IMPLEMENTATION PHASE

REVIEW PLAN
FOR

DESIGN DOCUMENTATION REPORT AND PLANS & SPECIFCATIONS

OAKLAND COUNTY 219 – OPEN DRAIN SLOPE STABILIZATION
OAKLAND COUNTY, MI

Initial MSC Approval Date

15 Oct 2014

Last Revision Date

DDMM YYYY

U.S. ARMY CORPS OF ENGINEERS
DETROIT DISTRICT

CELRE-EC-G (1110)

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OAKLAND COUNTY 219 – OPEN DRAIN SLOPE STABILIZATION
OAKLAND COUNTY, MI

07-MAY-2014

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan (RP) is for the implementation phase of the project and defines the scope, level of risk, and level of peer review for the design and construction activities associated with the Oakland County Section 219 – Open Drain Slope Stabilization. This project consists of slope repair of failed slopes and slope failure mitigation along the Red Run Drain between Dequindre and Ryan Road in Warren, Michigan.

b. References

(1) Engineer Circular (EC) 1165-2-214, Civil Works Review, 15 December 2012
(2) Engineer Regulation (ER) 1110-1-12, Quality Management, 31 July 2006
(3) CELRE Quality Management Plan, CELRE DC 5-1-1 and, in particular, Appendix C-3 – Engineering Subplan dated November 30, 1998
(4) Quality Assurance Plan (QAP)
(5) Quality Control Plan (QCP)

c. Requirements. This review plan was 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 from initial planning through design, construction, and Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R). It provides the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation, and operations and maintenance documents and work products. The EC outlines three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review.

(1) District Quality Control (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). 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. It is managed in the home district. 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 for a complete reading of any reports and accompanying appendices prepared by or for the PDT to assure the overall coherence and integrity of the report, technical appendices, and the recommendations before approval by the District Commander. The Major Subordinate Command (MSC)/District Quality Management Plans address the conduct and documentation of this fundamental level of review. DQC is addressed later in this review plan.

(2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team will review the various work products and will assure that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel, preferably recognized subject matter experts with the appropriate technical expertise such as regional technical specialists (RTS), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the home MSC.

(3) Independent External Peer Review (IEPR). 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. For clarity, IEPR is divided into two types, Type I is generally for decision documents and Type II is generally for implementation documents.

A Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities. External panels will review the design and construction activities prior to initiation of physical construction and periodically thereafter until construction activities are completed. The review shall 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 that good science, sound engineering, and public health, safety, and welfare are the most important factors that determine a project's fate.

2. REVIEW MANAGEMENT ORGANIZATION (RMO)

The RMO is responsible for managing the overall peer review effort described in this review plan. The RMO for the implementation documents is the home MSC. The MSC maintains authority and oversight but delegates the coordination and management of implementation

document ATR to the District. The home District will post the MSC approved review plan on its public website.

3. PROJECT INFORMATION

a. Project. Oakland County Section 219 – Open Drain Slope Stabilization. This project consists of slope repair of failed slopes and slope failure mitigation (slope softening and toe drain installation). The total approximate project cost is $1,000,000.

b. General Site Location and Description. The project site is located on the Red Run Drain in the City of Wayne, Michigan between Dequindre and Ryan Roads

c. Project Delivery Team (PDT). The PDT in charge of designing this project includes the following:

NAME	FUNCTIONAL DISCIPLINE	PHONE
	Project Manager	
	Project Engineer	
	Technical Coord./Geotechnical Engineer	
	Contract Administrator	
	Cost Estimator	
	Contracting Specialist	
	Real Estate	
	Environmental Analysis	

4. RISK INFORMED DECISIONS ON APPROPRIATE REVIEWS

a. Project Risks Stability of existing slopes and maintenance of existing structures. Construction activities may affect the existing condition of the Red Run Drain side slopes and streamflow through the Red Run Drain.

b. Risk Analysis. Based on the risks outlined above, this project requires DQC and ATR level of reviews. The project is primarily excavation and earthmoving, elements with little technical complexity. The end result of excavation and earthmoving activities will be an increase in the slope stability of the Red Run Drain. The slope will be actively monitored during construction activities for potential construction related failure. All activities document risk informed decisions that determine which level of reviews are appropriate (DQC, ATR, IEPR) for the product being developed. Insure there is attention paid to the possibility of a significant threat to human life.

5. REVIEW TYPES AND REQUIRED DISCIPLINES

a. District Quality Control (DQC/QA).

DQC/QA efforts will include the necessary expertise to address compliance with published Corps policy. The PDT will develop a Quality Management Plan (QMP) for this project. The Detroit District will execute DQC/QA review which will include: Plan-In-Hand (PIH) Review and Supervisory Review. All review comments will be submitted into DrChecks.

(1) **DQC Review:** A DQC review of the DDR will be done within the Detroit District to ensure that the design conforms to proper criteria, that appropriate design methods have been followed, that an internal check of the design has been completed and is indicated on the drawings and computation sheets and that the completed project design is adequately documented in the DDR.

The following disciplines will be represented during the DQC process: civil engineering, geotechnical engineering, environmental analysis, cost engineering, construction management and real estate. The DQC reviewers are as follows:

NAME	FUNCTIONAL DISCIPLINE	PHONE
	Civil Engineering	
	Geotechnical Engineer	
	Environmental Analysis	
	Cost Estimator	
	Construction Management	
	Real Estate	

(2) **Plan-In-Hand (PIH) Review:** On-site review to ensure design engineers and CADD technicians have a proper understanding of existing site conditions, the new design will coordinate with existing conditions, and the design meets customer's requirements. The plan-in-hand review will be performed after the 50% plans and specifications review. If a project is halted after the performance of the PIH, an additional PIH can be held based on engineering judgment of the PDT and approved by the Chief of Engineering and Construction. The Plan-In-Hand reviewers are as follows:

NAME	FUNCTIONAL DISCIPLINE	PHONE
	Geotechnical Engineer	
	Civil Engineer	

(3) **Supervisory Review:** Review to ensure Ready to Advertise (RTA) package is ready for final routing, all reviews have been completed and back checked, all files are properly labeled as dictated by project milestone and filed in ProjectWise, and package is ready for advertisement. The Supervisory reviewers are as follows:

NAME	FUNCTIONAL DISCIPLINE	PHONE
	Chief, E&C	
	Chief, CAB	

b. Agency Technical Review (ATR)

For this project an ATR will be required based on the Risk Analysis summarized in paragraph 3.a.

(4) **General.** ATR will be managed and performed outside of the Detroit District. EC 1165-2-214 requires the MSC to serve as the RMO for this project. As required, there will be appropriate coordination and processing through CoPs; relevant PCXs, and other relevant offices to ensure that a review team with appropriate independence and expertise is assembled and a cohesive and comprehensive review is accomplished. The ATR shall ensure that the product is consistent 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 the results in a reasonably clear manner for the public and decision makers. Members of the ATR team will be from outside the Detroit District. The ATR lead will be from outside the Great Lakes & Ohio River Division.

(5) **Products to be Reviewed.** The ATR team will be reviewing the Design Documentation Report (DDR) and associated Plans & Specifications supporting the DDR.

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

(i) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;

(ii) The basis for the concern – cite the appropriate law, ASA (CW)/USACE policy, guidance or procedure that has not been properly followed;

(iii) 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

(iv) The probable specific action needed to resolve the concern – identify the action(s) that must be taken 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 will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation.

ATR may be certified when all ATR concerns are either resolved or referred to HQUSACE for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed to date, for the DDR and Plans and Specifications. A sample ATR certification form is included as Attachment 1.

(7) **Required ATR Team Expertise.** ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. The disciplines represented on the ATR team will reflect the significant disciplines involved in the planning, engineering, design, and construction effort. These disciplines include civil and geotechnical engineering. To assure independence, the leader of the ATR team will be outside of the MSC. A list of the ATR members and disciplines is provided below. The chief criterion for being a member of the ATR team is knowledge of the technical discipline.

The ATR reviewers are as follows:

NAME	FUNCTIONAL DISCIPLINE	DISTRICT	PHONE
	ATR Review Lead (Geotechnical)	MVR	
	ATR Review (Civil)	MVR	

c. Independent External Peer Review (IEPR)

(1) **General.** Type I and Type II IEPRs are conducted in accordance with the guidance promulgated in EC 1165-2-214. Type I IEPRs are conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, significant controversy, a high level of complexity, or significant economic, environmental and social effects to the nation. However, it is not limited to only those cases and most studies should undergo Type I IEPR. In accordance with EC 1165-2-214 a Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities.

(2) **Decision on Type II IEPR.** In accordance with EC 1165-2-214 a Type II IEPR (SAR) is not required for the following reasons: The project is not a hurricane, storm

risk management or flood risk management project. The project is a slope stabilization project that doesn't have potential hazards that pose a significant threat to human life. Therefore, a Type II IEPR exclusion is not required.

(3) **Decision on Type I IEPR.** This document is not a decision document. Therefore, Type I IEPR is not required**.**

d. Value Engineering

Value Engineering (VE) studies will be performed for this project in accordance with ER 11-1-321, 01 Jan 2011, change 1 and ER 1110-2-1150, Para. 14.7, 31Aug 99.

e. BCOES Reviews

Reviews to assure solicitation documents are readily understood; the product can be bid, built, operated and maintained efficiently; environmental concerns are protected, and sustainability is addressed. A 50% and 95% BCOES review will be conducted for this project. Design team members will conduct the BCOES reviews utilizing DrChecks. All DrChecks comments must be resolved and closed out by the reviewer. Comments not entered in DrChecks, but discussed during the BCOES meeting will be recorded and inserted in the BCOES Technical Memorandum.

Prior to the start of the BCOES Review, the Technical Coordinator (TC) should contact each office element to ascertain the name(s) of their representative(s) participating in the review. The TC should also determine from each office element listed above the number of Certified Final Submittals – BCOES Review Plans and Specifications required for the review. The plans and specifications shall be distributed to the office elements by memorandum or email link to the appropriate ProjectWise folder. As a minimum, the memorandum should state:

(i) Whether the plans and specs were prepared in-house, by an A-E or both
(ii) Start and end dates for the Review
(iii) Review Comments will be entered into DrChecks
(iv) Project Review Name in DrChecks
(v) Labor Cost Codes and amounts (Provided by PM)

The BCOES reviewers are as follows:

NAME	FUNCTIONAL DISCIPLINE	PHONE
	Civil Engineering	
	Geotechnical Engineer	
	Environmental Analysis	
	Cost Estimator	
	Construction Management	
	Real Estate	

6. PUBLIC INVOLVEMENT

a. Public Comment Period: This Review Plan when approved by the MSC Commander will be posted to the LRE web site to allow the public an opportunity to comment. This will not result in a formal comment period and there is no set time frame for public comment. If and when comments are received, the PDT will consider them and decide if revisions to the review plan are necessary.

b. Review Participation from Public: There is no expectation of obtaining support from personnel outside of the USACE to conduct reviews.

7. IN-KIND CONTRIBUTION BY SPONSOR

There are no in-kind contributions from the sponsor for the development of the implementation documents.

8. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resource management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data still are the responsibility of the users and is subject to DQC, ATR, and IEPR reviews (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE-developed and commercially available engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR reviews. All appropriate reviews will be conducted in accordance with policy during the implementation phase of the project.

a. Model Certification/Approval Schedule and Cost

(1) For implementation documents prepared under the model National Programmatic Review Plan, use of existing certified or approved planning models is encouraged.

Where uncertified or unapproved models are used, approval of the model for use will be accomplished through the ATR process. The ATR team will apply the principles of EC 1105-2-412 during the ATR to ensure the model is theoretically and computationally sound, consistent with USACE policies, and adequately documented. If specific uncertified models are identified for repetitive use within a specific district or region, the appropriate PCX, MSC(s), and home District(s) will identify a unified approach to seek certification of these models.

(2) The models listed below were used in the design of the lock replacement project. Any models required for new work packages will be identified in the package-specific QCP. This may include engineering and cost models. Certifications for those models will be addressed at that time.

Model Name	Model description	Model Type
CSlide	Sliding Analysis of Structures	Engineering
Geo Studio SLOPE/W	2D slope stability	Engineering

9. SCHEDULE AND COST OF REVIEWS

a. DQC Schedule and Cost. The cost for DQC is included in the costs for PDT activities. Cost is broken out separately for the PIH, and BCOES reviews as indicated below. DQC will occur seamlessly throughout the DDR and the P&S development. Quality checks and reviews occur during the development process and are carried out as a routine management practice.

(1) **DQC Schedule and Cost:** The DQC is scheduled to occur in June 2014. The DQC is budgeted at $7,500.

(2) **PIH Schedule and Cost:** The PIH is scheduled to occur in August 2014. The PIH is budgeted at $1,500.

b. ATR Schedule and Cost: The ATR is scheduled to begin in the 4th Quarter of FY14. The total ATR budget is $10,000.

c. IEPR Schedule and Cost. N/A

d. BCOES Schedule and Cost: The 50% BCOES is scheduled to begin in July 2014 and the 100% BCOES is scheduled to begin in September 2014. The total BCOES is budgeted at $10,000.

10. MSC APPROVAL

The Great Lakes and Ohio River Division is responsible for approving the review plan. Approval is provided by the MSC Commander. The commander's approval should reflect vertical team input (involving district, MSC, and HQUSACE members) as to the appropriate scope and level of review for the project. Like the PMP, the

review plan is a living document and may change as the project progresses. The review plan must be updated and approved by the MSC throughout the PED phase (and the construction Phase, as applicable). Changes to the review plan should be approved by following the process used for initially approving the plan. MSCs will review the changes and the appropriate level of review as they relate to project updates.

11. REVIEW PLAN POINT OF CONTACT

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

- Paul Powell, Detroit District Project Manager, 313-226-2094
- Phil Ross, Detroit District Chief of Engineering and Construction, 313-226-4761

ATTACHMENT 1: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR IMPLEMENTATION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *<type of product>* for *<project name and location>*. 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 DrChecks[sm].

SIGNATURE _____ Date _____
Name
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ Date _____
Name
Project Manager (home district)
Office Symbol

SIGNATURE _____ Date _____
Name
Architect Engineer Project Manager[1]
Company, location

SIGNATURE _____ Date _____
Name
Review Management Office Representative
Office Symbol

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.

SIGNATURE _____ Date _____
Name
Chief, Engineering Division (home district)
Office Symbol

[1] Only needed if some portion of the ATR was contracted

ATTACHMENT 2: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CAP	Continuing Authorities Program	O&M	Operation and maintenance
CSDR	Coastal Storm Damage Reduction	OMB	Office and Management and Budget
DPR	Detailed Project Report	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DQC	District Quality Control/Quality Assurance	OEO	Outside Eligible Organization
DX	Directory of Expertise	OSE	Other Social Effects
EA	Environmental Assessment	PCX	Planning Center of Expertise
EC	Engineer Circular	PDT	Project Delivery Team
EIS	Environmental Impact Statement	PAC	Post Authorization Change
EO	Executive Order	PMP	Project Management Plan
ER	Ecosystem Restoration	PL	Public Law
FDR	Flood Damage Reduction	QMP	Quality Management Plan
FEMA	Federal Emergency Management Agency	QA	Quality Assurance
FRM	Flood Risk Management	QC	Quality Control
FSM	Feasibility Scoping Meeting	RED	Regional Economic Development
GRR	General Reevaluation Report	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
LRR	Limited Reevaluation Report	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
		WRDA	Water Resources Development Act