CEMVN-ED-S

MAR 2 3 2009

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Requirement for Use of Benchmarks for USACE Projects (Engineering Division Datum Policy Memo #3)

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

2. The recently established District Datum Policy Memo #1 and Engineering Division Datum Policy Memo #2 (References 1c & 1d) establish requirements and methods for assessment, verification, and utilization of current vertical control information and define its relevant application to projects. This memorandum supplements these documents by defining and establishing field data collection requirements for the vertical control, the benchmarks that become the basis for all future endeavors.

3. All future collection of elevation/orthometric height data shall be connected to vertical control points in the National Spatial Reference System (NSRS) or USACE benchmarks having elevations/orthometric heights with respect to the most recently determined epoch of NAVD88 (e.g., NAVD88 (2006.81)). These marks should be established during a project's planning and design phase. Enclosure 1 outlines how conformance to this requirement shall be accomplished. An example is included as Enclosure 2.

4. At all established hurricane protection, flood control, shore protection, and navigation projects, three permanent benchmarks (new or existing) shall be identified/established at the immediate work site (situated as nearly as is practicable at the middle and at each end of the project) and referenced to the applicable required epoch of NAVD88, as specified by the Engineering Division Datum Policy Memo #2 (Reference 1d).

5. The location, identification, datum, epoch and elevation of these three permanent benchmarks shall be shown on all relevant design drawings.

6. All project benchmarks shall be verified to ensure local/internal consistency (usually to 3rd order loop-closure standards or higher if specified, and, if necessary, shall be re-tied to the NSRS using the geodetic vertical transfer methods referenced below). Ties between the project control and the local survey control are required at the beginning and ending of field data collection activities or every 6 months (whichever is less). This applies to all surveys, including prior to actual construction layout, during construction, post-construction or as-built surveys, and engineering surveys. Field records of these survey verifications shall be permanently archived in the District's Enterprise Geographic Information System (EGIS) and the District's archival system (e.g. ProjectWise).

7. All design and construction documents shall be certified and signed by the District's Datum Coordinator (DDC) for compliance with this policy memorandum, and References 1a. and 1b.

8. All surveying activities within the District boundaries, including those establishing benchmarks, shall be coordinated and approved via the DDC. All contracted design work utilizing independent survey collection shall submit a Survey Plan, to be approved by the DDC prior to data collection. All District 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 transmitted to Survey Section within 5 working days for quality assurance, database incorporation, and archival in District's EGIS and the District's archival system.

9. These policies are effective immediately.

10. Questions regarding the benchmark requirements may be addressed to the District's Datum Coordinator, Design Services Branch, Mr. Josh Hardy (x1852).

2 Encls

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

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Enclosure 1: (for CEMVN-ED-S, memo, dated 23 March 2009, SUBJECT: Requirement for Use of Benchmarks for USACE Projects (Engineering Division Datum Policy Memo #3))

Benchmark Requirements for USACE Projects

All future collection of elevation/orthometric height data shall be connected to vertical control points in the National Spatial Reference System (NSRS) or USACE benchmarks having elevations/orthometric heights with respect to the most recently determined epoch of the North American Vertical Datum of 1988 (e.g., NAVD88 (2006.81)). These marks should be established during a project's planning and design phase. Conformance to this requirement shall be accomplished as follows:

1. At a given project site, at least one vertical control point (primary benchmark) shall be determined/established in a manner that will ensure that it can be incorporated into the NSRS. For example, via collection and processing using the newly released standards for publishing Online Positioning User Service (OPUS) Results in the NGS Integrated Database.

2. Two additional nearby benchmarks at the project sites shall be determined / established with respect to the primary benchmark described above via conventional or GPS techniques that meet local project accuracy standards. The purpose of establishing these three vertical control points (primary and two secondary) at a given project site is to provide a means of detecting and dealing with the potentially compromised accuracy of one or more of the benchmarks due to local disturbance.

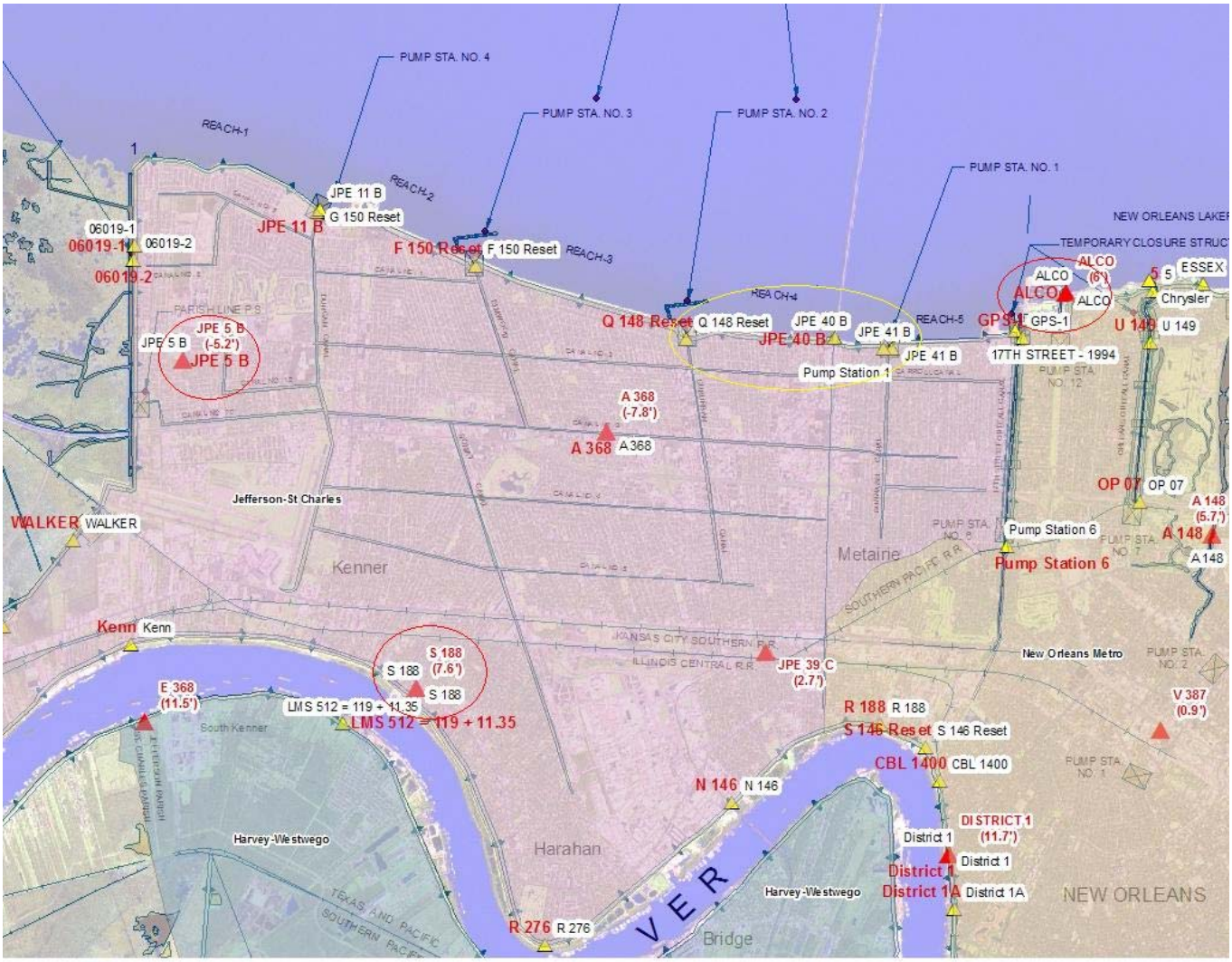
3. Once established, these benchmarks shall be periodically re-observed and verified, either by GPS or conventional levels connecting all three marks.

4. All surveys will require a minimum of one direct geodetic tie to the project's design reference benchmarks to determine conversion factor to be used for referencing the survey to the original (design) datum and epoch.

5. At all established hurricane protection, flood control, shore protection, and navigation projects, three temporary benchmarks (new or existing) shall be identified/established at the immediate work site (situated as nearly as is practicable at the middle and at each end of the project) and referenced to the applicable required epoch of NAVD88, as specified by the Engineering Division Datum Policy Memo #2.

Enclosure 2: (for CEMVN-ED-S, memo, dated 23 March 2009, SUBJECT: Requirement for Use of Benchmarks for USACE Projects (Engineering Division Datum Policy Memo #3))

Example control layout for Jefferson Parish Lakefront Levee Reach 4 (LPV 19.2)



The above example East Jefferson/St. Charles polder or project is referenced to the benchmarks shown in red. The survey of Reach 4 of the Jefferson Parish Lakefront Levee (LPV 19.2) in the vicinity of the Causeway toll plaza would be directly tied to the project control. Local benchmarks (shown in yellow) are established at the job site relative to the project benchmarks and are used to conduct the survey. These are the benchmarks that are used to calibrate/verify system accuracy during data collection.