



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND OR 97208-2870

REPLY TO
ATTENTION OF

CENWD-RBT

11 AUG 2015

MEMORANDUM FOR Commander, Kansas City District (CENWK-PM-CJ /Michael Chirpich)

SUBJECT: Review Plan (RP) Approval for the Tuttle Creek Spillway Bridge Deck Replacement Project.

1. References:

- a. Review Plan for Tuttle Creek Spillway Bridge Deck Replacement Manhattan, Kansas.
- b. EC 1165-2-214 Civil Works Review, 15 December 2012.

2. Reference 1.a. above has been prepared in accordance with reference 1.b. above.

3. The RP has been coordinated with the Business Technical Division, Northwestern Division, U.S. Army Corps of Engineers, which is the Review Management Organization for the plan. The Review Plan includes District Quality Control and Agency Technical Review.

4. I hereby approve this RP, which is subject to change as circumstances require, consistent with the study development process and the Project Management Business Process. Subsequent revisions to this RP or its execution will require written approval from this office.

5. For further information, please contact Mr. Douglas Putman, P.E. at (503) 808-3883.

A handwritten signature in black ink, appearing to read "Scott A. Spellmon".

SCOTT A. SPELLMON
BG, USA
Commanding

Encl



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BUILDING
601 E 12TH STREET
KANSAS CITY MO 64106-2824

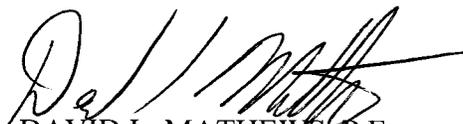
CENWK-ED

16 July 2015

MEMORANDUM FOR Commander, Northwestern Division, USACE, ATTN: Mr. Douglas Putman.

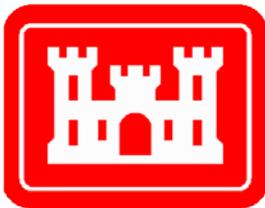
SUBJECT: Tuttle Creek Spillway Bridge Deck Replacement Project Review Plan (P2#453203)

1. The review plan for the Tuttle Creek Spillway Bridge Deck Replacement Project is attached for Northwestern Division's review and approval. The review plan was prepared in accordance with EC_1165-2-214 and uses RMC's review plan template for ATR for implementation documents and other work products in accordance with the EC policy memo dated 15 December 2012.
2. The point of contact for this memorandum is the project manager, Michael Chirpich at (816) 389-3452.

 7/16/15
DAVID L. MATHEWS, P.E.
Chief, Engineering Division
Kansas City District

**Review Plan
U.S. Army Corps of Engineers
Northwest Division
Kansas City District**

**Tuttle Creek Spillway Bridge
Deck Replacement
Manhattan, Kansas**



**US Army Corps
of Engineers®**

July 2015

1. PURPOSE AND REQUIREMENTS

1.1 PURPOSE

This Review Plan is intended to ensure a quality-engineering project is developed by the U.S. Army Corps of Engineers – Kansas City District (NWK) and is developed for the Tuttle Creek Spillway Bridge Deck Replacement. This Review Plan was prepared in accordance with Engineering Circular (EC) 1165-2-214, “Civil Works Review Policy” and provides a value added process that assures the correctness of the information shown. It is imperative that vertical teaming efforts are proactive and well coordinated to assure collaboration of the report findings, conclusions, and recommendations, and that there is consensus at all levels of the organization with the recommended path forward. This Review Plan describes the scope of review for this project and is included in the Project Management Plan (P2 #453203). All appropriate levels of review are included in this Review Plan and identifies the 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.

1.2 GUIDANCE AND POLICY REFERENCES

- ER 5-1-11, USACE Business Processes
- EC 1165-2-214, Civil Works Review Policy, 15 DEC 2012
- ER 1110-2-1156, Safety of Dams – Policy and Procedure, 31 MAR 2014
- ER 1110-1-12, Quality Management, 31 MAR 2011

1.3 REQUIREMENTS

This Review Plan is developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects.

1.4 REVIEW MANAGEMENT ORGANIZATION

The U.S. Army Corps of Engineers – Northwest Division (NWD) is the Review Management Organization (RMO) for this project.

2. PROJECT DESCRIPTION AND INFORMATION

The project is located at mile 10 on the Big Blue River, 6 miles north of Manhattan in Riley County, Kansas. It is an earth and rock-fill dam 7,500 feet long with a crest about 166 feet above the original streambed, gated outlet works, and gated concrete spillway. The reservoir storage capacity is 2,141,300 acre-feet. The project provides flood protection, navigation flow support on the Missouri River, water quality, and recreation benefits to the State of Kansas and the region.

Tuttle Creek Spillway Bridge is an eighteen span steel girder-floorbeam-stringer bridge that carries Kansas State Highway 13 across the gate-controlled chute type spillway of Tuttle Creek Lake with approximately 1000 vehicles per day. The bridge has a deteriorated concrete deck which is extensive enough that the deck is leaking and affecting the 2010 paint repair on the bridge main structural members and the tainter gate electrical and mechanical equipment below. Without the deck repair, the deck will continue to leak, the paint will continue to degrade, and impact to the capacity of the main structural bridge members will increase. The deck and nineteen deck joints routinely need patching and repairs in order to maintain a safe drivable surface. Repairs have started to increase in frequency and require costly lane closures. A full depth deck replacement is required. If it is not performed, local repairs will continue to increase in frequency, require more lane closures and will continue to impact the functionality of the highway. Deterioration resulting in bridge closure would require an official 27 mile state detour. A two-lane paved county road would likely be used by the locals as an unofficial alternate route. Three other state highway bridges built during the same era, during construction of the lake, have been replaced or are currently being replaced by the Kansas Department of Transportation.

The project scope includes a full depth concrete deck replacement. Some additional, work such as a few pier spall repairs and girder bearing anchor bolt repairs, will be included due to the ease of access to these areas when the deck is removed. The scope includes design, plans and specifications for the work.

This project includes the generation of construction drawings, specifications, design documentation, and possible updates to the existing Operations and Maintenance Manual and Record Drawings. All items will be reviewed in accordance with this Review Plan.

Refer to Figure 1 below for a project location map.



3. REVIEW REQUIREMENTS

3.1 DISTRICT QUALITY CONTROL

District Quality Control (DQC) consists of quality assurance reviews, in-progress reviews, and chiefs' reviews. Peer reviews will be conducted by an engineering peer within each discipline for all design products. DQC will be conducted on calculations, conceptual analysis, system designs, decision documentation, risk determinations, completeness of the plans and specifications, ensure all aspects of the project are included in the documentation, etc. Interdisciplinary reviews will be conducted by the PDT to ensure cross coordination between disciplines. All team members will review

all products to ensure it accurately accounts for all discipline specific aspects and the documents collectively correlate with each other.

The Dam Safety Program Manager (DSPM) will provide a review of all submittal packages and be invited to all pertinent project meetings to ensure he is fully aware of the improvements and decision process.

Select section, branch, and division level chiefs in Engineering, Construction and Project Management will review the documentation, analysis, and decision-making process in the documentation to verify the plans, specifications, and design documentation are correct and accurately reflect current policy and guidance in accordance with Engineering Regulation (ER) 415-1-11.

3.2 AGENCY TECHNICAL REVIEW

An Agency Technical Review (ATR) is mandatory for all implementation documents (including supporting data, analyses, environmental compliance documents, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers.

The four key parts of a quality review comment will normally include:

- The review concern. Identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- The basis for the concern. Cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- The significance of the concern. Indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
- The probable specific action needed to resolve the concern. Identify the action(s) that the reporting officers must take to resolve the concern.

At the conclusion of the ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;

- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

3.2.1 ATR Team Expertise

The ATR team shall be chosen based on each individual's qualifications and experience with similar projects. Specifically for this project, the reviewers should be familiar with the design and construction of concrete decked bridges. Therefore, this ATR team shall consist only of a structural engineer. All members are required to have a minimum of five years of experience in design of similar projects, be a licensed engineer.

The ATR for this project is to be conducted by the Philadelphia District (NAP). The reviewer is identified and listed below. The ATR will be in compliance with EC 1165-2-214. Comments from the ATR team will be captured, resolved, and backchecked via DrChecks. After resolution of the comments, and in accordance with NWK BQP 7.3.01, an ATR Certification will occur. Certification requires that the reviewers have witnessed the resolution of their comments sufficiently and accurately addressed on the contract documents. Disputes and significant unresolved ATR concerns will be handled in accordance EC 1165-2-214. A site visit will not be scheduled for the ATR team.

The ATR reviewers from NAP include the following:

- ATR Lead/Structural Engineer – Jiten Soneji

3.2.2 ATR Lead

The ATR team lead shall be a senior professional with extensive experience in preparing Civil Works documents and conducting ATRs. The lead shall have the necessary skills and experience to lead a virtual team through the ATR process.

The ATR lead for this review is Jiten Soneji. Jiten is a licensed structural engineer and Chief of the Structural section at NAP and has extensive experience designing and reviewing projects of similar nature and magnitude. Mr. Soneji has over 30 years of experience and previously worked for the State of Delaware Bridge Design Program as the head of their bridge design section. He was responsible for managing, reviewing and coordinating all bridge design projects. Mr. Soneji will also serve as the structural engineering reviewer.

3.3 INDEPENDENT EXTERNAL PEER REVIEW DETERMINATION

An Independent External Peer Review (IEPR) is required for some implementation documents under certain circumstances. IEPR is the most independent level of review

and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-214, is made as to whether an IEPR is appropriate.

The spillway deck replacement project is not considered a flood risk management project, but is considered non-routine maintenance. Furthermore, the project does not include the use of innovative materials or techniques, does not present complex challenges, does not contain precedent-setting methodology, or present conclusions that differ from prevailing practices. The project does not include any unique construction sequencing or scheduling challenges. The project does require the removal, replacement, and construction of a concrete deck that must be robust and resilient. The new concrete deck will replace the aging and deteriorated existing decking.

The project does not involve life safety risks as the spillway and tainter gates operation will not be affected by this project. The probability of a failure during this project is unlikely. All traffic on the bridge will be diverted to two different detours. Therefore, the total risk to the threat to human life is low.

The NWK Chief of Engineering has determined that a Type II IEPR is not necessary for this project. The decision process is document in Attachment 2 of this Review Plan.

3.4 POLICY AND LEGAL COMPLIANCE REVIEW

All documents will be reviewed throughout the project for their compliance with current law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies.

4. REVIEW SCHEDULE AND COSTS

To the extent practical, reviews should not extend the design schedule but should be embedded in the design process. Reviewers should be involved at key decision points and are encouraged to provide timely over the shoulder comments.

4.1 ATR COST

The anticipated cost for the ATR is \$5,000. The team is limited to one member, acting as both the lead and a reviewer, to help reduce project costs.

4.2 REVIEW SCHEDULE

Peer reviews, ATRs, and BCOES reviews will be completed at the 65% and 95% submittals and all comments will be closed out with the final 100% submittal. The current schedule for the reviews is listed below. The project will be designed to the 95% stage and then shelved until construction funds become available. It is anticipated that funds will be requested in FY17. The schedule has been setup to accommodate these constraints. The Project Delivery Team (PDT) and ATR team have agreed to this schedule.

Activity Name	Duration	Start	Finish
Develop 65% Design	70.0d	16-Jun-15	23-Sep-15
65% Design Peer Review	5.0d	24-Sep-15	30-Sep-15
65% Review and Comment	10.0d	24-Sep-15	7-Oct-15
Develop 65% Working Estimate	15.0d	24-Sep-15	15-Oct-15
65% BCOE Review	10.0d	24-Sep-15	7-Oct-15
65% Design Interdisciplinary Review	5.0d	1-Oct-15	7-Oct-15
MS: 65% Design Complete	0.0d		7-Oct-15
65% Design ATR	10.0d	8-Oct-15	22-Oct-15
Develop 95% Design	30.0d	8-Oct-15	20-Nov-15
MS: 65% ATR Start	0.0d	8-Oct-15	
Conduct VE Study	15.0d	8-Oct-15	29-Oct-15
MS: 65% ATR Complete	0.0d		22-Oct-15
Develop OMRR&R Manual	60.0d	23-Oct-15	21-Jan-16
95% Design Peer Review	5.0d	23-Nov-15	30-Nov-15
95% Design Review and Comment	10.0d	23-Nov-15	7-Dec-15
Plan in Hand Review	1.0d	23-Nov-15	23-Nov-15
Develop 95% Working Estimate	15.0d	23-Nov-15	14-Dec-15
95% Design Interdisciplinary Review	5.0d	1-Dec-15	7-Dec-15
MS: 95% Design Complete	0.0d		7-Dec-15
95% Design ATR	10.0d	08-Jan-16	22-Jan-16
MS: 95% ATR Start	0.0d	08-Jan-16	
MS: 95% ATR Complete	0.0d		22-Jan-16
Request / Await Funding		25-Jan-16	

5. PUBLIC PARTICIPATION

As required by EC 1165-2-214, the approved Review Plan will be posted on the District public website ([http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksPrograms and Projects/CivilWorksReviewPlans.aspx](http://www.nwk.usace.army.mil/Missions/CivilWorks/CivilWorksProgramsandProjects/CivilWorksReviewPlans.aspx)). Information will be conveyed to the public through the use of press releases and media interviews, as necessary, and through the use of posting information to the Kansas City District's website. There is no formal public review planned for the plans and specifications under development .

6. REVIEW PLAN APPROVAL AND UPDATES

The MSC for this project is NWD. The MSC Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input as to the appropriate scope and level of review for the study. Like the PMP, the Review Plan is a living document and may change as the study progresses. NWK is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented. Significant changes to the Review Plan (such as changes to the scope and/or level of review) will be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the Kansas City District's webpage and linked to the HQUSACE webpage. The latest Review Plan will also be provided to the MSC.

ATTACHMENT 1

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the construction documents for the Tuttle Creek Spillway Bridge Deck Replacement project. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, 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 results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrCheckssm.

Jiten Soneji, P.E.
ATR Team Leader
CENAP-EC-ER

Date

Michael Chirpich, P.E.
Project Manager
CENWK-PM-CJ

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: *Describe the major technical concerns and their resolution.* As noted above, all concerns resulting from the ATR of the project have been fully resolved.

David L. Mathews, P.E.
Chief, Engineering Division / Dam Safety Officer
CENWK-ED

Date

ATTACHMENT 2

DOCUMENTATION OF TYPE II IEPR RISK-INFORMED DECISION

This attachment documents the vertical team's risk informed recommendation to not conduct Type II IEPR.

The following table, based on the US Army Field Manual 5-19, *Composite Risk Management*, was used to assess each identified risk.

Risk Assessment Matrix

	Risk Probability			
Risk Severity	Frequent	Probable	Seldom	Unlikely
Catastrophic	Extremely High	Extremely High	High	Medium
Critical	Extremely High	High	Medium	Low
Marginal	High	Medium	Medium	Low
Negligible	Medium	Low	Low	Low

The following table details the risks, frequency, severity, risk assessment, and how the risk contributes to the IEPR decision. The risks were developed by reviewing the IEPR triggers from EC 1165-2-214.

Based on the below assessment, it is the risk-informed decision of the vertical team that a Type II IEPR is not required for this project.

TODAY'S DATE	1-Jul-15	Tuttle Creek Spillway Bridge Deck Replacement			RISK MATRIX
UPDATED	1-Jul-15				
BY WHOM	MCC				
RISK IDENTIFICATION	PROBABILITY	SEVERITY	TOTAL RISK	MITIGATION/PREVENTION	
Does the project address hurricane and storm risk management and flood risk management.	UNLIKELY	NEGLIGIBLE	LOW	This project includes replacement of the concrete bridge deck. It does not affect the flood risk management program at Tuttle Creek lake.	
Does the project include a Federal action justified by life safety.	UNLIKELY	NEGLIGIBLE	LOW	The life safety risks are low with the replacement of the concrete deck.	
Does a failure in the project pose a significant threat to human life.	UNLIKELY	NEGLIGIBLE	LOW	The probability of a failure during this project is low. Any failure during this project will not pose a threat to human life. All traffic will be routed to one of the two available detours.	
Does the project involve the use of innovative materials or techniques where the engineering is based on novel methods, present complex challenges for interpretations, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices.	UNLIKELY	NEGLIGIBLE	LOW	This project does not contain any innovative or complex design or construction methods.	
Does the project require redundancy, resiliency, and robustness.	PROBABLE	NEGLIGIBLE	LOW	The project does require the removal, replacement, and construction of the concrete bridge deck that will be robust and resilient.	
Does the project include unique construction sequencing or a reduced or overlapping design and construction schedule.	UNLIKELY	NEGLIGIBLE	LOW	This project does not include any unique construction sequencing or scheduling.	