



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

CESAD-RBT

19 FEB 2016

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT

SUBJECT: Approval of the Review Plan for Section 408 Permission Package for S-169 Structure Relocation and C-20 Canal Improvements, Glades and Hendry Counties, Florida

1. References:

- a. Memorandum, CESAJ-EN-Q, 13 January 2016, CESAJ-EN Approval of Review Plan for Section 408 Permission Package for S-169 Structure Relocation and C-20 Canal Improvements, Glades and Hendry Counties, Florida (Encl).
- b. EC 1165-2-216, Policy and Procedural Guidance for Processing Request to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408, 31 July 2014.
- c. EC 1165-2-214, Civil Works Review, 15 December 2012.

2. The enclosed Review Plan for the S-169 Structure Relocation and C-20 Canal Improvements, Section 408 Permission Package, prepared by the South Florida Water Management District, reviewed by the Jacksonville District and submitted for approval by reference 1.a, has been reviewed by this office and is approved in accordance with references 1.b and 1.c above.

3. We concur with the conclusion in the Review Plan and the District Chief of Engineering that a Type II Independent External Peer Review (IEPR) is not required on this structure relocation canal improvement project. The primary basis for our concurrence is that the failure or lose of the features associated with this structure relocation canal improvement project do not pose a significant threat to human life.

4. The District should take steps to post the Review Plan to its web site and provide a link to CESAD-RBT. Before posting to the web site, the names of Corps/Army employees should be removed. Subsequent significant changes to this Review Plan, should they become necessary, will require new written approval from this office.

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

Encl


C. DAVID TURNER
Brigadier General, USA
Commanding

CF:
[REDACTED]



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
701 San Marco Blvd.
JACKSONVILLE, FLORIDA 32207

REPLY TO
ATTENTION OF

CESAJ-EN-Q

13 January 2016

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

SUBJECT: Approval of Review Plan for Section 408 Permission Package for S-169 Structure Relocation and C-20 Canal Improvements, Glades and Hendry Counties, Florida

1. References.

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

b. EC 1165-2-216, Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408, 31 Jul 14

2. CESAJ-EN has reviewed the Review Plan for the Section 408 Permission Package for S-169 Structure Relocation and C-20 Canal Improvements (dated December 2015) and concurs that this Review Plan provides for an adequate level of review and complies with the current review policy requirements outlined in EC 1165-2-214 and EC 1165-2-216.

3. This Review Plan was prepared by the South Florida Water Management District (SFWMD), reviewed by Jacksonville District and the South Atlantic Division, and all review comments have been satisfactorily resolved.

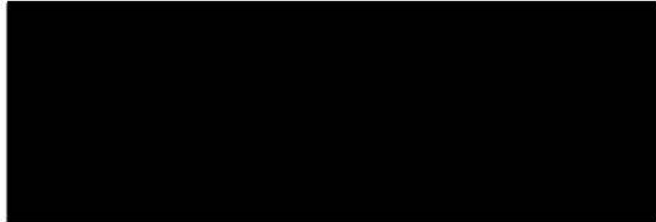
4. The design for this project is under development by the SFWMD and their A-E who will perform quality checks on all products they developed. This RP outlines three levels of review: Quality Assurance by SFWMD and Quality Control by their A-E, a Pre-Coordination Review, and a Jacksonville District-led Agency Technical Review. 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.

CESAJ-EN-Q

SUBJECT: Approval of Review Plan for Section 408 Permission Package for S-169 Structure Relocation and C-20 Canal Improvements, Glades and Hendry Counties, Florida

5. CESAJ-EN endorses this document to be approved by the MSC Commander. Upon approval of the RP, 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. It is my understanding that non-substantive changes to this Review Plan, should they become necessary, are authorized by CESAD.

FOR THE COMMANDER:



Encl

PROJECT REVIEW PLAN

For Review of

Section 408 Permission Package

For

S-169 Structure Relocation and C-20 Canal Improvements

Glades and Hendry Counties, Florida

January 2016

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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ATTACHMENT A - Approved Review Plan Revisions

ATTACHMENT B - Partial List of Acronyms and Abbreviations

ATTACHMENT C - Quality Control Plan for SFMWD Work Products

ATTACHMENT D - SFWMD Engineering Design and Review Process

1. PURPOSE AND REQUIREMENTS

a. Purpose

This Review Plan defines the scope and level of review activities for the 33 USC 408 (Section 408) Permission Package to be submitted for the S-169 Structure Relocation Project (Project), Hendry and Glades Counties, Florida. The Project features include construction of a new culvert structure, removal of the existing structure from service, and dredging and armoring of the C-20 Canal, from the new structure to the S-4 Pump Station. Design and construction of the Project is being performed by the non-federal sponsor, the South Florida Water Management District (SFWMD). The design documents to be reviewed are Plans and Specifications (P&S) and Design Documentation Report (DDR) prepared by the non-federal sponsor. 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) effort by their A-E, and a Preliminary and Final U.S. Army Corps of Engineers (USACE) Technical Review. This USACE Technical Review, which is discussed below, is part of the coordination to aid in identifying potential issues with the Section 408 Package. A District-led Agency Technical Review (ATR), which is discussed below, will be performed on the Section 408 Package to determine if requirements set forth in this EC 1165-2-216 have been met. Also as discussed below, an Independent External Peer Review (IEPR) is not recommended on this Section 408 design and 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). EC 1165-2-216, "Policy and Procedural Guidance for Processing Requests to Alter US Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408", 31 July 2014
- (5). SFWMD Everglades Restoration and Capital Projects Engineering Submittal Requirements, 05 November 2009

c. Requirements

This Review Plan was developed in accordance with EC 1165-2-216. The EC provides the policy and procedural guidance for processing requests by private, public, tribal, or other federal entities, to make alterations to, or temporarily or permanently occupy or use, any US Army Corps of Engineers federally authorized civil works project pursuant to Section 408. Proposed alterations must not be injurious to the public interest or affect the USACE project's ability to meet its authorized purpose.

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, RMO, 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 RMO and home MSC.

2. PROJECT INFORMATION AND BACKGROUND

a. S-169 Structure Relocation

Structure S-169 is located adjacent to the Herbert Hoover Dike (HHD) within the C-20 Canal right-of-way, on the southwest side of Lake Okeechobee, in Clewiston, Hendry County, Florida. S-169 is a component of a regional network of water management infrastructure that provides both flood protection and water supply benefits to the S-4 basin. The existing S-169 structure is a three barreled, corrugated metal pipe culvert operated using sluice gates at the southeast ends of the culverts. The existing structure was designed for a capacity of 625 cubic feet per second (cfs); however, the actual flows currently are up to approximately 1,090 cfs, resulting in the existing structure being significantly under-capacity for a 25-year storm event. In addition, the existing corrugated metal pipes have incurred some structural loss due to corrosion.

The project proposes to move Structure S-169 westward in order to better meet irrigation demands to the west. Figure 1 shows the existing and proposed locations of S-169 and other nearby structures. The capacity of the new structure will also be increased in order to accommodate all inflows to the Clewiston Canal from existing private landowner pump stations under design flood conditions. The proposed replacement structure is a 4-bay concrete box culvert with automated stainless steel gates. Figure 2 shows the proposed site footprint. Temporary flow bypass capacity will be provided during construction of the proposed S-169 structure. The existing structure will not be taken out of service until the new structure is fully operational.

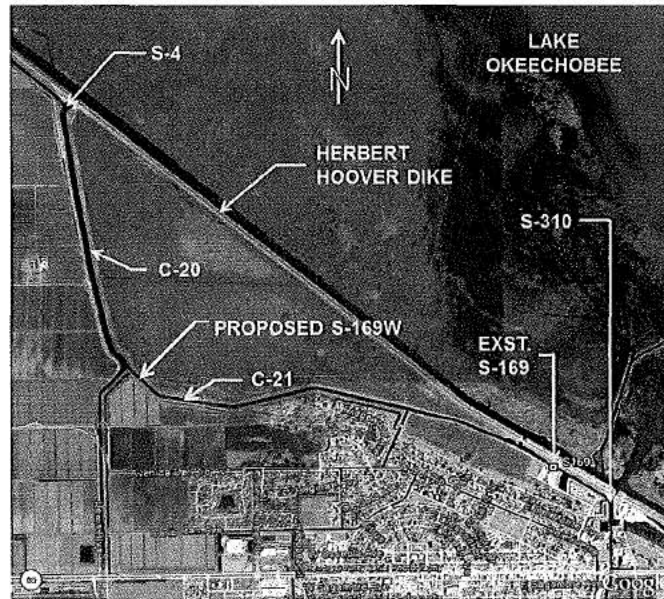


Figure 1: Aerial Map of Project Area

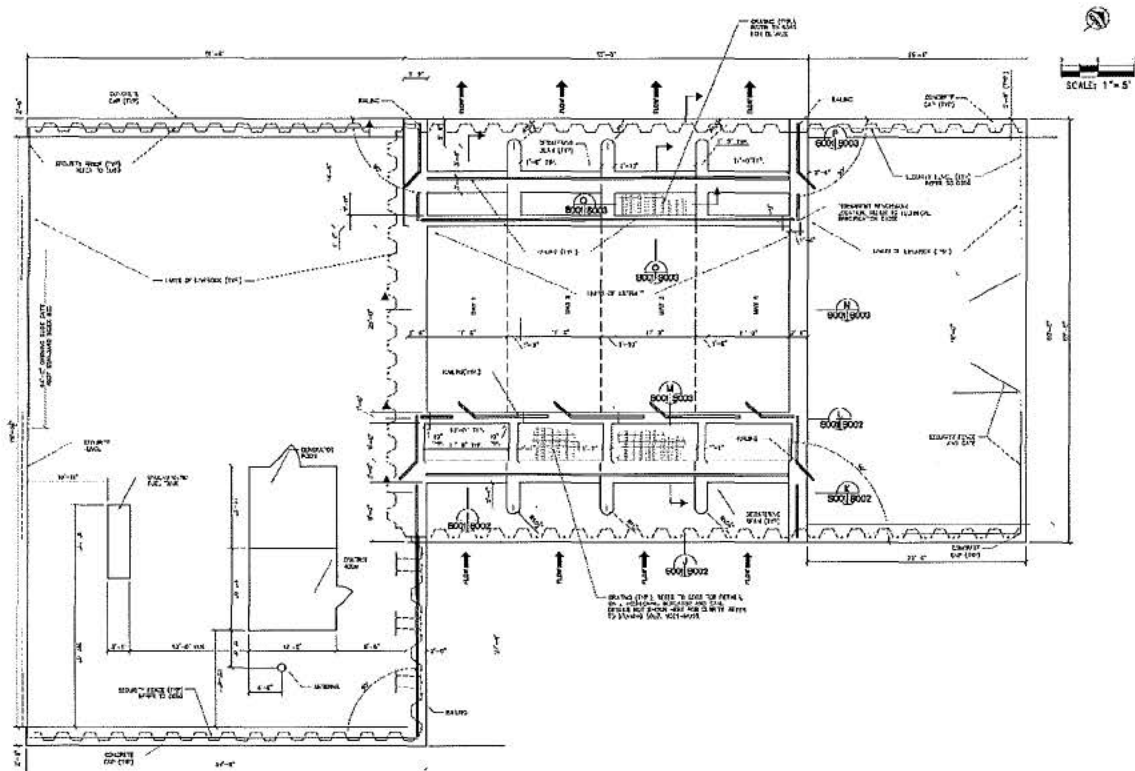


Figure 2: Proposed S-169W Site Footprint

b. C-20 and C-21 Canal Improvements

Soil borings and review of the existing cross sections indicate that Canal C-20 has experienced a significant amount of erosion and siltation. The project proposes to dredge Canal C-20 to its original excavated elevation of -8.00 feet (NGVD29), from Pump Station S-4 to the C-20/C-21 confluence, just downstream of the relocated S-169 structure. Since the existing C-21 canal bottom is approximately the same elevation as originally designed (+2 ft. NGVD29), there will be no dredging of C-21.

Canal C-20 will be armored with rubble riprap to protect the bank from erosion due to rapid drawdown and due to wave action from hurricane winds as experienced during Hurricane Wilma in 2005. The canal cross section just upstream of Pump Station S-4 and downstream of the relocated S-169 will be armored to protect the canal banks and bottom from erosive velocities. No improvements will be made to Canal C-21.

c. Public Participation

SFWMD will coordinate with the City of Clewiston and other affected parties regarding impacts of this effort to local activities. 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.

d. In-Kind-Contributions by Project Sponsor

This project is being conducted entirely by the SFWMD as the Local Sponsor for the Central and Southern Florida (C&SF) System. The work is being performed at no cost to the Federal Government.

e. 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 control reviews by the non-federal sponsor as outlined in the SFWMD Quality Control Plan (Attachment C) and the SFWMD Design and Engineering Review Process (Attachment D).

4. PRE-COORDINATION REVIEW

a. General

The P&S and DDR produced by the SFWMD 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 activities has been requested by the SFWMD and will be performed by USACE personnel at the pre-coordination phase of the Section 408 request process.

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, 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.

Initial coordination should also consist of a meeting to discuss the proposed project and inform the requester of any known issues that would impact their Section 408 proposal.

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 close of all comments. USACE shall prepare a report that consolidates the results of the USACE review and documents that all comments have been closed or identify any open comments. SAD shall receive a copy of the summary report for its information.

5. DISTRICT-LED AGENCY TECHNICAL REVIEW

a. General

For the purposes of Section 408, a District-led ATR is conducted in order to determine if the requirements set forth in EC 1165-2-216 have been met and assists USACE review team members in the formulation and agreement of the determinations described in EC 1165-2-216. The District-led ATR will be conducted after submission of the Section 408 Permission Package by SFWMD. USACE team members conducting the District-led ATR may be from within CESAJ. If lacking the appropriate expertise, CESAJ may supplement their staff with outside subject matter experts through appropriate communities of practice, centers of expertise, or other offices. Review teams shall be comprised of reviewers with the appropriate independence and expertise to conduct a comprehensive review in a manner commensurate

with the complexity of the Section 408 proposal. The District-led ATR team will make the following determinations:

- **Impair the Usefulness of the Project Determination.** The objective of this determination is to ensure that the proposed alteration will not limit the ability of the project to function as authorized and will not compromise or change any authorized project conditions, purposes or outputs. All appropriate technical analyses including geotechnical, structural, hydraulic and hydrologic, real estate, and operations and maintenance requirements, must be conducted and the technical adequacy of the design must be reviewed. If at any time it is concluded that the usefulness of the authorized project will be negatively impacted, any further evaluation under 33 USC 408 should be terminated.
- **Injurious to the Public Interest Determination.** Proposed alterations will be reviewed to determine the probable impacts, including cumulative impacts, on the public interest. Evaluation of the probable impacts that the proposed alteration to the USACE project may have on the public interest requires a careful weighing of all those factors that are relevant in each particular case. The benefits that reasonably may be expected to accrue from the proposal must be compared against its reasonably foreseeable detriments. The decision whether to approve an alteration will be determined by the consideration of whether benefits are commensurate with risks. If the potential detriments are found to outweigh the potential benefits, then it may be determined that the proposed alteration is injurious to the public interest. This determination is not the same as the "contrary to the public interest determination" that is undertaken pursuant to Sections 10/404/103. Factors that may be relevant to the public interest depend upon the type of USACE project being altered and may include, but are not limited to, such things as conservation, economic development, historic properties, cultural resources, environmental impacts, water supply, water quality, flood hazards, floodplains, residual risk, induced damages, navigation, shore erosion or accretion, and recreation. This evaluation should consider information received from the interested parties, including tribes, agencies, and the public.
- **Legal and Policy Compliance Determination.** A determination will be made as to whether the proposal meets all legal and policy requirements. CESAJ Office of Counsel concurrence is required. The compliance determination for any Section 10/404/103 permit decision associated with the proposed alteration is separate from and will not be included in this compliance determination.

b. Documentation

After reviewing the documents included in the Section 408 Permission Package, the review team members shall utilize DrCheckssm to capture team member input for the determinations described in EC 1165-2-216. If necessary, a separate DrCheckssm review may also be used to consolidate any requests for additional information (RAI) concerning the Section 408 Permission Package. These RAIs will be forwarded to SFWMD for response.

6. SUMMARY OF FINDINGS

Upon completion of the District-Led ATR, demonstration of environmental compliance, and receipt of responses to RAIs from SFWMD, USACE will develop a Summary of Findings to summarize the district rationale and conclusions for recommending approval or denial of the 408 request. The Summary of Findings will serve as the basis for the final decision on the

approval/disapproval of the proposed alteration. The Summary of Findings will be signed by the Jacksonville District Commander and contain the following, if applicable:

- Summary of rationale and conclusions for recommending approval or denial;
- Written request;
- A physical and functional description of the existing project, including a map;
- Project history and authorization;
- Impact to the usefulness of the USACE project determination;
- Injurious to the public interest determination;
- Policy Compliance certification;
- Certification of Legal Sufficiency from District Office of Counsel;
- Certification by the Chief of the District Real Estate Division that the real estate documentation is adequate;
- A description of any related, ongoing USACE studies (if applicable), including how the proposed alteration may impact those studies;
- Summary of any changes to the O&M manual. If the district has determined that USACE would assume O&M responsibilities as part of its responsibilities for the USACE project, include the rationale and any anticipated increase in USACE O&M costs.
- Summary of any changes to a project partnership agreement (PPA) or local cooperation agreement (if applicable);
- Applicable environmental compliance documentation including but not limited to NEPA documentation, Endangered Species Act (ESA) documentation, and other necessary documentation;
- Finding of No Significant Impact (FONSI) or Record of Decision (ROD) (These will be signed concurrently with the Section 408 decision. If HQUSACE approval is required, these will be draft and will be signed by the Director of Civil Works);
- Summary of the acceptance and use of funds pursuant to Section 214 if applicable;
- Any additional final conclusions or information, including any associated controversial issues.

7. 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.

Per EC 1165-2-214 and EC 1165-2-216, because this Section 408 request is 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) Does it include any design (structural, mechanical, hydraulic, etc)?
Response: Yes, the project includes design of a concrete control structure with associated civil, mechanical and electrical works, as well as canal dredging and bank stabilization.
- 2) Does it evaluate alternatives?
Response: No. The alternatives had previously been vetted by the SFWMD and final design features are already determined.
- 3) Does it include a recommendation?
Response: No. The projects' features are already determined and are beyond the recommendation phase.
- 4) Does it have a formal cost estimate?
Response: Yes. There is a planning level cost estimate based on SFWMD guidelines and DCM-7. However, the total project cost will be paid for with State funds out of the SFWMD's budget and other non-federal sources.
- 5) Does it have or will it require a NEPA document?
Response: SFWMD permitting staff believes that this project will fall under Categorical Exclusion, however if any additional NEPA documents are required, they will be coordinated with the USACE's Regulatory Branch.
- 6) Does it impact a structure or feature of a structure whose performance involves potential life safety risks?
Response: The project is a relocation of an existing structure. The purpose of the structure is to provide both flood protection and water supply for the area. The new structure operations will not vary significantly from the existing structure. In the unlikely event of a structure failure, there is a risk of minor economic losses, but no significant threat to human life.
- 7) What are the consequences of non-performance?
Response: In the event of non-performance, there will be minimal impact to the operation of the system. For stages under 15.5' NGVD in Lake Okeechobee, the gates are either fully closed or fully open, depending on water supply needs, and do not require operation on a regular or intermittent schedule. When stages in Lake Okeechobee are above 15.5' NGVD, SFWMD staff at the Clewiston Field station are in close proximity to the structure and can manually operate the gates as needed utilizing existing SFWMD equipment until the structure can be repaired to full performance capabilities.

- 8) Does it support a significant investment of public monies?
Response: Yes. The total project cost will be paid for with State funds out of the SFWMD's budget and other non-federal sources.
- 9) Does it support a budget request?
Response: No Federal funds are being requested, so a budget request out of the Federal budget is not anticipated.
- 10) Does it change the operation of the project?
Response: The operational stages of the new structure will remain unchanged from the existing stages. There will be some minor impact to the existing USACE culverts as the structure will be relocated to the opposite side of the USACE culverts. This will cause some changes to the stages seen by the USACE culverts, but those changes are currently being accounted for in the construction of new USACE culverts under separate contract by the USACE.
- 11) Does it involve excavation, subsurface investigations (drilling or sampling or both), or placement of soil?
Response: Yes, the project includes maintenance dredging, minor excavation for construction of the new structure, and some fill. Excavation and backfill will be constructed consistent with previously approved specifications and traditional construction methods.
- 12) Does it affect any special features, such as cultural resources, historic properties, survey markers, etc, that should be protected or avoided?
Response: No, there are no special features that will be impacted by this work.
- 13) Does it involve activities that trigger regulatory permitting such as Section 404 or stormwater/NPDES related actions?
Response: Yes, the project will require Section 404 and NPDES approval.
- 14) Does it involve activities that could potentially generate hazardous wastes and/or disposal of materials such as lead based paints or asbestos?
Response: No activities are expected to generate or require disposal of hazardous materials; however, dredged materials will be tested, and if they are found to be hazardous they will be disposed in accordance with local, state, and federal guidelines.
- 15) Does it reference use of or reliance on manufacturers' engineers and specifications for items such as prefabricated buildings, playground equipment, etc?
Response: There is a possibility of requirements for manufacturers' engineers to be utilized for some minor components. These items include, but are not limited to, prefabricated control buildings and stainless steel gates. These specifications and requirements are consistent with normal construction and design activities used on previous SFWMD and USACE projects.
- 16) Does it reference reliance on local authorities for inspection/certification of utility systems like wastewater, stormwater, electrical, etc?
Response: SFWMD is working with Hendry County building department officials to obtain the appropriate permits.
- 17) Is there or is there expected to be any controversy surrounding the Federal action associated with the work product?

Response: No. The work proposed is consistent with other similar projects that have been built by the SFWMD on public lands.

18) The failure of the project would pose a significant threat to human life.

Response: The project is a relocation of an existing structure. The purpose of the structure is to provide both flood protection and water supply for the area. The new structure operations will not vary significantly from the existing structure. In the unlikely event of a structure failure, there is a risk of minor economic losses, but no significant threat to human life.

19) The project involves the use of innovative materials or techniques.

Response: This project will utilize methods and procedures used by the Corps of Engineers and the project sponsor on other similar works.

20) The project design lacks redundancy.

Response: The projects do not require the addition of redundant project features or redundancy design considerations.

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

Response: This projects construction activities do not have unique sequencing or a reduced or overlapping design. The installation sequence and schedule has been used successfully by the SFWMD on other similar works.

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

8. MODEL CERTIFICATION AND APPROVAL

The following models were utilized by SFWMD in the design of this project:

- HEC-RAS 4.1: The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional unsteady flow river hydraulics calculations. The program was utilized to compute the peak stage profiles for the design flow condition of the C-20 and C-21 canals (steady state analysis).
- SLOPE/W and SEEP/W (GeoStudio 2007 Suite, Version 7.20, Build 5033): SEEP/W is a two-dimensional finite element program that performs seepage analyses for hydrogeologic models and determines seepage paths, seepage flow rates, phreatic surfaces, pore water pressures, and exit gradients for steady state and transient state seepage problems. SLOPE/W performs a limit-equilibrium analysis using a method-of-slices search routine to look for the critical failure surface, which is the surface with the minimum factor of safety.
- CWALSHT, 1990: This model was developed by the USACE for the design and analysis of sheetpile walls using classical methods.
- Computational Fluid Dynamics (CFD) Analysis: This model will determine the near bottom velocities in the C-20 Canal during S-4 pumping operations and during flows through the relocated S-169 Structure. The results will be used in determining the optimum operation of the S-4 pump station, the depth and lateral extent of dredging,

and/or of the need for a silt basin and the lateral extent of armoring downstream of the relocated S-169 structure.

- FDOT Box Culvert Program: This program was used for design of the structure slab.
- Microsoft Excel: This program was used for rip rap design calculations.

This project does not use any engineering models that have not been approved for use by USACE.

9. PROJECT DELIVERY TEAM DISCIPLINES

Discipline/Expertise
Project Manager
Cost Estimation
Procurement
Survey
Civil Site Design
Mechanical Engineering
Electrical Engineering
Structural Engineering
Environmental Engineering
Hydrogeology & Geology
Geotechnical Engineering
Hydraulic & Hydrologic Engineering
Water Mgt (Project Operations Manual)
NEPA Compliance
Real Estate
Field Stations – Operation and Maintenance

10. SCHEDULE AND COST

a. Schedule.

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

<u>S-169 Relocation Review Schedule</u>	<u>Start</u>	<u>Finish</u>
SFWMD Preliminary Design Review	11/18/2015	12/11/2015
SFWMD Preliminary Design Submittal Complete	11/18/2015	11/18/2015
SFWMD QA Review	11/19/2015	12/10/2015
SFWMD Preliminary Design Submittal to USACE	12/11/2015	12/11/2015
Preliminary USACE Technical Review	12/14/2015	2/19/2016
USACE Review	12/14/2015	1/7/2016
USACE Provides Preliminary Comments	1/8/2016	1/8/2016
SFWMD Provides Responses to Comments	1/11/2016	1/29/2016
USACE Backcheck of Comments	2/1/2016	2/19/2016
SFWMD Final Design Review	6/8/2016	7/1/2016

SFWMD Final Design Submittal Complete	6/8/2016	6/8/2016
SFWMD QA Review	6/9/2016	6/30/2016
SFWMD Section 408 Permission Submittal	7/1/2016	7/1/2016
Section 408 Permission Submittal Review	7/5/2016	9/30/2016
USACE Final Technical Review/District-led ATR	7/5/2016	7/25/2016
USACE Provides Technical Review Comments	7/26/2016	7/26/2016
USACE Provides RAIs from District-led ATR	7/26/2016	7/26/2016
SFWMD Provides Responses to Comments & RAIs	7/27/2016	8/12/2016
USACE Backcheck of Comments & RAIs	8/15/2016	8/26/2016
USACE Preparation of Summary of Findings	8/29/2016	9/9/2016
SFWMD submits Corrected Final P&S and DDR	9/26/2016	9/26/2016
Routing of Summary of Findings for Approval	9/12/2016	9/23/2016
Issuance of 408 Permit Package Determination	9/30/2016	9/30/2016

b. Review Cost.

The estimated cost for the USACE preliminary and final technical reviews and the District-led ATR is \$70,000.

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
EA	Environmental Assessment
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

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

ATTACHMENT C: SFWMD PROJECT QUALITY CONTROL PLAN

The SFWMD currently implements a rigorous Design Review process utilizing the DrChecks system to capture all comments from various disciplines and enable proper closure of technical issues. At the beginning of the project planning or design phase, the SFWMD Project Manager will either establish or reconfirm with the SFWMD's Project Development Section what will be the composition of the Design Review Team (DRT) for the project. The DRT may consist of representatives from the SFWMD, USACE, 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 SFWMD staff.

As part of the Design Work Orders to outside consultants or in accordance with internal Design Section policy, each deliverable shall be reviewed by the Designer's Quality Control (QC) Officer prior to submittal for the DRT review. The QC officer shall be someone not directly involved in the preparation of the plans and specifications nor the project management responsibilities. The Consultant or SFWMD Project QC officer shall be charged with the responsibility of the Plan's implementation and documentation of current QC activities. The Design Submittal shall include a signed copy of the SFWMD's Quality Certificate of Compliance (see example on next page) with each Deliverable signifying that the internal QC was followed.

For this project, SFWMD will utilize internal staff for design and technical review. SFWMD staff performs review activities associated with electrical, instrumentation and control (I&C), geotechnical, hydraulics, hydrology, HVAC, plumbing, fire, mechanical, and structural disciplines, checking deliverables for compliance with SFWMD engineering guidelines, level of risk associated with the work, and operations and maintenance considerations. Project modeling tasks and deliverables will be reviewed and coordinated by the SFWMD's Project Development Section and the Hydrologic and Environmental Systems Modeling Section. The primary objectives of the DRT are to confirm that:

1. The engineering concepts are valid.
2. The recommended plan is feasible and will be safe and functional.
3. A reasonable opinion of probable construction cost estimate has been developed in accordance with Operation, Maintenance and Construction Engineering Bureau Procedures for Development of Opinions of Construction Costs (see Design Criteria Memorandum 7).
4. The approach to the engineering analysis is sound.
5. The submittal complies with SFWMD engineering submittal requirements.
6. The submittal complies with accepted engineering practice within the SFWMD and applicable Operation, Maintenance and Construction Engineering Bureau Design Criteria Memoranda (DCM) and Comprehensive Everglades Restoration Plan (CERP) Guidance Memoranda (CGM).



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

The reviews performed by the DRT shall be based on:

- SFWMD Standards for Construction of Water Resource Facilities – Design Details and Design Guidelines
- SFWMD Major Pumping Station Engineering Guidelines
- Operation, Maintenance and Construction Engineering Bureau Design Criteria Memoranda
- Operation, Maintenance and Construction Engineering 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 SFWMD 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 Operation, Maintenance and Construction Engineering Bureau Submittal Requirements).

Following completion of the Technical Review process, a Technical Review Briefing (TRB) is conducted where the project submittal is summarized to SFWMD Management staff. The SFWMD Project Manager presents the project, including any changes from the previous submittal, results of the Technical Review and how issues were resolved, cost estimate and estimated construction schedule, procurement strategy and planned path forward. Once all reviews TRBs are completed, a Certificate of Technical Review Completion form is prepared and signed by the appropriate parties signifying that the reviews were done appropriate to the level of risk and complexity inherent in the Project. During the Technical Review, compliance with established policy, principles and procedures, utilizing justified and valid assumptions, were verified including a review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; constructability and operability; reasonableness of the results, including whether the product meets the customer’s needs; and consistency with law and existing SFWMD and USACE policies. The Certificate includes a statement that the Technical Review was accomplished by an independent team made up of personnel from the SFWMD, USACE, other agencies and/or external consultant staff.

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.