



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION
60 FORSYTH STREET SW, ROOM 10M15
ATLANTA, GA 30303-8801

CESAD-RBT

14 SEP 2016

MEMORANDUM FOR COMMANDER, WILMINGTON DISTRICT

SUBJECT: Approval of Review Plan for Plans, Specifications and Design
Documentation Report Lock and Dam 2 Scour Hole Repairs, Bladen County, NC

1. References:

a. Memorandum, CESAW-ECP-E, 29 July 2016, subject: Approval of Review Plan for Lock and Dam 2 Scour Hole Repairs, Bladen County, NC, Implementation Documents (Encl).

b. EC 1165-2-214, Civil Works Review, 15 December 2012.

2. The Review Plan (RP) for the Plans and Specifications and Design Documentation Report for the Lock and Dam 2 Scour Hole Repairs, submitted by the Wilmington District via reference 1.a has been reviewed by this office and is hereby approved in accordance with reference 1.b above.

3. SAD concurs with the conclusion of the Wilmington District that a Type II Independent External Peer Review (IEPR) is not required. The primary basis for the concurrence that a Type II IEPR is not required is the determination and vertical team's agreement that the failure of the scour hole repairs on Lock and Dam 2 would not pose a significant threat to human life. The RP also complies with all applicable policy and provides for adequate agency technical review (ATR) and other aspects of the plan development.

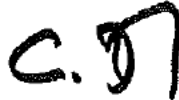
4. The district should take steps to post the approved RP to its web site and provide a link to CESAD-RBT. Before posting to the web site, the names of Corps/Army employees should be removed in accordance with references above. Subsequent significant changes to this RP, such as scope changes or level of review, should they become necessary, will require new written approval from this office.

CESAD-RBT

SUBJECT: Approval of Review Plan for Plans, Specifications and Design
Documentation Report Lock and Dam 2 Scour Hole Repairs, Bladen County, NC

5. The SAD point of contact is [REDACTED] CESAD-RBT, [REDACTED] or
email: [REDACTED]

Encl



C. DAVID TURNER
Brigadier General, USA
Commanding

CF:
CESAW-ECP-E [REDACTED]
CESAW-ECP-E [REDACTED]



DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-ECP-E

29 July 2016

MEMORANDUM FOR Commander, US Army Corps of Engineers, South Atlantic Division (CESAD-RBT), ATTN: [REDACTED] CESAD-RBT, Rm 10M15, 60 Forsyth Street, SW, Atlanta, Georgia 30303-8801

SUBJECT: Approval of Review Plan for Lock and Dam 2 Scour Hole Repairs, Bladen County, NC, Implementation Documents

1. Reference

a. EC 1165-2-214, Civil Works Review Policy, 15 Dec 2012

2. I hereby request approval of the enclosed Review Plan for Lock & Dam 2 Scour Hole Repairs, Bladen County, NC, Implementation Documents. The Review Plan complies with applicable policy and includes DQC and ATR plans for this project. Also, SAW-Dam Safety Officer and Chief of Engineering agree with the Review Plan as submitted.

3. The District will post the Corps of Engineers South Atlantic Division (CESAD) approved Review Plan to its website and provide a link to CESAW for its use. Names of Corps/Army employees are withheld from the posted version, in accordance with guidance.

Encl

A handwritten signature in black ink, appearing to read "FOR [unclear]".

KEVIN P. LANDERS SR.
COL, EN
Commanding



Review Plan

For

**Lock & Dam No. 2 Scour Hole Repair,
– Implementation Documents**

**Bladen County, North Carolina
P2 #: 111630**

**U.S. Army Corps of Engineers
Wilmington District
Wilmington, North Carolina**

July 2016

THE INFORMATION CONTAINED IN THIS REVIEW PLAN IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PREDISSEMINATION REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY THE U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

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Attachment 1: Acronyms and Abbreviations

Attachment 2: Completion of Agency Technical Review Form

1. PURPOSE AND REQUIREMENTS

1.1 Purpose

This Review Plan defines the scope and level of review activities for design of the Lock & Dam No. 2 Scour Hole Repair project, located in Bladen County, NC. The Scour Hole Repair design will consist of placement of bedding and armor stone within an existing scour hole just downstream of Lock & Dam No. 2 on the Cape Fear River. The review activities consist of District Quality Control (DQC) and Agency Technical Review (ATR). The project is in the design and implementation phase and the related documents are a Design Documentation Report (DDR) and Plans and Specifications (P&S). Upon approval, this review plan will be included into the Project Management Plan.

1.2 References

- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug. 1999
- ER 1110-1-12, Engineering and Design Quality Management, 31 March 2011
- EC 1165-2-214, Civil Works Review, 15 Dec. 2012
- Engineering and Construction Bulletin, No. 2016-9, 04 Mar 2016
- ER 415-1-11, Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review, 1 January 2013
- ER-1110-2-1156, Safety of Dams – Policy & Procedures, 31 March 2014
- Quality Control Plan
- Project Management Plan

1.3 Requirements

This review plan was developed in accordance with EC 1165-2-214, 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 provides the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) Civil Works decision, implementation, and operations and maintenance documents and other work products. The EC outlines five levels of review for implementation documents: District Quality Control, Agency Technical Review, Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review, Legal Review and Independent External Peer Review. Refer to the EC for the definitions and procedures for the five levels of review.

1.4 Review Management Organization (RMO).

The South Atlantic Division is designated as the RMO for this effort.

2. PROJECT INFORMATION AND BACKGROUND

2.1 Project Description

Lock and Dam #2 (L&D#2) is located on the Cape Fear River near Elizabethtown, NC approximately 50 miles northwest of Wilmington. L&D#2 includes a low head, rock filled dam structure 50 ft wide and 229 ft long and a lock chamber 40 ft by 200 ft. The dam has a crest elevation of 18.5 ft NAVD88 on the upstream side and slopes downward to elevation 10.0 ft NAVD88.

A 40 ft deep scour hole extends about 750 ft downstream of the dam structure. This scour hole was documented in Periodic Inspection (PI) #7 February 2010. A hydrographic survey of July 2008 had indicated the scour hole and prompted a recommendation of "armor the riverbed to prevent further scouring and undermining of the dam." The 2010 Interim Risk Reduction Measures Plan (IRRMP) and subsequent updates to that IRRMP recommend filling the scour hole to reduce the risk of destabilizing the dam.

Two sizes of stone will be placed in the scour hole to stabilize the dam base. The majority of the scour hole will be filled with NCDOT Class B riprap. Two layers of armor stone are required to be placed over the riprap to provide erosion protection. The armor stone size will be defined by the maximum water velocity passing over the existing 50 ft wide dam crest.

The project cost is expected to be less than \$8M. There is no negative impact to the stability of the dam and when constructed, stability is increased.

3. DISTRICT QUALITY CONTROL

District Quality Control (DQC) and Quality Assurance activities for implementation documents (DDRs and P&S) are stipulated in ER 1110-1-12, Engineering & Design Quality Management. The subject project DDR and P&S will be prepared by the Wilmington District using the SAW procedures and will undergo DQC at 35% and 95% completion. DQC Certification will be verified as part of the Agency Technical Review.

4. AGENCY TECHNICAL REVIEW

Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-214 and ER 1110-1-12. An ATR will be performed on the Plans and Specifications and Design Documentation Report.

ATR will be conducted by individuals and organizations that are external to the Wilmington District (SAW). The ATR Team Leader will be a Corps of Engineers employee outside the South Atlantic Division. The required disciplines and experience are described below.

4.1 ATR Team Expertise

As stipulated in ER 1110-1-12, ATR members will be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; appointed SME or senior level experts from the responsible district; experts from other U.S. Army Corps of Engineers Districts; contractors; academic or other technical experts; or a combination of the above. An ATR will be conducted on the 95% Plans and Specifications and DDR. The ATR Team will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

ATR Team Leader. The ATR lead will be a senior registered professional with experience in earthen dam safety matters and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (such as geotechnical, site engineering, planning, etc).

Geotechnical Engineering. Team member will be a registered professional engineer familiar with design of revetment systems.

Civil/Site Engineering. Team member will be a registered professional engineer. Experience with underwater construction is preferred.

NEPA Compliance. The team member should have experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for earthen dam embankment projects.

4.2 Documentation of ATR

DrCheckssm review software will be used to document all ATR comments, responses, and associated resolutions accomplished throughout the review process. Comments are expected to 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 plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; 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 DrCheckssm will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall:

- 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 an overview for the project information in which the ATR members were charged to review;
- Describe the nature of their review and their findings and conclusions; 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.

The ATR may be certified when all ATR concerns are either resolved or referred to U.S. Army Corps of Engineers South Atlantic Division (CESAD) for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed for the 95% plans & specifications. A sample certification is included in this Review Plan (see attachment 2).

5. BIDDABILITY, CONSTRUCTABILITY, OPERABILITY, ENVIRONMENTAL, AND SUSTAINABILITY REVIEW

The value of a BCOES review is based on minimizing problems during the construction phase through effective checks performed by knowledgeable, experienced personnel prior to advertising for a contract. Biddability, constructability, operability, environmental, and sustainability requirements must be emphasized throughout the planning and design processes for all programs and projects, including during planning and design. This will help to ensure that the government's contract requirements are clear, executable, and readily understandable by private sector bidders or proposers. It will also help ensure that the construction may be done efficiently and in an environmentally sound manner, and that the construction activities and projects are sufficiently sustainable. Effective BCOES reviews of design and contract documents will reduce risks of cost and time growth, unnecessary changes and claims, as well as support safe, efficient, sustainable operations and maintenance by the facility users and maintenance organization after construction is complete. A BCOES Review will be conducted for this project at the Final Design Phase.

6. INDEPENDENT EXTERNAL PEER REVIEW (WRDA 2007 Section 2035 Safety Assurance Review)

EC 1165-2-214 provides implementation guidance for both Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law (P.L.) 110-114). The EC addresses review procedures for both the Planning and the Design and Construction Phases (also referred to in USACE guidance as the Feasibility and the Pre-construction, Engineering and Design Phases). The EC defines Section 2035 Safety Assurance Review (SAR), Type II Independent External Peer Review (IEPR). The EC also requires Type II IEPR be managed and conducted outside the Corps of Engineers.

6.1 Type I IEPR

A Type I IEPR is typically associated with decision documents. No decision documents are addressed/covered by this Review Plan. A Type I IEPR is not applicable to the P&S and DDR covered by this Review Plan.

6.2 Type II IEPR, Determination

This Scour Hole Repair project does not trigger WRDA 2007 Section 2035 factors for Safety Assurance Review (termed Type II IEPR in EC 1165--2-214) and therefore, a Type II IEPR review under Section 2035 and/or EC 1165-2-214 is not required. The factors in determining whether a review of design and construction activities of a project is necessary, as stated under Section 2035 and EC 1165-2-214 along with this review plans' applicability statement which follows.

- (1) The failure of the project would pose a significant threat to human life.

The filling of the scour hole will increase the stability of the dam. Failure of this dam poses no threat to human life. Construction would incorporate existing engineering standards/methods and will not lead to short term increases in probability of dam failure.

- (2) The project involves the use of innovative materials or techniques.

The scour hole repair uses standard materials and construction methods familiar to contractors.

- (3) The project design requires redundancy, resiliency and robustness.

The scour hole repair will increase the stability of the current dam. During construction, the stability of the current dam will not be reduced and the dam will operate as normal with full functionality.

- (4) The project has unique construction sequencing or a reduced or overlapping design construction schedule.

The project design does not require unique construction sequencing, or a reduced or overlapping design construction schedule. The construction sequence has been used successfully by the Corps of Engineers on other similar works.

As indicated above, this project does not pose a significant threat to human life, and does not trigger any of the EC 1165-2-214 factors for Type II IEPR. Therefore, the District Chief of Engineering, as the Engineer in Responsible Charge has determined that a Type II IEPR of these implementation documents (DDR and P&S) is not needed.

7. POLICY AND LEGAL COMPLIANCE

The Wilmington District Office of Counsel will review this contract actions for legal sufficiency in accordance with Engineer Federal Acquisition Regulation Supplement 1.602-2 Responsibilities. The subject implementation documents and supporting environmental documents will be reviewed for legal sufficiency prior to advertisement.

8. MODEL CERTIFICATION AND APPROVAL

The certified computer model HECRAS was used to model river flows and calculate velocities for armor stone sizing. The HECRAS Model is certified.

9. ESTIMATED COSTS AND SCHEDULE

9.1 Project Milestones

35% District Quality Control	2 Aug 2016
95% District Quality Control	7 Sep 2016
ATR of 95% P&S and DDR	22 Sep 2016
District BCOE and Certification	TBD
Issue Date	TBD
Bid Opening	TBD
Construction Contract Award	TBD

9.2 ATR Schedule and Cost

The ATR will be conducted in FY16. It is envisioned that each reviewer will be afforded 28 hours review plus 4 hours for coordination. It is envisioned that the ATR Leader will be allowed 40 hours if also serving as a reviewer. The estimated cost range is \$10k - \$25k. The ATR schedule follows. (Estimated to occur in September 2016)

ATRT Selected and Resourced (ATR Start)	26 Jul 2016
ATR Kickoff and ATR Start	8 Sep 2016
ATRT Completes Comments	13 Sept 2016
PDT Completes Evaluations	19 Sept 2016
ATRT Completes Back Checks	21 Sept 2016
ATR Certification	22 Sep 2016

10. POINTS OF CONTACT

Per guidance, the names of the following individuals will not be posted on the Internet with the Review Plan. Their titles and responsibilities are listed below.

Wilmington District POCs:

Review Plan, ATR and QM Process,

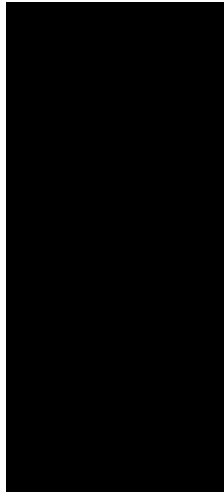
Dam Safety Program Manager

Project Manager (PM):

Chief of Geotechnical,
and Dam Safety:

Chief of Engineering Branch,
and Dam Safety Officer:

South Atlantic Division POC:



11. MSC APPROVAL

The MSC that oversees the home district is the South Atlantic Division and it is responsible for approving the review plan. Approval will be provided by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, and HQUSACE members) as to the appropriate scope and level of review for the pre-construction and engineering design phase of this effort. Like a PMP, the Review Plan (RP) is a living document and may change as work progresses. Significant changes to the RP should be approved by following the process used for initially approving the RP. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project scope.

Attachment 1

ACRONYMS AND ABBREVIATIONS

ATR – Agency Technical Review
ATRT – Agency Technical Review Team
BCOE – Biddability, Constructability, Operability and Environmental
CESAD – U.S. Army Corps of Engineers South Atlantic Division
DCP – District Control Plan
DDR – Design Documentation Report
DQC – District Quality Control
EC – Engineer Circular
EIS – Environmental Impact Statements
ER – Engineer Regulations
HQUSACE – Headquarters U.S. Army Corps of Engineers
IEPR – Independent External Peer Review
MSC – Major Subordinate Command
PDT – Project Delivery Team
PMP – Project Management Plan
P&S – Plans and Specifications
RMC – USACE Risk Management Center
RMO – Review Management Organization
RP – Review Plan
RTS – Regional Technical Specialists
SAD – South Atlantic Division
SAW – Wilmington District
SAR – Safety Assurance Review
SME – Subject Matter Expert
USACE – U.S. Army Corps of Engineers
WRDA – Water Resources Development Act

