

DEC 01 2008

CEMVN-ED-S

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Revised Vertical Control Requirements for USACE Projects (Engineering Division Datum Policy Memo #2)

1. This document supersedes the following:

a. CEMVN-ED, memo, dated 11 April 2002, SUBJECT: Vertical Control and Permanent Benchmarks.

b. CEMVN-ED, memo, dated 20 December 2002, SUBJECT: Vertical Datum Policy.

2. References:

a. CECW-CE, memo, dated 04 December 2006, SUBJECT: Implementation of Findings from the Interagency Performance Evaluation Task Force (IPET) for Evaluating Vertical Datums and Subsidence/Sea Level Rise Impacts on Flood Control, Shore Protection, Hurricane Protection, and Navigation Projects.

b. CECW-CE, Engineer Circular, 1110-2-6065, dated 01 July 2007, SUBJECT: Guidance for a Comprehensive Evaluation of Vertical Datums on Flood Control, Shore Protection, Hurricane Protection, and Navigation Projects.

c. CEMVN-ED-S, memo, dated 3 October 2008, SUBJECT: Assignment of District Datum Coordinator Role and Authority (District Datum Policy Memo #1).

d. CEMVN-ED-S, memo, dated 1 December 2008, SUBJECT: Requirement for Use of Benchmarks for USACE Projects (Engineering Division Datum Policy Memo #3).

3. The purpose of this memorandum is to update the vertical control requirements for USACE projects in order to implement the lessons learned from the IPET report and the resulting directive for project evaluations of vertical datums (Reference 2b).

4. The region's vertical control is periodically readjusted to develop current elevations based on updated datums and epochs (e.g. NAVD88 (2003), NAVD88 (2004.65), NAVD88 (2006.81)) in response to subsidence. Enclosure 1 indicates the appropriate project datum / epoch to use based on project type and location.

5. Design and construction documents must document the estimated rate of subsidence, project benchmarks, seasonal variation of local mean sea level, unit of measure, datum, and gaging

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stations used for determination of tidal/hydraulic datum for use in future reevaluations of the vertical datum to be conducted at each scheduled periodic inspection.

6. All design and construction documents shall be certified and signed by the District's Datum Coordinator (DDC) for compliance to this policy and References 2a, 2b and 2d.

7. All surveying activities within the District boundaries shall be coordinated through the DDC. All contracted design work utilizing independent survey collection or independent gaging shall provide a Survey Plan, to be approved by the DDC, prior to data collection. All surveying activities within the District boundaries shall be performed in accordance with the published USACE MVN Minimum Surveying Guidelines which can be found at <http://www.mvn.usace.army.mil/ed/edss/surveyingguidelines.asp>. All collected or obtained survey deliverables shall be routed to Survey Section within 5 working days for quality assurance, database incorporation, and archival in EGIS and the District's archival system (e.g. ProjectWise).


8. Subsequent periodic reevaluations of project reference elevations and related datums shall be included as an integral component of the Periodic Inspection Program, Quality Assurance Program, Dam Safety Program, or Levee Safety Program, as appropriate. The frequency of these reevaluations is a function of estimated magnitude of geophysical changes that could impact flood protection or navigation grades. See enclosure 1 for more details.

9. All spatial data shall be collected relative to the latest datum/epoch with direct geodetic ties to project control such that the elevations can be converted back to the project design datum and epoch. This will provide current elevations to validate the estimated subsidence rate utilized during design. The direct tie to the existing project vertical control will provide the conversion factor for conversion back to the design datum.

10. These policies are effective immediately.

11. Questions regarding the required vertical control requirements may be addressed to the DDC, Design Services Branch, Mr. Josh Hardy (x1852).

Encl


WALTER O. BAOMY, P.E.
Chief, Engineering Division

DISTRIBUTION:

Chief, CECW-CE

Commander, Mississippi Valley Division

Director, Task Force Hope

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Chief, Engineering Control Branch

**Enclosure 1: (to CEMVN-ED-S, memo, dated 14 October 2008, SUBJECT:
Revised Vertical Control Requirements for USACE Projects
(Engineering Division Datum Policy Memo #2))**

Vertical Control Requirements for USACE Projects

The region's vertical control network is periodically readjusted to develop current elevations (e.g. NAVD88 (2003), NAVD88 (2004.65), NAVD88 (2006.81)) in response to subsidence. This process affects projects whose construction spans many years and therefore spans several vertical control adjustments. If each phase of construction were to use the latest adjusted elevations, projects would have segments using varying reference surfaces causing an uneven design grades. Regional subsidence and its effect on the design grades of USACE projects necessitates consideration of the vertical control as it relates to project design, construction, inspection, and maintenance.

1. All project design grades shall incorporate the estimated amount of subsidence/sea level rise for the project's lifecycle, 50 years in most cases. With this estimated subsidence and sea level rise factored into design grades, the use of the design's reference elevation throughout project lifecycles will not affect the intended design grade/protection level. Accordingly the following actions are required:
 - a. Existing hurricane protection projects (Lake Pontchartrain and Vicinity, Grand Isle and Vicinity, Larose to Golden Meadow, West Bank and Vicinity, New Orleans to Venice, Morganza to the Gulf, and Morgan City and Vicinity) shall use the project datum, elevation, and epoch at the time of initiating design efforts (i.e. NAVD88 (2004.65)). Accordingly, elevations shall be periodically collected and assessed to monitor actual subsidence versus estimated subsidence.
 - b. New hurricane protection projects authorized after the date of this policy memo shall use the latest available datum, elevation, and epoch for design and construction (e.g. NAVD88 (2006.81) or newer).
 - c. Flood control protection projects shall use the datum, elevation, and epoch consistent with the compatible flow line, where required (e.g. NAVD88 (2004.65) or newer).
 - d. Coastal navigation projects design and maintenance shall be referenced to the latest available Mean Lower Low Water (MLLW) elevations published by the National Oceanic and Atmospheric Administration (e.g. MLLW 2002-2006).
 - e. Mississippi River and Atchafalaya River, LA (excluding Bayous Chene, Boeuf, and Black) navigation projects design and maintenance shall be referenced to the latest approved Low Water Reference Plane (currently Mississippi River LWRP – 2007 and Atchafalaya River LWRP - 2000).

- f. All other existing projects not referenced in above paragraphs shall use the project datum, elevation, and epoch at the time of initiating design efforts (i.e. NAVD88 (2004.65)). All other new projects authorized after the date of this policy memo not referenced in above paragraphs shall use the latest available datum, elevation, and epoch for design and construction (e.g. NAVD88 (2006.81) or newer).
2. Consideration for subsidence extends to the District's stream gaging program, since gages are also subsiding thereby causing higher water level readings. All automatic gages, including data collection platform (DCP) gages, shall be inspected yearly and gage offsets to the latest available adjustment will be calculated. These offsets will be used to adjust raw gage readings to the desired datum and epoch, as needed, and shall be maintained in a database by Hydraulics and Hydrologic Branch. All staff gages shall document the current elevation upon inspection, and updated gage offset values will be calculated. High water staff gages on the Mississippi River shall be inspected annually. Other high water staff gages shall be inspected every three years. Hydraulics and Hydrologic Branch shall coordinate with USGS, NOAA, the State of Louisiana and other gage operators to facilitate discussions, exchange information, and improve awareness of datums.
3. Subsequent periodic reevaluations of project reference elevations and related datums shall be included as an integral component of the Periodic Inspection Program, Quality Assurance Program, Dam Safety Program, or Levee Safety Program, as appropriate. The frequency of these reevaluations is a function of estimated magnitude of geophysical changes that could impact flood protection or navigation grades. For project design water levels a reevaluation shall be performed by H&H Branch every 10 years or after a major flood or storm event. Any uncertainties in protection levels that are identified during the inspection will also need to be incorporated into any applicable risk/reliability models developed for the project (Ref: EM 1110-2-1619, Risk Based Analysis for Flood Damage Reduction Studies). Details on these periodic reevaluations will be provided in subsequent guidance.