstate Highway 45 (IH 45), where the levee merges with the IH 45 overpass. Approximately 160 feet of the crest elevation between the IH-45 main lanes and frontage roads is about 0.7 feet below the minimum required levee crest elevation. Galveston County is in the process of engaging an engineering firm to prepare the construction documents (plans and specifications) to raise the levee at this location to an elevation exceeding the freeboard requirement.

**Closures** – As stated in Chapter 2, all openings through the levee and floodwalls meet the minimum design requirements in 44 CFR 65.10 consistent with 100-year flood protection.

**Embankment Protection** – The TCHFP Levee is adjacent to two tidal bayous (Dickinson Bayou and Highland Bayou) and Galveston Bay. Along all of the exposed areas, the levee has side slopes of 3H:1V or flatter, is grassed, contains varying degrees of riprap toe protection, and is well maintained by Galveston County. Significant hurricanes have occurred on several occasions since the levee was constructed in 1987. There have been no signs of significant erosion during these hurricane events. Recent site visits revealed no signs of significant erosion of the levee or foundation areas. As stated in Chapter 3 of this report, the TCHFP Levee meets the embankment protection requirements in 44 CFR 65.10.

Embankment and Foundation Stability – The reports “Embankment and Foundation Stability Report” dated August 2013 and “Geotechnical Study” dated April 2013, in Chapter 4 present the results of foundation and stability analyses for the TCHFP Levee. The reports conclude that the TCHFP Levee meets the embankment and stability requirements of 44 CFR 65.10.

Settlement – In Chapter 5, the “Settlement Analysis” report dated June 2013 presents the results of settlement analyses for the TCHFP Levee. The report concludes that the TCHFP Levee meets the settlement requirements of 44 CFR 65.10.

Interior Drainage – As stated in the “Joint Probability Interior Drainage Analysis” dated July 2013 found in Chapter 6, the interior drainage facilities meet the minimum design and operation standards consistent with the 100-year level of flood protection and the interior drainage requirements of 44 CFR 65.10.

Other design criteria – No other design criteria has been identified.

Operation Plans and Criteria – Galveston County adopted the operation plans for the TCHFP Levee as set forth in the USACE Operation and Maintenance Manuals, copies of which are contained in Attachment E to this report.

Maintenance Plans and Criteria – Galveston County adopted the maintenance plans for the TCHFP Levee as set forth in the USACE Operation and Maintenance Manuals, copies of which are contained in Attachment E to this report. Galveston County Commissioners Court formally adopted the updated Operation and Maintenance Manuals on July 9, 2013.

Certification – Based on analysis of USACE Design Memoranda and structural analyses, and the studies, reports and certifications contained in this report, Huitt-Zollars, Inc. certifies that the Texas City Hurricane-Flood Protection Levee System, with the exception of approximately a one hundred sixty (160') foot reach of crest elevation between Interstate Highway 45 main lanes and frontage road, complies with the requirements set forth in paragraphs (b)(1) through (b)(7) of 44 CFR Section 65.10, Mapping of Areas Protected by Levee Systems. After this one hundred sixty (160') foot reach of levee is raised approximately 0.7 feet, the entire Texas City Hurricane-Flood Protection Levee System will comply with the requirements in paragraphs (b)(1) through (b)(7) of 44 CFR Section 65.10. Copies of the “as-built” plans for the TCHFP Levee are in Attachment A to this report.



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*August 23, 2013*