DEPARTMENT OF THE **ARMY**
U.S. ARMY CORPS OF ENGINEERS, FORT WORTH DISTRICT
P.O. BOX 17300
FORT WORTH, TX 76102-0300

25 NOV 2019

CESWF-PM-C

MEMORANDUM FOR Chief, Business Technical Division, U.S. Army Corps of Engineers, Southwestern Division, (CESWD-RBT/Mr. Zalesak), 1100 Commerce Street, Dallas, TX 75242-1347

SUBJECT: Dallas Floodway and Dallas Floodway Extension, Dallas, TX Flood Risk Management Preconstruction Engineering and Design and Construction Phases Review Plan.

1. References:

a. Dallas Floodway and Dallas Floodway Extension, Dallas, TX Flood Risk Management Preconstruction Engineering and Design and Construction Phases Review Plan.

b. Engineering Circular 1165-2-217, Water Resources Policies and Authorities, Review Policy for Civil Works, 20 February 2018.

2. Enclosed for your review and approval is the Dallas Floodway and Dallas Floodway Extension, Dallas, TX Flood Risk Management Preconstruction Engineering and Design and Construction Phases Review Plan. The Review Plan was developed in accordance with Engineering Circular 1165-2-217.

3. Detailed information desired by your staff can be obtained by contacting the Program Manager, Gail Hicks at 817-886-1900 or email:=ai=l.=s'-'-.h.:..:...:ic=-k=s===::..:..:::;;i--:-:-:-:...i...:.-.:. m=il.

Encl

KENNETH N. R E D, PMP
Colonel, EN
Commanding

US Army Corps of Engineers®

Prepared by:

Fort Worth District

Southwestern Division

Dallas Floodway and Dallas Floodway Extension
Dallas, TX
Flood Risk Management Preconstruction Engineering and Design (PED) and Construction Phases Review Plan
West Levee – #3005000006 East Levee – #3005000002

PREPARED BY:

Gail Hicks

Gail S. Hicks, PMP
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ENDORSED BY:

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David E. Carlson, P.E
Chief, Eastern Division
USACE, Risk Management Center

APPROVED BY:

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Pete G. Perez, P.E.
Director, Programs Directorate

MSC Approval Date: Pending

Last Revision Date: None (not approved yet by MSC)

Section 1
Introduction

1.1 Purpose

This Review Plan (RP) includes the Dallas Floodway (DF, P2 #468759) and Dallas Floodway Extension (DFE, P2 #106680 and #476460) since the two projects will operate as one Flood Risk Management system once constructed. This RP will help ensure a quality-engineering project is developed by the U. S. Army Corps of Engineers in accordance with EC 1165-2-217, “Review Policy for Civil Works.” As part of the Project Management Plan, this RP establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products, creates a value added process, and describes the scope of review for the current phase of work. The EC outlines five general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Biddability, Constructability, Operability, Environmental, and Sustainability (BCOES) Review, Safety Assurance Review (SAR), and Policy and Legal Compliance Review. This RP will be provided to Project Delivery Team (PDT), DQC, ATR, BCOES, and SAR Teams. The technical review efforts addressed in this RP, DQC and ATR are to augment and complement the policy review processes. The Fort Worth District Chief of Engineering has assessed that the life safety risk of the two projects is significant; therefore, a Type II Independent External Peer Review (IEPR)/SAR will be required (see Paragraph 5.1).

1.2 References

The latest edition of the following should be used:

- EC 1165-2-217, Review Policy For Civil Works
- ECB 2019-15, Interim Approach for Risk-Informed Designs for Dam and Levee Projects
- ECB 2018-11, Control System Cyber Security Coordination Requirement
- EM 1110-1-1802, Geophysical Exploration for Engineering and Environmental Investigations
- EM 1110-1-1804, Engineering and Design - Geotechnical Investigations
- EM 1110-1-2908, Engineering and Design - Rock Foundations
- EM 1110-2-6054, Inspection, Evaluation and Repair of Hydraulic Steel Structures
- EM 1110-2-1413, Hydrologic Analysis of Interior Areas
- EM 1110-2-1416, River Hydraulics
- EM 1110-2-1601, Hydraulic Design of Flood Control Channels
- EM 1110-2-1901, Engineering and Design - Seepage Analysis and Control for Dams
- EM 1110-2-1902, Engineering and Design - Slope Stability
- EM 1110-2-1906, Laboratory Soils Testing

- EM 1110-2-1911, Engineering and Design - Construction Control for Earth and Rock-Fill Dams
- EM 1110-2-1913, Engineering and Design - Design and Construction of Levees
- EM 1110-2-2000, Engineering and Design - Standard Practice for Concrete for Civil Works Structures
- EM 1110-2-2002, Evaluation and Repair of Concrete Structures
- EM 1110-2-2006, Engineering and Design - Roller-Compacted Concrete
- EM 1110-2-2100, Engineering and Design - Stability Analysis of Concrete Structures
- EM 1110-2-2102, Waterstops and Other Preformed Joint Materials for Civil Works Structures
- EM 1110-2-2104, Engineering and Design - Strength Design for Reinforced-Concrete Hydraulic Structures
- EM 1110-2-2105, Engineering and Design - Design of Hydraulic Steel Structures
- EM 1110-2-2301, Test Quarries and Test Fills
- EM 1110-2-2302, Engineering and Design - Construction with Large Stone
- EM 1110-2-2502, Engineering and Design - Retaining and Flood Walls
- EM 1110-2-2504, Engineering and Design - Design of Sheet Pile Walls
- EM 1110-2-2701, Engineering and Design - Vertical Lift Gates
- EM 1110-2-2901, Engineering and Design - Tunnels and Shafts in Rock
- EM 1110-2-2902, Engineering and Design - Conduits, Culverts, and Pipes
- EM 1110-2-2906, Engineering and Design - Design of Pile Foundations
- EM 1110-2-3105, Mechanical and Electrical Design of Pumping Stations
- EM 1110-2-3600, Engineering and Design - Management of Water Control Systems
- EM 1110-2-4300, Instrumentation for Concrete Structures
- EM 1110-2-6051, Engineering and Design - Time-History Dynamic Analysis of Concrete Hydraulic Structures
- EM 1110-2-6053, Engineering and Design - Earthquake Design and Evaluation of Concrete Hydraulic Structures
- EM 385-1-1, Safety and Health Requirements
- ER 1110-1-12, Quality Management
- ER 1110-1-1300 - Cost Engineering Policy and General Requirements

- ER 1110-1-1807, Engineering and Design - Procedures for Drilling in Earth Embankments
- ER 1110-1-1901, Project Geotechnical and Concrete Materials Completion Report for Major USACE Project
- ER 1110-2-100, Periodic Inspection and Continuing Evaluation of Completed Civil Works Structure
- ER 1110-2-1156, Safety of Dams – Policy and Procedure
- ER 1110-2-1302 - Civil Works Cost Engineering
- ER 1110-2-1806, Engineering and Design - Earthquake Design and Evaluation for Civil Works Projects
- ER 1110-2-240, Water Control Management
- ER 1130-2-530, Flood Control Operations and Maintenance Policies
- ER 1165-2-132, Hazardous, Toxic and Radioactive Waste Guidance for Civil Works Projects
- ER 1180-1-6, Contracts - Construction Quality Management
- ER 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews
- ETL 1110-2-584, Design of Hydraulic Steel Structures
- MSC and/or District Quality Management Plan(s)
- Project Management Plan (PMP) for Design and Construction

1.3 Review Management Organization

The USACE Risk Management Center (RMC) is the Review Management Organization (RMO) for this project.

Section 2
Project Description

2.1 Project Description

The approved projects, located in metropolitan Dallas, Texas, include flood risk management, ecosystem restoration, and recreation. The projects are located within the Upper Trinity River Watershed, along the Trinity River, in Dallas, Texas. The original authorization for the Dallas Floodway (DF) Project was approved in 1945, modified by Section 5141 of the Water Resources Development Act (WRDA) of 2007, and amended by the Water Resources Reform and Development Act of 2014. The DF Project is located adjacent to the Stemmons Business Corridor and the Central Business District. The recommended plan for the Modified Dallas Floodway Project (MDFP) consists of restoring the floodway capacity to

accommodate the water surface elevation corresponding to a 277,000 (277K) cubic feet per second flow; modifying the existing levee side slopes to 4:1; modifying the Atchison, Topeka, and Santa Fe (AT&SF) Bridge to increase conveyance efficiency; constructing and/or renovating five interior drainage pump stations (one constructed by non-federal sponsor for credit); and implementing ecosystem restoration. The levee raise, AT&SF bridge modification and the pump stations received $260M under the Supplemental Appropriations in the Bipartisan Budget Act of 2018.

The DFE Project generally begins downstream of the AT&SF Bridge. The DFE authorization is contained in Section 301 of the River and Harbor Act of 1965 (for flood control), modified by Section 351 of WRDA 1996 (authorizing inclusion of non-federal levees into the project), and further modified to add ecosystem restoration and recreation as project purposes by Section 356 of WRDA 1999. The DFE Project will increase the level of protection to the existing DF project, providing an additional $6.7 million in average annual benefits to approximately 10,000 structures. Completion of the DFE Project will reduce the water surface elevations within the existing DF Project, thereby reducing the risk to life and safety for those protected by the existing levees. Major flood risk management elements of DFE include: Lamar Levee, Cadillac Heights Levee, Chain of Wetlands, one non-federal levees (Rochester Park Levee), and one levee in the Federal system (Central Waste Water Treatment Plant (CWWTP) Levee). Lamar Levee will tie into Rochester Park Levee, and Cadillac Heights Levee will tie into the CWWTP Levee. Recreation features include trails, trailhead access areas, bridges, and associated facilities. Ecosystem restoration features are integrated into the Chain of Wetlands. DFE also includes extensive on-site mitigation areas. Lamar and Cadillac Heights levees received $135M under the Supplemental Appropriations in the Bipartisan Budget Act of 2018.

The following is a description of the features of the total project:

Dallas Floodway Features:

A project map showing the Dallas Floodway levees, pump station sites, and sump locations is attached (see Attachment 1).

AT&SF Bridge Modification – Design–Bid–Build (DBB) Procurement

This project will modify the existing AT&SF Railroad Bridge by demolishing portions of the bridge, while maintaining the Santa Fe Trestle Trail features. The AT&SF Railroad Bridge removal includes demolition and removal of approximately 900 linear feet of wooden trestle ballast-deck bridge, demolition and removal of approximately 100 linear feet of wooden trestle open deck bridge located on the left bank side of the Floodway, and demolition and removal of approximately 660 linear feet of concrete ballast-deck bridge located on the right bank side of the Floodway.

277K Levee Raise – Design–Build (DB) Procurement

This feature includes raising the existing East and West levees to meet a 277,000 cfs water surface elevation and constructing new levee crest access roads. The levee system extends along the Trinity River upstream from approximately the Atchison, Topeka, and Santa Fe (AT&SF) Railroad Bridge at Trinity River Mile 497.37, to the confluence of the West and Elm Forks at River Mile 505.50, thence upstream along the West Fork for approximately 2.2 miles and upstream along the Elm Fork approximately 4 miles. Of the 22.6 miles of levees within this reach, the East Levee is 11.7 miles in length and the West Levee is 10.9 miles in length and includes a 1.5-mile segment along Mountain Creek. The levee raises will occur at any location where the effective levee crest height is less than the 277,000 cfs water surface elevation.

There are three bridge/levee interfaces that require structural bridge sealing plans: Corinth Street, the Union Pacific Railroad, and Irving Boulevard (SH 356) on the East Levee. Verification of the Trinity River HEC-RAS hydraulic model that represents the levee raises and the modification of the levee slopes is part of this feature.

Levee Side Slope Flattening – DB Procurement

The existing East and West Levees have side slopes varying from approximately 2:8H:1V to 4H:1V. This portion of the project will modify the levees along the entire length of the river side of the levees anywhere the existing slope is steeper than 4H:1V. This part of the project is a betterment with the design, and construction funded entirely by the Non-federal sponsor.

Delta Pump Station Renovation – DB Procurement

The Delta Pump Station is located north of Canada Drive and west of Hampton Road on the landward side of the West Levee, just upstream of Hampton Road. The existing Delta Pump Station consists of a main pump building that houses two 40,000 gpm pumps, a low flow pump building, a trash rack and a conveyor. The discharge structure is located on the river side of the levee.

The proposed work involves the renovation of the pump station and the improvement of the sump and outfall area to prevent further erosion and preserve the integrity of the levee. The existing pumps will be replaced with pumps of equal capacity but capable of supporting a higher head. The two replacement pumps will be rated for 40,000 gpm at 46.4 ft Total Dynamic Head (TDH) with a motor size of 700 HP. The installation of the two pumps will require the removal of the roof to lower the pumps via a crane. A new roof will be constructed on the existing building after installation of the new pumps. New roof openings of adequate size shall be created to accommodate future removal and/or maintenance. The heating and ventilation equipment will also be replaced. There are two existing 4-foot by 4-foot box culverts that will remain in place at the discharge structure. Due to the increased pump motor size, the electrical service to the existing building will have to be improved. A new 14' x 18' x 14' Electrical building, with transformer pad, will be provided and will be located between the existing low flow pump and main pump buildings.

Hampton 3 Pump Station – DBB Procurement

The scope of work for this feature includes a new pumping station at Hampton (Hampton 3), demolition of the existing Old Hampton Pumping Station (OHX), and upgrades to the existing New Hampton Pumping Station (NHX). The current operations of the existing pump stations must be maintained during the construction of the Hampton 3 Pump Station. The existing NHX station will remain in place. The new Hampton 3 Pump Station will replace the old Hampton OHX Pump Station and will have a maximum capacity of 700,000 gpm consisting of five (5) 140,000 gpm pumps. The addition of the Hampton 3 Pump Station will add the capacity of pumping 500,000 gpm of storm water from the interior drainage area behind the East Levee and discharging into the Trinity River. For the new Hampton 3 Pump Station, water, wastewater, electrical distribution, control, protection, instrumentation, grounding, and communications infrastructure shall be required. Site work shall also provide general access to the building for workers and large delivery trucks. The site shall have parking for employees servicing and maintaining the facility. A protective security fence and locking gates shall be installed around the perimeter of the station. A ladder basket with locking door for the roof ladder and heavy gage pedestrian doors shall be provided. Space for parking and large turnaround radii will be required to provide for fire and maintenance truck access.

Charlie Pump Station – DB Procurement

This feature includes the construction of a new Charlie pump station and the demolition of the existing Charlie pump station. The new Charlie pump station project site is located in triangular parcel of land adjacent to the West Levee of the Dallas Floodway and is southwest of the intersection of Jefferson and Zang Boulevard. The three acre site is bounded on the north by the Charlie/Corinth Canal and the West Levee, on the south by the right-of-way of Brazos Street, and on the west by the E. Jefferson Boulevard right-of-way. Approximately three more acres will be impacted to install the station's discharge piping from the new Charlie pump station over the West Levee and into the floodway. The new Charlie Pump station will receive storm water runoff from the Charlie and Cornith watersheds requiring a capacity of 225,000 gpm. The new Charlie Pump Station will have three 75,000 gpm pumps and one 6,000 gpm low flow sump pump. The following are required at this station: programmable logic controllers to monitor and operate the facility remotely, two means to prevent backflow, a way to dewater the sump and pump intakes, a trash rack and rake, and dual uninterrupted power supply to service the facility. Above ground discharge piping will be required from the new Charlie Pump Station to the existing West Levee over two realigned and improved gravel West Levee access roads and from a new concrete access road running parallel along the West Levee. The area for the discharge pipes over the levee will require raising the existing levee crest to the water surface elevation corresponding to a flow of 277,000 cfs with a 4H:1V river side slope. A new concrete channel will be required to receive water from the Charlie and Corinth watersheds to the new concrete channel leading to the concrete-lined sump for the intake channel of the new pump station. The new concrete channel to the west is downstream of the existing Charlie Pump Station and will need to extend underneath the Jefferson Boulevard Viaduct to the new concrete intake channel for the new Charlie Pump Station. The new concrete channel to the east will be required to have multiple concrete pipe culverts receiving gravity runoff from a grass lined channel that is fed by so the discharges pipes can run over the levee unimpeded above ground. A concrete road access and parking are required for workers and large delivery trucks from Jefferson Boulevard. A concrete access road will be required from the building to the intake and trash rack for operations and maintenance. The site will be secured with chain link fencing and access gates. Coordination and phasing shall be required for the construction of the new Charlie Pump Station and the demolition of the existing Charlie Pump Station.

Trinity-Portland Pump Station – DB Procurement

The new Trinity-Portland Pump Station will be located on the landward side of the West Levee at the end of the cul-de-sac on Mexicana Drive. The new Trinity-Portland Pump station will receive storm water runoff from the Trinity-Portland watersheds requiring a capacity of 250,000 gpm. The new Trinity-Portland Pump Station will have two 125,000 gpm concrete volute pumps and one 6,000 gpm low flow sump pump. The new Trinity-Portland Pump Station requires programmable logic controllers to monitor and operate the facility remotely, two means to prevent backflow, a way to dewater to the sump and pump intakes, a trash rack and rake, and dual uninterrupted power supply to service the facility. Above ground discharge piping will be required from the new Trinity-Portland Pump Station to the existing West Levee over realigned West Levee access road and over a new concrete access road running parallel along the West Levee from the Trinity-Portland Pump Station site to the Mexicana Drive cul-de-sac. The area for the discharge pipes over the levee will require raising the existing levee crest to the water surface elevation corresponding to a flow of 277,000 cfs with a 4H:1V river side slope. A concrete access road and parking are required for workers and large delivery trucks from the cul-de-sac of Mexicana Drive. A concrete access road will be required from the building to the intake and trash rack for operations and maintenance. The grass lined channel to the east will be required to have multiple concrete pipe culverts receiving gravity runoff from a grass lined channel under the new concrete access road from the cul-de-sac from Mexicana Drive.

Nobles Branch Sump Improvements – DBB Procurement

The planned improvements of the Nobles Branch Sump are designed to increase the connectivity of the sump and consists of the addition of three (3) 60-inch gated pipe culverts and the modification and extension of the existing single 60-inch gated pipe culvert located under Empire Central Drive to provide a 100-year level of protection. The existing 48" RCP from the west will have a re-aligned outlet parallel to the new 60-inch pipes. New upstream concrete headwalls and aprons will be constructed to support the new and existing drainage structures.

Dallas Floodway Extension Features:

Lamar Levee – DBB Procurement

The Lamar Levee will be located in southeast Dallas in Dallas County, Texas, as shown in Figure 2. The project area is bounded by the Trinity River on the south and west and the Union Pacific Railroad (UPRR) on the north and east. The levee alignment begins at the tie-in with the Rochester Levee just east of the UPRR at baseline Station (Sta.) 16+43.63. The alignment continues westward until it ties in with the DF East Levee just west of the Dallas Area Regional Transit (DART) rail system at baseline Sta. 236+00.20. The Lamar Levee will be approximately 16,000 feet long, with an average height of 20 feet, 1V:4H side slopes, and a crest width of 20 feet. The proposed alignment will connect the Rochester Levee to the DF East Levee as shown in Figure 2.

The Lamar Levee alignment will cross three main thoroughfares (State Highway 310, Interstate 45, and Martin Luther King, Jr. Boulevard) and three rail systems (UPRR, the Burlington Northern Santa Fe Railroad [BNSF], and the DART Rail System). The USACE-preferred design alternative consists of building an earthen levee for most of the alignment, with the exception of where the levee crosses highway and rail systems. At those crossings, the levee will include a combination of floodwalls, flood gates, and earth embankments. A design risk assessment has been performed for Lamar Levee

Cadillac Heights Levee – DBB Procurement

The Cadillac Heights Levee would have an approximate length of 12,000 feet, with an average approximate height of 15 feet, a maximum approximate height of 26 feet, 1V:4H side slopes, and crown width of 20 feet.

CWWTP Levee

The CWWTP Levee is a ring levee on the right bank of the Trinity River. The levee system is non-federally constructed and locally maintained by the City of Dallas. The CWWTP levee was authorized to be included into DFE by Section 351 of WRDA of 1996. The levee is included in the DF annual and periodic inspection schedule and is active in the Federal Rehabilitation and Inspection Program (RIP) (Public Law 84-99).

Rochester Park Levee

Rochester Park Levee is non-federally constructed and locally maintained by the City of Dallas and is currently inactive in the RIP. The Rochester Park levee is authorized to be included into DFE by Section 351 of WRDA 1996, but the City of Dallas must correct deficiencies to meet current performance and safety criteria for USACE before it can be fully incorporated into the DFE Project. A Risk Assessment will not be performed for the Rochester Park Levee as it is not a part of the supplemental work package.

Chain of Wetlands

The Chain of Wetlands include an Upper Chain (cells A, B, C) and a Lower Chain (cells D, E, F, G). The Chain of Wetlands, also known as swales in feasibility documents, serve as both flood risk management

and ecosystem restoration features. The wetlands and surrounding grasslands areas allow flood conveyance during over-banking events. These same wetlands include water control structures which allow manipulation of water levels for management of wetland and grassland habitat areas. The Chain of Wetlands, while a part of the DFE project, were constructed previously. Therefore, the chain of wetlands are not covered by this RP.

Recreation Features

The DFE Project includes both previously constructed trails that serve as maintenance paths along the Chain of Wetlands and additional planned recreation features/trails that are currently under design. The previously constructed trails, known as Phase One, are 12 foot wide concrete maintenance paths approximately five miles in length, divided into separate segments along both the Upper and Lower Chain of Wetlands, and adjacent to the mitigation lands. The recreation features/trails under design, known as Phase Two, include approximately two miles of 12 foot wide concrete trails, three bridges, gates, pipe rail fences, and bird watching platforms.

Interstate Highway 45 River Realignment

Approximately 3,300 feet of the Trinity River at Interstate Highway 45 was realigned in 2005-2007, as part of the Chain of Wetlands construction. This realignment was part of the recommended plan for DFE. This feature was constructed previously and not covered by this RP.

Mitigation Lands

The DFE Project includes approximately 1,179 acres of on-site mitigation lands generally located southeast of the Chain of Wetlands. Implementation of a portion of the mitigation treatments has been carried out, with additional restoration planned for the future to fulfill remaining mitigation requirements for the DFE Project.

2.2 Project Sponsor

Products and analyses provided by non-federal sponsors as in-kind services are subject to DQC, ATR, policy and legal compliance, BCOES, and SAR reviews. There will be in-kind contributions for this effort. The non-federal sponsor for the project is the City of Dallas. The City is seeking in-kind contributions for the construction of the CWWTP Levee.

The Central Wastewater Treatment Plant and Rochester levees were constructed by the City and, and as a result of the Water Resources Development Act of 1996, Public Law 104-303, Section 351 they became Federal levees. The Corps has determined that the Central Wastewater Treatment Plant Levee is a completed functional portion of the Dallas Floodway Extension Project and is eligible for credit in accordance with the existing Dallas Floodway Extension Project Cooperation Agreement (PCA), dated 14 December 2001. The work-in-kind documentation submitted is under review.

Section 3
District Quality Control

3.1 Requirements

All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) shall undergo DQC in accordance with EC 1165-2-217. The designs are being performed by Architect-Engineers (A/E) and their Quality Control process is required to be described in their Quality Control Plans. The AE's QCP states that all work was checked and certified by independent well qualified reviewers in accordance with Paragraph 8 of EC 1165-2-217 and that reviews assuring compliance with appropriate USACE guidance are completed. A certification letter is to accompany the corresponding submittal. The Government will QA for compliance.

See Attachment 2, Table 6 for the Corps DQC Lead, reviewers, and reviewer's disciplines.

3.2 Documentation

Documentation of DQC activities is required and will be implemented by the process described in paragraph 3.1.

3.3 DQC Schedule and Estimated Cost

Although DQC is always seamless, the reviews scheduled are shown in Attachment 3. The cost for each DQC ranges from $15,000 to $30,000 depending on the feature under review.

Section 4
Agency Technical Review

4.1 Requirements

All implementation documents (including supporting data, analyses, reports, environmental compliance documents, water control manuals, etc.) shall undergo ATR in accordance EC 1165-2-217. ATR reviews will occur seamlessly, including early involvement of the ATR team for validation of key design decisions, and at the scheduled milestones as shown in Attachment 3. A site visit will be scheduled for the ATR Team.

4.2 Documentation of ATR

Documentation of ATR will occur using the requirements of EC 1165-2-217. This includes the four part comment structure and the use of DrChecks[SM].

4.3 Products to Undergo ATR

The ATR team will begin reviewing RFPs', Design Documentation Reports and Plans and Specifications for the levee raise and flattening, and pump stations at the draft DB RFP stage while the trails, maintenance access, Lamar levee, Cadillac Heights levee, and sump improvements will start at the DBB interim review. The review will continue with follow on submittals until the RFP is ready to advertise.

4.4 Required Team Expertise and Requirements

ATR teams will be established in accordance with EC 1165-2-217. All Engineering and construction reviewers will be certified in CERCAP. The following disciplines will be required for ATR of this project:

ATR Lead: The ATR team lead is a senior professional outside the home MSC with extensive experience in preparing Civil Works documents and conducting ATRs. The lead has the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline, in this case, Geotechnical Engineering. As a SAR is required, the ATR Lead will be an engineer/geologist with a strong dam/levee safety background.

Geotechnical Engineer: Shall have experience in the field of geotechnical engineering, analysis, design, and construction of levees, floodwalls, pump stations, vertical construction foundations, and pavements. The geotechnical engineer shall have experience in subsurface investigations, rock and soil mechanics, internal erosion (seepage and piping), slope stability evaluations, erosion protection design, and earthwork construction. The geotechnical engineer shall have knowledge and experience in the forensic investigation of seepage, settlement, stability, and deformation problems associated with high head dams, flood risk management projects and appurtenances constructed on rock and soil foundations.

Hydrologic and Hydraulic Engineer: Shall have experience in urban flooding and hydrologic and hydraulic modeling of river systems and watershed runoff interior drainage areas. Experience shall include review modeling work using the HEC-RAS program for the computation of water surface profiles and related hydraulic data. The Hydraulic Engineer shall have experience in the design of drainage sluice structures, flood control channels, and pump stations. Experience with the physical modeling of pump stations is a plus. The Hydrologic Engineer shall have experience in watershed runoff modeling, in particular interior drainage design. Experience shall include modeling using the HEC-HMS program and other programs for interior drainage area design and pump station design.

Civil Engineer: Shall have experience with levee and channel designs, utility relocations, interior drainage requirements, and digital terrain model interpretations and be a civil design subject matter expert

Mechanical Engineer: Shall have experience in machine design, machine rehabilitation and be familiar with new and rehabilitation design of planned and existing storm water pump stations, mechanical gates, and controls for flood control structures.

Structural Engineer: Shall have experience evaluating the design, construction, and evaluation of hydraulic structures for levees (including gates/closure structures and penetrations), potential failure mode analysis, and levee safety risk analysis.

Construction Engineer: Reviewer should be a senior level, professionally registered engineer with extensive experience in the engineering construction field with particular emphasis on levee safety projects. The Construction reviewer should have a minimum of 10 years of experience.

Environmental/Cultural Resources: The environmental/cultural resources reviewer should be experienced in National Environmental Policy Act (NEPA) process and analysis, and have a biological or environmental background.

Real Estate: The Real Estate (RE) team member shall be an expert in real estate acquisitions for civil works projects. The RE team member will have experience working with non-federal sponsors, ROW (right-of-way) determination, maps and evaluation of necessary easements.

Other ATR Members: Depending on the feature, there may also be Architectural, Electrical, Cost Estimating, Operations, and other disciplines. All Engineering and construction reviewers will be certified in CERCAP. See Table 1 for the disciplines required for each feature. See Attachment 2, Table 7 for a list of the ATR team members and disciplines.

Cybersecurity: This project has been coordinated with the USACE Cybersecurity MCX. Cyber CX was provided the full system architecture of Dallas's existing system. Upon review of that system, the MCX stated that we did not need the Cyber Security requirement for Dallas as we are connecting into their existing system. The Dallas system is on or will be on a dedicated fiber circuit separate from any other system.

ATR Team	277K Levee Raise and Flattening	Trinity Portland & Charlie pump stations	Hampton Pump Stations	Delta Pump Station	Nobles Branch Sump	Lamar Levee	Cadillac Heights Levee
Geotechnical /Lead	X	X	X	X	X	X	X
Geologist						X	X
Structural	X	X	X	X	X	X	X
Electrical		X	X	X			
Mechanical		X	X	X			
Civil	X	X	X	X	X	X	X
Hydrology/Hydraulics	X	X	X	X	X	X	X
Architect		X	X	X			
Cost Engineering	X	X	X	X	X	X	X
Operations	X	X	X	X	X	X	X
Cultural Resources	X	X	X	X	X	X	X
Environmental	X	X	X	X	X	X	X
Construction	X	X	X	X	X	X	X
Real Estate	X	X	X	X	X	X	X

Table 1 ATR Disciplines

4.5 Statement of Technical Review Report

At the conclusion of each ATR effort, the ATR team will prepare a review report with a completion and certification memo. The report will be prepared in accordance with EC 1165-2-217.

4.6 ATR Schedule and Estimated Cost

The preliminary ATR schedule is listed in Attachment 3. The cost for each ATR is approximately $84,000, depending on the feature reviewed.

Section 5
Safety Assurance Review

5.1 Decision on SAR

The Fort Worth District Chief of Engineering and Construction Division, who is also the Levee Safety Officer, has made a risk-informed-decision that this Flood Risk Management project poses a significant threat to human life (public safety), and therefore, a SAR will be performed on the levees and pump stations. However, based on the risk-informed-decision the SAR is not required on the sump or the trails. The risk informed decision is on file and also located in the project management plan.

The selection of SAR panel members will be made up of independent, recognized experts from outside USACE in the appropriate disciplines, representing a balance of expertise suitable for the review being conducted. The selection of SAR panel members will be selected using the National Academy of Science (NAS) Policy which sets the standard for “independence” in the review process. The SAR will be coordinated through the RMC, whether it is performed through contract acquisition or by another government agency. Existing RMC contracts are managed by CE-LRL POC is: christopher.j.hogan@usace.army.mil.

5.2 Products to Undergo SAR

A SAR will be performed for each D-B RFP and feature at the interim Design Documentation Report (DDR), Plans, and Specifications (P&S) submittal and during the midpoint of the construction. Risk-informed design to mitigate for any potential failure modes will be incorporated into the P&S. The RMC will facilitate a risk assessment on Cadillac Heights once the geotechnical investigation information is received. The Risk Assessment for Lamar Levee has been completed. These Risk Assessments will be provided to the SAR team to use as part of their review.

5.3 Required Team Expertise and Requirements

SAR panels will be established in accordance with EC 1165-2-217. The following disciplines will be required for SAR of this project:

SAR Lead - The SAR team lead is a senior professional outside the home MSC with extensive experience in preparing Civil Works documents and conducting SARs. The lead has the necessary skills and experience to lead a virtual team through the ATR process. The SAR lead may also serve as a reviewer for Geotechnical Engineering. The SAR Lead will be dual-hatted as the geotechnical engineer reviewer and shall have a strong levee safety background.

Geotechnical Engineer - The Geotechnical Engineer panel member should be a senior-level, registered professional engineer from an Architect-Engineer or consulting firm, a public agency, or academia with 20 years of demonstrated experience in the field of geotechnical engineering, analysis, design, and

construction of embankment dams and levees. The Panel Member should have knowledge and experience in the forensic investigation and evaluation of seepage and piping, settlement, slope stability, and deformations problems associated with embankments constructed on weathered and jointed rock and alluvial soils. The Panel Member should have experience in the design and construction of seepage barriers or cutoff walls. The Panel Member should have experience in failure mode analysis, risk assessment of embankment dams and levees, and evaluating risk reduction measures for levee safety assurance projects. The Geotechnical panel member shall have familiarity with preparing plans and specifications for USACE projects and knowledge of USACE design and construction procedures and policies.

Structural Engineer – The Structural Engineer panel member shall be a registered professional civil engineer from an Architect-Engineer or consulting firm, a public agency, or academia with 20 or more years of demonstrated experience, with a minimum BS degree or higher in engineering. Active participation in related professional engineering and scientific societies is encouraged. The Structural panel member shall have extensive experience in the design and construction of hydraulic structures for large and complex civil works projects including gates, drainage structures, closure structures, and flood walls. The Structural panel member should be a recognized expert in stability analysis and structural design, seismic design, the determination and evaluation of dynamic site-specific response spectra analysis, and the evaluation of soil-structure interaction; and the design and construction of T-wall and L-wall floodwall design. The Structural Engineering panel member should be proficient in performing stability analysis using limit equilibrium analysis; design and construction of deep sheet pile walls; design and installation of post-tensioned high-strength steel anchors to stabilize mass concrete structures; and cofferdam design. The Structural panel member shall have familiarity with preparing plans and specifications for USACE projects, knowledge of USACE design and construction procedures and policies, and USACE levee safety assurance policy and guidance.

Mechanical Engineer – The Mechanical Engineer panel member shall be a registered professional mechanical engineer from an Architect-Engineer or consulting firm, a public agency, or academia with 20 or more years of demonstrated experience, with a minimum BS degree or higher in engineering. The Mechanical panel member should be a recognized expert in new and rehabilitation design of planned and existing storm water pump stations, mechanical gates, and controls for flood control structures with primary focus on the operation of levee systems. The Mechanical panel member shall have familiarity with preparing plans and specifications for USACE projects and knowledge of USACE design and construction procedures and policies.

A Hydrologic/Hydraulic Engineer SAR panel member was not necessary as the Trinity River CDC approved model that is the basis of design has previously undergone a SAR review and is not anticipated to change. If the model does change, then a Hydrologic/Hydraulic Engineer will be added to the SAR.

SAR Team	277K Levee Raise and Flattening & Nobles Sump	Trinity Portland & Charlie pump stations	Hampton Pump Stations	Delta Pump Station	Lamar Levee	Cadillac Heights Levee
Geotechnical /Lead	X	X	X	X	X	X
Structural	X	X	X	X	X	X
Mechanical		X	X	X		

Table 2 SAR Disciplines

See Attachment 2, Table 8 for a list of the SAR team members and disciplines.

5.4 Documentation of SAR

Documentation of SAR will be prepared in accordance with EC 1165-2-217.

5.5 Scope, Schedule, and Estimated Cost of SAR's

The SAR's will be performed in accordance with EC 1165-2-217. SAR reviews will occur at the milestones shown in Table . The estimated cost for the SAR's of this project are in the range of $30,000 to $40,000 per review with $700,000 to $800,000 total. This estimate will be refined when the Scope of Work for the SAR task order is completed.

Milestone Reviews for Each Feature	Geotech	Mech (on Pump stations)	Structural	Site Visit Duration (days)
Draft DB RFPs	X		X	1
Interim (Midpoint of) Design	X	X	X	
Midpoint of Construction	X	X	X	1
Pump Testing (for the pump stations)		X		.5

Table 3 Reviews with Required Review Disciplines and Site Visit Duration

Section 6
Public Posting of Review Plan

As required by EC 1165-2-217, the approved RP will be posted on the District public website (https://www.swf.usace.army.mil/About/Organization/PPMD/Peer-Review-Plans/). This is not a formal comment period and there is no set timeframe for the opportunity for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the RP are necessary.

Section 7
Review Plan Approval and Updates

The MSC Commander, or delegated official, is responsible for approving this RP. The Commander's approval reflects vertical team input (involving the District, MSC, and RMC) as to the appropriate scope, level of review, and endorsement by the RMC. The RP is a living document and should be updated in accordance with 1165-2-217. All changes made to the approved RP will be documented in Attachment 5, Table 10 RP Revisions. The latest version of the RP, along with the Commanders' approval

memorandum, will be posted on the District's webpage and linked to the HQUSACE webpage. The approved RP should be provided to the RMO.

Section 8
Engineering Models

The use of certified, validated, or agency approved engineering models is required for all activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, BCOES, policy and legal review, and SAR (if required). Where such approvals have not been completed, appropriate independent checks of critical calculations will be performed and documented. The following engineering models, software, and tools are anticipated to be used:

Model Name	Version	Validation Date
HEC-RAS (River Analysis System)	5.0.6	HH&C CoP Preferred Model
HEC-HMS (Hydrologic Modeling System)	4.3	

Table 4 Models and Status

Section 9
Review Plan Points of Contact

Title	Organization	Phone
Program Manager	CESWF-PM-C	817-886-1900
Lead Engineer	CESWF-EC-G	817-886-1691
Senior Reviewer	CEIWR-RMC	304-399-5217

Table 5 RP POC's

ATTACHMENT 1

Project Maps

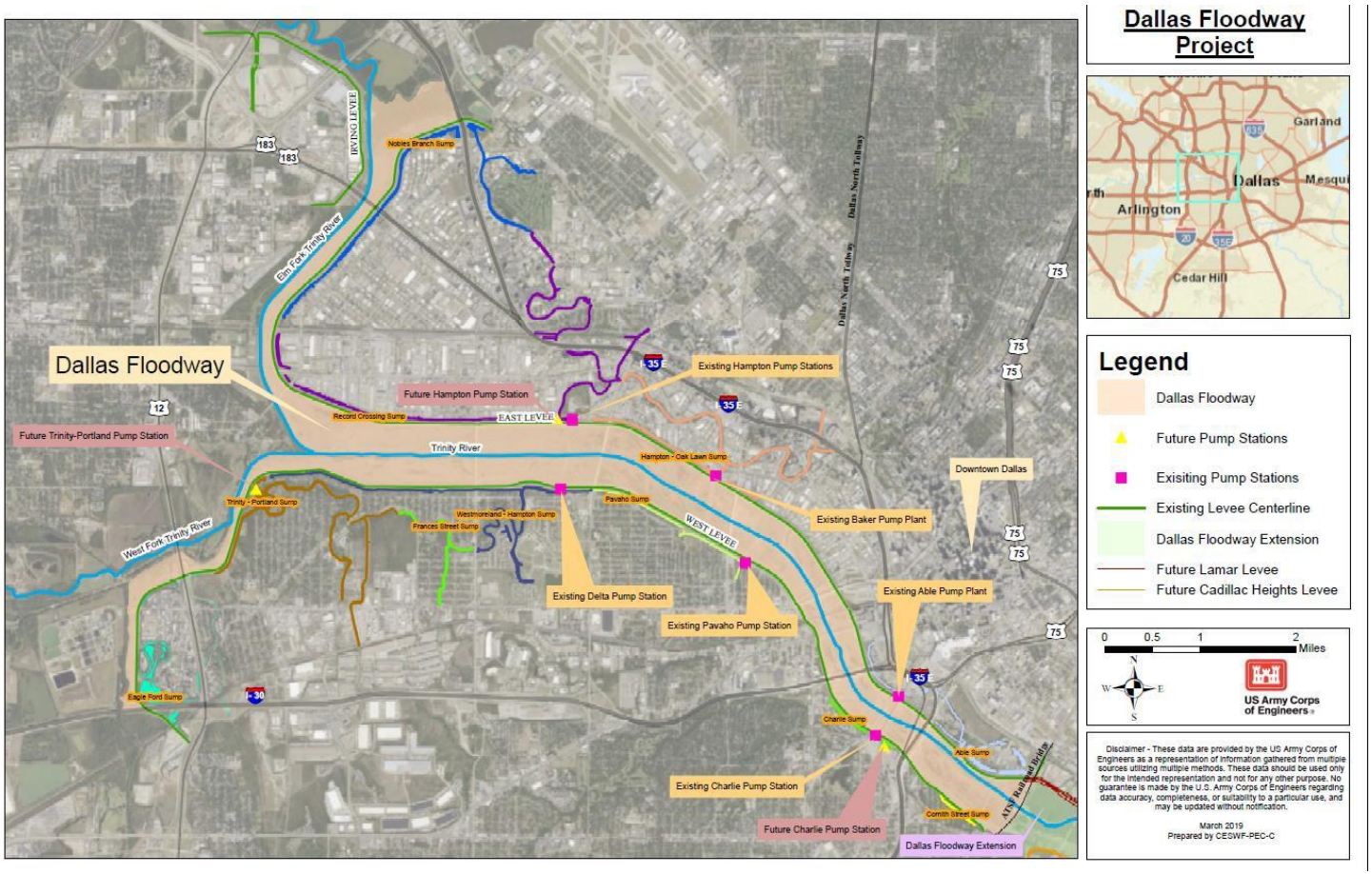

Figure 1 Dallas Floodway

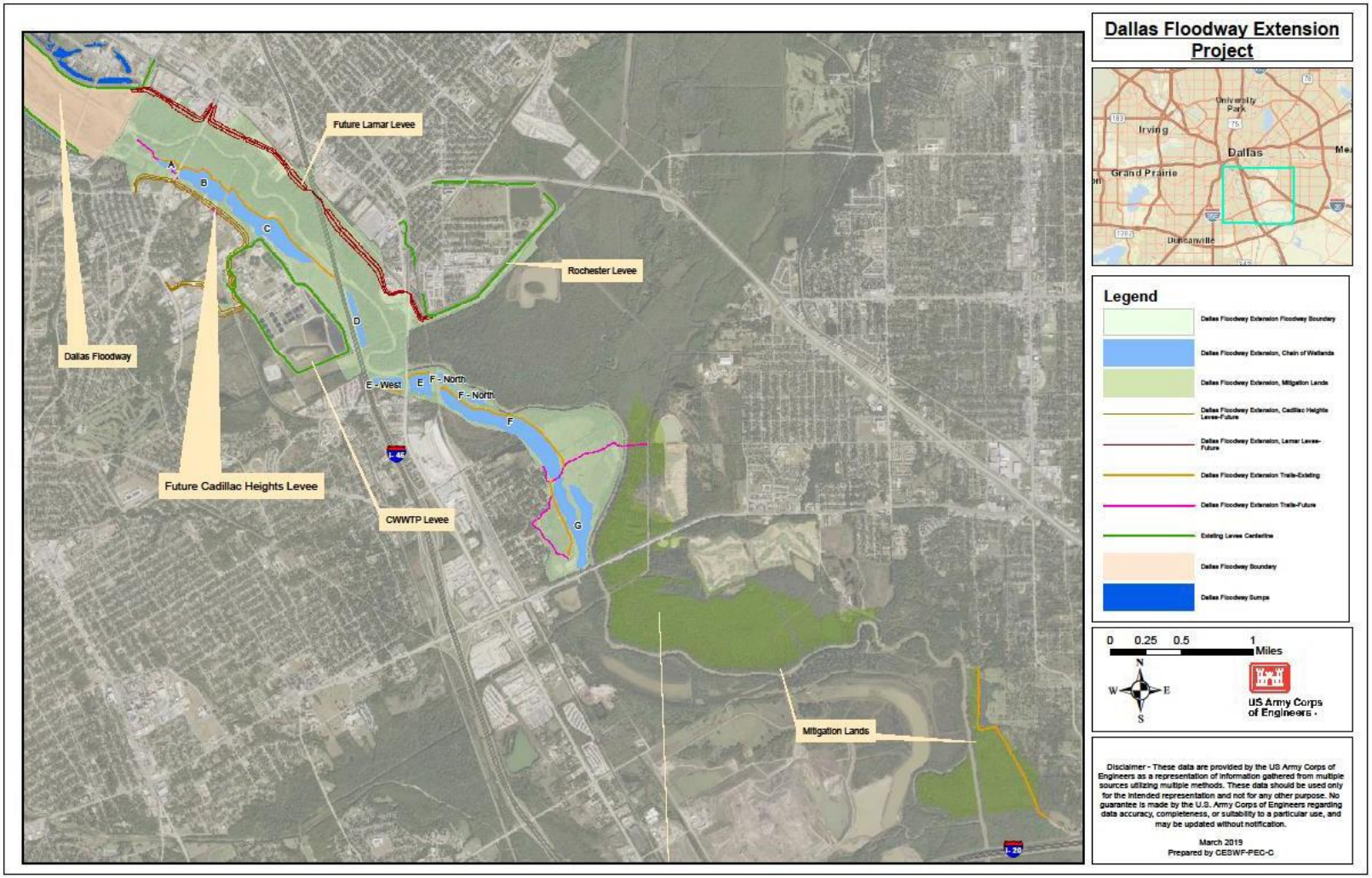

Figure 2 Dallas Floodway Extension

ATTACHMENT 3

Schedule of Reviews

Dallas Floodway				
Feature	**Review**	**Duration**	**Start**	**Finish**
277K Levee Raise and 4:1 Slope Flattening	Draft RFP DQC, ATR, SAR, & BCOES Review	16.0d	17-Mar-20	31-Mar-20
	Final RFP DQC, ATR, & BCOES Review	18.0d	23-May-20	9-Jun-20
	Corrected Final RFP Backcheck Review	11.0d	7-Jul-20	17-Jul-20
	Interim Design DQC, ATR, & BCOES Submittal Review	15.0d	13-Oct-21	28-Oct-21
	Design SAR Review	15.0d	1-Nov-21	16-Nov-21
	Final Design Submittal DQC, ATR, & BCOES Review	15.0d	31-Jan-22	15-Feb-22
	Corrected Final Design Submittal Backcheck	11.0d	4-Mar-22	15-Mar-22
	SAR Review Midpoint of Construction	16.0d	15-Mar-23	29-Mar-23
Charlie Pump Stations (1 new & 1 demo)	Draft RFP DQC, ATR, SAR & BCOES Review	16.0d	21-Mar-20	5-Apr-20
	Final RFP DQC, ATR & BCOES Review	16.0d	2-Jun-20	17-Jun-20
	Corrected Final RFP Backcheck Review	13.0d	16-Jul-20	28-Jul-20
	Interim Design Submittal DQC, ATR, & BCOES Review	16.0d	11-Dec-21	27-Dec-21
	Design SAR Review	16.0d	4-Jan-22	19-Jan-22
	Final Design Submittal DQC, ATR, & BCOES Review	15.0d	28-Mar-22	11-Apr-22
	Corrected Final Design Submittal Backcheck	10.0d	28-Apr-22	7-May-22
	SAR Review Midpoint of Construction	16.0d	21-Sep-22	10-Oct-22
Delta Pump Station Renovation	Draft RFP DQC, ATR, SAR & BCOES Review	16.0d	11-Apr-20	26-Apr-20
	Final RFP DQC, ATR & BCOES Review	18.0d	17-Jun-20	4-Jul-20
	Corrected Final RFP Backcheck Review	11.0d	1-Aug-20	11-Aug-20
	Interim Design Submittal DQC, ATR, & BCOES Review	15.0d	4-May-24	4-May-24
	Design SAR Review	16.0d	24-May-24	10-Jun-24
	Final Design Submittal DQC, ATR, & BCOES Review	15.0d	22-Aug-24	6-Sep-24
	Corrected Final Design Submittal Backcheck	10.0d	19-Sep-24	29-Sep-24
	SAR Review Midpoint of Construction	16.0d	8-Nov-24	24-Nov-24

Hampton Pump Stations (1 new, 1 Reno)	Interim Design Submittal DQC, ATR, & BCOES Review	15.0d	15-Apr-22	30-Apr-22
	Design SAR Review	16.0d	1-May-22	16-May-22
	Final Design Submittal DQC, ATR, & BCOES Review	15.0d	8-Sep-22	18-Sep-22
	Corrected Final Design Submittal Backcheck	10.0d	1-Nov-22	11-Nov-22
	SAR Review Midpoint of Construction for New Hampton	15.0d	27-Nov-24	12-Dec-24
	SAR Review Midpoint of Construction for Reno Hampton	15.0d	1-Apr-27	12-May-27
Trinity Portland Pump Station	Draft RFP DQC, ATR, SAR & BCOES Review	16.0d	21-Mar-20	5-Apr-20
	Final RFP DQC, ATR, & BCOES Review	16.0d	29-May-20	13-Jun-20
	Corrected Final RFP Backcheck Review	13.0d	12-Jul-20	24-Jul-20
	Interim Design Submittal DQC, ATR, & BCOES Review	16.0d	24-Jan-22	24-Jan-22
	Design SAR Review	16.0d	29-Jan-22	13-Feb-22
	Final Design Submittal DQC, ATR, & BCOES Review	15.0d	17-May-22	31-May-22
	Corrected Final Design Submittal Backcheck	11.0d	21-Jun-22	2-Jul-22
	SAR Review Midpoint of Construction	16.0d	2-Oct-22	18-Oct-22
Nobles Branch Sump	Initial DDR & P&S DQC, & BCOES Submittal Review	16.0d	16-Apr-21	1-May-21
	Interim DDR & P&S DQC ATR & BCOES Submittal Review	16.0d	24-Jul-21	8-Aug-21
	Design SAR Review	16.0d	9-Aug-21	24-Aug-21
	Final DDR & P&S DQC, ATR, & BCOES Submittal Review	16.0d	1-Oct-22	16-Oct-21
	Backcheck Final Submittal Review	12.0d	12-Nov-22	23-Nov-22
	SAR Review Midpoint of Construction	16.0d	3-Sep-22	18-Sep-22
Dallas Floodway Extension				
Lamar Levee	Initial DDR & P&S DQC, & BCOES Submittal Review	16.0d	16-Apr-21	1-May-21
	Interim DDR & P&S DQC ATR & BCOES Submittal Review	16.0d	31-Aug-21	15-Sep-21
	Design SAR Review	16.0d	16-Sep-21	7-Oct-21
	Final DDR & P&S DQC, ATR, & BCOES Review	16.0d	24-Jan-22	8-Feb-22
	Backcheck Final Submittal Review	11.0d	21-Mar-22	31-Mar-22
	SAR Review Midpoint of Construction	16.0d	6-Nov-23	29-Nov-23
	Initial DDR & P&S DQC, & BCOES Submittal Review	16.0d	5-Jan-21	20-Jan-21

Cadillac Heights Levee	Interim DDR & P&S DQC ATR & BCOES Submittal Review	16.0d	25-Aug-21	9-Sep-21
	Design SAR Review	16.0d	10-Sep-21	26-Sep-21
	Final DDR & P&S DQC, ATR, & BCOES Submittal Review	16.0d	17-Dec-21	1-Jan-22
	Backcheck Final Submittal Review	11.0d	30-Jan-22	9-Feb-22
	SAR Review Midpoint of Construction	16.0d	22-Aug-23	7-Sep-23

Table 9 Schedule of Reviews

ATTACHMENT 5
Review Plan Revisions

Revision Date	Description of Change	Page/Paragraph Number

Table 10 RP Revisions