DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080

REPLY TO
ATTENTION OF:

19 July 2010

CEMVD-RB-T

MEMORANDUM FOR Commander, New Orleans District

SUBJECT: Review Plan Approval for Engineering Products/ Hurricane and Storm Damage Risk Reduction System and Mississippi River Levees (HSDRRS/MRL) Co-located Project

1. The enclosed Review Plan for the work products for HSDRRS/MRL co-located projects has been prepared in accordance with EC 1165-2-209 and the HSDRRS Peer Review Plan approved by CECW-CE, October 2008.

2. The Review Plan has been coordinated with the Mississippi Valley Division Business Technical Division which is acting as the Review Management Organization until the Risk Management Center is operational. The Savannah District will be responsible for conducting Agency Technical Review on referenced technical documents. This Review Plan will be incorporated into the Programmatic HSDRRS Review Plan.

3. I hereby approve this Review Plan, which is subject to change as circumstances require. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.

Encl

MICHAEL J. WALSH
Major General, USA
Commanding

REVIEW PLAN
Agency Technical Reviews of Engineering Documents
for the
Hurricane and Storm Damage Risk Reduction System and Mississippi River Levees (HSDRRS/MRL) Co-located Project

1. **General.** The Agency performing the technical review in accordance with EC 1165-2-209 dated 31 January 2010 shall furnish all services, materials, supplies, plant, labor, equipment, superintendence, and coordination with Federal authorities as required for the review of all engineering documents and calculations related to the HSDRRS/MRL project. A list of all documents related to the project including estimated dates for the start of each review is included in Section 3.

2. **Project Description.** The MRL serves as an integral part of the HSDRRS system. In the co-located project area, the levees will be raised to elevation required to provide risk reduction from a 1% exceedence hurricane event. The project area consist of approximately 17 miles of the Mississippi River Levees (MRL) on the west bank and 5.5 miles of levees on the east bank which will be raised to the 1% HSDRRS design elevations. For the west bank of the Mississippi, the project area begins at river mile 70 where the WBV Eastern Tie-In Project ties into the MRL. From there it extends up river to river mile 87, just south of the Algiers Lock. For the east bank of the Mississippi River Levees, the project area begins at river mile 81.5 where the Caernarvon floodwall ties into the MRL. From there it extends up river to RM 87.

Based on preliminary assessments and rough order of magnitude cost estimates it was determined that design and construction of permanent levee enlargements and floodwalls could not be completed with available funds to meet the goal of June 2011 completion. Therefore it has been recommended to construct the project in phases. Phase 1 consists of Engineered Advance Measures (EAMs) that can be placed to along the MRL, while funding is obtained for design and construction of the permanent measures. EAMs will stay within the existing levee footprints and will meet the required factors of safety and criteria as defined in the HSDRRS design guidelines.

Permanent Measure work is required to improve the resiliency and longevity of the EAMs. As much as practical, Permanent Measures will incorporate the features and materials placed for EAMs. Authority and funding for Phase 2 work is currently not available, it will be requested in budgets for fiscal year 12 and 13. Once funding is available and construction is complete, the permanent measures will provide 1% risk reduction based on HSDRRS design elevations for future years. For instance floodwalls built as permenant measures will meet the 2057 HSDRRS design elevations while levees enlargements will meet at a minimum the 2021 HSDRRS design elevations with future lifts planned for a project life to 2057.

3. Documents Requiring ATR

The CEMVN Engineering Division will prepare the following documents for the HSDRRS/MRL project. These documents are critical for successful completion and execution of the project.

Hydraulic Reports – An addendum to the HSDRRS hydraulic report will document modeling and analysis completed to determine design elevations for 1% Hurricane event along the Mississippi River. The first addendum (65%) will document the approach and methodology used to determine the 1% design elevations for 2011. Once modeling and analysis is completed to determine the future conditions design elevations another addendum (95%) will be prepared.

Engineering Alternatives – Three Engineering Alternatives Reports (EARs) will be completed for this project. The first will cover Engineered Advance Measures for both the west and east bank of HSDRRS/MRL project. A second EAR will cover the Permanent Measures for the west bank of the HSDRRS/MRL project, while the third will cover Permanent Measures for the East Bank. The EARs will consider several alternatives that will be design level of detailed equivalent to a Feasibility Study. The EAR will develop alternatives to a sufficient level of detail to determine the technical application and design, ROW requirements, Environmental impacts, construction cost, and construction schedules, and operations and maintenance. Information provided in the EAR will be used select the best alternative for each construction contract reach of the project.

Geotechnical Report - The geotechnical report will be prepared to document the geotechnical data design for both EAMs as well as permanent measures. One comprehensive report for the entire system will be prepared. Since the report will not be prepared until all design work is complete reviews of the geotechnical design for each contract reach will be performed in conjunction with the ATR for the 65% P&S submittal.

Plans and Specifications – Plans and Specifications will be prepared for each construction reach identified for the project. P&S will require reviews at the 65% and 95% level of completion. Currently the project consists of 13 contract reaches for construction of EAMs, and 12 contract reaches for construction of permanent measures.

The below table summarizes the estimated dates these documents will be ready for ATR. A formal technical review through the use of DrChecks will take place at minimum the 65% and 95% level of completion for each document. This is to ensure that corrections and recommendations are provided early for incorporation into the document before it is substantially complete. The below table shows the number of reviewers from each disciple that are required to complete the ATRs.

	Document Title	~ Date Document will be complete an ready for ATR		# of Each Discipline Needed		
Hydraulic Report		65% Submittal	95% Submittal	Coastal	Hydraulic	Civil
	1% Levee Elevations Assessments Mississippi River Levees Hurricane and Storm Damage Risk Reduction System, with Addendums	Jan 2010	May 2010	1	1	1

	Document Title	~ Date Document will be complete an ready for ATR		# of Each Discipline Needed				
Deliverables for Phase 1 of the Project		65% Submittal	95% Submittal	Geotechnical	Structural	Civil	Coastal	Hydraulic
	Geotechnical Report on Interim Engineered Alternatives	n/a	5-May-10	2	0	0	0	0
	Engineering Alternative Report for IEA	n/a	19-Mar-10	1	1	1	1	1
	LPV-MRL 1.1 P&S	n/a	11-May-10	1	1	1	1	1
	LPV-MRL 2.1 P&S	n/a	11-May-10	1	1	1	1	1
	LPV-MRL 3.1 P&S	n/a	11-May-10	1	1	1	1	1
	LPV-MRL 4.1 P&S	n/a	11-May-10	1	1	1	1	1
	WBV-MRL 1.1a P&S	15-Jul-10	11-Sep-10	1	1	1	1	1
	WBV-MRL 1.1b P&S	15-Jul-10	11-Sep-10	1	1	1	1	1
	WBV-MRL 1.1c P&S	15-Jul-10	17-Sep-10	1	1	1	1	1
	WBV-MRL 2.1 P&S	15-Jul-10	17-Sep-10	1	1	1	1	1
	WBV-MRL 3.1 P&S	n/a	11-Aug-10	1	1	1	1	1
	WBV-MRL 4.1 P&S	n/a	11-Aug-10	1	1	1	1	1
	WBV-MRL 5.1 P&S	n/a	15-Aug-10	1	1	1	1	1
	WBV-MRL 6.1 P&S	n/a	15-Aug-10	1	1	1	1	1
	WBV-MRL 7.1 P&S	n/a	19-Aug-10	1	1	1	1	1

Deliverables for Phase 2 Measure	Document Title	~ Date Document will be complete an ready for ATR		# of Each Discipline Needed				
		65% Submittal	95% Submittal	Geotechnical	Structural	Civil	Coastal	Hydraulic
	Geotechnical Report on Permanent Measures	n/a	18-Oct-10	2	0	0	0	0
	Engineering Alternative Report for Permanent Measures	17-Apr-10	15-May-10	1	1	1	1	1
	LPV-MRL 1.2 P&S	1-Jan-11	28-Feb-11	1	1	1	1	1
	LPV-MRL 2.2 P&S	1-Feb-11	19-May-11	1	1	1	1	1
	LPV-MRL 3.2 P&S	7-Feb-11	23-May-11	1	1	1	1	1
	LPV-MRL 4.2 P&S	15-Jan-11	4-Mar-11	1	1	1	1	1
	WBV-MRL 1.2a P&S	1-Jun-11	11-Sep-11	1	1	1	1	1
	WBV-MRL 1.2b P&S	1-May-11	29-Jun-11	1	1	1	1	1
	WBV-MRL 2.2 P&S	1-Jun-11	17-Sep-11	1	1	1	1	1
	WBV-MRL 3.2a P&S	1-Apr-11	23-May-11	1	1	1	1	1
	WBV-MRL 3.2b P&S	1-Apr-11	23-May-11	1	1	1	1	1
	WBV-MRL 4.2 P&S	20-Jul-11	17-Nov-11	1	1	1	1	1
	WBV-MRL 5.2a P&S	1-Apr-11	27-May-11	1	1	1	1	1
	WBV-MRL 5.2b P&S	1-Apr-11	27-May-11	1	1	1	1	1
	WBV-MRL 6.2 P&S	1-Apr-11	27-May-11	1	1	1	1	1
	WBV-MRL 7.2 P&S	1-Apr-11	31-May-11	1	1	1	1	1

4. Specific Required Work Items. Specific work items shall include but not be limited to the following:

4.1. Review of all document identified in section 3.

4.2. Review design calculations.

4.3 Enter and resolve all review comments resulting from reviews of the work through Dr. Checks.

4.4 ATR certification upon completion of each review. ATR certification should be signed by the ATR team leader as well as the E&C chief for the agency performing the review. The ATR certificates should be used for certifying all reviews. Each certification will include copies of DrChecks review comments showing that all comments are resolved and closed (see para.5.3).

4.5. Specific submission requirements will be coordinated with the below POC.

5. Objectives.

5.1. The primary objectives of the review are to ensure that:

(a). The project meets the Government's scope, intent and quality objectives.

(b). Design concepts are valid.

(c). The design is feasible and will be safe, functional, and constructible

(d). Appropriate methods of analysis were used and basic assumptions are valid and used for the intended purpose.

(e). The source, amount, and level of detail of the data used in the analysis are appropriate for the complexity of the project.

(f). The project complies with accepted practice and design criteria within the industry.

(g). All relevant engineering and scientific disciplines have been effectively integrated.

(h). Content is sufficiently complete for the current phase of the project and provides an adequate basis for future development effort.

(i). Project documentation is appropriate and adequate for the project phase.

5.2. Team Membership. Team members will demonstrate senior-level competence in the type of work being reviewed. Junior-level staff cannot be members of the team. All team members should have a minimum of 10 years of experience within their discipline and should be registered in their field of expertise.

5.3. Comments. The DrChecks review tool will be used by the ATR Team in the formal review of the documents. A Corps of Engineers POC will facilitate DrChecks setup and use for these reviews. All comments will give a clear statement of the concern, the basis of the concern and, when appropriate, the actions necessary to resolve the concern. Comments will cite

appropriate references. The COE Design Team Responses will clearly state concurrence or non-concurrence with the comment. Concurrences shall include what the corrective action is and where and when it will be done. The COE Design tram will evaluate and respond to each comment in Dr. Checks. Non-concurrences by the Design Engineers will require a mutual resolution between the designer and the ATR Team, before the ATR Team's Statement of Independent Technical Review is signed. A printout of all DrChecks comments together with the Statement will accompany the submittal of each document noted above. A Statement template is attached at the end of this Scope of Work.

6. **Reference Information and Design Criteria.** All designs shall be based on established engineering practices, incorporating advanced technology when it has been demonstrated that such technology gives safe and efficient designs. The ATR team shall review the design features of the various projects in accordance with the applicable provisions set forth in engineering publications and the design methodology provided below.

CEMVN Design Guidelines

- Hurricane and Storm Damage Risk Reduction System Design Guidelines. New Orleans Engineer District Engineering Division, June 2008

USACE Publications – Includes Engineering Regulations (ER), Engineering Manuals (EM), Engineering Circulars (EC) and Memorandums for Records (MFR)

- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999.
- ER 1110-1-12, Quality Management, 21 July 2006.
- EM 385-1-1 Safety and Health Requirements Manual, ENG Form 5044-R, September 2008
- EM 1110-2-2000 Standard Practice for Concrete for Civil Works Structures Change 2, March 2001
- EM 1110-2-2102 Water stops and Other Joint Materials, September 1995
- EM 1110-2-1913 Design & Construction of Levees, April 2000
- EC 1165-2-209 Water Resources Policies and Authorities – Civil Works Review Policy, 31 January 2010
- EC 110-2-6067, Engineering and Design USACE Process for the National Flood Insurance Program (NFIP) Levee System Evaluation, 30 July 2009
- USACE MFR: Subject: Hurricane Protection System Seepage Design Criteria and Retention Slope Stability Criteria, 16 Jan 2009
- CEMVN MFR: Subject: Engineering Division Quality Management Policy Letter #3
- Implementation of "After Action Review" and "Lessons Learned" Action Plan for the Hurricane and Storm Damage Risk Reduction System (HSDRRS) Projects, 20 March 2009

Other Publications:

- American Association of State Highway and Transportation Officials (AASHTO), Load and Resistance Factor Design (LRFD),Bridge Design Specification 4th Edition 2007 Louisiana Department of Transportation and Development Standards and Specifications for Roads and Bridges 2006 Edition American Society for Testing and Materials (ASTM) to be used in conjunction with Corps of Engineers EM

- Deformed Bars	ASTM A615, Grade 60
- Prestressing Strands	ASTM A416 Grade 250 or Grade 270
- Steel Shapes (structural)	ASTM A992
- Steel Shapes (plates, misc.)	ASTM A36

- Steel Pipes, Sheet Piles, H-Piles ASTM A572, Grade 50

7. **Points of Contact.** The MVN technical point of contact for this task order is Ms. Jennifer Vititoe, phone (504) 862-1252. The agency performing the review shall appoint one individual as team lead for the ATR to serve as a single point of contact and liaison between the districts. Upon acceptance of this work an estimated cost along with information on how to fund this work shall be provided to the MVN POC so that funding can be set up.

USACE STATEMENT OF TECHNICAL REVIEW

COMPLETION OF AGENCY TECHNICAL REVIEW

The [Name of ATR team leader's district] Agency Technical Review (ATR) team has completed the ATR of [type of product] for [project name and location]. Notice is hereby given that the ATR has been conducted in accordance with the requirements of EC 1165-2-209. The review was appropriate to the level of risk and complexity inherent in the project. The review was conducted as defined in the project's Review Plan. 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 result, including whether the product meets the customer's needs consistent with law and 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 ATR have been resolved.

_____ _____

[Name]
ATR Team Leader
[Office Symbol]

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:
(*Describe the major technical concerns, possible impact, and resolution*)

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

_____ _____

[Name]
Chief, Engineering Division
[Office Symbol]

Date

Instructions:
[Input] – Information in Blue brackets and text is required. Once the input is provided, text should be formatted in black and the brackets should be deleted. Delete these instructions in the completed form.

STATEMENT OF TECHNICAL REVIEW

COMPLETION OF QUALITY ASSURANCE REVIEW AND AGENCY TECHNICAL REVIEW

The [Name of ATR team leader's district] Agency Technical Review (ATR) team has completed the ATR of [type of product] for [project name and location]. Notice is hereby given that (1) a Quality Assurance review has been conducted as defined in the [Name of home district] Quality Assurance Plan and (2) an agency technical review, appropriate to the level of risk and complexity inherent in the project, has been conducted. The ATR has been conducted as defined in the project's Review 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 US Army Corps of Engineers policy. All comments resulting from this QA review and ATR have been resolved.

_____ _____

[Name] Date
QA Review Team Leader
[Name of home district]

_____ _____

[Name] Date
Project Manager
[Name of home district]

CERTIFICATION OF QUALITY ASSURANCE REVIEW AND AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:
(*Describe the major technical concerns, possible impact, and resolution*)

As noted above, all concerns resulting from agency technical review of the project have been fully resolved.

_____ _____

[Name] Date
Chief, Engineering Division
[Name of home district]

Instructions:
[Input] – Information in Blue brackets and text is required. Once the input is provided, text should be formatted in black and the brackets should be deleted. Delete these instructions in the completed form.