DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, U.S. ARMY CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

6 Dec 12

CEPOD-PDC

MEMORANDUM FOR COMMANDER HONOLULU ENGINEER DISTRICT (CEPOH-PP-C/CINDY BARGER), BUILDING 230, FORT SHAFTER, HI 96858-5440

SUBJECT: Review Plan Approval for the Wailele Stream Continuing Authorities Program Section 205 Feasibility Report, Island of Oahu, Hawaii, Flood Risk Management Project

1. References:

a. Engineering Circular 1165-2-209, Civil Works Review Policy, 31 January 2010, and Change 1, 31 January 2012.

b. Policy Memorandum #1, HQ USACE, CECW-P, 19 January 2011, subject: Continuing Authority Program Planning Process Improvements.

c. Review Plan for the Wailele Stream Continuing Authorities Program Section 205 Feasibility Report, Island of Oahu, Hawaii, Honolulu District, U.S. Army Corps of Engineers.

2. The enclosed Review Plan (reference 1.c.) for the Wailele Stream, Island of Oahu, Hawaii, Flood Risk Management Project was prepared IAW references 1.a. and 1.b. The Pacific Ocean Division Civil Works Division is the lead office to execute this Review Plan. This plan does include Type I Independent External Peer Review.

3. I approve this Review Plan. It is subject to change as circumstances require, consistent with project development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office.

4. The point of contact for this memorandum is Mr. Russell Iwamura, Senior Economist, Civil Works Integration Division, at 808-835-4625 or email Russell.K.Iwamura@usace.army.mil.

Encl

GREGORY J. GUNTER
Colonel, EN
Acting Commander

REVIEW PLAN

WAILELE STREAM FLOOD RISK MANAGEMENT STUDY
ISLAND OF O'AHU, HAWAI'I

Feasibility Study
Continuing Authorities Program (CAP)
Section 205 of the Flood Control Act of 1948
Public Law (PL) 80-858

U.S. Army Corps of Engineers, Honolulu District

Lā'ie Flooding in 2012 (photo courtesy of KHON)

MSC Approval Date: 6 December 2012
Last Revision Date: 19 November 2012

US Army Corps of Engineers ®

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REVIEW PLAN

WAILELE STREAM FLOOD RISK MANAGEMENT STUDY
ISLAND OF O'AHU, HAWAI'I

Feasibility Study

Continuing Authorities Program (CAP)
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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Wailele Stream Flood Risk Management (FRM) Study, Island of O'ahu, Hawai'i, Feasibility Study, Continuing Authorities Program (CAP), Section 205 of the Flood Control Act of 1948, Public Law (PL) 80-858, as amended.

This Review Plan was developed using the National Planning Center of Expertise (PCX) review plan template dated 15 June 2011.

b. References.

(1) Engineer Circular (EC) 1165-2-209, Civil Works Review Policy, 31 January 2010 and Change 1, 31 January 2012.

(2) EC 1105-2-412, Assuring Quality of Planning Models, 31 March 2011.

(3) Engineer Regulation (ER) 1110-1-12, Quality Management, 30 September 2006.

(4) ER 1105-2-100, Planning Guidance Notebook, Appendix F, CAP, Amendment #2, 31 January 2007.

(5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 November 2007.

(6) Wailele FRM Project Feasibility Study Project Management Plan (PMP), dated 13 September 2012.

(7) Director of Civil Works Policy Memorandum #1, "CAP Planning Process Improvements," dated 19 January 2011.

(8) U.S. Army Corps of Engineers (USACE) Pacific Ocean Division (POD) Quality Management Plan, December 2010.

(9) USACE Honolulu District (POH) Civil Works Review Policy (ISO CEPOH-C_12203), 1 November 2010.

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. In addition to these levels of review,

decision documents are subject to cost engineering review, certification (per EC 1165-2-209), and planning model certification/approval (per EC 1105-2-412), and Value Management Plan requirements in the Project Management Business Process (PMBP) Reference 8023G and the ER 11-1-321, Change 1.

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 decision documents is typically either a PCX or the Risk Management Center (RMC), depending on the primary purpose of the decision document. In accordance with EC 1165-2-209, as a CAP project, the RMO for the peer review effort described in this Review Plan is the Major Subordinate Command (MSC), USACE POD. As needed, POD will seek assistance or direct POH to coordinate with the USACE National FRM-PCX.

POD will coordinate with the Cost Engineering Mandatory Center of Expertise (MCX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies. As a FRM study, there are potential life safety issues associated with flooding and reducing risk of flooding to the residents of Lā'ie Town. POD will coordinate with the RMC, as appropriate, for review of these life safety issues.

3. STUDY INFORMATION

a. Decision Document. Section 205 of the Flood Control Act of 1948, as amended, authorizes USACE to study, design and construct FRM projects. It is a CAP which focuses on water resource related projects of relatively smaller scope, cost and complexity. Traditional USACE civil works projects are of wider scope and complexity and are specifically authorized by Congress. The CAP is a delegated authority to plan, design, and construct certain types of water resource and environmental restoration projects without specific Congressional authorization. An integrated feasibility study and environmental assessment (EA) are being prepared for this project. The purpose of the document is to identify a recommended plan to reduce flood risk to Lā'ie town and residents in the Wailele watershed from Wailele stream. As a CAP project, the POD Commander (as the MSC) will be approving the decision document.

b. Study/Project Description.

Background: Wailele Stream is on the windward side of the island of O'ahu and flows through the town of Lā'ie. Brigham Young University – Hawai'i (BYUH), the Polynesian Cultural Center and the residential and commercial areas of Lā'ie are all at risk of damages associated with the flooding of Wailele Stream. Since 1879, there have been 14 storm events that resulted in Wailele Stream overtopping and flooding Lā'ie. Most recently, in December 2008, a major storm event hit Hawai'i and as a result, Wailele Stream flooded. The State of Hawai'i and the Federal Government declared that the December 2008 event was a state and national disaster. Residential damages were about $2 million, plus $1.5 million to BYUH facilities and about $600,000 to the Polynesian Cultural Center. In March 1991, flooding of Wailele Stream resulted

in an estimated $200,000 in damages to BYUH facilities and $500,000 in damages to homes, public facilities and emergency costs. Approximately 300 homes were affected.

In 1991, the City and County of Honolulu (C&C) requested USACE assistance to address flooding problems in Wailele Stream. In January 1999, a cost share agreement between USACE and the C&C was executed. The cost share agreement is being amended to address additional complexities in identifying solutions that will adequately address the problems and opportunities in the study area and comply with current USACE regulations and policies.

Project Description: The study area is located on the windward side of the Ko'olau Mountain Range in northern O'ahu (Figure 1). Wailele watershed is approximately 4 square miles. The stream is approximately 12.5 miles in length. Within the watershed, approximately 69.4% of the watershed is steep unbuildable terrain designated as conservation lands, within the lower watershed 14.8% is agricultural, and 15.8% is urban. Because of the limited buildable space, the majority of the urban development, including BYUH campus, is in the lower watershed near the northern bank of the stream.

Project Sponsor: The non-Federal sponsor is the C&C, as represented by the Department of Design and Construction (DDC).

Project Goal and Objectives: The project goal is to reduce flood risk to the community of Lā'ie, including the BYUH campus.

The project objectives are to:

- Identify a recommended plan that meets the USACE regulations and policies for National Economic Development (NED), environmental quality, regional economic development, and other social effects.

- Minimize impacts of flood risk to the Lā'ie community while maximizing opportunities to support economic growth.

- Provide a level of risk reduction that would also meet the C&C regulations and policies.

Alternatives Formulation: Since the signing of the Feasibility Cost Share Agreement (FCSA), an initial evaluation of six alternatives was conducted:

- Alternative 1A: Levee with Flood Proofing.

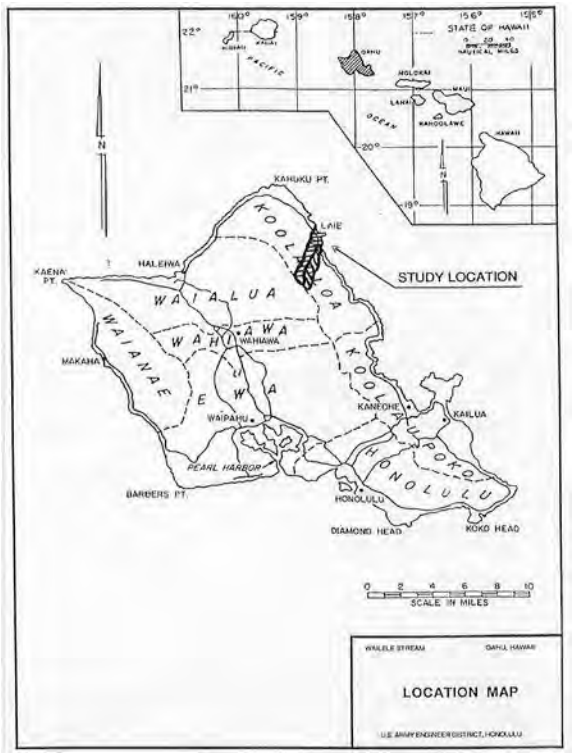
- Alternative 1B: Stream and Ring Levees with Floodwall.

- Alternative 1C: Stream Levee and Buyout Existing Homes.

- Alternative 2A: Enlarged Channel with Stream Diversion.
- Alternative 2B: Enlarged Channel with New Outlet.
- Alternative 3: Diversion Channel, Cutoff Berm, and Koloa Stream Widening.

In reviewing the proposed alternatives with the non-Federal sponsor and key stakeholders, the Project Delivery Team (PDT) determined that the current set of alternatives do not fully address the problems and study objectives. Specifically, the alternatives evaluated to date reduce flood risk to most of the residential area of Lā'ie, but do not significantly reduce flood risk to the BYUH campus, Polynesian Cultural Center, and may cause flooding of Kamehameha Highway and residential areas near Koloa Stream and the ocean. The Sponsor and the PDT also determined that there may be additional alternatives or variations on the existing alternatives that may better maximize opportunities for economic growth through flood risk reduction.

Figure 1: Location Map of Wailele Stream



c. Factors Affecting the Scope and Level of Review. As a CAP project, the project risks are minimal. Environmental impacts are anticipated to be less than significant. Plan formulation is not expected to be challenging or novel. As mentioned above, the alternatives need to be re-formulated to ensure that consideration is given to reducing flood risk to the entire watershed, and considering the full opportunities and benefits associated with a FRM project. The project is not anticipated to require redundancy, resiliency and/or robustness, unique construction

sequencing, or reduction in overlapping design construction schedules. There are no requests by the Governor of Hawai'i or significant public dispute over the proposed project. The primary concern for this project is potential life safety issues, associated with FRM projects.

As a FRM project, there is the potential for life safety issues in the event that FRM measures fail during a flood event and place residents at risk. A Type I Independent External Peer Review (IEPR) will be needed. Consistent with EC 1165-2-209, Mr. Todd Barnes, POH Chief of Engineering and Construction, concurs with the assessment that there are potential life safety issues at this stage in plan formulation. If life safety issues are minimized as the tentatively selected plan, POH will seek an exclusion from the IEPR in accordance with USACE regulations and policies.

d. In-Kind Contributions. The non-Federal sponsor is not proposing work-in-kind contributions as part of this project.

4. DISTRICT QUALITY CONTROL (DQC)

All decision 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 PMP. POH, as the home District, shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the POH and POD, the home MSC.

a. Documentation of DQC. Consistent with the POH Quality Manual, DQC will be documented using the POH DQC review table. When all comments have been addressed and back checked, the DQC lead will sign a DQC certification in compliance with the POH Quality Manual. The DQC comments and responses will be provided for the ATR team at each review.

b. Products to Undergo DQC. The following products will be subject to DQC:

(1) Draft and final integrated feasibility study/EA.

(2) All technical reports and appendices developed in support of the integrated feasibility study/EA.

(3) The draft and final EA decision.

c. Required DQC Expertise. The following expertise is needed for DQC:

- FRM plan formulation;
- Economics with expertise in FRM projects;

- Hydraulic engineering with expertise in tropical/flash flood systems; and,

- Environmental specialist with expertise in Civil Works environmental compliance including National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Clean Water Act (CWA) Section 404(b)(1) alternatives analysis; and Executive Order (EO) 11988 Floodplain Management.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision 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. Additionally, the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by POD, and is conducted by a qualified team from outside POH 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 POD.

a. Products to Undergo ATR. The following products will be subject to ATR:

(1) Draft and final integrated feasibility study/EA

(2) All technical reports and appendices developed in support of the integrated feasibility study/EA.

(3) The draft and final EA decision.

b. Required ATR Team Expertise. The following ATR expertise is required for this project. Because the project is small, where possible ATR team members will address multiple disciplines and emphasis. POD will identify the final make-up of the ATR team and the ATR team lead in coordination with the PM, vertical team and other appropriate centers of expertise. Once identified, the ATR team members for this study and a brief description of their credentials will be added in Attachment 1.

Table 1: ATR Required Expertise

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting an ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a

ATR Team Members/Disciplines	Expertise Required
	specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with experience in FRM, CAP projects and compliance with EO 11988 Floodplain Management.
Economics	The economics reviewer should be a senior economist with experience in flood risk and CAP management projects
Environmental Resources	The environmental reviewer should have experience in CAP projects, and Civil Works environmental compliance, including NEPA, NHPA, CWA Section 404(b) (1) alternatives analysis; and EO 11988 Floodplain Management. Familiarity with the Habitat Equivalency Protocol (HEP) methodology for stream systems will also be required for review of the study specific ecosystem output model.
Hydrology & Hydraulic Engineering	The Hydrology & Hydraulic Engineering reviewer will be an expert in the field of hydrology and hydraulics and have experience and understanding of tropical and/or flash flood systems. With knowledge on proposed measures of open channel dynamics, levels, and enclosed channel systems.
Cost Engineering	The cost engineering reviewer will have experience in FRM and CAP projects.
Real Estate	The real estate reviewer will have experience in FRM and CAP projects. There are only a few large landowners in the footprint of the proposed alternatives so the real estate appendix is anticipated to be relatively straight forward.

c. Documentation of ATR. DrChecks[sm] 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:

(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 where information is incomplete or unclear, comments may seek clarification in order to assess whether further specific concerns may exist.

The ATR documentation in DrChecks[sm] will include 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 POH, POD, and possibly the FRM-PCX 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[sm] 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 should be completed, based on work reviewed to date, for the Alternative Formulation Briefing (AFB), draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision 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 to assess whether an IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines. The expertise on the IEPR team represents 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 by an Outside Eligible Organization (OEO) external to USACE. 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 I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review (SAR)) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

- Type II IEPR. Type II IEPR, or SAR, is managed by the RMC and is conducted on design and construction activities for hurricane, storm, and FRM 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 IEPR. As a FRM project, there is a potential for life safety issues related to FRM reduction measures such as levees, channel alterations, and considerations of work in flood plains. Consistent with the Director of Civil Works Policy Memorandum #1 dated 19 January 2011; Section 205 studies have the potential for life safety issues and require a Type I IEPR. As the tentatively selected plan is formulated, POH may determine that life safety issues are minimal. In this event, POH will coordinate with POD and the FRM-PCX and seek an appropriate waiver from the IEPR.

The project is not likely to require an Environmental Impact Statement (EIS) and will not produce influential scientific information. There have been no requests for an IEPR from a head of a Federal or state agency charged with reviewing the project. There are no innovative materials or techniques proposed. The project design will not require redundancy, resiliency, and/or robustness. The project does not have unique construction sequencing or a reduced or overlapping design construction schedule.

Since the project is a FRM project, a Type II IEPR is anticipated on the design and construction of this project. Safety Assurance will also be addressed during the Type I IEPR per Paragraph 2.c. (3) of Appendix D of EC 1165-2-209.

b. Products to Undergo Type I IEPR. The draft integrated feasibility study/EA and draft EA decision and supporting technical documentation will undergo a Type I IEPR. The IEPR will be scheduled with the public review of the report.

c. Required Type I IEPR Panel Expertise. The following IEPR expertise is required for this project. Because the project is small, where possible IEPR panel members will address multiple disciplines and emphasis. POD will identify the final make-up of the expertise required for the IEPR team in coordination with the PM, vertical team and other appropriate centers of expertise.

Table 2: IEPR Required Expertise

IEPR Panel Members/Disciplines	Expertise Required
Economics	The Economics Panel Member should be a senior economist with experience in FRM projects.
Environmental	The Environmental Panel Member should have experience in NEPA, NHPA, CWA Section 404(b) (1) alternatives analysis; and EO 11988 Floodplain Management. No federally listed endangered species occur in the study area.
Engineering	The Engineering Panel Member should have experience in hydraulic engineering in tropical and/or flash flood systems and EO 11988 Floodplain Management. With knowledge on proposed measures of open channel dynamics, levels, and enclosed channel systems.

d. Documentation of Type I IEPR. The IEPR panel will be selected and managed by an 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 economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 5.c. above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- 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 no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. 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 decision documents will be reviewed throughout the study process 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 POD Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents.

8. COST ENGINEERING MANDATORY CENTER OF EXPERTISE (MCX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering MCX, located in the Walla Walla District. The MCX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The MCX will also provide the Cost Engineering Certification. POD is responsible for coordination with the Cost Engineering MCX.

9. MODEL CERTIFICATION AND APPROVAL

a. Planning Models. The approval of planning models under EC 1105-2-412 is not required for CAP projects. The POD Commander is responsible for assuring models for all planning activities are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models are defined as any models and analytical tools that planners use to define water resources 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 selection and application of the model and the input and output data are still the responsibility of the users and are subject to DQC, ATR, and IEPR (if required).

For this project, the PDT plans to use the Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) model, the Institute for Water Resources (IWR) Planning Suite 2.0 to assist with the Cost Effectiveness/Incremental Cost Analysis (CE/ICA), and a study specific spreadsheet model for the ecosystem output model. See Table 3 for detailed descriptions of the models. ATR will be used to ensure that the models and analyses are compliant with USACE policy.

Table 3: Planning Models and Certification/Approval Status

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
HEC-FDA 1.2.4 (Flood Damage Analysis)	The HEC-FDA program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating FRM plans using risk-based analysis methods. The program will be used to evaluate and compare the "future without-project" and "future with-project" plans along the Wailele Stream to aid in the selection of a recommended plan to manage flood risk.	Certified
IWR Planning Suite	This model assists with formulating plans, cost-effectiveness, and incremental cost analysis, which are required for ecosystem restoration projects. An "annualizer" module has been included to allow for easy calculations of equivalent annual average values, total net values, and annualizing non-monetary benefits and calculating costs.	Certified
Wailele Study Site Specific Spreadsheet Mitigation Model	Depending on the Tentatively Selected Plan (TSP), an ecosystem output model may be required to assess the mitigation requirements for this study. In the absence of any regionalized ecosystem output model that quantifies habitat benefits for stream habitats in Hawai'i, a customized spreadsheet model will be developed specifically for use on the Wailele Stream FRM Project. This is considered an appropriate approach. A spreadsheet model can be tailored to focus on metrics that are directly applicable to the project mitigation objective. In particular, habitat quality parameters contained within the model can serve as a key dataset for quantification of habitat impacts and benefits in the spreadsheet model. In addition, elements of the HEP approach will be used, as the State of Hawai'i Division of Aquatic Resources has conducted a state wide stream and watershed assessment using this approach, providing focused baseline	Model will be reviewed during the ATR.

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
	information on stream functions throughout the State, including Wailele Stream.	

b. Engineering Models. The responsible use of well-known and proven USACE developed and commercial 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 initiative, many engineering models have been identified as preferred or acceptable for use on USACE studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data are still the responsibility of the users and are subject to DQC, ATR, and IEPR (if required).

The following engineering models are anticipated to be used in the development of the decision document:

Table 4: Engineering Models and Approval Status

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
Microcomputer Aided Cost Engineering System (MCACES) 2nd Generation (MII)	The MCACES MII construction cost estimating software, developed by Building Systems Design, Inc., is a tool used by cost engineers to develop and prepare all USACE Civil Works cost estimates. Using the features in this system, cost estimates are prepared uniformly allowing cost engineering throughout USACE to function as one virtual cost engineering team.	Cost Engineering MCX Required Model
HEC-RAS 4.0 (River Analysis System)	The HEC's River Analysis System (HEC-RAS) program provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without- and with-project conditions along the Wailele Stream and its tributaries.	HH&C CoP Preferred Model

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. The ATRs for this study will be accomplished in accordance with the cost and schedule in the PMP. As of the approval date of this Review Plan, the ATRs of the various documents are scheduled as follows:

- Draft report review – 17 months after FCSA Amendment is executed (tentatively October 2014).

- Final report review – 26 months after FCSA Amendment is executed (tentative July 2015).

- Estimated cost: $56,800.

b. Type I IEPR Schedule and Cost. The IEPR for this study will be accomplished in accordance with the cost and schedule in the PMP. As of the approval date of this Review Plan, the IEPR is scheduled as follows:

- Draft report review – 22 months after FCSA Amendment is executed (tentatively March 2015).

- Estimated Contract Cost - $75,000.

Pursuant to Section 2034 of the Water Resource Development Act (WRDA) of 2007, this amount is 100% federally funded.

- Estimated cost for District and FRM-PCX Coordination of the IEPR: $40,000.

This estimate was developed using the Type I IEPR Standard Operating Procedure table provided by the PCXs. This amount is cost-shared between USACE and the non-federal Sponsor.

c. Model Certification/Approval Schedule and Cost. The use of existing certified or approved planning models is encouraged for CAP decision documents. Where uncertified or unapproved model are used, review of the model for use will be accomplished through the ATR process. The Wailele Stream site specific ecosystem output model will be used on a one-time basis and will be reviewed during the ATR.

11. PUBLIC PARTICIPATION

A Public Involvement Plan will be developed for the feasibility study to guide the public participation process. To date, three meetings have been held with the community and stakeholders. Small group meetings will be conducted to collect specific information relevant to study goals and objectives and provide information to key stakeholders and interest groups relevant to study goals and objectives. A public meeting will be held during the public review process to seek input on the draft report.

12. REVIEW PLAN APPROVAL AND UPDATES

The POD Commander is responsible for approving this Review Plan. The POD Commander's approval reflects vertical team input (involving POH, POD, and possibly the FRM-PCX and HQUSACE) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. POH is responsible for keeping the Review Plan up to date. Minor changes to the Review Plan since the

last POD Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) will be re-approved by the POD Commander, following the process used for initially approving the plan. The latest version of the Review Plan, along with the POD Commander's approval memorandum, will be posted on the POH's webpage. The latest Review Plan will also be provided to the FRM-PCX and POD.

13. REVIEW PLAN POINTS OF CONTACT

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

Honolulu District
Ms. Deborah Solis
Project Manager
Civil and Public Works Branch
Programs and Project Management Division
U.S. Army Corps of Engineers, Honolulu District
Building 230, Room 307
Ft. Shafter, HI 96858-5440
Telephone: (808) 835-4035

Review Management Organization/Pacific Ocean Division
Mr. Russell Iwamura
Economist
U.S. Army Corps of Engineers, Pacific Ocean Division
Building 525 CEPOD-PDC
Ft. Shafter, HI 96858-5440
Telephone: (808) 835-4625

ATTACHMENT 1: TEAM ROSTERS

Table 5: Project Delivery Team

DISCIPLINE	NAME	OFFICE
Project Manager/Planner	Ms. Deborah Solis	PP-C
Project Sponsor	Mr. Gary Kam	DDC
Hydraulic Engineer	Mr. Jarrett Hara	EC-T
Economist	Mr. Lance Shiroma	EC-T
Environmental	Ms. Uyen Tran	PP-E
Cost Engineer	Ms. Lorrie Kaneshige	EC-S
Value Engineer	Mr. Elton Choy	EC-S
Real Estate	Mr. Mike Sakai	PP-R
Program Analyst	Mr. Craig Hashimoto	PP-PC
Geotechnical Engineer	Mr. Russell Leong	EC-Q
GIS Specialist	Ms. Sarah Falzarano	EC-G
Public Affairs	Mr. Joe Bonfiglio	PA
Contracting	Mr. Ed Chambers	CT
Small Business	Ms. Catherine Yoza	DB
Office of Counsel	Ms. Lindsey Kasperowicz	OC

Table 6: Review Team

DISCIPLINE	NAME	DESCRIPTION OF CREDENTIALS
RMO	Mr. Russell Iwamura	POD
District Quality Control	Ms. Debbie Solis	PP-C
ATR Team Lead	To Be Determined (TBD)	TBD
Planning	TBD	TBD
Economics	TBD	TBD
Environmental Resources	TBD	TBD
Hydrology and Hydraulic Engineering	TBD	TBD
Cost Engineering	TBD	TBD
Real Estate	TBD	TBD

Table 7: IEPR Team

DISCIPLINE	NAME	DESCRIPTION OF CREDENTIALS
Economics	TBD	TBD
Environmental	TBD	TBD
Engineering	TBD	TBD

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECSION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The ATR has been completed for the feasibility study for the Wailele Stream FRM Project, Island of O'ahu, Hawai'i. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. 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 USACE policy. The ATR also assessed the 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 _____ _____

Name Date
ATR Team Leader
Office Symbol/Company

SIGNATURE _____ _____

Name Date
Project Manager
Office Symbol

SIGNATURE _____ _____

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

SIGNATURE _____ _____

Name Date
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 _____ _____

Name Date
Chief, Engineering Division
Office Symbol

SIGNATURE _____ _____

Name Date
Chief, Planning Division
Office Symbol

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

ATTACHMENT 3: REVIEW PLAN REVISIONS

Table 8: Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Table 9: Standard Acronyms & Abbreviations

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NER	National Ecosystem Restoration
ASA(CW)	Assistant Secretary of the Army for Civil Works	NEPA	National Environmental Policy Act
ATR	Agency Technical Review	NHPA	National Historic Preservation Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
CWA	Clean Water Act	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
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	POD	U.S. Army Corps of Engineers, Pacific Ocean Division
FRM	Flood Risk Management	POH	U.S. Army Corps of Engineers, Honolulu District
FSM	Feasibility Scoping Meeting	QMP	Quality Management Plan
GRR	General Reevaluation Report	QA	Quality Assurance
HEP	Habitat Equivalency Protocol	QC	Quality Control
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RED	Regional Economic Development
IEPR	Independent External Peer Review	RMC	Risk Management Center
ITR	Independent Technical Review	RMO	Review Management Organization
LRR	Limited Reevaluation Report	RTS	Regional Technical Specialist
MCX	Mandatory Center of Expertise	SAR	Safety Assurance Review
MSC	Major Subordinate Command	USACE	U.S. Army Corps of Engineers
NED	National Economic Development	WRDA	Water Resources Development Act