US Army Corps
of Engineers®
Savannah District

PROJECT REVIEW PLAN

For

PRECONSTRUCTION ENGINEERING AND DESIGN IMPLEMENTATION DOCUMENTS

For

NOYES CUT

Satilla River Watershed
Georgia

Continuing Authorities Program Section 206
Aquatic Ecosystem Restoration

23 JULY 2020

The Review Plan (RP) is the foundational document that presents the endorsed/approved documentation of accountability and the steps to produce a credible product, consistent with this Circular. The RP is also the basis for compliance with the Information Quality Act requirement to confirm and maximize the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by the agency.

US Army Corps of Engineers
Water Resources Policies and Authorities
Review Policy for Civil Works, Engineer Circular 1165-2-217

Table of Contents

Attachments

List of Acronyms

AE	Architect-Engineer Firm
ATR	Agency Technical Review
BCOES	Biddability, Constructability, Operability, Environmental, and Sustainability Review
CAP	Continuing Authorities Program
DDR	Design Documentation Report
DQC	District Quality Control
EC	Engineer Circular
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ETL	Engineering Technical Lead
FONSI	Findings of No Significant Impact
FY	Fiscal Year
IEPR	Independent External Peer Review
MLLW	Mean Lower Low Water
MSC	Major Subordinate Command
NEPA	National Environmental Policy Act
P&S	Plans and Specifications
PDT	Project Delivery Team
PED	Preconstruction Engineering and Design
PM	Project Manger
RMO	Review Management Organization
RP	Review Plan
SAD	South Atlantic Division
SAR	Safety Assurance Review
SAS	Savannah District
USACE	US Army Corps of Engineers
WRDA	Water Resources Development Act

1.0 INTRODUCTION

1.1 Purpose

As stated in the US Army Corps of Engineers (USACE) Guidance document EC 1165-2-217 *Review Policy for Civil Works*, "All civil works planning, engineering, and O&M products must undergo review."

The purpose of this Review Plan (RP) is to define the scope of review activities for all project features associated with the design phase for the Noyes Cut Ecosystem Restoration Project. These review activities include District Quality Control (DQC), Agency Technical Review (ATR), Biddability, Constructability, Operability, Environmental and Sustainability Review (BCOES), and under certain circumstances Independent External Peer Review (IEPR).

1.2 References

EC 1165-2-217, *Review Policy for Civil Works*, 20 February 2018

ER 415-1-11, *Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews*, 1 January 2013

ER 1110-2-1150, *Engineering and Design for Civil Works Projects*, 31 August 1999

USACE, Savannah District, *Engineering Division Quality Management Manual for Military, Civil, and HTRW Programs*, February 2020

USACE, Savannah District, *Noyes Cut Section 1135 Ecosystem Restoration Study Satilla River Basin, Georgia Final Integrated Feasibility Study and Environmental Assessment*, 30 March 2018

USACE, Savannah District, *Project Management Plan Noyes Cut Section 1135 Ecosystem Restoration Project Design and Implementation Phase*, 4 February 2020

1.3 Review Management Organization

The USACE South Atlantic Division (SAD) is the Review Management Organization (RMO) for this project. The RMO, in cooperation with the vertical team, will approve the ATR Team members for this review. Savannah District (SAS) will assist SAD with management of the ATR and development of the charge to reviewers.

1.4 Review Plan Approval and Updates

The SAD Commander is responsible for approving this RP. The Commander's approval reflects vertical team input (involving the district, MSC, RMO, and HQUSACE) as to the appropriate scope and level of review. Like the PMP, the RP is a living document and may change as the project progresses. SAS is responsible for revising the RP as necessary to reflect changes in the project. Minor changes are documented in Attachment A. Significant changes to the RP, such as

changes to the scope and/or level of review) will be resubmitted to the MSC Commander for approval.

1.5 Public Posting of Review Plan

The latest version of the RP, along with the Commander's approval memorandum, will be posted to the SAS district webpage for the public. The RP will also be provided to the RMO and MSC.

2.0 Project Description

2.1 Project Location

The project area is located in southern Georgia, in Camden County, just south of Brunswick, Georgia. It includes Noyes Cut, Dover Creek and Umbrella Creek, which are part of the lower Satilla River estuary adjacent to the St. Andrews Sound. See Figure 1.

Figure 1: Project Area Including Constructed Features, Satilla River, Tributary System, St. Andrews Sound, and proximity to the AIWW.

The area benefiting from the project consists of over 4500 acres of tidal creeks and marshes. Tidal marshes and creeks are some of the most ecologically productive ecosystems, providing critical habitat for fish and shellfish of commercial and recreational importance. Tidal marshes also provide a rich food source for both resident and migratory birds, including osprey and eagles, and they are utilized for many traditional, low impact recreational activities.

The lands adjacent to Dover and Umbrella Creeks are sparsely populated with some residential developments along the creeks that include Dover Bluff Community, Piney Bluff Community, and River Marsh Landing.

2.2 Project Authorization

Noyes Cut is part of the Federally authorized Atlantic Intracoastal Waterway (AIWW), although it is not currently part of the active or alternative AIWW navigation channel. This project includes the deauthorization and closure of Noyes Cut; however, deauthorization and construction of the project features have no impact on the active or alternative AIWW.

2.3 Project Sponsor

The non-Federal project sponsors are the Georgia Department of Natural Resources (GADNR) and the Satilla Riverkeeper. In addition to the non-Federal sponsors, the residents of Dover Bluff collaborated on the feasibility study.

2.4 Project Background Description

The non-Federal sponsors, GADNR and the Satilla Riverkeeper, in collaboration with Dover Bluff residents, requested that the Savannah District investigate under Section 1135 the best way to restore the Satilla River estuary system.

In 1933, USACE widened and deepened Noyes Cut as part of the Inland Waterway. In 1940, USACE constructed the AIWW from Umbrella Creek through the lower reach of Dover Creek. In total, eight man-made cuts account for the degraded ecosystem in the study area. Those cuts changed the water circulation patterns in the estuary, altering patterns of tidal exchange; disrupting gradual salinity gradients from the headwaters to the mouth of the creeks; and limiting access to the headwaters for estuarine species due to channel sedimentation.

The estuarine species historically found in Dover and Umbrella Creeks include shrimp (white and brown), river herring, American shad, blue crabs, eastern oyster, and striped bass. All of these species would benefit from the restoration of tidal flows, water depths, and salinity gradients in the area.

To improve the quality of the existing aquatic habitat for resident species and increase connectivity for migratory species in the upper reaches of the Dover and Umbrella Creek watersheds, the study recommends closing the cuts to restore historic flow patterns in the watershed. The team assessed, evaluated, and compared several alternatives focusing on the cost effectiveness of ecosystem benefits. Using this methodology, the team identified Alternative 7 as the Selected Plan because it would provide the greatest amount of ecosystem restoration benefits and the best ecosystem for migratory fish spawning habitat.

The Selected Plan (Alternative 7) alters the environment and estuary hydrodynamics by closing Noyes Cut, Dynamite Cut, and Old River Run. As stated in the feasibility study, the conceptual

design of these closure structures consists of a combination of various stone sizes (rip rap and bedding stone) and sheet pile end walls. See Figures 2 and 3 below for typical sections and Table 1 for typical dimensions and estimated material quantities for each closure structure. Closure structures include signage on both sides to warn boaters of the potential hazard associated with the constructed structures.

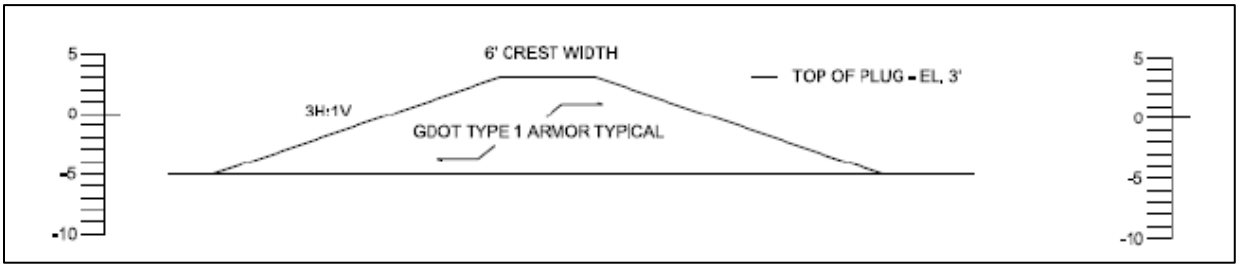

Figure 2: Conceptual Typical Design (Cross Section View) of Closure Structure

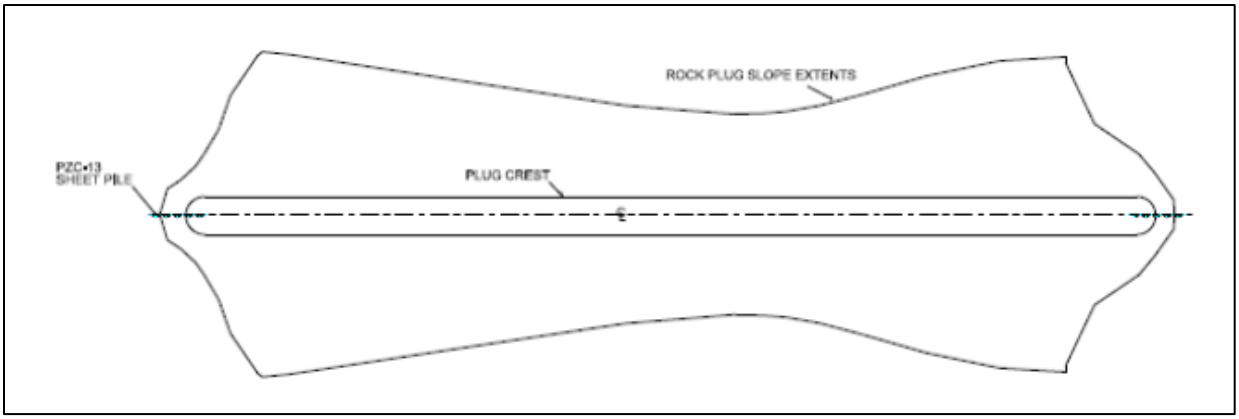

Figure 3: Conceptual Typical Design (Plan View) of Closure Structure

Table 1: Conceptual Design Dimensions and Estimated Material Quantities for Closure Structures

Location	**Conceptual Structure Dimensions**	**Estimated Material Quantities**
Noyes Cut	432 feet long, 72 feet wide, 8 feet high	6.5 Tons Sheet Pile, 1200 Tons Bedding Stone, and 4800 Tons GDOT Type 1 Rip Rap
Dynamite Cut	312 feet long, 66 feet wide, and 10 feet high	6.5 Tons Sheet Pile, 1030 Tons Bedding Stone, and 4140 Tons GDOT Type 1 Rip Rap
Old River Run	112 feet long, 54 feet wide, and 8 feet high	6.5 Tons Sheet Pile, 320 Tons Bedding Stone, and 1100 Tons GDOT Type 1 Rip Rap

This RP covers review activities for the design of all three closure structures included in the selected plan (Noyes Cut, Dynamite Cut, and Old River Run), despite the project name only referencing one of these features- Noyes Cut.

2.5 Public Participation

The Integrated Feasibility Report (including Appendices) was made available to the public for a 30-day review. The Satilla Riverkeeper, one of the non-Federal sponsors for the project, has been coordinating with local fisherman, boaters, and other organizations in the area regarding the potential construction of this project. Most local residents and commercial fisherman (crabbing) have been supportive of alternatives involving closure of man-made cuts in the project area.

A community engagement meeting was conducted on January 19, 2018. The response from the community for Alternative 7 (the Selected Plan) was very positive. All written comments from the public are documented in the feasibility report titled *Noyes Cut Section 1135 Ecosystem Restoration Study Satilla River Basin, Georgia Final Integrated Feasibility Study and Environmental Assessment* and dated March 2018.

2.6 Engineering Model Certification & Approval

In April of 2016, USACE Savannah District entered into a contract with an Architect-Engineer (AE) Firm, Dynamic Solutions LLC, to develop a calibrated hydrodynamic model and a representative coupled sedimentation transport model. The AE delivered the completed model code, associated documentation and model output for the base condition and seven selected alternative project runs, to include the Selected Plan (Alternative 7). Details for model development are documented in the report titled *Hydrodynamic and Sediment Transport Modeling Report* prepared by Dynamic Solutions and dated January 2017.

The model utilized in the feasibility study, Adaptive Hydraulics Model System (ADH), is enterprise software, which was developed and is currently maintained by USACE at the Engineer Research and Development Center (ERDC). This model is currently listed as "Preferred" by the USACE Hydrology, Hydraulics, and Coastal Community of Practice for computations and simulations of complex river hydraulics.

Per Enterprise Standard (ES)-08101, *Software Validation for the Hydrology, Hydraulics and Coastal Community of Practice*, the model used for the Noyes Cut Section 1135 Ecosystem Restoration Feasibility Study satisfies the requirement of the Corps' Scientific and Engineering Technology (SET) initiative and is acceptable for use in the study of alternatives and conceptual design development.

3.0 Charge to Reviewers

As stated in the USACE guidance document EC 1165-2-217 *Review Policy for Civil Works,* "When preparing to initiate review of a USACE product, the Charge to the reviewers for both the ATR Teams and IEPR panels will contain the instructions regarding the objective of the review and the specific advice sought."

During the feasibility study, the Cost Schedule Risk Analysis identified issues that could negatively affect successful project implementation. These items, which were identified with a risk level of significant/critical or likely/very likely to occur, are included below so that the review of the implementation documents is conducted with these concerns in mind.

Sheet pile Wall: Concerns documented during feasibility regarding the sheet pile wall include accessibility issues during construction with placement of the wall in the tidal marsh as well as the potential for underestimating the wall length due to the potential of a changed site condition between feasibility material estimates and construction award (due to erosion of the marsh from hurricanes or other high water events). Since the feasibility document was finalized and the start of the full design process, the district has had very positive experience with construction of several successful cut closure structures in a tidal marsh environment without the use of sheet pile. For this reason, the design team has determined that the sheet pile as recommended during feasibility is not necessary.

Rip-Rap: Concerns documented during feasibility regarding the material quantity for rock include the unknown estimate of settlement that could occur during or post-construction of the rock. An additional quantity of rock was identified to minimize this risk; however, it is unknown if that quantity is sufficient. Additional subsurface investigations during the design phase are limited due to the project funding available for this effort.

Cultural Resources Avoidance: During the feasibility study, field investigation identified a potential cultural resources target consisting of a submerged piling and other debris at the mouth of Dynamite Cut. Disturbance of the target would require additional investigation and agency coordination not supported by the project budget; therefore, the PDT determined that the target (with 100 ft buffer) should be avoided. Avoidance may be somewhat difficult during the construction effort due to the location of the target. Constructability of the cut closure structure should be considered in light of the prominent position of the cultural resources target.

Providing these concerns for the reviewers to evaluate are not meant to limit the focus of the review effort. Reviewers are encouraged to fully evaluate all documents and provide comments as appropriate utilizing the following comment structure:

Clear statement of the concern;
The basis for the concern;
The significance of the concern; and
The probable specific action needed to resolve the concern.

4.0 District Quality Control (DQC)

4.1 Requirements

As stated in the USACE guidance document EC 1165-2-217 *Review Policy for Civil Works,* "District Quality Control is the backbone of the Corps of Engineers' quality process. All work products and reports, evaluations, and assessments will undergo necessary, robust, and appropriate District Quality Control (DQC). It is an internal review process of basic science and engineering work products."

4.2 Work Products Included with Review

A DQC review will be performed by SAS personnel on the Plans and Specifications (P&S) and the Design Documentation Report (DDR) at all stages of submittal as outlined in the project schedule in accordance with the SAS quality management process.

4.3 Documentation of DQC

Comments and responses developed during the DQC review will be documented in DrChecks[SM]. DrChecks[SM] is a module in the ProjNet[SM] suite of tools developed and operated at ERDC (www.projnet.org). Completion of the review will be verified by the Agency Technical Review Team.

5.0 Agency Technical Review (ATR)

5.1 Requirements

As stated in the USACE guidance document EC 1165-2-217 *Review Policy for Civil Works,* "Agency Technical Review (ATR) is undertaken to ensure the quality and credibility of the government's scientific information." This level of review is comprehensive in nature and ensures that the results and decisions are clearly supported by the information presented and comply with agency policies and procedures. This review is inclusive of NEPA documents or other environmental compliance work products to include any work products provided by the local project sponsors or their AEs.

The ATR review is in addition to the DQC review and will be conducted by individuals and organizations external to the Savannah District. The ATR Team Leader will be a USACE employee outside of SAD.

5.2 Work Products Included with Review

The ATR review will cover the Plans and Specifications (P&S) and the Design Documentation Report (DDR) for the 65% submittal as outlined in the project schedule in accordance with the SAS quality management process. Responses from the PDT to the ATR comments will include an

acceptable path forward agreed upon by both parties. At the 95% submittal the ATR team will be provided the opportunity to review the P&S to backcheck their comments and ensure they have been addressed and resolved.

5.3 Required Team Expertise

Table 2 outlines the disciplines and levels of expertise required for this review.

Table 2: ATR Team Expertise and Requirements

Team Member	**Requirements**
ATR Team Lead	The ATR team lead is a senior professional outside of SAD with 10 years minimum experience in preparing Civil Works documents and conducting ATRs. The lead has the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline on the team.
Civil Engineer	Reviewer shall be a registered professional engineer with 10 years minimum experience including design of channel improvements to include diversion channels, embankment armoring, and other erosion control measures.
Geotechnical Engineer	Reviewer shall be a registered professional engineer with 10 years minimum experience including experience in subsurface investigations, rock and soil mechanics, internal erosion, slope stability evaluations, erosion protection design, and earthwork construction.
Hydraulic Engineer	Reviewer shall be a registered professional engineer with 10 years minimum experience including experience in the field of hydraulics and hydrology, have a thorough understanding of open channel dynamics and computer modeling techniques, and experience with diversion channels and embankment armoring design.
Environmental	Reviewer shall have a biological or environmental background with 10 years minimum experience including experience in the National Environmental Policy Act (NEPA) process and analysis and marine construction in the coastal estuarine environment.

5.4 Documentation of ATR

Comments and responses developed during the ATR review will be documented in DrChecks^{SM}. DrChecks^{SM} is a module in the ProjNet^{SM} suite of tools developed and operated by ERDC (www.projnet.org). At the conclusion of the ATR, the ATR Team Leader will prepare a report that summarizes the review, which will include a Charge to Reviewers, ATR Certification Form, the DrChecks^{SM} printout of the review comments and responses, and any outstanding issues or concerns.

6.0 Biddability, Constructability, Operability, Environmental, and Sustainability Review (BCOES)

6.1 Requirements

As stated in ER 415-1-11 Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews, "The value of BCOES reviews is based on minimizing problems during the construction phase through effective checks performed by knowledgeable, experienced personnel prior to advertising for a contract….This will help ensure that the government's contract requirements are clear, executable, and readily understandable by private-sector bidders or proposers."

6.2 Documentation of BCOES

Comments and responses developed during the BCOES review will be documented in DrChecks[SM]. DrChecks[SM] is a module in the ProjNet[SM] suite of tools developed and operated by ERDC (www.projnet.org). Upon completion of the review, a BCOES Certification sheet will be routed for signature by members of the SAS Corporate Board.

7.0 Independent External Peer Review (IEPR)

7.1 Requirements

EC 1165-2-217 *Review Policy for Civil Works* provides implementation guidance for both Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law 110-114) and addresses review procedures for both the Planning and the Design and Construction Phases. The EC requires that IEPR reviews be managed and conducted outside of USACE.

As stated in the EC, "Independent External Peer Review (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. Any work product, report, evaluation, or assessment that undergoes DQC and ATR may also be required to undergo IEPR under certain circumstances. A risk-informed decision… will be made as to whether IEPR is appropriate for that product and documented in the RP."

7.2 IEPR Determination

7.2.1 Type I IEPR

A Type I IEPR is primarily associated with project studies (decision documents) and as such is not applicable to the plans and specifications (implementation documents) covered by this RP.

7.2.2 Type II IEPR

This project does not trigger WRDA 2007 Section 2035 factors for a Safety Assurance Review (termed Type II IEPR in EC 1165-2-217). 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 the applicability statements of this RP are shown in Table 3. Based on the information provided in Table 3, **the District Chief of Engineering does not recommend a Type II IERP Safety Assurance Review** of the P&S and DDR for this project.

Table 3: Type II IEPR Factors and Applicability

Type II IEPR Factors	**Applicability to this Project**
The failure of the project would pose a significant threat to human life.	This project consists of constructing closure structures across previously man-made cuts in a coastal estuary. The project area is low in elevation and all within the tidal creeks, rivers, and marsh of coastal Georgia. It is a remote location accessible only by boat. The nearby properties are sparsely located along the riverbanks. While these closure structures will effectively re-route the tidal flow, they will not impound water in the same way that a dam would. While there will be a head differential across the structure at some portions of the tidal cycle, that head difference will be minimal. For these reasons, it has been determined that failure of these closure structures would not pose a significant threat to human life.
The project involves the use of innovative materials or techniques.	This project utilizes typical construction methods and materials for similar closure structures constructed in a marine environment. This project does not involve the use of innovative materials or techniques.
The project design lacks redundancy.	The concept of redundancy does not apply to closure structures constructed in a marine environment.
The project has unique construction sequencing or a reduced or overlapping design construction schedule.	This project's construction sequence and schedule have been used successfully by USACE on other similar works. Construction schedules for this project do not have unique sequencing and activities are not reduced or overlapped.

7.3 Work Products Included with Review

Based on the information provided above, this review is **not required**.

7.4 Required IEPR Panel Expertise

Based on the information provided above, this review is **not required**.

7.5 Documentation of IEPR

Based on the information provided above, this review is **not required**.

8.0 Schedule and Estimated Cost

Task	**Scheduled Date**	**Estimated Cost**
DQC	July 2020 (35%) September 2020 (65%) December 2020 (95%)	$24,500
ATR	September 2020 (65%) December 2020 (95%)	$32,000
BCOES	December 2020 (95%)	$13,500
IEPR	N/A	
Total Review Costs		$70,000

9.0 Points of Contact

The points of contact for this project and the review plan are:

Title	Organization	Phone
Chief, Hydrology & Hydraulics Branch	CESAS-EN-H	912-652-5268
Project Manager	CESAS-PM-C	912-652-5099
SAD Quality Manager	CESAD-RBT	404-562-5121

Attachment A

Review Plan Document History - Updates and Revisions

Document History

Document	Date	Description of Revision	Date Approved	Approved By
Original RP	July 2020	-		