



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

23 April 2012

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT (CESAJ-EN-QC/
LUIS A. RUIZ)

SUBJECT: Approval of the Review Plan for the Alternative Rehabilitation Plan Pilot Test Letter Report and Seepage Management Test Facility (Pilot Test) Plans and Specifications, Herbert Hoover Dike, Martin and Palm Beach Counties, Florida

1. References:

a. Memorandum, CESAJ-EN-QC, 16 April 2012, Subject: Approval of Review Plan for Alternative Rehabilitation Plan Pilot Test Letter Report with Environmental Assessment and Seepage Management Test Facility (Pilot Test) Plans and Specifications, Herbert Hoover Dike, Martin and Palm Beach Counties, Florida (Enclosure).

b. Memorandum, CEIWR-RMC, 13 April 2012, Subject: Risk Management Center Endorsement – Herbert Hoover Dike Alternative Rehabilitation Plan Pilot Test Letter Report with Environmental Assessment and Seepage Management Test Facility (Pilot Test) Plans and Specifications Review Plan (Enclosure).

c. EC 1165-2-209, Civil Works Review Policy, 31 January 2010.

2. The enclosed Review Plan dated 30 March 2012 for the Alternative Rehabilitation Plan Pilot Test Letter Report and the Seepage Management Test Facility Plans Implementation Documents submitted by reference 1.a and endorsed by reference 1.b, has been reviewed by this office and is approved in accordance with reference 1.c.

3. The South Atlantic Division (SAD) concurs with the determination that the Pilot Test Report is an Other Work Product and not a Decision Document, is required to undergo ATR and is not required to undergo a Type I or a Type II Independent External Peer Review (IEPR). SAD also concurs with the determination that the Plans and Specification and Design Documentation Report for the Seepage Management Test Facility are Implementation Documents and that ATR and Type II IEPR are required. SAD further agrees that the Risk Management Center (RMC) will serve as the Review Management Organization for the ATRs and IEPRs performed on all of these documents. Non-substantive changes to this RP do not require further approval.

4. The determination of the appropriate levels of review for the Seepage Management Test Facility construction activities is not addressed in this Review Plan (RP). Jacksonville District should prepare another RP or update to this RP to addresses those activities. After coordination and endorsement by the RMC, Jacksonville District shall submit that RP to SAD for our review and approval.

CESAD-RBT

23 April 2012

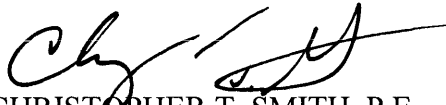
SUBJECT: Approval of the Review Plan for the Alternative Rehabilitation Plan Pilot Test Letter Report and Seepage Management Test Facility (Pilot Test) Plans and Specifications, Herbert Hoover Dike, Martin and Palm Beach Counties, Florida

5. The District should take steps to post this approved Review Plan to its web site, provide a link to CESAD-RBT and provide the RMC the information requested in paragraph 3 of reference 1.b. Before posting to the web site, the names of Corps/Army employees should be removed.

6. The SAD point of contact is Mr. James Truelove, CESAD-RBT, 404-562-5121.

FOR THE COMMANDER:

Encl



CHRISTOPHER T. SMITH, P.E.
Chief, Business Technical Division



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

CESAJ-EN-QC

16 April 2012

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

SUBJECT: Approval of Review Plan for Alternative Rehabilitation Plan Pilot Test Letter Report with Environmental Assessment and Seepage Management Test Facility (Pilot Test) Plans and Specifications, Herbert Hoover Di-ke, Martin and Palm Beach Counties, Florida

1. References.

a. EC 1165-2-209, Civil Works Review Policy, 31 January 2010


b. Risk Management Center Endorsement – Herbert Hoover Di-ke Alternative Rehabilitation Plan Pilot Test Letter Report with Environmental Assessment and Seepage Management Test Facility (Pilot Test) Plans and Specifications Review Plan, 13 April 2012

2. I hereby request approval of the enclosed Review Plan and concurrence with the conclusion that Type II Independent External Peer Review (IEPR) of this project is required for the Pilot Test. The related review activities are defined in EC 1165-2-209 as review for Other Work Products and Implementation Documents. The related determinations were based on the EC 1165-2-209 Risk Informed Decision Process as presented in the Review Plan. The Review Plan complies with applicable policy and has been endorsed by the Risk Management Center. 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 are withheld from the posted version, in accordance with guidance.

FOR THE COMMANDER:

Encl


LUIS A. RUIZ, P.E.
Chief, Engineering Division



DEPARTMENT OF THE ARMY
RISK MANAGEMENT CENTER, CORPS OF ENGINEERS
13952 DENVER WEST PARKWAY SUITE 200
GOLDEN, CO 80401

REPLY TO
ATTENTION OF

CEIWR-RMC

13 April 2012

MEMORANDUM FOR: Commander, South Atlantic Division, ATTN: CESAD-CE

SUBJECT: Risk Management Center Endorsement – Herbert Hoover Dike Alternative Rehabilitation Plan Pilot Test Letter Report with Environmental Assessment and Seepage Management Test Facility (Pilot Test) Plans and Specifications Review Plan

1. The Risk Management Center (RMC) has reviewed the Review Plan (RP) for Herbert Hoover project, dated 30 March 2012, and concurs that this RP complies with the current peer review policy requirements outlined in EC 1165-2-209 “Civil Works Review Policy”, dated 31 January, 2011.
2. This review plan was prepared by the Jacksonville District, reviewed by South Atlantic Division and the RMC, coordinated with the Flood Risk Management Planning Center of Expertise, and all review comments have been satisfactorily resolved.

The RMC concurs that a Type I IEPR is not required for this project. The RMC will be the RMO for the Type II IEPR.

3. The RMC clears 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, and a link to where the RP is posted on the District website to Colin Krumdieck, RMC Senior Review Manager (colin.w.krumdieck@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, the Independent External Peer Review (as appropriate), and Model Certification efforts defined in the RP. For further information, please contact Mr. Colin Krumdieck at 303-963-4541.

Sincerely,

A handwritten signature in black ink, appearing to read "Nathan J. Snorteland".

NATHAN J. SNORTELAND, P.E.
Director
Risk Management Center

CF:
CEIWR-RMC-ZA (Mr. Snorteland)
CESAD-CE (Division Quality Manager)

**OTHER WORK PRODUCTS
AND
IMPLEMENTATION DOCUMENTS
REVIEW PLAN**

For

**Alternative Rehabilitation Plan Pilot Test
Letter Report with Environmental
Assessment
and
Seepage Management Test Facility
(Pilot Test) Plans and Specifications**

Herbert Hoover Dike

Martin and Palm Beach Counties, Florida

Jacksonville District

30 March 2012

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, JACKSONVILLE DISTRICT. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.



**US Army Corps
of Engineers** ®

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Attachment A – Supporting Project Information

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope of review activities for the Alternative Rehabilitation Plan Pilot Test Letter Report (Letter Report) with Environmental Assessment (EA) and the Seepage Management Test Facility (Pilot Test) Implementation Documents. The Implementation Documents are the Plans and Specifications (P&S) and Design Documentation Report (DDR) for the Pilot Test. All products addressed by this review plan are for the Herbert Hoover Dike (HHD), Florida. Upon approval, this review plan will be included into the Project Management Plan as appendix to the Quality Management Plan.

Review activities for the Letter Report consist of District Quality Control (DQC) and Agency Technical Review (ATR). Review Activities for the Pilot Test consist of DQC, ATR, and Type II Independent External Peer Review.

The purpose of the Letter Report is to seek approval to precede with the pilot tests efforts. These efforts are needed to support efficient and effective future rehabilitation of the Herbert Hoover Dike (HHD). The results of the testing will be documented in a test report and used in HHD Dam Safety Modification Report. The Dam Safety Modification Report will be the Decision Document for the rehabilitation as defined in ER 1110-2-1156, Safety of Dams – Policy and Procedures.

The related review activities for the Letter Report are defined in EC 1165-2-209, Civil Works Review Policy as review for Other Work Products. The Other Work Products category was selected since the Letter Report is neither a decision document nor an implementation document. The EC 1165-2-209 Risk Informed Decision process was used to determine the appropriate level of review and type of document classification for the Letter Report.

Two other HHD Review Plans are scheduled for FY 2012. They are the HHD Dam Safety Modification Report Review Plan and the HHD Design and Construction Phases Fiscal Years 2012 and 2013 Program.

b. References.

- (1) ER 1110-2-1156, Safety of Dams – Policy and Procedures, 1 November 2010 draft edition
- (2) ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3) EC 1165-2-209, Civil Works Review Policy, 31 January 2010
- (4) Central and Southern Florida Project, Project Management Plan, Herbert Hoover Dike Major Rehabilitation Evaluation Reports, March 2010, P2 Number 114527

c. 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 provides the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and other work products. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review. Refer to the EC for the definitions and procedures for the three levels of review.

d. Review Management Organization (RMO). The Risk Management Center (RMC) is designated as the RMO.

2. PROJECT INFORMATION AND BACKGROUND

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 dike is divided into eight areas, or reaches, for the purpose of rehabilitation. Reach 1 is further divided into four subreaches: sub-Reach A - 4.9 miles; B - 4.0 miles; C - 6.2 miles; and D - 7.4 miles. Project information, videos, pictures and fact sheets can be viewed at the following Jacksonville District internet site. Related project information sheets are located in Attachment A.

<http://www.saj.usace.army.mil/Divisions/Operations/Branches/SFOO/HHDProject/HHD.htm>

Due to the ongoing emergency repairs to the embankment, including an increase in frequency of those occurrences, the Jacksonville District prepared a Major Rehabilitation Evaluation Report (MRR) in 2000 that analyzed the integrity of the existing dike system. The report covered the overall condition of the dike, but due to the size of the project the recommended solutions were prioritized specific for Reach 1. Subsequently, a similar effort was initiated for Reaches 2 and 3. The related report was the Major Rehabilitation Evaluation Report for Reaches 2 and 3 (MRR 2 and 3).

During the completion of MRR 2 and 3, it was decided that additional real estate outside existing Federal rights-of-way would not be acquired to the extent needed for a comprehensive solution to reduce risks for the HHD. As a result of that decision, the Jacksonville District was tasked to explore least-cost alternatives within the footprint of the federal rights-of-ways (ROW) that would reduce the risk of failure from seepage and piping.

The Risk Management Center (RMC) subsequently made a recommendation that the HHD team conduct a pilot test project on site at the HHD to verify the effectiveness of potential risk reduction measures. This recommendation was based on a thorough review of the draft Major Rehabilitation Report (MRR) for Reach 2 and 3 by the RMC and other experts in August 2010. The review specifically focused on the results of the baseline risk assessment model.

MRR 2 and 3 has been replaced by the HHD Dam Safety Modification Report (Decision Document) with Systems Analysis Report. That decision document is being developed following the latest Dam Safety requirements which expands the Risk Assessment (RA) and could extend recommendations to the entire dike system. The results of the testing defined in this Letter Report will be used in that decision document. The decision document requirements are defined in ER 1110-2-1156, Safety of Dams – Policy and Procedures.

3. LETTER REPORT AND EA OTHER WORK PRODUCTS RISK INFORMED DECISION DETERMINATION

The EC 1165-2-209 directs the Project Delivery Team to make a risk informed decision regarding the level of review activities and whether the product covered by a review plan is a decision document or an implementation document or Other Work Product. The EC stipulates that the

answers to the questions in Paragraph 15.b. be used in for both type of document as well as the level of review activities determinations.

- (1) Does it include any design (structural, mechanical, hydraulic, etc)? No, the Letter Report does not include detailed design. The engineering and design for the installed features will be contained in the Pilot Test P&S and DDR implementation documents. The results of the Pilot Test will be documented in the Pilot Test Report and analyzed as part of the activities for the HHD Dam Safety Modification Report.
- (2) Does it evaluate alternatives? No, the Letter Report does not evaluate alternatives. It does document needed tests to identify appropriate risk reduction measures that were based on risk analyses by RMC and other experts.
- (3) Does it include a recommendation? Yes, the Letter Report will recommend proceeding with pilot testing program. The Letter Report does not address recommendations for reducing risks at HHD. HHD recommendations will be documented in the HHD Dam Safety Modification Report (Decision Document).
- (4) Does it have a formal cost estimate? Yes, it contains the costs for the pilot test efforts/program.
- (5) Does it have or will it require a NEPA document? Yes, an EA is required. The EA is out for public review and comment. Related project work occurs on existing rights-of-way that have been developed for project purposes. Related EA information can be obtained at the hyperlink in above paragraph 2. The EA concludes a Finding of No Significant Impact.
- (6) Does it impact a structure or feature of a structure whose performance involves potential life safety risks? No, Letter Report. Yes, Pilot Test. Prior to construction a Type II IEPR will be conducted on the Pilot Test P&S and DDR.
- (7) What are the consequences of non-performance? Pilot tests are needed to address the risk and uncertainty associated with comprehensive risk reduction measures for HHD.
- (8) Does it support a significant investment of public monies? Yes, approximately \$10-20 million.
- (9) Does it support a budget request? No, however the Letter Report does support the allocation of dam safety program funds.
- (10) Does it change the operation of the project? No, pilot tests do not change project operations of HHD.
- (11) Does it involve ground disturbances? No, Letter Report. Yes, Pilot Test. The Rehabilitation Plan Pilot Test Letter Report will support installation of modifications to HHD for data collection purposes. Prior to construction a Type II IEPR will be conducted on the Pilot Test P&S and DDR.
- (12) Does it affect any special features, such as cultural resources, historic properties, survey markers, etc, that should be protected or avoided? No
- (13) Does it involve activities that trigger regulatory permitting such as Section 404 or stormwater/NPDES related actions? No
- (14) Does it involve activities that could potentially generate hazardous wastes and/or disposal of materials such as lead based paints or asbestos? No

(15) Does it reference use of or reliance on manufacturers' engineers and specifications for items such as prefabricated buildings, playground equipment, etc? No

(16) Does it reference reliance on local authorities for inspection/certification of utility systems like wastewater, stormwater, electrical, etc? No

(17) Is there or is there expected to be any controversy surrounding the Federal action associated with the work product? No.

Review of the answers to the above questions from EC 1165-2-209 Paragraph 15.b led to the PDT determination that: The Letter Report is an Other Work Product; Agency Technical Review (ATR) is deemed appropriate for the Letter Report; and ATR is not required for the supporting Environmental Assessment (EA).

4. DISTRICT QUALITY CONTROL

District Quality Control (DQC) activities for engineering products are stipulated in ER 1110-1-12, Engineering & Design Quality Management and EC 1165-2-209. DQC will be performed on the P&S and DDR in accordance CESAJ Engineering Division Quality Management System (EN QMS). The EN QMS defines DQC as the sum of two reviews, Discipline Quality Control Review and Product Quality Control Review. Product Quality Control Review is the DQC Certification that will precede ATR.

5. AGENCY TECHNICAL REVIEW

a. Scope. Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-209 and ER 1110-1-12. An ATR will be performed on the Letter Report.

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

ATR comments are documented in the DrCheckssm model review documentation database. DrCheckssm is a module in the ProjNetsm suite of tools developed and operated at ERDC-CERL.

At the conclusion of ATR, 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 organization affiliations, and include a short paragraph on both the credentials and relevant expertise of each reviewer;
- Include the charge to the reviewer;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issues (if any); and
- Include a verbatim copy of each reviewers comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

b. ATR Disciplines. As stipulated 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; 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.

Hydrology, Hydraulics and Hydrodynamics. One or more team members may be required to review the hydraulic design, hydraulic modeling, hydrologic modeling, and wind/wave analyses. The team member(s) should be registered professionals with 10 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with 2D hydraulic modeling, 3D hydrologic and groundwater modeling, wind/wave analysis, and performance of risk assessments is required.

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 flood risk management structures. Experience needs to encompass static and dynamic slope stability evaluation; evaluation of the seepage through earthen embankments and under seepage through the foundation of the flood risk management structures, including dams, levee embankments, floodwalls, cut off walls, closure structures and other pertinent features; and settlement evaluations.

Geologist. The team member should be a registered professional and have 10 or more years experience in engineering geology. Experience needs to encompass flood risk management structures, including dams, levee embankments, floodwalls, closure structures and other pertinent features; and related geological evaluations.

Structural Engineering. The team member should be a registered professional engineer and have 10 or more years experience in structural engineering. Experience needs to include the engineering and design of flood risk management project features such as water control structures, coffer dams, conveyance culverts, and spillways.

Civil Engineering. The team member should be a registered professional engineer and have 7 or more years experience with civil/site work projects to include embankments, roads and highways, relocations, paving and drainage.

Construction Management/Quality Control. The team member should have 10 or more years demonstrated in the experience with dam and/or levee safety projects. Project experience should encompass cutoff walls, cofferdams and seepage management features.

Cost Engineering, Letter Report. The Cost DX has reviewed and certified the Letter Report.

ATR Team Leader. The ATR Team Leader should have experience with Flood Risk Management Projects. The ATR Team Leader may be a co-duty to one of the review disciplines.

c. Letter Report PDT and ATR Disciplines.

Letter Report PDT Disciplines	Corresponding ATR Disciplines
Geotechnical	Required
Geology	Required
Construction	Required
Structural	Required
Cost Engineering	Cost DX, Letter Report Certified by Cost DX
NEPA Compliance	Not Required, DQC per RP

b. Seepage Management Test Facility (Pilot Test) Description, PDT and ATR Disciplines.

The Seepage Management Test Facility is a pilot project which will hydraulically load the HHD embankment in two locations. The hydraulic loading will be accomplished by constructing a

containment cell within the lake. Water will be pumped into the containment cell to the SPF elevation of 25 NAV88. The first location site 1, was identified as an area of the embankment which is known historically for its poor performance. The second location site 2, was identified as an area where existing cutoff wall exists. The proposed test improvements also include a filter toe and chimney drain on the landside, within the embankment and associated instrumentation. These features will be constructed at site 1 only.

Pilot Test PDT Disciplines	Corresponding ATR Disciplines
Hydrology, Hydraulics & Hydrodynamics	Required, Two Reviewers
Geotechnical	Required
Geology	Required
Structural	Required
Construction	Required
Civil	Required
Cost	Not Required, per Cost DX IGE Guidance
NEPA Compliance	Not Required, covered as part of BCOE

6. INDEPENDENT EXTERNAL PEER REVIEW

a. General. EC 1165-2-209 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.

b. Type I Independent External Peer Review (IEPR) Determination (Section 2034). Type I IEPR is generally for decision documents. No decision documents are addressed by this Review Plan. The Letter Report does not evaluate alternatives. It does document needed tests to identify appropriate risk reduction measures that were based on risk analyses by RMC and other experts. The Letter Report does not have the properties of a decision document and Type I IEPR is not required. Moreover, a Type I IEPR will be conducted on the HHD Dam Safety Modification Report.

c. Type II Independent External Peer Review (IEPR) Determination (Section 2035). The Letter Report does not trigger WRDA 2007 Section 2035 factors for Safety Assurance Review (termed Type II IEPR in EC 1165-2-209) and therefore, a review under Section 2035 is not required. The Pilot Test recommended by the Letter Report does trigger WRDA 2007 Section 2035 factors for Safety Assurance Review and therefore, a review under Section 2035 is required.

d. Type II IEPR Experts and Members. Following are the professional descriptions for the Pilot Test Design Phase Type II IEPR Independent Experts.

Geotechnical Engineering Independent Expert. The Geotechnical Engineering Independent Expert should be a registered professional engineer from academia, a public agency, or an Architect-Engineer or consulting firm with 15 years experience in conducting and evaluating geotechnical and geologic analyses for water control structures, cutoff walls, levees, cofferdams, dams and impoundments. Experience needs to include geotechnical evaluation of flood risk management structures. Experience needs to encompass static and dynamic slope stability evaluations; evaluation of the seepage through earthen embankments and under seepage

through the foundation of the flood risk management structures; and settlement evaluations. Experience with the Dam Safety program is desired. Active participation in related professional societies is encouraged.

Geologist Independent Expert. The Geologist Independent Expert shall be a registered professional geologist from academia, a public agency, an Architect-Engineer or consulting firm with 15 or more years experience in assessing seepage and piping through and beneath dams constructed on or within various geologic environments, including but not limited to karstic and solution prone rock formations, and fractured & faulted rock. The Geologist should be familiar with identification of geological hazards, exploration techniques, field & laboratory testing, and instrumentation. The Geologist should be experienced in the design of grout curtains & cutoff walls and must be knowledgeable in grout rheology and other materials used in foundation seepage barriers.

Structural Engineering Independent Expert. The Structural Engineering Independent Expert should be a registered professional engineer from academia, a public agency, or an Architect-Engineer or consulting firm with 15 years experience in conducting and evaluating structural analyses for water control structures, coffer dams, dams and impoundments. Experience with the Dam Safety program is desired. Active participation in related professional societies is encouraged.

7. MODEL CERTIFICATION AND APPROVAL

This project does not use any engineering models that have not been approved for use by USACE.

8. SCHEDULE AND COST ESTIMATES

a. Schedules.

ARP Letter Report	
DQCP	06Feb2012
PQCP	14Feb2012
ATR	09Mar2012
ATR Certification	1Apr2012

Seepage Management Test Facility P&S	
PED Phase	FY12
DQCP	06Feb2012
PQCP	14Feb2012
ATR Start	09Mar2012
BCOE Start	15Mar2012
ATR Certification	1Apr2012
Advertise	23May2012
Type II IEPR	May-June 2012

b. Cost Estimates. Each ATR reviewer will be funded for 24 hours review plus 8 hours for coordination and orientation time. 16 hours of funding will be provided for ATR Team Leader duties. The estimated ATR cost range is \$15,000-\$20,000 for the Letter Report. The estimated ATR range is \$20,000-\$30,000 for the Pilot Test Implementation Documents. The cost for the Type II IEPR will range \$100,000-\$125,000.

9. POINTS OF CONTACT

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

Jacksonville District POCs:

Review Plan, ATR and QM Process:	Jimmy D. Matthews 904-232-2087 Jimmy.D.Matthews@usace.army.mil
Project Information:	Michael Christofidis 904-232-2273 Michael.Christofidis@usace.army.mil
Project Manager:	Timothy D. Willadsen 904-232-2436 Timothy.D.Willadsen@usace.army.mil
South Atlantic Division:	James C. Truelove 404-562-5121 James.C.Truelove@usace.army.mil
Risk Management Center:	Colin Krumdieck 720-215-5545 Colin.W.Krumdieck@usace.army.mil

ATTACHMENT A
SUPPORTING INFORMATION

Herbert Hoover Dike Rehabilitation Project

Progress Update

22 February 2012

Background: The Herbert Hoover Dike (HHD) Major Rehabilitation Report (MRR) from 2000 divided the 143-mile dike into eight (8) Reaches with the initial focus on Reach 1. This Reach by Reach approach has been replaced with a system wide risk reduction approach as utilized for USACE safety modifications to dams. The implementation of the cutoff wall component in Reach 1 and the water control structure (culvert) replacements and removals around Lake Okeechobee satisfy the majority of the risk reduction goals for these areas. The goal of the project is to satisfactorily reduce risks thereby lowering the current DSAC I rating.

Reach 1 Cutoff Wall Construction:

The final Multiple Award Task Order Contract (MATOC) task orders were awarded for the 21.4 miles of cutoff wall installation between Port Mayaca and Belle Glade. Currently 18 miles (84%) of installed wall have been accepted with 100% completion by fall of 2013.

- Cutoff wall task order #4(D): 17,600-ft of cutoff wall complete (17,600-ft total) and accepted. Finish work will continue through February 2012.
- Cutoff wall task order #5(E): 14,530-ft of cutoff wall complete (20,050-ft total) and accepted, 15,612-ft of cutoff wall installed with a scheduled completion date of December 7, 2013
- Cutoff wall task order #6(F): 8,650-ft of cutoff wall complete (14,070-ft total) and accepted, 10,160-ft of cutoff wall installed with a scheduled completion date is February 14, 2013
- Cutoff wall task order #7(G): 16,795-ft of cutoff wall complete (18,210-ft total) and accepted, 18,210-ft of cutoff wall installed with a scheduled completion date is May 25, 2013
- Cutoff wall task order #8(H): (3,340-ft total) contractor anticipates mobilizing by the end of February.
- Cutoff wall task order #9(I): (2,450-ft total) contractor anticipates mobilizing by early March

Water Control Structure (Culvert) Replacements and Removals:

As part of the risk reduction approach, the 32 water control structures around Lake Okeechobee that are maintained by the Corps are being replaced, removed or safely abandoned.

- Culvert 14 removal was completed in February 2012.
- Culverts 1, 1A, 11 and 16 replacements are currently under construction.
- Culverts 3, 4A, 5, 10, 12 replacements are scheduled for awards in FY 2012 and FY 2013.
- Culverts 7, 9 and TCC removals (abandonments) are scheduled for awards in FY 2013.

Dam Safety Modification Report (DSMR):

A dam safety modification report is being developed which will address the entire dike as a system and include a risk reduction approach to implementing features based on priority and reducing risk as quickly as possible. Potential failure mode analysis, risk assessment and risk reduction measures are ongoing and will be required for each Reach segment around Lake Okeechobee. The draft DSMR is scheduled for completion in April 2013 with final approval by March 2014. Construction on future modifications could then start in FY 2016.



SPRING 2012

Lake Okeechobee, the nation's second largest freshwater lake and the largest lake in Florida is the heart of the Kissimmee-Okeechobee-Everglades system. The original lake was likely filled with salt water, which was eventually replaced by freshwater from rainfall. Water flowed from the Kissimmee basin into Lake Okeechobee. Today, the lake provides drinking water for communities around the lake and to the more than 6 million people living along the lower east coast. It serves as a source of irrigation for a \$1.5 billion-a-year agricultural industry that produces sugar cane, winter vegetables, citrus and rice.

HISTORICAL BACKGROUND

In the early 1900s, local governments and residents built up the lake's natural embankments with sand, shell, muck and marl. By 1927, six large drainage canals and numerous smaller canals totaling 440 miles had been constructed. Despite these actions, hurricane winds in 1926 and 1928 caused the lake's waters to quickly overwhelm its shallow edge. This flow resulted in massive flooding and the loss of many lives. To help prevent a repeat of this type of disaster, the U.S. Army Corps of Engineers (Corps) was asked by Congress to build a taller dike. It would protect the areas from Port Mayaca to Moore Haven and from the Kissimmee River to Nubbin Slough.

In 1947 and 1948, two more hurricanes passed directly over Lake Okeechobee, causing massive flooding. Although the levees had done their job in that no lives were lost, the need for better flood protection was evident. To increase protection of peoples' lives, their property and the prosperous agricultural industry located south of the lake, the Corps enhanced the existing levees. Completely encircling the lake and raising the existing levees, one of the levee's primary purposes was to provide protection during severe hurricanes. In 1960, Congress named the levee Herbert Hoover Dike (HHD).

THE DIKE

The Corps built the dike with gravel, rock, limestone, sand and shell — using state-of-the-art engineering in the 1930s. These natural materials allow water to trickle through at times. This is a normal process called seepage. When the water level in the lake is too high, however, the water pressure causes extra seepage that can lead to erosion, or piping. When the water level is too low, the soil dries out and that changes the makeup within the structure and foundation. Neither extreme is good, so engineers closely monitor the lake levels and the dike.

The Corps will remove or replace all federal culverts in the dike system.



MAKING IT BETTER AND STRONGER Managing and Monitoring Lake Okeechobee and Herbert Hoover Dike

Together, the Corps and the South Florida Water Management District manage the lake according to a regulation schedule. The schedule allows the Corps to manage the lake at a safe level at the beginning of the wet, hurricane season to allow for more capacity or a higher lake level by the end of the wet season. The safe lake level helps provide storage capacity for wet season rainfall, which in turn provides water supplies to the environment and the people. The schedule has been developed over time to meet the many demands for the lake's water. It also provides water managers with the authority to determine when and in what amounts water is to be released from the lake. For the optimum health of the lake and use of its water, water managers strive to maintain the levels between 12.5 and 15.5 feet, not too high and not too low. Past hurricane seasons, however, created higher than desirable water levels, raising concerns about the stability of the HHD in extreme weather conditions.

Water levels and the condition of the dike are monitored on a regular basis. Prior to a tropical storm, the dike is inspected and outlets are closed until after the storm. Once weather conditions permit, typically within 24 to 48 hours after a storm, Corps personnel inspect the dike again.

Stored in different areas around the lake are equipment, sandbags, stone, rock and other materials to expedite making repairs or strengthening areas that may become eroded by the force of hurricane-driven waves.

Rigorous analysis has shown that a major rehabilitation of HHD is required to prevent harmful seepage, which could undermine the dike structure. The first part of the rehabilitation currently underway, focuses on a section of the dike that spans 22.4 miles from Port Mayaca to Belle Glade.

The U.S. Army Corps of Engineers and the South Florida Water Management District are committed to maintaining Florida's fragile balance between the needs of people and the conservation of the state's unique wildlife and water environments. Herbert Hoover Dike plays an important role in helping us to keep that commitment.



FOR MORE INFORMATION



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EMERGENCY ACTION

If a weakened dike condition is observed, the Corps will activate its Emergency Action Plan. The plan includes a formal notification process that moves in rapid order from the federal government, to the state, to the county Emergency Operations centers. The counties surrounding the lake would notify residents of any actions, such as evacuations, that residents should take.





SPRING 2012

Herbert Hoover Dike (HHD) is listed as one of the nation's dams and its rehabilitation is a top priority of the U.S. Army Corps of Engineers. In the last five years, the HHD Rehabilitation Project received \$56 million in 2008, \$74 million in 2009, \$124 million in 2010, and \$107.8 million in 2011—this represents a significant portion of Dam Safety funding nation-wide. There are currently 10 dams in the nation receiving additional funds for construction projects to reduce the risk of failure; HHD is one of them.

Jacksonville District is working to rehabilitate the 143-mile dike system. Actions taken include installing a cutoff wall, removing and replacing water control structures (culverts), testing landside seepage management features and conducting a variety of studies and technical reviews to help ensure the safety of south Florida residents. Corps teams work daily on the dike, providing contractor oversight, quality assurance, inspections and dike operations and maintenance. Much progress is also being made behind the scenes at the District, where a team of engineers, hydrologists, geologists, scientists, contract and real estate specialists, budget analysts and many others, work to ensure the very best rehabilitation strategies are applied to the dike today and in the future.

Here is a progress update on the most significant components of the rehabilitation.



OVERALL SYSTEMS APPROACH

The Corps is approaching this project utilizing a dam safety process that prioritizes what can be done to lower the risk across the entire HHD system. Work is underway to produce a Dam Safety Modification (DSM) Report for HHD, which will address the entire dike as a system. It will include a risk reduction approach to implementing features based on priority and reducing risk as quickly as possible. All features planned and under construction support the goal of this report.

CUTOFF WALL CONSTRUCTION

Construction of the cutoff wall is providing the solution by eliminating existing piping and preventing additional internal erosion through the dike and foundation. The Corps awarded multiple 'task order' contracts for cutoff wall construction in the dike between Port Mayaca and Belle Glade to three contractors. To date, over 21 miles of cutoff wall in the southeast section are under construction or have been completed, totaling over \$225 million in cutoff wall contracts.

HHD CULVERT REMOVALS OR REPLACEMENTS

Built in the 1930s, most of these old culverts along the HHD are still in use today. From a structural integrity perspective, culverts pose a risk of failure due to the loss of embankment material into and along the culverts.

As part of the federal culvert replacement program, the Corps will replace or remove 32 culverts within the HHD system. Work began in late 2011, with the removal of Culvert 14 north of Canal Point. Additional work began in 2012 to replace Culverts 11 and 16 south of Port Mayaca, and Culverts 1 and 1A east of Moore Haven. Contracts for the replacement of Culverts 3 and 4A near South Bay are expected to be awarded in the fall. The Corps anticipates removing or replacing all the culverts with construction continuing through 2018.



A temporary dam is constructed in advance of the removal of Culvert #14 near Port Mayaca. The culvert was removed in the fall of 2011. (Photo courtesy of Optimum Services, Inc)

LANDSIDE FEATURES AND SEEPAGE MANAGEMENT PILOT TEST

The Corps is planning to implement a pilot test to identify potential alternate plans that stabilize the dike for lower total project cost. This pilot test will be in two locations on the southern embankment and demonstrate whether this alternative approach result in a more economical rehabilitation plan with less impact on adjacent lands while still addressing the embankment and foundation seepage and piping concerns. The results of this study will also support the overall risk reduction approach for the entire HHD system.

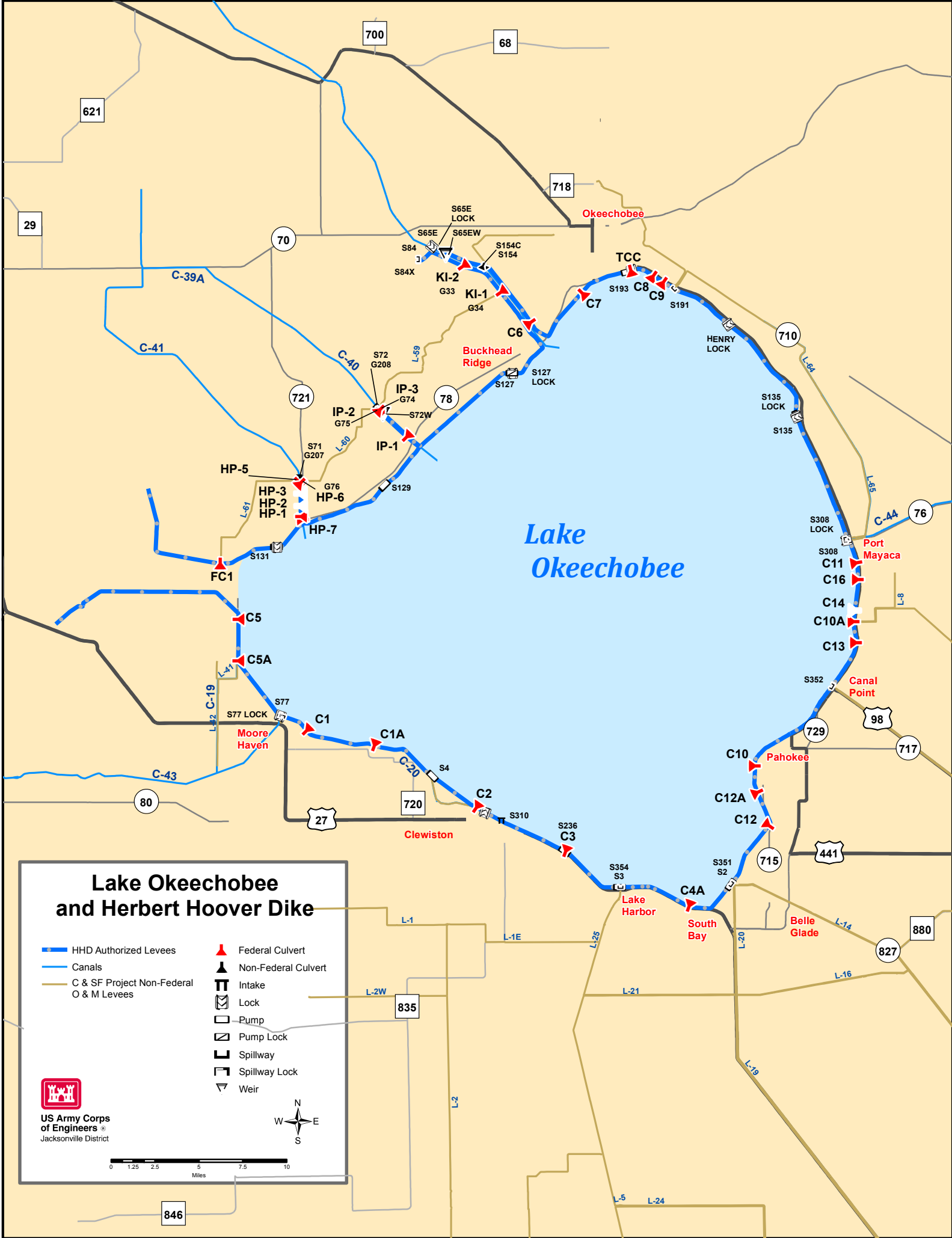
FOR MORE INFORMATION



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Lake Okeechobee

Lake Okeechobee and Herbert Hoover Dike

- HHD Authorized Levees
- Canals
- C & SF Project Non-Federal O & M Levees
- ▲ Federal Culvert
- ▲ Non-Federal Culvert
- T Intake
- L Lock
- P Pump
- P Pump Lock
- L Spillway
- L Spillway Lock
- V Weir



846

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- Task Order (TO) #1 (A) ● Water Control Structures
- Task Order (TO) #2 (B) — Canals
- Task Order (TO) #3 (C) ● HHD Crest
- Task Order (TO) #4 (D) □ Counties
- Task Order (TO) #5 (E) — Cities and Towns
- Task Order (TO) #6 (F)
- Task Order (TO) #7 (G)



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