REVIEW PLAN

AMERICAN RIVER COMMON FEATURES, SACRAMENTO COUNTY, CALIFORNIA
WRDA 96 & 99 SITES L5A, L9, L9A, R10, NEMDC & JACOB LANE REACH C

Prepared by:

U.S. Army Corps of Engineers, Sacramento District

NOVEMBER 2012

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APRIL 2012

1. INTRODUCTION.

a. Purpose. This Review Plan defines the scope and level of quality management activities for the American River Common Features, Sacramento County, California WRDA 96 & 99 Sites L5A, L9, L9A, R10, NEMDC (Natomas East Main Drainage Canal) and Jacob Lane Reach C plans and specifications, Design Documentation Reports, Environmental Impact Statement (R10, NEMDC, and Jacob Lane Reach C only), and Operation and Maintenance Manuals.

b. References.

(1) ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999

(2) ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006

(3) WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007

(4) EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010

(5) Army Regulation 15–1, Committee Management, 27 November 1992 (Federal Advisory Committee Act Requirements)

(6) National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003

c. Review Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. This Review Plan describes the scope of review for the work products described herein. All appropriate levels of review (DQC, ATR, IEPR and Policy and Legal Review) will be included in this Review Plan and any levels not included will require documentation in the Review Plan of the risk-informed decision not to undertake that level of review. The RP identifies the most important skill sets needed in the reviews and the objective of the review and the specific advice sought, thus setting the appropriate scale and scope of review for the individual project.

2. PROJECT DESCRIPTION.

a. Project Authority. The American River Common Features WRDA 96 project was authorized by the Water Resources Development Acts (WRDA) of 1996. WRDA 96 authorized the construction of remediation for gaps in the existing slurry wall on the north and south banks of the Lower American River. The American River Common Features WRDA 99 project was authorized by the Water Resources Development Acts (WRDA) of 1999. WRDA 99 authorized levee improvements on the Lower American

River levees to meet the 160,000 cfs release objective.

b. Location and Description. The American River Common Features project was originally authorized in 1996. This project authorized construction of cutoff walls in 22 miles of the American River levees located in Sacramento, California. Most of this cutoff wall work was completed within five years of the authorization. However, many "gaps" were left where there were road or utility crossings. The work in this review plan covers remediation of four of these gaps (L5A, L9, L9A, and R10) with the construction of slurry walls.

The WRDA 99 authorization authorized the construction of remediating levee deficiencies, such as flattening oversteepened slopes or installing cutoff walls, and widening the levee crown in order to meet Corps of Engineers levee criteria. The NEMDC site involves both slope flattening and installing cutoff walls, and the Jacob Lane Reach C site involves both slope flattening and levee crown widening.

Site L5A is located on the south (left) bank of the American River between the Capitol City Freeway and H Street Bridges, about one-half mile downstream of Glenn Hall Park. The City of Sacramento Sump 10 River Park Pump Station crosses through the levee at this site, which is why it was not constructed with the original slurry wall construction project. The remediation at L5A includes constructing a 100-foot long cement-bentonite slurry wall to a depth of 60 feet around the Sump 10 pipelines to connect the existing slurry walls terminated at each end.

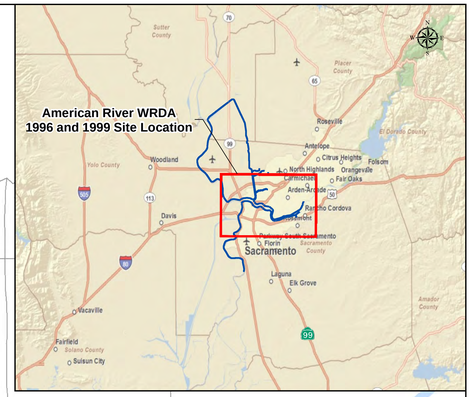
Site L9 is located on the south (left) bank of the American River between the Guy West and Howe Avenue Bridges, just downstream of the Fairbairn Water Treatment Plant. Two City of Sacramento Force Main Sewers cross through the levee at this site, which is why it was not constructed with the original slurry wall construction project. The remediation at L9 includes constructing a 150-foot long cement-bentonite slurry wall to a depth of 60 feet to connect the existing slurry walls terminated at each end.

Site L9A is located on the south (left) bank of the American River between the Guy West and Howe Avenue Bridges, located at the Fairbairn Water Treatment Plant. Four water intake pipes cross through the levee at this site, which is why it was not constructed with the original slurry wall construction project. The remediation at L9A includes constructing a 200-foot long cement-bentonite slurry wall to a depth of 60 feet to connect the existing slurry walls terminated at each end.

Site R10 is located on the north (right) bank of the American River at the Watt Avenue Bridge. The existing slurry wall was terminated just upstream and downstream of the Watt Avenue Bridge, and the seepage analysis determined remediation is required for the entire gap. The remediation at R10 includes constructing a 183-foot long cement-bentonite slurry wall to a depth of 72 feet to connect the existing slurry walls terminated at each end.

The NEMDC site is approximately 1.6 miles long and is located on the north (right) bank of the American River in the vicinity of the Highway 160 bridges, just upstream of the confluence with the Natomas East Main Drainage Canal (NEMDC). This site was determined to require cutoff walls or slope flattening for stability. The upstream 1,850 feet and downstream 1,467 feet will have a soil cement –bentonite slurry wall installed to a depth of 50 feet to continue the existing slurry walls at each end. The center section will have slope flattening on the landside to flatten the slope to 3H:1V.

AMERICAN RIVER WRDA 1996 AND 1999 COMMON FEATURES REMAINING SITES



NAT
ARN
ARS
NEMDC
R2
R3A
L1
L3
L5D/S
L5U/S
L5A
L7
L9
L9A
L10
L15
R5
R6
R7
R9 & Howe Ave
R10
Jacob Lane
Reach C
Mayhew Levee Raise
East End Connection
Mayhew Levee Raise
C.D. 05
C.D. 03
A
B
C
D
E
F
G
H
I

Existing Cutoff Wall

Incomplete (L# or R#)

Alignment Breaks

Project Levees

Reclamation Districts

112th Congressional Districts (C.D. XX)

C.D. 01 - Mike Thompson
C.D. 03 - Daniel E. Lungren
C.D. 05 - Doris Matsui

2,000 1,000 0 2,000 Feet

0.5 0.25 0 0.5 Miles

JANUARY 2012

Date: 1/25/2012
Path: \\Arcticproject_data\CA\CVV\americanRiverCommonFeaturesGRR\GIS\GIS_Projects\MapFiles\2012\ARCF_WRDA_Basin2012.mxd

The Jacob Lane Reach C site is approximately 1,384 feet long, and is located on the north (right) bank of the American River adjacent to the Sacramento County Sheriff's Training Facility. It involves widening this section of levee, to meet the 20-foot crown and 3H:1V waterside slope, and 2H:1V landside slope requirements. The existing levee crown also has an inconsistent grade from the upstream limit to the downstream limit, so this will be made a constant slope.

3. WORK PRODUCTS. Plans and specifications, a Design Documentation Report (DDR), and Operations and Maintenance Manuals will be developed for the Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C projects.

4. SCOPE OF REVIEW. The Scope of this Review Plan is for plans and specifications, and environmental documents being developed for the American River Common Features, WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C. The levels of review required are DQC (District Quality Control), ATR (Agency Technical Review). DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). ATR is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-209. The Type II IEPR (SAR) is conducted to examine resiliency, robustness, and redundancy of the project and to "consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare."

a. District Quality Control Activities. All work products and reports, evaluations, and assessments shall undergo necessary and appropriate District Quality Control/Quality Assurance (DQC). This review is managed by the home district in accordance with the Major Subordinate Command (MSC) and district Quality Management Plans (P2 Project #105608) and includes seamless quality checks and reviews, supervisory reviews, Project Delivery Team reviews (PDT) including input from the Local Sponsor. To ensure specific discipline efforts are on target with regard to compliance with policy and criteria and an acceptable level of quality, sub-products will be technically coordinated and reviewed before they are integrated into the overall project. DQC will be conducted on 60, 90, 100% and for Biddability, Constructability, Operability and Environmental reviews (BCOE).

b. Agency Technical Review. According to EC 1165-2-209, ATR is mandatory for all decision documents and implementation documents and is undertaken to "ensure the quality and credibility of the government's scientific information." ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of a project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. DrChecks will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. American River Common Features, Sacramento County, California WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C plans and specifications, and Environmental Impact Statement (Sites R10, NEMDC, and Jacob Lane Reach C only) are an implementation document and therefore ATR is required for this project.

Due to the nature of the bank protection/levee cutoff wall designs, it was determined that civil, geotechnical, and environmental expertise was needed for the ATR review activities which will be performed at the 90% review for the engineering documents, and the draft EIS for the environmental review.

c. Independent External Peer Review. EC 1165-2-209 requires that a Type II IEPR (also known as a Safety Assurance Review) shall be conducted for any project addressing hurricane and storm risk management or flood risk management, or any other project where the Federal action is justified by life safety, or the failure of the project would pose a significant threat to human life. The SAR team is an independent external panel that conducts reviews at various work phases, and is to be approved by the Review Management Organization (RMO), which is the Risk Management Center (RMC). The SAR shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health, safety, and welfare. Factors to consider for conducting a Type II review of a project or components of a project are:

(1) The project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices;

(2) The project design requires redundancy, resiliency, and robustness.

(a) Redundancy. Redundancy is the duplication of critical components of a system with the intention of increasing reliability of the system, usually in the case of a backup or failsafe.

(b) Resiliency. Resiliency is the ability to avoid, minimize, withstand, and recover from the effects of adversity, whether natural or manmade, under all circumstances of use.

(c) Robustness. Robustness is the ability of a system to continue to operate correctly across a wide range of operational conditions (the wider the range of conditions, the more robust the system), with minimal damage, alteration or loss of functionality, and to fail gracefully outside of that range.

(3) The project has unique construction sequencing or a reduced or overlapping design construction schedule; for example, significant project features accomplished using the Design-Build or Early Contractor Involvement (ECI) delivery systems.

All of the project sites in this Review Plan have a large population area located behind the levee at their location, and would pose a significant threat to human safety if the project were to fail. Therefore, all of these sites require a Type II IEPR (SAR) review.

The Sacramento District Chief of Engineering is responsible for coordinating with the RMO, for attending review meetings with the SAR review panel, communicating with the agency or contractor selecting panel members, and for coordinating the approval of the final report with the MSC Chief of Business Technical Division.

After receiving the report from the peer review panel, the District Chief of Engineering, with full coordination with the Chiefs of Construction and Operations, shall consider all comments contained in the report and prepare a written response for all comments and note concurrence and subsequent action or non-concurrence with an explanation. The District Chief of Engineering shall submit the panel's report and the District's responses shall be submitted to the MSC for final MSC Commander approval and then make the report and responses available to the public on the District's website.

(d) Policy Compliance and Legal Review. The American River Common Features WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C plans and specifications are an implementation document and therefore do not need to be reviewed for compliance with law and policy. The Environmental Impact Statement (R10, NEMDC, and Jacob Lane Reach C), however, does need a

legal review.

5. REVIEW TEAM.

a. District Quality Control Activities. The American River Common Features WRDA 96 Sites L5A plans and specifications were prepared by the Sacramento District Corps of Engineers. Sites L9 and R10 plans and specifications were prepared by an A-E, Pacific Civil and Structural Consultants, JV (PCSC), and Site L9A plans and specifications were also prepared by an A-E, HDR-Fugro. The American River Common Features WRDA 99 Sites NEMDC plans and specifications were prepared by an A-E, Kleinfelder, and the Jacob Lane Reach C plans and specifications were prepared by the Sacramento District Corps of Engineers. The Environmental Impact Statements (EIS) for Sites R10, NEMDC, and Jacob Lane Reach C were prepared by the Sacramento District Corps of Engineers. All of the A-E's and the Sacramento District submitted a Quality Control Plan that outlined their respective A-E and in-house quality control activities. Certification of the quality control activities will be on file with the District upon completion. DQC will be managed in the Sacramento District (District) in accordance with Major Subordinate Command (MSC) and district Quality Management Plans. Supervisory reviews will be conducted at 90% and 100%. DQC activities will be recorded in DrChecks.

The Real Estate Take Letters for all of the sites are being prepared by the Sacramento District Corps of Engineers, and the Real Estate Certification Packages are being prepared by Department of Water Resources Real Estate Division, and reviewed and approved by the Sacramento District Corps of Engineers. There are no permanent easements required for any of the sites, so only temporary work area easements will be acquired. Utility relocations are required at the NEMDC site, which have been designed by Kleinfelder-Geomatrix, and will be paid for by the Department of Water Resources through a letter agreement.

A-E (PCSC) PDT AND QC/QA TEAM

PROJECT DEVELOPMENT TEAM MEMBERS		
Name	**Discipline (Activity)**	**Phone**
Jonathan Kors	Project Manager (R10)	916-326-5294
Bob Sennett	Project Manager (L9)	916-421-1000
David Kitzmann	Geotech Design (L9 & R10)	916-371-1690
John Boatman	Cost Estimating	425-828-0500
QC/QA MEMBERS		
Jonathan Kors	Civil Design (L9)	916-326-5294
Bob Sennett	Civil Design (R10)	916-421-1000
Martin McIlroy	Geotech Design (L9 & R10)	916-371-1690
Dennis Teshlog	Cost Est (L9 & R10)	425-828-0500

A-E (HDR-FUGRO) PDT AND QC/QA TEAM

PROJECT DEVELOPMENT TEAM MEMBERS		
Name	**Discipline (Activity)**	**Phone**
Blake Johnson	Project Manager	916-817-4879

Robert Durkee	Civil Lead	916-817-4849
Chris Krivanec	Geotech Lead	916-817-4842
Dan Gott	Electrical	916-817-4941
Mario Carreon	Transportation	916-471-5842
Keith DeLapp	Structural	916-817-4812
Russell Douglas	CADD	916-817-4982
QC/QA MEMBERS		
Pete Hradilek	Geotech	916-817-4912
Les Harder	Geotech	916-817-4973
Lee Frederiksen	Civil	916-817-4883

A-E (KLEINFELDER) DEVELOPMENT TEAM

A-E (Kleinfelder-Geomatrix) TEAM MEMBERS		
Name	**Discipline (Activity)**	**Phone**
Lynn O'Leary	Program Manager	916-366-2347
Mark Stanley	Task Order Leader	916-366-1701
John Ballegeer	Civil Design	303-237-6601
Frank Szerdy	Soil Design	510-663-4100
Ronald Gibson	Structural Design	719-632-3593
Louis Bridges	Environmental	303-237-6601
Michael Bailey	Surveying	209-943-2021
Blake Johnson	Cost Estimating	916-817-4879
A-E (Kleinfelder-Geomatrix) ITR MEMBERS		
Ray Costa	Geotechnical	916-377-1701
Mike Traubenik	Geotechnical	510-663-4100
Peter Hradilek	Civil Design	916-817-4912

PROJECT DEVELOPMENT TEAM (PDT)

SACRAMENTO DISTRICT TEAM MEMBERS		
Name	**Discipline (Activity)**	**Phone**
John Hoge	Project Manager	916-557-5304
Mark Boedtker	Technical Lead	916-557-6637
Larry Nemetz	Civil Design (L5A)	916-557-7056
Anthony Burdock	Civil Design (Jacob)	916-557-7760
Robert Iwasa	Soil Design	916-557-7179
Todd Rivas	Hydraulic Design	916-557-7523
Levi Bowers	Mechanical (L5A)	916-557-7093
Spenser Brown	Structural (L5A)	916-557-7891
John Suazo	Environmental (99)	916-557-6693
Robin Rosenau	Environmental (96)	916-557-5397
Jeremy Hollis	Real Estate	916-557-6880

Jim Louis	Cost Estimating	916-557-6984
LOCAL SPONSOR TEAM MEMBERS		
Matthew Pi	DWR Project Manager	916-574-2881
Delia Grijalva	DWR Real Estate	916-657-4400
Erin Brehmer	DWR Environmental	916-574-2236
Pete Ghelfi	SAFCA Project Manager	916-874-8733
Grant Kreinberg	SAFCA Real Estate	916-874-8736
KC Sorgen	SAFCA Environmental	916-874-6099

SACRAMENTO DISTRICT QUALITY CONTROL/ASSURANCE TEAM

Name	**Discipline (Activity)**	**Phone**
Mark Boedtker	Chair	916-557-6637
John Hoge	Project Manager	916-557-5304
Anthony Burdock	Civil Design	916-557-7760
Joe Sciandrone	Soil Design	916-557-7184
Ethan Thompson	Hydraulic Design	916-557-7142
Mary Perlea	Levee Safety	916-557-7185
Matt Davis	Environmental	916-557-6708
Sherman Fong	Cost Engineering	916-557-6983
Edward Stewart	Construction	916-373-1617 x311
Dennis Potter	QA Civil Reviewer	916-557-7329

SACRAMENTO DISTRICT LEGAL REVIEW TEAM

Name	**Discipline (Activity)**	**Phone**
Lisa Clay	Office of Counsel	916-557-5295

b. Agency Technical Review. The ATR teams are listed below for each of the projects. Due to the nature of the bank protection/levee designs, it was determined by the PDT that civil, geotechnical, and environmental expertise was needed for the ATR review activities. The geotechnical models developed for these sites included seepage and slope stability analyses for all of the sites, a geomorphology study of historical riverbeds under the NEMDC levee, and specialized jet grout designs for Sites L9/L9A, and R10 ATR. The seepage was analyzed using SEEP/W with verification by USACE's Blanket Theory model. The slope stability was analyzed using SLOPE/W with verification by UTEXAS4 model. The geomorphology study was completed by a geotechnical engineer with experience in river geomorphology, so a geotechnical ATR person with this background was included for the NEMDC review. Review of the hydraulic design models developed for the entire Common Features project will be performed by Robert Mrse of Los Angeles District in January 2013. These models were not developed independently for each site, so only one Hydraulic Design ATR review will be performed covering all of the sites in this project.

NEMDC AGENCY TECHNICAL REVIEW TEAM (ATRT)

Name	Discipline	District Location	Phone	Experience
Scott Loehr	ATR Team Leader / Soil Design	Kansas City	816-389-3601	31 years geotechnical/geomorphological
Jared Mewmaw	Civil Design	Kansas City	816-389-3666	20 years civil design experience
Hannah Hadley	Environmental	Seattle	206-764-6950	10 years environmental experience

L9 & L9A AGENCY TECHNICAL REVIEW TEAM (ATRT)

Name	Discipline	District Location	Phone	Experience
Arthur Fong	ATR Team Leader / Soil Design	Portland	503-808-4862	30 years geotechnical experience
Mark Brodesser	Civil Design	Portland	503-808-4914	20 years civil design experience
Joseph Kauschinger	Jet Grout Design	Nashville	678-778-5858	35 years jet grout experience

R10 AGENCY TECHNICAL REVIEW TEAM (ATRT)

Name	Discipline	District Location	Phone	Experience
Arthur Fong	ATR Team Leader / Soil Design	Portland	503-808-4862	30 years geotechnical experience
Mark Brodesser	Civil Design	Portland	503-808-4914	20 years civil design experience
Joseph Kauschinger	Jet Grout Design	Nashville	678-778-5858	35 years jet grout experience
Hannah Hadley	Environmental	Seattle	206-764-6950	10 years environmental experience

JACOB LANE C AGENCY TECHNICAL REVIEW TEAM (ATRT)

Name	Discipline	District Location	Phone	Experience
Arthur Fong	ATR Team Leader / Soil Design	Portland	503-808-4862	30 years geotechnical experience
Mark Brodesser	Civil Design	Portland	503-808-4914	20 years civil design experience
Hannah Hadley	Environmental	Seattle	206-764-6950	10 years environmental experience

L5A AGENCY TECHNICAL REVIEW TEAM (ATRT)

Name	Discipline	District Location	Phone	Experience
Arthur Fong	ATR Team Leader / Soil Design	Portland	503-808-4862	30 years geotechnical experience
Mark Brodesser	Civil Design	Portland	503-808-4914	20 years civil design experience

c. Type II IEPR (SAR). A Type II IEPR (SAR) is required for Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C. The PDT consulted with Sacramento District geotechnical and levee safety engineers to identify the necessary skill sets required for the SAR. The PDT has determined that two SAR team members will be required due to the scope of the designs, and the modeling completed for the slope stability and seepage analyses. The team members should also have experience with jet grout cutoff walls. The team shall consist of a geotechnical expert with experience in design, inspection and construction of levee projects and either another geotechnical engineer or general civil engineer with significant experience with earthwork construction quality assurance and control in flood control projects including levees. Experience in groundwater seepage analysis, slope stability analysis, seepage cutoff walls constructed with soil mixing and slurry methods will be necessary. An IDIQ contract with an AE firm will be utilized for SAR team selection. The AE will select suitable reviewers according to the National Academy of Science (NAS) policy which sets the standard for "independence" in the review process. The PDT determined that reviews conducted on the plans and specifications and design documentation report along with reviews during construction will be necessary.

According to guidance set forth in EC 1165-2-209, Appendix E, paragraph 5, it is expected that the SAR reviewers will review the plans and specifications and DDR prior to beginning construction and review construction activities at midpoint of construction and prior to final inspection.

SAR TEAM MEMBERS

Name	Discipline/Experience
TBD	Geotechnical with 30+ years experience in design, construction, inspection of levee projects
TBD	Geotechnical/Civil with 30+ years experience in earthwork construction quality assurance and control in flood control projects

d. Value Engineering Study. A Value Engineering (V-E) Study will be performed for Sites L5A, L9, L9A, R10, NEMDC, and Jacob Lane Reach C at the 60% P&S completion. Sacramento District selected a V-E team composed of a geotechnical, civil, mechanical, construction, and cost engineer. The V-E team is responsible for determining the projects meet their intended purpose and cost efficiency.

VALUE ENGINEERING TEAM

SACRAMENTO DISTRICT TEAM MEMBERS		
Name	**Discipline (Activity)**	**Phone**
Mary Diel	V-E Officer	916-557-6833
Sherman Fong	Cost Engineer	916-557-6983

Michael Ramsbotham	Geotechnical Engineer	916-557-7174
Ramchandra Singh	Civil Engineer	916-557-6678
Sam Yang	Construction Engineer	916-557-7028
T. Kyle Cronin	Mechanical Engineer	916-557-5312

6. PUBLIC COMMENT. To ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government, this Review Plan will be published on the district's public internet site following approval by SPD at http://www.spk.usace.army.mil. 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 review plan are necessary. The public is invited to review and submit comments on the plan as described on the web site.

7. SCHEDULE/COSTS.

Table 1. Review Schedule

L5A

Title and Activity	Start Date	End Date
60% P&S Review (DQC)	3/2/12	3/16/12
90% P&S Review (DQC)	5/4/12	5/18/12
90% P&S Review (ATR)	5/4/12	5/18/12
100% P&S Review (DQC)	6/11/12	6/25/12
100% P&S Review (ATR)	6/11/12	6/25/12
BCOE Review	5/4/12	5/18/12
SAR P&S Review	6/11/12	6/25/12
Draft O&M Manual (DQC/ATR/SAR)	11/15/13	11/30/13

The cost of DQC for L5A is $10,000. The cost for ATR for L5A is $5,000. The cost for SAR for L5A is $30,000.

L9

Title and Activity	Start Date	End Date
60% P&S Review (DQA)	2/19/12	3/4/12
90% P&S Review (DQA/BCOE)	4/30/12	5/14/12
90% P&S Review (ATR)	4/30/12	5/14/12
100% P&S Review (DQA/BCOE)	6/11/12	6/25/12
100% P&S Review (ATR)	6/11/12	6/25/12
BCOE Review	4/30/12	5/14/12
SAR P&S Review	6/11/12	6/25/12
Draft O&M Manual (DQC/ATR/SAR)	11/15/13	11/30/13

The cost of DQC for L9 is $10,000. The cost for ATR for L9 is $5,000. The cost for SAR for L5A is $30,000.

L9A

Title and Activity	Start Date	End Date
60% P&S Review (DQA)	2/19/12	3/4/12
90% P&S Review (DQA/BCOE)	4/30/12	5/14/12
90% P&S Review (ATR)	4/30/12	5/14/12
100% P&S Review (DQA/BCOE)	6/11/12	6/25/12
100% P&S Review (ATR)	6/11/12	6/25/12
BCOE Review	4/30/12	5/14/12
SAR Review	6/11/12	6/25/12
Draft O&M Manual (DQC/ATR/SAR)	11/15/13	11/30/13

The cost of DQC for L9A is $10,000. The cost for ATR for L9A is $5,000. The cost for SAR for L9A is $30,000.

R10

Title and Activity	Start Date	End Date
60% P&S Review (DQA)	3/16/12	3/30/12
90% P&S Review (DQA/BCOE)	5/17/12	5/31/12
90% P&S Review (ATR)	5/17/12	5/31/12
100% P&S Review (DQA/BCOE)	6/22/12	7/6/12
100% P&S Review (ATR)	6/22/12	7/6/12
BCOE Review	5/17/12	5/31/12
SAR Review	6/22/12	7/6/12
Draft EIS Review (DQC)	4/14/12	5/15/12
Draft EIS Review (ATR)	4/14/12	5/15/12
Draft EIS Review (Legal)	4/14/12	5/15/12
Draft O&M Manual (DQC/ATR/SAR)	11/15/13	11/30/13

The cost of DQC for R10 is $10,000. The cost for ATR for R10 is $10,000. The cost for SAR for R10 is $30,000.

NEMDC

Title and Activity	Start Date	End Date
60% P&S Review (DQA)	11/14/11	11/25/11
60% P&S Review (ATR)	11/14/11	11/25/11
90% P&S Review (DQA)	4/3/12	4/17/12
90% P&S Review (ATR)	4/3/12	4/17/12
100% P&S Review (DQA)	6/11/12	6/25/12
100% P&S Review (ATR)	6/11/12	6/25/12
BCOE Review	4/3/12	4/17/12
SAR Review	6/11/12	6/25/12

Draft EIS Review (DQC)	4/14/12	5/15/12
Draft EIS Review (ATR)	4/14/12	5/15/12
Draft EIS Review (Legal)	4/14/12	5/15/12
Draft O&M Manual (DQC/ATR/SAR)	11/15/13	11/30/13

The cost of DQC for NEMDC is $15,000. The cost for ATR for NEMDC is $5,000. The cost for SAR is $30,000.

Jacob Lane Reach C

Title and Activity	Start Date	End Date
60% P&S Review (DQC)	2/29/12	3/13/12
90% P&S Review (DQC/BCOE)	5/4/12	5/18/12
90% P&S Review (ATR)	5/4/12	5/18/12
100% P&S Review (DQC/BCOE)	6/11/12	6/25/12
100% P&S Review (ATR)	6/11/12	6/25/12
BCOE Review	5/4/12	5/18/12
SAR Review	6/11/12	6/25/12
Draft EIS Review (DQC)	4/14/12	5/15/12
Draft EIS Review (ATR)	4/14/12	5/15/12
Draft EIS Review (Legal)	4/14/12	5/15/12
Draft O&M Manual (DQC/ATR/SAR)	11/15/13	11/30/13

The cost of DQC for Jacob Lane Reach C is $15,000. The cost for ATR for Jacob Lane Reach C is $5,000. The cost for SAR for Jacob Lane Reach C is $30,000.

8. DOCUMENTATION OF REVIEW. The District Quality Control activities for the American River Common Features, Sacramento County, California WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C will be completed by Sacramento District. The Agency Technical Review activities for the American River Common Features, Sacramento County, California WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C will be completed by Kansas City District, Portland District, and Seattle District. The team used the Document Review and Checking System (DrChecks) to document the review process. Reviewers were then responsible for back checking the A/E's responses to the review comments and either close the comment or attempt to resolve any disagreements.

For the final submittal, the A/E has provided certification that the plans and specifications (P&S) have undergone the A/E's quality control procedure and that the plans are ready for advertising. It is also noted that the A/E is required to have all the design drawings stamped by a registered professional engineer. The AE's Quality Control Plan is provided as an Appendix to this review plan.

9. POINTS OF CONTACT. Questions about this Review Plan may be directed to the applicable District Project Delivery Team, Lead Engineer, Mark Boedtker at (916) 557-6637, or to the Project Manager, John Hoge at (916) 557-5304. The Chief, Engineering Division is Rick Poeppelman at (916) 557-7301.

10. REVIEW PLAN APPROVAL.

The Sacramento District requests that the South Pacific Division endorse the above recommendations and approve this Review Plan as described in Appendix B of EC 1165-2-609.

List of Acronyms

AE – Architect/Engineer
ATR – Agency Technical Review
BCOE – Biddability, Constructability, Operability and Environmental
BI/COI - Background Information and Confidential Conflict of Interest Disclosure
DDR – Design Documentation Report
DQC – District Quality Control
EC – Engineering Circular
ER – Engineering Regulation
IDIQ – Indefinite Delivery Indefinite Quantity
IEPR – Independent Peer Review
MSC – Major Subordinate Command
NAS – National Academy of Sciences
NEMDC – Natomas East Main Drainage Canal
PDT – Project Delivery Team
PMP – Project Management Plan
RMO – Review Management Organization
RP – Review Plan
SAR – Safety Assurance Review
SPD – South Pacific Division
USACE – United State Army Corps of Engineers
WRDA - Water Resources Development Act

APPENDIX A

FORMS

AMERICAN RIVER COMMON FEATURES

WRDA 96 & 99 SITES L5A & JACOB LANE REACH C
PLANS AND SPECIFICATIONS

COMPLETION OF DISTRICT QUALITY CONTROL

COMPLETION OF QUALITY CONTROL ACTIVITIES. The District has completed the geotechnical and civil portion of the design plans and specifications for the American River Common Features, Sacramento County, California WRDA 96 and 99 Sites L5A and Jacob Lane Reach C Plans and Specifications. Certification is hereby given that all quality control activities, appropriate to the level of risk and complexity inherent in the project, associated with project development and District Quality Control (DQC), as defined in the Quality Control Plan and Review Plan (RP), have been completed.

GENERAL FINDINGS. Compliance with established policy, principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and materials used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the project meets the customer's needs consistent with law and existing Corps policy. Documentation of the quality control process is contained in the project file.

_____ _____
QC Geotechnical Engineer, Joe Sciandrone Date

_____ _____
QC Civil Engineer, Anthony Burdock Date

_____ _____
Technical Lead, Mark Boedtker Date

_____ _____
Project Manager, John Hoge Date

_____ _____
ED-GS Chief, Edward Ketchum Date

_____ _____
ED-DA Chief, Peter Valentine Date

AMERICAN RIVER COMMON FEATURES

WRDA 99 SITE NEMDC
PLANS AND SPECIFICATIONS

STATEMENT OF TECHNICAL REVIEW

COMPLETION OF QUALITY ASSURANCE REVIEW AND AGENCY TECHNICAL REVIEW

The District has completed the Plans and Specifications for the American River Common Features, Sacramento County, California WRDA 99 Site NEMDC contract. Notice is hereby given that (1) a Quality Assurance review has been conducted as defined in the Quality Control/Assurance Plan and (2) an agency technical review that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the project's Quality Management Plan. During the agency technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The review also assessed the DQC documentation and made the determination that the DQC activities employed appear to be appropriate and effective. The agency technical review was accomplished by the Corps of Engineers. All comments resulting from DQC/QA and ATR have been resolved.

_____ _____

Scott Loehr Date
NWK-ED-GD ATR Lead

_____ _____

John Hoge Date
PM-C Project Manager

_____ _____

Peter Valentine Date
Chief, Civil Engineering Design Section A

_____ _____

Eric Nagy Date
Chief, Design Branch

AMERICAN RIVER COMMON FEATURES

WRDA 96 & 99 SITES L5A, L9, L9A, R10, & JACOB LANE REACH C
PLANS AND SPECIFICATIONS

STATEMENT OF TECHNICAL REVIEW

COMPLETION OF QUALITY ASSURANCE REVIEW AND AGENCY TECHNICAL REVIEW

The District has completed the Plans and Specifications for the American River Common Features, Sacramento County, California WRDA 96 and 99 Sites L5A, L9, L9A, R10, and Jacob Lane Reach C contracts. Notice is hereby given that (1) a Quality Assurance review has been conducted as defined in the Quality Control/Assurance Plan and (2) an agency technical review that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the project's Quality Management Plan. During the agency technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The review also assessed the DQC documentation and made the determination that the DQC activities employed appear to be appropriate and effective. The agency technical review was accomplished by the Corps of Engineers. All comments resulting from DQC/QA and ATR have been resolved.

_____ _____

Arthur Fong Date
NWP-EC-DC ATR Lead

_____ _____

John Hoge Date
PM-C Project Manager

_____ _____

Peter Valentine Date
Chief, Civil Engineering Design Section A

_____ _____

Eric Nagy Date
Chief, Design Branch

AMERICAN RIVER COMMON FEATURES

WRDA 96 & 99 SITES L5A, L9, L9A, R10, NEMDC & JACOB LANE REACH C PLANS AND SPECIFICATIONS

BCOE CERTIFICATION

Project Title: American River Common Features WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C Plans and Specifications

I certify that all appropriate Biddability, Constructability, Operability and Environmental comments received and reviewed by the office on _____ have been incorporated into the bid package. Feedback has been provided to reviews for all comments.

_____ _____

Date Drew A. Perry

Chief, Construction Quality Assurance Section

Construction-Operations Division

I certify that all appropriate Biddability, Constructability, Operability and Environmental comments received and reviewed by the office on _____ have been incorporated into the bid package. Feedback has been provided to reviews for all comments.

_____ _____

Date Norbert F. Suter

Chief, Construction Branch

Construction-Operations Division

US Army Corps of Engineers
Sacramento District
DISTRICT ENGINEER'S QUALITY CONTROL CERTIFICATION

COMPLETION OF QUALITY CONTROL ACTIVITIES

The District has completed the plans and specifications for the American River Common Features, Sacramento County, California WRDA 96 and 99 Sites L5A, L9, L9A, R10, NEMDC and Jacob Lane Reach C contracts. Certification is hereby given that all quality control activities associated with Project Development and Agency Technical Review (ATR), as defined in the Quality Control Plan, appropriate to the level of risk and complexity inherent in the project have been completed. Documentation of the quality control process is contained in the project file.

GENERAL FINDINGS and RECOMMENDATION

Compliance with clearly established policy, principles and procedures, utilizing clearly justified and valid assumptions, has been verified. This includes assumptions; methods, procedures and materials used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the project meets the customer's needs consistent with law and existing Corps policy. All appropriate ATR and Biddability, Constructibility, Operability and Environmental (BCOE) review comments have been incorporated into this project. Accordingly, the undersigned recommends certification of the quality control process for this project.

_____ _____

RICK L. POEPPELMAN, P.E. Date
Chief, Engineering Division

QUALITY CONTROL CERTIFICATION

As noted above, all requirements have been met and any issues and concerns associated with the development and Agency Technical Review of the project have been resolved. The project may proceed to construction.

_____ _____

WILLIAM J. LEADY Date
COL, EN
Commanding

APPENDIX B – REVIEW PLAN CHECKLIST

Section II - Implementation Documents

Review Plan Checklist

For Implementation Documents

Date: APRIL 2012

Originating District: SACRAMENTO DISTRICT

Project/Study Title: AMERICAN RIVER COMMON FEATURES, SACRAMENTO COUNTY, CALIFORNIA, WRDA 96 & 99 SITES L5A, L9, L9A, R10, NEMDC & JACOB LANE REACH C PLANS AND SPECIFICATIONS

PWI #:

District POC: Mr. Mark Boedtker

PCX Reviewer:

Please fill out this checklist and submit with the draft Review Plan when coordinating with the appropriate RMO. For DQC, the District is the RMO; for ATR of Dam and Levee Safety Studies, the Risk Management Center is the RMO; and for non-Dam and Levee Safety projects and other work products, SPD is the RMO; for Type II IEPR, the Risk Management Center is the RMO. Any evaluation boxes checked 'No' indicate the RP possibly may not comply with EC 1165-2-209 and should be explained. Additional coordination and issue resolution may be required prior to MSC approval of the Review Plan.

REQUIREMENT	REFERENCE	EVALUATION
1. Is the Review Plan (RP) a stand alone document?	EC 1165-2-209, Appendix B Para 4a	Yes ☒ No ☐
a. Does it include a cover page identifying it as a RP and listing the project/study title, originating district or office, and date of the plan?		a. Yes ☒ No ☐
b. Does it include a table of contents?		b. Yes ☒ No ☐
c. Is the purpose of the RP clearly stated and EC 1165-2-209 referenced?	EC 1165-2-209 Para 7a	c. Yes ☒ No ☐

d. Does it reference the Project Management Plan (PMP) of which the RP is a component including P2 Project #? e. Does it include a paragraph stating the title, subject, and purpose of the work product to be reviewed? f. Does it list the names and disciplines in the home district, MSC and RMO to whom inquiries about the plan may be directed?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	EC 1165-2-209 Para 7a (2) EC 1165-2-209 Appendix B Para 4a EC 1165-2-209, Appendix B, Para 4a	d. Yes ☒ No ☐ e. Yes ☒ No ☐ f. Yes ☒ No ☐
2. Documentation of risk-informed decisions on which levels of review are appropriate.	EC 1165-2-209, Appendix B, Para 4b	Yes ☒ No ☐
a. Does it succinctly describe the three levels of peer review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent External Peer Review (IEPR)? b. Does it contain a summary of the CW implementation products required? c. DQC is always required. The RP will need to address the following questions: i. Does it state that DQC will be managed by the home district in accordance with the Major Subordinate Command (MSC) and district Quality Management Plans? ii. Does it list the DQC activities (for example, 30, 60, 90, BCOE reviews, etc) iii. Does it list the review teams who will perform the DQC activities? iv. Does it provide tasks and related resource, funding and schedule showing when the DQC activities will be performed? d. Does it assume an ATR is required and if an ATR is not required does it provide a risk	EC 1165-2-209 7a EC1165-2-209 Para 15 EC1165-2-209 Para 15a EC1165-2-209 Para 8a EC 1165-2-209 Appendix B (1) EC 1165-2-209 Appendix B 4g EC 1165-2-209 Appendix B Para 4c	a. Yes ☒ No ☐ b. Yes ☒ No ☐ i. Yes ☒ No ☐ ii. Yes ☒ No ☐ iii. Yes ☒ No ☐ iv. Yes ☒ No ☐

based decision of why it is not required? If an ATR is required the RP will need to address the following questions: i. Does it identify the ATR District, MSC, and RMO points of contact? ii. Does it identify the ATR lead from outside the home MSC? iii. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)? If the reviewers are listed by name, does the RP describe the qualifications and years of relevant experience of the ATR team members?* iv. Does it provide tasks and related resource, funding and schedule showing when the ATR activities will be performed? v. Does the RP address the requirement to document ATR comments using Dr Checks? **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.* e. Does it assume a Type II IEPR is required and if a Type II IEPR is not required does it provide a risk based decision of why it is not required including RMC/ MSC concurrence? If a Type II IEPR is required the RP will need to address the following questions: i. Does it provide a defensible rationale for the decision on Type II IEPR? ii. Does it identify the Type II IEPR District, MSC, and RMO points of contact? iii. Does it state that for a Type II IEPR, it will be contracted with an A/E contractor or arranged with another government agency to manage external to the Corps of Engineers? iv. Does it state for a Type II IEPR, that the selection of IEPR review panel members will	EC1165-2-209 Para 15a EC 1165-2-209 Para 7a EC 1165-2-209 Para 9c EC 1165-2-209 Appendix B 4g EC 1165-2-209 Appendix C Para 3e EC 1165-2-209 Para 7d (1) EC1165-2-209 Para 15a EC 1165-2-209 Para 7a EC 1165-2-209 Appendix B Para 4a	d. Yes ☒ No ☐ i. Yes ☒ No ☐ ii. Yes ☒ No ☐ iii. Yes ☒ No ☐ iv. Yes ☒ No ☐ v. Yes ☒ No ☐ e. Yes ☒ No ☐ i. Yes ☒ No ☐ ii. Yes ☒No ☐ iii. Yes ☒ No ☐

be made up of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of expertise suitable for the review being conducted?	EC 1165-2-209 Appendix B Para 4k (4)	iv. Yes ☒ No ☐
v. Does it state for a Type II IEPR, that the selection of IEPR review panel members will be selected using the National Academy of Science (NAS) Policy which sets the standard for "independence" in the review process?	EC 1165-2-209 Appendix B, Para 4k(1) & Appendix E, Para's 1a & 7	
vi. If the Type II IEPR panel is established by USACE, has local (i.e. District) counsel reviewed the Type II IEPR execution for FACA requirements?	EC 1165-2-209 Para 6b (4) and Para 10b	v. Yes ☒ No ☐
vii. Does it provide tasks and related resource, funding and schedule showing when the Type II IEPR activities will be performed?		vi. Yes ☒ No ☐
viii. Does the project address hurricane and storm risk management or flood risk management or any other aspects where Federal action is justified by life safety or significant threat to human life? *Is it likely? Yes* ☒ *No* ☐ *If yes, Type II IEPR must be addressed.*	EC1165-2-209 Appendix E, Para 7c(1) EC1165-2-209 Appendix E, Para 5a	vii. Yes ☒ No ☐ iii. Yes ☒ No ☐
ix. Does the RP address Type II IEPR factors? Factors to be considered include: • Does the project involve the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent setting methods or models, or presents conclusions that are likely to change prevailing practices? • Does the project design require redundancy, resiliency and robustness • Does the project have unique construction sequencing or a reduced or overlapping design construction schedule; for example, significant project features accomplished	EC1165-2-209 Appendix E Para 2	ix. Yes ☒ No ☐

using the Design-Build or Early Contractor Involvement (ECI) delivery systems. *Is it likely? Yes* ☒ *No* ☐ *If yes, Type II IEPR must be addressed.* g. Does it address policy compliance and legal review? If no, does it provide a risk based decision of why it is not required?	EC 1165-2-209 Para 14	g. Yes ☒ No ☐
3. Does the RP present the tasks, timing, and sequence of the reviews (including deferrals)?	EC 1165-2-209, Appendix B, Para 4c	Yes ☒ No ☐
a. Does it provide and overall review schedule that shows timing and sequence of all reviews?	EC 1165-2-209, Appendix C, Para 3g	a. Yes ☒ No ☐
b. Does the review plan establish a milestone schedule aligned with the critical features of the project design and construction	EC 1165-2-209, Appendix E, Para 6c	b. Yes ☒ No ☐
4. Does the RP address engineering model certification requirements?	EC 1165-2-209, Appendix B, Para 4i	Yes ☒ No ☐ The hydraulic models have been previously reviewed in prior projects. Slope stability and seepage analyses have been developed for these projects.
a. Does it list the models and data anticipated to be used in developing recommendations?		a. Yes ☐ No ☐
b. Does it indicate the certification /approval status of those models and if certification or approval of any model(s) will be needed?		b. Yes ☐ No ☐
c. If needed, does the RP propose the		

for the model(s) and how it will be accomplished?		
5. Does the RP explain how and when there will be opportunities for the public to comment on the study or project to be reviewed?	EC 1165-2-209, Appendix B, Para 4d	Yes ☒ No ☐
a. Does it discuss posting the RP on the District website? b. Does it indicate the web address, and schedule and duration of the posting?		a. Yes ☒ No ☐ b. Yes ☒ No ☐
6. Does the RP explain when significant and relevant public comments will be provided to the reviewers before they conduct their review?	EC 1165-2-209, Appendix B, Para 4e	Yes ☐ No ☒ There is no public review for these project documents.
a. Does it discuss the schedule of receiving public comments? b. Does it discuss the schedule of when significant comments will be provided to the reviewers?		a. Yes ☐ No ☐ b. Yes ☐ No ☐
7. Does the RP address whether the public, including scientific or professional societies, will be asked to nominate professional reviewers?*	EC 1165-2-209, Appendix B, Para 4h	Yes ☐ No ☒ There is no public review for these project documents.
a. If the public is asked to nominate professional reviewers then does the RP provide a description of the requirements and answer who, what, when, where, and how questions? * Typically the public will not be asked to nominate potential reviewers		a. Yes ☐ No ☐
8. Does the RP address expected in-kind contributions to be provided by the sponsor?	EC 1165-2-209, Appendix B, Para 4j	Yes ☐ No ☒ There are no in-kind sponsor contributions for these projects.
a. If expected in-kind contributions are to be provided by the sponsor, does the RP list the expected in-kind contributions to be provided by the sponsor?		a. Yes ☐ No ☐

9. Does the RP explain how the reviews will be documented?		Yes ☒ No ☐
a. Does the RP address the requirement to document ATR comments using Dr Checks and Type II IEPR published comments and responses pertaining to the design and construction activities summarized in a report reviewed and approved by the MSC and posted on the home district website?	EC 1165-2-209, Para 7d	a. Yes ☒ No ☐
b. Does the RP explain how the Type II IEPR will be documented in a Review Report?	EC 1165-2-209 Appendix B Para 4k (14)	b. Yes ☒ No ☐
c. Does the RP document how written responses to the Type II IEPR Review Report will be prepared?	EC 1165-2-209 Appendix B Para 4k (14)	c. Yes ☒ No ☐
d. Does the RP detail how the district/PCX/MSC and CECW-CP will disseminate the final Type II IEPR Review Report, USACE response, and all other materials related to the Type II IEPR on the internet?	EC 1165-2-209 Appendix B Para 5	d. Yes ☒ No ☐
10. Has the approval memorandum been prepared and does it accompany the RP?	EC 1165-2-209, Appendix B, Para 7	Yes ☒ No ☐

Appendix A – CW Products and Type of Reviews

There are few absolutes in terms of review and those tend towards higher levels of review rather than lower. All Civil Works products shall get district quality control. All decision and implementation documents shall undergo Agency Technical Review. The law states when peer review is mandatory. Beyond this, the EC requires a risk informed decision be made on each individual study/project to determine the appropriate level of review. This determination will first be made as part of the review plan, which is part of the PMP. But the determination may change based upon changes the product undergoes during its development.

Any deviation from the following requires use of a risk informed decision process.

CW Planning Products	Required Review	SPD Requirement
Reconnaissance Report	DQC, ATR	
Feasibility Study	DQC, ATR, Type I IEPR	
General Reevaluation Report	DQC, ATR, Type I IEPR	
Limited Reevaluation Report	DQC, ATR, Type I IEPR	
Continuing Authorities Project	DQC, ATR, Type I IEPR	
Major Rehab Report (Hydropower, Navigation)	DQC, ATR, Type I IEPR	
Dredge Material Management Plan	DQC, ATR	
Shoreline Management Plan	DQC, ATR, Type I IEPR	
Master Plan	DQC, ATR	
Master Plan Update	DQC	
Operational Management Plan	DQC	
Annual Work Plan	DQC	
Hydrologic Studies*	DQC, ATR	QMP

*Data from hydrologic studies must undergo a minimum of DQC and ATR prior to its substantive use in plan formulatin studies.

CW Engineering Products	Required Review	SPD Requirement
Engineering Studies (EDR's, DDR's, etc)	DQC, ATR,SAR	
Cost Engineering Products	DQC, ATR	
Engineering Appendices for FS	DQC, ATR, SAR*	
Operation and Maintenance Manuals	DQC, ATR, SAR*, Policy Review	
Major Maintenance Reports	DQC, ATR	
PL 84-99 Project Information Reports	DQC, ATR	
PL 84-99 Rehab Plans and Specs	DQC, ATR, SAR*	
Plan and Specs for Levee and Dam Projects	DQC, ATR, SAR	
Purchase Orders	DQC, ATR	
Field Investigations	DQC, ATR	
Plan and Specs	DQC, ATR, SAR*	
Construction	SAR* (assumes DQC, ATR and IEPR were done in PED)	
Plans and Specs	DQC, ATR, SAR*	
Issue Evaluation Studies	DQC, ATR	
Engineering Investigations	DQC, ATR	

Operations Engineering Products	Required Review	SPD Requirement
Operation and Maintenance Manuals	DQC, ATR, SAR*	
Major Maintenance Reports	DQC, ATR	
Plan and Specs for Levee or Dam Projects	DQC, ATR, SAR	
Purchase Orders	DQC, ATR	
Field Investigations	DQC, ATR	
Construction		
Plan and Specs	DQC, ATR	
Engineering Investigations	DQC, ATR	
Routine Maintenance/Replacement-in-kind	DQC***	
Periodic Inspections of Completed Projects	DQC	

* SAR is required for any engineering product with life safety issues.

** Routine maintenance work typically does not require any DQC because the DQC occurs during the development/update of the O&M manual.

*** Routine maintenance or Replacement–In-Kind that follows industry standards does not require DQC.

APPENDIX C – CESPD SUPPLEMENT REVIEW PLAN CHECKLIST

CESPD Supplemental Review Plan Checklist

Review Plan: AMERICAN RIVER COMMON FEATURES, SACRAMENTO COUNTY, CALIFORNIA
WRDA 96 & 99 SITES L5A, L9, L9A, R10, NEMDC & JACOB LANE REACH C

Date of review:

Reviewed by:

References: CESPD R 1110-1-8, Appendix C, Planning; EC 1165-2-209, Civil Works Review Policy

Note: Any "No" answer requires explanation in the comment field.

	Item	Yes	No	Comment
1	Is there a Technical Review Strategy Session identified early in the study process? (See Appendix C paragraph 8.2,)	☐	☒	TRSS applies only to decision documents.
2	Are potential Continuing Authority Program (CAP) "spinoffs" identified, along with the appropriate QCP identified for them?	☐	☒	These are levee remediation sites. No possible CAP spinoffs.
3	Are the review costs identified?	☒	☐	
	For District Quality Control (DQC)?	☒	☐	
	ATR?	☒	☐	
	Independent External Peer Review (IEPR)?	☒	☐	
4	Does the RP identify seamless DQC technical review (8.4), including supervisory oversight of the technical products? (See Appendix C paragraph 8.5)	☒	☐	
5	Does the RP identify the recommended review comment content and structure? (See Appendix C paragraph 8.5.4)	☒	☐	
6	Does the RP encourage face-to-face resolution of issues between the PDT and reviewers? (See Appendix C paragraph 8.5.5)	☒	☐	
7	If issues remain, does the RP must identify an appropriate dispute resolution process? (See Appendix C paragraph 8.6)	☒	☐	
8	Does the RP require documentation of all significant decisions, and leave a clear audit trail? (See Appendix C paragraph 8.5.6)	☒	☐	
9	Does the RP identify all requirements for technical certifications? (See Appendix C paragraph 8.5.7)	☐	☒	No, this RP is for P&S
10	Does the RP identify the requirement that without-project hydrology will be certified by the Feasibility Scoping Meeting? (See Appendix C paragraph 8.5.8)	☐	☒	No, this RP is for P&S
11	Does the RP fully address products developed by contractors? (See Appendix C paragraph 8.10)	☒	☐	
12	Is the need for a VE study identified, and incorporated into the review process, after the feasibility scoping meeting? (See Appendix C paragraph 8.11)	☒	☐	A V-E Study is required for this process, and will be conducted during the 100% Review.

	Item	Yes	No	Comment
13	Does the RP include a Feasibility Alternative Review Milestone, where CESPD buy-in to the recommended plan is obtained? (See Appendix C paragraph 12.1)	☐	☒	No, this RP is for P&S
14	Does the RP identify the final public meeting milestone? (See Appendix C, Enclosure 1, SPD Milestones)	☐	☒	No, this RP is for P&S
15	Does the RP identify the report approval process, and if there is a delegated approval authority?	☐	☒	No, this RP is for P&S
16	Does the RP reference CESPD milestones, along with PGN milestones?	☐	☒	No, this RP is for P&S

Revised 10May10

APPENDIX D – HDR-FUGRO QUALITY CONTROL PLAN

QUALITY CONTROL PLAN

November 2011

American River Common Features WRDA96 Phase 2 Remaining Sites Sacramento County, CA

Prepared for:

U.S. ARMY CORPS OF ENGINEERS

Sacramento District

W91238-10-D-0003, Delivery Order No. 0010

Project Number 028-452781-170084

2365 Iron Point Road, Suite 300
Folsom, CA 95630
HDR Project Number 170084

TABLE OF CONTENTS

APPENDICES

1. PROJECT NAME

American River Common Features, WRDA96 Phase 2 Remaining Sites
Sacramento County, California

2. CLIENT

U.S. Army Corps of Engineers, Sacramento District (USACE SPK)
Mr. Mark Boedtker, Project Technical Lead

3. INTRODUCTION AND OBJECTIVE

HDR/Fugro WLA JV was awarded Delivery Order No. 10 under Contract No. W91238-10-D-0003 on September 3, 2010. The Statement of Work (SOW), dated June 23, 2010 (Revised August 24, 2010; Revised After Neg. August 25, 2010), associated with this Task Order requires the A-E firm to prepare a brief Quality Control Plan (QCP) following USACE Engineering Regulation ER-1110-1-12, Engineering and Design Quality Management. The Statement of Work also requires that technical review be consistent with the South Pacific Division Corps of Engineers (SPD) Quality Management Plan (CESPD R 1110-1-8) and associated technical review implementation guidance. The SOW includes 90%, 100%, and final Design Plans and Specifications, Design Documentation Report (DDR), MCACES cost estimate, and Engineering Considerations and Information for Field Personnel (ECIFP) for 5 sites (R3A, L7, R7, LIO, L13); explorations and draft and final Remedial Methods Report for 2 Sites (L1 and L5); and geotechnical exploration, 100% and final Design Plans and Specifications Design Documentation Report (DDR), MCACES cost estimate, and Engineering Considerations and Information for Field Personnel (ECIFP) for site L9A. Take Mapping and a Tract Register shall also be submitted for site L9A with the 100% submittal.

The objective of this QCP is to define the key members of the project delivery team (PDT) and internal independent technical review (ITR) team, project deliverables and review procedures for these deliverables, and technical guidance to be followed. The QCP will be reviewed by the USACE Engineering Technical Lead, and any issues with the QCP will be resolved early in the contract with approval by the USACE Engineering Technical Lead. The QCP will provide the overview guidance information for all involved with the TO to ensure a common understanding of the delivery process and procedures necessary to deliver quality professional engineering services and products by HDR/Fugro WLA JV to SPK.

4. BACKGROUND AND PROJECT DESCRIPTION

This feature of the American River Common Features was authorized by the Water Resources Development Act of 1996. The U.S. Army Corps of Engineers (Corps), the State of California, and the Sacramento Area Flood Control Agency (SAFCA) are all cost-sharing partners for project implementation. Most of the levee system along the American River was remediated with slurry cutoff walls and the sites under this SOW are located between areas of non-remediated segments of the levee. HDR was tasked (W91238-09-D-0003 Task Order 008) to evaluate potential underseepage, through seepage, and slope stability for the gaps in the existing remediated levee alignment for seven remaining sites known as Phase 2. The result of the HDR analysis was that only five of the seven remaining sites needed remediation, however they recommended the two sites not needing remediation for further study. The analysis results were included in the Draft Remediation Methods Report (RMR),

November 2010. For this delivery order, there are five project sites in the grouping know as Phase 2 that were recommended for remediation. Geotechnical field investigations, draft and final RMR, and 60% design of improvements for these 5 sites were accomplished under Contract W91238-10-D-0003 Delivery Order 004. A sixth site, L9A, was designed to 90% plans and specifications during the work for W91238-09-D-0003 Delivery Order 008 and additional geotechnical exploration (being done under a separate task order) was needed to finalize the design. Two other sites, L1 and L5, are recommended for additional analysis to confirm the initial finding that remediation for these sites is not needed.

Table 1 (below) provides the site identification numbers, descriptions, and approximate length.

SITE NO.[1]	DESCRIPTION	UNTREATED LENGTH BETWEEN EXISTING CUTOFFS [2](FT)
L1	I-5 and Discovery Park Bridges Crossing	Approximately 492
L5	Business 80 (Capitol City Freeway) Bridge Crossing	Approximately 164
L7	H-Street Bridge Crossing	Approximately 130
L9A	Fairbairn Water Treatment Conduit Crossings	Approximately 180
L10	Howe Avenue Bridge and Storm Drain Pipes Crossing	Approximately 190
L13	Watt Avenue Bridge Crossing	Approximately 190
R3A	Business 80 (Capitol City Freeway) Bridge Crossing	Approximately 340
R7	H-Street Bridge Crossing	Approximately 180

1. Letter "R" designates right bank levees and "L" designates left bank levees. Left and right directions are referenced in a downstream facing direction.

2. Length measured along levee alignment or projected levee alignment. Note remediation may need to extend beyond the untreated length indicated in the table. The lengths indicated in the table are based on construct records where the full depth of the cutoff occurs (e.g. lead-in trenches are not included).

5. PROJECT REQUIREMENTS

USACE will provide the A-E with existing topography for each site, geotechnical data from previous and current investigations, and the design water surfaces for seepage and slope stability analyses. The work includes a review of encroachments, analyses of seepage and slope stability. Preparation of a final RMR for 2 sites (L1 and L5), the submittal of a Draft and Final Design Documentation Report, and the development of a 90%, 100% and Final Design Plans with a MCACES cost estimates for five sites (L7, L10, L13, R3A, and R7) and 100% and final design for 1 site (L9A).

HDR will complete the work outlined in Statement of Work dated June 24, 2011 and revised August 19, 2011. This document provides an overview of the report preparation approach and quality control methodology that HDR will implement in order to provide to the Sacramento District high quality professional services from the HDR Project Team. This QCP outlines quality control procedures to be followed in conjunction with the following tasks:

The scope of services to be performed under this TO is presented in the attached SOW. As outlined in the SOW, the services are to be provided under the following nine (9) tasks:

Task 1 - Quality Control – Quality Control Plan to be drafted per ER 1110-1-12, Engineering and Design Quality Management. Technical review will be consistent with the Quality Management Plan (CESPD 1110-1-8).

Task 2 – Geotechnical Exploration of Subsurface Conditions – Sites L1 and L5 – Subsurface Investigation Plan to be submitted and approved prior to beginning explorations. The plan will include information for previous and planned explorations. After approval, a general testing program will be provided detailing the testing to be performed. A report containing the subsurface investigation results will be submitted and will include a compilation of existing information and new subsurface interpretations

Task 3 – Geotechnical Analyses Final Remediation Methods Report (RMR): L1 and L5 –Additional Geotechnical analysis including additional seepage analysis is needed to confirm finding of no additional remediation based on previous analysis of L1 and L5 done through contract W91238-09-D-0003 Task Order 8. This document will be updated with previous draft RMR submitted under Task Order 8. .

Task 4 – Develop 90%, 100% and Final Design Plans for 5 Sites: R3A, L7, R7, L10, L13– 90%, 100% and Final designs will be submitted for each of the 5 sites based on the 60% design submittal developed in SOW for W91238-10-D-0003 Task Order 6. The 90% submittal will be a complete set of plans and specifications. The 100% submittal shall be the 90% plans and specifications, with the 90% review comments incorporated. The final submittal shall be the 100% plans and specifications, with any unresolved backcheck comments incorporated. For quality assurance review, provide the following submittals of the construction plans and specifications: 90% Submittal, 100% Submittal, and final 100% submittal with incorporated comments.

Task 5 – 90%, 100%, AND FINAL Draft Design Documentation Report (DDR) FOR 5 SITES: R3A, L7, R7, L10, AND L13 – DDR to be drafted per ER 1110-2-1150, Engineering Design for Civil Works, with emphasis given to Appendix D, which provides content and format guidance. The DDR will provide basis of design for subsequent design packages and serve as a record of any design changes.

Task 6 – 90%, 100%, AND FINAL ECIFP FOR 5 SITES: R3A, L7, R7, L10, AND LB - 90%, 100% and Final ECIFP: HDR will complete the 90%, 100%, and final Engineering Considerations and Instructions for Field Personnel (ECIFP) report. The ECIFP will be drafted per Appendix G of ER 1110-2-1150.

Task 7 – 90%, 100%, AND FINAL MCACES Cost Estimates FOR 5 SITES: R3A, L7, R7, L10, AND L8 – A draft MCACES cost estimate will be prepared for the 90%, 100% and Final designs of R3A, L7, R7, L10, and L8 and will follow ER 1110-2-1302, Cost Estimating Guide, Fair and Reasonable Contract Estimate for Civil Works. MCACES Second Generation (MII) will be used.

Task 8 - Additional Geotechnical Exploration And Analysis, 100% And Final Construction Plans And Specifications, ECIFP, Real Estate Parcel Mapping And Tract Register, And MCACES Cost Estimate For Site No. L9a: Fairbairn Water Treatment Conduit Crossings Using Jet Grout Construction Method.

Additional Geotechnical Exploration and Analysis: The results of the preliminary geotechnical analysis at Site L9A indicate this gap should be mitigated with jet-grouting techniques. Jet grouting is feasible in this location; but, due to the fixed jet-grout portals at the EA Fairbairn Water Treatment Plant intake flume and varied subsurface conditions, selection of the proper type of jet-grouting is crucial to a successful seepage mitigation program.

There are two existing borings (one upstream and one downstream of the portals) that show different subsurface conditions. One indicates layers of mostly sand and gravel and one indicates a layer of cobbles from about 30 to 55 feet below the levee crown. The identification of cobbles requires the collection of additional subsurface data in order to select the appropriate jet grouting equipment.

The general scope of this task includes drilling two standard exploratory borings and one large-diameter boring. Each of these boring locations shall be coordinated with the COE for approval. Laboratory testing shall be performed and coordinated with the COE for approval. All of the work and services required under this task shall be performed or supervised by a State of California, Registered Geotechnical Engineer.

Task 9 – Coordination, Meetings And Project Management Information – One Coordination “Kick-Off” Meeting, Twice-Monthly Project Delivery Team (PDT) Meetings, four Progress Meetings, and a minimum of one Design Review Conference to be attended by appropriate project team members.

5.1 SUBMITTALS

- Progress Reports
- Quality Control Plan
- Subsurface Investigation Plan
- Field and Laboratory Testing Programs
- Draft Subsurface Investigative Results Report
- Final Subsurface Investigative Results Report
- Geotechnical Analysis Final Remediation Methods Report (RMR), L1, and L5.
- 90%, 100%, and final design plans for 5 sites: L 7, R 7, L1 0, L13, AND R3A
- 90%,100%, and final Design Document Report (DDR)
- 90%,100%, and final ECIFP
- 90%,100%, and final Preliminary MCACES Cost Estimate
- Geotechnical Data Report
- 100% Final Design Documents (Plans, Specifications, MCACES Cost Estimates, Final DDR, ECIFP, Submittal Register, Bid Schedule, Electronic Files / Electronic Bid Set)
- Corrected Final Design Documents Submittal (Responses to any Comments from 100% final submittal, All corrected final design documents, Electronic Files/Electronic Ready to Advertise Bid Set Files in PDF, All CAD Files and SpecIntact files)

Prior to the completion of each of these submittals, a Quality Control review will be done. In addition, prior to completion of the Draft 90% Plans, an Independent Technical Review (ITR) will be completed. Review comments from the ITR as well as SPK review comments will be addressed in the Draft 100% Plans and confirmed during backcheck.

PROJECT QUALITY CONTROL OBJECTIVES / PROCEDURES
The A-E shall prepare a brief Quality Control Plan (QCP) immediately following contract award. The technical review shall be consistent with the Quality Management Plan for the Sacramento District COE, and the South Pacific Division COE Quality Management Plan (CESPD R 1110-1-8), and associated technical review implementation guidance. The Sacramento District will provide quality assurance and can provide technical and planning management support to the A-E as needed in resolving major policy and technical issues. The QCP shall describe the objective of the review, the products that shall be reviewed, and the members of the A-E production and the review teams with a brief description of their qualifications. The QCP will be reviewed by the USACE Engineering Technical Lead. Any issues on the QCP shall be resolved early in the contract with approval by the USACE Engineering Technical Lead.

Quality Control Objectives

Quality control for this project will be undertaken following the procedures outlined below. The deliverables discussed above will be reviewed for conformance with the appropriate guidance and/or reference to ensure the quality control objectives are met.

Quality Control Procedures

Before submittal of a deliverable to SPK, the production document and supporting materials will undergo PDT review and internal ITR review. For PDT review, document review will be performed by a senior level individual(s) with the appropriate technical background for the subject document. Depending on the complexity of the document or number of elements of a particular document, PDT review will also be performed as part of an on-going process during document development. Such on-going PDT reviews will be performed by an individual at or above the technical level of the person performing the work. An example of a more complex document that will receive on-going review is the geotechnical report. Report components such as boring logs and figures will receive on-going peer review. Final reviews will then be performed by senior level individuals to result in a draft document, ready for ITR review. The ITR Team will review all components of a deliverable for technical clarity and accuracy and to ensure that the content is consistent with the project requirements and technical criteria specified in the project SOW. The project documents will also be reviewed for editorial type comments. Following completion of the ITR review, the ITR reviewers will discuss their comments with the PDT to convey a clear understanding of any required changes, modifications or clarifications to the project documents.

ITR reviews of deliverables shall be completed to help ensure, as a minimum:

(a) Compliance with established policy and other appropriate guidance
(b) Compliance with project SOW requirements
(c) Appropriateness of data used, including level of detail
(d) Appropriateness of alternatives evaluated
(e) Accuracy of calculations
(f) Consistency with standards of practice

(g) Appropriateness of assumptions made
(h) Reasonableness of results

Concurrent with submission of a draft project deliverable for client / external review, HDR/Fugro WLA JV will submit an Initial Quality Control Certificate (QCC) to the SPK Project Manager stating that the deliverable has been reviewed internally in accordance with the QCP and that all internal review comments have been addressed.

When review comments are received from SPK or other external reviewers resulting from their review of draft versions of the deliverable, similar procedures will be followed to ensure quality control during the revision process. Review comments will be addressed by members of the PDT that originally worked on the deliverable. Changes to the document will be made and will be back-checked upon revision.

All QC activities associated with ITR and external reviews will be fully documented following a tabular comment-response format. QC documentation will be maintained in the project file for review by SPK. A Final QCC will accompany the final submittal of a deliverable. The Final QCC will certify that procedures outlined in this QCP have been performed and that all concerns identified during internal and external QC review have been resolved.

6. GUIDANCE / STANDARDS / TECHNICAL CRITERIA

Appropriate provisions of the following Guidance, Standards and Criteria shall be followed during preparation of the project documents required to be developed under the SOW for this project:

- CESPK-ED-G SOP EDG-003 Geotechnical Levee Practice
- CESPD R 1110-1-8 – Quality Management Plan
- Code of Federal Regulations, Title 44, Chapter 1, 65.10 – Mapping of areas protected by levee systems
- EM 385-1-1 - Safety and Health Requirements
- EM 1110-1-1804 - Geotechnical Investigations
- EM 1110-1-1906 - Soils Sampling
- EM 1110-2-1906 - Laboratory Soils Testing
- EM 1110-2-1913 - Design and Construction of Levees
- ER 200-2-2 – USACE NEPA Implementing Regulation
- ER 1110-1-8100 - Laboratory Investigations and Testing
- ER 1110-1-1807 - Procedures for Drilling in Earth Embankments
- CESPK – "Cost Estimating Guide, Fair and Reasonable Contract Estimate for Civil Works", dated May 1988
- ASTM D 422 - Standard Test Method for Particle-Size Analysis of Soils
- ASTM D 1452 - Standard Practice for Soil Investigation and Sampling by Auger Borings
- ASTM D 1586 - Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils
- ASTM D 1587 - Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes
- ASTM D 2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D 2435 - Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

- ASTM D 2488 - Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
- ASTM D 2850 - Standard Test Methods for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils
- ASTM D 4767 - Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils
- ASTM D 5778 - Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils
- ASTM D 6066 - Standard Practice for Determining the Normalized Penetration Resistance of Sands for Evaluation of Liquefaction Potential

7. REFERENCE DOCUMENTS

The following are reference documents to be used in the execution of the work associated with this project:

- US Army Corps of Engineers, American River Common Features GRR.
- US Army Corps of Engineers, Sacramento District, 60% Plans and Specifications for ARCF-Natomas-Reach I, prepared under Contract W91238-09-D-0003..
- All available project data for the Natomas Basin within Sacramento County provided by the Corps of Engineers. Coordinate existing data with the Corps and other local agencies.
- Historical exploratory boring data developed by the Corps of Engineers.

8. PROJECT DELIVERY AND ITR TEAMS

Overall project delivery efforts will be managed by the HDR/Fugro WLA JV Task Order Manager, Blake Johnson, P.E.. Mr. Johnson will serve as the main point of contact for this task order. Mr. Robert Durkee will provide the day to day supervision of the project as Deputy Task Order Manager. The ITR Team will be led by Peter Hradilek, P.E., G.E., and will include Les Harder, P.E., G.E., John Hess, Michael T. Johnson, and Barry Meyer, P.E. . Presented below is the contact information for the PDT and our subconsultants for this TO.

The table below shows additional Key Project Delivery Team Members:

Name	Project Role	Telephone	E-mail
Johnnie Mack	Contract Manager	916-817-4700	Johnnie.mack@hdrinc.com
Blake Johnson	Task Order Manager	916-817-4700	Blake.Johnson@hdrinc.com
Duston Marlow	Task Order Manager	916-773-2600	dmarlow@fugro.com
Robert Durkee	Deputy Task Order Manager	916-817-4700	Robert.Durkee@hdrinc.com
Peter Hradilek	QC/ITR	916-817-4700	Peter.Hiradilek@hdrinc.com
Michael Johnson	QC/ITR	916-817-4700	Michael.Johnson@hdrinc.com
Barry Meyer	QC/ITR	916-817-4700	Barry.Meyer@hdrinc.com
John Hess	QC/ITR	916-817-4700	John.Hess@hdrinc.com
Les Harder	QC/ITR	916-817-4700	Les.Harder@hdrinc.com
Subcontractors	Utility Field Data		
Chris Trumbull	Lead Geotechnical Analysis	916-817-4700	Chris.Trumbull@hdrinc.com
Tony Quintrall	Geotechnical Analysis	916-817-4700	Tony.Quintrall@hdrinc.com
Kimberly Brown	Geotechnical Analysis	916-817-4700	Kimberly.Brown@hdrinc.com

Name	Project Role	Telephone	E-mail
Robert Durkee	Lead Civil Engineering	916-817-4700	Robert.Durkee@hdrinc.com
Dennis Mui	Civil Engineering	916-817-4700	Dennis.Mui@hdrinc.com
Nicholas Gooding	Civil Engineering	916-817-4700	Nicholas.Gooding@hdrinc.com
Daniel Teak	Civil Engineering	916-817-4700	Daniel.Teak@hdrinc.com
John Russ	MCACES Cost	916-817-4700	John.Russ@hdrinc.com
Nicolas Gooding	MCACES Cost	916-817-4700	Nicolas.Gooding@hdrinc.com
Edwin Woo	Senior Geotechnical Engineer and Lead	510-267-4447	ewoo@fugro.com
Christopher Hitchcock	Senior Engineering Geologist	925-256-6070	c.hitchcock@fugro.com

Contact information for project subconsultants is presented below:

Name	Firm/Project Role	Telephone	E-mail
Dana Remington	Andregg Geomatics/ surveying	530-885-7072	dremington@andregg.com
Adrienne Sandino	Taber Drilling	916-371-8234	ASandino@taberdrilling.com
John Ferla	Sacramento Drilling	916-638-1766	estimating@sacramentodrilling.com

9. PROJECT SCHEDULE AND MILESTONES

The following work schedule covers the work in this SOW.

Task Description	Task Completion (calendar days after contract award)
Task 1: Quality Control Plan	14 days
Task 2: Subsurface Investigation for Sites L1 and L5 Draft Report Final Report	 90 days 120 days
Task 3: RMR: L1 AND L5 Draft RMR Final RMR	 180 days 210 days
Tasks 4 through 7: Sites R3A, L7, R7, L10, and L13 90% Design Submittal 100% Design Submittal Final Submittal	 180 days 240 days 270 days
Task 8: Site L9A 100% Design Submittal Final Submittal	 120 days 180 days

The following reviews of submittals will be performed by the Corps and sponsors:

(a) Subsurface Investigation Plan	14 calendar days after receipt of submittal
(b) Subsurface Investigation Results Report	14 calendar days after receipt of submittal
(c) RMR: L1 and L5	14 calendar days after receipt of submittal
(d) 90% Design Submittal R3A, L7, R7, L10, and L13	14 calendar days after receipt of submittal
(e) 100% Design Submittal R3A, L7, R7, L10, and L13	14 calendar days after receipt of submittal

(f) Final Design Submittal R3A, L7, R7, L10, and L13	14 calendar days after receipt of submittal
(g) 100% Design Submittal L9A	14 calendar days after receipt of submittal
(h) Final Design Submittal L9A	14 calendar days after receipt of submittal

10. PROJECT BUDGET

The attached DO Award documentation that presents the lump sum contract fee negotiated for this project. This document also contains the distribution of the lump sum fee amongst the primary Tasks cited in the SOW.

11. TRANSFER OF DATA

Maintaining the schedule for this project will hinge upon the timely transfer of project data from SPK to HDR/Fugro WLA to support the work efforts required. Additionally, it will be important that HDR/Fugro WLA and SPK maintain a mutually cooperative and timely handling of production documents for review / comment / response focusing on the established schedule dates. The DrChecks system will be used to document the review comment / response process for this project.

APPENDIX A
PROJECT AWARD, BUDGET AND STATEMENT OF WORK

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 25

1. CONTRACT/PURCH. ORDER/ AGREEMENT NO.	2. DELIVERY ORDER/ CALL NO.	3. DATE OF ORDER/CALL (YYYYMMMDD)	4. REQ./ PURCH. REQUEST NO.	5. PRIORITY
W91238-10-D-0003	0010	2011 Sep 01	W62N6M12369868	

6. ISSUED BY CODE W91238
USACE SACRAMENTO DISTRICT
ATTN: CONTRACTING DIVISION
1325 J ST
SACRAMENTO CA 95814-2922

7. ADMINISTERED BY *(if other than 6)* CODE
SEE ITEM 6

8. DELIVERY FOB
[X] DESTINATION
[ ] OTHER
(See Schedule if other)

9. CONTRACTOR CODE 5WVQ8 FACILITY
NAME AND ADDRESS
HDR FUGRO WLA
JOHNNIE MACK
2365 IRON POINT RD
FOLSOM CA 95630-8711

10. DELIVER TO FOB POINT BY (Date) *(YYYYMMMDD)*
SEE SCHEDULE

11. MARK IF BUSINESS IS
[ ] SMALL
[ ] SMALL DISADVANTAGED
[ ] WOMEN-OWNED

12. DISCOUNT TERMS

13. MAIL INVOICES TO THE ADDRESS IN BLOCK
See Item 15

14. SHIP TO CODE W91238
USACE SACRAMENTO DISTRICT
ATTN: CONTRACTING DIVISION
1325 J ST
SACRAMENTO CA 95814-2922

15. PAYMENT WILL BE MADE BY CODE W916TX
USACE FINANCE CENTER
ATTN: CEFC-FP
5722 INTEGRITY DRIVE
MILLINGTON TN 38054-5005

MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.

16. TYPE OF ORDER
DELIVERY/CALL [X] — This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.
PURCHASE [ ] — Reference your quote dated
Furnish the following on terms specified herein. REF:

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR	SIGNATURE	TYPED NAME AND TITLE	DATE SIGNED (YYYYMMMDD)
HDR Fugro WLA		Robert Boling Sr. VP	20110901

[ ] If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/ LOCAL USE
See Schedule

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/ SERVICES	20. QUANTITY ORDERED/ ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	SEE SCHEDULE				

* *If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.*

24. UNITED STATES OF AMERICA
TEL: 916-557-5185
EMAIL: Donna.S.Hammock@usace.army.mil
BY: DONNA S HAMMOCK
Donna S. Hammock
CONTRACTING / ORDERING OFFICER

25. TOTAL $1,040,369.56
26. DIFFERENCES

27a. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE | c. DATE (YYYYMMMDD) | d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE

f. TELEPHONE NUMBER | g. E-MAIL ADDRESS

36. I certify this account is correct and proper for payment.
a. DATE (YYYYMMMDD) | b. SIGNATURE AND TITLE OF CERTIFYING OFFICER

28. SHIP NO. | **29. DO VOUCHER NO.** | **30. INITIALS**

[ ] PARTIAL [ ] FINAL

31. PAYMENT
[ ] COMPLETE [ ] PARTIAL [ ] FINAL

32. PAID BY

33. AMOUNT VERIFIED CORRECT FOR

34. CHECK NUMBER

35. BILL OF LADING NO.

37. RECEIVED AT	38. RECEIVED BY	39. DATE RECEIVED (YYYYMMMDD)	40. TOTAL CONTAINERS	41. S/R ACCOUNT NO.	42. S/R VOUCHER NO.

Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	MAX QUANTITY	UNIT	UNIT PRICE	MAX AMOUNT
0001		1,040,369.56	Dollars, U.S.	$1.00	$1,040,369.56

Tasks 1-9
FFP
The A-E shall perform the following tasks, in accordance with the Statement of Work (SOW) dated 24 June 2011, revised 19 August 2011, incorporated herein:

Task 1 – Quality Control, $13,379.75
Task 2 – Geotechnical Exploration of Subsurface Conditions – Sites L1 & L5, $219,749.62
Task 3 – Geotechnical Analysis Final Remediation Methods Report (RMR) : L1 & L5, $96,256.47
Task 4 – 90%, 100%, & Final Design Plans & Specifications for 5 Sites, R3A, L7, R7, L10 & L13, $242,880.95
Task 5 - 90%, 100%, & Final Design Documentation Report (DDR) for 5 Sites, R3A, L7, R7, L10 & L13, $95,935.61
Task 6 - 90%, 100%, & Final ECIFP for 5 sites, R3A, L7, R7, L10 & L13, $22,673.48
Task 7 - 90%, 100%, & Final MCACES Cost Estimates for 5 sites, R3A, L7, R7, L10 & L13, $34,130.59
Task 8 – Add'l Geotechnical Exploration & Analysis 100% & Final Construction Plans & Specifications, ECIFP, Real Estate Parcel Mapping & Tract Register, Site No. L91; Fairbairn Water Treatment Conduit Crossings using Jet Grout Construction Method, $268,940.99
Task 9 – Cordination, Meetings, & Project Management Information, $ 46,422.10

All work and services shall be completed in accordance with theSubmittal Schedule in the SOW, but not later than 270 calendar days from the effective date of this task order.

FOB: Destination
PURCHASE REQUEST NUMBER: W62N6M12369868

MAX NET AMT	$1,040,369.56
ACRN AA	$1,040,369.56

CIN: W62N6M123698680001

Section C - Descriptions and Specifications

T.O. 0010 SOW
CESPK-ED-DA

24 June 2011
Revised: 19 August 2011

STATEMENT OF WORK

1. PROJECT DATA

1.1. PROJECT TITLE AND LOCATION: American River Common Features WRDA96 Phase 2 Remaining Sites, Sacramento County, California

1.2. PROJECT NUMBER: 105608

1.3. CONTRACT NO: W91238-10-D-0003 Task Order 0010

1.4. CONTRACTOR DATA:

HDR/Fugro WLA Joint Venture (JV)
2365 Iron Point Road
Suite 300
Folsom, CA 95630
Tel: (916) 817-4853
Fax: (916) 817-4747
Contact: Mr. Victor Duran
Victor.Duran@hdrinc.com

1.5. GOVERNMENT POINTS OF CONTACT:

Sacramento District Project Technical Lead:
U.S. Army Corps of Engineers, Sacramento District
ATTN: CESPK-ED-DB (***Mr. Mark Boedtker***)
1325 J Street
Sacramento, California 95814-2922
Telephone (916) 557-***6637***
Facsimile (916) 557-***7966***
Markus.S.Boedtker@usace.army.mil

Sacramento District A-E Contracting Officer:
Carolyn Mallory
CECT-SPK
1325 J Street
Sacramento, CA 95814-2922
(916) 557-5203
Carolyn.E.Mallory@usace.army.mil

1.6. AUTHORIZATION: Water Resources Development Act (WRDA) of 1996

1.7. SCOPE: This Statement of Work includes 90%, 100%, and final Design Plans and Specifications, Design Documentation Report (DDR), MCACES cost estimate, and Engineering Considerations and Information for Field Personnel (ECIFP) for 5 sites (R3A, L7, R7, L10, L13); explorations and draft and final Remedial Methods Report

for 2 Sites (L1 and L5); and geotechnical exploration, 100% and final Design Plans and Specifications Design Documentation Report (DDR), MCACES cost estimate, and Engineering Considerations and Information for Field Personnel (ECIFP) for site L9A. Take Mapping and a Tract Register shall also be submitted for site L9A with the 100% submittal.

1.8. CONSTRUCTION COST: The estimated total construction cost for sites R3A, L7, R7, L10, L13 and L9A is approximately $16.7 million.

1.9. DRAWINGS TITLES: American River Common Features, WRDA 1996 Levee Improvements, Sacramento County, California

1.10. CRITERIA:

1.10.1. Quality Management Criteria, including the referenced CESPD R 1110-1-8, is found at http://iso9000.spk.usace.army.mil/qmp_s/qmp_s.html

1.10.2. (ER 1110-1-12) Engineering and Design Quality Management

1.10.3. CBBS at http://cbbs.spk.usace.army.mil/ae.html

1.10.4. CADD Drawings shall use A/E/C CADD Standard Release 3.0 Standard which can be found at https://cadbim.usace.army.mil

1.10.5. Additional Sacramento District CADD standards and border sheets can be found at: http://www.spk.usace.army.mil/organizations/cespk-ed/SPKCADD/AutoCAD/autocad.html

1.10.6. Detailed instructions for preparing cost estimates are presented in CESPK Publication, "Cost Estimating Guide, Fair and Reasonable Contract Estimate for Civil Works", dated May 1988 and ER 1110-2-1302.

1.10.7. Guidance for preparing a Design Document Report (DDR) and plans can be found in Engineering Regulation ER 1110-2-1150.

1.11 GEOTECHNICAL CRITERIA: Design Guidance can be found at Publications of the Headquarters, United States Army Corps of Engineers at http://www.usace.army.mil/publications/ including but not limited to Engineering Manuals- and Engineering Technical Letter. The following technical guidance documents shall be utilized:

- Geotechnical Levee Practice SOP EDG-03
- Code of Federal Regulations, Title 44, Chapter 1, 65.10 – Mapping of areas protected by levee systems
- EM 385-1-1 - Safety and Health Requirements
- EM 1110-1-1804 - Geotechnical Investigations
- EM 1110-1-1906 - Soils Sampling
- EM 1110-2-1906 - Laboratory Soils Testing
- EM 1110-2-1913 - Design and Construction of Levees
- ER 200-2-2 - USACE NEPA implementing regulation
- ER 1110-1-8100 - Laboratory Investigations and Testing
- ER 1110-1-1807 - Procedures for Drilling in Earth Embankments
- ASTM D 422 - Standard Test Method for Particle-Size Analysis of Soils
- ASTM D 1452 - Standard Practice for Soil Investigation and Sampling by Auger Borings
- ASTM D 1586 - Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils

- ASTM D 1587 - Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes
- ASTM D 2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D 2435 - Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading
- ASTM D 2488 - Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
- ASTM D 2850 - Standard Test Methods for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils
- ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D 4767 - Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils
- ASTM D 5778 - Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils
- ASTM D 6066 - Standard Practice for Determining the Normalized Penetration Resistance of Sands for Evaluation of Liquefaction Potential

2. BACKGROUND

This feature of the American River Common Features was authorized by the Water Resources Development Act of 1996. The U.S. Army Corps of Engineers (COE), the State of California, and the Sacramento Area Flood Control Agency (SAFCA) are all cost-sharing partners for project implementation. Most of the levee system along the American River was remediated with slurry cutoff walls and the sites under this SOW are located between areas of non-remediated segments of the levee. HDR was tasked (W91238-09-D-0003 Task Order 008) to evaluate potential underseepage, through seepage, and slope stability for the gaps in the existing remediated levee alignment for seven remaining sites known as Phase 2. The result of the HDR analysis was that only five of the seven remaining sites needed remediation, however they recommended the two sites not needing remediation for further study. The analysis results were included in the Draft Remediation Methods Report (RMR), November 2010. For this task order, there are five project sites in the grouping know as Phase 2 that were recommended for remediation. A sixth site, L9A, was designed to 95% plans and specifications during the work for W91238-09-D-0003 Task Order 008 and additional geotechnical exploration (being done under a separate task order) was needed to finalize the design. Two other sites, L1 and L5, are recommended for additional analysis to confirm the initial finding that remediation for these sites is not needed.

3. DESCRIPTION OF WORK AND SERVICES

3.1. TASK 1 - QUALITY CONTROL.

3.1.1. Quality Control Plan (QCP): The Contractor shall prepare a brief Quality Control Plan (QCP) immediately following contract award. The technical review shall be consistent with the Quality Management Plan for the Sacramento District COE, and the South Pacific Division COE Quality Management Plan (CESPD R 1110-1-8), and associated technical review implementation guidance. The Sacramento District will provide quality assurance and can provide technical and planning management support to the Contractor as needed in resolving major policy and technical issues. The QCP shall describe the objective of the review, the products that shall be reviewed, and the members of the Contractor's production and the review teams with a brief description of their qualifications. The QCP will be reviewed by the COE Engineering Technical Lead. Any issues on the QCP shall be resolved early in the contract with approval by the COE Engineering Technical Lead.

3.1.2. Statement of Quality Control: After the final submittal is approved by the Government, the Contractor shall submit a Statement of Quality Control to be signed by the firm's Project Manager and a Principal.

3.2 TASK 2 – GEOTECHNICAL EXPLORATION OF SUBSURFACE CONDITIONS - SITES L1 and L5.

3.2.1. Sub Task 2.1 – Exploration Program and Field and Laboratory Testing Program

- Subsurface Investigation Plan. Additional subsurface investigations (approximately 8 borings) shall be performed as needed to supplement data gaps from the existing explorations. The subsurface investigations plan shall be based on an exploration program and laboratory and field-testing program developed by the Contractor. The plan shall include a location map showing all previous explorations locations and information obtained at each location, and the proposed explorations including proposed exploration method, depth of exploration, sampling intervals, and types of sampling. In addition, a general testing program shall be provided describing the types of field and laboratory testing that shall be performed. When field explorations are completed a final laboratory test program shall be developed and provided to COE for approval. The Subsurface Investigation Plan shall be provided to the COE in hard and electronic copy. The Subsurface Investigation Plan shall be coordinated with the COE and the local partners and shall be approved before beginning any field explorations.
- Right of Entry (ROE) for the subsurface investigation shall be obtained by the Contractor. The ROE shall be coordinated with the PM and the State of California.
- Explorations and Field and Laboratory Testing. Explorations and field and laboratory testing shall be performed based on the approved Subsurface Investigation Plan. The subsurface investigation shall conform to the COE guidance requirements listed in paragraph 1.11. No drilling method using drilling fluid shall be used in the embankment portion of the levee. The drilling method shall allow for taking water level readings during drilling.

3.2.2. Sub-Task 2.2 – Boring Location Surveying

The Contractor shall include all boring logs and locations in GIS geo-database (ARCGIS Version 9.3) format. The exact location of each boring / CPT, and the elevation of the ground at each location shall be determined. The location of each boring hole and CPT shall be within one-foot horizontal accuracy and 0.1-foot vertical accuracy. All horizontal data shall be NAD83. Horizontal coordinates shall be in Northing and Easting. The stationing of each borehole is referenced to the stationing along the river axis.

3.2.3. Sub -Task 2.3 - Explorations and Laboratory Testing

Explorations shall be initiated upon receiving approval of the Subsurface Investigation Plan from the COE. All final exploration locations marked in the field shall have received ROE permits, clearance from Underground Service Alert (USA) and American River Flood Control District. In addition, Sacramento County drilling permits shall be obtained prior to start of work. The Contractor shall notify COE a minimum of three (3) calendar days prior to starting field explorations. ***A hammer energy analysis shall be performed while driving samplers in one boring, in order to establish the efficiency of the hammer used.*** Only a licensed Geologist or Civil Engineer shall log the exploration and have at least 5 years experience in logging and classifying soil in accordance with ASTM D 2488. The resume of the soil logger shall be submitted at least fourteen (14) calendar days prior to starting the work and shall be approved by the COE. Laboratory testing shall consist of primary and secondary tests. These tests include sieve analysis, hydrometer analysis, water content and dry unit weight, Atterberg limits, consolidation (all loads with time rates), permeability (flexible wall), and triaxial shear (CU) tests. The laboratory shall have been inspected and met the approval by the Engineer Research Development Center of the COE.

3.2.4. Sub-Task 2.4 - Subsurface Investigation Results and Report

- Submit draft field logs and preliminary laboratory test results as they become available along with

final logs and laboratory test results.

- Prepare a report summarizing the existing subsurface conditions based on new data. The report shall include the compilation of existing information and new subsurface interpretations (plans and profiles). This report shall include all results of the subsurface investigation. Final logs incorporating laboratory test data shall be submitted in gINT format or gINT compatible format in hard copy (paper) and electronic copy (compact disc) formats. The final laboratory test report shall be submitted in both hard copy (paper) and electronic copy (compact disc) formats. Stick logs shall be developed and incorporated in levee profile sheets and included in the DDR.

3.3. TASK 3 – GEOTECHNICAL ANALYSIS FINAL REMEDIATION METHODS REPORT (RMR): L1 AND L5.

Additional Geotechnical analysis including additional seepage analysis is needed to reconfirm finding of no additional remediation based on previous analysis of L1 and L5 done through contract: W91238-09-D-0003 Task Order 008. This document shall update the previous draft RMR submitted under Task Order 008. The technical approach shall follow the established methods used and recommended during the analysis of these sites for the draft RMR under contract W91238-09-D-0003 Task Order 008.

3.4. TASK 4 – 90%, 100%, AND FINAL DESIGN PLANS AND SPECIFICATIONS FOR 5 SITES: R3A, L7, R7, L10, AND L13.

90%, 100% and Final Plans and Specifications: The Contractor shall develop the 90% submittal, 100% submittal, and final design plan submittal for each of the 5 sites as separate plan sets, based on the 60% design submittal developed in SOW for W91238-10-D-0003 Task Order 6. The 90% submittal shall be a complete set of plans and specifications. The 100% submittal shall be the 90% plans and specifications, with the 90% review comments incorporated. The final submittal shall be the 100% plans and specifications, with any unresolved backcheck comments incorporated. For quality assurance review, provide the following submittals of the construction plans and specifications: 90% Submittal, 100% Submittal, and final 100% submittal with incorporated comments.

3.5 TASK 5 – 90%, 100%, AND FINAL DESIGN DOCUMENTATION REPORT (DDR) FOR 5 SITES: R3A, L7, R7, L10, AND L13

90%, 100% and Final Design Document Report (DDR): Based on the results from the geotechnical exploration and analysis and 60% submittal developed in SOW for W91238-10-D-0003 Task Order 6, the Contractor shall submit the 90%, 100%, and final DDR. Content and format are shown in Appendix D of ER 1110-2-1150.

3.6 TASK 6 – 90%, 100%, AND FINAL ECIFP FOR 5 SITES: R3A, L7, R7, L10, AND L13.

90%, 100% and Final ECIFP: The Contractor shall complete the 90%, 100%, and final Engineering Considerations and Instructions for Field Personnel (ECIFP) report. The ECIFP is a report outlining the engineering considerations and providing instructions for field personnel to aid them in the supervision and inspection of the construction contract. Appendix G of ER 1110-2-1150 provides an outline of the ECIFP content.

3.7 TASK 7 – 90%, 100%, AND FINAL MCACES COST ESTIMATES FOR 5 SITES: R3A, L7, R7, L10, AND L13.

90%, 100% and Final MCACES Cost Estimates: The Contractor shall complete the 90%, 100%, and final MCACES cost estimates based on the 60% cost estimate prepared for the SOW W91238-10-D-0003 Task Order 6. Detailed instructions for preparing cost estimates are presented in CESPK Publication, "Cost Estimating Guide, Fair and Reasonable Contract Estimate for Civil Works," dated May 1988 and ER 1110-2-1302. MCACES (Micro-Computer Aided Cost Engineering System) is the required software for the preparation of the cost estimate. The estimates for this task order shall be performed using MII and shall be consistent with the current estimating practices of the construction industry (American Society of Professional Engineers). Software can be obtained by completing a form supplied by the COE. Upon completion of the cost estimate, the Contractor shall submit to the

COE the required back-up information and cost estimate as required by the "Cost Estimating Guide, Fair and Reasonable for Civil Works." The COE Cost Engineers shall be contacted directly for any explanations and/or clarifications.

3.8. TASK 8 – ADDITIONAL GEOTECHNICAL EXPLORATION AND ANALYSIS, 100% AND FINAL CONSTRUCTION PLANS AND SPECIFICATIONS, ECIFP, REAL ESTATE PARCEL MAPPING AND TRACT REGISTER, AND MCACES COST ESTIMATE FOR SITE NO. L9A: FAIRBAIRN WATER TREATMENT CONDUIT CROSSINGS USING JET GROUT CONSTRUCTION METHOD.

Additional Geotechnical Exploration and Analysis: The results of the preliminary geotechnical analysis at Site L9A indicate this gap should be mitigated with jet-grouting techniques. Jet grouting is feasible in this location; but, due to the fixed jet-grout portals at the EA Fairbairn Water Treatment Plant intake flume and varied subsurface conditions, selection of the proper type of jet-grouting is crucial to a successful seepage mitigation program.

There are two existing borings (one upstream and one downstream of the portals) that show different subsurface conditions. One indicates layers of mostly sand and gravel and one indicates a layer of cobbles from about 30 to 55 feet below the levee crown. The identification of cobbles requires the collection of additional subsurface data in order to select the appropriate jet grouting equipment.

The general scope of this task includes drilling two standard exploratory borings and one large-diameter boring. Each of these boring locations shall be coordinated with the COE for approval. Laboratory testing shall be performed and coordinated with the COE for approval. All of the work and services required under this task shall be performed or supervised by a State of California, Registered Geotechnical Engineer.

3.8.1. Task 8.1 - Standard Exploratory Borings.

Perform a subsurface exploration program to log and sample two exploratory borings using hollow-stem auger drilling equipment. The borings shall be drilled to depths of 80 feet. In the event the hollow-stem borings cannot penetrate the granular stratum underlying the embankment, rotary drilling methods would be used. Rotary drilling methods shall not be used within the embankment and shall only be used at a level deeper than 5 feet below the bottom of embankment. The borings shall be backfilled with a cement-bentonite mixture in accordance with the Sacramento County Environmental Health Department guidelines.

Standard penetration resistance shall be determined at approximately 2.5-foot intervals through the levee embankment and at approximately 5-foot depth increments thereafter. Other split barrel samplers and Shelby tubes may be used as necessary. Samples shall be obtained for laboratory testing as described in Paragraph 3.8.3.

A hammer energy analysis shall be performed while driving samplers in one boring, in order to establish the efficiency of the hammer used.

Soil cuttings shall be contained and disposed of offsite. The borings shall be backfilled in accordance with the Sacramento County Environmental Health Department guidelines.

3.8.2. Task 8.2 – Large Diameter Exploratory Boring.

Following completion of the two standard exploratory borings described in Paragraph 3.8.1, the Contractor shall analyze the presence of the potential cobble layer and determine, with concurrence from COE, the location of the large-diameter boring. It shall be located over or immediately adjacent one of the two standard exploratory borings.

The large diameter boring will be approximately 30 inches in diameter and drilled up to a depth of 75 feet. A combination of flight auger and bucket auger shall be used, as necessary, to reach the desired depth. In the

event of caving, the hole shall be cased through the embankment. If fluid is necessary to stabilize the hole, the level of fluid shall be kept below the bottom of embankment level.

Grab samples of select soil layers shall be obtained for classification and index testing. The use of drilling fluid is not planned.

Soil cuttings shall be contained and disposed of offsite. The boring shall be backfilled in accordance with the Sacramento County Environmental Health Department guidelines. The surface shall be restored with concrete, as approved by the City of Sacramento.

3.8.3. Task 8.3 – Laboratory Testing.

Laboratory testing of selected samples recovered from the exploratory borings is required. These tests shall include, as appropriate: 1) Classification and index tests such as sieve and hydrometer analysis and Atterberg Limits determinations to provide data for future analysis; and, 2) Moisture content and dry density determinations to aid in the qualitative evaluation of the soil types encountered and their strength characteristics.

The following type and number of laboratory tests is required:

Lab Testing Summary			
Lab Test	Qty		
	Std	Bucket	Total
Grain Size Distribution	10	5	15
Atterberg limits	4	2	6
DD/MC	8	0	8

3.8.4. Task 8.4 – Geotechnical Data Report.

The Contractor shall submit two (2) versions of a Geotechnical Data Report consisting of a draft and final version that includes the following:

- Regional and local description of the project area.
- A GIS map of the locations of all borings and CPT's.
- Detailed results of all field and laboratory testing, to include the laboratory reports.
- Photocopies of any paper field logs.
- Plan and profile drawings of the project area showing the historic and new stick logs and interpreted stratigraphy. Each plan view shall have a corresponding profile with the stick logs on the same sheet.

The Contractor shall provide five (5) hardcopies and five (5) electronic copies of each version of the data report.

3.8.5. Task 8.5 100% and Final Plans and Specifications: L9A.

Based on the results from the geotechnical exploration and analysis from SSOW for W91238-09-D-0003 Task Order 008, and the 95% construction plans and specifications developed for W91238-09-D-0003 Task Order 008, the Contractor shall complete and submit the 100% and final plans and specifications. The submittal register and bid schedule shall be included. For quality assurance review, the following submittals of the construction plans and specifications (a) Final 100% Submittal and (b) Backcheck submittal shall be required before final approval as discussed in the section SUBMITTALS.

3.8.6. Task 8.6 100% and Final Design Document Report (DDR): L9A.

Based on the results from the geotechnical exploration and analysis from SSOW for W91238-09-D-0003 Task Order 008, the Contractor shall submit the 100% and final DDR. Content and format are shown in Appendix D of ER 1110-2-1150. ***The draft Remediation Methods Report prepared previously for this site by the Contractor shall be finalized including the new geotechnical information obtained in Task 8.4 – Geotechnical Data Report, and shall be included as an appendix to the DDR.***

3.8.7 Task 8.7 100% and Final ECIFP: L9A.

The Contractor shall complete the 100% and final Engineering Considerations and Instructions for Field Personnel (ECIFP) report. The ECIFP is a report outlining the engineering considerations and providing instructions for field personnel to aid them in the supervision and inspection of the construction contract. Appendix G of ER 1110-2-1150 provides an outline of the ECIFP content.

3.8.8 100% and Final MCACES Cost Estimates: L9A.

The Contractor shall complete the 100% and final MCACES Cost Estimates. Detailed instructions for preparing cost estimates are presented in CESPK Publication, "Cost Estimating Guide, Fair and Reasonable Contract Estimate for Civil Works," dated May 1988 and ER 1110-2-1302. MCACES (Micro-Computer Aided Cost Engineering System) is the required software for the preparation of the cost estimate. The estimates for this task order shall be performed using MII and shall be consistent with the current estimating practices of the construction industry (American Society of Professional Engineers). Software can be obtained by completing a form supplied by the COE. Upon completion of the cost estimate, the Contractor shall submit to the COE the required back-up information and cost estimate as required by the "Cost Estimating Guide, Fair and Reasonable for Civil Works." The COE Cost Engineers shall be contacted directly for any explanations and/or clarifications.

3.8.9. 100% and Final Take Mapping and Submittal Register.

The Contractor shall complete the 100% and final take mapping and submittal register. The take mapping is a set of drawings showing required permanent Rights-of-Way, temporary construction easements, access, and temporary contractor staging areas necessary for construction and maintenance of the project. Drawings should be submitted in hardcopy and in electronic in both CAD and PDF file formats. The Contractor shall also submit a Tract Register listing all of the parcel numbers, property owners, addresses, and acreages.

3.9. TASK 9 – COORDINATION, MEETINGS, AND PROJECT MANAGEMENT INFORMATION.

The meetings requiring attendance from the Contractor are listed below. All meetings shall be held in the offices of the COE, Sacramento District, unless notified by the COE.

3.9.1. Coordination Kickoff Meeting . A kick-off meeting shall be held at the Sacramento District office before the beginning of work. The kick-off meeting shall include information availability, geotechnical criteria, requirements for the geomorphology study, scope and requirements of the new proposed subsurface investigation plan, field and laboratory testing, cross section modeling selection for seepage and slope stability analyses, requirements for seepage and slope stability analyses. In addition, the meeting shall discuss the coordination of the field work and schedule.

3.9.2. Project Development Team (PDT) Meetings. The Contractor project manager shall attend when requested PDT meetings between COE, DWR, SAFCA, and Other Agencies (2 meetings per month) for the duration of this SOW. These meetings will be held at the COE Office.

3.9.3. Progress Meetings. An additional 2 progress meetings shall be held at the Sacramento District or through teleconference. The meetings shall discuss progress to date, project design issues, schedule, and coordination with the COE. These meetings will be held at the COE Office.

3.9.4. Design Review Conferences. A review conference between the COE, local sponsors, and the Contractor shall take place following each review period of the 90%, and 100% design submittal to discuss the review comments. The Contractor shall be represented, as a minimum, by the Contractor project manager and a senior engineer.

4. SUBMITTALS

4.1. PROGRESS REPORTING

The Contractor shall prepare progress/status reports to be delivered by the 10th of each month. Progress reports shall be brief (1-2 pages), describing work performed and a quantitative statement of overall work progress, including percentage of work accomplished on each task and submittal. Also, include a description of the current problems that may impede performance of the tasks outlined in this SOW and suggest corrective actions. This report shall also discuss work to be performed on the next two (2) week time frame along with containing a current submittal schedule. Progress reports shall be mailed to the Technical Manager and the A-E Administration Section.

4.2. TASK 1 - QUALITY CONTROL PLAN

Documents shall be provided in Microsoft Word (.doc) electronic format. Type face of report text shall be Times New Roman. Point size shall be 12. The report numbering shall be outline numbered as follows:

1.
1.1.
1.1.1.

The first line on each sub paragraph shall be indented from the above paragraph.

4.3 TASK 2 – GEOTECHNICAL EXPLORATION OF SUBSURFACE CONDITIONS - SITES L1 and L5.

4.3.1. Sub-Task 2.1 – Subsurface Investigation Plan:

4.3.1.1. Draft Submittal - The Contractor shall submit three (3) hard copies and two (2) electronic copies of the Draft Subsurface Investigation Plan. The COE shall return the submittal not later than twenty (20) calendar days following receipt of the draft submittal.

4.3.1.2. Final Submittal - The Contractor shall submit three (3) hard copies and two (2) electronic copies of the Final Subsurface Investigation Plan to the COE no later than seven (7) calendar days following the receipt of COE comments. The report shall be in Microsoft Word format.

4.3.2. Sub-Task 2.2 – Field and Laboratory Testing Program:

4.3.2.1. Qualifications – The Contractor shall submit the name(s) and addresses of the geotechnical laboratories selected to perform the soil tests.

4.3.3. Sub-Task 2.4 – Subsurface Investigation Results Report:

4.3.3.1. Draft Subsurface Investigation Results Report - Prepare a report summarizing the existing subsurface conditions based on new data. The report shall include the compilation of existing information and new subsurface interpretations (plans and profiles). This report shall include all results of the

subsurface investigation. Final logs incorporating laboratory test data shall be submitted in gINT format or gINT compatible format in hard copy (paper) and electronic copy (compact disc) formats. A final laboratory test report shall be submitted in both hard copy (paper) and electronic copy (compact disc) formats. The report shall be provided in electronic format for review and comment by the COE and local agencies. COE and local agencies will require fourteen (14) calendar days for review and comment upon receipt of the draft report. The Contractor shall respond to the comments provided in Dr. Checks and address the comments in the Final Geotechnical Report. The Contractor shall provide three (3) hard copies and one (1) electronic copy of the Draft Geotechnical Report.

4.3.3.2. Final Subsurface Investigation Results Report - The Final Subsurface Investigation Results Report shall address all comments provided by the COE, and the Sponsor to the previous data and draft evaluation reports. All comments in Dr. Checks shall be closed prior to acceptance of the Final Geotechnical Report. The Contractor shall provide three (3) paper copies and one (1) electronic copies of the Final Geotechnical Report.

4.4 TASK 3 – GEOTECHNICAL ANALYSIS FINAL REMEDIATION METHODS REPORT (RMR): L1 AND L5.

Report Layout: All documents shall be submitted on 8 ½" x 11" paper and presented in the manner described below:

- Page size shall be 8 ½" x 11." Larger pages (if used for tables, etc.) shall be folded to 8 ½" x 11."
- Narrative material shall be typed with lines of type at 1-½ spaces. Draft materials may be doubled spaced to allow for comments. Originals shall be furnished using one side of the sheet; however, the additional required copies may be printed on both sides of the sheet.
- Margins for 8 ½" x 11" paper at the binding edge shall be 1 ½" and not less than 1" at the outer edges. Top and bottom margins shall not be less than 1."

Pages: Pages shall be numbered consecutively. Each major section of the report shall start on a new page. Capitalized section headings shall be centered on the page.

Cover: Document covers shall be of hard stock. The project name, submittal date, name of agency, and any other appropriate identifying data shall be shown on the front of the document. Binding shall be by metallic or plastic binders so that additional or revised material may be inserted.

Word Processing: All documents shall be created and stored electronically for printing on 8 1/2" x 11" paper in black-and-white format. All text shall be created in MS Word 2007 format.

Credits: The use of credit lines, by-lines, logotypes, insignia, and similar forms of identification of the Contractor shall be limited to one reference on the title page.

Maps or Drawings: Maps and drawings shall be of good quality, consistent format and must include a North arrow, scale, title block, and legend. Maps shall be either on 8 ½" x 11" or 11" x 17" format. Larger pages shall be folded to 8 ½" x 11." All maps shall be prepared to allow reproduction in black-and-white format. The title block of all drawings shall contain the name of the project, date, and subject of the drawing. All drafting shall be done to scale that will provide a clear reproduction. Crowding of detail and lettering will not be acceptable. Graphic scales shall be used on all drawings and placed below the view to which they pertain.

Photographs and Illustrations: Good quality color photographs will be used showing general views of appropriate subjects to include in the main text. All photographs shall be annotated to describe location

and/or significant features. All line illustrations shall be carefully drawn with scale, if appropriate, title block, north arrow, and other pertinent features.

4.5. TASK 4 – DEVELOP 90%, 100%, AND FINAL DESIGN PLANS FOR 5 SITES: L7, R7, L10, L13, AND R3A .

a. Drawings. The specific content of the drawings may vary depending on the stage of the submittal.

(1) CADD drawings shall follow the A/E/C CADD Standard Release 3.0 Standard which can be found at https://cadbim.usace.army.mil. Sacramento District specific standards and border sheets can be found at http://www.spk.usace.army.mil/organizations/cespk-ed/SPKCADD/index.html

(2) The Contractor has the responsibility to show all information necessary to completely describe the project on the plans. Regardless of local practice or procedures, the designer shall prepare original drawings with the expectation that both the COE, in the role of construction manager, and the construction contractor will be able to construct this project without numerous modifications to correct design deficiencies. Plans shall include longitudinal profiles, plan views, and as many cross-sections and details necessary to show the features of the project. All dimensions and elevations of the channel excavation and flood protection features shall be indicated. Survey controls shall be based on information presented in previous construction submittals for this project. The datum refers to National Geodetic Vertical Datum of 1929.

(3) The cover sheet(s) shall include the schedule of drawings, vicinity map, location map, legend, and list of abbreviations. The schedule of drawings shall include the consecutive sheet numbers, the design discipline sheet numbers, and the drawings titles. The vicinity map shall be a single-line type showing major cities, nearby towns, major streams and rivers, current routes of nearby highways and railroads, and a north arrow. Show location of the project on a small scale location map indicating the general relationship between the new project and streets to facilitate identification of the proposed site. On the location map, show the north arrow and highlight the approved project boundaries, the Contractor's haul roads, location and phone numbers of nearest medical facility, and the approved location of the borrow and disposal areas.

(4) The submittal drawings shall be single thickness paper drawing sheets and sized no less than 22"x34" (D size) full-size and 11"x17" half-size. Drawing material that does not meet COE standards may be rejected at any time during design. The Contractor is liable for replacing rejected drawings at no expense to the Government. All sheets shall have the COE standard borders and title blocks. The title block is for all sheets other than the cover sheet. The cover sheet title block requires a number of signatures by COE personnel.

(5) All drawings shall be consecutively numbered by discipline. The drawings shall be placed in the drawings set in the discipline sequence. The cover sheet must be the first of the drawing set. All final drawings prepared and submitted by the Contractor shall bear the stamp and signature of a registered engineer identified in the Contractor's QC Plan, preferably one of the principals of the firm. Drawings submitted by the designer shall not be dated. Cross referencing for sections and details shall be based on the discipline drawing number (e.g., S-1, S-3, etc.).

(6) Scales shall be selected to avoid overcrowded and cluttered conditions on the drawings. Where necessary to maintain proper scale, drawings or large structures shall be placed on two or more sheets. A graphic scale for each of the different scales used on a drawing shall be placed on the drawings preferable near the title block. Scales shall be consistent throughout all the disciplines' drawings. Acceptability of scale is determined by clarity of drawings at one-half scale reduction. Plan sheets are recommended to have a scale of 1 in= 40 ft.

(7) After the backcheck has been completed and approved, the Contractor shall submit to the COE a CD containing all CAD files as well as an index for the reference files for each drawing. In addition, electronic files of the drawings in Acrobat PDF format shall submitted.

4.6. TASK 5 – 90%, 100%, AND FINAL DESIGN DOCUMENT REPORT (DDR)

The DDR shall be a bound document that is to be developed and expanded upon with each subsequent submittal so that it represents the complete design history. Included shall be a table of contents, a narrative, and appendices. Content and format are shown in Appendix D of ER 1110-2-1150. It shall be noted that the DDR will not be part of the construction bid documents; therefore, any information contained in the DDR that will be needed to complete the construction of the project shall be included in the plans and specifications.

(a) The Table of Contents shall clearly define the location of all information contained therein.

(b) The narrative shall provide a complete explanation of the basis of design discipline-by-discipline. It shall also include the results of field investigations performed, including basic findings and a discussion of items that warrant special attention.

(c) The appendices shall include copies of all pertinent correspondence; all design calculations and worksheets, and all submittal review comments. Copies of all pertinent correspondence (e.g., statements of work, conference minutes and other pertinent data) are required so that the DDR presents the project history from inception to completion of the design documents. Design calculations and worksheets citing applicable codes and standards shall also be included to verify the design. Sketches, details and plans, as necessary, shall be prepared to support the calculation. The calculations shall be computed and checked by separate individuals. Checking shall be accomplished by registered engineers of the firm under contract to the COE, as identified in the Contractor's QC Plan. The names of these individuals shall be indicated on the page or insert carrying the calculation. Presentation shall be clear and legible with a tabulation showing all design loads and conditions. The source of loading conditions formulas and references shall be identified. All assumptions and conclusions shall be explained and cross-referencing shall be clear. When a computer program is used, the program shall be named and described. This description must be sufficient to verify the validity of methods, assumptions, theories, and formulas, but will not require source code documentation or otherwise which will compromise proprietary programs. Lastly, all review comments generated by the reviewers, annotated by the Corps of Engineers, and responded to by the Contactor shall also be included as an appendix.

(d) The specific contents of the DDR vary depending on the stage of the submittal. Do not delete information from earlier stages of design in subsequent design submittals. The original DDR shall be loosely assembled while the copies shall be bound. If more than one volume is used, all volumes shall be numbered sequentially and assembled under a cover page indicating the volume and total number of volumes for the project. All material shall be 8-1/2" X 11" standard page size. Larger material, folded to 8-1/2" X 11" may be utilized when reduction is not feasible. This applies to all drawings, published data or automatic data processing printouts that must be included in the DDR. Both side margins shall be 1" minimum to permit loose side bindings and head-to-head printing.

(e) Electronic Media: All submittals shall be stored on CD or other agreed-upon media compatible with a personal computer operating Windows XP Professional. The word processing used to generate the text shall be Microsoft Word 2007 format. Graphics must be in a form that can be imported into the Word documents. Final submittal shall be in both MS Word 2007 format and Adobe Acrobat PDF.

(f) Structural Design Calculations: The structural calculations shall comply with COE criteria. All calculations shall be certified (stamped) by the person indicated in the Contractor's QC Plan. The design calculations shall be separately bound and clearly subdivided by structure.

4.7. TASK 6 – 90%, 100%, AND FINAL ECIFP

The Contractor shall complete the final Engineering Considerations and Instructions for Field Personnel (ECIFP) report. The ECIFP is a report outlining the engineering considerations and providing instructions for field personnel to aid them in the supervision and inspection of the construction contract. Appendix G of ER 1110-2-1150 provides an outline of the ECIFP content.

4.8. TASK 7 – 90%, 100%, AND FINAL PRELIMANARY MCACES COST ESTIMATES

The cost estimate submitted with the submittals shall be as accurate as possible based on the design accomplished at that time and consistent with the best estimating practices of the construction industry. These estimates shall be in MCACES (Micro-Computer Aided Cost Engineering System) which can be obtained by completing a form supplied by the COE. The cost estimate shall be divided into two (2) separate cost accounts: flood control, and non-Federal relocation costs and betterments. Upon completion of the cost estimate, the Contractor shall submit to the COE Project Manager the required back-up information and cost estimate as required by the "Cost Estimating Guide, Fair and Reasonable for Civil Works." The COE Cost Engineers shall be contacted directly for any explanations and/or clarifications.

4.9. TASK 8 – ADDITIONAL GEOTECHNICAL EEXPLORATION AND ANALYSIS, 100% AND FINAL CONSTRUCTION PLANS AND SPECIFICATIONS, ECIFP, AND MCACES COST ESTIMATE FOR SITE NO. L9A: FAIRBAIRN WATER TREATMENT CONDUIT CROSSINGS USING JET GROUT CONSTRUCTION METHOD

a. Drawings. The specific content of the drawings may vary depending on the stage of the submittal.

(1) CADD drawings shall follow the A/E/C CADD Standard Release 3.0 Standard which can be found at https://cadbim.usace.army.mil. Sacramento District specific standards and border sheets can be found at http://www.spk.usace.army.mil/organizations/cespk-ed/SPKCADD/index.html

(2) The Contractor has the responsibility to show all information necessary to completely describe the project on the plans. Regardless of local practice or procedures, the designer shall prepare original drawings with the expectation that both the COE, in the role of construction manager, and the construction contractor will be able to construct this project without numerous modifications to correct design deficiencies. Plans shall include longitudinal profiles, plan views, and as many cross-sections and details necessary to show the features of the project. All dimensions and elevations of the channel excavation and flood protection features shall be indicated. Survey controls shall be based on information presented in previous construction submittals for this project. The datum refers to National Geodetic Vertical Datum of 1929.

(3) The cover sheet(s) shall include the schedule of drawings, vicinity map, location map, legend, and list of abbreviations. The schedule of drawings shall include the consecutive sheet numbers, the design discipline sheet numbers, and the drawings titles. The vicinity map shall be a single-line type showing major cities, nearby towns, major streams and rivers, current routes of nearby highways and railroads, and a north arrow. Show location of the project on a small scale location map indicating the general relationship between the new project and streets to facilitate identification of the proposed site. On the location map, show the north arrow and highlight the approved project boundaries, the Contractor's haul roads, location and phone numbers of nearest medical facility, and the approved location of the borrow and disposal areas.

(4) The submittal drawings shall be single thickness paper drawing sheets and sized no less than 22"x34" (D size) full-size and 11"x17" half-size. Drawing material that does not meet COE standards may be rejected at any time during design. The Contractor is liable for replacing rejected drawings at no expense to the Government. All sheets shall have the COE standard borders and title blocks. The title block is for all sheets other than the cover sheet. The cover sheet title block requires a number of signatures by COE personnel.

(5) All drawings shall be consecutively numbered by discipline. The drawings shall be placed in the drawings set in the discipline sequence. The cover sheet must be the first of the drawing set. All final drawings prepared and submitted by the Contractor shall bear the stamp and signature of a registered engineer identified in the Contractor's QC Plan, preferably one of the principals of the firm. Drawings submitted by the designer shall not be dated. Cross referencing for sections and details shall be based on the discipline drawing number (e.g., S-1, S-3, etc.).

(6) Scales shall be selected to avoid overcrowded and cluttered conditions on the drawings. Where necessary to maintain proper scale, drawings or large structures shall be placed on two or more sheets. A graphic scale for each of the different scales used on a drawing shall be placed on the drawings preferable near the title block. Scales shall be consistent throughout all the disciplines' drawings. Acceptability of scale is determined by clarity of drawings at one-half scale reduction. Plan sheets are recommended to have a scale of 1 in= 40 ft.

(7) After the backcheck has been completed and approved, the Contractor shall submit to the COE a CD containing all of the CAD files as well as an index for the reference files for each drawing. In addition, an Electronic Bid Set file package in Acrobat PDF format shall be prepared of the contract drawings.

(8) Revisions to drawings after the project has been advertised for construction can include revisions issued by amendment during the bidding period requiring changes to drawings. The Contractor shall be required to make all necessary revisions resulting from errors on the part of the Contractor at no cost to the government.

b. Specifications. Specifications shall include technical provisions covering site work, earthwork, environmental restoration, and other components of work requiring details. Specification shall be prepared according to ER 1110-1-8155. SPECSINTACT software shall be used to prepare specifications. In the interest of uniform construction, it is mandatory for the Contractor to use COE guide specifications unless otherwise noted. The Contractor shall acquire all COE guide specifications via the electronic bulletin board. The bulletin board provides the most current guide specifications available for use. It shall be noted that the guide specifications shall be followed without deviations. However, if a change is needed, the Contractor shall consult with the COE Project Manager. Contactor prepared specifications shall be used only if there isn't a COE guide specification available for a specific item of work. Technical provisions shall be sufficiently complete and detailed to insure high quality work. Each technical provision shall have a table of contents and text submitted on 8-1/2" X 11" paper using the Construction Specifications Institute (CSI) format. The use of trade names or proprietary items on the drawings and/or in the specifications by adopting a manufacturer's description of a particular commercial article followed by the words "or approved equal" shall be avoided. Following the backcheck review and approval of the specifications, the Contractor shall provide a CD with SPECSINTACT computer file for the specifications. In addition, another CD shall be submitted to the COE containing the specifications in PDF-format for use as an electronic bid set for advertisement of the contract.

c. Submittal Register. The submittal register shall include a tabulation of all contractor submittal requirements for this contract using ENG Form 4288. This register shall be coordinated with the specifications and is developed through use of the SPECSINTACT software.

d. Bid Schedule: The bid schedule shall cover all work in this Statement of Work and contain sufficient details to provide a basis for bidding by contractors to construct the project. See the CESPK Publication, "Cost Estimating Guide, Fair and Reasonable Contract Estimate for Civil Works," for instructions on preparing the bid schedule. Include line items which can easily be divided into two (2) separate cost accounts: flood control, and non-Federal relocations and betterments

e. Submittals:

(1) Geotechnical Data Report

(2) 100% Final Design Documents

A. Plans
B. Specifications
C. MCACES Cost Estimates
D. Final DDR
E. ECIFP
F. Submittal Register
G. Bid Schedule
H. Electronic Files \ Electronic Bid Set

(3) Corrected Final Design Documents Submittal

A. Responses to any Comments from 100% final submittal
B. All corrected final design documents
C. Electronic Files \Electronic Ready to Advertise Bid Set Files in PDF
D. All CAD files and Specsintact files

4.10. TASK 9- COORDINATION, MEETINGS, AND PROJECT MANAGEMENT INFORMATION

a. Meetings: The CONTRACTOR shall provide minutes of the Design Review Meetings within five (5) calendar days of the meeting.

b. Furnish the COE with copies of all written communications pertaining to the work under this contract received from other agencies within five (5) calendar days of receiving this communication. When it is clearly indicated that a copy of the communication has been furnished to the COE by the originator, the Contractor shall obtain the concurrence of any action items from the COE. Prepare a summary of all discussions between the Contractor and representatives of interested groups and individuals of other agencies relating to work under this contract and furnish a copy to the COE within five (5) calendar days.

4.11. REPRODUCTION REQUIREMENTS:

(1) The Contractor's reproduction responsibility for the TASKS 4 through 7: 90% and 100% Design submittal for R3A, L7, R7, L10, and L13 shall be as follows:

ITEM	COE	DWR	SAFCA
90 % and 100% Drawings (full size)	3	0	0
90 % and 100% Drawings (half size)	10	3	2
90% and 100% Specifications	10	3	2
90% and 100% DDR	10	3	2
90% and 100% Submittal Register	5	3	2
90% and 100% Bid Schedule	5	3	2
90% and 100% MCACES Cost Estimate	5	1	1
90% and 100% ECIFP	5		
Electronic Files on CD-ROM	1		

(2) The Contractor's reproduction responsibility for the TASKS 4 through 7: R3A, L7, R7, L10, and L13 Backchecked Final Design submittal shall be as follows:

ITEM	TO COE
Drawings (full size)	3
Drawings (half size)	5
Specifications	5

DDR	5
Submittal Register	5
Cost Estimate	5
ECIFP	5
Statement of Quality Control	1
Electronic Files / EBS files	1

(3) The Contractor's reproduction responsibility for the subsurface investigation results report submittals shall be as follows

ITEM	COE
Hardcopy	3
Electronic Files on CD-ROM	1

(4) The Contractor's reproduction responsibility for the RMR submittals shall be as follows:

ITEM	COE	DWR	SAFCA
Draft Hardcopy	10	3	2
Electronic Files of Draft	1		
Final Hardcopy	10	3	2
Electronic Files on CD-ROM	1		

(5) The Contractor's reproduction responsibility for the TASK 8: L9A 100% Design submittal shall be as follows:

ITEM	COE	DWR	SAFCA
Drawings (full size)	3	1	1
Drawings (half size)	10	3	2
Specifications	10	3	2
DDR	10	3	2
Submittal Register	5	3	2
Bid Schedule	5	3	2
MCACES Cost Estimate	5	1	1
ECIFP	5		
Real Estate Mapping and Tract Register (100%)	5		
Electronic Files on CD-ROM	1		

(6) The Contractor's reproduction responsibility for the TASK 8: L9A Backchecked Final Design submittal shall be as follows:

ITEM	TO COE
Drawings (full size)	3
Drawings (half size)	5
Specifications	5
DDR	5
Submittal Register	5
Cost Estimate	5
ECIFP	5
Statement of Quality Control	1
Electronic Files / EBS files	1

(7) The Evaluation of Results and Remediation Method Development Report, 90% Design, the 100% Design submittal packages shall be submitted directly to the COE - Sacramento District, Department of

Water Resources, and SAFCA. The addresses for the Department of Water Resources and SAFCA are as follows:

Department of Water Resources
ATTN: Mr. Kris Brown
3310 El Camino Avenue
Sacramento, California 95864

SAFCA
ATTN: Mr. Grant Kreinberg
1007 Seventh Street, 7th Floor
Sacramento, California 95814

4.12. COE REVIEW PROCESS

General. All design data prepared by the Contractor shall be reviewed by the COE and other agencies for conformance with the contract requirements and technical as well as functional criteria utilizing the COE of Engineers' Design, Review, and Checking System (Dr. Checks). Dr. Checks is a computerized method for transmittal and storage of design review comments. It provides interactive capability to address and respond to design review comments. The Contractor can access Dr. Checks at the website www.projnet.org. The Contractor shall also need to get login capability. If the Contractor requires assistance, encounters problems, or has questions or comments, call the Dr. Checks Coordinator, Laura Haven, at (916) 557-7651.

Review Periods. A review by the COE and the local sponsor shall follow the receipt of each design submittal. The review schedule is shown in paragraph 5.2.

Review Comments. Written review comments will be returned to the Contractor via Dr. Checks. This review effort in no way replaces the Contractor's review requirements outlined in the Contractor's Quality Control Plan. All review comments will be "coordinated" by the COE Project Manager. That is, they will be reviewed for applicability to the project against the project's design criteria. All design review comments will be electronically transmitted between the COE and the Contractor via Dr. Checks. Comments shall be received at a personal computer in the Contractor office by use of the Dr. Checks website described above. All comments shall be stored in Dr. Checks. The Contractor can then download the review comments, respond to the comments, upload the responses back to the COE computer and forward responses to the COE Project Manager.

Contractor Responses. Once review comments have been forwarded to the Contractor, the Contractor shall respond to the review comments in Dr. Checks as follows:

(1) "Concur" if the Contractor agrees with the comment.

(2) "Non-Concur" if the Contractor does not agree with the comment. A response on why the Contractor does not agree with the comment.

(3) "For Information Only" if the Contractor feels the comment is for information only.

(4) If "Check and Resolve" if the Contractor needs further analysis to respond to the comment. An explanation of what needs to be done to resolve the comment should be included.

Submitting a separate sheet of paper with location of compliance or rebuttals is not allowed. All information MUST be entered into Dr. Checks. When all of the comments have been sufficiently responded to, they shall be electronically transmitted between the COE and the Contractor via Dr. Checks. In addition, all responses shall be stored in Dr. Checks. If the Contractor has any hardware or software problems with the Dr. Checks system, call Laura Haven, the Dr. Checks coordinator, at (916) 557-7651.

Backcheck of Previous Comments. Review comments on prior submittals will be checked for incorporation in the subsequent submittals. Those comments verified as done and explanations concurred with will be annotated, "COMMENT CLOSED," in Dr. Checks. Previous comments not verified as done or explanations not concurred with will be annotated, "COMMENT OPEN," will appear in the current review stage's comments. These comments will require further action by Contractor prior to next submittal. All final submittals will be backchecked by the COE, after Contractor corrections are made, to ensure compliance with or resolution of comments to the satisfaction of the COE.

5. SUBMITTAL SCHEDULE

5.1. WORK SCHEDULE: The following work schedule covers the work in this SOW.

Task	Task Completion (calendar days after contract award)
Task 1: Quality Control Quality Control Plan	14 days
Task 2: Subsurface Investigation for Sites L1 and L5 Draft Report Final Report	 90 days 120 days
Task 3: RMR: L1 and L5 Draft RMR Final RMR	 180 days 210 days
Tasks 4 through 7: Sites R3A, L7, R7, L10, and L13 90% Design Submittal 100% Design Submittal Final Submittal	 180 days 240 days 270 days
Task 8: Site L9A 100% Design Submittal Final Submittal	 120 days 180 days

5.2. REVIEW SCHEDULE: The following reviews of submittals will be performed by the COE and sponsors:

(a) Subsurface Investigation Plan	14 calendar days after receipt of submittal
(b) Subsurface Investigation Results Report	14 calendar days after receipt of submittal
(c) RMR: L1 and L5	14 calendar days after receipt of submittal
(d) 90% Design Submittal R3A, L7, R7, L10, and L13	14 calendar days after receipt of submittal
(e) 100% Design Submittal R3A, L7, R7, L10, and L13	14 calendar days after receipt of submittal
(f) Final Design Submittal R3A, L7, R7, L10, and L13	14 calendar days after receipt of submittal
(g) 100% Design Submittal L9A	14 calendar days after receipt of submittal
(h) Final Design Submittal L9A	14 calendar days after receipt of submittal

6. OVERALL PERIOD OF PERFORMANCE

All work and services shall be completed within two hundred-seventy (270) calendar days after the effective date of the contract action.

7. AUTHORITIES STATEMENT

No person other than the Government Contracting Officer has the authority to make any changes to this contract action that impact cost or schedule. Authority from the Contracting Officer to the contractor to make changes that impact cost or schedule will be in the form of an official, signed modification.

8. PAYMENTS STATEMENT

The contractor shall submit invoices on ENG Form 93, available from A-E Administration Section. A separate ENG Form 93 must be submitted for each task order. Multiple task orders or contracts may not be invoiced on the same ENG Form 93. Invoices shall be submitted no more often than monthly. Each line item on an invoice shall give a detailed description of the work item, its negotiated amount, percentage of work completed, and earnings to date. Upon receipt, the COE Project Manager will certify that the requested earnings are appropriate before payment will be made. The completed ENG Form 93 shall be mailed to the following address:

District Commander
Sacramento District U.S. Army Corps of Engineers
ATTN: CESPK-ED-SA, A-E Administration Section
1325 J Street
Sacramento, California 95814-2922

/s/
Mark Boedtker
Technical Lead

Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	N/A	N/A	N/A	Government

Section F - Deliveries or Performance

DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	POP 31-AUG-2011 TO 27-MAY-2012	N/A	USACE SACRAMENTO DISTRICT . ATTN: CONTRACTING DIVISION 1325 J ST SACRAMENTO CA 95814-2922 FOB: Destination	W91238

Section G - Contract Administration Data

ACCOUNTING AND APPROPRIATION DATA

AA: 96 NA X 3122.0000 L2 X 08 2451 075522 96042 3230 2BG9G5
AMOUNT: $1,040,369.56
CIN W62N6M123698680001: $1,040,369.56

APPENDIX E – PCSC QUALITY CONTROL PLAN

QUALITY CONTROL PLAN

AMERICAN RIVER COMMON FEATURES PROJECT

Sacramento County, CA

WRDA 96 PHASE 3 REMAINING SITES
R10, L3, L9, R2, and R9

Contract No. W91238-10-D-0016, Task Order No. 3

Prepared For

U.S. Army Corps of Engineers, Sacramento, CA
1325 J Street
Sacramento, CA 95814

Prepared By

PACIFIC CIVIL AND STRUCTURAL CONSULTANTS, LLC
7415 Greenhaven Drive, Suite 100
Sacramento, CA 95831

September 2011

1.0 PROJECT DESCRIPTION

The project includes the preparation of final design documents (Plans, Specifications, Cost Estimate, Design Documentation Report, Engineering Considerations and Instructions for Field Personnel, Take Mapping, and Tract Register) for WRDA 96 Phase 3 Remaining Site R10, and geotechnical investigation of WRDA 96 Phase 3 Remaining sites L3, L9, R2, and R9. The completion of final design documents at these additional sites are options to the base contract. The sites included in the project are areas where existing cutoff walls installed at the American River levees are discontinuous at major roadways and utility crossings. Also as part of the project, Pacific Civil and Structural Consultants, LLC (PCSC) will assist the U.S. Army Corps of Engineers (USACE) in completing a feasibility analysis of the potential remediation at each site by providing cost estimates for various alternatives formulated by the USACE.

2.0 PROJECT QUALITY CONTROL OBJECTIVES

The objectives of this Quality Control (QC) Plan are to outline the procedures for performing the QC functions by which the management, engineering, documentation, and ancillary work necessary to complete the project and produce work products which are:

- In conformance with USACE and industry standards for performance and accuracy.
- Completed in accordance with the established schedule.
- Completed within the negotiated task order budget.

The provisions of this QC Plan are applicable to PCSC and its subcontractors on this task order.

3.0 PROJECT QUALITY CONTROL PROCEDURES

PCSC's QC Plan consists of quality control review of all work products by the technical leads managing the work and internal QC review within the PCSC team. The personnel responsible for developing the work products and internally reviewing them are listed in Table 1 below. Internal reviews will be performed prior to each work product submittal. It is noted that there is no requirement for Independent Technical Review (ITR) on this task order. Comments that are made as a result of internal reviews will be discussed and resolved with the individual responsible for developing the work product. After the designer reviews and responds to the

comments in writing, the reviewer will conduct a back-check of the comment/response and the revised work product to ensure that the comment has been addressed in a satisfactory manner.

Table 1: Task Order Work Products and QC Responsibility

Work Product	Firm/Location	Work Product Developer	Internal Reviewer
Quality Control Plan	Wood Rodgers / Sacramento	Jonathan Kors, P.E.	Pete Tobia, P.E.
Alternatives Analysis – Sites R10, L2, and L3	Wood Rodgers / Sacramento	Jonathan Kors, P.E.	Bob Sennett, P.E., S.E.
Alternatives Analysis – Sites R9 and R2	MGE Engineering/ Sacramento	Bob Sennett, P.E., S.E.	Jonathan Kors, P.E.
60%, 90%, 100%, and Final Plans and Specifications – Sites R10, L2, and L3	Wood Rodgers / Sacramento	Jonathan Kors, P.E.	Bob Sennett, P.E., S.E.
60%, 90%, 100%, and Final Plans and Specifications – Sites R9 and R2	MGE Engineering / Sacramento	Bob Sennett, P.E., S.E.	Jonathan Kors, P.E.
MCASES Cost Estimates – All Sites	Project Dimensions / Kirkland, WA	John Boatman	Dennis Teshlog
Draft Geotechnical Data Report	Taber Consultants / West Sacramento	David A. Kitzmann, C.E.G.	Martin McIlroy, C.E.G., P.E.
Final Geotechnical Data Report	Taber Consultants / West Sacramento	David A. Kitzmann, C.E.G.	Martin McIlroy, C.E.G., P.E.
Laboratory Analysis Results*	Blackburn Consulting / West Sacramento	Mike Robertson / Kristi O'Hara, P.E.	Bob Lokteff, P.E, G.E.

*It is noted that the laboratory analysis results will be included in the Draft and Final Geotechnical Data Report products; however, it is listed here separately to identify the work product developer and supervising reviewer for Blackburn Consulting.

4.0 PROJECT DELIVERABLES SCHEDULE

Table 2 presents the project deliverable dates in accordance with the Statement of Work dated 19 August 2011, and reflects a contract award date of 1 September 2011.

Table 2: Project Deliverables Schedule – Base Contract

Deliverable	Date
Task 1: Quality Control Plan	14 days
Task 2: Alternatives Cost Analysis (R10)	45 days
Task 3 : P&S Site R10 60% Design Submittal Draft RE Mapping and Tract Register 90% Design Submittal 100% Design Submittal Final Submittal	 150 days 150 days 210 days 250 days 280 days
Task 4: Geotechnical Borings Sites L9, R2, and R9	60 days
Task 6: Geotechnical Data Report Sites L9, R2, and R9 Draft Geotechnical Data Report Final Geotechnical Data Report	 90 days 120 days

Table 3: Project Deliverables Schedule – Optional Items

Deliverable	Date
Optional Task 1: P&S Site L9 Alternatives Cost Analysis 60% Design Submittal Draft RE Mapping and Tract Register 90% Design Submittal 100% Design Submittal Final Submittal	45 days 150 days 150 days 210 days 250 days 280 days
Optional Task 2: P&S Site R2 Alternatives Cost Analysis 60% Design Submittal Draft RE Mapping and Tract Register 90% Design Submittal 100% Design Submittal Final Submittal	45 days 150 days 150 days 210 days 250 days 280 days
Optional Task 3: P&S Site R9 Alternatives Cost Analysis 60% Design Submittal Draft RE Mapping and Tract Register 90% Design Submittal 100% Design Submittal Final Submittal	45 days 150 days 150 days 210 days 250 days 280 days
Optional Task 4: P&S Site L3 Alternatives Cost Analysis 60% Design Submittal Draft RE Mapping and Tract Register 90% Design Submittal 100% Design Submittal Final Submittal	45 days 150 days 150 days 210 days 250 days 280 days
Optional Task 1: P&S Site L9 Alternatives Cost Analysis 60% Design Submittal Draft RE Mapping and Tract Register 90% Design Submittal 100% Design Submittal Final Submittal	45 days 150 days 150 days 210 days 250 days 280 days

5.0 STANDARDS OF PRACTICE

PCSC, exercising reasonable care and professional competence, will complete the deliverables and subtask elements in accordance with the requirements of the Task Order Statement of Work. At a minimum, the work products will be of a quality acceptable to the USACE Contract Manager and Technical Lead. The criteria for acceptance will be the Project Quality Control objectives outlined above, and the additional characteristics of organization, appearance, and the correct use of grammar and punctuation.

6.0 COMMUNICATION/COORDINATION

Direct communication between PCSC's Project Manager and the USACE's team leaders will be used to facilitate completion of the work products. Refer to Table 4 below for the names and contact information for PCSC's Project Manager, PCSC's discipline leads, and the USACE team leaders. Coordination between PCSC's Project Manager, PCSC's discipline leads, and the USACE team leads will be facilitated through meetings, telephone calls, and emails. The Project Manager will attend all meetings and prepare written action items from each meeting. All email correspondence will be copied to the Project Manager and the USACE technical lead. Telephone calls will be documented with written notes and filed in project correspondence files. Furthermore, an email from the Project Manager to the USACE technical lead will serve to document important decisions or discussions resulting from telephone discussions.

Table 4: Project Discipline Lead and USACE Team Lead Contacts

Discipline Leaders	Discipline	Telephone Number	E-Mail Address
Jonathan Kors	Project Manager (Sites R10, L2, and L3)	(916) 326-5294	jkors@woodrodgers.com
Bob Sennett	Project Manager (Sites R2 and L9)	(916) 421-1000	rsennett@mgeeng.com
Martin McIlroy	Geotechnical Investigation Lead	(916) 371-1690	MMcilroy@taberconsultants.com
Robert Lokteff	Laboratory Testing Lead	(916) 375-8706	bobl@blackburnconsulting.com
Dan Tibbitts	Project Manager	(916) 557-7372	Dan.P.Tibbitts@usace.army.mil
Mark Boedtker	Technical Lead	(916) 557-6637	Markus.S.Boedtker@usace.army.mil
Mary Perlea / Mike Kynett	Geotechnical Engineer	(916) 557-7185 (916) 557-7898	mary.p.perlea@usace.army.mil; Michael.N.Kynett@usace.army.mil

7.0 RESUMES

Resumes for the PCSC Team's Project Managers, Geotechnical Investigation Lead, Laboratory Testing Lead, and internal reviewers are included on the following pages.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Jonathan Kors, P.E.	**Deputy Project Manager & Task Order Manager**	14	8

15. FIRM NAME AND LOCATION (*City and State*)
Wood Rodgers, Inc. (Sacramento, California)

16. EDUCATION (*DEGREE and SPECIALIZATION*)	17. CURRENT PROFESSIONAL REGISTRATION (*STATE AND DISCIPLINE*)
BS, Civil Engineering, 1995	Registered Professional Engineer, Civil, California No. 59538

18. OTHER PROFESSIONAL QUALIFICATIONS (*Publications, Organizations, Training, Awards, etc.*)

Mr. Kors is a registered Civil Engineer with 14 years of experience in water resources engineering design and construction management. Mr. Kors has led teams of engineers in the preparation of plans, specifications, and cost estimates for projects involving the construction of pipelines, levees, pumping plants, hydraulic structures, detention basins, channels, flumes, floodwalls, and miscellaneous water supply, flood control, drainage, and irrigation facilities. Mr. Kors has also been involved in construction management, including construction coordination, administration, inspection, and claims negotiation.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
Sacramento Area Flood Control Agency (SAFCA), Natomas Levee Improvement Program - Sutter and Sacramento Counties, CA	2006 - Current	Ongoing

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Managed four design contracts for the design of 15 miles of levee improvements at the south levee of the Natomas Cross Canal, west levee of the Pleasant Grove Creek Canal, and west levee of the Natomas East Main Drainage Canal. Improvements included the installation of soil-bentonite and soil-cement-bentonite cutoff walls, adjacent levees, levee raises and slope flattening, and the correction of non-compliant levee penetrations and encroachments. Performed alternatives analyses to identify preferred mitigation measures for each levee reach. Prepared detailed planning and final construction level cost estimates. Coordinated with the US Army Corps of Engineers, DWR, and Central Valley Flood Protection Board to obtain project approval. Phase 1 construction was completed in 2007 at a cost of $14 million, Phase 1B was completed in September of 2008 at 3.5 million. Phase 2 was completed in December of 2009 at a cost of $24 million. The goal of these projects is to restore 100-year flood protection to the Natomas Basin as soon as possible, and provide 200-year protection shortly thereafter. Also managed Wood Rodgers' efforts in supporting the USACE's Natomas Post Action Change Authorization by developing cost estimates to be used in determining the National Economic Development (NED) Project for the Natomas Basin.

b.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
Bear River (East) North Levee Rehabilitation Project - Reclamation District 2103 - Wheatland, CA	2006	2008

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Responsible for the preparation of construction drawings, specifications, and opinion of probable cost for the first phase of Reclamation District 2103's levee improvements at the north levee of the Bear River. The project involved the installation of 7,250 lineal feet of soil-bentonite-cement slurry cutoff wall and other miscellaneous levee improvements including levee widening and reconstruction of reaches with slope stability concerns. Phase 1 of Project construction was completed in 2007 at a cost of $3.5 million.

c.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
USACE, ID/IQ Contract for Support of South Pacific Division - Wide Dams and Levee Safety Programs	2009	N/A

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Task Order Manager for Wood Rodgers' Periodic Inspection (PI) of San Joaquin River and Duck Creek/Walker Slough Levees within Reclamation District No. 404. Completed USACE Levee Inspection training workshop and performed inspection of levee segments in December of 2009. Currently preparing PI Inspection Report.

d.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
Lower Feather River Setback Levee at Star Bend - Levee District No. 1 of Sutter County - Yuba City, CA	2007	2009

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc)* AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Project Engineer for the design of a 3,400 foot setback levee and foundation cutoff wall at the right bank of the Feather River at Star Bend. Used the USACE's flood damage assessment software HEC-FDA to estimate inundation reduction for the proposed project and project alternatives during the planning phase of the project. Developed alternatives and analyzed each to determine preferred project. Evaluated improvements to an existing 92 cfs pumping plant and irrigation water delivery system owned and operated by the Tudor Mutual Water Company necessary to convey water beneath the new setback levee alignment. Provided quality control and managements of final plans, specifications, and opinion of probable cost development. Coordinated design components with USACE representatives and project Safety Assurance Review team. The setback levee was constructed in the summer of 2009 at a cost of $8.0 million.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Jonathan Kors, P.E.	**Deputy Project Manager & Task Order Manager**	14	8

e.

(1) TITLE AND LOCATION (*City and State*)

South Urban Growth Area, Regional Storm Drainage Facilities Project (SLSPA-Phase 1) – City of Woodland, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2005	2005

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

Project Engineer for design of this $8.4 million Regional Storm Drainage Facilities Project. Coordinated the preparation of construction plans, specifications, and an opinion of probable cost for the design of a 360-acre-foot detention basin, approximately two and one half miles of trapezoidal channel, seven reinforced concrete box structures and related drainage facilities to serve the City's South Urban Growth Area. Mr. Kors prepared preliminary engineering for future facilities including pipelines and channels.

f.

(1) TITLE AND LOCATION (*City and State*)

City of Winters, Rancho Arroyo Detention Basin Pump Station - Winters, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2004	N/A

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

Project Engineer for the preparation of plans, specifications, and opinion of probable cost for the construction of a 15 cfs drainage pump station, pond inlet pipe and structure, and miscellaneous water quality improvements at the existing Rancho Arroyo Detention Basin in the City of Winters, California.

g.

(1) TITLE AND LOCATION (*City and State*)

City of Chico, One Mile Dam Replacement Project – Chico, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2005	2005

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

Project Manager for the design of a 40-foot-wide by 8-foot-high replacement dam structure for One Mile Dam on Big Chico Creek. Managed the preparation of plans, specifications, and an opinion of probable cost for the installation of a pneumatically-operated spillway gate at the Sycamore swimming pool on Big Chico Creek in Bidwell Park.

h.

(1) TITLE AND LOCATION (*City and State*)

Yolo County Flood Control & Water Conservation District, Critical Irrigation System Upgrades - Yolo County, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2006	

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

Managed the design of three critical irrigation facility upgrades for the Yolo County Flood Control and Water Conservation District, including replacement of the Yolo Central Canal's crossing of County Road 88, repair of the Cottonwood Canal Headgate Structure on the Winter's Canal, and installation of an overshot gate, new flash board structure and catwalk at the Fredericks Flume on the Winters Canal.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. role in this contract	14. YEARS EXPERIENCE a. TOTAL	b. WITH CURRENT FIRM
ROBERT SENNETT, IV, S.E.	Project Manager	21	16

15. FIRM NAME AND LOCATION (City and State)

MGE ENGINEERING, INC.

Sacramento, CA 95831

16. EDUCATION (DEGREE AND SPECIALIZATION)	17. CURRENT PROFESSIONAL REGISTRATION (STATE AND DISCIPLINE)
M. Eng./1987/Structural Engineering B.S./1986/Civil Engineering	1990/Civil Engineering/CA #46195 1995/Structural Engineering/CA #3976 2004/Civil & Structural Engineering/OR #16881PE

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Mr. Sennett is responsible for supervision of engineering activities at MGE, including management of civil and structures planning and design. His experience includes management of multi-discipline teams responsible for development of complex civil works and transportation projects for federal, state and local agencies. He has an excellent record as a project manager for completion of Delivery Orders under multiple IDIQ contracts for federal agencies including the Sacramento District of the US Army Corps of Engineers.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*

Unionhouse Creek Channel Improvements and Morrison Creek Floodwalls, USACE, Sacramento District – Contract: W91238-06-D-0010

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: On-going; CONSTRUCTION (If applicable):

(3) BRIEF DESCRIPTION (Brief Scope, size, cost, etc.) AND SPECIFIC ROLE ☒ Check if project performed with current firm

Project Manager/Delivery Order Manager responsible for the completion of the plans, specifications and estimate for construction of a rectangular concrete lined channel to increase the flood flow capacity of Unionhouse Creek, and construction of 3300 feet of floodwall between the UPRR and Morission Creek in Sacramento County, California.

b.

(1) TITLE AND LOCATION (City and State)

Larose to Golden Meadow Hurricane Protection Project, Preparation of an Engineering Alternatives Report, Lafourche Parish, Louisiana, USACE, New Orleans District - Contract: W912P8-08-D-0062

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: On-going; CONSTRUCTION (If applicable):

(3) BRIEF DESCRIPTION (Brief Scope, size, cost, etc.) AND SPECIFIC ROLE ☒ Check if project performed with current firm

Lead Structural Engineer for structural analysis, preliminary design of floodwall alternatives, alternative evaluation, and Engineering Alternatives Report for three pump stations. At each of the pump stations the invert of the outflow pipes are below the authorized levee elevation. The plan is have the pipes through a floodwall rather than the earthen levee.

c.

(1) TITLE AND LOCATION (City and State)

Success Dam and Reservoir Seismic Remediation Project, Tulare County, USACE, Sacramento District - Contract: W91238-06-D-0010

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: On-going; CONSTRUCTION (If applicable):

(3) BRIEF DESCRIPTION (Brief Scope, size, cost, etc.) AND SPECIFIC ROLE ☒ Check if project performed with current firm

Project Manager/Deliver Order Manager for independent technical review (ITR) of the retrofit design for the existing outlet conduit to provide an assessment of the merits, feasibility, and constructability of the completed retrofit design (STA. 12+10 to STA. 13+65) downstream of the control tower.

d.

(1) TITLE AND LOCATION (City and State)

Napa River / Napa Creek Plans Flood Control Project Contract W91238-04-D-0018, USACE, Napa, California

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: On-going; CONSTRUCTION (If applicable):

(3) BRIEF DESCRIPTION (Brief Scope, size, cost, etc.) AND SPECIFIC ROLE ☒ Check if project performed with current firm

IDIQ Contract Project Manager /Delivery Order Manager for a Delivery Order for preparation of plans, specifications and cost estimate for flood control improvements to a reach of Napa Creek through the City of Napa. The proposed improvements include channel widening, construction of overbank flood plain terraces, flood walls and berms, and hydraulic grade control work to create riffles and pools. Responsibilities include civil and structural design, identification of utilities needing relocation, direction of subcontractors, and coordination with the Napa County Flood Protection District, City of Napa, and other project stakeholders. The intermediate and final plans, specifications and estimate are submitted to the Corps of Engineers via the internet. The estimated cost for the Napa Creek improvements is more than $20 million.

e.

(1) TITLE AND LOCATION *(City and State)*

Napa River/Napa Creek Flood Protection Project, Contract 2W, Hatt Building to First Street, USACE, Sacramento District

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2006-07; CONSTRUCTION (If applicable): 2008

(3) BRIEF DESCRIPTION (Brief Scope, size, cost, etc.) AND SPECIFIC ROLE ☒ Check if project performed with current firm

IDIQ Contract Project Manager/Delivery Order Manager for preparation of plans and specification for a contract to construct flood walls and associated amenities along the Napa River. The project included 1,600 feet of soldier pile retaining/flood walls, upper setback retaining/flood walls with a pedestrian recreation river walk along the west bank of the Napa River, and amphitheater in the City of Napa. Construction of this $19 million project is substantially complete.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Pete Tobia, PE, LEED® AP	**Task Order Manager**	20	9

15. FIRM NAME AND LOCATION (*City and State*)
Wood Rodgers, Inc. (Sacramento, California)

16. EDUCATION (*DEGREE and SPECIALIZATION*)	17. CURRENT PROFESSIONAL REGISTRATION (*STATE AND DISCIPLINE*)
MS, Business Administration, 1997 BS, Civil Engineering, 1989	Registered Civil Engineer, California No. 49799 Registered Civil Engineer, Nevada No. 14283 Leadership in Energy and Environmental Design Accredited Professional (LEED® AP)

18. OTHER PROFESSIONAL QUALIFICATIONS (*Publications, Organizations, Training, Awards, etc.*)

Mr. Tobia has 20 years of broad professional experience in the planning, engineering and management of large and complex municipal projects. He has been the project manager and licensed professional responsible for a multitude of large-scale public and private development projects, from master planning, engineering and environmental document coordination to specific drainage, sewer, and water master plans, capital improvement programs, public financing, and final design. His direct design experience includes flood control projects, roadways and interchanges, water treatment and conveyance, pump stations, and hydrologic and hydraulic modeling.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
Sacramento Area Flood Control Agency (SAFCA), Natomas Cross Canal Levee Rehabilitation Project- Phase 1 - Sutter County, CA	2009	

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Provided Quality Control for the preparation of plans, specifications, and cost estimates for levee improvements for the south levee of the Natomas Cross Canal. Phase 1 construction cost estimated at approximately $15.9 million. This project represents the first phase of SAFCA's Natomas Levee Improvement Program, implemented to restore 100-year flood protection to the Natomas Basin.

b.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
North Area Levee Project, Sacramento Area Flood Control Agency - Sacramento, CA	1992-1995	1994-1997

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE — ☐ Check if project performed with current firm

Project Engineer for eight miles of improvements to existing urban levees on Arcade Creek and the Natomas East Main Drainage Canal. The design included a combination of flood walls, stoplog structures, and earthen enlargements to strengthen and raise existing levees. He prepared preliminary design and final PS&E for five separate project contracts, which required extensive right-of-way acquisitions and utility relocations. Levees had multiple crossings of the Union Pacific Railroad and City of Sacramento streets.

c.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
Folsom Water Treatment Plant Expansion - City of Folsom, CA	1998-1999	1999-2000

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE — ☐ Check if project performed with current firm

For the City of Folsom's 15 MGD WTP expansion, Mr. Tobia provided civil design and inspection support. He was in charge of the civil design for this $10-million construction project. He was also responsible for submittal reviews, field engineering support, oversight of plant shutdowns, and inspections of pipe installations and structures. Facilities included new raw water delivery pipeline, booster pumps, backwash pumping system, sedimentation basins, SCADA upgrades and building improvements.

d.

(1) TITLE AND LOCATION (*City and State*)	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
UC Davis West Village Offsite Infrastructure – Davis, CA	2007-2008	2009

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE — ☒ Check if project performed with current firm

Principal-in-Charge for planning, design, estimating, and construction administration of $12 million of infrastructure improvements to support a new campus residential community. Work includes a new 300,000 gallon water tank and booster pump station; 2.6 mgd sewer lift station; five miles of sewer, water, and drainage piping; reconfiguration of existing power systems; and roadway improvements, including two multi-lane roundabouts.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
Pete Tobia, PE, LEED® AP	**Task Order Manager**	a. TOTAL: 20	b. WITH CURRENT FIRM: 9

e.

(1) TITLE AND LOCATION (*City and State*)

Sacramento City College Transportation, Access, and Parking Project, Los Rios Community College District - Sacramento, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2005-2006	2007

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc)* AND SPECIFIC ROLE

☒ Check if project performed with current firm

Principal in Charge for this major reconfiguration of the campus circulation and parking system. The on campus work included the relocation of seven tennis courts, design of several parking lots providing a total of 600 parking stalls, correction of existing ADA deficiencies within the limits of work, lighting, and circulation improvements for pedestrians and vehicles. Offsite work included the modification of an existing City of Sacramento traffic signal, and the reconstruction of an existing hook-ramp type intersection into a signalized four way intersection at the main campus entrance. 15 acres; $5.5 million

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Martin W. McIlroy	**Geologist/Engineering Geologist/Engineer**	**16**	**12**

15. FIRM NAME AND LOCATION *(City and State)*

Taber Consultants, 3911 West Capitol Avenue, West Sacramento, CA 95691

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
B.S. / 1994 / Geology	**2002 / Professional Geologist CA#7435** **2004 / Certified Engineering Geologist CA#2322** **2011/ Professional Engineer CA#78846**

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Mr. McIlroy has participated in geologic, engineering geology and foundation engineering studies with increasing responsibility during his ten-year tenure at Taber Consultants. He is responsible for field investigations, data evaluations and report preparation and office analysis for engineering geologic projects including earth fill dams, liquefaction study, seepage, soil and rock slope stability analysis, foundations, soil/structure interaction, retaining walls, pavement design, buildings, and rock mechanics.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*: **Woodbridge Dam and Fishscreens, San Joaquin County, California**

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2006 — CONSTRUCTION *(If applicable)*: 2007

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒ Check if project performed with current firm

Geotechnical engineering services for this partially CALFED funded project included separate "Foundation Investigation" reports for new dam and fish screen diversion structures and fish bypass pipeline. The project consists of replacing the existing timber pile supported diversion dam constructed in 1901 with a new diversion structure founded on concrete piling. A fish ladder structure was also included with construction of the new diversion dam. A new fish screen structure was built at the existing irrigation intake canal approximately 1700±ft upstream from the existing dam. The structure consists of a 130±ft long pile supported concrete structure with a V-shaped intake box extending partially into the Mokelumne River.

b.

(1) TITLE AND LOCATION *(City and State)*: **Wilson Dam, Napa County, California**

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2000 — CONSTRUCTION *(If applicable)*: 2004

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒ Check if project performed with current firm

Geotechnical investigation for design and construction of a private new 50 ft high, 237 AF irrigation storage dam. Crest length is approximately 1040 feet. Dam was designed and constructed under California Department of Water Resources Division of Safety of Dams jurisdiction. Study included investigation of a landslide at the left abutment and permeability/seepage study using downhole packer testing within weathered rock at the abutments and under the foundation.

c.

(1) TITLE AND LOCATION *(City and State)*: **USACE Morrison Creek Floodwall, Sacramento, California**
South Sacramento Streams Flood Protection Project

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2009 — CONSTRUCTION *(If applicable)*:

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒ Check if project performed with current firm

Geotechnical investigation for design and construction of a new 3300-ft long floodwall along the left bank of Morrison Creek. Project involves drilling and sampling to evaluate foundation conditions for the floodwall and underseepage characteristics of the underlying soils beneath the Union Pacific Railroad embankment. Geotechnical Issues include liquefaction potential; analysis of embankment stability and settlement from added embankment fill, analysis of permeability and seepage characteristics below the flood wall area.

d.

(1) TITLE AND LOCATION *(City and State)*: **La Contenta Dam, Valley Springs, California**

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2000 — CONSTRUCTION *(If applicable)*:

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒ Check if project performed with current firm

Geotechnical investigation for increasing existing dam height 20±ft to increase storage of effluent storage. The existing dam is approximately 300 ft long and 25 ft high and founded in metamorphic rock.

e.

(1) TITLE AND LOCATION *(City and State)*: **Livermore Valley Dam, Livermore, California**

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2006 — CONSTRUCTION *(If applicable)*:

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

☒ Check if project performed with current firm

Preliminary geotechnical investigation for design and construction of a new 60-ft high wastewater storage embankment dam with 1500±ft crest length and 2200 acre-ft capacity. Project was under the jurisdiction of the State Division of Safety of Dams. Reservoir was initiated as a condition of a 12,500 unit subdivision development to the east and was later abandoned when voters stopped the subdivision expansion.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Robert B. Lokteff, P.E., GE	**Geotechnical Investigation, Analyses, & Design**	20	11

15. FIRM NAME AND LOCATION (*City and State*)
Blackburn Consulting - West Sacramento, CA

16. EDUCATION (*DEGREE and SPECIALIZATION*)	17. CURRENT PROFESSIONAL REGISTRATION (*STATE AND DISCIPLINE*)
MS Civil Engineering Specializing in Geotechnical Engineering – California State University, Sacramento	CA Registered Civil Engineer CA Registered Geotechnical Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS (*Publications, Organizations, Training, Awards, etc.*)
ASCE – American Society of Civil Engineers, CalGeo – California Geoprofessionals Association

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (*City and State*)
Mammoth Reservoir Dam – Placer County, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2000	

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

As Project Manager, performed a subsurface investigation and prepared the plans and specifications for a 15-foot-deep, 300-foot-long slurry cutoff wall. The project consisted of mitigating seepage on the downstream toe of the dam. The project was performed under the jurisdiction of the Division of Safety of Dams (DSOD).

b.

(1) TITLE AND LOCATION (*City and State*)
Lake Arthur Dam Rehab – Placer County, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2002	

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

As Project Manager, performed a subsurface investigation and prepared the plans and specifications for a 15-foot-deep, 300-foot-long slurry cutoff wall. The project consisted of mitigating seepage on the downstream toe of the dam. The project was performed under the jurisdiction of the Division of Safety of Dams (DSOD).

c.

(1) TITLE AND LOCATION (*City and State*)
Star Bend Setback Levee – Sutter County, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2009	2009

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

As Geotechnical Engineer of Record, performed a subsurface investigation along the Star Bend Setback Levee project alignment which consists of about 3,600 lineal feet of new levee construction along the west side of the Feather River in Sutter County. Investigation included laboratory testing and preparation of a report containing geotechnical findings and design recommendations. Analysis included finite element seepage analysis, slope stability analysis and settlement analysis for the new levee. Report included recommendations for seepage mitigation options including a slurry cut-off wall, seepage berm and pressure relief wells in accordance with current US Corps of Engineers design criteria.

d.

(1) TITLE AND LOCATION (*City and State*)
Mayberry Slough Setback Levee, Sherman Island – Sacramento County, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2009	2009

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

As Geotechnical Engineer of Record, performed subsurface exploration (exploratory borings and down-hole vane shear testing), laboratory testing (including permeability, consolidation and triaxial shear) and engineering analysis, and prepared a Geotechnical Report that provided recommendations for design and construction of the proposed Mayberry Slough Setback Levee which consists of approximately 1.6 miles of levee upgrades including construction of landside setback levee and waterside slope flattening.

e.

(1) TITLE AND LOCATION (*City and State*)
Main Drain Pump Station Improvements - West Sacramento, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (*If applicable*)
2009	Ongoing

(3) BRIEF DESCRIPTION (*Brief scope, size, cost, etc*) AND SPECIFIC ROLE

☒ Check if project performed with current firm

Project Manager and Geotechnical Engineer of Record for design and construction of a new pump station building, intake and outfall structures and new 54" pipes through the existing levee. Project includes excavations up to 25-feet-deep, coffer dam, dewatering and reconstruction of a portion of the existing flood control levee. Project required compliance with current US Army Corps levee fill criteria and approval by the local reclamation district and California DWR.

APPENDIX F – KLEINFELDER-GEOMATRIX QUALITY CONTROL PLAN

QUALITY CONTROL PLAN

AMERICAN RIVER COMMON FEATURES PROJECT

CONTRACT NO. W91238-08-D-0015

TASK ORDER 0007

October 10, 2008

Prepared for:

US Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814

K-G JV Project No. 98145

Prepared by:

Joshua P. Fortmann, PG
Project Geologist

Scott S. Smith, PhD, PE
Task Manager

Elena Sossenkina, PE
Geotechnical Design Lead

KLEINFELDER-GEOMATRIX JV
3077 Fite Circle
Sacramento, California 95827
(916) 366-1701

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1 INTRODUCTION

This Quality Control Plan (QCP) defines how quality control will be executed by Kleinfelder-Geometrix Joint Venture (K-G JV) project team for products and deliverables developed for the American River Common Features Project (ARCFP). The ARCFP is task Order 0007 issued to K-G JV under Contract Number W91238-08-0015. This QCP is prepared in accordance with the requirement of US Army Corps of Engineers (USACE) Engineering and Design Quality Management (ER 1110-1-12) and is a component of the Design Quality Control Plan prepared by K-G JV for the prime contract on 20 February 2008.

Quality control is an integral part of quality management focused on fulfilling the project quality requirements defined in the K-G JV Project Management Plan (PMP). It includes processes and procedures used to ensure that performance meets the agreed upon customer requirements and is consistent with law, regulations, policies, sound technical criteria, schedules, and budget. The QCP describes the objective of the reviews, the products that shall be reviewed and the qualifications of the members of the review teams. The basic components of QCP are:

- Quality checks and reviews at all level of project performance;
- Formalized review of deliverables by Independent Technical Review (ITR) Team; and
- Biddability, Constructability, Operability and Environmental (B/C/O/E) reviews for design documents.

The purpose of this QCP is to address the following in detail:

- K-G JV quality control procedures for project deliverables
- ITR Team members' review responsibilities;
- Potential risks inherent to the project and corrective action procedures; and
- Any special considerations and/or crucial design features.

2 PROJECT SCOPE OF WORK

The ARCFP area includes a segment of the American River along the right bank from River Mile (RM) 2.00 to RM 3.6, total length is about 6,000 ft linear foot long. The activities under this project consist of:

- Conduct geomorphology study, tree survey, surveying and topographic mapping and data review;
- Perform field explorations with borings and laboratory testing and analysis;
- Assess the need for remediation and develop remedial alternatives
- Provide reports on subsurface investigation results, seepage analysis results, slope stability analysis, and evaluation of results and remediation method development;

- Develop final construction plans and specifications for recommended remedial measure to be used for fair and competitive bidding and execution.
- Prepare Design Document Report (DDR), Engineering Considerations and Instructions for Field Personnel (ECIFP) report
- Develop cost estimates for construction including labor, equipment, and material using Micro-Computer Aided Cost Engineering System (MCASES) MII.

The following are the list of tasks identified in the SOW:

Task 1: Quality Control
Task 2: Surveying, Utility, and Field Data Collection
Task 3: Geotechnical Investigations and Analysis
- Task 3.1: Review Existing Data
- Task 3.2: Geomorphology Study
- Task 3.3: Exploration Program and Field and Laboratory Testing Program
- Task 3.4: Explorations and Laboratory Testing
- Task 3.5: Subsurface Investigation Results
- Task 3.6: Cross Section Development for Modeling
- Task 3.7: Seepage Analyses
- Task 3.8: Slope Stability Analyses
- Task 3.9: Evaluation of Results and Remediation Method Development

Task 4: Develop Final Construction Plans and Specifications
Task 5: DDR
Task 6: ECIFP Report
Task 7: MCACES Cost Estimates
Task 8: Coordination, Meetings, and Project Management Information

3 DELIVERABLES AND SCHEDULE

The deliverables for the ARCFP generated during the performance of Tasks 1 through 8 are presented in the following table.

TASK NO.	DELIVERABLE (S)
1	Quality Control Plan
2	Data for Task 2 will be shown on drawings prepared for TASK 4 Construction Plans and Specifications.
3.3	Subsurface Investigation Plan - includes mapping of existing and proposed exploration locations, exploration methods, sampling depths and intervals, and general testing program.
3.5	Subsurface Investigation Results – includes draft field logs and final GINT logs, preliminary and final laboratory test data.
3.7	Seepage Analysis Report – summarizes results of finite element analyses and blanket-theory analyses.
3.8	Slope Stability Analysis Report – summarizes results of slope stability analyses
3.9	Evaluation of Results and Remediation Method Development Report – briefly discusses recommended locations for remediation, methods of remediation, including alternative methods, and analyses performed.
4	Final Construction Plans and Specifications. Submittal stages include 30%, 90% and 100% design. Files to be provided in electronic format and hard copies. 30% package to include 30% plans, outline specifications, Right of Way (RW) and Temporary Construction Easement (TCE) Request Drawings, and 30% DDR. 90% package to include responses to comments on 30% package, draft final plans, 90% draft specifications, MCACES cost estimates, draft final DDR, draft ECIFP, submittal register, and bid schedule. 100% package to include, responses to 90% comments, plans, specifications, MCACES cost estimates, final DDR, ECIFP, submittal register and bid schedule. Corrected Final Design package to include responses to comments on 100% package and all corrected final documents

TASK NO.	DELIVERABLE (S)
5	DDR – including a table of contents, narrative and appendices representing the complete design history.
6	ECIFP – summarizes data and includes informal discussion of design, material, etc. selections, and provides instructions for construction field personnel.
7	MCACES Cost Estimate – including two separate cost accounts: flood control, and non-Federal relocation costs and betterments.
8	Record of meetings throughout the project.

Other deliverables include progress/status reports to be delivered by the 10th of each month. Progress reports shall be brief (1-2 pages), describing work performed and a quantitative statement of overall work progress, including percentage of work accomplished on each task and submittal and description of the current problems that may impede performance of the tasks outlined in this SOW and suggest corrective actions.

A project schedule detailing the activity sequence and delivery dates for each submittal is included as Appendix A.

4 PROJECT STAKEHOLDERS

The project involves a variety of stakeholders, including:

- USACE Sacramento District Project and Technical Managers
- K-G JV Project Team including Team Subcontractors
- California Department of Water Resources (DWR)
- Sacramento Area Flood Control Agency (SAFCA)
- Other interested parties which may include the local community

The K-G JV Program Manager will communicate with USACE to identify potential stakeholders and obtain contact information. Members of the K-G JV team will attend appropriate project team meetings to ensure full coordination with other agencies and other interested stakeholders. USACE will determine stakeholders' roles in any review processes.

5 K-G JV PROJECT TEAM ROLES AND RESPONSIBILITIES

The personnel working on for Task Order 0007 include:

- USACE Technical Lead – Primary point of contact at USACE Sacramento District;
- Program Manager – Responsible for overall Contract management;
- Task Order Leader – Responsible for delivery and successful completion of the Task Order 0007;
- Quality Control and Technical Leads – Staff members responsible for specific technical areas;
- Technical staff – Individuals performing various tasks on the project; and
- Team subcontractors – Responsible for delivery of specific products and/or services reporting to the Technical Leads.

NAME	TASK ORDER ROLE	AFFILIATION	CONTACT INFORMATION
Paul Hsia	USACE Technical Lead	USACE Sacramento District	916- 557-6648 shanching.hsia@usace.army.mil
Lynn O'Leary	Program Manager	Kleinfelder	916-366-1701 loleary@kleinfelder.com
Scott Smith	Task Order Leader	Kleinfelder	775-689-7800 sssmith@kleinfelder.com
Mark Stillman	Project Controls	Kleinfelder	916-366-1701 mstillman@kleinfelder.com
Ray Costa	Geotechnical ITR	Kleinfelder	916-366-1701 rcosta@kleinfelder.com

NAME	TASK ORDER ROLE	AFFILIATION	CONTACT INFORMATION
Mike Traubenik	Geotechnical ITR	Geomatrix	510-663-4100 mike.traubenik@amec.com
Peter Hradilek	Civil Design ITR	HDR	916-817-4912 Peter.Hradilek@hdrinc.com
Frank Szerdy	Geotechnical Lead	Geomatrix	510-663-4100 frank.szerdy@amec.com
John Ballegeer	Civil Design Lead	Kleinfelder	303-237-6601 jballegeer@kleinfelder.com
Ronald Gibson	Structural Design Lead	Kleinfelder	719-632-3593 rgibson@kleinfelder.com
Elena Sossenkina	Geotechnical Design Lead	Kleinfelder	303-237-6601 esossenkina@kleinfelder.com
Blake Johnson	Cost Estimating Lead	HDR	916-366-1701 blake.johnson@hdrinc.com
Michael Bailey	Surveying Lead	PBS&J	209--943-2021 rgray@siegfriedeng.com
Louis Bridges	Environmental Assessment Lead	Kleinfelder	(303) 237-6601 lbridges@kleinfelder.com

6 QCP IMPLEMENTATION

This QCP will be implemented during project execution. The QCP may be updated as required to reflect changes in project conditions.

7 PROJECT COORDINATION

The K-G JV Task Order Leader is responsible for regular coordination of project activities among the Project Delivery Team (PDT) members, ITR members, and with the USACE. Other project coordination between other Districts, government agencies, and other stake holders including the local community will be the responsibility of the USACE Project Manager.

Coordination is necessary to ensure that the QCP is being followed and the quality objectives are being achieved, and to make adjustments as needed. The coordination includes frequent in-person, telephonic, written and email communications, as well as pre-design conferences, progress and design review meetings, meetings on special issues, and visits to the project site as required.

8 FIELD INVESTIGATIONS

8.1. Topographic Mapping

The field investigation for this project includes topographic mapping of the project reach to be used for project design and construction plans and specifications. The topographic surveys will be conducted using the combination of Trimble R8 real-time kinematic Global Positioning System (GPS) and, at locations where the tree and/or brush canopy blocks the adequate acquisition of satellite signals, Trimble 5600 robotic total stations will be used. Datum will be based on NAD83/NAVD88 and based on published NGS monuments in the project vicinity and shall be verified with the control data from the recently completed NLD surveys for the USACE Sacramento District. Control coordinates will be verified by supplemental ties to the existing National Levee Data Base control. Review and editing of data points and mapping of 1-foot contours will be performed using Autocad Land Development Desktop software. All survey point data will be taken to assure +/- 0.20 horizontal and vertical location on ground surfaces and +/- 0.05 feet horizontal and vertical location on hard surfaces and fixed facilities. The primary field data collection equipment will include the following:

- 3 Trimble R8 units with on-board RTK radio transmit capability and VRS;
- 2 Trimble 5600 robotic total stations;
- Trimble TSC2 data collectors.

The R8 GPS units are set up for RTK survey, with a base station set up over one of the site control points. The data collectors are connected to the R8 rover units for data collection and observation the status of the GPS. Underground utility locations will be determined using the following approach:

- Research of existing utility company records;
- Field location and marking of existing utilities using a combination of digital utility frequency locators, magnetometers or other methods generally accepted for use in the practice of Subsurface Utility Engineering;
- Where it is determined by the design engineer that more precise vertical and horizontal location of existing facilities is necessary, establish this information by the use of potholing.

8.2. Tree Survey

Locations and size of trees and dense vegetation for removal shall be identified and shown on base mapping for purposes of possible environmental mitigation. The tree inventory will consist

of a pedicel survey at each site. During the survey, existing trees with a diameter at breast height (DBH) of 6 inches or greater shall be identified by both common and scientific name. Location of trees shall be logged in NAD-83 by use of a handheld GPS. DBH shall be recorded by use of a logger/diameter tape and measurements shall be recorded in inches.

Elderberry trees/bushes (*Sambucus spp.*) shall be identified on each site. Each tree/bush shall be measured at ground level (DGL), and each tree/bush shall be flagged. The elderberry tree/bush is the required habitat for the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*), as this beetle is associated with elderberry trees/bushes in California's Central Valley during its entire life cycle. The Valley Elderberry Longhorn Beetle and has been listed by the U.S. Fish and Wildlife Service as a Federally Threatened species as of 1980. The exit holes made by the emerging adults are distinctive small oval openings. Often these holes are our only evidence that the beetles occur in an area. Each elderberry tree/bush shall be inspected for occurrence of the Valley Elderberry Longhorn Beetle and each exit hole shall be recorded. DGL measurements shall be recorded on tree/bushes that are greater than one inch, to the nearest tenth of an inch.

8.3. Geomorphology Study

A geomorphology study of the area will be performed and at a minimum identify historical tributaries to the American River; past geomorphology of the American River; and predicted future geomorphology based upon present managed flows in the American River in the study area.

8.4. Exploratory Borings

A Subsurface Investigation Plan (SIP) will be prepared that describes the subsurface investigations that will be performed to supplement data obtained in previous investigations. The SIP will include a location map showing previous investigation locations and proposed exploration locations. The SIP will also describe proposed exploration methods, depth of exploration, sampling interval and sampling methods. It will include a description of a general testing program, including the types of field and laboratory testing that will be performed; a final laboratory testing program will be prepared after field explorations are complete.

All right of entry (ROE) permits and permission will be obtained for the subsurface investigations. ROE will be coordinated with the American River Flood Control District, USACE project manager, and the State of California.

Exploration locations will be marked in the field and Underground Service Alert (USA) will be notified to provide clearances for all exploration locations prior to the start of work. In addition, a

private utility surveyor will be retained to check boring locations for underground utilities prior to the start of the field exploration.

Sacramento County Environmental Management Department (SCEMD) drilling permits will be obtained prior to the start of work and SCEMD personnel will inspect grouting of each boring following completion.

The borings will be drilled using a truck-mounted drill rig equipped with both hollow-stem augers (HSA) and mud-rotary drilling equipment capable of achieving a maximum exploration depth of 80 feet below existing grade. All drilling in embankment materials will be conducted using HSA methods, which will continue down to the groundwater table. Below the groundwater table, drilling will be continued using mud-rotary methods. The borings will be terminated at the maximum exploration depth indicated or at practical refusal. The upper 30 feet of the borings will be cased to prevent erosion of embankment materials by circulating drilling fluids.

Sampling will be performed using alternating SPT samplers (without liners) and California samplers. Blow counts shall be recorded and samples collected every 2.5 feet to the depth of 60 feet and every 5 feet thereafter. In addition, up to five (5) Shelby/Pitcher barrel samples will be collected per bore hole. A licensed Civil Engineer or Geologist with a minimum of 5 years experience will log and classify soils collected from each boring in accordance with ASTM D2488.

Soil samples will be screened with photoionization detector (PID) for the presence of volatile organic compounds. If hazardous materials are encountered in the borings via PID readings or observation, work will cease and the USACE will be contacted for direction on how to proceed. Sampling, collection, or disposal of hazardous materials will not be performed as part of this work order.

Traffic control at the boring locations will consist of placing "Road Work Ahead" signs approximately 200 feet from the drill rig and placing safety cones around the work area. Where work encroaches into the adjacent bike path, cones will direct pedestrians and bicyclists around the rig, including situations where the path width is reduced to one lane. Upon completion, each boring will be backfilled to existing grade with neat cement grout per SCEMD requirements.

All cuttings and fluids generated during drilling will be contained and collected in a soil bin. The bin will be temporarily stored on site at a central location to be specified. One (1) composite soil sample from the disposal bin will be analyzed for chemical constituents to confirm status for disposal purposes. Assuming the laboratory testing indicates that soil and drilling fluid stored in the bin is non-hazardous, the drilling contractor will arrange for drop off, pickup, transport, and disposal of the bin once laboratory testing is complete.

9 QUALITY CHECKS AND REVIEWS

Quality checks and reviews will take place throughout the project duration and will begin with selection of qualified individuals to perform detailed review and check work as in accordance with the responsibility matrix presented in Section 5 of this QCP. Quality checks will be carried out as a routine management practice and will include checking basic assumptions and calculations.

Quality checks will be performed by staff responsible for the work, Technical Leads, and designated individuals from the senior staff and other qualified personnel prior to submittal to ITR Team for their review and evaluation.

9.1. Design Control

Design standards will include a sound design basis for any design with each element rooted in fundamentally sound design principles, calculation checks, and peer review of output deliverables. A variety of design tools are available for use by K-G JV Team design professionals including CADD, GIS, numerical modeling and other software, spreadsheet, workbook calculation packages, cost estimating software packages, specification writing packages, and other tools. Design control will be performed in accordance with applicable requirements of KQP-4.5, Peer Review of Deliverables, KQP 6.1 – Scientific and Engineering Calculations, KQP 6.2 - Design Control, and KQP 6.3 - Control of Drawings.

Drawings will be prepared in accordance with USACE guidance documents as a joint effort between the drafting groups and the project staff. The primary identification for a drawing will be a unique drawing number, which will be maintained throughout the project regardless of any revisions or changes to its content. Drawing numbers and titles will be recorded in a drawing logbook maintained by the drafting group with appropriate notations for revised versions. Report figure numbers and titles may be used as a secondary identifier. Standardized symbols will be used on all drawings. If a non-standard symbol is used, it will be defined on the drawing. References to other drawing and sources of information, and the drawing revision status, will be clearly indicated on the drawing.

Drafting personnel will be responsible for checking that the drawing standards have been met, while the designer will be responsible for checking the drawing for technical correctness. Drawings will be signed and dated by designer, the draftsperson, and the reviewer, or designee. Revisions will be made in accordance with USACE guidance documents and will be noted on the drawing original with a revision number and a brief note describing each revision. The note will be signed and dated by the designer and the reviewer.

Drawings will be divided into two categories and reviewed differently:

- Presentation Drawings - These drawings present only information and generally communicate project data such as laboratory test data, geologic cross-sections, maps, etc. Presentation drawings are generated and approved by the originator.
- Design Drawings - These drawing are generally based on the results of calculations. Typical examples are detailed drawings for construction, excavation plans, etc. Design drawings will be independently reviewed by a person capable of verifying all aspects of the design or data interpretation.

Design-related drawings that are based on judgment or a conceptual presentation will also be independently reviewed unless the drawing is marked "for information only." Judgmental or conceptual drawings, which present a final opinion, will also be independently reviewed. The Quality Assurance Manager, with the assistance of the Task Order Leader, and designer, will decide whether a design requires independent review.

The series of checkpoints will be kept in the project file to validate the checking process. The final check print in the series will show a drawing, which corresponds, directly to the original hand-drawn or rough version, plus the additions noted on the check prints in blue or green throughout the checking process. If a drawing is revised, the entire checking process will be repeated for the revised areas only, and a new series of check prints will be prepared. Revisions will not be made without the formal checking procedure.

Under no circumstances will a design drawing signed and stamped by a registered professional engineer be revised without being re-signed and re-stamped by the same registered professional engineer.

9.2. Engineering Calculations and Analyses

Project related scientific and engineering calculations will be prepared legibly and in a format, that allows reproduction, filing, and retrieval. Calculations will be easily understandable and verifiable by a technically qualified person. Calculation sheets will be identified with the author's name and date of work, the reviewer's name and date of work, the subject, project number, and page number. This will be completed in a consistent manner for each calculation, derivation, or graph.

Calculation sections will include the following information:

- Statement of purpose of calculation or derivation
- Discussion of method or approach used

- Any assumptions used and justifications for assumptions
- Include references for all data, equations, or relationships used
- Step by step numerical calculations including all units
- Results will be clearly marked

All calculations will be formally reviewed. Assignments for checking calculations will be made by the Task Order Leader. The reviewer will have the technical expertise to verify the following:

- Applicable design code, regulatory and technical requirements have been correctly identified and calculations meet these requirements
- Appropriate calculation methods have been used
- Assumptions have been adequately described and justified
- Data has been verified, correctly selected and incorporated into the calculations
- Information and equations from external sources have been referenced
- Numerical calculations are correct and have been completely documented
- The results are reasonable and clearly marked

Each of the applicable review comments will be verbally discussed with the preparer and clarified or resolved, as needed so that the preparer has clear direction to make the required revisions.

The reviewer will be responsible for every item on every sheet. A numerical check will not be sufficient. After the review has been completed and both the author and the reviewer have agreed on the calculations and results, each then sign the section. Under no circumstances will calculations be altered after final signature by the reviewer. If it becomes necessary for calculations to be revised later, the new pages will be formally reviewed using the above procedure.

9.3. Peer Review

A peer review involves a thorough examination of documents, results and/or design against project requirements, applicable standards, procedures, and regulations. The purpose of the peer review is to ensure that documents meet appropriate standards and requirements including, but not limited to:

- K-G JV Team internal quality and professional standards;
- Project/client specific standards;
- Professional standards for engineers, geologists and scientists;
- Regulatory requirements;
- Biddability and constructability elements; and
- Clarity of presentation including approach, format and content.

A peer review is conducted by a qualified peer reviewer, defined as an individual whose technical competency, practical experience, professional judgment, and education are considered by the Program Manager or Quality Assurance Manager as being adequate to conduct the Peer Review. Peer review is conducted in accordance with KQP-4.5, Peer Review of Deliverables. Peer review will be performed at key project milestones by experienced staff that has not otherwise worked on the task. The Peer Reviewer assigned to a task will meet with staff before work begins and will check all deliverables. For this project, several peer reviewers will be necessary; one for each technical component of the project. Review comments will be provided, or referenced, in writing on the Peer Review Checklist and resolved by the document author. Review comments that cannot be resolved will be escalated to the Program Manager for resolution.

9.4. Senior Review

Senior review will be conducted by technical leads and other senior staff designated to perform quality control function for the project. The senior review will have the same scope as the peer review with the overall objective of improving the overall accuracy, quality and presentation of documents and deliverables for the Task Order.

9.5. Independent Technical Review

All decision and implementation documents for ARCFP will be subjected to an internal Independent Technical Review (ITR) for the following criterion:

1. Compliance with established policy and other appropriate guidance
2. Adequacy of the scope of the document
3. Appropriateness of data used, including level of detail
4. Appropriateness of alternatives evaluated
5. Consistency
6. Accuracy
7. Comprehensiveness
8. Reasonableness of results

The primary objectives of ITR are to ensure that:

a. The project meets the customer's scope, intent and quality objectives as defined in the PMP.
b. Formulation and evaluation of alternatives are consistent with applicable regulations and guidance.
c. Concepts and project costs are valid.

d. The recommended alternative is feasible and will be safe, functional, constructible, environmentally sustainable, within the Federal interest, and economically justified according to policy.
e. All relevant engineering and scientific disciplines have been effectively integrated.
f. Appropriate computer models and methods of analysis were used and basic assumptions are valid and used for the intended purpose.
g. The source, amount, and level of detail of the data used in the analysis are appropriate for the complexity of the project.
h. The project complies with accepted practice within USACE.
i. Content is sufficiently complete for the current phase of the project and provides an adequate basis for future development effort.
j. Project documentation is appropriate and adequate for the project phase.

The review will be documented, but documentation will not be submitted to the USACE except upon request. After the final submittal is approved by the USACE, we will submit a Statement of Quality Control to be signed by the Project Manager and a Principle.

9.6. Non-Conformances and Corrective Action

Non-conforming items and activities are those, which do not meet the delivery order requirements and may have been identified during any review phase (peer review, senior review, and ITR review). When such a condition is identified, the K-G JV Team will implement a corrective action program, which will consist of the following actions:

- Document the non-conforming item or procedure on a Quality Improvement Report (QIR);
- Determine the cause of the non-conformance;
- Determine the resultant effect on completed work;
- Correct the non-conforming procedure or replace the non-conforming item;
- Document the corrective action; and
- Verify that all corrective actions have been accomplished prior to closing the QIR.

If appropriate, K-G JV Team will stop work on any item or activity pending satisfactory correction of serious deficiencies, as required by the USACE. When problems are noted in the field, personnel will have the authority to stop work until corrective action is implemented. The corrective action may be obvious and may be implemented immediately upon identification of the non-conformance, or may require additional input from technical staff, additional equipment/materials or changes in the completed work. The serious deficiency and corrective actions will be documented on a QIR and tracked to conclusion by the Task Order Leader or QA Manager. Daily field reports, or equivalent documentation, will document the verification of

corrective actions completed. QIRs with company-wide application may be distributed as lessons learned.

All subcontractors are responsible for the accuracy of their deliverables to K-G JV Team. If a subcontractor procedure or result is found to be non-compliant with specified requirements, a QIR will be initiated. Steps that may be taken to correct a non-compliant subcontractor procedure or result include:

- Check all calculations involved in the calibration of testing equipment and/or the generation of data;
- Recalibrate equipment and/or prepare new standards as appropriate if such procedures were not conducted in accordance with specified requirements;
- Assure the maintenance and repair equipment on a regular basis;
- Retrain or reassign personnel; and
- Reanalyze results.

10 DESIGN REVIEW AND CHECKING SYSTEM (DR. CHECKS) PROCEDURE

All submittals prepared for the ARCFP will be reviewed by USACE and other agencies for conformance with the contract requirements and technical as well as functional criteria utilizing the Corps of Engineers' Design, Review, and Checking System (Dr. Checks). Dr. Checks is a computerized method for transmittal and storage of design review comments. It provides interactive capability to address and respond to design review comments. Dr. Checks is accessible at the website (www.projnet.org).

a) USACE Review Periods: A review by the USACE shall follow the receipt of each design submittal. At the 90% submittal stage, the USACE will also perform a B/C/O/E review to determine acceptance of the design documents. If the design documents are not acceptable after the 100% design review, a 7-calendar day corrected final review by the USACE will be required.

b) USACE Review Comments: USACE will return written review comments via Dr. Checks. This review effort in no way replaces the K-G JV review requirements outlined in this QCP. All review comments will be "coordinated" by the USACE Project Manager and will be stored in Dr. Checks and electronically transmitted between the USACE and the K-G JV Team.

c) K-G JV Responses Procedure: Once review comments have been forwarded to the K-G JV Team, the response to the review comments in Dr. Checks as follows:

1. “Concur” if agree with the comment.

2. “Non-Concur” if does not agree with the comment accompanied by a response on why K-G JV Team does not agree with the comment.
3. “For Information Only” if K-G JV feels the comment is for information only.
4. "Check and Resolve” if the K-G JV needs further analysis to respond to the comment. An explanation of what needs to be done to resolve the comment will be included.

Submitting a separate sheet of paper with location of compliance or rebuttals is not allowed. All information must be entered into Dr. Checks.

d) Backcheck of Previous Comments: Review comments on prior submittals will be checked for incorporation in the subsequent submittals. Those comments verified as done and explanations concurred with will be annotated, "COMMENT CLOSED", in Dr. Checks. Previous comments not verified as done or explanations not concurred with will be annotated, "COMMENT OPEN", will appear in the current review stage's comments. These comments will require further action by A-E prior to next submittal. All final submittals will be backchecked by the USACE, after A-E corrections are made, to ensure compliance with or resolution of comments to the satisfaction of the USACE.

11 BIDDABILITY, CONSTRUCTABILITY, OPERABILITY AND ENVIRONMENTAL (BCOE) REVIEW

In accordance with ER 415-1-11, a BCOE review is required for all implementation documents, which are being finalized for a construction contract advertisement. At the 90% submittal stage, the USACE will perform a BCOE review to determine the acceptance of design documents. If the design documents are not acceptable after the 100% design review, a 7-calender day corrected final review by the USACE will be required.

12 AUDITS

K-G JV Program Manager will schedule audits of the Task Order performance to evaluate adherence to requirements and to identify areas of improvement. Audits will be led by the Director-QA with the assistance of the QA Manager and selected project personnel. USACE staff will be invited to join the audit team. These audits are an overhead function within K-G JV organization and unless unique project requirements exist, will not be part of the scope of work. When unusual requirements are necessary, the scope of the audit would be negotiated with the USACE.

Prior to performing the audit, the audit scope will be established and an appropriate checklist developed. The audit will be conducted in such a manner that disruption of daily work activities is kept to a minimum.

An audit report will be prepared and will include the audit scope, findings, and any corrective action recommendations. Deficiencies will be documented on a QIR and tracked to closure by the audit leader. Copies of the report will be provided to the Program Manager, Task Order Leader, and corporate management and retained in the project files.

13 ANY SPECIAL CONSIDERATIONS AND/OR CRUCIAL DESIGN FEATURES

There are no special considerations for this project.

14 QUALITY CONTROL RECORDS

The K-G JV Task Order Leader will maintain a file of quality control records for the project. Documents to be stored in the project quality control file will include, but not be limited to: the QCP; annotated reviews comments in Dr. Checks; QIRs and QC certifications.

15 DOCUMENT CONTROL

Reports, plans, or procedures prepared for this task order will be available at locations where they are used. Documents changes may be initiated by anyone in the organization, but will be approved and issued only by the authorized technical lead. Document changes will be reviewed and authorized by the same function that issued the original document. Revised portions of documents will be distributed with a change brief. Obsolete documents will be removed from the work area but retained for legal and/or knowledge-preservation purposes.

Project files will be organized so that information is clearly and readily accessible. Specific procedures will be developed for maintenance of the filing system, including a cumulative file designation system. Each person performing a particular task will be responsible for providing required documentation, in the correct format, to the Task Order Leader.

Typical documents maintained in the project files will include, as a minimum:

- Design Drawings
- Invoices
- Specifications
- Purchase Orders
- Technical Reports
- Correspondence (e.g. with client, agencies),
- Laboratory Data Reports
- Training, Qualification and Certification Records
- Field Reports
- Calculations
- Procedures
- Meeting Minutes

- Quality Improvement Reports
- Daily Field Reports
- Audit Reports
- Review comments and comment resolution documentation

Hardcopies of final design drawings and technical reports will be archived in the project files. When drawings or documents are too large to be stored in an actual file, such documents will be stored in a designated location (e.g. drafting department for drawings and project specific library for technical documents) and appropriately labeled in accordance with the procedures of the document and record keeping system. Design drawings and technical reports will also be maintained in electronic format. Quality records pertaining to these documents shall be included in the project files.

APPENDIX A

US Army Corps of Engineers, Contract W91238-10-D-0016 Task Order 3
American River Common Features WRDA 96 Phase 3 Remaining Sites, Site R10

Project Schedule

ID	Task Name	Duration	Start	Finish
1	**Contract Milestones**	**201 days?**	**Thu 9/1/11**	**Thu 6/7/12**
2	Effective Date of Task Order	1 day	Thu 9/1/11	Thu 9/1/11
3	Quality Control Plan (14 Calendar Days)	1 day	Thu 9/15/11	Thu 9/15/11
4	Geotechnical Borings - Sites L9, R2, R9 (60 Calendar Days)	1 day?	Mon 10/31/11	Mon 10/31/11
5	Draft Geotechnical Data Report - Sites L9, R2, R9 (90 Calendar Days)	1 day?	Thu 12/29/11	Thu 12/29/11
6	Final Geotechnical Data Report - Sites L9, R2, R9 (120 Calendar Days)	1 day?	Fri 1/27/12	Fri 1/27/12
7	60% Design Submittal (150 Calendar Days)	1 day	Fri 1/27/12	Fri 1/27/12
8	Draft RE Mapping and Tract Register (150 Calendar Days)	1 day	Fri 1/27/12	Fri 1/27/12
9	90% Design Submittal (210 Calendar Days)	1 day?	Thu 3/29/12	Thu 3/29/12
10	100% Design Submittal (250 Calendar Days)	1 day?	Tue 5/8/12	Tue 5/8/12
11	Final Design Submittal (280 Calendar Days)	1 day?	Thu 6/7/12	Thu 6/7/12
12	**USACE Reviews**	**200 days**	**Fri 9/16/11**	**Thu 6/21/12**
13	Draft Quality Control Plan	3 days	Fri 9/16/11	Tue 9/20/11
14	Alternatives Cost Analysis	15 days	Wed 10/26/11	Tue 11/15/11
15	60% Submittal	15 days	Mon 1/30/12	Fri 2/17/12
16	90% Submittal	10 days	Fri 3/30/12	Thu 4/12/12
17	100% Submittal	10 days	Wed 5/9/12	Tue 5/22/12
18	Final PS&E	10 days	Fri 6/8/12	Thu 6/21/12
19	Draft Geotechnical Data Report	15 days	Fri 12/30/11	Thu 1/19/12
20	**Statement of Work Items**	**216 days**	**Fri 9/2/11**	**Fri 6/29/12**
21	**Quality Control (Durations Include Comment Resolution)**	**177 days**	**Fri 9/2/11**	**Mon 5/7/12**
22	Quality Control Plan	7 days	Fri 9/2/11	Mon 9/12/11
23	ITR QCP	2 days	Tue 9/13/11	Wed 9/14/11
24	ITR 60% PS&E	5 days	Fri 1/20/12	Thu 1/26/12
25	ITR 90% PS&E	5 days	Thu 3/22/12	Wed 3/28/12
26	ITR 100% PS&E	5 days	Tue 5/1/12	Mon 5/7/12
27	Draft GDR ITR	10 days	Thu 12/15/11	Wed 12/28/11
28	**Utilities Identification**	**45 days**	**Wed 9/21/11**	**Tue 11/22/11**
29	Research and Identify Utilities	45 days	Wed 9/21/11	Tue 11/22/11
30	**Alternatives Cost Analysis**	**216 days**	**Fri 9/2/11**	**Fri 6/29/12**
31	Analyze Cost of USACE Alternatives	15 days	Wed 9/21/11	Tue 10/11/11
32	Prepare Cost Analysis Report	10 days	Wed 10/12/11	Tue 10/25/11
33	**Plans and Specifications, DDR, MCACES Cost Estimate, ECIFP, RE Mapping, Tract Register- Site R10**	**146 days**	**Wed 11/16/11**	**Wed 6/6/12**
34	**60% Design Submittal**	**47 days**	**Wed 11/16/11**	**Thu 1/19/12**
35	Plans, Specifications, MCASES Estimate, Submittal Register	47 days	Wed 11/16/11	Thu 1/19/12
36	ECIFP	47 days	Wed 11/16/11	Thu 1/19/12
37	DDR	47 days	Wed 11/16/11	Thu 1/19/12
38	Draft RE Take Mapping	47 days	Wed 11/16/11	Thu 1/19/12
39	**90% Design Submittal**	**23 days**	**Mon 2/20/12**	**Wed 3/21/12**
40	Plans, Specifications, MCASES Estimate, Submittal Register	23 days	Mon 2/20/12	Wed 3/21/12
41	ECIFP	23 days	Mon 2/20/12	Wed 3/21/12
42	DDR	23 days	Mon 2/20/12	Wed 3/21/12
43	Final RE Take Mapping	23 days	Mon 2/20/12	Wed 3/21/12
44	**100% Design Submittal**	**12 days**	**Fri 4/13/12**	**Mon 4/30/12**
45	Plans, Specifications, MCASES Estimate, Submittal Register	12 days	Fri 4/13/12	Mon 4/30/12
46	ECIFP	12 days	Fri 4/13/12	Mon 4/30/12
47	DDR	12 days	Fri 4/13/12	Mon 4/30/12
48	**Final PS&E**	11 days	Wed 5/23/12	Wed 6/6/12
49	**Geotechnical Borings and Sampling**	**28 days**	**Wed 9/21/11**	**Fri 10/28/11**
50	Geotechnical Borings and Sampling	21 days	Wed 9/21/11	Wed 10/19/11
51	Boring Location Survey	7 days	Thu 10/20/11	Fri 10/28/11
52	Laboratory Testing	20 days	Mon 10/31/11	Fri 11/25/11
53	**Geotechnical Data Report**	**44 days**	**Mon 11/28/11**	**Thu 1/26/12**
54	Draft Geotechnical Data Report	13 days	Mon 11/28/11	Wed 12/14/11
55	Final Geotechnical Data Report	5 days	Fri 1/20/12	Thu 1/26/12
56	**Coordination, Meetings, and Project Management Information**	**216 days**	**Fri 9/2/11**	**Fri 6/29/12**
57	Coordination Kickoff Meeting	1 day	Fri 9/2/11	Fri 9/2/11
58	PDT Meetings (Semi-Monthly)	192 days	Thu 10/6/11	Fri 6/29/12
59	Progress Meetings (2 Total)	192 days	Thu 10/6/11	Fri 6/29/12
60	**Design Review Conferences**	**68 days**	**Mon 2/20/12**	**Wed 5/23/12**
61	60% Design Review Conference	1 day	Mon 2/20/12	Mon 2/20/12
62	90% Design Review Conference	1 day	Fri 4/13/12	Fri 4/13/12
63	100% Design Review Conference	1 day	Wed 5/23/12	Wed 5/23/12