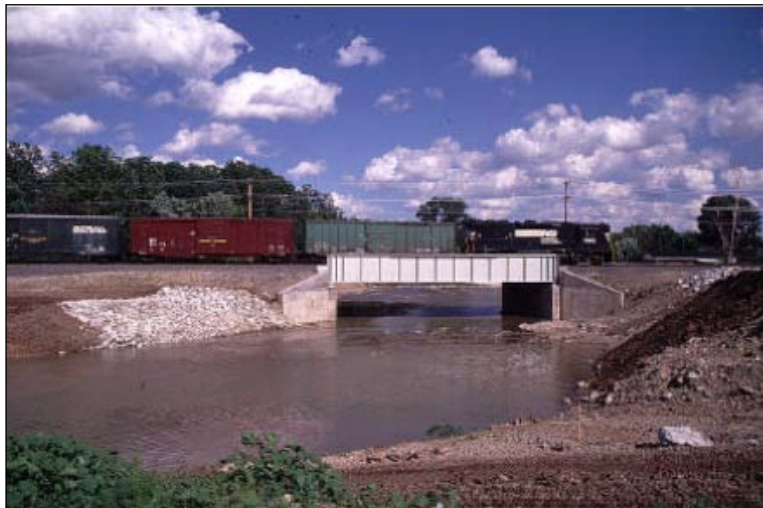


REVIEW PLAN

HOLES CREEK
LOCAL FLOOD PROTECTION PROJECT
WEST CARROLLTON, OHIO

FINAL CONSTRUCTION CONTRACT
LOUISVILLE DISTRICT

JANUARY 2013



MSC Approval Date: 24 Jan 13
Last Revision Date: None



**US Army Corps
of Engineers ®**

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1. PURPOSE AND REQUIREMENTS

a. **Purpose.** This Review Plan defines the scope and level of peer review for the Final Construction Activities for the Holes Creek, OH Local Flood Protection Project.

b. References

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (2) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (3) Holes Creek, OH Local Flood Protection Project; Project Management Plan

c. **Requirements.** This review plan was developed in accordance with EC 1165-2-209, 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 from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review.

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for implementation documents is typically the Risk Management Center (RMC). The RMO for the peer review effort described in this Review Plan is the RMC since the only remaining work is award of the final construction contract to complete the project.

3. STUDY INFORMATION

a. **Implementation Document.** The only remaining work is the final construction contract that will close out the project. The project received additional funding to award this contract in the FY12 Work Plan.

The authorized project is "Holes Creek, West Carrollton, Ohio – Local Flood Protection Project". The Chief's report was transmitted to Congress on 16 March 1984. The project was authorized in the Water Resources Development Act (WRDA) of 1986. The Project Cooperation Agreement was executed in June 1996. Amendment No. 1 to the PCA was executed in September 2000. A post-authorization modification occurred in Section 584 of WRDA 1999. Addendum No. 2 to the Final Reevaluation Report was completed in May 2005.

b. **Study/Project Description.** This flood risk management project is located in West Carrollton, Ohio, just south of Dayton and consists of channel widening, replacement of a railroad bridge, a floodwall and relocations. See Attachment 3 "Map Showing Limits of Floodwall Contract" for a map of the area. Project construction consisted of 0.9 mile of channel improvement (80-foot bottom width) and a new clear span railroad bridge. Anticipated construction completion was originally in 2002. However, an error in survey data used in the hydraulic model was discovered near the end of the channel work, leaving a mix of residential and commercial properties on both sides of the creek west of

Springboro Pike below the level of protection specified in the PCA. The reevaluation report was amended to provide for additional work (floodwall and relocations) necessary to provide the authorized level of protection in the PCA. Least cost means of providing the level of protection required by the PCA was to buyout three properties south of the creek and to demolish the structures and to construct a small floodwall to protect nine commercial structures north of the creek. The three properties south of the creek have been purchased and demolished. The final construction contract was awarded on 26 September 2012 to Kwest Group, LLC in the amount of \$3,244,696.85. The non-Federal sponsor is the Miami Conservancy District.

c. Factors Affecting the Scope and Level of Review. The majority of this project was completed prior to 2002. The only remaining work is the final construction contract that will complete the project and allow the project to be turned over to the sponsor for operation and maintenance. All of the reviews have been previously completed including the ATR. After the final funding was obtained, the PDT re-visited the site and made revisions to the plans and specs. The final plans and specs were reviewed by the ATR team and comments were incorporated. The Holes Creek, OH Project is also a flood risk management project which requires a Type II – IEPR (Safety Assurance Review) in accordance with paragraph 12 of EC 1165-2-209.

d. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include: Not Applicable. There are no in-kind services anticipated as part of this cost share project.

4. DISTRICT QUALITY CONTROL (DQC)

All implementation documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. 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). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, etc. Quality checks may be performed by staff responsible for the work, such as supervisors, work leaders, team leaders, designated individuals from the senior staff, or other qualified personnel. However, they should not be performed by the same people who performed the original work, including managing/reviewing the work in the case of contracted efforts. Additionally, the PDT is responsible to ensure consistency and effective coordination across all project disciplines during project design and construction management. See Tables 1 and 2 on Attachment 1 for PDT and DQC members.

a. Documentation of DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC. DrChecks review software will be used to document comments to the plans and specs.

b. Products to Undergo DQC. All products completed to date have undergone DQC including the final set of plans and specs.

5. AGENCY TECHNICAL REVIEW (ATR)

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. Management of ATR reviews is dependent upon the phase of work and the reviews are conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

The only remaining work is the final construction contract that will close out the project. The project received additional funding in the FY12 Work Plan to award this contract. This final set of plans and specs has already been reviewed twice by an independent technical review (ITR) team. This was the process at the time of review of the only remaining work – the last set of plans and specs. Once the additional funding was obtained, the plans and specs were updated by the Project Delivery Team (PDT) to ensure that any changes in site conditions were addressed on the plans and specs. The project also underwent a BCOE (Biddability, Constructability, Operability, and Environmental) review after the PDT performed the plan-in-hand review and made any necessary changes.

The ATR review was performed and ATR certification was obtained in July 2012. The ATR review had a focused, limited scope. The reason for the “limited scope” was because the P&S were previously developed in 2006 and went through the ITR and BCOE process. But due to insufficient funds, the contract was never advertised and was put on the “shelf”. The P&S were updated in 2009 when we were getting the project ready for potential ARRA funds that never came. The project finally received additional funding in the FY12 Work Plan in February 2012 to award this contract. The PDT re-visited the site on 28 February 2012 and made minor revisions to the plans and specs. The Structural reviewer was from outside the Division and served as ATR Lead. See Table 3 of Attachment 1 for ATR members.

a. Products to Undergo ATR. The final set of plans and specs. See above discussion.

b. Documentation of ATR. DrChecks review software was used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments were limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

- (1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) 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

- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks includes the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each 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.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review was completed for the final set of plans and specs and is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for 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 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study.
- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

- a. **Decision on Type I IEPR.** A Type I IEPR will not be performed on the final set of plans and specifications since the project's decision document was completed in April 1994 and the total project cost is under \$45,000,000. In addition, there were no requests by the Governor of Indiana or heads of Federal or state agencies to conduct a Type I IEPR, nor are there significant public issues or complex design methods that warrant review.

Decision on Type II IEPR. In accordance with EC 1165-2-209, a Type II IEPR Safety Assurance Review (SAR) shall be conducted on design and construction activities for flood risk management projects prior to initiation of physical construction and periodically thereafter until construction activities are completed. This review will be on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety and welfare. Since sections of the Holes Creek, OH Project were designed and constructed prior to implementation of EC 1165-2-209, a SAR will be conducted for design and construction of only the last section to be constructed. The SAR will provide verification that the Louisville District's PDT applied good science and sound engineering in design of this section. SAR team members will also assure that design requirements, standards and assumptions are implemented throughout construction activities. The project features were designed in accordance with current Corps of Engineers' design standards. The PDT assumes it will provide a safe, long-term project by maintaining close adherence to those standards during both design and construction of the project features. As further safety measures, the local sponsor is required to perform inspections of the project, including continuous inspections during flood events. The Louisville District's Chief of Engineering Division, as the Engineer-In-Responsible-Charge, is responsible for ensuring the Type II review is conducted in accordance with EC 1165-2-209, and will fully coordinate the design and construction phase of the Holes Creek, OH project with the Chief of Construction Division and the Project Manager.

The IEPR Type II contractor is Gannett Fleming, Inc., which is an independent, national AE firm under contract with the Institute for Water Resources/Risk Management Center to perform Type II IEPRs for Flood Risk Management projects. The IEPR review was initiated in May 2012 and will continue through the end of construction at an approximate cost of

\$48,000. To date, the IEPR Type II contractor has provided review comments on the final set of plans and specs.

b. Products to Undergo Type I IEPR. Not Applicable.

Products to Undergo Type II IEPR. A Safety Assurance Review (SAR) will be performed on the plans and specifications for construction of the final contract of the Holes Creek project. The SAR team will also make site visits to the project near the midpoint of construction and prior to final inspection as reviews to ensure implementation of design requirements, standards and assumptions.

Dr Checks review software will be used to document IEPR comments and aid in the preparation of Review Reports. Comments should address the adequacy and acceptability of the design calculations, engineering methods, and models used in design of the Holes Creek plans and specifications. IEPR comments should generally include the same four key parts as described for ATR comments in Section 5 of this Review Plan. A panel of experts provided by the SAR Contractor will be responsible for compiling and entering comments into DrChecks. The panel will also prepare Review Reports on design and construction activities of the Holes Creek project. Upon conclusion of each scheduled milestone, the panel lead will provide the Louisville District with a Review Report that fully describes any design or construction deviations. Those reports will accompany the panel's publication of the final report for the project.

c. Required Type I IEPR Panel Expertise. Not applicable.

Required Type II IEPR Panel Expertise. Type II IEPR Expert Reviewers will be established in consultation with the MSC. The Louisville District will award a Delivery Order to an Architect-Engineer firm designated to conduct a SAR. Prior to award, the Contracting Officer shall verify the contractor has no potential conflicts with review of the Holes Creek plans and specifications. Expert Reviewers will be selected based on their technical qualifications and experience. The Expert Reviewers should be independent of USACE and free of conflicts of interests. The Expert Reviewers will be able to evaluate whether the interpretation of analysis and conclusions based on analysis are reasonable. The Expert Reviewers will be given the flexibility to bring important issues to the attention of decision makers. However, the Expert Reviewers will be instructed to not make a recommendation on whether a particular alternative should be implemented, as the Chief of Engineers is ultimately responsible for the final decision on a planning or reoperations study. The Expert Reviewers may, however, offer their opinion as to whether there are sufficient analyses upon which to base a recommendation. The Expert Reviewers will have experience in design and construction of projects similar in scope to the Holes Creek Flood Damage Reduction Project. Expert Reviewers shall be registered professional engineers in the United States, or similarly credentialed in their home country. The Expert Reviewers must also have an engineering degree. A Master's degree in engineering is preferable, but not required, as hands-on relevant engineering experience in the listed disciplines is more important. Expert reviewers shall have a minimum of 15 years experience and responsible charge of engineering work.

Independent External Peer Review (IEPR) Expert Reviewers		
NAME	DISCIPLINE	EXPERIENCE
	Hydraulic Engineer	The hydraulic engineering reviewer will be an expert in the field of hydraulics and have a thorough understanding of open channel flow dynamics and application of levees and flood walls. The Hydraulic Engineer shall be a licensed professional engineer.
	Structural Engineer	The structural engineering reviewer will be an expert in the field of structural engineering and have a thorough understanding of structural analysis, design, and construction of concrete flood wall structures. Working familiarity with pertinent Corps of Engineers manuals is required. Shall have a proven track record of design of structures used in flood damage reduction systems. In particular, shall have experience in design of concrete-faced sheet pile I-walls with concrete caps. The Structural Engineer shall be a licensed professional engineer.

d. Documentation of Type I IEPR. Not Applicable.

Documentation of Type II IEPR. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-209, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the engineering methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments above. The OEO will prepare a final Review Report that will:

- 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; 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.

The final Review Report will be submitted by the OEO as scheduled in the Scope of Work. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All implementation documents will be reviewed throughout the project for their compliance with

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.

8. REVIEW SCHEDULES AND COSTS

- a. ATR Schedule and Cost.** The ATR review was conducted in May and June 2012 at an approximate cost of \$12,000. ATR certification was obtained in July 2012.
- b. Type II IEPR Schedule and Cost.** The IEPR review was initiated in May 2012 and will continue through the end of construction at an approximate cost of \$48,000. IEPR Type II contractor is Gannett Fleming, Inc.

9. PUBLIC PARTICIPATION

Not Applicable.

10. REVIEW PLAN APPROVAL AND UPDATES

The Great Lakes and Ohio River Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the implementation document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district 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 in Attachment 4. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should 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, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

11. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

Louisville District POC:
Louisville District Technical POC
Great Lakes and Ohio River Division POC:
Review Management Organization POC:

ATTACHMENT 1: HOLES CREEK, OH TEAM ROSTERS

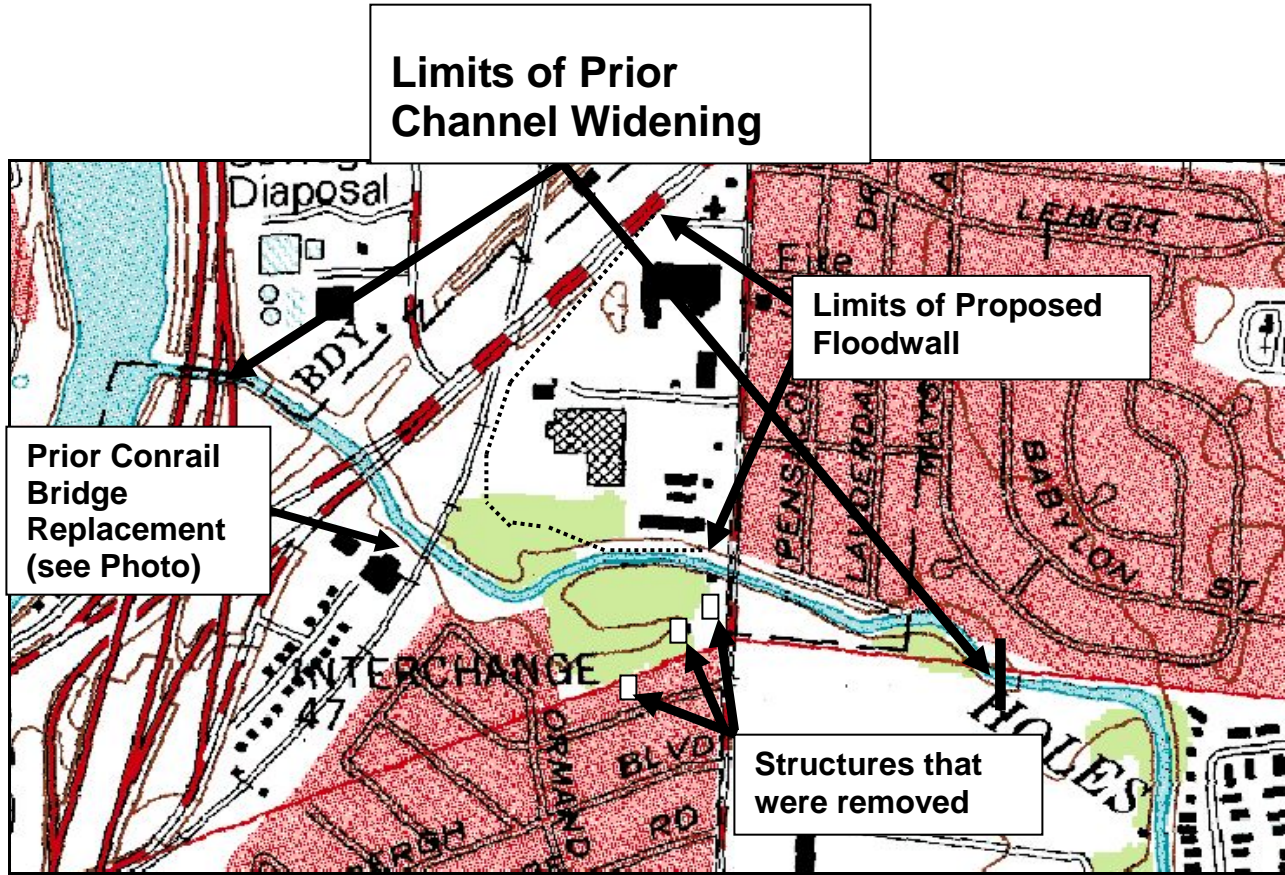
TABLE 1: Product Delivery Team (PDT)		
Functional Area	Name	Office
Project Manager		CELRL-PM-C
Project Engineer		CELRL-ED-T-H
Real Estate		CELRL-RE-C
Civil Design		CELRL-ED-T-C
Cost Engineering		CELRL-ED-M-C
Hydrology and Hydraulics		CELRL-ED-T-H
Structural		CELRL-ED-D-S
Geotechnical		CELRL-ED-T-G
Construction		CELRL-CD-W-W
Environmental		CELRL-PM-P

TABLE 2: District Quality Control (DQC) Team		
Functional Area	Name	Office
Civil Design		CELRL-ED-T-C
Cost Engineering		CELRL-ED-M-C
Hydrology and Hydraulics		CELRL-ED-T-H
Structural		CELRL-ED-D-S
Geotechnical		CELRL-ED-T-G
Construction		CELRL-CD-W-W
Environmental		CELRL-PM-P

TABLE 3: Agency Technical Review (ATR) Team		
Functional Area	Name	Office
Civil Design		CELRP-EC-NC
Hydrology and Hydraulics		CELRP-EC-DH
Structural and ATR Lead		CESPK-ED-DS
Geotechnical		CELRC-TS-D-G

ATTACHMENT 2: STATEMENT OF TECHNICAL REVIEW FOR IMPLEMENTATION DOCUMENTS – ATR REVIEW CERTIFICATION

ATTACHMENT 3: MAP SHOWING LIMITS OF FLOODWALL CONTRACT



**Location of Flood Damage Reduction Measures Completed between 1998 and 2000
Relative to Location of Proposed Additional Floodwall and Structures that have been removed**

ATTACHMENT 4: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number