



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

CESAD-RBT

30 October 2018

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT

SUBJECT: Approval of Review Plan of the Preconstruction, Engineering, and Design Phase Implementation Documents for the C-44 Intake Canal Bank Stabilization Project, Martin County, Florida

1. References:

- a. Memorandum, CESAJ-EN-Q, 9 October 2018, subject as above.
- b. Engineering Circular (EC) 1165-2-217, Water Resources Policies and Authorities Review Policy for Civil Works, 20 February 2018.
- c. WRDA 2007, H.R. 1495, Public Law 110-114, 8 November 2007.

2. The Review Plan (RP) for the design and construction phases for the C-44 Intake Canal Bank Stabilization Project and concurrence with the conclusion that a Type II Independent External Peer Review (IEPR) of the subject project is not required, reference 1.a, has been reviewed by the South Atlantic Division (SAD) and is hereby approved in accordance with reference 1.b.

3. SAD concurs with the District's RP recommendation that outlines the requirements for District Quality Control (DQC), Agency Technical Review (ATR), and Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Review. The Safety Assurance Review/Type II Independent External Peer Review is not required. Documents to be reviewed include Plans and Specifications and Design Documentation Report.

4. The South Atlantic Division Office (SAD) shall be the Review Management Organization for this project.

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

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

[REDACTED]



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT  
701 SAN MARCO BOULEVARD  
JACKSONVILLE, FLORIDA 32207-8915

9 OCT 2018

CESAJ-EN-Q

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

SUBJECT: Approval of Review Plan of the Preconstruction, Engineering, and Design Phase Implementation Documents for the C-44 Intake Canal Bank Stabilization Project, Martin County, Florida

1. References.

- a. Engineering Circular (EC) 1165-2-217, Civil Works Review, 20 Feb 18.
- b. WRDA 2007, H. R. 1495, Public Law 110-114, 8 Nov 07.

2. I hereby request approval of the enclosed Review Plan for the design and construction phases of the C-44 Intake Canal Bank Stabilization Project and concurrence with the conclusion that a Type II Independent External Peer Review (IEPR) of the subject project is not required. The recommendation not to perform a Type II IEPR is based on the EC 1165-2-217 Risk Informed Decision Process as presented in the Review Plan. The Review Plan complies with applicable policy, provides for Agency Technical Review, and has been coordinated with the CESAD. 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 memo, please feel free to contact me or contact [REDACTED]

Encl

[REDACTED]

# **PROJECT REVIEW PLAN**

For

## **Preconstruction, Engineering and Design Phase Implementation Documents**

For

### **C-44, Intake Canal – Bank Stabilization Project Martin County, Florida**

Project P2 number: 114470

**Jacksonville District**

**September 2018**



**US Army Corps  
of Engineers** ®

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ATTACHMENT B - Partial List of Acronyms and Abbreviations

ATTACHMENT C - ATR Report Outline and Completion of Agency Technical Review Form

## **1. PURPOSE AND REQUIREMENTS**

### **a. Purpose**

This Review Plan defines the scope of review activities for the C-44 Intake Canal Bank Stabilization Project in Martin County, Florida. As discussed below, the review activities consist of a District Quality Control (DQC) effort, an Agency Technical Review (ATR), and a Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review. Also as discussed below, an Independent External Peer Review (IEPR) is not recommended. The C-44 Intake Canal Bank Stabilization Project is currently in the Pre-Construction, Engineering and Design (PED) phase. The implementation documents to be reviewed are Plans and Specifications (P&S) and a Design Documentation Report (DDR). Upon approval, this Review Plan will be included into the Project Management Plan (PMP) for this project as an appendix to the Quality Management Plan (QMP).

### **b. References**

- (1). ER 1110-2-1150, "Engineering and Design for Civil Works Projects", 31 August 1999
- (2). ER 1110-1-12, "Engineering and Design Quality Management", 31 March 2011
- (3). EC 1165-2-217, "Civil Works Review", 20 February 2018
- (4). ER 415-1-11, "Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review", 1 January 2013
- (5). 02611-SAJ Quality Control of In-House Products: Civil Works PED, 21 November 2011
- (6). 08550-SAJ, BCOES Reviews, 21 September 2011
- (7). Enterprise Standard (ES)-08025, Government Construction Quality Assurance Plan and Project/Contract Supplements
- (8). Enterprise Standard (ES)-08026, Three Phase Quality Control System
- (9). Project Management Plan for the C-44 Project
- (10). HDR Engineering Inc., DOR, CNT 1 Design Task Order; W912ES-07-D-0005, Task Order CS01
- (11). HDR Engineering Inc., DOR, CNT 1, Engineering During Construction (EDC) Task Order; W912EP-10-D-0017, Task Order 0002
- (12). MFR, C-44 Reservoir/STA, Contract 1 – Anchor Reinforced Vegetative System (ARVS) Replacement, Conference Call Meeting Minutes, 14 April 2015
- (13). HDR's Final Rip-Rap (Anchor Reinforced Vegetative System (ARVS) Replacement) Technical P&S, and DDR, 22 June 2015
- (14). MFR; Subject C-44 Intake Canal (C-400 Canal) Bank Sloughing: Survey Review, Additional Alternative, Site Inspection, and Path Forward Recommendations for the Bank Stabilization Project, from EN-GS, 9 January 2017

### **c. Requirements**

This review plan was developed in accordance with EC 1165-2-217, 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 five levels of review: District Quality Control, Agency Technical Review, and an Independent External Peer Review, Policy and Legal Review and a Biddability, Constructability, Operability, Environmental, and Sustainability Review.

### **d. Review Plan Approval and Updates**

The South Atlantic Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input as to the appropriate scope and level of review. Like the PMP, the Review Plan is a living document and may change as the project progresses. The Jacksonville District is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last (Major Subordinate Command) MSC Commander approval are documented in Attachment A. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the Jacksonville District's webpage. The latest Review Plan will be provided to the RMO and home MSC.

### **e. Review Management Organization**

The South Atlantic Division (SAD) is designated as the Review Management Organization (RMO). The RMO, in cooperation of the vertical team, will approve the ATR team members. CESAJ will assist SAD with management of the ATR and development of the charge to reviewers.

## **2. PROJECT INFORMATION**

### **a. Project Location**

The C-44 Reservoir and Stormwater Treatment Area (C-44 RSTA) located in western Martin County, Florida, is part of the Indian River Lagoon-South (IRLS) Restoration Project. The C-44 RSTA Project is a joint effort between USACE and the local sponsor, the South Florida Water Management District (SFWMD). The C-44 RSTA will be approximately 12,000 acres in size and will include a 3,400-acre reservoir with a maximum storage capacity of 50,600 acre-feet and a pump station with a capacity to pump 1,100 cubic feet per second (cfs) of water.

The work site for the C-44 Intake Canal Bank Stabilization Project covered under this review plan is located north of the existing bridge crossing the C-44 intake canal along Citrus Blvd, east of Indiantown, Florida. See Figure 1 for project location and Figure 2 for C-44 RSTA project features.

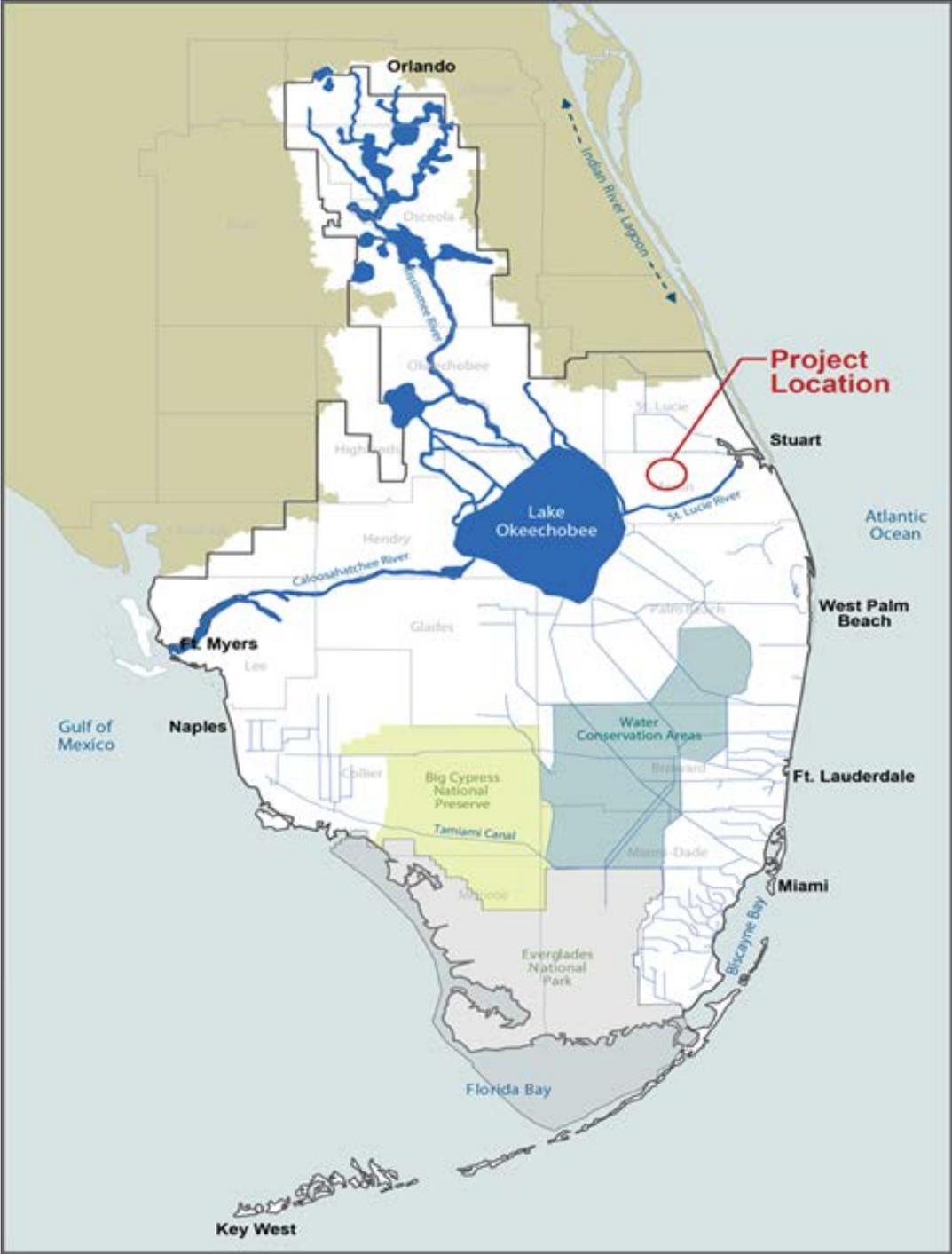


Figure 1: Project Location

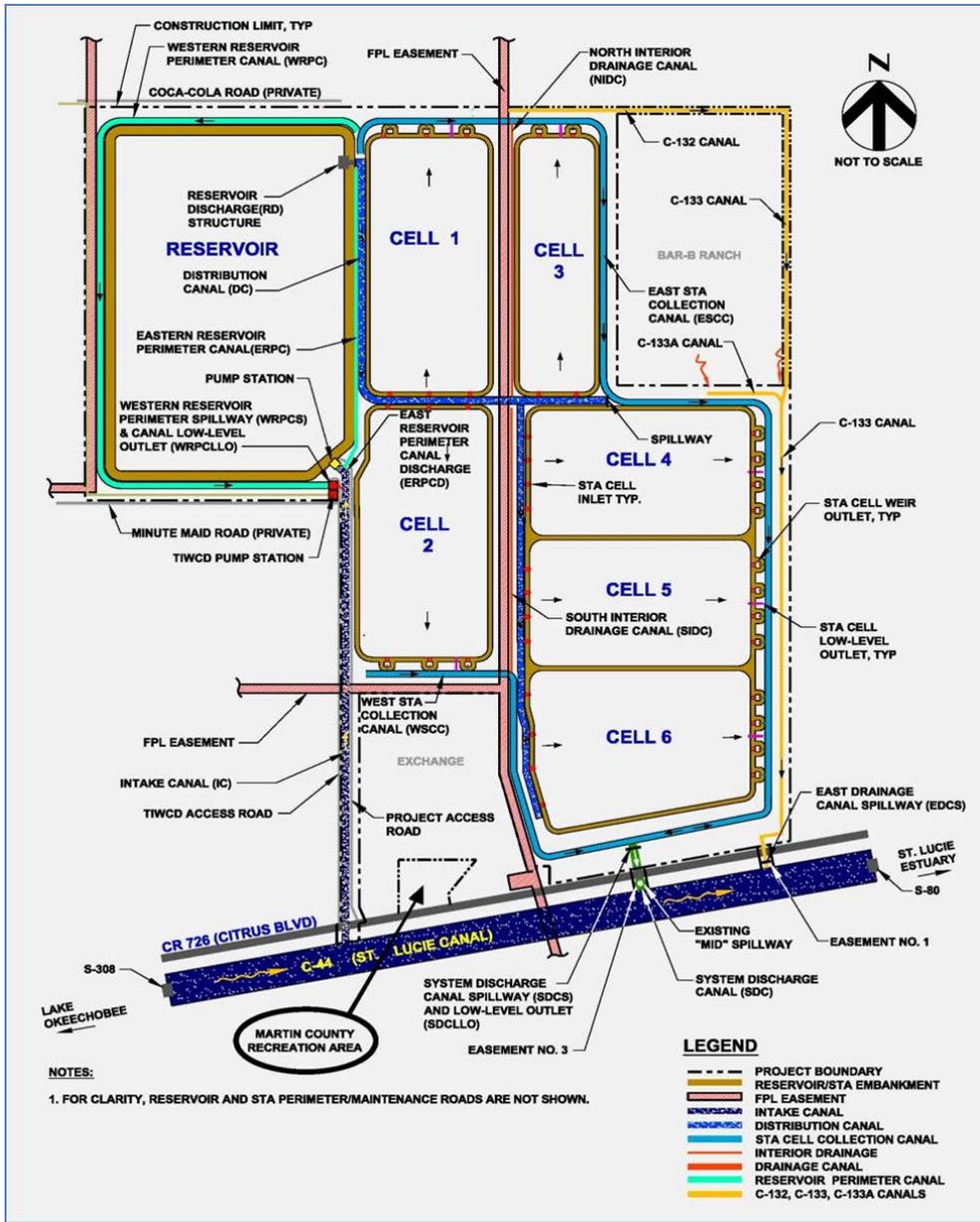


Figure 2: Project Site Plan

**b. Project Background**

The C-44 RSTA Project has been divided into multiple contracts for construction. Two contracts are complete. One included construction by USACE of the intake canal, access roads, a drainage canal and outlet for C- 133A and C-133, Citrus Boulevard box culvert, and a new bridge over the intake canal from Citrus Boulevard. The other included construction by SFWMD of the system discharge. Another contract is currently under construction by USACE and consists of an above-ground reservoir, discharge canal, discharge tower, and associated structures to capture water from the C-44 Basin. Two other contracts are currently under construction by SFWMD and consist of construction of a pump station, communications tower, STA cells, and final site work. The C-44 Intake Canal Bank Stabilization Project covered under

this review plan will be an additional contract consisting of armoring of the C-44 Intake Canal north of the existing bridge crossing the C-44 intake canal along Citrus Blvd.

The Designer of Record (DOR) for the C-44 RSTA Project was HDR Engineering, Inc., which provided plans and specifications for the entire project, including Contract 1 for construction of the intake canal. Figure 2 shows a project site plan and the alignment of the C-44 Intake Canal.

The intake canal originally incorporated use of a permanent turf reinforcement mat (TRM) along the canal slopes for erosion protection. The anticipated erosion for which protection is required is primarily due to runoff as a result of changing water levels in the Intake Canal over the life of the C-44 Project. The Contract 1 construction contractor was unable to successfully install the TRM and completed the slopes with sod placed to the water line. In 2015, HDR developed a technical memorandum to evaluate possible alternatives for erosion protection on the slopes. After review of the memorandum and discussion between the USACE, SFWMD and HDR, HDR developed a set of drawings and specifications that used riprap to stabilize the canal slopes in lieu of the TRM originally shown in Contract 1 documents.

**c. Project Description**

In January 2017, the Government prepared a technical memorandum which presented a phased approach to HDR’s riprap design. For the C-44 Intake Canal Bank Stabilization Project, the USACE design team will prepare a phased set of plans and specifications for construction of the intake canal armoring. This phased design will include partially lining the east intake slopes of the C-44 Intake Canal with riprap prior to commissioning of the STA cell 2 and the pump station as the first order of work.

**d. Public Participation**

The Jacksonville District Corporate Communications Office continually keeps the affected public informed on Jacksonville District projects and activities. There are no controversial concerns, planned activities, public participation meetings, or workshops that could generate issues needing provision to review teams. The project review plan will be posted on the Jacksonville District Internet. Any comments or questions regarding the review plan will be addressed by the Jacksonville District.

**e. Civil Works Cost Engineering Mandatory Center of Expertise Review and Certification**

The cost related documents associated with this contract do not require external peer review or certification. Therefore, no additional review requirements will be executed by the Cost Engineering Mandatory Center of Expertise (MCX) for the implementation documents addressed by this review plan.

**3. DISTRICT QUALITY CONTROL**

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

#### **4. AGENCY TECHNICAL REVIEW**

##### **a. Risk Informed Decision on Appropriate Level of Review**

PED phase implementation documents are being prepared, and an ATR of the pre-final P&S and DDR documents will be undertaken.

##### **b. Agency Technical Review Scope**

Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-217 and ER 1110-1-12.

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

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 ATR, the ATR Team Leader will prepare an ATR Review Report that summarizes the review. An outline for an ATR Review Report is in Attachment C. The report will include at a minimum the Charge to Reviewers, ATR Certification Form from EC 1165-2-217, and the DrChecks<sup>sm</sup> printout of the comments.

##### **c. ATR Disciplines**

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

Civil Engineering. The team member should be a registered professional engineer with 5 years minimum experience in civil/site work that encompasses embankment, road and channel design. Related construction experience is also desired.

Geotechnical Engineering. The team member should be a registered professional engineer with 5 years minimum experience that encompasses retention/detention area, embankment and channel design. Related construction experience is also desired.

Hydrology and Hydraulics (H&H). The team member should be a registered professional with a minimum of 5 years of experience that encompasses detention/retention area, embankment, weir and flow way modeling and design.

National Environmental Policy Act (NEPA) Compliance. The team member should have experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for civil works projects.

ATR Team Leader. The ATR Team Leader will be from outside SAD and should have experience with civil works projects. ATR Team Leader may also serve as a co-duty to one of the review disciplines.

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

The value of a BCOES review is based on minimizing problems during the construction phase through effective checks performed by knowledgeable, experienced personnel prior to advertising for a contract. Biddability, constructability, operability, environmental, and sustainability requirements must be emphasized throughout the planning and design processes for all programs and projects, including during planning and design. This will help to ensure that the government's contract requirements are clear, executable, and readily understandable by private sector bidders or proposers. It will also help ensure that the construction may be done efficiently and in an environmentally sound manner, and that the construction activities and projects are sufficiently sustainable. Effective BCOES reviews of design and contract documents will reduce risks of cost and time growth, unnecessary changes and claims, as well as support safe, efficient, sustainable operations and maintenance by the facility users and maintenance organization after construction is complete. A BCOES Review will be conducted for this project. Requirements and further details are stipulated in ER 1110-1-12, ER 415-1-11, and SAJ EN QMS 08550.

## **6. INDEPENDENT EXTERNAL PEER REVIEW**

### **a. General.**

EC 1165-2-217 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 Determination.**

A Type I IEPR is primarily associated with decision documents. A Type I IEPR is not applicable to the implementation documents covered by this Review Plan.

### **c. Type II Independent External Peer Review Determination.**

This project does not trigger WRDA 2007 Section 2035 factors for Safety Assurance Review (termed Type II IEPR in EC 1165-2-217) and therefore, a review under Section 2035 is not required. The factors in determining whether a review of design and construction activities of a project are necessary as stated under Section 2035 along with this review plans applicability statements follow.

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

*Failure of the C-44 Bank Stabilization Project would not pose a threat to human life. The project consists of the placement of geotextile and riprap along the slopes of the C-44 Intake Canal. There are no communities residing along or near the project works.*

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

*This project will utilize methods and techniques used by the Corps of Engineers on other similar works.*

(3) The project design lacks redundancy.

*The concept of redundancy does not apply to this project.*

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

*The C-44 Intake Canal Bank Stabilization Project does not have or pose unique sequencing or a reduced or overlapping design. The construction methods and procedures have been used successfully by the Corps of Engineers on other similar works. This project is non-complex, routine riprap construction.*

Based on the discussion above, the District Chief of Engineering, as the Engineer-In-Responsible-Charge, does not recommend a Type II EPR Safety Assurance Review of the P&S and DDR.

## **7. POLICY AND LEGAL COMPLIANCE**

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

## **8. MODEL CERTIFICATION AND APPROVAL**

Modeling for the containment dike design was accomplished with *GeoStudio 2007*, *SEEP/W* and *SLOPE/W* (Version 7.14), a computerized seepage and slope stability analysis program. Computerized structural modeling for design of the site access bridges and weirs was performed with *STAAD* structural analysis software.

## **9. PROJECT DELIVERY TEAM DISCIPLINES**

<b>Discipline/Expertise</b>
Civil Site Design
Environmental Sciences
Geotechnical Engineering
Hydraulic & Hydrologic Engineering

## 10. BUDGET AND SCHEDULE

### a. Project Milestones.

Milestone	Task	Start Date	End Date
CW310	Draft P&S complete	14-Aug-2018	14-Aug-2018
	PQCR	27-Aug-2018	27-Sep-2018
	ATR Review	02-Oct-2018	23-Oct-2018
	Evaluate ATR Comments	24-Oct-2018	30-Oct-2018
	Backcheck and Close Comments	31-Oct-2018	6-Nov-2018
	Incorporate ATR Comments	7-Nov-2018	14-Nov-2018
	ATR Review Certification	15-Nov-2018	19-Nov-2018
	BCOES	23-Nov-2018	13-Dec-2018
CW320	BCOES Certification	22-Jan-2019	22-Jan-2019
	Contract Award	11-Apr-2019	22-Apr-2019

### b. ATR Cost.

Funds will be budgeted to execute ATR and schedule as outlined above. It is envisioned that each reviewer will be afforded 24 hours review plus 8 hours for coordination. The estimated cost range is \$35,000 - \$40,000.

**ATTACHMENT A: APPROVED REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page / Paragraph Number</b>

**ATTACHMENT B: 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

<u>Acronyms</u>	<u>Defined</u>
PPA	Project Partnering Agreement
PQCR	Product Quality Control Review
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 C:**

**ATR REPORT OUTLINE AND COMPLETION OF AGENCY TECHNICAL REVIEW**

**C-44, Intake Canal – Bank Stabilization Project  
Preconstruction, Engineering and Design Phase Implementation Documents  
Martin County, Florida**

**ATR REPORT OUTLINE (Unneeded items, such as ATR Team Member Disciplines that are not identified as needed in the Review Plan, shall be deleted from the ATR Report.)**

**1. Introduction:**

**2. ATR Team Members:**

ATR Team Leader  
Civil Engineer  
Geotechnical Engineer  
Hydraulic/Hydrologic Engineer  
NEPA Compliance Reviewer

**3. ATR Objective:**

**4. Documents Reviewed:**

**5. Findings and Conclusions:**

**6. Unresolved Issues:**

# COMPLETION OF AGENCY TECHNICAL REVIEW

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The Agency Technical Review (ATR) has been completed for the Preconstruction, Engineering and Design Phase Implementation Documents for the C-44, Intake Canal, Bank Stabilization Project, Martin County, Florida, including the design documents, plans and specifications and DDR. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-217 and ER 1110-1-12. 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.

\_\_\_\_\_  
NAME  
ATR Team Leader

\_\_\_\_\_  
Date

\_\_\_\_\_  
NAME  
Project Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
NAME  
Review Management Office Representative

\_\_\_\_\_  
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.

\_\_\_\_\_  
NAME  
Chief, Engineering Division  
SAJ-EN

\_\_\_\_\_  
Date