



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

CESAD-RBT

15 JAN 2016

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT

SUBJECT: Approval of the Review Plan for the Herbert Hoover Dike Rehabilitation,
Reach 1 Cutoff Wall Gap Closure Project

1. References:

a. Memorandum, CESAJ-EN-Q, 30 November 2015, subject: Approval of Review Plan for Herbert Hoover Dike Rehabilitation, Reach 1 Cutoff Wall Gap Closure Project (Encl 1).

b. Memorandum, CEIWR-RMC, 17 November 2015, Risk Management Center Endorsement – Herbert Hoover Dike, Reach 1 Cutoff Wall Gap Closure Project, Review Plan (Encl 2).

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

2. The Review Plan (RP) for the Herbert Hoover Dike Rehabilitation, Reach 1 Cutoff Wall Gap Closure Project, submitted by the Jacksonville District via reference 1.a and endorsed by the Risk Management Center (RMC) via reference 1.b has been reviewed by this office is hereby approved in accordance with reference 1.c above.

3. The RMC will serve as the Review Management Organization (RMO) for this Reach 1 Cutoff Wall Gap Closure Project. SAD concurs with the conclusion of the Jacksonville District and the RMC that a Type II Independent External Peer Review (IEPR) is required on the design and construction efforts this for this project.

4. The District should take steps to post the approved RP to its web site and provide a link to CESAD-RBT and the RMC Senior Review Manager (rmc.review@usace.army.mil). Before posting to the web site, the names of Corps/Army employees should be removed. Subsequent significant changes, such as scope changes or level of review, to this RP, should they become necessary, will require new written approval from this office.

CESAD-RBT

SUBJECT: Approval of the Review Plan for the Herbert Hoover Dike Rehabilitation,
Reach 1 Cutoff Wall Gap Closure Project

5. The SAD point of contact is [REDACTED].

2 Encls

1. Memo, CESAJ-EN-Q, 30 Nov 15
2. Memo, CEIWR-RMC, 17 Nov 15

C.D.T.

C. DAVID TURNER
Brigadier General, USA
Commanding

CF:

[REDACTED]



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 SAN MARCO BOULEVARD
JACKSONVILLE, FLORIDA 32207

CESAJ-EN-Q

30 November 2015

MEMORANDUM FOR Commander, South Atlantic Division (CESAD-RBT)

SUBJECT: Approval of Review Plan for Herbert Hoover Dike Rehabilitation, Reach 1 Cutoff Wall Gap Closure Project

1. References.

- a. EC 1165-2-214, Civil Works Review, 15 December 2012
- b. WRDA 2007 H. R. 1495 Public Law 110-114, 08 November 2007
- c. Risk Management Center Endorsement of Herbert Hoover Dike Reach 1 Cutoff Wall Gap Closure Project Review Plan, 17 November 2015

2. I hereby request approval of the enclosed Review Plan for the design and construction phases of the Herbert Hoover Dike Rehabilitation, Reach 1 Cutoff Wall Gap Closure Project and concurrence with the conclusion that a Type II Independent External Peer Review (IEPR) of the subject project is required. The recommendation to perform a Type II IEPR is based on the EC 1165-2-214 Risk Informed Decision Process as presented in the Review Plan. Documents to be reviewed include plans, specifications, and design documentation. The Review Plan complies with applicable policy, provides for technical review, and has been coordinated with the CESAD and RMC. It is my understanding that non-substantive changes to this Review Plan, should they become necessary, are authorized by CESAD.

3. The district will post the CESAD approved Review Plan to its website and provide a link to the CESAD for its use. Names of Corps/Army employees will be withheld from the posted version, in accordance with guidance.

FOR THE COMMANDER:

[REDACTED]

ENCL 1



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
RISK MANAGEMENT CENTER
12596 WEST BAYAUD AVE., SUITE 400
LAKEWOOD, CO 80228

REPLY TO
ATTENTION OF

CEIWR-RMC

17 Nov 2015

MEMORANDUM FOR: Commander, Jacksonville District, ATTN: CESAJ-EN-Q

SUBJECT: Risk Management Center Endorsement –Herbert Hoover Dike, Reach 1
Cutoff Wall Gap Closure Project, Review Plan

1. The Risk Management Center (RMC) has reviewed the Review Plan (RP) for – Herbert Hoover Dike, Reach 1 Cutoff Wall Gap Closure Project, dated 27 October 2015, and concurs that this RP complies with the current peer review policy requirements outlined in EC 1165-2-214 "Civil Works Review Policy", dated 15 December, 2012.
2. This review plan was prepared by Jacksonville District, reviewed by SAD, and the RMC, and all review comments have been satisfactorily resolved. For this project a Type II IEPR will be performed.
3. The RMC endorses this document to be approved by the MSC Commander. Upon approval of the RP, please provide a copy of the approved RP, a copy of the MSC Commander's approval memorandum to the RMC Senior Review Manager (rmc.review@usace.army.mil).
4. Thank you for the opportunity to assist in the preparation of this RP. Please coordinate all aspects of the Agency Technical Review and the Independent External Peer Review (as appropriate) efforts defined in the RP. For further information, please contact me at [REDACTED]

[REDACTED]

CF:

[REDACTED]

ENC 7

**Review Plan
U.S. Army Corps of Engineers
SAD Division
SAJ District**

**Herbert Hoover Dike
Reach 1 Cutoff Wall Gap Closure Project**

MSC Approval Date: 15 January 2016

Last Revision Date: ('none')

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



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1. Purpose and Requirements

a. Purpose

This Review Plan is intended to ensure a quality-engineering project is developed by the Corps of Engineers. This Review Plan has been developed for Herbert Hoover Dike (HHD) Rehabilitation, Reach 1 Cutoff Wall Gap Closure Project, hereafter called the Project. This Review Plan was prepared in accordance with EC 1165-2-214, "Civil Works Review Policy". The Review Plan describes the scope of review for the current phase of work and shall layout a value added process that assures the correctness of the information shown. Upon approval, this review plan will be included into the Project Management Plan (PMP) for this project (P2 # 114527) as an appendix to the Quality Management Plan (QMP).

b. Guidance and Policy References

- EC 1165-2-214, Civil Works Review Policy, 15 December 2012
- ER 1110-1-12, Quality Management, 31 Mar 2011
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 Mar 2014
- ER 1110-2-1150, "Engineering and Design for Civil Works Projects", 31 August 1999
- ER 10-1-51, "Organizations and Function, Roles and Responsibilities – Dam Safety Modification Mandatory Center of Expertise", 29 June 2012.
- ER 415-1-11, "Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review", 1 January 2013
- SAJ EN QMS 02611, "SAJ Quality Control of In-House Products: Civil Works PED", 21 November 2011
- SAJ EN QMS 08550, "BCOES Reviews", 21 September 2011
- Enterprise Standard (ES) 08025, "Government Construction Quality Assurance Plan and Project/Contract Supplements"
- Enterprise Standard (ES) 08026, "Three Phase Quality Control System"
- Central and Southern Florida Project, Project Management Plan, Herbert Hoover Dike Major Rehabilitation Evaluation Reports, P2 Number 114527
- Jacksonville District, "Herbert Hoover Dike Major Rehabilitation Evaluation Report," USACE, Jacksonville, FL, November 2000

c. 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 outlines five levels of review: District Quality Control (DQC), Agency Technical Review (ATR), and an Independent External Peer Review (IEPR), Policy and Legal Review, and a Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review. The RP identifies the most



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important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual project. This Review Plan should be provided to the PDT, DQC, ATR, BCOES, and IEPR Teams.

d. Review Management Organization

The USACE Risk Management Center (RMC) is the Review Management Organization (RMO) for the project. Contents of this review plan have been coordinated with the RMC and the SAD Division, the Major Subordinate Command (MSC). In-Progress Review (IPR) team meetings with the RMC, SAD, and HQ will be scheduled on an "as needed" basis to discuss programmatic, policy, and technical matters. The SAD Dam Safety Program Manager will be the POC for vertical team coordination. This review plan will be updated for each new project phase. The Jacksonville District will assist the RMC with management of the ATR and IEPR reviews and development of the draft ATR and IEPR "charges".

2. Project Description and Information

a. Project Description

Herbert Hoover Dike is an earthen embankment system located along the perimeter of Lake Okeechobee, a large (724 square mile surface area) freshwater lake in south Florida. The lake is located about 30 miles west of the Atlantic Ocean and 60 miles east of the Gulf of Mexico. The lake and surrounding drainage area encompass approximately 5,600 square miles. The dike was constructed primarily to provide local flood protection. Components of the embankment system have been built intermittently since the early 1900's. Federal involvement began in the 1930's with the construction of dikes (for flood protection) along portions of the north and south shores.

In the 1960's, the crest elevations of those dikes were increased and additional embankments were constructed on the northwest and northeast shores. As a result, the Herbert Hoover Dike system now encircles Lake Okeechobee entirely, except in the vicinity of Fisheating Creek on the western shore.

The existing embankments total about 143 miles in length with crest elevations ranging from 32 to 46 feet, National Geodetic Vertical Datum (NGVD). Adjacent land elevations typically range from 10 to 20 feet, NGVD. Lakeside levee slopes vary from 1V:3H to 1V:10H and landside slopes range from 1:2 to 1:5.

The Jacksonville District published a Major Rehabilitation Evaluation Report (MRR) in 2000 that analyzed the integrity of the existing dike system, due to increasing emergency repairs when seepage, piping, erosion, and sink holes appeared. The MRR covered the overall condition of the entire earthen embankment. Due to the size and cost of the project, the 2000 MRR focused on Reach 1. In 2013, 21.4 miles of seepage cut-off wall in the south-east section of the dike, Reach 1, was substantially completed. Reach 1 spans from Port Mayaca (S-308) to Belle Glade (S-351). The construction of



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21.4 mile of cutoff wall in Reach 1 satisfies the majority of the risk reduction goals for that reach but left gaps at existing structures S-308, S-352, S-351 and the Tory Island Bridge.

This project will close the gaps at existing structures S-308, S-352, S-351 and the Tory Island Bridge. The closure of the gaps is consistent with the 2000 MRR and the ongoing Dam Safety Modification Study. Although there are gaps in the Reach 1 cutoff wall at other structure locations, these gaps will be closed when the structure is replaced as part of the culvert replacement program. The structures referenced above are not scheduled for replacement.

It is anticipated that conventional panel cutoff wall similar to the existing Reach 1 cutoff wall will be constructed across the majority of the open gap. This method of cutoff wall will be constructed by mixing the insitu soil with bentonite and cement to construct a panel of low permeability and low strength. At areas where a conventional panel wall cannot be constructed due to limited real estate, jet grout will be used. It is anticipated that the jet grout will be limited to less than 25 feet in length with a depth not deeper than the existing structure when constructing adjacent to a structure or existing Reach 1 panel wall.

The jet grout will produce soil, cement and bentonite columns of low permeability and low strength. The jet grout method utilizes a high velocity stream of cement and bentonite slurry to erode the in-situ soils and to mix them thoroughly with the slurry. During the jet grout process, the overall fluid pressure is maintained at hydro-static pressure levels by maintaining an open borehole with continuous fluid return to the ground surface. This condition is required to prevent excess grout pressure build-up within the embankment. The columns would be placed in a line or geometric pattern that would produce a wall of the desired minimum thickness. The column diameters are expected to be in the range of 4 to 5 feet and will be placed in an overlapping or secant pile configuration to ensure that there will be no gaps in the completed wall section. The jet grout method is well-suited to making intimate contact with the existing structure walls or existing utility lines so that all seepage paths within the limits of the wall would be closed.

b. Project Sponsor

The Rivers and Harbors Act of 1935 authorized the USACE construction of 22 drainage structures in the levees (now HHD) with the United States being responsible for operation and maintenance of the levees and drainage structures.

The Flood Control Act of 1948 created the Central and South Florida (C&SF) Project and included authorization for Phase 1 of the C&SF Project, including raising the existing levees and construction of additional levees along the northeast and northwest shores. It also required the United States to operate and maintain the levees, channels, locks, and control works of the St. Lucie Canal, Lake Okeechobee, and Caloosahatchee River, and the main spillways of the conservation areas.



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The cost to install the project design features (cutoff wall) is considered maintenance costs associated with Flood Control Act of 1948, HHD, and are therefore a full Federal responsibility.

For the HHD, the South Florida Water Management District is the sponsor and is only responsible for the provision of lands. Since the cutoff wall installation is within the Federal right-of-way of HHD, no additional lands are required. The sponsor will not be providing in-kind contributions to the project.

3. District Quality Control

a. Requirements

All implementation documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo a DQC. A 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. The home district shall manage the DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

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. Quality Checks include a review of the alternatives considered, schedules, budgets, means and methods of construction, and have lessons learned been considered. DQC is assuring the math and assumptions are correct by having a checker initial each sheet of the computations. Additionally, the PDT is responsible to ensure consistency and effective coordination across all project disciplines during project design and construction management. See Attachment 2 for PDT and DQC members and disciplines.

District Quality Control and Quality Assurance activities for DDRs and P&S are stipulated in ER 1110-1-12, Engineering & Design Quality Management and SAJ EN QMS 02611. The subject project DDR and P&S will be prepared by the Jacksonville District using ER 1110-1-12 procedures and will undergo District Quality Control. SAJ EN QMS 02611 defines DQC as the sum of two reviews, Discipline Quality Control Review (DQCR) and Product Quality Control Review (PQCR). Product Quality Control Review Certification is the DQC Certification and will precede ATR.

b. Documentation

DQCRs occur during the design development process and are carried out as a routine management practice by each discipline. Checklists are utilized by each discipline to facilitate the review and to document the DQCR review comments. Certification of the Discipline Quality Check and Review is signed by the Branch Chief certifying that the



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DQCR on all design analyses and products have been completed in accordance with the EN QMS process prior to release from the Branch.

The PQCR shall ensure consistency and effective coordination across all disciplines and to assure the overall coherence and integrity of the products. Review comments and responses for this review will be documented in DrChecks. The Product Quality Control Review shall be QC certified by the Engineering Technical Lead (ETL) and all applicable Section and Branch Chiefs. This PQCR certification signifies that all Discipline Specific Quality Checks and Review Certification are complete, as well as the Product Quality Control Reviews.

4. Agency Technical Review

a. Requirements

ATR is mandatory for all implementation documents (including supporting data, analyses, environmental compliance documents, etc.). This project will include a preliminary ATR Coordination Meeting, an Intermediate Design Phase ATR, and a Final Design Phase ATR.

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, went through robust DQC, and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. The PDT should obtain ATR agreement on key data such as hydraulic and geotechnical parameters early in design process. The goal is to have early involvement of ATR team, especially when key decisions are made. The ATR Lead should be invited virtually to all PDT meetings, in order to understand the design efforts and to know when to engage other ATR members for key decisions. Value added Lessons Learned from the ATR team should be shared early on to have the best chance of being adopted by the PDT. Most of the ATR effort should be accomplished midway through the design effort; after completion of design the ATR effort will check that the effort agreed to at mid-point was accomplished. This is consistent with the requirement that the ATR members shall not be involved in the day-to-day production of the project/product. A site visit will not be scheduled for the ATR Team.

b. Documentation of ATR

DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments will 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 been 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.

c. Comment Resolution

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 includes 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 in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrCheckssm with a notation that the concern has been elevated to the vertical team for resolution.

d. Products to Undergo ATR

Products scheduled to undergo ATR shall include project drawings, specifications, and design documentation report.

e. Required ATR Team Expertise and Requirements

As stipulated ER 1110-1-12, ATR members will be sought from the following sources: regional technical specialists (RTS); subject matter experts (SME) certified in CERCAP; senior level experts from other districts; Center of Expertise staff; experts from other USACE commands; contractors; academic or other technical experts; or a combination of the above. The ATR Team will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

ATR Team Leader. The ATR Team Leader should have 7 or more years of experience with Civil Works Projects and have performed ATR Team Leader duties on complex civil works projects. The ATR Team Leader can also serve as one of the review disciplines.

Geotechnical Engineering. The team member should be a registered professional engineer and have 10 or more years of experience in geotechnical engineering with special expertise in grouting within an embankment dam, earthen levees or embankment impoundments. Experience needs to include geotechnical evaluation of flood risk management structures such as static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankment dams and under seepage



through the foundation of the flood risk management structures including dams, levee embankments, floodwalls, closure structures and other pertinent features.

Construction Engineering. The team member should be a registered professional and have 10 or more years of experience in construction engineering. Experience needs to be relevant to flood risk management project features such as water control structures, conveyance culverts, spillways and embankment dams.

Civil Engineering. The team member should be a registered professional engineer and have 10 or more years of experience in civil engineering. Experience needs to include the engineering and design of flood risk management project features such as embankments, roads and highways, demolition of infrastructure, paving and drainage.

f. Completion and Certification of the ATR

At the conclusion of the 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:

- (1) Identify the document(s) reviewed and the purpose of the review;
- (2) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- (3) Include the charge to the reviewers;
- (4) Describe the nature of their review and their findings and conclusions;
- (5) Identify and summarize each unresolved issue (if any); and
- (6) 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 completion of ATR and Certification of ATR. The Certification will certify that the issues raised by the ATR team have been resolved (or elevated to the vertical team). The completion and certification should be completed based on the work reviewed to date for the project. A Sample Completion of ATR and Certification of ATR are included in Attachment 1.

5. Independent External Peer Review /Safety Assurance Review

a. Requirements

IEPR may be required for implementation documents under certain circumstances. 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 1165-2-214, 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.

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.

b. Decision on Type II IEPR

A Type II IEPR will be performed during design phase of project development. A companion Type II IEPR will be performed during the construction phase of project development. A risk-informed decision was made as to whether IEPR is appropriate based on the factors to consider for conducting a Type II IEPR review that are outlined in EC 1165-2-214, Appendix E, Section 2 (a) thru (c).

A risk informed decision was made that this project does pose a significant threat to human life (public safety) since it involves grouting within and earthen embankment dam. A project briefing and site visit will be part of the IEPR activities.

c. Products to Undergo Type II IEPR

Products to undergo Type II IEPR shall include the Project drawings, specifications, and design documentation report.

d. Required Type II IEPR Panel Expertise

The following provides an estimate of the Type II IEPR panel members and the types of expertise that should be represented on the review panel. All panel members shall be recognized experts in their field and have specialized experience pertaining to the work being performed on this project. In addition, all panel members should have an advanced degree and be professionally registered.

Team Leader. The Team Leader should have 7 or more years of experience with Civil Works Projects and have performed Team Leader duties on complex civil works projects. The Team Leader can also serve as one of the review disciplines.

Geotechnical Engineering. The team member should be a registered professional engineer and have 10 or more years of experience in geotechnical engineering with special expertise in grouting within an embankment dam, earthen levees or embankment impoundments. Experience needs to include geotechnical evaluation of



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flood risk management structures such as static and dynamic slope stability evaluation, evaluation of the seepage through earthen embankment dams and under seepage through the foundation of the flood risk management structures including dams, levee embankments, floodwalls, closure structures and other pertinent features.

Construction Engineering. The team member should be a registered professional and have 10 or more years of experience in construction engineering or engineering design. Experience needs to be relevant to flood risk management project features such as water control structures, conveyance culverts, spillways and embankment dams.

e. Documentation of Type II IEPR

The Type II IEPR will be managed by an AE firm which meets the criteria set forth in EC 1165-2-214. DrCheckssm review software may be used to document the Type II IEPR comments and aid in the preparation of the Review Report but is not required.

This review report, including reviewer comments and a recommendation letter will be provided to the RMC as soon as they become available. Written responses to the IEPR Review Report will be prepared to explain the agreement or disagreement with the views expressed in the report, the actions undertaken or to be undertaken in response to the report, and the reasons those actions are believed to satisfy the key concerns stated in the report (if applicable). These comment responses will be provided to the RMC for concurrence. The revised submittal will be provided to the RMO with the USACE response and all other materials related to the review.

6. 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 Intermediate and Final Design Phases. Requirements and further details are stipulated in ER 1110-1-12, ER 415-1-11, and SAJ EN QMS 08550.



7. Policy and Legal Compliance Review

All implementation documents will be reviewed for their compliance with law and policy. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies.

8. Review Schedule and Costs

a. Schedule of Reviews

To the extent practical, reviews should not extend the design schedule but should be embedded in the design process. Reviewers should be involved at key decision points and are encouraged to provide timely over the shoulder comments. Provide an overall review schedule that shows timing and sequence of all reviews.

DQCR, PQCR, ATR, & BCOES REVIEW SCHEDULE		
ACTIVITY	REVIEW START DATE	REVIEW END DATE
Preliminary		
DQCR	6/22/15	6/24/15
ATR Coordination Meeting ⁽¹⁾	6/22/15	7/6/15
Intermediate		
DQCR	9/16/15	9/21/15
PQCR	9/29/15	10/5/15
ATR/BCOES ⁽²⁾	10/30/15	11/20/15
IEPR II	2/2/16	3/2/16
Final		
DQCR	2/2/16	2/5/16
PQCR ⁽³⁾	2/16/16	2/19/16
ATR	3/21/16	4/8/16
BCOES	3/24/16	4/13/16

- (1) ATR Coordination meeting to discuss and gain concurrence on the conceptual design.
- (2) Depending upon the design and construction complexity, a single final review may occur at the final design phase.
- (3) SAJ EN QMS 02611 defines DQC as the sum of DQCR and PQCR.

b. ATR Schedule and Cost

The preliminary review schedule is listed in the provided in the table in paragraph (a.) of this section. The total cost for the ATR activities at each level of design is approximately \$70,000.



c. IEPR Schedule and Costs

A Type II IEPR will be required for this project. The estimated cost for the Type II IEPR is in the range of approximately \$ 80,000 to \$ 180,000. This estimate will be refined when the Scope of Work for the IEPR Type II contract is completed. The IEPR Type II contractor will be involved with the project through the construction phase and into the OMR&R phase. More specific milestone dates will be added in the future during the construction phase, but it can be assumed to occur near the mid-point of construction and near the end of construction.

9. Public Participation of Review Plan

As required by EC 1165-2-214, the approved Review Plan will be posted on the District public website (<http://www.saj.usace.army.mil/Missions/CivilWorks/ReviewPlans.aspx>). The public will have 30 days to provide comments on the documents; after all comments have been submitted, the comments will be provided to the technical reviewers. This is not a formal comment period and there is no set timeframe for the opportunity for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the review plan are necessary. This engagement will ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the federal government.

10. Review Plan Approval and Updates

The MSC for this Review Plan is SAD. The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving the SAJ District, MSC, and RMC) as to the appropriate scope and level of review for the study and endorsement by the RMC. Like the PMP, the Review Plan is a living document and may change as the study progresses, the District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented in Attachment 4 to this plan. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-endorsed by the RMC and 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 District's webpage and linked to the HQUSACE webpage. The latest Review Plan should also be provided to the RMO and home MSC.

11. Engineering Model Certification and Approval

The use of certified or approved engineering models is required for all activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. The selection and



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application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required). The following engineering models are anticipated to be used:

- Bentley Microstation V8i, Bentley Systems Inc., 2010
- Bentley InRoads Microstation V8i, Bentley Systems, Inc., 2010
- HEC-UNET v4.0, USACE Hydraulic Engineering Center (HEC)
- HEC-RAS v4.1
- HY-8
- AdH
- SMS v.10.1
- GIS (ESRI ArcMap)
- STWAVE Full Plane (Version 5.0)
- STWAVE Half Plane (Version 4.0)
- ACES (Version 4.03)
- Bretschneider
- Compaq Visual Fortran (Professional Edition 6.1.0)
- SEEP/W, GeoStudio 2012 Version 8.0.9.6484
- SLOPE/W, GeoStudio 2012 Version 8.0.9.6484
- STAADPro v8.0
- Ram Element Version 10.7

12. Review Plan Points of Contact

NAME/TITLE	ORGANIZATION	PHONE
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]



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ATTACHMENT 1: COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the plans, specifications, and Design Documentation Report for Hebert Hoover Dike Reach 1 Gap Closures Project. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. 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, alternatives evaluated, 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 DrCheckssm.

SIGNATURE

Name
ATR Team Leader
Office Symbol/Company

Date

SIGNATURE

Name
Project Manager (home district)
Office Symbol

Date

SIGNATURE

Name
Architect Engineer Project Manager¹
Company, location

Date

SIGNATURE

Nathan Snorteland
Director
CEIWR-RMC

Date

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
Chief, Engineering Division (home district)
Office Symbol

Date

SIGNATURE

Name
Dam or Levee Safety Officer² (home district)

Office Symbol

Date

¹ Only needed if some portion of the ATR was contracted
² Only needed if different from the Chief, Engineering Division.



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ATTACHMENT 4: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number