



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

10 May 2012

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT (CESAJ-EN-QC/  
[REDACTED])

SUBJECT: Approval of the Review Plan for the Herbert Hoover Design and Construction Phases, Martin, Palm Beach, Glades and Okeechobee Counties, Florida

1. References:

a. Memorandum, CESAJ-EN-QC, 19 April 2012, Subject: Approval of Review Plan for Herbert Hoover Design and Construction Phases, Martin, Palm Beach, Glades and Okeechobee Counties, Florida (Enclosure).

b. Memorandum, CEIWR-RMC, 18 April 2012, Subject: Risk Management Center Endorsement. Review Plan for the Herbert Hoover Dike Design and Construction Phases, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida (Enclosure).

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

2. The enclosed Review Plan dated 18 April 2012 for the Herbert Hoover Design and Construction Phases 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 above.

3. The South Atlantic Division (SAD) concurs with the conclusion that Type II Independent External Peer Review (IEPR) is required for the Construction Phase. SAD agrees that the Risk Management Center (RMC) will serve as the Review Management Organization for the ATRs and Type II IEPRs identified in this Review Plan. Non-substantive changes to this RP do not require further approval.

4. 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.

5. The SAD point of contact is [REDACTED]

FOR THE COMMANDER:

Encl

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



REPLY TO  
ATTENTION OF

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

CESAJ-EN-QC

19 April 2012

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

SUBJECT: Approval of Review Plan for Herbert Hoover Dike Design and Construction Phases, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida

1. References.

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

b. Risk Management Center Endorsement – Review Plan for the Herbert Hoover Dike Design and Construction Phases, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida, 18 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 Construction Phase. 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.

FOR THE COMMANDER:

Encl





**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

18 April 2012

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

SUBJECT: Risk Management Center Endorsement – Review Plan for the Herbert Hoover Dike Design and Construction Phases, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida

1. The Risk Management Center (RMC) has reviewed the Review Plan (RP) for Herbert Hoover Dike Design and Construction Phases, dated 18 April 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 [REDACTED]

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 [REDACTED]

Sincerely,

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

CF:

[REDACTED]

# REVIEW PLAN

for

## HERBERT HOOVER DIKE

### DESIGN AND CONSTRUCTION PHASES

Martin, Palm Beach, Hendry, Glades and Okeechobee Counties,  
Florida

Jacksonville District

**Second Revision Date:** 18 April 2012

Initial MSC Approval Date: 27 September 2010

First Revision Date: 30 November 2010

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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## 1. PURPOSE AND REQUIREMENTS

**a. Purpose.** This review plan revises the review activities defined in the “Review Plan for Herbert Hoover Dike Design and Construction Phases, Martin and Palm Beach Counties, Florida, 27 September 2010, as amended 30 November 2010.” This revision updates the construction contracts that are envisioned for near future so that required review activities can be scheduled and completed. Review activities consist of District Quality Control (DQC), Agency Technical Review (ATR), and Type II Independent External Peer Review (IEPR).

Portions of the project are in the Pre-Construction, Engineering and Design (PED) Phase and the Construction Phase. The related documents are Implementation Documents that consist of Plans and Specifications (P&S) and Design Documentation Reports (DDR). The P&S and DDRs addressed by this review plan are for the replacement and/or removal of the water control structures (culverts). Upon approval, this review plan will be included into the Project Management Plan as an appendix to the Quality Management Plan.

Two other HHD Review Plans are scheduled for FY 2012. They are: the HHD Dam Safety Modification Report Review Plan and the Alternative Rehabilitation Plan Pilot Test Letter Report with Environmental Assessment (Letter Report) and the Seepage Management Test Facility P&S (Pilot Test) Review Plan.

### **b. References.**

- (1) EC 1165-2-209, Civil Works Review Policy, 31 January 2010;
- (2) ER 1110-2-1156, Engineering and Design, Safety of Dams – Policy and Procedures, 28 October 2011;
- (3) Review Plan for Herbert Hoover Dike Design and Construction Phases, Martin and Palm Beach Counties, Florida, 27 September 2010, as amended 30 November 2010;
- (4) Central and Southern Florida Project, Project Management Plan, Herbert Hoover Dike Major Rehabilitation Evaluation Reports, 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).** In accordance with ER 1110-2-1156, the Institute of Water Resources Risk Management Center (RMC) is designated as the RMO.

## 2. PROJECT INFORMATION

**a. 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 Herbert Hoover Dike 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 21.4 mile cutoff wall component in Reach 1 satisfies the majority of the risk reduction goals. The construction of this cutoff wall will be complete in 2013. As part of this risk reduction approach, the 32 water control structures (culverts) operated by the Corps are being replaced, removed or abandoned based on USACE approval in May 2011. One structure has been removed and four structures are currently under contract for replacement.

Project information, videos, pictures and fact sheets can be viewed at the following Jacksonville District internet site. Refer to Attachment A – Supporting Project Information for project information sheets.

<http://www.saj.usace.army.mil/Divisions/ProgramProjectMgt/Branches/WtrRes/FloodCtrl/HHDProject/index.htm>

### **3. 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 (DQCR) and Product Quality Control Review (PQCR). Product Quality Control Review is the DQC Certification that will precede ATR. The following EN QMS Procedures define related DQC activities for CESAJ-EN.

#### [02611 - SAJ Quality Control In-House Products: Civil Works PED](#)

Attachments and Samples

[02600 - QCP QAP Approval](#)

[02611 - DQC Certification](#)

[02611 - PQCR Certification](#)

[02621 - SAJ Sample Quality Control Plan](#)

[02622 - SAJ Quality Control Plan for O&M Dredging](#)

#### [02612 - SAJ Quality Assurance for Outsourced \(AE\) Engineering Products: Civil Works PED](#)

Attachments and Samples

[02600 - QCP QAP Approval](#)

[02612 - QA Certification for AE](#)

[02612 - QAP Approval for AE](#)

[02612 - QC Certification for AE](#)

[02625 - SAJ Sample Quality Assurance Plan](#)

[02613 - SAJ Quality Assurance of Work by Other Corps: Civil Works PED](#)

- Attachments and Samples
- [02600 - QCP QAP Approval](#)
- [02613 - QAP Approval for Other Corps](#)
- [02613 - QAP Approval for AE](#)
- [02613 - QC Certification for AE](#)
- [02625 - SAJ Sample Quality Assurance Plan](#)

[02710 - SAJ Preparation and Submittal of Civil Works Review Plans](#)

#### 4. 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 contract P&S submittals as noted in the below milestone schedule. The RMC as RMO is responsible assembling the ATR Team and completing ATR in accordance with this review plan and USACE guidance.

ATR comments will be documented in the DrChecks<sup>sm</sup> model review documentation database. DrChecks<sup>sm</sup> is a module in the ProjNet<sup>sm</sup> suite of tools developed and operated at ERDC-CERL ([www.projnet.org](http://www.projnet.org)).

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

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their 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.** ATR will be conducted by individuals and organizations that are external to the Jacksonville District. The ATR Team Leader will be a USACE employee outside the South Atlantic Division. As stipulated ER 1110-1-12, ATR members were 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 USACE commands; contractors; academic or other technical experts; or a combination of the above. The ATR Team is comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

Hydrology and Hydraulics. 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, cut off walls, 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, conveyance culverts, and spillways.

Mechanical and Electrical Engineering. The team members should have 10 or more years experience in mechanical and electrical engineering. Experience needs to include engineering and design of flood risk management project features such as water control structures, related systems and components.

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, real estate implications, 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.

ATR Team Leader. The ATR Team Leader should have 7 or more years 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.

## **5. 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). Sections 2034 and 2035 call for peer review procedures for both the Planning and the Design and Construction (PED) phases. The EC terms the Section 2034 Independent Peer Review, Type I Independent External Peer Review and the Section 2035 Safety Assurance Review, Type II Independent External Peer Review.

**b. Type I Independent External Peer Review (IEPR) Determination (Section 2034).** Type I IEPR is generally for decision documents. No decision documents or other applicable Section 2034 products are addressed by this Review Plan. Therefore Type I IEPR is not applicable to the implementation documents addressed by this Review Plan.

**c. Type II Independent External Peer Review (IEPR) Determination and Methodology.** A design phase Type II IEPR has been completed for water control structures (Culvert Contracts 1 and 2). Per above reference b. (3), no additional Type II IEPR is required for the design phase for the culvert contracts. A Construction Phase Type II IEPR is required for the HHD System and is slated for completion fiscal year 2012. A Construction Phase Type II IEPR is also required for the Seepage Management Test Facility P&S (Pilot Test) in fiscal year 2013. The EC charges for the construction phase are:

B. For the construction phase, the SAR shall address the numbered questions below.

1. Do the assumptions made during design remain valid through construction as additional knowledge is gained and the state-of-the-art evolves? (Final DDRs, CO QMPs, site visits, and other similar appropriate documents will be provided to expert reviewers for this assessment.)
2. For O&M manuals, do the requirements stipulated in the O&M manuals adequately maintain the operating conditions of the design feature that were assumed during design and validated during construction;
3. Will the project monitoring adequately reveal any deviations from the assumptions made for performance?

**d. Type II Independent External Peer Review (IEPR) Institute for Water Resources Risk Management Center (RMC) Procedures.** The EC requires Type II IEPR be managed and conducted outside the Corps of Engineers under the purview of the RMC. The RMC will provide a vetted Architect-Engineer firm to manage and execute Type II IEPR outside USACE in accordance with National Academy of Sciences procedures.

To insure independence and to obtain the required expertise, the Type II IEPR Independent Experts will be acquired by the Architect-Engineer firm. Independent Experts will submit and comply with National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, current edition.

The RMC is a technical center within the USACE Institute for Water Resources. Additional information about the RMC can be viewed at the following web site.

<http://www.iwr.usace.army.mil/index.php>

**e. Type II IEPR Experts and Members.** Following are the professional descriptions for the Construction Phase Type II IEPR independent experts.

Type II IEPR 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 a minimum of 15 years experience. Experience should be in the analysis, design, and construction of embankment dams and levees including subsurface investigations; soil mechanics; seepage and piping; filter and drainage elements; cutoff wall design and construction; cofferdam design and construction; long-term consolidation and settlement; deformation problems associated with embankments constructed on karstic and solution prone rock formations; and sheet pile cut-off walls and temporary cofferdams. Experience with the Dam Safety program is desired. Active participation in related professional societies is encouraged.

Type II IEPR Engineering Geologist Independent Expert – The Engineering Geologist Independent Expert should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with a minimum of 15 years experience. The geologist should be proficient in assessing seepage and piping through and beneath dams constructed on or within karstic and solution prone rock formations. In addition, the expert should be familiar with identification of geological hazards; subsurface exploration techniques; field & laboratory testing; instrumentation and performance monitoring; and should be experienced in the design of grout curtains & cutoff walls and must be knowledgeable in grout rheology, concrete mix designs, and other materials used in foundation seepage barriers. Experience with the Dam Safety program is desired. Active participation in related professional societies is encouraged.

Type II 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.

Type II IEPR Hydrology and Hydraulics (H&H) Independent Expert. The H&H Independent Expert should be a registered professional from academia, a public agency, or an Architect-Engineer or consulting firm with 15 or more years experience in conducting and evaluating hydrologic and hydraulic analyses for flood risk management projects. Experience with water control structures, dam hydrodynamics, Water Control Manuals, coffer dam design and dam operations are required. Experience with the Dam Safety Program is desired. Active participation in related professional societies is encouraged.

**f. Type II IEPR Report Approval.** The approval authority for Type II IEPR Reports is the South Atlantic Division (SAD). Approval activities and responsibilities are stipulated in EC 1165-2-209. Related excerpt is below.

*“10. District Responsibilities to complete the SAR Report.*

*a. The host district Chief of Engineering is responsible for coordinating with the RMO, for attending review meetings with the SAR review panel, communicating with the agency or contractor selecting the panel members, and for coordinating the approval of the final report with the MSC.*

*b. After receiving a report on a project from the peer review panel, the District Chief of Engineering shall consider all comments contained in the report and prepare a written response for all comments and note agreement and subsequent action or disagreement with an explanation. The reviewer’s report and the Districts responses shall be submitted to the MSC for final approval and made available to the public on the District’s website.”*

## **6. PRODUCTS, SCHEDULES AND BUDGETS**

**a. Culvert Contract Descriptions, Project Delivery Team (PDT) Disciplines and ATR Disciplines.** The culvert contracts address the removal and replacement of culverts.

- Culvert 3 (S-277): Culvert 3 is a double barrel, 10 foot diameter structure. The structure will be removed and replaced with a triple, 7 x 7 foot square barrel structure.
- Culvert 4A (S-276): Culvert 4A is a double barrel, 10 foot diameter structure. The structure will be removed and replaced with a triple, 7 x 7 foot square barrel structure.
- Culvert 7, Culvert 9 and Taylor Creek Culvert (TCC): Culverts 7, 9 and TCC were abandon in the 1980s do to their poor condition. The proposed improvements include a seepage cutoff feature to intercept any seepage paths and/or voids in or around the conduit. In addition a downstream embankment toe drain will be designed to allow safe release of any seepage.
- Culvert 5 (S-282): Culvert 5 is a triple barrel, 10 foot diameter structure. The structure will be removed and replaced with a triple barrel, 10 foot diameter structure.
- Culvert 10 (S-273): Culvert 10 is a double barrel, 10 foot diameter structure. The structure will be removed and replaced with a double barrel, 10 foot diameter structure.

- Culvert 12 (S-275): Culvert 12 is a triple barrel, 10 foot diameter structure. The structure will be removed and replaced with a triple barrel, 10 foot diameter structure.

Culvert Contracts PDT Disciplines	Corresponding ATR Disciplines
Hydrology, Hydraulics & Hydrodynamics	Required
Geotechnical	Required
Engineering Geology	Required
Structural	Required
Mechanical and Electrical	Required
Construction	Required
Civil	Required
Cost Engineering	Not Required for IGE per Cost DX Guidance
NEPA Compliance	Not Required, covered as part of BCOE

**b. Design and Construction Phase Project Milestones for FY 2012 and 2013.** Project review milestones are contained in the following table. Related contract and product descriptions are above. Water control structure replacement designations have changed from “culvert” to “structure” and are included in parentheses.

### DQC, ATR, BCOE and Type II IEPR SCHEDULE

PRODUCT	Activity	Location	Preparer	Date
Culverts 1 (S-280) and 1A (S-279)	Construction	LD1	SAJ	NTP 04Jan2012
Culverts 11(S-269) and 16 (S-270)	Construction	LD9	SAJ	NTP 05Jan2012
MATOC Cutoff Wall Task Order 8(H)	Construction	LD9	SAJ	NTP 19Jan2012
MATOC Cutoff Wall Task Order 9(I)	Construction	LD9	SAJ	NTP 19Jan2012
Culverts 3 (S-277) and 4A (S-276)	PED	LD2	SAJ	FY12
	DQCP			27Jan2012
	PQCP			07Feb-22Mar2012
	ATR Review			27Mar12-9Apr12
	ATR Comment Evaluation			10Apr12-16Apr12
	ATR Comment Backcheck / Close			17Apr12-23Apr12
	Incorporate ATR comments			4May12-17May12
	Prepare ATR Report and Submit for Certification			18May12-22May12
	ATR Certification			22May12
	BCOE Certification			31Mar2012
	Advertise			07Jun2012
Culverts 7, 9 and TCC Abandonment	PED	LD4	SAW/NAP	FY12
	DQCP			13Mar2012
	PQCP			26Mar12-22Apr12
	ATR Review			23Apr12-11May12
	ATR Comment Evaluation			14May12-18May12
	ATR Comment Backcheck / Close			21May12-25May12
	Incorporate ATR comments			28May12-1Jun12
	Prepare ATR Report and Submit for Certification			4Jun12-6Jun12
	ATR Certification			6Jun12
	BCOE Certification			8Jun2012
	Advertise			15Jun2012
Culvert 5 (S-282)	PED	LD3	SAJ	FY12-FY13
	DQCP			26Nov2012
	PQCP			07Dec2012
	ATR			04Feb2013
	BCOE			28Mar2013
	Advertise			05Jun2013

Culverts 10 (S-273) and 12 (S-275)	PED	LD9/LD2	SAJ	FY12-FY13
	DQCP			24Dec2012
	PQCP			07Jan2013
	ATR			26Feb2013
	BCOE			26Mar2013
	Advertise			04Jun2013
Construction Phase Type II IEPR		1	SAJ	Summer/Fall2012
Seepage Management Test Facility P&S (Pilot Test) - Construction Phase Type II IEPR		1	SAJ	FY13

**b. ATR Budget Estimate.** The ATR Costs for FY12 will range \$80,000-\$120,000.

**c. Type II IEPR Budget Estimate.** The FY12 Construction Phase Type II IEPR will range \$150,000-\$250,000.

**7. 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.

Risk Management Center POC:

[Redacted]  
[Redacted]  
[Redacted]

South Atlantic Division POC:

[Redacted]  
[Redacted]  
[Redacted]

Jacksonville District POCs:

Review Plan, ATR and IEPR Process:

[Redacted]  
[Redacted]  
[Redacted]

Project Information, PM:

[Redacted]  
[Redacted]  
[Redacted]

Project Information, Project Engineer:

[Redacted]  
[Redacted]  
[Redacted]

**ATTACHMENT A: REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>
30Nov10	Change SOW to remove landside features and Rename RP to HHD D&C Phases.	Throughout
18Apr12	Updated FY12 & 13 Culvert Contracts, removed Seepage Collection Pilot Project and updated Construction Phase Type II IEPR	Throughout

**ATTACHMENT B: 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.*







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.

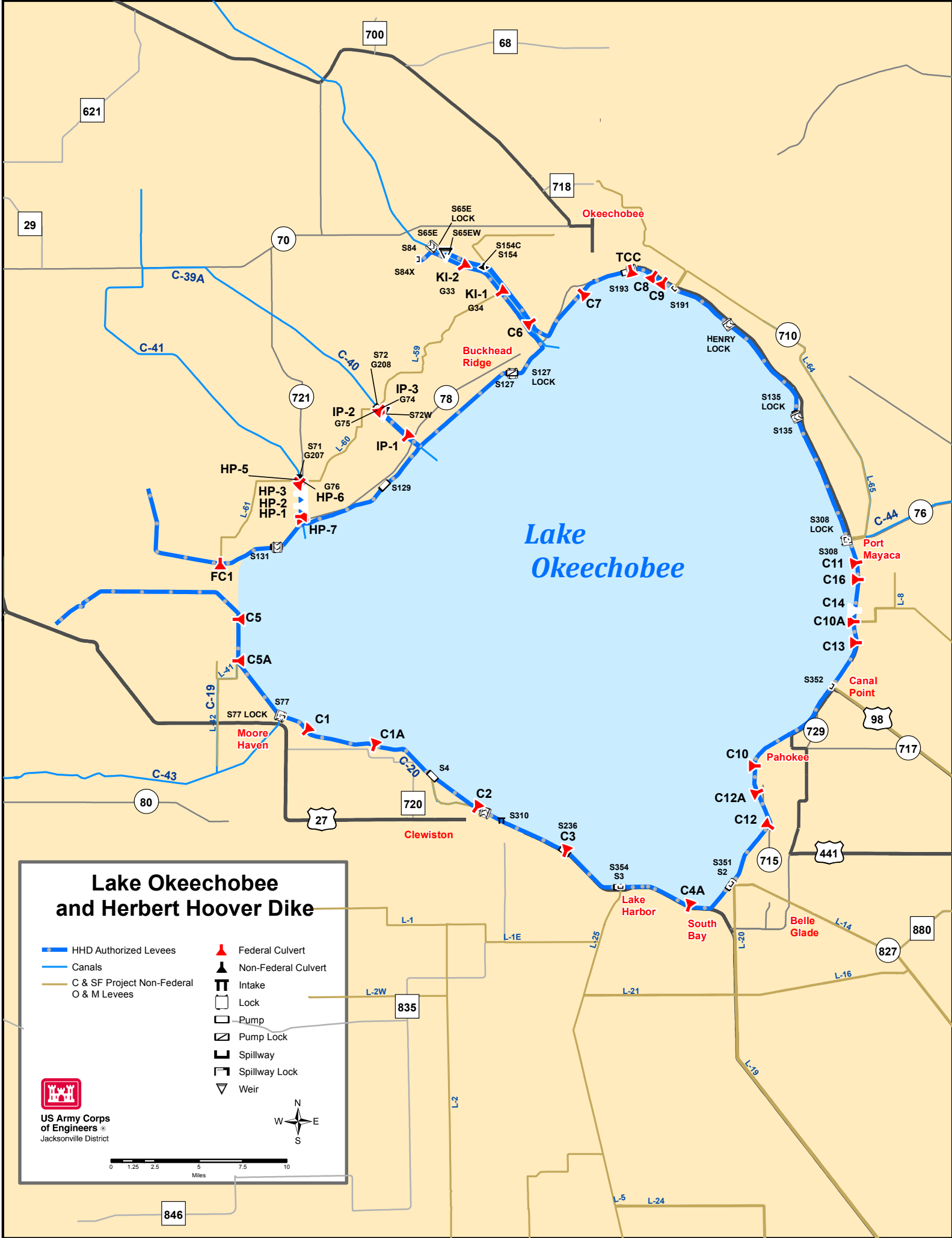
### FOR MORE INFORMATION



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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
- Intake
- Lock
- Pump
- Pump Lock
- Spillway
- Spillway Lock
- Weir



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