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

REPLY TO
ATTENTION OF:

CEMVD-PD-SP

12 DEC 12

MEMORANDUM FOR Commander, St. Louis District

SUBJECT: Review Plan Approval for Chain of Rocks Ditch Work Phase 2, Review Plan

1. References:

a. Memorandum, CEMVS-PM-F, 7 November 2012, subject: Chain of Rocks Ditch Work Phase 2, Review Plan Documentation (encl 1).

b. Review Plan, CEMVS-PM-F, November 2012, subject: Agency Technical Review of Plans and Specifications for the Chain of Rocks Ditch Work Phase 2 Project (encl 2).

c. Memorandum, CEMVD-RB-T, 5 December 2012, subject: Chain of Rocks Ditch Work Phase 2, Review Plan (encl 3).

2. The enclosed Review Plan (RP) for the Chain of Rocks Ditch Work Phase 2 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 c. 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

REVIEW PLAN

Agency Technical Review of Plans and Specifications

for the Chain of Rocks

Ditch Work Phase 2 Project

Saint Louis District

November 2012

MSC Approval Date: Pending

Last Revision Date: None

US Army Corps of Engineers ®

REVIEW PLAN

Chain of Rocks

Ditch Work Phase 2 Project

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REVIEW PLAN FOR THE CHAIN OF ROCKS DITCH WORK PHASE 2 PLANS AND SPECIFICATIONS

1. Purpose and Requirements

This review plan defines the scope and level of peer review for the Chain of Rocks Ditch Work Phase 2, Plans and Specifications. This project is being carried out in order to correct design deficiencies of the Chain of Rocks Canal Project.

a. References

(1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
(2) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
(3) Chain of Rocks Design Deficiency Report, July 1997
(4) Project Management Plan for Chain of Rocks Canal Levee Design Deficiency Correction, 19 July 1997

b. Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). 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.

2. Review Management Organization (RMO) and Coordination

The RMO for this project is the Mississippi Valley Division (MVD).

The RMO will establish ATR teams for review of the P&S in accordance with EC 1165-2-209 and coordinate with the Cost Engineering Branch & Directories of Expertise (DX) to conduct any necessary ATRs of cost estimates, construction schedules and contingencies.

3. Project Description

The Chain of Rocks Levee provides front line protection for the Metro East St. Louis area from the Mississippi River and Chain of Rocks Canal. The levee is located between Mississippi River Miles 184.3 and 194.3, above the confluence of the Ohio River with the Mississippi River. Combined with adjoining levees, the project provides flood protection for approximately 180,000 residents and approximately 85,000 acres.

The Ditch Work Phase 2 project is related only to the interior drainage system of the levee. Specifically, this project consists of replacing an existing 48 inch culvert with a 72 inch diameter reinforced concrete pipe (RCP). The section of new pipe is approximately 230 feet in length, and is underneath an existing railroad embankment. The height of fill over the culvert ranges from approximately 15 feet outside the railroad embankment to approximately 35 feet directly under the railroad tracks. Four new precast concrete manholes will be required in order to tie into the existing 72” RCP that exists on either side of the existing 48” culvert. Two existing manholes will be removed.

The means of installation of the culvert will be by the jack-and-bore method. The jack-and-bore method uses proven technology and does not involve the use of innovative materials or techniques, nor is it based on novel methods. This method is required to minimize disturbance to the embankment, and the operations of the railroad. This method includes excavating adjacent to the railroad embankment on each side, and pushing the sections of RCP through the embankment by boring through the soil and jacking against the wall of the excavation.

In-Kind Contributions. No in-kind products are anticipated for this project.

4. Execution of District Quality Assurance

All implementation documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

Documents Requiring DQC: The documents to be reviewed are the project drawings and specifications which detail the project requirements for Ditch Work Phase 2.

DQC Schedule: DQC will be performed at two separate project review phases. First, a DQC review will be conducted at the 65% level. Additionally, a final DQC review will be conducted in the form of a BCOE, which will be concurrently with the ATR review at the 95% level. See Table 1 below for the complete project schedule, including required DQC reviews.

Required DQC Expertise. The quality assurance / technical reviewers will be chosen from a pool of reviewers submitted by appropriate technical elements. DQC team members will not be directly involved in the production of the plans and specifications. The team will be comprised of the selected disciplines that have experience in the type of analysis in which they are responsible for reviewing. The DQC team is identified in Attachment 1.

5. Agency Technical Review

ATR is mandatory for all implementation documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. ATR lead will be from outside MVD.

Documents Requiring ATR. The documents to be reviewed are the 95% Plans and Specifications for Ditch Work Phase 2.

Table 1. Project Schedule

Milestone	Date
Distribute 65% Submittal (DQC Only)	06 DEC 2012
65% DQC Review Complete	08 JAN 2013
Distribute 95% Submittal (ATR & BCOE)	15 FEB 2013
ATR/BCOE Complete	07 MAR 2013
P&S Approval	28 MAR 2013
RTA (Ready to Advertise)	28 MAR 2013
Contract Award	08 JUL 2013
Construction Completion	TBD

Specific Required ATR Work Items.

Specific work items shall include but not be limited to the following:

- Review of all documents identified in Section 5.
- Review design calculations.
- Enter and resolve all review comments resulting from reviews of the work through DrChecks.
- ATR certification upon completion of review. ATR certification requirements are found in EC 1165-2-209. ATR certificates shall be used to certify all reviews. Each certification will include copies of DrChecks review comments showing that all comments are resolved and closed (see paragraph 7).
- Specific submission requirements will be coordinated with the below POC.

ATR Review Objectives.

The primary objectives of the review are to ensure that:

- The project meets the Government's scope, intent and quality objectives.
- Design concepts are valid.
- The design is feasible and will be safe, functional, and constructible.
- Appropriate methods of analysis were used and basic assumptions are valid and used for the intended purpose.
- The source, amount, and level of detail of the data used in the analysis are appropriate for the complexity of the project.
- The project complies with accepted practice and design criteria within the industry.
- All relevant engineering and scientific disciplines have been effectively integrated.
- Content is sufficiently complete for the current phase of the project and provides an adequate basis for future development effort.
- Project documentation is appropriate and adequate for the project phase.

Team Membership. Team members will demonstrate senior-level competence in the type of work being reviewed. Junior-level staff cannot be members of the team. All team members should have a minimum of 10 years of experience within their discipline. The following is a list of disciplines anticipated to be required for ATR:

Discipline	
ATR Lead	The team lead should understand the requirements of EC 1165-2-209, 31 January 2010, Water Resources Policies and Authorities, CIVIL WORKS REVIEW POLICY and have experience conducting technical reviews; have a thorough understanding of Projnet's DrChecks (www.projnet.org); be accomplished in the management of multidisciplinary teams and issue resolution; be proficient in developing the review report to document the ATR; and have extensive knowledge of the authorities, regulations, and policies of the Corps of Engineers. The ATR lead may also serve as one of the technical reviewers.
Real Estate	Team member will be experienced in federal civil work real estate laws, policies and guidance. Members shall have experience working with respective sponsor real estate issues.
Geotechnical Engineering	The team member should be a registered professional engineer and have 10 or more years experience in geotechnical engineering. Experience needs to include geotechnical evaluation of levee systems and their seepage control systems. Experience needs to encompass interior drainage systems such as culverts and open ditches which are required to convey water from storm events and flood event seepage.
Cost Estimating	Team member will be familiar with cost estimating for similar civil works projects using MCACES version MII. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. A separate process and coordination is also required through the Walla Walla District DX for cost engineering.
Construction	The team member should be a registered professional engineer and have 10 or more years experience in civil engineering. Experience needs to include the engineering and design of water management project features such as conveyance culverts, and spillways, and the installation of culverts or pipes using the jack-and-bore method.
Biologist/Environmental	The team member will be experienced in NEPA/CEQA process and analysis, and have a biological or environmental background that is familiar with the project area and ecosystem restoration. The team member will be an expert in environmental evaluation and compliance requirements pursuant to the "Procedures for Implementing NEPA" (ER 200-2-2), national environmental statutes, applicable executive orders, and other Federal planning requirements, into the planning of Civil Works projects.
Civil Engineering	The team member should be a registered professional engineer and have 10 or more years experience in civil engineering. Experience needs to include the engineering and design of water management project features such as conveyance culverts, and spillways, and the installation of culverts or pipes using the jack-and-bore method.
Structural Engineering	The team member should be a registered professional engineer and have 10 or more years experience in structural engineering. Experience needs to encompass the analysis and design of culverts under embankments and railroads.

Documentation. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;

(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;

(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the documents; and

(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A sample Statement of Technical Review is included in Attachment 2.

Coordination of Funding for ATRs. Upon establishment of an ATR team, the organization performing the reviews will provide a cost estimate along with information on how to fund this work to the MVS POC so that funding can be set up.

6. Independent External Peer Review (IEPR)

IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

a. **Decision on IEPR.** MVS has determined that the Chain of Rocks Ditch Work Phase 2 is not a project study, and therefore, does not require a Type I IEPR. MVS has determined that the Chain of Rocks Ditch Work Phase 2 project does not require a Type II IEPR for the following reasons:
   - It does not involve the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations; does not contain precedent-setting methods or models; and does not present conclusions that are likely to change prevailing practices;
   - It does not require redundancy, resiliency, and/or robustness;
   - It does not involve unique construction sequencing or a reduced or overlapping design construction schedule; and
   - It does not pose a significant threat to human life.

7. Public Review

The public had opportunities to review the overall project during the completion of the Design Deficiency Report, and the public will not review this individual project separately.

8. 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.

9. 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. Upon MVD approval, this review plan will be posted to the District's website for public review. The review plan will be posted for a minimum of 14 days, at the following website: http://www.mvs.usace.army.mil/

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 Attachment 3.

10. Points of Contact

The MVS technical point of contact for this plan is the Project Manager, phone 314-331-8790.

The Review Management Organization (RMO) point of contact is the District Support Team (DST) representative, phone 601-634-5293.

The agency or USACE organization performing the review shall appoint one individual as team lead for the ATR to serve as a single point of contact and liaison between their organization, the RMO, and MVS.

ATTACHMENT 1: TEAM ROSTERS

Product Delivery Team

Name	Role	Phone Number	E-mail
Hal Graef, PMP	Project Manager	[redacted]	
Joshua VerDught	Civil Designer		
Jose Lopez	Geotechnical Engineer		
Stephen O'Connor	Materials Engineer		
Robert Heer, PE	Structural Engineer		
Greg Dyn	Cost Engineering		
Genny Walters	Hydrology		
Lara Anderson	Cultural Resources		
Tim Kennedy	Real Estate		
Heather Asunskis	Office of Counsel		

DQC Team

Name	Role	Phone Number	E-mail
TBD	Project Manager		
TBD	Civil Engineer		
TBD	Geotechnical Engineer		
TBD	Structural Engineer		
TBD	Construction Branch		
TBD	Cost Engineering		
TBD	Hydrology Branch		
TBD	Environmental Branch		
TBD	Area Office		

ATR Team

Name	Role	Review District
TBD	ATR Lead	TBD
TBD	Real Estate	TBD
TBD	Geotechnical Engineer	TBD
TBD	Cost Engineer	TBD
TBD	Construction	TBD
TBD	Biology/Environmental	TBD
TBD	Civil Engineer	TBD
TBD	Structural Engineer	TBD

Vertical Team

Name	Role	Phone Number	E-mail
Phil Hollis	Review Management Organization	601-634-5293	Philip.B.Hollis@usace.army.mil
Phil Hollis	District Support Team	601-634-5293	Philip.B.Hollis@usace.army.mil
Gib Owen	Regional Implementation Team	202-761-4495	Gib.A.Owen@usace.army.mil

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *<type of product>* for *<project name and location>*. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, 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,, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks[sm].

SIGNATURE _____ _____

Name Date
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ _____

Name Date
Project Manager
Office Symbol

SIGNATURE _____ _____

Name Date
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ _____

Name Date
Review Management Office Representative
Office Symbol

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: *Describe the major technical concerns and their resolution.*

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

SIGNATURE _____ _____

Name Date
Chief, Engineering Division
Office Symbol

[1] Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number