REVIEW PLAN for ENGINEERING AND DESIGN PRODUCTS
LOYALHANNA DAM SERVICE BRIDGE REHABILITATION
PITTSBURGH DISTRICT

Current Version Date: 1-April-2019

1. PURPOSE AND REQUIREMENTS

a. Purpose. This review plan defines levels and scopes of review required for the engineering and design (E&D) products for the Loyalhanna Dam Service Bridge Rehabilitation.

b. References. This review plan is prepared in accordance with regional business process QMS 08504 LRD latest versions of the documents below.

(1) Engineering Regulation (ER) 415-1-11, Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews
(2) ER 1110-1-12, Quality Management
(3) Engineering Circular (EC) 1165-2-217, Civil Works Review Policy
(4) PMP dated March 2019

c. Requirements. The design and construction activities and documents for the Loyalhanna Dam Service Bridge Rehabilitation project are required to be reviewed by independent technical experts in accordance with ER 1110-1-12 and EC 1165-2-217. Review requirements may include district quality control/assurance (DQC), agency technical review (ATR) and independent external peer (IEPR) review as indicated below.

2. REVIEW MANAGEMENT ORGANIZATION (RMO). The RMO for this project is the Great Lakes and Ohio River Division (LRD). The RMO has provided the District with written concurrence for this review plan.

3. PROJECT SCOPE AND PRODUCTS

a. Project Description and Scope of Work.

The project consists of providing engineering services to perform investigations, calculations, and other analyses needed to develop the design, prepare plans, technical specifications, quantities, and supporting documents for the rehabilitation of the Service Bay and Spillway Bridges. The scope of the project is divided into a Base Contract and three options, the limits of which are controlled by dam gate operations.

The original Phase 1 scope was previously designed by the US Army Corps of Engineers, Detroit District (LRE) in FY14 to 75% level using a conventional method for concrete repair. In FY18 the US Army Corps of Engineers, Pittsburgh District (LRP), developed this Phase 1 to 100% level (complete and Certified Final) incorporating CFRP (Carbon Fiber Reinforced Polymer) and GFRP (Glass Fiber Reinforced Polymer) to the deteriorating concrete at Service Bay Monolith 5 as part of the design package. The 2018 design was released for construction but the received bids were outside the awardable range of the Independent Government Estimate. Therefore the FY18 solicitation was cancelled and the project funds were carried over to FY19 with the intent to expand the work scope to increase the amount of work and allow the

potential contractors to be more cost effective. Additional project funds are schedule to be received in FY20 and will be used to fund the awardable options.

The FY19 scope of work will be a repackaging and verifying the FY18 Phase 1 design as the FY19 Base Contract into the larger contract package, with the remaining two project phases that will complete the service bridge repairs as Awardable Options.

The Base Contract scope includes:

- Monolith 5 service bay girder (CFRP) and deck (GFRP) repairs with steel supports.
- Monolith 6 and Monolith 7 Pier deck overlays.
- Span 6/7 steel girder painting and deck replacement.

Option 1 Contract scope includes:

- Monolith 8 and Monolith 9 Pier deck overlays.
- Spans 7/8 and 8/9 steel girder painting and deck replacement.

Option 2 Contract scope includes:

- Monolith 10 Pier deck and Monoliths 11 and 12 deck overlays.
- Spans 9/10 and 10/11 steel girder painting and deck replacement.

Option 3 Contract scope includes:

- Installation of seven 25-foot light poles along the top of the dam.

Additional work items include replacing the tops of sections of the parapets, concrete spall repairs on monoliths, review of electrical conduits and lighting, mechanical coordination review of dogging devices. Options 1 through 3 will not include any composite materials, CFRP and GFRP methods, and will include conventional bridge repair methods.

Project Type:	O&M – Service Bridge Rehabilitation
Location:	Loyalhanna Lake, Westmoreland County, PA
Purpose/Function:	Service Bridge Rehabilitation
Key Physical Components:	Service Bridge
Estimated Construction Cost:	$6,000,000
E&D Product Method Delivery:	Design, Bid, Build
Construction Delivery Method:	IFB

b. Engineering and Design Products. The engineering and design products to be prepared and reviewed include the following:

The engineering and design products to be prepared and reviewed include the following:

(1) Design Documentation Report (DDR)

(2) Plans and Specifications (P&S)

(3) Engineering Considerations and Instructions for Field Personnel (ECFIP)

(4) Major Construction Contract Modifications

c. Required Quality Reviews.

(1) District Quality Control (DQC): DQC procedures will be performed for all E&D products.

(2) Agency Technical Review (ATR): The District Chief of Engineering has determined based on Tables 2 and 3 of QMS 08504 LRD that ATR is required for the E&D products.

(3) Type II Independent External Peer Review (IEPR), Safety Assurance Review (SAR): The District Chief of Engineering has determined that the project does not pose significant life safety risks and a Type II IEPR (SAR) is not required.

d. Technical Risk Analysis and Review Charge: ATR is required and a review charge will be prepared and issued to each review team. According to paragraph 7.4 d and Table 4 of QMS 08504 LRD, the independent technical reviews will focus on the following primary project complexities and risks:

(1) Bridge rehabilitation measure utilize newer material technology with the CFRP and GFRP to rehabilitate a dam service bridge. ATR member requires experience in the material selection and the engineering design of CFRP and GFRP systems.
(2) Bridge rehabilitation measure utilize deck overlay materials, bridge steel girder painting and reinforced concrete materials. ATR member requires experience in bridge rehabilitation design and rehabilitation methods.

4. PROJECT DELIVERY TEAM (PDT). The project delivery team members are listed in Attachment 1.

5. REVIEW EXECUTION. District quality control (DQC) will be performed per Chapter 3 of ER 1110-1-12 and Section 8 of EC 1165-2-217. ATR shall be performed in accordance with Section 9 of EC 1165-2-217. Based on the review charge in paragraph 3.d, the technical disciplines and expertise required for the ATR team are shown in Table 1. ATR Team. ATR members are listed Attachment 1. SAR, if required, will be executed in accordance with procedures in Appendix E of EC 1165-2-217 and as directed by the RMO.

Table 1. ATR Team Technical Disciplines and Expertise

Technical Discipline or Name	Expertise Required
ATR Team Leader and Bridge Structural	The ATR Lead and bridge structural engineer should be a senior professional with experience in preparing Civil Works implementation documents, structural team member experienced in the structural design for bridge repairs, reinforced concrete, structural steel design and moving loads analysis. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process.
Composite Materials Engineer and Structural Engineer	Review teams should be a senior professional with experience in the design and appropriate selection of composite material systems CFRP and GFRP systems used on the project.

6. REVIEW SCHEDULE AND BUDGET. The schedule and budgets for reviews are shown in Table 2.

Table 2. Review Schedule and Budgets			
Review	Start Date	Finish Date	Budget ($)
30% BCOES	5 Feb 2019	8 Feb 2019	$1,000
95% Design ATR	24 Apr 2019	8 May 2019	$5000
95% BCOES	24 Apr 2019	8 May 2019	$5000

7. REVIEW PLAN POINTS OF CONTACT. Questions and comments relating to this review plan can be directed to the following points of contact:

a. District Project Leaders.
(1) Project Manager: Craig R. Carney, PMP; CELRP-PM-PM; 412 395-7316, Craig.R.Carney@usace.army.mil

(2) Technical Lead: Dr. Sjaan Korvink, P.E.; CELRP-ECN-S; 412 395-7134, Sjaan.A.Korvink@usace.army.mil

b. Design Center: Not used

c. ATR Leader: John Kedzierski, P,E; CENAE-EDD; 978 318-8521 John.H.Kedzierski@usace.army.mil

d. Review Management Organization (RMO). Marvin Ruhl, P.E.; Bridge Safety Program Manager (BSPM); CELRP-RBT, 513 684-2009, Marvin.O.Ruhl@usace.army.mil

8. APPROVED BY ELECTRONIC SIGNATURE:

District Chief of Engineering

ATTACHMENT 1 – TEAM MEMBERS

PROJECT DELIVERY TEAM		
Function/Discipline	Name (Last, First)	Office
Project Manager	Carney, Craig	CELRP-PM-PM
Technical Lead	Korvink, Sjaan	CELRP-ECN-S
Cost Engineer (required)	Andre, Thomas	CELRP-ECN-T
Value Engineer (required)	Pittman, Hugh	CELRD
Operations Tech POC	Potter, Emily	CELRP-OP-SC
Civil Site Engineer	Sakmar, Ben	CELRP-ECN-C
Surveyor	Price, Robert	CELRP-ECG-I
Mechanical Engineer	Fergoso, Alan	CELRP-ECN-T
Electrical Engineer	Nguyen, Daniel	CELRP-ECN-T
Hydraulic Engineer	Shipps, Hillary	CELRP-ECG-WH
Environmental	Stuart, Erin	CELRP-PME-V

DQC REVIEWERS		
Function/Discipline	Name (Last, First)	Office
Project Engineer	Dr. Sjaan Korvink	CELRP-ECN-S
O&M Lead Engineer (EC)	Robert Burstynowicz	CELRP-ECN-T
CADD – Project Lead Tech	Robert Tyszkiewicz	CELRP-ECN-S
Civil Engineer Checker	Rusnak, John	CELRP-ECN-C
Civil CADD Checker	Quinn, Erich	CELRP-ECN-S
Concrete Materials Checker	Lucarelli, Brian	CELRP-ECN-S
Cost Engineer Checker	Oladapo, Dare	CELRP-ECN-T
Electrical Engineer Checker	Gadomski, Ron	CELRP-ECN-T
H&H Engineer Checker	Swansinger, Scott	CELRP-EC-DH
Mechanical Engineer Checker	Buccini, Dave	CELRP-ECN-T
Specification Engineer Checker	Burstynowicz, Robert	CELRP-ECN-T
Structural Engineer Checker	Yagla, Bradley	CELRP-ECN-S
Structural CADD Checker	Quinn, Erich	CELRP-ECN-S
Survey Checker	Martinez, Aaron	CELRP-ECG-I
Survey CADD Checker	Quinn, Erich	CELRP-ECN-S
BCOES TEAM MEMBERS		
Function/Discipline	Name (Last, First)	Office
Biddability	Pontus, John	CELRP-ECCA
Constructability	Polizzano, Denise	CELRP-ECC-O
Operability	Anderson, Neil	CELRP-OPT-M
Environmental	McClain, Bobbi Jo	CELRP-PME-V
Sustainability	Anderson, Neil	CERLP-OPT-M
ATR TEAM MEMBERS		
Function/Discipline	Name (Last, First)	Office
ATR Leader	Kedzierski, John	CENAE-EDD
Structural Bridge Engineer	Kedzierski, John	CENAE-EDD
Materials Engineer	Trovillion, Jonathan	CEERD-CFM
Structural Engineer	Harper, John	CEERD-CERL