



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

15 June 2018

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT

SUBJECT: Approval of Review Plan for Implementation for S-333N Gated Spillway, Miami-Dade County, Florida

1. References:

a. Memorandum, CESAJ-EN-Q, 2 April 2018, subject as above.

b. 1165-2-217, Water Resources Policies and Authorities Review Policy for Civil Works, 28 February 2018.

2. The Review Plan (RP) submitted by the Jacksonville District for the design of the S-333N Gated Spillway by the South Florida Water Management District (SFWMD) and their A-E via reference 1.a has been reviewed by the South Atlantic Division (SAD) and is hereby approved in accordance with reference 1.b above.

3. SAD concurs with the District's RP recommendation that outlines the requirements for Quality Assurance by the SFWMD and Quality Control by their A-E, as well as a Technical Review by the Jacksonville District. We also concur with the District Chief of Engineering and conclusions in the RP that a Type II Independent External Peer Review (IEPR) of the subject project is not required. The recommendation to exclude Type II IEPR is based on reference 1.b Risk Informed Decision Process as presented in the RP. Documents to be reviewed include plans, specifications, and a design documentation report.

4. 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.

5. The SAD point of contact is

[REDACTED]

[REDACTED]

Director of Programs



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

REPLY TO
ATTENTION OF

CESAJ-EN-Q

- 2 APR 2018

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

SUBJECT: Approval of Review Plan for Implementation Documents for S-333N Gated Spillway, Miami-Dade County, Florida

1. References:

EC 1165-2-214, Civil Works Review, 15 Dec 12

2. The design for this project is under development by the SFWMD and their A-E who will perform quality checks on all products they developed. This RP outlines requirements for Quality Assurance by SFWMD and Quality Control by their A-E, as well as a Technical Review by Jacksonville District. The Review Plan includes a recommendation that a Type II Independent External Peer Review (IEPR) of the subject project is not required. The recommendation to exclude Type II IEPR is based on the EC 1165-2-214 Risk Informed Decision Process as presented in the Review Plan. Documents to be reviewed include plans, specifications, and a design documentation report.

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]
LTC, EN
Commanding

PROJECT REVIEW PLAN

For Review of

Implementation Documents

For

S-333N Gated Spillway Construction

Miami-Dade County, Florida

March 2018

THE INFORMATION CONTAINED IN THIS REVIEW PLAN IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PREDISSEMINATION PEER REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY THE U.S. ARMY CORPS OF ENGINEERS, JACKSONVILLE DISTRICT. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

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1. PURPOSE AND REQUIREMENTS

a. Purpose

This Review Plan defines the scope and level of review activities for the design documents for S-333N Gated Spillway Project (Project), Miami-Dade County, Florida. The Project scope includes construction of a new gated spillway structure to operate in conjunction with the existing S-333 spillway structure. Design and construction of the Project is being performed by the non-federal sponsor, the South Florida Water Management District (SFWMD) and their design consultant. The design documents to be reviewed are Plans and Specifications (P&S) and Design Documentation Report (DDR) prepared by the non-federal sponsor and their design consultant. As discussed below, the review activities for these documents consist of a Quality Assurance (QA) effort by the local sponsor and a Quality Control (QC) by their design consultant, as well as a Preliminary and Final U.S. Army Corps of Engineers (USACE) Technical Review. Also, as discussed below, an Independent External Peer Review (IEPR) is not recommended on this implementation effort.

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 1165-2-214, "Civil Works Review", 15 December 2012
- (4). SFWMD Everglades Restoration and Capital Projects Engineering Submittal Requirements, 05 November 2009

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 levels of review: District Quality Control (DQC), Agency Technical Review (ATR), an Independent External Peer Review (IEPR), and a Policy and Legal 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 the PDT, DQC, ATR, and IEPR Teams.

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 (involving district, MSC, and HQUSACE members) as to the appropriate scope and level of review. The Review Plan is a living document and may change as the project progresses. The SFWMD is responsible for keeping the Review Plan up to date. Minor changes to the Review Plan since the last 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) will 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 Commander's approval memorandum, will be posted on the Jacksonville District Review Plan webpage. The latest Review Plan will be provided to the home MSC.

2. PROJECT INFORMATION AND BACKGROUND

a. Project Description

The project is located at the southern end of the L-67A levee at the southeast corner of Water Conservation Area 3A about 30 miles west of Miami. The S-333N structure is a gated spillway structure that will work in conjunction with the existing S-333 spillway to increase hydraulic connectivity between WCA-3A and Everglades National Park (ENP). S-333N is a complementary structure to the existing S-333 spillway. The structure is proposed as a two-bay gated spillway with a design flow of 1,150 cfs and hydraulic head of 0.5 feet. The design flow was established in order to reach a combined conveyance with the existing S-333 spillway (1,350 cfs) of 2,500 cfs. At times when capacity is available, the proposed S-333N and existing S-333 spillways will provide additional conveyance to ENP.

The project scope includes design and construction of a new structure adjacent to the existing S-333 on the L-67A levee. The project design is anticipated to include modeling, structural, civil and electrical components and will comply with USACE regulations. The project timeline is expedited and shall include preliminary and final design with an anticipated Governing Board approval in August of 2018. Modifications to the existing S-333 are not anticipated.

This project is a feature of the Central Everglades Planning Project (CEPP), which has a primary goal of improving the quantity, quality, timing, and distribution of water flows to the Northern Estuaries, Central Everglades, and Florida Bay, while increasing water supply for municipal, industrial, and agricultural users.

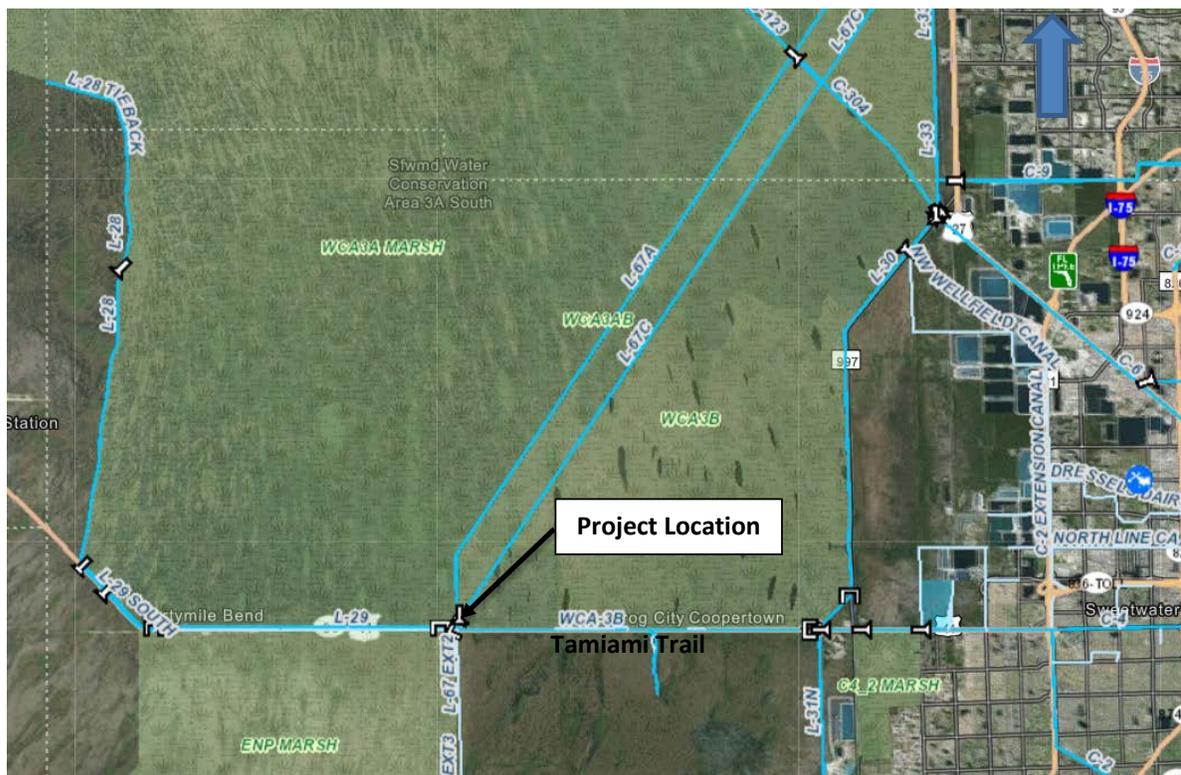


Figure 1: Aerial Map of Project Area

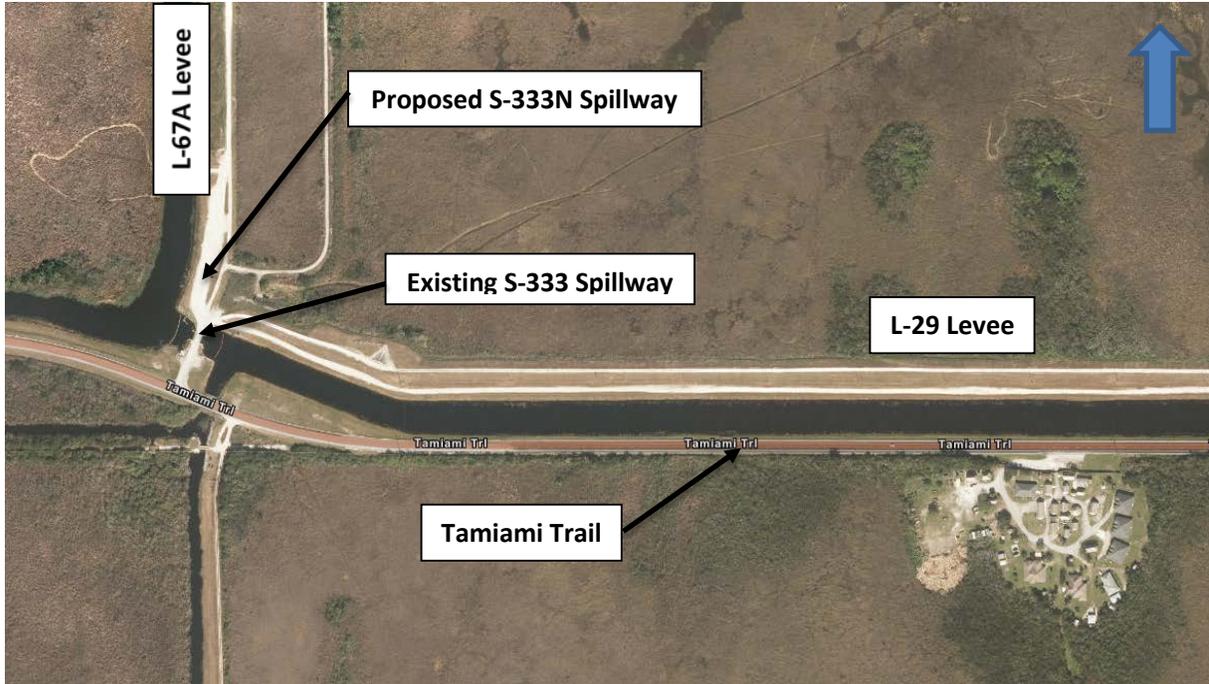


Figure 2: Location Map

b. Public Participation

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 or the SFWMD.

c. Cost Engineering Directory of Expertise Review and Certification

The cost related documents associated with this contract do not require external peer review or certification since the design and construction will be performed by the SFWMD. Therefore, no additional review requirements will be executed by the Cost Engineering Directory of Expertise (DX) for the implementation documents addressed by this review plan.

3. QUALITY CONTROL BY NON-FEDERAL SPONSOR

The design will be subjected to quality assurance reviews by the non-federal sponsor and quality control reviews by their consultant as outlined in the SFWMD Quality Assurance Plan (Attachment C), the SFWMD Design and Engineering Review Process (Attachment D), and the Consultant Quality Control Plan (Attachment E).

4. USACE TECHNICAL REVIEW

a. General

The P&S and DDR produced by the SFWMD and their consultant are not work products of the Corps of Engineers. Therefore, the specific ATR requirements in EC 1165-2-214 do not apply. However, as stated in EC 1165-2-214, the use of and compliance with the EC may be advisable to help expedite an eventual USACE review and approval process. A rigorous technical review commensurate with the risk of the proposed S-333N Gated Spillway Project design activities will be performed by USACE personnel. This review will assist the sponsor in assuring that the work is in accordance with the authorized project and Corps guidance.

USACE shall develop a charge to reviewers to assist the USACE team members in their review by clarifying the scope of the review required. Since the P&S and DDR are being prepared by SFWMD and their consultant, the USACE review team may be led by and contain members from CESAJ. The review team will be supplemented with outside subject matter experts if necessary.

b. Documentation

All comments from the USACE review will be documented in the DrCheckssm model review documentation database. DrCheckssm is a module in the ProjNetsm suite of tools developed and operated at ERDC-CERL (www.projnet.org). SFWMD will provide evaluations to all comments, and USACE staff will be responsible for backchecking and if appropriate closing of all comments. USACE shall prepare a report that consolidates the results of the USACE review and documents that all comments have been closed. SAD shall receive a copy of the summary report for information only.

5. INDEPENDENT EXTERNAL PEER REVIEW

a. General.

EC 1165-2-214 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 the Section 2034 Independent Peer Review, Type I Independent External Peer Review, and the Section 2035 Safety Assurance Review, Type II Independent External Peer Review.

According to EC 1165-2-214, when a non-Federal interest undertakes a study, design, or implementation of a Federal project, or requests permission to alter a Federal project, the non-Federal interest is required to undertake, at its own expense, any IEPR that the Government determines would have been required if the Government were doing the work. The non-Federal interest shall make a risk informed decision on whether to undertake a Type I and/or Type II IEPR and document their proposed reviews in a Review Plan that will be reviewed by the local district and approved by the host MSC Commander. Any IEPR undertaken by a non-Federal Interest shall be submitted as part of the decision package for review by USACE and ultimate action by USACE.

b. Type I Independent External Peer Review Determination.

Because the P&S and DDR covered by this Review Plan are not a planning study, a Type I IEPR is not required.

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 1165-2-214) 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 the applicability statements for this Review Plan are as follows:

- 1) The failure of the project would pose a significant threat to human life.
The existing S-333 structure and the L-67A and L-29 levees will be minimally impacted. The minimal disturbance of levee embankments during construction will not impact the function of the project because disturbed areas will be restored or rebuilt to meet current

levee construction standards. The work proposed is within existing operational limits and design parameters of the existing S-333 Structure. The level of protection provided by the existing system is not changing. The normal operating range for the L-67A is 14 feet NGVD29 and the L-29 Canal is 12 feet NGVD29. The Design Levee Grade for the L-29 Levee is 14.0 feet NGVD29. No change to the risk of significant threat to human life will be caused by the addition of the S-333N Structure. Operations of the S-333 and S-333N structures will follow the existing, approved operational plan for the S-333 structure. The project will be discussed with adjacent communities. Evacuation routes are not expected to be impacted or changed due to this project construction.

- 2) The project involves the use of innovative materials or techniques.
This project will utilize methods and procedures used by the Corps of Engineers and the project sponsor on other similar works.
- 3) The project design lacks redundancy.
The project does not require the addition of redundant project features or redundancy design considerations.
- 4) The project has unique construction sequencing or a reduced or overlapping design construction schedule.
This project's construction activities do not have unique sequencing or a reduced or overlapping design schedule. Construction will be coordinated with the Florida Department of Transportation Contractor working on the Department of Interior bridge construction on the US 41 Roadway (Tamiami Trail).

Based on the discussion above, CESAJ does not recommend a Type II IEPR Safety Assurance Review of the P&S and DDR.

6. MODEL CERTIFICATION AND APPROVAL

A three-dimensional (3D) Computational Fluid Dynamics (CFD) model was used to confirm the spillway sizing calculations and design erosion mitigation measures at the proposed structure. The CFD model is based on the commercial package ANSYS FLUENT which solves the Reynolds-Averaged Navier-Stokes Equations. This model has extensively been used in mechanical engineering applications, and incrementally in hydraulic engineering of water control structures, as evidenced by several peer-reviewed publications in this field. A member of the USACE Technical Review team will have at least 10 years of experience working with this type of model.

The spillway sizing equations are dimensional analysis-based equations that were published in the ASCE Journal of Irrigation and Drainage Engineering (2016).

7. PROJECT DELIVERY TEAM DISCIPLINES

The table below provides a listing of the SFWMD Project Delivery Team disciplines:

Discipline/Expertise
Project Manager
Cost Estimation
Procurement
Survey
Civil Site Design

Discipline/Expertise
Mechanical Engineering
Electrical Engineering
Structural Engineering
Environmental Engineering
Hydrogeology & Geology
Geotechnical Engineering
Hydraulic & Hydrologic Engineering
Water Mgmt (Project Operations Manual)
NEPA Compliance
Real Estate
Field Stations – Operation and Maintenance

8. SCHEDULE AND COST

a. Schedule.

The table below summarizes the schedule of reviews identified in this review plan:

<u>Review Schedule</u>	<u>Start</u>	<u>Finish</u>
SFWMD Preliminary Design/Review		
SFWMD Preliminary Design Submittal Complete	12/22/2017	12/22/2017
SFWMD QA Review	12/22/2017	2/2/2018
SFWMD Preliminary Design Submittal to USACE	12/27/2017	12/27/2017
Preliminary USACE Technical Review		
USACE Review	1/3/2018	1/24/2018
USACE Provides Preliminary Comments	1/25/2018	1/25/2018
SFWMD Provides Responses to Comments	1/26/2018	2/2/2018
USACE Backcheck of Comments	2/5/2018	2/16/2018
SFWMD Final Design/Review		
SFWMD Final Design Submittal Complete	3/29/2018	3/29/2018
SFWMD QA Review	3/29/2018	5/10/2018
SFWMD Final Design Submittal to USACE	4/6/2018	4/6/2018
USACE Final Technical Review		
USACE Review	4/6/2018	4/27/2018
USACE Provides Technical Review Comments	4/30/2018	4/30/2018
SFWMD Provides Responses to Comments	5/1/2018	5/7/2018
USACE Backcheck of Comments	5/8/2018	5/25/2018
SFWMD Submits Corrected Final P&S and DDR	6/7/2018	6/7/2018

b. Review Cost.

The estimated cost for the USACE preliminary and final technical reviews is between \$40,000 to \$50,000.

ATTACHMENT A: APPROVED REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

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
ER	Engineering Regulation
EA	Environmental Assessment
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

<u>Acronyms</u>	<u>Defined</u>
PQCR	Product Quality Control Review
QA	Quality Assurance
QCP	Quality Control Plan
QMP	Quality Management Plan
QMS	Quality Management System
RMC	Risk Management Center
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

Quality Control Plan for SFWMD Work Products

The Consultant shall follow the Consultant's Quality Assurance/Quality Control Plan (QA/QC) for the Project. A copy of the Consultant's QA/QC Plan shall be submitted to the District at the first Progress Review Meeting. The QA/QC Plan shall identify the QA/QC officer for the Project and provide the qualifications of the officer to perform the required QA/QC reviews. The QA/QC officer shall be someone not directly involved in the preparation of the plans and specifications nor the project management responsibilities. The Consultant Project QA/QC officer shall be charged with the responsibility of the Plan's implementation and documentation of current QA/QC activities. An update on all QA/QC activities shall be reported in the Monthly Status Reports. All work performed by the Consultant design team members, including sub-consultants, on the Tasks for this Work Order shall be in accordance with this QA/QC Plan.

All engineering submittals, including memoranda, reports and studies, shall undergo quality management reviews in accordance with the Consultant's documented QA/QC processes for the Project. The purpose of the QC review is to verify that the resulting design meets acceptable practice and that the documents have been properly coordinated to the satisfaction of the District. The QC reviewer shall inform the Project team of any exception or proposed improvement that may be noted. QC reviews shall be provided for all engineering submittals. The QC reviews shall be conducted prior to submittal to allow time for incorporation of any recommended revisions.

A signed *Quality Certificate of Compliance*, as required by the *Everglades Restoration & Capital Projects Engineering Submittal Requirements*, shall be submitted for each engineering deliverable that confirms that the Consultant has performed all internal QA/QC activities in accordance with their documented QA/QC Plan and that the contents of the submittal are complete and meet the requirements as stated in the Statement of Work for this Work Order. The Consultant shall complete the *Certificate* with the required information specific to the deliverable being submitted. Where any components of a particular submittal are not complete, an explanation and schedule for submitting the missing components shall be provided. Where District technical comments have been received by the Consultant on a previous engineering submittal, a copy of the Consultant's responses that address the comments shall be provided as part of the subsequent submittal to the District.

Attachment D: SFWMD Engineering and Construction Design Review Process

This section summarizes the Engineering and Construction review process, review phases, and timeframes for review by the Design Review Team (DRT) which may include participants from a Full Service Engineering Consultant for large project engineering activities. Each project may have one planning and one or more design phases associated with project plan and technical specification development. The Technical Review process begins with the submittal of each planning or design phase deliverable as presented below, including Engineering During Construction.

Establishment of Project Design Technical Review Team

At the beginning of the project planning or design phase, the Project Manager will either establish or reconfirm with the Project Development Section Representative the composition of the Design Review Team (DRT) for the project. The DRT may consist of representatives from the South Florida Water Management District (District), US Army Corps of Engineers (USACE) (member for all USACE projects), Florida Department of Environmental Protection (FDEP), US Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), local agencies and in many cases, independent consultants to supplement District staff.

The District has utilized full service consulting firms to provide engineering discipline expertise to augment the District staff review efforts for technical design deliverables. These services are typically specific to the fields of architecture, electrical, instrumentation and control (I&C), geology, geotechnical, hydraulics, hydrology, HVAC, plumbing, fire, mechanical, and structures and involve reviewing the design for conformance to industry standards, checking the calculations, etc. District staff performs review activities associated with checking deliverables for compliance with District engineering guidelines, risk analysis and operations and maintenance considerations. Project modeling tasks and deliverables will be reviewed and coordinated by Project Development and the Hydrologic and Environmental Systems Modeling Section. A modeling request form should be filled out by the Project Manager to request reviews of modeling tasks and these types of deliverables.

The District has established Points of Contact within each Bureau for the various resource areas who provide membership on the Project Design Review Teams. These Points of Contact are able to provide staff members who will represent their Bureau during review of the project deliverables. The Project Development Section Representative will utilize the District Points of Contact to request membership on each Project Design Review Team. Replacement team members will be requested for ineffective team member participation.

The Project Development Section Representative will manage all aspects of the DRT from contract management of auxiliary staff, to logistics involved with delivery of copies of each deliverable to be reviewed, to issue resolution of lingering, unresolved review comments. As services are difficult to actually predict, general budgetary guidelines have been developed based on deliverable type, scale of project, and review time duration for both external (\$) and internal (hours) review assistance. This guidance is updated periodically. The Project Manager should utilize these guidelines in development of the project budget to ensure that sufficient funds are available to perform the expected deliverable reviews. Project schedule

should also be discussed with the Project Development Section Representative. The Project Manager is encouraged to schedule the project deliverables as soon as the expected delivery dates are known. The Project Development Section will make every effort to schedule reviews to avoid impacting project schedules. There may be instances, however, when District priorities may require adjustment of review schedules.

The primary objectives of the DRT are to confirm that:

7. The engineering concepts are valid.
8. The recommended plan is feasible and will be safe and functional.
9. A reasonable opinion of probable construction cost estimate has been developed in accordance with Engineering and Construction Bureau *Procedures for Development of Opinions of Construction Costs* (see Design Criteria Memorandum 7).
10. The approach to the engineering analysis is sound.
11. The submittal complies with District engineering submittal requirements.
12. The submittal complies with accepted engineering practice within the District and applicable Engineering and Construction Bureau Design Criteria Memoranda (DCM) and Comprehensive Everglades Restoration Plan (CERP) Guidance Memoranda (CGM).

Technical Review Documents

The type of documents intended to be reviewed under the Technical Review process includes but is not limited to the following:

- Feasibility Study
- Reconnaissance Study
- Conceptual Design Study
- Project Implementation Report (PIR)
- Geotechnical Report
- Hydraulic and Hydrologic Report
- Water Budget Report
- Survey
- Design Documentation Report (DDR)
- Preliminary Design
- Intermediate Design
- Final Design
- Corrected Final Design (Issued for Bid)
- Technical Memorandum
- Opinion of Probable Construction Cost (OPCC)
- Construction Schedule
- Project Operations Manual (POM)
- Water Control Plan (WCP)
- Operation, Maintenance, Repair, Rehabilitation and Replacement (OMRR&R) Manual
- Monitoring Plan
- Permit Supporting Documentation
- Response to Construction Submittal

For federal projects that the SFWMD is designing, it is especially important to have the USACE – Jacksonville District participate in the technical review of the design deliverables in order to provide feedback on the following:

- Technical design is in conformance with federal guidelines (e.g. Engineering Manuals, Engineering Regulations, etc.)
- The project is in accordance with the Project Implementation Report (PIR)
- Obvious areas that may not qualify for work-in-kind crediting are identified

Prior to submittal of a project deliverable to Project Development, the Project Manager is requested to complete the Technical Review Release form. By completing the Review Release form, the Project Manager certifies that the project deliverable meets the task requirements, is complete, has the correct number of copies, is in the correct format, identifies the Documentum location of stored project files, identifies the project charge codes, includes the designers quality assurance/quality certification form, explains any unusual circumstances, and is ready to be sent to the DRT.

Technical Review Summary

The reviews performed by the DRT shall be based on:

- District Standards for Construction of Water Resource Facilities – Design Details and Design Guidelines
- District Major Pumping Station Engineering Guidelines
- Engineering and Construction Bureau Design Criteria Memoranda
- Engineering and Construction Bureau Submittal Requirements
- CERP Guidance Memoranda
- Applicable US Army Corps of Engineers requirements
- Applicable Florida Department of Transportation (FDOT) Standards
- Other Applicable National and Industry Design Codes

The intent of each Technical Review is to identify fatal flaws to the design or items that are in conflict with District or other applicable standards and guidelines. The DRT members are discouraged from commenting on items that are “designer preference” in nature. The Technical Review shall include an evaluation of the level of completion for the respective submittal according to the Detailed Description of Plan Submittal Requirements (see Engineering and Construction Bureau Submittal Requirements). The comment and response forum for each Technical Review shall be through the Design Review and Checking System (DrChecks). DrChecks is available through PROject extraNet (ProjNet) which is a web based service that allows the secure exchange of design and construction information among authorized business partners in the context of specific business processes. Comments from the Technical Reviews shall be made available to other review teams, including the USACE Technical Review teams and the Independent External Peer Review (IEPR) teams.

Technical Review Process

In general, the Design Engineer will submit a deliverable to the District. The District will send copies of the deliverable to the DRT as well as a link to the District’s Documentum database site where the information can be found electronically. Depending on the deliverable, the DRT will have either ten (10) or fifteen (15) business days from the time the link is transmitted to perform the review. The Project Manager and Design Engineer will have ten (10) or fifteen

(15) business days to respond to the comments in DrChecks. The DRT shall backcheck the responses and assist the District in resolving non-concurred issues within another ten (10) business days. The DRT shall adhere to the review and backcheck times given for each deliverable. In the event of extenuating circumstances, the DRT shall notify the District Project Development Section Representative for resolution.

The District will provide all DRT members with a 3-month look ahead schedule each month to assist the DRT with planning of staff availability. This schedule is a continuously changing document. As such, it is intended as a guide only and the DRT members should be prepared for any last minute changes that may arise due to circumstances beyond the District's control.

As each deliverable is submitted by the Design Engineer, the District will have a predetermined time to review the submittal and provide comments back to the Design Team using the DrChecks review tool. The DRT shall participate in the reviews and assist the District as needed. The DRT may be required to perform, but not be limited to, the following general functions:

- Attend meetings with the District and Design Engineer to review the Project and establish criteria
- Perform a technical review of the project plans, technical specifications, reports and calculations by senior level engineering staff with the appropriate experience in the fields required for the project
- Review and become familiar with District Standards, including updates, and other applicable design standards

The DRT is responsible for obtaining updates of, and keeping current with the following documents:

- District Standards for Construction of Water Resource Facilities – Design Details and Design Guidelines (latest edition, including updates),
- District Major Pumping Station Engineering Guidelines (latest edition, including updates),
- Engineering and Construction Bureau Design Criteria Memoranda (latest edition, including updates),
- Engineering and Construction Bureau Submittal Requirements (latest edition, including updates),
- CERP Guidance Memorandums (latest edition, including updates), and
- Other guidelines and standards as applicable.

DDR Technical Review

Following submittal of the DDR by the Design Engineer, the District will provide the DRT with electronic and hard copies of the DDR as agreed upon by each member. The District will also provide a link to the Documentum site containing the DDR. The DRT shall provide review comments in DrChecks on the DDR within ten (10) business days following receipt of the Documentum link. The review of the DDR shall look for and identify conflicts with design standards or fatal flaws, if any, to the approach, calculations, evaluations, conceptual plans, and any other design information provided in the DDR. Typically, the review performed by the Consultant DRT will not include the Opinion of Probable Construction Costs (OPCC), operations plan, modeling, or survey. These items will typically be reviewed by District members of the DRT.

Development of the Basis of Design Report will generally consist of the following activities:

1. Site Investigations.
2. Design Criteria Development.
3. Hydrology and Hydraulic Analysis.
4. Project Layout and Evaluation of Options.
5. Project Feature Design Development.
6. Opinion of Probable Construction Cost Based on Conceptual Designs.
7. Engineering Analyses to Support Designs.

A more detailed description of the DDR requirements for the Design Engineer can be found in the Engineering and Construction Bureau Submittal Requirements.

Once the comment period is closed, the Design Engineer will have ten (10) business days to respond to the comments generated by the DRT. During this time, the DRT shall be available to answer any questions from the Design Engineer regarding the comments and work closely with the District to resolve outstanding issues. At the completion of the ten (10) day response period, the DRT members shall backcheck the responses provided by the Design Engineer in DrChecks. If the Design Engineer properly addressed the comment, the DRT member shall close the comment. If the comment was not properly addressed, the DRT member shall work with the Design Engineer through the District Project Manager to resolve the issue within ten (10) business days. The District reserves the right to close a comment on behalf of the DRT if the comment is not closed in a timely fashion. Upon closure of all comments, the Project Manager shall conduct a Technical Review Briefing for District Management to discuss the Project Features, issues resolved during the review and path forward.

Following the end of the backcheck period, the Consultant DRT Manager shall submit to the District within five (5) business days a brief summary of the main issues encountered and resulting resolution.

Preliminary Design Technical Review

Following submittal of the Preliminary Design by the Design Engineer, the District will provide the DRT with electronic and hard copies of the Preliminary Design Report as agreed upon by each member. The Preliminary Design Report will typically include a narrative, design calculations, plans, list of proposed specifications, opinion of construction costs and construction schedule for the Project and related work prepared by the Design Engineer and submitted to the District for review. The District will also provide a link to the Documentum site containing the Preliminary Design Report. The DRT shall provide review comments in DrChecks on the Preliminary Design Report within ten (10) business days following receipt of the Documentum link. The review of the Preliminary Design Report shall look for and identify conflicts with design standards or fatal flaws, if any, to the approach, calculations, evaluations, conceptual plans, and any other design information provided in the Preliminary Design Report. Typically, the review performed by the Consultant DRT will not include the Opinion of Probable Construction Costs (OPCC), operations plan, modeling, or survey. These items will typically be reviewed by District members of the DRT. The DRT shall not comment on items that are "designer preference" in nature.

The Preliminary Design will generally consist of the following activities:

1. Supplemental Site Investigations

2. Finalize Modeling
3. Preparation of Project Layout and Features
4. Preliminary Design of Project Features
5. Preliminary Design Calculations
6. Develop Draft Project Operations Manual (POM)
7. Preparation of Preliminary Plans
8. Preparation of Technical Specification Outline
9. Updated Opinion of Probable Construction Cost
10. Updated Construction Schedule
11. Updated Engineering Report to reflect Preliminary Design

A more detailed description of the Preliminary Design Report requirements for the Design Engineer can be found in the Engineering and Construction Bureau Submittal Requirements. The response and backcheck process will follow the same procedures as identified in the DDR Technical Review above. Additionally, the Design Engineer will receive from the District five (5) business days after the comment period has closed a set of consolidated, red line marked up Plans and Specifications as applicable compiled by the Project Development Quality Control Engineer. Each plan sheet with mark ups is stamped with lines to identify the comment initiator and date of comment. The stamp also includes lines to be filled out by the Design Engineer with corrections by. These supplemental mark ups will be returned by the Design Engineer with the next submittal with indications of how each mark up was addressed (changes highlighted in yellow and exceptions to the comments noted in another ink color other than red). As part of the next deliverable review, the Quality Control Engineer will revisit the previous submittal's mark ups and the corrections made or notes provided by the design engineer. Once the drawing is checked, the Quality Control Engineer or his delegate will initial and date the checked by line of the stamp area. Upon closure of all comments, the Project Manager shall conduct a Technical Review Briefing for District Management to discuss the Project Features, issues resolved during the review and path forward.

Following the end of the backcheck period, the Consultant DRT Manager shall submit to the District within five (5) business days a brief summary of the main issues encountered and resulting resolution.

Intermediate Design Technical Review

Following submittal of the Intermediate Design by the Design Engineer, the District will provide the DRT with electronic and hard copies of the Intermediate Design Report as agreed upon by each member. The Intermediate Design Report will include a narrative, design calculations, plans, list of proposed specifications, opinion of construction costs and construction schedule for the project and related work prepared by the Design Engineer and submitted to the District for review. The District will also provide a link to the Documentum site containing the Intermediate Design Report. The DRT shall provide review comments in Dr Checks on the Intermediate Design Report within fifteen (15) business days following receipt of the Documentum link. The review of the Intermediate Design Report shall look for and identify conflicts with design standards or fatal flaws, if any, to the approach, calculations, evaluations, conceptual plans, and any other design information provided in the Intermediate Design Report. Typically, the review performed by the Consultant DRT will not include the Opinion of Probable Construction Costs (OPCC), operations plan, modeling, or survey. These items will typically be reviewed by District members of the DRT. The DRT shall not comment on items that are "designer preference" in nature.

The Intermediate Design Plans and Specifications shall generally consist of the following activities:

1. Finalize Site Investigations
2. Finalize Project Layout and Features
3. Detailed Design of Project Features
4. Updated Draft Project Operations Manual
5. Draft Geotechnical and Hydro-meteorologic Monitoring Plan Template
6. Summary of DCM Compliance and Results
7. Preparation of Plans and Specifications for Bidding/Construction
8. Updated Opinion of Probable Construction Cost
9. Updated Construction Schedule
10. Design Calculations (civil, electrical, mechanical, structural)
11. Updated Engineering Report to reflect Intermediate Design

A more detailed description of the Intermediate Design Report requirements for the Design Engineer can be found in the Engineering and Construction Bureau Submittal Requirements. The response and backcheck process will follow the same procedures as identified in the DDR Technical Review above except the time allowed for both providing comments and responding to comments is fifteen (15) business days. Additionally, the Design Engineer will receive from the District five (5) business days after the comment period has closed a set of consolidated, red line marked up Plans and Specifications from the Project Development Quality Control Engineer as described previously in the Preliminary Design Phase. These mark ups will be returned by the Design Engineer during the backcheck period with indications of how each mark up was addressed.

Following the end of the backcheck period, the Consultant DRT Manager shall submit to the District within five (5) business days a brief summary of the main issues encountered and resulting resolution.

Final Design Technical Review

Following submittal of the Final Design by the Design Engineer, the District will provide the DRT with electronic and hard copies of the Final Design Report as agreed upon by each member. The Final Design Report will include a narrative, design calculations, plans, list of proposed specifications, opinion of construction costs and construction schedule for the Project and related work prepared by the Design Engineer and submitted to the District for review. The District will also provide a link to the Documentum site containing the Final Design Report. The DRT shall provide review comments on the Final Design Report within fifteen (15) business days following receipt of the Documentum link. The review of the Final Design Report shall look for and identify conflicts with design standards or fatal flaws, if any, to the approach, calculations, evaluations, conceptual plans, and any other design information provided in the Final Design Report. Typically the review performed by the Consultant DRT will not include the Opinion of Probable Construction Costs (OPCC), operations plan, modeling, or survey. These items will typically be reviewed by District members of the DRT. The DRT shall not comment on items that are "designer preference" in nature.

The Final Plans and Specifications shall generally consist of the following activities:

1. Final Design of Project Features
2. Updated Engineering report to reflect Final Design

3. Completed Draft Project Operating Manual
4. Final Geotechnical and Hydro-meteorologic Monitoring Plan Template
5. Final Design Calculations
6. Final Plans and Specifications for Bidding/Construction, subject to Technical Review comments
7. Final Opinion of Probable Construction Cost
8. Final Construction Schedule

A more detailed description of the Final Design Report requirements for the Design Engineer can be found in the Engineering and Construction Bureau Submittal Requirements. The response and backcheck process will follow the same procedures as identified in the DDR Technical Review above except the time allowed for both providing comments and responding to comments is fifteen (15) business days. Additionally, the Design Engineer will receive from the District five (5) business days after the comment period has closed a set of consolidated red line marked up Plans and Specifications from the Project Development Quality Control Engineer as described previously in the Intermediate Design Phase. These mark ups will be returned by the Design Engineer during the backcheck period with indications of how each mark up was addressed. Upon closure of all comments, the Project Manager shall conduct a Technical Review Briefing for District Management to discuss the Project Features, issues resolved during the review and path forward.

Following the end of the backcheck period, the Consultant DRT Manager shall submit a brief summary to the District within five (5) business days of the main issues encountered and resulting resolution.

Corrected Final Design Technical Review

Prior to submittal of the Corrected Final Design Report, the Design Engineer will submit complete sets of plans and technical specifications for review by the DRT. The District may hold a review workshop to verify that the Corrected Final Plans and Technical Specifications have been properly addressed based on the Final comments. The review workshop may be one day or multiple days depending on the size of the project and volume of the deliverables. Two or three key members of the Consultant DRT team (i.e. Structural, Geotechnical, and/or Site/Civil) shall attend the final review workshop. Following the workshop and resolution of all outstanding issues, the Consultant DRT Manager shall submit to the District within five (5) business days a brief statement that all comments have been addressed.

Miscellaneous Deliverables Technical Review

Following submittal of any other deliverables by the Design Engineer as identified in the Technical Review Documents section above and not already addressed, the District will provide the DRT with electronic and hardcopies of the deliverable. The deliverable may include a narrative, design calculations, plans, list of proposed specifications, opinion of construction costs and construction schedule, study findings, recommendations, modeling results or other engineering related data for the Project and related work prepared by the Design Engineer and submitted to the District for review. The District will also provide a link to the Documentum site containing the deliverable. The DRT shall provide review comments on the deliverable within ten (10) business days following receipt of the Documentum link. The review of the deliverable shall look for and identify conflicts with design standards, applicable codes, standard practice, or fatal flaws, if any, to the approach, findings,

calculations, evaluations, conceptual plans, and any other information provided in the deliverable. The DRT shall not comment on items that are "designer preference" in nature.

The response and backcheck process will follow the same procedures as identified in the DDR Technical Review above.

Following the end of the backcheck period, the Consultant DRT Manager shall submit a brief summary to the District within five (5) business days of the main issues encountered and resulting resolution.

Continuity of Design Review Team Members

It is imperative that there be continuity in all of the Design Review Team members for both Consultant and District DRT members. Once assigned to a project, the same Design Review Team shall be utilized throughout the length of the project. If there needs to be a change in the staff involved, the District Point of Contact for that resource area or Consultant DRT Manager shall contact the District Project Development Section Representative for resolution.

Conclusion of Design Phase and Transfer to Procurement and Construction

At the conclusion of the Design Phase for the Project, one last Technical Review Briefing will be held. The Project Development Section Representative will prepare and sign the Completion of and the Certification of Independent Technical Review forms and provide them to the Project Manager for inclusion in the project file.



Attachment E:

Project Quality Control Plan S-333N Structure

Work Order 4600003017-WO13

PO No. 9500007403

Erdman Anthony Job No: 60245.13

October 24, 2017

Prepared by:

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1 Project Information

1.1 Project Information

Name: S333N Structure

Location: WCA 3 and ENP, Intersection L-67A and L-29 Canals, Miami-Dade, FL

Contract Number: 4600003017

Work Order Number: W0-13

Purchase Order Number: 9500007403

Erdman Anthony Project Number: 60245.13

1.2 Project Description

The South Florida Water Management District (District) intends to design and construct a fully automated, electrically operated two (2) gate spillway with peak capacity of 1,150 cfs to be built adjacent to the existing S-333 Structure at the intersection of the L-67A and L-29 Canal, Section 3, in Miami-Dade County. The purpose of the proposed S-333N Structure is to provide additional operational flexibility and conveyance of flows to Everglades National Park (ENP). The proposed S-333N will work in conjunction with the existing S-333 Structure to increase hydraulic connectivity between Water Conservation Area-3A (WCA-3A) and ENP. The design flow was established to reach a combined conveyance with the existing S-333 Structure (1,350 cfs) of 2,500 cfs. The project may also include modifications to the L-67A and L-29, Section 3 Levees and canals.

The Central Everglades Planning Project (CEPP) includes a suite of storage, treatment, conveyance and seepage management measures that will provide the necessary components to deliver additional fresh water from Lake Okeechobee south to WCA 3, ENP and Florida Bay. Once implemented, the project will restore more natural quantity, quality, timing and distribution of water flows to the remaining portions of The River of Grass. The Final Integrated Project Implementation Report was published in the Federal Register in July 2014, the Chief of Engineers Report was signed in December 2014 and the Record of Decision was signed in August 2015. The project received Congressional authorization in December of 2016 and is awaiting appropriations. The S-333N structure is the first component of the CEPP to move forward.

1.3 Project Goals and Deliverables

The objectives of this Statement of Work are to complete the Design Process for the S-333N Structure Project features. This Work Order includes the Project design by the Consultant from the Preliminary Design level through the Corrected Final Design documents, suitable for solicitation of a construction contractor.

The Design Process as defined in this Statement of Work shall include, but not be limited to, preparation of the following for the Project features:

- Design calculations, plans, specifications, opinions of probable construction costs, construction schedule, operations plan, and the design for the required submittals (Preliminary, Final, and Corrected Final/ RTA) in accordance with Everglades Restoration & Capital Engineering Submittal Requirements
- Presentations for briefings and meetings with the South Florida Water Management District (District) and Design Review Team (DRT), and Project Stakeholders

The Consultant, in consultation with the District Project Manager (PM), shall coordinate with the District to brief them on the substantive elements of the Preliminary Design and Final Design for the Project. The Consultant shall provide the necessary support to the District, including engineering and decision making process documentation to defend the recommendations made. The key elements of this project are the following:

- Structure
- Levee modifications
- Canal modifications and hardening

The project deliverables are listed in Exhibit A – Project Deliverables.

2 Project Administration

2.1 Communication

The design team includes subconsultants for specialized areas of expertise as listed in Exhibit B - Contact List for Design Team. All communications with SFWMD, either by email, letter or by telephone shall be through the Erdman Anthony Project Manager, [REDACTED]. Subconsultants shall coordinate all efforts with [REDACTED].

Also, the Consultant shall prepare for and participate in monthly progress review meetings and/or conferences with the District Project Manager. At the progress review meetings, the Consultant shall update the District on work in progress, inform the District of problems or delays as they are encountered, and receive input from District staff on a continuing basis throughout the course of work on the Project. Erdman Anthony's Project Manager and key members of the Project team, as appropriate for the work to be discussed, shall attend the progress review meetings. It is expected that one key project team member will attend each meeting. Additional technical meetings may also be held to review specific issues.

At each monthly meeting, the Consultant shall provide the District with a Monthly Project Status Report. This Report shall include, but not necessarily be limited to, the following information:

- Activities accomplished in the previous months
- Problems and present concerns encountered in the Project
- Planned actions for the next month
- Updated Work Order Schedule

The Consultant shall prepare and submit a Monthly Status Report to be submitted to the District Project Manager.

2.2 Document Control and Record Plan

The Consultant shall provide each Deliverable in both hard-copy and electronic formats to the District. All technical references used in completing the work shall be documented by the Consultant. Depending on the Deliverable, the Consultant shall provide the electronic deliverable in MSWord, MSeXcel, or AutoCAD, in a version compatible with District software. The Consultant shall provide reports in a completed format with all tables and figures included in the file of the report. Appendices may be provided as a separate file but all figures and tables within that appendix must be included in that same file. Additionally, the Consultant shall provide full reports and plans as Adobe PDF files. Individual PDF files shall be provided for each plan sheet, one (1) PDF file shall be provided of all the plan sheets, individual PDF files shall be provided for each technical specification, one (1) PDF file shall be provided for each technical specification division, and one PDF file shall be provided of all the technical specifications for each applicable Deliverable.

One electronic copy of meeting notes shall be transmitted to the District PM by email within five business days of the meeting. Hard-copies, electronic copies (pdf files), and native files (Word, Excel, AutoCAD) of the deliverables shall be submitted in quantities as called for in the Work Order.

All Project related documents shall be retained in a readily accessible and secure location until the Project is accepted. After the Project is accepted, the documents shall be retained by Erdman Anthony as per current Erdman Anthony policy. The quality control review documentation, which is developed during the production and review of the work, is to be retained in the project files, according to the requirements of this document for quality assurance review and audit purposes. This will demonstrate that the Project Control and Quality Control Plan requirements have been met.

2.3 Standards

The Consultant team shall prepare all design calculations, plans, specifications, and other required deliverables for Project features based on the guidance provided by the most current version of the District Engineering Design Guidelines, Design Criteria Memorandums (DCM's) as provided by the District and industry practice for such

facilities. The District Guidelines are provided for guidance to the Consultant for consistency of important design features and equipment arrangements and are regularly updated. As the Engineer of Record, the Consultant team shall confirm the adequacy of the District's Engineering Design Guidelines and modify them as necessary for Project specific requirements as approved by the District. The Consultant shall incorporate the guidelines into the Consultant's signed/sealed Plans and Specifications as they relate to their specific use on the Project. Detailed design of these features shall be performed by the Consultant consistent with District, industry, US Army Corps of Engineers (USACE), Florida Department of Environmental Protection (FDEP), and Florida Department of Transportation (FDOT) standards and procedures as applicable. The Consultant shall identify the design criteria, including codes, to be used for design, minimum material strengths and basic design loads. The Consultant shall identify any special requirements, including specific load conditions and deviations from national codes. Review of previous and existing designs and coordination with District staff shall be performed to ensure the proposed work is in accordance with the District's Operation and Maintenance (O&M) guidelines (as of the date of Notice to Proceed for this Work Order) for installation and operation.

Development of the Design shall include, but not be limited to, the following guidelines and standards:

- *South Florida Water Management District Engineering Design Guidelines for construction of water resource facilities (i.e., Details, Guidelines, AutoCAD Standards, and Technical Specifications) (latest edition, including updates, as provided by the District)*
- *Everglades Restoration & Capital Projects Engineering Design Criteria Memorandums (DCMs)*
- *Everglades Restoration & Capital Projects Engineering Submittal Requirements (latest edition, including updates)*
- *Comprehensive Everglades Restoration Plan (CERP) Guidance Memorandums (CGMs)*
- Applicable USACE requirements
- Applicable FDOT Standards
- Other Applicable National and Industry Design Codes

In the event of a conflict between the above Design Guidelines and Standards, the Consultant shall notify the District Project Manager to develop a resolution to the conflict.

The Consultant shall include a Design Report as part of each design submittal. This shall include a narrative that describes any significant changes to the Project since prior submittal as a result of the design progression and may also include supporting information such as figures, model results for the structure, or design analyses as appropriate.

The submittals generally shall include, but not be limited to, the following:

- Cover Sheet and Drawing Index
- General Notes, Abbreviations and Symbols
- Plans and Specifications (Civil/Site, Structural, Mechanical, Electrical, Instrumentation/Controls, Telemetry)
- Design Calculations
- Engineer's Opinion of Probable Construction Cost
- Construction Schedule
- Design Report

2.4 Billing Plan

Erdman Anthony shall invoice at the end of each fiscal period (13 four week periods per year). The invoice will include the lump sum amount for all items completed, submitted, and accepted by the SFWMD. Subconsultants shall provide an invoice for that period that includes the subconsultant's portion of those completed items. Subconsultant invoices shall be submitted to Erdman Anthony's project manager for approval and processing. Subconsultant invoices will be paid within 14 calendar days of payment of the invoice by SFWMD.

3 Quality Control Measures

The Consultant team shall have in-house engineering professionals and construction specialists not directly involved in the design of the facilities perform constructability reviews. The reviews shall focus on the construction to be performed and the potential for modification of the designs to reduce project costs without affecting quality and intended performance, allocating risk and minimizing the potential for construction claims and schedule delays. Additional attention shall be paid to coordination of various trades and components to eliminate the potential for conflicts between conduits, boxes, equipment, ladders, and the like with clear instructions and dimensions included on the plans and in the specifications. The reviews shall be performed in parallel with and documented in the required submittals for the Design Process. This Project Quality Control Plan establishes minimum guidelines for checking procedures on this Project. Subconsultant firms are to comply with the guidelines of this plan and shall follow Erdman Anthony's review process for all Project Deliverables. An update on all QA/QC activities shall be reported in the Monthly Status Reports that the Consultant submits to the District.

3.1 Quality Control Process

The Deliverables listed in Exhibit D are to receive an appropriate Quality Control Review prior to submittal to our client or regulatory agency. In addition to these deliverables,

each work element upon which subsequent work elements depend will receive a Quality Control Review before releasing the results for use. Submittals that include components from various design team members shall also receive a Coordination Review prior to the initial and final submittals.

The design team members, including the subconsultants, shall follow the Consultant's Project Quality Control Plan for the Project. A copy of the Consultant's Quality Control Plan shall be made available to the District if requested. The Consultant Quality Manager shall be charged with the responsibility of confirming that this Project Quality Control Plan has been followed.

All engineering submittals, including memoranda, reports and plans, shall undergo quality control reviews in accordance with this Project Quality Control Plan and Erdman Anthony's quality control procedures, or the subconsultant's quality control procedures. The purpose of the quality control review is to verify that the resulting design meets acceptable practice and that the documents have been properly coordinated to the satisfaction of the District. Quality control reviews shall be provided for all submittals and they shall be conducted prior to submittal to the District to allow time for incorporation of any recommended revisions.

Erdman Anthony's Consultant Quality Manager and Project Manager shall sign Exhibit C - Quality Certificate of Compliance, as required by the Everglades Restoration Engineering Submittal Requirements, which shall be submitted for each deliverable listed in Exhibit D – Deliverables Requiring a Quality Control Review to confirm that the Consultant has performed all internal quality control activities in accordance with this plan.

The Quality Review shall check to make sure that the contents of the submittal are complete and meet the requirements as stated in the Scope of Work for this Work Order. Where any components of a particular submittal are not complete, an explanation and schedule for submitting the missing components shall be provided. Where technical comments have been received by the Consultant on a previous engineering submittal, a copy of the Consultant's responses that address the comments shall be provided as part of the subsequent submittal to the District.

3.1.1 Plan and Report Reviews

The Erdman Anthony team will provide internal quality control reviews for the initial and final submittals. A coordinated checking procedure will be followed to document that the plans or reports have been reviewed and corrected as appropriate prior to submittal to the SFWMD. The key individuals in the quality control process are the following:

- Originator - the lead technical professional who signs and seals the contract documents.

- Reviewer - the design professional who performs detailed checking and also back checks for incorporation of review comments and responses. The reviewer shall be a professional with the same or better qualifications as the originator, in both technical knowledge and experience. The reviewer may be taken from the same team as the originator. It is expected and acceptable for professionals to act as the originator on some assignments, and reviewer on others. However, a person cannot serve as both originator and the reviewer for the same task, and the professional responsible for signing and sealing the document cannot serve as the reviewer.
- Quality Control Manager - the design professional who confirms that the process has been followed. [REDACTED] with Erdman Anthony, is the Quality Control Manager for this project. In this role, he will see that all documents are Quality Control Reviewed at the appropriate time. He will ensure that the appropriate reviewer for a particular discipline has reviewed all plans and documents.

The following steps will be taken:

1. Prepare Plans: Originator checks plans/reports for completeness and submits to reviewer.
2. Check Plans: Reviewer checks plans/reports and makes comments.
3. Recommend Corrections: Originator reviews comments and the corrections recommended by the reviewer. The Originator responds to the reviewer by offering explanations to the reviewer in response to the reviewer's comments and/or indicates the corrections that will be implemented.
4. Confirm that the recommended correction satisfies the comment: The reviewer reads the recommended correction or the explanations and concurs. The reviewer and the originator must agree upon all changes or corrections. Steps 3 and 4 will be repeated until all changes or corrections are agreed upon.
5. Make the correction: The support staff (originator, technician, drafter, administrative assistant, etc.) makes all changes or corrections.
6. Check the correction: The reviewer and/or the originator back checks the corrections to confirm that they have been made.
7. Verification: The quality control manager and project manager confirm that the quality control process has occurred and signs the certification.

A check set of the plans or reports shall be printed and retained in the project files. On this check set there shall be a place for the key individuals to sign and date to indicate that the intended function has been completed. The quality control signature block shall include at a minimum the following items:

Description	Signature	Date
Plans prepared by		
Plans reviewed by		
Corrections confirmed by		

The subconsultants shall perform this quality control review on their work products prior to submittal to Erdman Anthony. Subconsultants shall provide Erdman Anthony with the original or copy of each quality control reviewed document bearing distinguishable markings that identify the quality control review steps that were performed by whom and when. Subconsultants shall retain their quality control review check set in their project files as described above.

3.1.2 Correspondence

All documents distributed, including correspondence and meeting minutes shall also be quality control reviewed. The key individuals in the quality control process for correspondence are the following:

- Originator - the lead technical professional who prepares the documents.
- Reviewer - the professional or administrative assistance who performs reviews the document for clarity, readability, grammar, and spelling.

The following steps will be taken:

1. Prepare Document: Originator checks document for completeness and submits to reviewer.
2. Check Document: Reviewer checks document and makes comments.
3. Recommend Corrections: Originator reviews comments and notes corrections recommended or offers explanations to the reviewer.
4. Make the correction: The support staff (originator, technician, drafter, administrative assistant, etc.) makes all changes or corrections.
5. Check the correction: The originator or the reviewer back checks the corrections and explanations.

3.1.3 QC Manager

The QA/QC officer for this Project will be [REDACTED]. The QA/QC officer is a seasoned professional not directly involved in the preparation of the plans and specifications nor is he responsible the project management responsibilities. He has

been charged with the responsibility of the Plan's implementation and documentation of current QA/QC activities.

3.2 Construction Review

The consultant and subconsultants shall have in-house engineering professionals and construction specialists not directly involved in the design of the facilities perform constructability reviews. The reviews shall focus on the construction to be performed and the potential for modification of the designs to reduce project costs without affecting quality and intended performance, allocating risk and minimizing the potential for construction claims and schedule delays. The reviews shall be performed in parallel with the required submittals for the Design Process.

3.3 Measuring for Quality

The evaluations made by the quality control manager and the project manager will use, as a minimum, the following items:

3.3.1 Quality Manager Evaluation:

- 1) Proper documents furnished to the QC Reviewer?
- 2) QC review made and properly documented?
- 3) Originator and Reviewer concurred?
- 4) Changes made and then confirmed by Reviewer?
- 5) Complete QC documentation furnished to PM?
- 6) QC review completed on schedule?

3.3.2 Project Manager Evaluation:

- 1) QC documentation is complete and correct?
- 2) QC Procedure followed and documented?
- 3) Contract requirements met?
- 4) Project goals met?
- 5) Subconsultant QC Plan adequate and followed?

Exhibit A – Project Deliverables

Deliverable	Deliverable Description	Due Date
1.1	Project Control/Kickoff Meeting Summary – Kickoff Meeting Summary	11/15/17
1.2.1	Progress Meeting Minutes (9)	Monthly
1.2.2	Monthly Progress Report (9) Reports	Monthly
1.3	Project Technical and Stakeholder Meetings Technical (9) Meetings/Summaries	Various
1.4	DRT Meeting Summary	2/23/18
2.1.1	Preliminary Geotechnical Analysis of Embankments Data and Reports	12/19/17
2.1.2	Final Geotechnical Analysis of Embankments Data and Reports	2/17/18
2.2	Seepage Analysis and Reports	12/19/17
2.3	Erosion Protection Analysis and Reports	12/19/17
2.4	Water Control Structure Foundations Data and Reports	12/19/17
3.1.1	Field Data Collection and Preliminary Survey Drawing Set	12/04/18
3.1.2	Electronically Signed and Sealed Topographic Survey	1/18/18
3.2.1	Alternative Site Layouts	11/09/17
3.2.2	Preliminary Design Submittal	12/22/17
3.2.3	Technical Review Comments and Responses	02/02/18
3.2.4	Presentation at Technical Review Briefing	2/02/18
3.3.1	Final Plans and Specifications Submittal	3/29/18
3.3.2	Technical Review Comments and Responses	5/10/18
3.3.3	Presentation at Technical Review Briefing	5/10/18
3.4.1	Corrected Final / RTA Submittal	5/31/18
3.4.2	Summary of Final Comment Resolution	5/31/18

Exhibit B – Contact List for Design Team

Client:

Company: South Florida Water Management District

Contact: [REDACTED]

3301 Gun Club Road

West Palm Beach, FL 33406

Phone: [REDACTED]

Email: [REDACTED]

Civil Engineering Consultant and Project Manager:

Company: Erdman Anthony

Contact: [REDACTED]

5405 Okeechobee Boulevard, Suite 200

Royal Palm Beach, FL 33417

Phone: [REDACTED]

Email: [REDACTED]

Mechanical Consultant:

Company Erdman Anthony

Contact: [REDACTED]

145 Culver Road, #200

Rochester, NY 14620

Phone: [REDACTED]

Email: [REDACTED]

Structural Consultant:

Company: Erdman Anthony

Contact: [REDACTED]

145 Culver Road, #200

Rochester, NY 14620

Phone: [REDACTED]

Email: [REDACTED]

Geotechnical Engineering Consultant:

Company: Radise International

Contact: [REDACTED]

4152 West Blue Heron Blvd., Suite 1114

Riviera Beach, FL 33404

Phone: [REDACTED]

Fax: [REDACTED]

Email: [REDACTED]

Electrical Consultant:

Company: Smith Engineering Consultants, Inc.

Contact: [REDACTED]

2161 Palm Beach Lakes Blvd., Suite 312

West Palm Beach, FL 33409

Phone: [REDACTED]

E-Mail: [REDACTED]

Exhibit C - Quality Certificate of Compliance



SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Quality Certificate of Compliance

Project Name	Contract No./Work Order No.	Date
Deliverable Description		

_____ has completed preparation of the above referenced
 Consultant Name

deliverable and herein submits it to the South Florida Water Management District (SFWMD) in accordance with the requirements of the referenced Work Order. It has been verified that this submittal includes all required components of the deliverable. Where required components are not submitted, an explanation and schedule for submitting the missing component(s) has been provided. Notice is hereby given that all quality control activities, appropriate to the level of risk and complexity inherent in the Project, have been completed. Compliance with established procedures as documented in the Project's Quality Control Plan submitted to the SFWMD has been verified.

This certification in no way relieves/replaces/changes/impacts/mitigates the contractual requirements to follow the consultant's own Quality Assurance/Quality Control (QA/QC) processes and procedures.

Consultant Quality Manager (Print)	Consultant Quality Manager (Signature)	Date
Consultant Project Manager (Print)	Consultant Project Manager (Signature)	Date

Exhibit D – Deliverables Requiring a Quality Control Review and Certificate of Compliance

- Geotechnical Reports
- Survey
- Preliminary Design Submittal
- Final Plans and Specifications
- Corrected Final / RTA Submittal