US Army Corps
of Engineers
Kansas City District

PEER REVIEW PLAN

Manhattan, Kansas Levee – Section 216
FLOOD RISK MANAGEMENT PROJECT
FEASIBILITY STUDY

JANUARY 2008 UPDATE

HEARTLAND ENGINEERS

PEER REVIEW PLAN

Manhattan, Kansas Levee – Section 216
FLOOD RISK MANAGEMENT PROJECT
FEASIBILITY STUDY

Table of Contents

PEER REVIEW PLAN

Manhattan, Kansas Levee – Section 216 FLOOD RISK MANAGEMENT PROJECT FEASIBILITY STUDY

1. DOCUMENT OBJECTIVE

This Project Review Plan (PRP) is a part of the Project Management Plan (PMP) under the QC/QA element in accordance with EC 1105-2-408 and the Standard Operating Procedures for Planning Centers of Expertise. This PRP provides guidance to the Project Delivery Team (PDT) on the specific review levels, responsibilities, and process requirements for execution of reviews for the Manhattan, Kansas Levee feasibility study.

2. GENERAL INFORMATION

Executive Summary -- Study Purpose and Background.
The U.S. Army Corps of Engineers Kansas City District along with local project sponsors, are conducting a feasibility study of the existing Manhattan, Kansas Levee flood risk management project. The study is authorized under Section 216 of the 1970 Flood Control Act (review of completed civil works). The levee unit withstood the Flood of 1993, but some elements were seriously challenged as releases from Tuttle Creek Dam (which lies just upstream on the Big Blue River) created a near overtopping situation at some locations along the Big Blue River levee segment. This event raised a concern that the project may provide less than the level of performance for which it was designed.

This feasibility study will update and verify data on the level of flood risk management provided by the project, and if warranted, will develop alternative plans for increasing the reliability of the existing levee unit. Such plans will be technically viable, economically feasible and environmentally acceptable.

Study Authority.
Section 216 of the 1970 Flood Control Act provides authority to reexamine completed civil works. Section 216 reads as follows:

> *The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects, the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying structures or their*

operation, and for improving the quality of the environment in the overall public interest.

Original Project Authority.
The original Manhattan, Kansas Levee project was authorized by the Flood Control Act approved 3 September 1954 (Title II, Public Law 780, 83d Cong., 2d Sess., H.R. 9859).

Feasibility Study Objectives.
The Kansas City District is undertaking this feasibility study with the following objectives:
1. adequately evaluate the reliability and performance of the existing levee project,
2. formulate plans for increasing the levee reliability through a cost-shared construction project, and if such plans are deemed feasible, then
3. develop the documentation necessary to seek project authorization and implementation.

Summary Study Scope and Execution Parameters.
The Project Management Plan for this study is based on a two-phase approach to performing the feasibility study.

- Feasibility Phase 1 will focus on refining knowledge of study area problems and a characterization of the existing condition of the levee unit with an emphasis on reliability quantification and an approximate determination of potential economic damages from various types of levee failure.
- Feasibility Phase 2 will focus on: a more detailed and accurate assessment of existing conditions economic damages, generating reliability improvement options array, development and costing of concept designs for implementation of such recommendations, overall plan formulation and evaluation, and the preparation of decision documents necessary for review and authorization of any proposed project.

While it is the intent of all parties to proceed through the entire feasibility process, a formal checkpoint will occur after the essential completion of the Phase 1 study and associated ITR, whereby the Kansas City District PDT and Planning Branch Management, the ITR team leader and the Sponsor will perform a detailed joint examination of the Phase 1 results to date, review current costs in detail, and perform a verification of both Federal and sponsor interest in proceeding into feasibility Phase 2. If warranted, the PMP study scope, estimated cost, and schedule may be updated at this checkpoint.

Local Sponsorship and Funding.
Feasibility funding source is 50% Federal General Investigations (GI) -- Civil Works Appropriation & 50% local cost share funding. All local funding will be provided from the City of Manhattan, Kansas. The City owns and operates the levee unit. The City signed a Feasibility Cost Sharing Agreement (FCSA) with the Corps in Nov 2005.

Description of Existing Overall Project and Problem.
The existing levee unit consists of 28,841 feet of levee, plus 4,100 feet of channel improvement for the Kansas River, the modification of a Rock Island (now Union Pacific) railroad bridge, six pressure relief wells, and two active pumping plants to address flooding from the Big Blue and

Kansas Rivers. Construction of the project was initiated on 4 May 1961 and the completed project was transferred to local interests for operation and maintenance in July 1963.

The levee unit is located in/around the City of Manhattan, Kansas. Manhattan, the seat of Riley County, has an area of about 16 square miles. The 2000 population stood at 44,831, which represented an impressive growth of nearly 19 percent over the 1990 population of 37,712. The city is the ninth-largest in Kansas. The broader Riley County area had a 2000 population of 62,843. The community is dominated by two public institutions: Kansas State University, with about 22,000 students and 3,000 employees, and the U.S. Army's Fort Riley (just west of the city) with a base population of more than 8,000. The number of active duty personnel at Fort Riley is expected to increase substantially given recent Congressional BRAC recommendations. This will in turn increase the surrounding civilian population. Manhattan is also the primary service and retail center for a three-county area of more than 100,000 people.

The town is situated along U.S. Highway 24, which links the area to Kansas City (about 125 miles to the east), and is also served by state routes 18 and 177 which link the area to Interstates 70 and 135. The Corps of Engineers Tuttle Creek Lake is situated to the north of Manhattan (see enclosure 3 and 4 for plans and description). Tuttle Creek is a major lake in the Kansas River basin system of flood control lakes.

The urban Manhattan floodplain includes a centrally located downtown and commercial area (which includes a major regional shopping mall), neighborhoods generally to the west of the downtown area, and a light industrial area comprising the eastern half of the study area. The study area contains more than 1,500 homes and roughly 500 businesses and public facilities. The estimated value of these homes and businesses, based on reconnaissance-level data, is more than $600 million.

This study was triggered by an incident in July of 1993. With approx. 60,000 cfs released from Tuttle Creek reservoir, and approx. 100,000 cfs flowing in the Kansas River, some problems related to potential overtopping were indicated along the Big Blue River segment of the levee unit. The original design documentation describes a levee unit designed for a significantly higher coincident flow regime than was experienced in 1993.

During the last decade, the City of Manhattan has undertaken a series of actions including engineering studies to characterize the potential overtopping threat posed under similar and higher discharge events. Those recent local efforts have produced a digital hydraulic model (Flood Predictive Model) that indicates much lower levels of flood performance than the original Corps design documentation.

The Corps undertook a reconnaissance study at the request of the City and performed most of the reconnaissance investigation in the 2003 to 2004 timeframe. The subsequent 905B document was approved in Nov 2004 by CENWD for progress into feasibility.

3. LEVELS OF REVIEW

Internal Peer Review (IPR).
Internal Peer Review will be conducted on the project feasibility study. As part of the Quality Management Plan on any project, there are internal reviews or design checks that constitute quality control for each deliverable product. It is the responsibility of each product development team member, their supervisors, and the Project Manager to ensure that every product receives an internal quality control review. It is the responsibility of the supervisor or section chief for each team member to ensure that a qualified internal peer review is selected and conducts a review of their product prior to delivery to the Project Manager, or prior to completion.

Independent Technical Review (ITR).
Independent Technical Review will be conducted. Independent Technical Review is an independent review, outside of Kansas City District, of the deliverables for the project and constitutes an independent review of the entire project. In accordance with EC 1105-2-408 dated 31 May 2005, and CECW-CP Memorandum dated 8 November 2006, all outside independent review teams for qualifying projects is coordinated through the Corps Flood Risk Management Center of Expertise. The PCX works collaboratively with the Division staff and the District Project Manager to find team member staff outside the Kansas City District with the requisite experience and qualifications to review the project. Review comments will be documented, processed, and resolved through the Dr. Checks software package.

External Peer Review (EPR).
External Peer Review **(**EPR) does not apply to this feasibility study and will not be conducted. EPR is an additional national level independent review process, outside the Corps of Engineers, to ensure that the projects are of national or regional interest and meet the requirements of Federal participation. Specific criteria that trigger the development and implementation of EPR are projects where novel methods are utilized, where the project presents complex challenges, where the project uses precedent setting methods or models, where the project is likely to present landmark conclusions that will affect policy, or where the project is centered or focused on an issue or proposal that is highly controversial. Also, per the Water Resources Development Act (WRDA) of 2007, an EPR will be conducted where the potential implementation cost will exceed $45 million.

This feasibility study is an evaluation of the condition and performance of an existing levee unit. There are currently no features or components anticipated to be highly controversial or significant to national policy. During the levee evaluation, standard Corps criteria, methods, and models will be utilized. No novel or precedent setting methods are anticipated. The potential implementation cost is not expected to exceed $45 million. Thus, EPR will not be conducted based on the project plan and the criteria established for use of EPR.

Architect-Engineer (AE) or Consulting Contracts.
Contracts used on this project will undergo a Quality Assurance Review of each deliverable product by assigned District PDT members. Additionally, any products developed by contract will also undergo ITR along with other products as outlined in the ITR paragraph above. All AE contractors are required to develop a Quality Management Plan for Corps Project Manager

review. This plan will detail the firm's internal quality management and design check review processes.

4. SELECTED REVEW PROCESS

The selected review process level for the Manhattan, Kansas Levee feasibility study is the Independent Technical Review. The ITR will be developed in coordination with the PCX for Flood Risk Management and the ITR team leader. This process will be coordinated through CENWD. Internal peer review (internal design checks) will be conducted in accordance with the approved District Business Practices, as outlined above. It is anticipated that A-E contracts will be utilized for development of technical products for this project. Contracts will be procured in accordance with the prior approval of the District Acquisition Strategy Board, as outlined in the approved District Business Quality Procedures.

5. ITR REFERENCES

- Refer to ER 1110-1-105, the primary Corps ITR regulation (see enclosed exhibit for summary of the major ITR requirements described in this regulation).

- EC 1105-2-408 dated 31 May 2005

- CECW-CP Memoranda dated 8 November 2006 and 30 March 2007.

- Refer to Kansas City District Business Quality Procedure (BQP) 5.5.04 (Quality Plans). Pertinent excerpts are quoted below:

> *5.6 ITRT Members:*
>
> - *Verify compliance with established policy, principles and procedures.*
> - *Verify criteria applied.*
> - *Verify assumptions, methods, procedures, and material used in analyses.*
> - *Evaluate alternatives.*
> - *Verify the appropriateness of data used and level of data obtained.*
> - *Verify completeness of design and documents.*
> - *Verify reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.*
> - *Conduct spot checks for interdisciplinary coordination.*
> - *Identify the specialized knowledge, experience, or training required to competently complete the product.*
> - *Verify comments are resolved by:*
>   - *Verifying incorporation of their comments or,*
>   - *Accepting the verification conducted by ei*ther the PM or ITRT Leader or,
>   - Withdrawing the comment.
>
> *6.1.7.7.3 Independent Technical Review: Qualified staff verifies the work meets reasonable professional levels and satisfies the client's needs and expectations. For small, simple, low complexity, low risk projects, independent technical review can be accomplished at the section level. Independent technical review can be managed at branch levels when a few disciplines are involved, the project is of moderate cost and complexity and the risk for life safety is relatively low. Independent technical review for all other projects should include individuals who do not have a vested interest in the project and are not involved in*

the day-to-day direction of the product. The PMP should define the level of independent technical review. Independent technical review is not a detailed check but a broad overview including:

- *Review of criteria applied,*
- *Review of the methods of analysis and design,*
- *Compliance with client and/or program requirements,*
- *Completeness of design and documents,*
- *Spot checks for interdisciplinary coordination,*
- *Biddability, constructability, operability and environmental.*

6.1.7.7.4 Independent reviewers are brought on board early on to participate in establishing criteria selection and broad approaches to be taken in addressing potential issues thus ensuring seamless review.

6. COMPOSITION AND ORGANIZATION OF THE ITR TEAM

Discipline-Specific Guidance & Expertise Requirements.
ITR Team representation is required in the disciplines listed below. A statement of qualifications is required for each team member prior to acceptance as an ITR Team member and for any subsequent changes thereto.

Hydrology & Hydraulics: Team member will be an expert in the field of large-river hydrology & hydraulics, have a through understanding of the dynamics of the confluence of two rivers, and be familiar with interior drainage issues related to levee construction. The team member will have an understanding of computer modeling techniques that will be used for this project (HEC-HMS, HEC-RAS, UNET, and TABS).

Structural: Team member will have a thorough understanding of levee , flood wall, and retaining wall design, and structures typically associated with levees (pump stations, gatewell structures, utility penetrations, stoplog & sandbag gaps, and other closure structures).

Mechanical: Team member shall be familiar with levee pump station and closure structure design. *Engineering disciplines other than Mechanical may be acceptable for review of this area of work subject to meeting the experience requirement stated above.*

Electrical *(if deemed necessary)* : Team member shall be familiar with levee pump station and electrical utilities design. Electrical ITR requirements for this study are very minimal.

Geotechnical: Team member will have extensive experience in levee and floodwall design, post-construction evaluation, and rehabilitation. Very critical ITR team member

Economics: Team member will have extensive experience in related flood risk management projects, and have a thorough understanding of HEC-FDA.

Plan Formulation: Team member will be familiar with current flood risk management planning and policy guidance, and have experience in plan formulation for large-scale flood risk management projects.

Civil / Site / Utilities / Relocations: This requirement may require a dedicated team member, or may be satisfied by structural or geotechnical reviewer, depending on individual qualifications. Team member will have experience in utility relocations and positive closure requirements for levee construction.

Cost Estimating: Team member will be familiar with cost estimating for similar projects using MCACES. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer. Cost estimating efforts will be coordinated with and separately reviewed by the Cost Engineering Center of Expertise at the USACE-Walla Walla District.

Other disciplines/functions involved in the project include Hazardous/Toxic Waste, Environmental/NEPA, Real Estate, Cultural Resources, and Legal. In each case, any required Independent Technical Review within these disciplines may be accomplished within Kansas City District or by other independent sources. The general experience requirements and principles contained in this document also apply to these disciplines/functional areas. *(Exception: Legal review is <u>not</u> under the purview of the ITR Team Leader but is instead responsible to the Corps of Engineers Office of Counsel chain-of-command).*

ITR Team Leader.

One member of the ITR Team will act as the ITR team leader. Team leader designation will be finalized based on input from ITR Team members and the CENWK Project Manager, the PDT, and CENWK staff. The ITR leader shall, in addition to discipline-specific review requirements, be responsible for:

- Acting as a liaison between the Product Development Team and the ITR Team
- In conjunction with the PM, the ITR team leader will perform active coordination of the ITR process and study findings with the Corps Flood Risk Management Center of Expertise (FRM-PCX, South Pacific Division), and ensure compliance with an adequate level of FRM-PCX review.
- Distributing information for review and coordinating efforts of the ITR Team.
- Ensuring that individual ITR Team members are operating IAW the guidelines established for ITR by ER 1110-1-105 (see enclosed exhibit for summary of the major ITR requirements described in this regulation).
- The ITR team is *not* geographically co-located. Therefore, it is of paramount importance that the ITR Team Leader be capable of organizing the total ITR efforts across District and Division boundaries.
- A substitute ITR Team Leader from the ITR team will be named by the ITR team leader for periods of extended (over 60 days) absence.

ITR Team Members and Organization.

The ITR team membership and ITR team organization will remain partially intact from a previously established ITR team for the Kansas Citys Levees feasibility study. This has the major advantage of keeping some experienced and approved reviewers in-place.

ITR, PDT, EPR and PCX Team Membership Appendix.
A separate appendix to this Peer Review Plan will be submitted for ITR team leader and FRM-PCX review as PDT, ITR, PCX, and EPR membership is finalized. Significant team member turnover has occurred over the past 18 months due to gaps in the project funding stream.

ITR and PDT Communication.
The ITR team members will be contacted on a regular basis by the corresponding PDT members so as to be kept aware of criteria selection and the broad approaches employed in this study thus ensuring a seamless review when products are submitted for ITR. The PM and the ITR leader will coordinate the exact timing, duration and information requirements for various interim and final ITR reviews.

7. ITR SCHEDULE

Project Schedule and Current Status.
The feasibility phase was initiated in November 2005. The Feasibility phase schedule continues to be impacted by constrained levels of Federal funding, and received limited funding in FY 2006. Federal funds were allocated in April 2007 and the feasibility study was reinitiated after being on hold for lack of funds since December 2006. Federal funding levels in FY 2008 are sufficient to maintain some progress on early portions of feasibility Phase 1 activities. The project schedule is being adjusted to reflect funding levels actually provided each fiscal year.

ITR Team Site Visit.
An initial site visit is required and will be schedule at some point within the existing conditions review and analysis period. The site visit timing is subject to adequate project funding and adequate establishment and availability of the ITR team. This site visit will provide each reviewer with the opportunity to view existing conditions and to meet corresponding Product Development Team members.

Phase 1 Schedule.
The Existing Conditions (EC) development (feasibility Phase 1) is to be accomplished Nov 2005 to Sep 2009 (SAF). ITR of the existing conditions findings and associated analysis products, which are primarily engineering related analysis supplemented with some HTRW, Real Estate, and Environmental baseline conditions documentation, will follow immediately thereafter. The Phase 1 ITR timeframe will be coordinated with the ITR review team as the review time approaches.

Phase 2 Schedule.
Anticipated milestones related to Phase 2 (Future Conditions and Alternatives Formulation and Development) activities and associated Feasibility Report (draft and final) product reviews are as follows (subject to change):

- **Sep 2010**: Complete draft Engineering Appendix and fwd to ITR review.
- **Dec 2010:** Complete draft Engineering Appendix ITR and resolution of comments.
- **Mar 2011:** Complete draft main Feasibility Report, HTRW, Econ, & RE Appendices & draft EIS for ITR.
- **Jun 2011:** Hold AFB review with CENWD, HQUSACE, selected ITR staff, and sponsors.

- **Late 2011 - early 2012:** depending on HQUSACE PGM and policy guidance timeframe, and the CWRB recommendations, a final feasibility report, EIS, and all appendices should be available for final ITR review in mid-2011.
- **2012:** Complete feasibility and begin authorization process.

8. ITR BUDGET

ITR is currently budgeted at $50,000 to $60,000 total for the:

- initial ITR team site visit,
- formal ITR reviews at the: Existing Conditions documentation checkpoint; pre-AFB submission of the Draft Feasibility Report, EIS and all appendices; and the Final Feasibility Report, EIS and all appendices,
- plus all associated interim coordination and consultations.

Note that the final ITR budget is dependent on:
-- the number and quantity of the areas of interest (those areas which are viable candidates for potential Federal project formulation efforts) developed during the feasibility study.
-- and the number of the reviews actually required to resolve any issues developed during the feasibility study.

9. PUBLIC COMMENT OPPORTUNITIES

This Project Review Plan will be available on the national Corps of Engineers planning website, and the CENWK project website, at the following links:
http://www.usace.army.mil/cw/cecw-cp/peer/peer_rev.html
http://www.nwk.usace.army.mil/projects/manhattan/

Public and Agency Review for this project will be conducted in accordance with NEPA, as well as the provisions of the Water Resources Development Act (WRDA) 2000, and as outlined in ER 1105-2-100. As such the review plan will be available through all public and agency scoping and other processes for the project

10. AVAILABILITY OF PUBLIC COMMENTS TO REVIEW TEAM

Public input from the NEPA workshops and the public scoping meetings will be available to the ITR members to ensure that public comments have been considered in the development of reviews and final reports.

==//==