DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

12 DEC 2012

CEMVD-PD-SP

MEMORANDUM FOR Commander, St. Louis District

SUBJECT: Review Plan Approval for St. Louis Flood Project, Review Plan Documentation

1. References:

a. Memorandum, CEMVS-PM-F, 11 December 2012, subject: Review Plan Approval for St. Louis Flood Project, Review Plan Documentation (encl 1).

b. Review Plan, CEMVS-PM-F, November 2012, subject: St. Louis Flood Project, Review Plan (encl 2).

c. Memorandum, CEMVD-RB-T, 10 December 2012, subject: Review Plan Documentation, St. Louis Flood Protection (encl 3).

2. The enclosed Review Plan (RP) for the St. Louis Flood Project has been prepared in accordance with EC 1165-2-209. The RP has been coordinated with the Upper District Support Team and the Regional Business Technical team, who concurred with the plan in reference b. of the enclosed memorandum.

3. I hereby approve this RP, which is subject to change as circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this RP or its execution will require new written approval from this office. Non-substantive changes to this RP do not require further approval. The District should post the approved RP to its web site.

4. The MVD point of contact is Mr. Philip Hollis, CEMVD-PD-SP, (601) 634-5293.

3 Encls

EDWARD E. BELK, JR., P.E., SES
Director of Programs

US Army
Corp of Engineers
St. Louis District

Review Plan

ST. LOUIS FLOOD PROTECTION, MO
ST. LOUIS DISTRICT

December 2012

P2# 112349

REVIEW PLAN

St Louis Flood Protection, MO

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REVIEW PLAN FOR ST LOUIS FLOOD PRTOTECTION, MO

1. Purpose and Requirements. This document is to serve as the review plan for the St. Louis District (MVS) for the construction of the St Louis Flood Protection project, as required by EC 1165-2-209 (Civil Works Review Policy). The purpose of this Review Plan is to define how the applicable requirements, procedures, and specific details of EC 1165-2-209 will be implemented for the ongoing construction of the project. The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. As construction of this project is approximately **ninety percent** constructed, only DQC is applicable.

a. References

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010

(2) Engineering Regulation (ER) 1110-2-1150, Engineering and Design -Engineering and Design for Civil Works Projects, 31 August 1999.

(3) Project Management Plan, St Louis Flood Protection, Project No. 112349.

b. <u>Review Process Requirements.</u> The criteria of EC 1165-2-209 is to assure the proper levels of reviews are planned and accomplished based on the following guidance:

(1) **<u>DCQ.</u>** DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements. DCQ will be performed by the St. Louis District.

(2) **<u>ATR.</u>** Documents requiring ATR will have a separate review plan developed in coordination with the RMO.

(3) **<u>IEPR.</u>** Due to the nature of the project covered by this plan, there are no IEPR, type I or type II anticipated for the work currently included in this plan. Should any project/product develop that would require a decision document a separate review plan will be developed in coordination with the RMO.

(4) **<u>Policy and Legal Compliance.</u>** In addition to the technical reviews, documents will be reviewed as applicable for their compliance with law and policy.

The project was designed, reviewed, and is being constructed in accordance with Corps of Engineers criteria contained in engineering regulations, manuals, and Engineering Technical Letters, and industry accepted codes and standards in effect at the time of design.

The review requirements applicable to this project (which included an Independent Technical Review (ITR) and DQC were outlined in ER1110-2-1150 and the Project Management Plan (PMP). The reviews were performed, and documented, as required.

This review plan is applicable to the ongoing construction of the project, specifically to construction modifications of the projects' design. The project covered by this review plan has been previously authorized and construction is nearing completion. The City of St Louis, MO is the Local Sponsor and is responsible for operations and maintenance of the project.

2. Review Management Organization (RMO) and Coordination

Review Management Organization (RMO) Coordination / MSC Approval: The Mississippi Valley Division (MVD) is the RMO for this review plan.

3. Project Description. The existing project is located in St. Louis, Missouri, on the right bank of the Mississippi River between Miles 176.3 and 187.2, above the mouth of the Ohio River. The existing project consists of an 11-mile combination of 35,614 feet of floodwalls, 20,700 feet of levees, closure structures, 28 pump stations, gravity drains, relief wells and other underseepage control measures, and pressure sewer emergency closure gatewells. The existing project protects approximately 3,160 acres of industrial and commercial development from Mississippi River flooding.

During the Great Flood of 1993, which was less than the project's design, a short section of the project failed and only quick, emergency actions by the City of St. Louis, Metropolitan St. Louis Sewer District, and Corps of Engineers prevented a large portion of the City of St. Louis from flooding. Significant problems identified during the 1993 flood include underseepage, foundation piping (which caused the failure in 1993), pipe crossings, inadequate toe drains, and inadequate relief wells. The reevaluation showed that the original project design did not include adequate closure structures. These design deficiencies are being corrected to ensure that the system provides its authorized level of service.

The approved project rehabilitates the protection system and upgrades existing features to current standards to included installing new gates at 20 closure structures, permanently closing gates at 13 closure structures, installing 70 new relief wells, and replacing 103 existing relief wells needed to improve underseepage control.

At the City's request, three of the locations slated for permanent closure will remain open. Gates were replaced at those locations. Additionally, one location that is seldom closed had a gate in good condition so it was not replaced. The resulting totals are 10 permanent closures were made and 22 gates have been replaced. Construction of 23 relief wells is all that remains to complete the project.

4. Execution of District Quality Assurance.

1. Quality checks and reviews occur during the modification process and are carried out as a routine management practice. Quality checks may be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. However, they should not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts. All DQC efforts will include the necessary expertise to address compliance with published Corps policy. Key PDT members will review all design changes and accompanying IGEs, with the customer if appropriate. The Administrative Contracting Officer/Resident Engineer (ACO) is responsible to

ensure sufficient independent technical review and design review, including appropriate compliance with regulatory, environmental, or real estate permit requirements. DQC is required for all design changes and shall follow the process below.

a. The Engineering Division Technical Lead (TL) is the designated responsible person for design modifications. The TL shall distribute the design changes to the proper offices for review in accordance with current Engineering and Construction Division SOP. Additional offices for review shall be included as necessary.

b. If multiple offices are required to review the modification, the reviewers for each office shall be identified and become members of the Review Team. This Review Team is responsible for only the review of the changes.

c. The Review Team shall review the documents and provide written comments to the TL.

d. The TL shall resolve all comments provided by the Review Team prior to completion and/or release of the modification. If all attempts to resolve any conflicts with the Review Team are unsuccessful, the District Chief, Engineering and Construction Division shall ultimately make the decision. When policy and/or legal concerns arise during DQC efforts that are not readily and mutually resolved by the Review Team and the TL, the district will seek issue resolution support from the MSC.

e. All steps of this process shall be documented and kept in the project files for internal audits to check for proper DQC implementation.

5. Agency Technical Review (Not applicable)

6. Independent External Peer Review (IEPR) (Not applicable)

7. Policy and Legal Compliance Review

All implementation documents will be reviewed for their compliance with law and policy. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods.

8. Review Plan Approval and Changes.

The Mississippi Valley Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input to the appropriate scope and level of review for the P&S documents. Like the PMP, the Review Plan is a living document and may change as the work progresses. MVS will keep the Review Plan up to date. Significant changes to this Review Plan (such as changes to the scope and/or level of review) will be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the MVS public webpage. Changes to this plan will be annotated in the following table.

Review Plan Changes Summary		
Revision Date	**Description of Change**	**Page / Paragraph Number**

9. Review Plan Points of Contact.
The MVS technical point of contact for this plan is the Project Manager, Dennis Gilmore, phone 314-331-8108.

The MVD point of contact is Mr. Philip Hollis, CEMVD-PD-SP, at (601) 634-5293.

Attachment 1 (St Louis Flood Protection, MO PDT)

Contact information and disciplines are listed below for the St Louis Flood Protection, MO Product Delivery Team (PDT).

Last	First	Role	Phone
Gilmore	Dennis	Project Manager	314-331-8108
Hanks	Michael	Civil Engineer	314-331-8252
Bailey	Jonathan	Geotechnical Engineer	314-331-8431
Fox	Catherine	Geologist	314-331-8444
Hoerner	Melissa	Realty Specialist	314-331-8157
Killiebrew	Barrietta	Contract Specialist	314-331-8514
Friesenborg	Stacy	Resident Engineer	314-331-8621
Weidner	Seth	Construction Manager	314-331-8447

Attachment 2 (ITR Certification)

COMPLETION OF INDEPENDENT TECHNICAL REVIEW

The District has completed the Plans and Specifications for the first contract of the **St. Louis Flood Protection Gate Replacement and Closure Modification**. Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan for the work performed by an Architectural-Engineering firm. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by John Zacher. All comments resulting from ITR have been resolved.

JOHN ZACHER, P.E.
Technical Review Team Leader

6/26/09
Date

TAMARA ATCHLEY, P.E.
Project Manager

6/29/09
Date

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

As noted above, all concerns resulting from independent technical review of the project have been fully resolved.

DAVID BUSSE, P.E.
Chief, Engineering and Construction Division

6/30/09
Date

Attachment 3 (Legal Certification)

LEGAL CERTIFICATION

The St. Louis Flood Protection Reconstruction Evaluation Report, including associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, St. Louis District, and is approved as legally sufficient.

Date: August 1, 2005

William P. Levins
District Counsel