



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

15 MAR 2017

CESAD-RBT

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT

SUBJECT: Approval of the Revised Review Plan for the Herbert Hoover Dike, Design and Construction Phases, Water Control Structures Update, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida

1. References:

a. Memorandum, CESAJ-EN-Q, 19 December 2016, subject: Approval of Revised Review Plan for Herbert Hoover Dike, Design and Construction Phases of Water Control Structures, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida (Encl 1).

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

2. The updated Review Plan (RP) for the Herbert Hoover Dike Water Control Structures Design and Construction, endorsed by the Risk Management Center (RMC) and submitted by the Jacksonville District via reference 1.a, has been reviewed by this office. This review resulted in additional coordination with both your Engineering Review Manager and the RMC concerning the Type II IEPR requirements identified for the culverts. This additional coordination resulted in only minor edits to the RP. The enclosed RP, with the coordinated minor edits incorporated, is hereby approved in accordance with reference 1.b above.

3. The RMC will serve as the Review Management Organization for the ATRs and IEPRs addressed in this RP. 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 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. Before posting to the web site, the names of Corps/Army employees should be removed. Subsequent significant changes/updates to this RP, such as scope or level of review changes, should they become necessary, will require new written approval from this office.

CESAD-RBT

SUBJECT: Approval of the Revised Review Plan for the Herbert Hoover Dike, Design and Construction Phases, Water Control Structures Update, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida

5. The SAD point of contact is [REDACTED]

[REDACTED]

Encl

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

19 DEC 2016

CESAJ-EN-Q

MEMORANDUM FOR Commander, South Atlantic Division (CESAD-RBT), 60 Forsyth Street SW 10M15, Atlanta, GA 30303

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

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 Revised Review Plan for the Herbert Hoover Dike Design and Construction Phases of Water Control Structures, Martin, Palm Beach, Hendry, Glades and Okeechobee Counties, Florida, 29 November 2016

2. I hereby request approval of the enclosed revised review plan for the design and construction phases of the water control structures of the Herbert Hoover Dike Project. This revision updates the scope and schedules for the remainder of the construction contracts so that required review activities can be scheduled and completed. The Review Plan complies with applicable policy, provides for Agency Technical Review (ATR), provides for Type II Independent External Peer Review (IEPR), and has been coordinated with 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.

4. If you have any questions regarding the information in this letter, please feel free to contact me or contact [REDACTED]

Encl

[REDACTED]  
[REDACTED]  
[REDACTED]  
Colonel, EN  
Commanding

**Review Plan  
U.S. Army Corps of Engineers  
South Atlantic Division  
Jacksonville District**

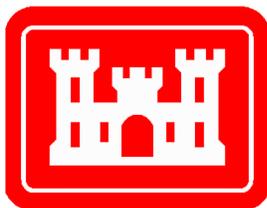
**Herbert Hoover Dike  
Design and Construction Phases of  
Water Control Structures**

**Martin and Palm Beach Counties, Florida**

**MSC Approval Date: *Pending***

**Last Revision Date: 29 October 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. 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 3: REVIEW PLAN REVISIONS

## **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 the design and construction phases of the Water Control Structures for the Herbert Hoover Dike Project. This Review Plan was prepared in accordance with EC 1165-2-214, “Civil Works Review Policy”. The review plan shall layout a value added process that assures the correctness of the information shown. This review plan describes the scope of review for the current phase of work, and will be included in the Project Management Plan (P2 #114527) upon approval.

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 29 October 2012”. Portions of the project are still in the Pre-Construction, Engineering and Design (PED) Phase, while other portions are in the Construction Phase. This revision updates the scope and schedules for the construction contracts that are envisioned for near future so that required review activities can be scheduled and completed. This review plan will be updated when necessary to address new designs or changes in the existing design, as well as ongoing construction efforts.

The implementation documents to be reviewed under this revision of the review plan are Plans and Specifications (P&S) and a Design Documentation Report (DDR) for the replacement and/or removal of the water control structures (culverts). The District Chief of Engineering has assessed that risk of the project is significant; therefore a Safety Assurance Review (SAR) will be required.

Review activities consist of District Quality Control (DQC), Agency Technical Review (ATR), a Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review, and Type II Independent External Peer Review (IEPR) of both the design and construction phases of the culverts.

Review Plans addressing the HHD Dam Safety Modification Report, the Pilot Test Letter Report, Pilot Test Facility implementation documents, Major Rehabilitation Report (MRR) Supplement, S-71 and S-72 Embankment Surface Armoring, Dam Repairs at US Sugar Raw Water Intake Facility, the Reach 1 Cutoff Wall Extension, and the Gap Closures at Reach 1 implementation documents will be addressed in separate review plans.

### **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 415-1-11, “Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review”, 1 January 2013
- ER 10-1-51, Organizations and Function, Roles and Responsibilities – Dam Safety Modification Mandatory Center of Expertise, 29 June 2012
- EM 1110-2-1913, Design, Construction, and Evaluation of Levees, 30 April 2000
- 02611-SAJ Quality Control of In-House Products: Civil Works PED, 21 November 2011
- 08550-SAJ, 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

### **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 four general levels of review: District Quality Control/Quality Assurance, Agency Technical Review, Independent External Peer Review, a Biddability, Constructability, Operability, Environmental, and Sustainability Review, and Policy and Legal Compliance Review. The RP identifies the most 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 PDT, DQC, ATR and IEPR Teams.

### **d. Review Management Organization**

The USACE Risk Management Center (RMC) is the Review Management Organization (RMO) for this project. Contents of this review plan have been coordinated with the RMC and the South Atlantic 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/Levee Safety Program Manager will be the POC for vertical team coordination. This review plan will be updated for each new project phase. The RMC as RMO is responsible for assembling the ATR Team and completing ATR in accordance with this review plan and USACE guidance. 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. 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 was completed 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. Project information, videos, pictures and fact sheets can be viewed at the following Jacksonville District internet site:

<http://www.saj.usace.army.mil/Missions/CivilWorks/LakeOkeechobee/HerbertHooverDike.aspx>

### **b. Culvert Contract Descriptions**

The following culvert contracts are currently in the construction phase:

- Culverts 1 (S-280) and 1A (S-279): The contract includes demolition of existing Culverts 1 and 1A, placing lengths of cutoff wall at the culvert locations, placement of new cast-in-place concrete culvert structures with gates and control systems at the same location, and restoring the embankment.
- Culverts 11(S-269) and 16 (S-270): The contract includes demolition of existing Culverts 11 and 16, placing lengths of cutoff wall to close the existing gaps in the existing cutoff wall at the culvert locations, construction of new cast-in-place



concrete culvert structures with gates and control systems at the same locations, and restoring the embankment.

- Culvert 3 (S-277) and 4A (S-276): The contract includes removal and replacement of the existing culvert structures. Culverts 3 and 4A are both double barrel, 10-foot diameter structures, and both will be replaced with a triple, 7 x 7 foot square barrel structure.
- Culvert 5 (S-282) and 5A (S-281): The contract includes removal and replacement of the existing culvert structures. Culverts 5 and 5A are both triple barrel, 10-foot diameter structures. Each will be replaced with a triple barrel, 10-foot diameter structure.
- Culvert 10 (S-273) and 12 (S-275): The contract includes removal and replacement of the existing culvert structures. Culverts 10 and 12 are both double barrel, 10-foot diameter structures. Each will be replaced with a triple barrel, 10-foot diameter structure.
- Culverts 8 and 13 (S-268 & S-272): The contract includes demolition and removal of the existing Herbert Hoover Dike Culverts 8 and 13 and the construction of new water control structures S-268 and S-272 at the respective existing locations of Culverts 8 and 13. S-268 will consist of three (3) 10-foot diameter culverts approximately 197 feet long. S-272 will consist of one (1) 10-foot diameter culverts approximately 171 feet long. A cutoff wall will also be installed in the centerline of the embankment at each site. The embankments will be reconstructed to match the existing crest elevation of the dike.
- Culvert HP2 and HP3 (S-287 & S-286): The contract includes removal and replacement of the existing culvert structures HP2 and HP3. HP2 has a single 7-foot diameter barrel and will be removed and replaced with a single 7-foot diameter structure. HP3 has a single 9-foot diameter barrel and will be removed and be replaced with a single 7-foot diameter structure.
- Culvert 2 and 12A (S-278 & S-274): Culvert 2 has six 10' diameter barrels. The structure will be removed and replaced with a triple 10-foot diameter structure. Culvert 12A has a horse shoe shaped barrel approximately 7-foot in diameter. The structure will be removed and replaced with a 7-foot diameter structure.
- Culvert 10A (S-271): Culvert 10A has five 10-foot diameter barrels. This structure will be replaced with a structure of equivalent hydraulic capacity.
- Culvert 6 (S-267): Culvert 6 has two 9-foot diameter barrels. The structure will be removed and will be replaced with a structure of equivalent capacity.
- Culvert IP1, IP2, IP3 (S292, S-290, S-291): IP1 has a single 5-foot diameter barrel. IP2 has a two 7-foot diameter barrel. IP3 has a two 6-foot diameter barrel. All three structures will be removed and replaced. The replacement structures will have an equivalent hydraulic capacity.

The following culvert contracts are currently in PED phase:

- Culvert HP6 (S-285): HP6 has a two 7-foot diameter barrels. The structure will be replaced with a structure of equivalent hydraulic capacity.
- Culvert KI1 and KI2 (S-266 & S265): KI1 has a three 6-foot diameter barrel. KI2 has a single 6-foot diameter barrel. Both structures will be removed and replaced. Each structure will be replaced with a structure of equivalent hydraulic capacity.
- Culvert HP1 and HP5 (S-288 & S284): HP1 has a single 2.5-foot diameter barrel. The structure will be removed and replaced. HP5 has a two 9-foot diameter barrel. The structure will be removed and replaced. Each structure will be replaced with a structure of equivalent hydraulic capacity.
- Culvert 7, Culvert 9 and Taylor Creek Culvert (TCC): Culverts 7, 9 and TCC were abandoned in the 1980s do to their poor condition. The contract includes construction of 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 constructed to allow safe release of any seepage.

### **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 PMP. 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 Check and Review (DQCR) and Product Quality Control Review (PQCR).

#### **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 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**

Agency Technical Review (ATR) is undertaken to ensure consistency with established criteria, guidance, procedures, and policy in accordance with EC 1165-2-214, ER 10-1-51 and ER 1110-1-12. ATR is mandatory for all implementation documents (including supporting data, analyses, environmental compliance documents, etc.). The ATR will assess whether the analyses presented are technically correct, went through robust DQC, and comply with published USACE guidance. The ATR will also assess whether 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. A site visit will not be required by 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 DrChecks 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 DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

#### **d. Products to Undergo ATR**

An ATR will be performed on the contract drawings, specifications, and DDR (which will include all relevant design information), as noted in the schedule included in Section 8.

#### **e. Required ATR Team Expertise and Requirements**

ATR will be conducted for each culvert construction contract 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 in 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 will be chosen based on each individual's qualifications and experience with similar projects. All EC reviewers will be certified in CERCAP:

[https://team.usace.army.mil/sites/ERDC-CRREL/PDT/atr\\_certification/default.aspx](https://team.usace.army.mil/sites/ERDC-CRREL/PDT/atr_certification/default.aspx) . The ATR Team will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

ATR Lead. The ATR team lead shall be a senior professional outside the home MSC with extensive experience in preparing Civil Works documents and conducting ATRs. The ATR Team Leader should have 10 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.

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 of 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 of 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, closure structures and other pertinent features; and settlement evaluations.

Structural Engineering. The team member should be a registered professional engineer and have 10 or more years of 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 Engineering. The team members should have 10 or more years of experience in mechanical engineering. Experience needs to include engineering and design of flood risk management project features such as water control structures, related systems and components.

Electrical Engineering. The team members should have 10 or more years of experience in 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 10 or more years of experience with civil/site work projects to include embankments, roads and highways, relocations, paving and drainage.

#### **f. Completion and Certification of the ATR**

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:

- (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. It 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 risk-informed decision was made as to whether an 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). The district chief of engineers made a risk-informed decision that this project does pose a significant threat to human life/public safety due to concerns regarding the dam's ability to perform satisfactorily for lake levels above elevation 15.5-ft NGVD (14.2-ft NAVD) which has resulted in its identification as a high-risk project and was assigned a Dam Safety Action Classification rating of 1 in 2006. For a Type II IEPR the selection of IEPR review panel members will be made up of independent recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of expertise suitable for the review being conducted. The selection of IEPR review panel members will be selected using the National Academy of Science (NAS) Policy which sets the standard for "independence" in the review process.

### **c. Products to Undergo Type II IEPR**

A design phase Type II IEPR was completed on the drawings, specifications, and DDR for water control structures (Culvert Contracts 1 and 2) in May 2011. Culvert Contracts 1 & 2 included Culvert Replacement Contracts for S-269 and S-270 and S-279 and S-280.

Although there were many comments, questions and observations posed during the review, all concerns were addressed in a satisfactory manner. It was determined that the assumptions made for the design hazards remained appropriate, as were the

models used to assess the design hazards. The analyses conducted adequately addressed the uncertainty given the consequences associated with the potential for loss of life.

In addition, a Construction Phase Type II IEPR was performed in November 2014. The IEPR process was used to review the construction phase documents and construction status of two culvert replacements under the Herbert Hoover Dike Rehabilitation, Culvert Replacements Project. Specifically, water control structures S-269 and S-270 were reviewed in detail comparing the design, drawings and specifications to the actual construction observed as part of a site visit. Although there were a number of comments, questions and observations posed during the review, all concerns raised by the IEPR review team members were addressed in a satisfactory manner. Many of the IEPR comments and suggestions for Structures S-269 and S-270 are relevant to the future culvert replacements scheduled for construction under the Herbert Hoover Dike Rehabilitation Project.

Beginning in FY17, an IEPR will be performed annually on a representative culvert contract in PED phase and a representative culvert contract in construction phase. The IEPR Team shall review the PED phase documents for the culvert contract in PED and the construction phase documents and construction status for the project in construction. The IEPR team will participate in a site visit to review construction related documents and to observe completed and on-going construction activities.

#### **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. The IEPR Team will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

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 Engineer. Panel member shall be a registered professional engineer with 15 or more years of experience in the field of geotechnical engineering. This panel member shall have experience in the design and construction of dams and / or major hydraulic control structures. Specialized experience shall include subsurface investigations, foundation systems, seepage and slope stability evaluations, dewatering systems, and erosion protection systems.

Structural Engineer. Panel member shall be a registered professional engineer with 15 or more years of experience in the field of structural engineering. This panel member shall have experience in the design and construction of dams and / or major hydraulic control structures. Specialized experience shall include mass and conventionally reinforced concrete structures.

### **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. DrChecks<sup>SM</sup> 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.

No later than 60 days following each milestone, the Type II IEPR panel will prepare a Review Report that will accompany the publication of the final report for the project and shall:

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

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 on each of the culvert contracts. 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 throughout the project 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

Culvert replacement Project Milestones for FY 2011 through 2018 are provided in the tables below.

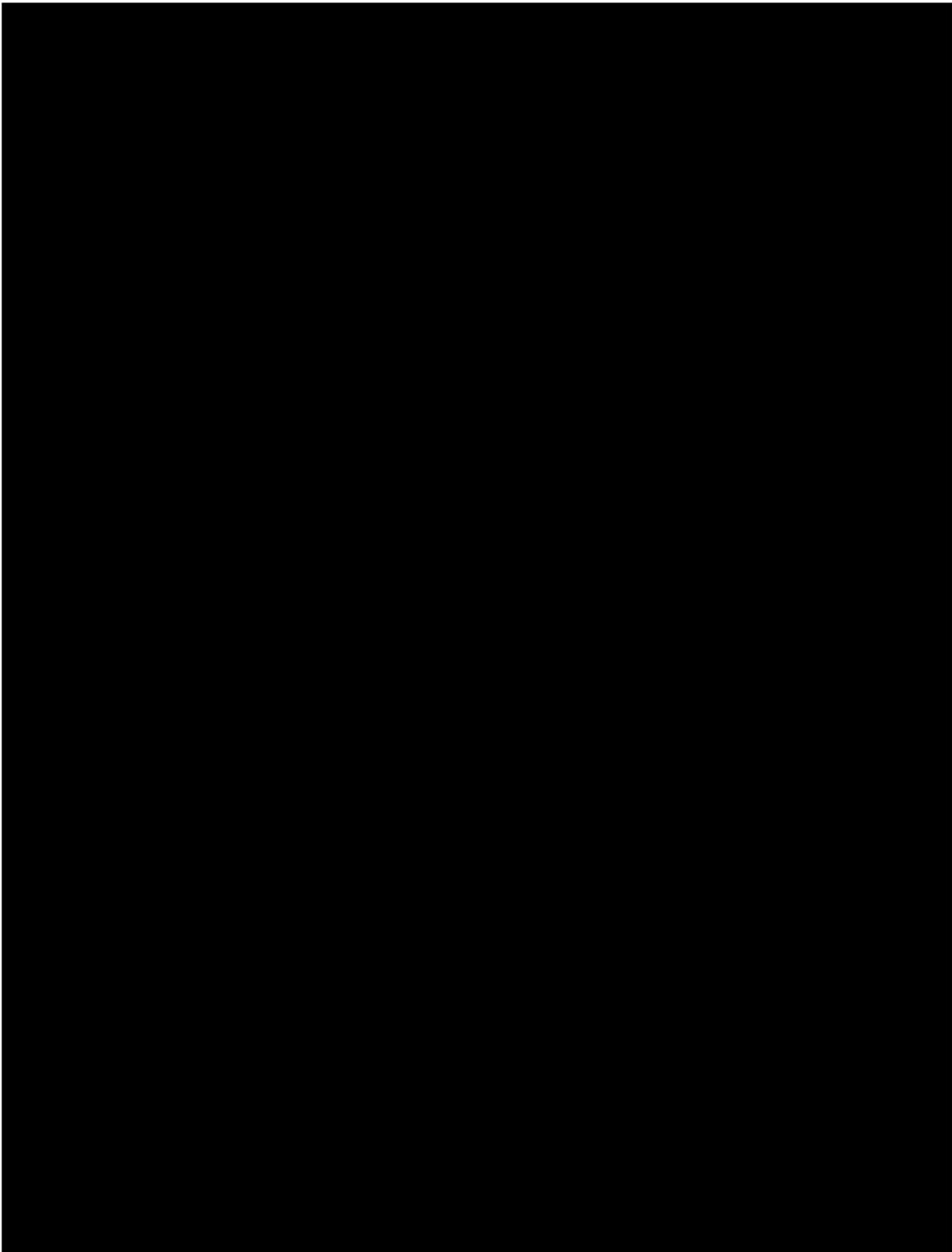
<b>HHD Culverts Under Construction and IEPR Design and Construction Schedule</b>					
<b>PRODUCT</b>	<b>Activity</b>	<b>Segment</b>	<b>Common Inundation Zone</b>	<b>Preparer</b>	<b>Date</b>
Culverts 1 (S-280) and 1A (S-279)	Construction	6 & 7	B	SAJ	ATR Cert: 10 Jun 2011 Award: 28 Sep 2011 NTP: 04 Jan 2012
Culverts 11(S-269) and 16 (S-270)	Construction	22	A	SAJ	ATR Cert: 10 Jun 2011 Award: 29 Sep 2011 NTP: 05 Jan 2012
Culverts 3 (S-277) and 4A (S-276)	Construction	2 & 4	B & A	SAJ	ATR Cert: 11 Jun 2012 Award: 24 Sep 2012 NTP: 24 Jan 2013
Culverts 5 & 5A (S-282 & S-281)	Construction	9	B	SAJ	ATR Cert: 01 May 2013 Award: 30 Aug 2013 NTP: 31 Dec 2013
Culverts 10 & 12 (S-273 & S-275)	Construction	24	A	SAJ	ATR Cert: 15 Apr 2013 Award: 13 Sep 2013 NTP: 11 Mar 2014
Culverts HP2 & HP3 (S-287 & S-286)	Construction	14A	C	SAJ	ATR Cert: 07 May 2014 Award: 19 Dec 2014 NTP: 2 Feb 2015
Culverts 8 & 13 (S-268 & S-272)	Construction	19A & 23	F & A	SAJ	ATR Cert: 15 May 2013 and 22 Apr 2013 Award: 27 Sep 2013 NTP: 28 Feb 2014
Culverts C2 & C12A (S-278 & S-274)	Construction	5 & 24	B & A	SAJ	ATR Cert: 14 May 2014 Award: 05 Sep 2014 NTP: 25 Sep 2014
Culvert 6 (S-267)	Construction	19A-3	F	SAJ	ATR Cert: 09 Jan 2015 Award: 24 Sept 2015 NTP: 20 Nov 2015
Culverts 10A (S-271)	Construction	23	A	SAJ	ATR Cert: 04 May 2015 Award: 11 Sept 2015 NTP: 16 Nov 2015

Culvert IP 1 & IP 2 (S-292 & S-290)	Construction	16	D	SAJ	ATR Cert: 15 April 2016 Award: Pending NTP: Pending
Culvert IP3 (S-291)	Construction	17	E	SAJ	ATR Cert: 15 April 2016 Award: Pending NTP: Pending
Design Phase Type II IEPR	S-269 & S-270 S-279 & S-280	22 7 & 6	A B	SAJ	Report: 31 May 2011
Construction Phase Type II IEPR	S-269 & S-270	22	A	SAJ	Report: 5 Feb 2015

<b>DQC, ATR, BCOES and Type II IEPR Schedule</b>					
<b>PRODUCT</b>	<b>Activity</b>	<b>Segment</b>	<b>Inundation Zone</b>	<b>Preparer</b>	<b>Date</b>
Culvert HP6 (S-285)	PED	14B	D	SAJ	FY16 / FY17
	DQCR				Oct 2016
	PQCR				Nov 2016
	ATR				Jan 2017
	BCOES				Feb 2017
	Advertise				May 2017
	Award				Jul 2017
Culvert KI1 & KI2 ( S-266 & S-265)	PED	18B	E	SAJ	FY16 / FY17
	DQCR				Oct 2016
	PQCR				Nov 2016
	ATR				Jan 2017
	IEPR Type II				Jan 2017
	BCOES				Jan 2017
	Advertise				Mar 2017
	Award				Jun 2017
Culvert HP1 (S-288)	PED	14A	C	SAJ	FY17 / FY18
	DQCR				Oct 2017
	PQCR				Nov 2017
	ATR				Nov 2017
	IEPR Type II				Feb 2018
	BCOES				Feb 2018
	Advertise				Feb 2018
Award				Jun 2018	



Culvert HP5 (S-284)	PED	14A	C	SAJ	FY18 / FY19
	DQCR				Feb 2018
	PQCR				Mar 2018
	ATR				Apr 2018
	IEPR Type II				Apr 2018
	BCOES				May 2018
	Advertise				Jun 2018
	Award				Nov 2018
Culverts 7, 9, TCC Abandonment	Design	19A-2, 19A,	F	SAJ	TBD



## **b. ATR Cost**

The cost for the ATR for each of the culvert contracts will range from approximately \$80,000 to \$120,000.

## **c. IEPR Cost**

The cost for each of the required IEPRs will range from approximately \$100,000 to \$150,000.

## **9. Public Participation of Review Plan**

As required by EC 1165-2-214, the approved Review Plan will be posted on the Jacksonville District public review plan website at <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 is the South Atlantic Division. The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving the Jacksonville 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 an Attachment 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 Commander's approval memorandum, will be posted on the Jacksonville District public review plan website at <http://www.saj.usace.army.mil/Missions/CivilWorks/ReviewPlans.aspx> 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



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:

MODEL
Bentley Microstation V8i, Bentley Systems Inc, 2010
Bentley InRoads Microstation V8i, Bentley Systems, Inc.
HEC-UNET v4.0, USACE Hydraulic Engineering Center
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	EMAIL/PHONE
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]



### ATTACHMENT 1: COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Project Title. 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 DrChecks<sup>sm</sup>.

SIGNATURE

Name  
ATR Team Leader  
Office Symbol/Company

Date

SIGNATURE

Name  
Project Manager  
Office Symbol

Date

SIGNATURE

Name  
Architect Engineer Project Manager<sup>1</sup>  
Company, location

Date

SIGNATURE

[Redacted Signature]

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  
Office Symbol

Date

SIGNATURE

Name  
Dam or Levee Safety Officer<sup>2</sup>  
Office Symbol

Date

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



## ATTACHMENT 2: PARTIAL LIST OF ACRONYMS AND ABBREVIATIONS

<u>Acronyms</u>	<u>Defined</u>
AFB	Alternatives Formulation Briefing
ATR	Agency Technical Review
BCOES	Biddability, Constructability, Operability, Environmental, and Sustainability Review
CAP	Continuing Authorities Program
CERCAP	Corps of Engineers Reviewer Certification and Access Program
CY	Cubic Yards
DDR	Design Documentation Report
DQC	District Quality Control
DQCR	Discipline Quality Control Review
EC	Engineering Circular
EA	Environmental Assessment
ER	Engineering Regulation
ERDC-CERL	Engineer Research and Development Center – Construction Engineering Research Laboratory
ESA	Endangered Species Act
ETL	Engineering Technical Lead
FDEP	Florida Department of Environmental Protection
FONSI	Findings of No Significant Impacts
FSCA	Feasibility and Cost Sharing Agreement
FY	Fiscal Year
GRR	General Reevaluation Report
IEPR	Independent External Peer Review
LPP	Locally Preferred Plan
MCX	Mandatory Center of Expertise
MLLW	Mean Low Low Water
MSC	Major Subordinate Command
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act
ODMDS	Ocean Dredged Material Disposal Site
OMB	Office of Management and Budget
OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
P&S	Plans and Specifications
PED	Preconstruction Engineering and Design
PDT	Project Delivery Team
PM	Project Manager
PMP	Project Management Plan
PPA	Project Partnering Agreement
PQCR	Product Quality Control Review



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## Jacksonville District

<u>Acronyms</u>	<u>Defined</u>
QA	Quality Assurance
QCP	Quality Control Plan
QMP	Quality Management Plan
QMS	Quality Management System
RMC	Risk Management Center
RMO	Review Management Organization
RP	Review Plan
RTS	Regional Technical Specialist
SAJ	South Atlantic Jacksonville District Office
SAD	South Atlantic Division Office
SAR	Safety Assurance Review (also referred as Type II IEPR)
SME	Subject Matter Expert
USACE	U.S. Army Corps of Engineers
WRDA	Water Resources and Development Act



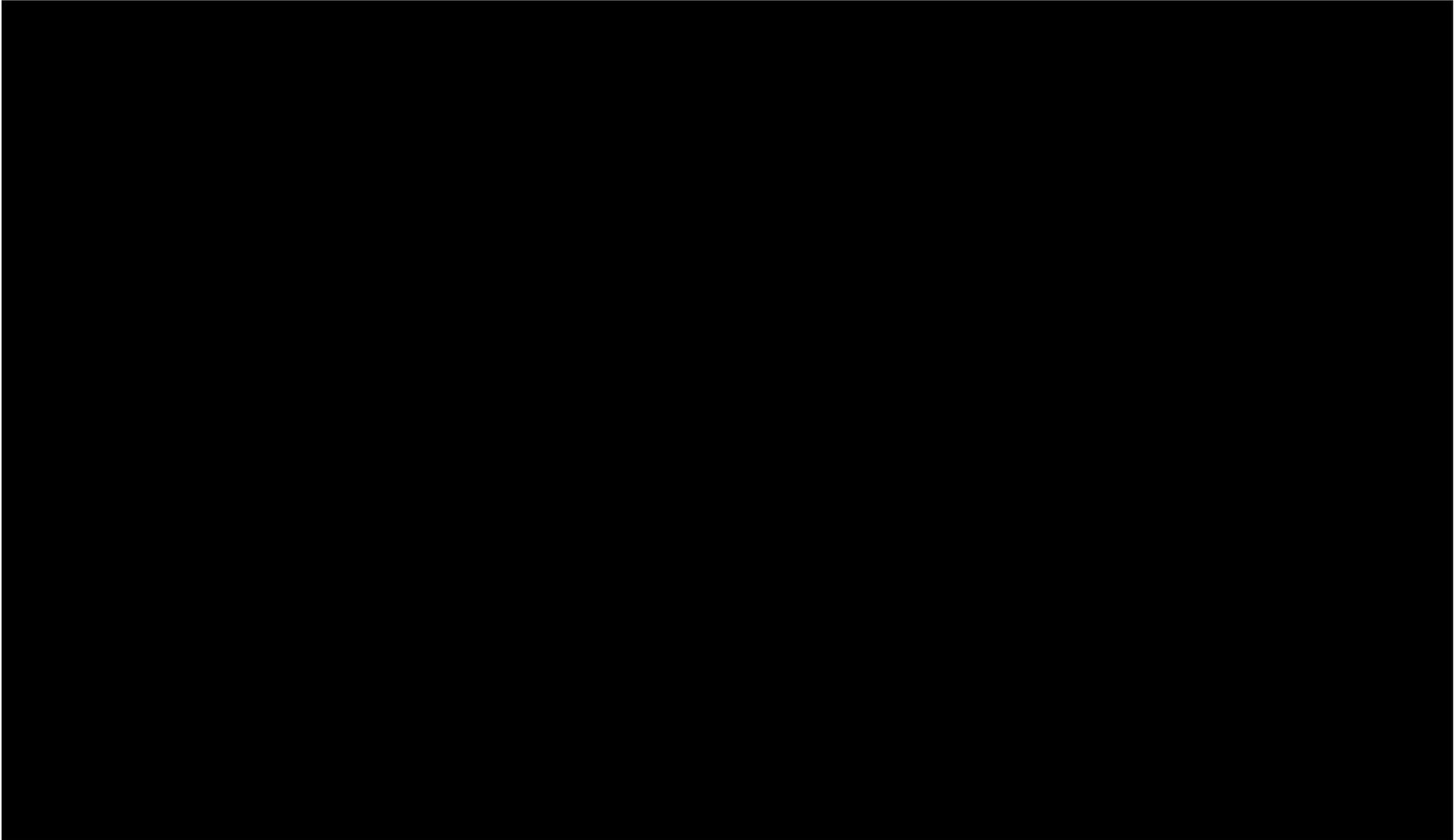
### ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
30 Nov 10	Changed SOW to remove landside features and Rename RP to HHD D&C Phases.	Throughout
18 Apr 12	Updated FY12 and 13 Culvert Contracts, removed Seepage Collection Pilot Project and updated Construction Phase Type II IEPR	Throughout
29 Oct 12	Updated FY13 Culvert Contracts and included new guidance from ER 10-1-51.	Throughout
30 Nov 16	Updated project information/status and culvert contract descriptions. Updated schedule for design and construction of the remaining culvert contracts. Updated the requirements for ATR and IEPR for the remaining culvert contracts.	Throughout



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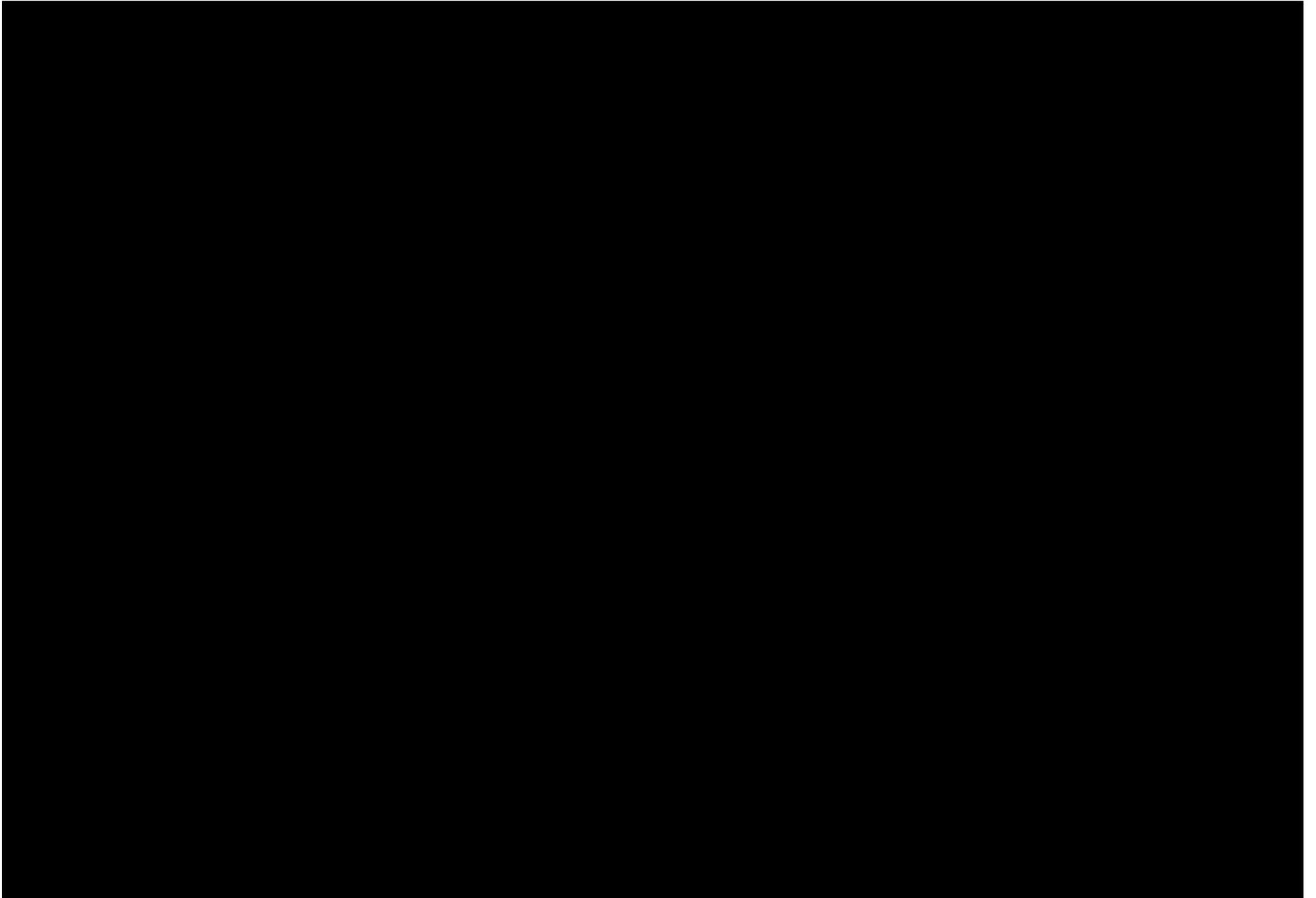
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