



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

CEPOD-PDC

30 JUN 2015

MEMORANDUM FOR Commander, Honolulu Engineer District (CEPOH-PP-C/Milton Yoshimoto), Building 230, Fort Shafter, HI 96858-5440

SUBJECT: Review Plan Approval for the Tinian Harbor Navigation Improvements Project, Island of Tinian, Commonwealth of the Northern Mariana Islands, Feasibility Report

1. References:

- a. Engineer Circular 1165-2-214 (Civil Works Review), 15 December 2012.
 - b. Review Plan for the Tinian Harbor Navigation Improvements Project, Island of Tinian, Commonwealth of the Northern Mariana Islands, Feasibility Report, Honolulu District, U.S. Army Corps of Engineers (Encl).
2. This memorandum constitutes approval of the Review Plan for the Tinian Harbor Navigation Improvements Project, Island of Tinian, Commonwealth of the Northern Mariana Islands, Feasibility Report, Honolulu District, U.S. Army Corps of Engineers, which includes a Type I Independent External Peer Review.
3. The approved Review Plan is, subject to change as circumstances require, consistent with project development under the Project Management Business Process. Subsequent significant revision to this Review Plan requires my written approval.
4. For further information or clarification about the review process, please contact the U.S. Army Corps of Engineers Deep Draft Navigation Planning Center of Expertise at 251-694-3842.
5. POC is Mr. Russell Iwamura, Senior Economist, Civil Works Integration Division, 808-835-4625, or email, Russell.K.Iwamura@usace.army.mil.

Encl

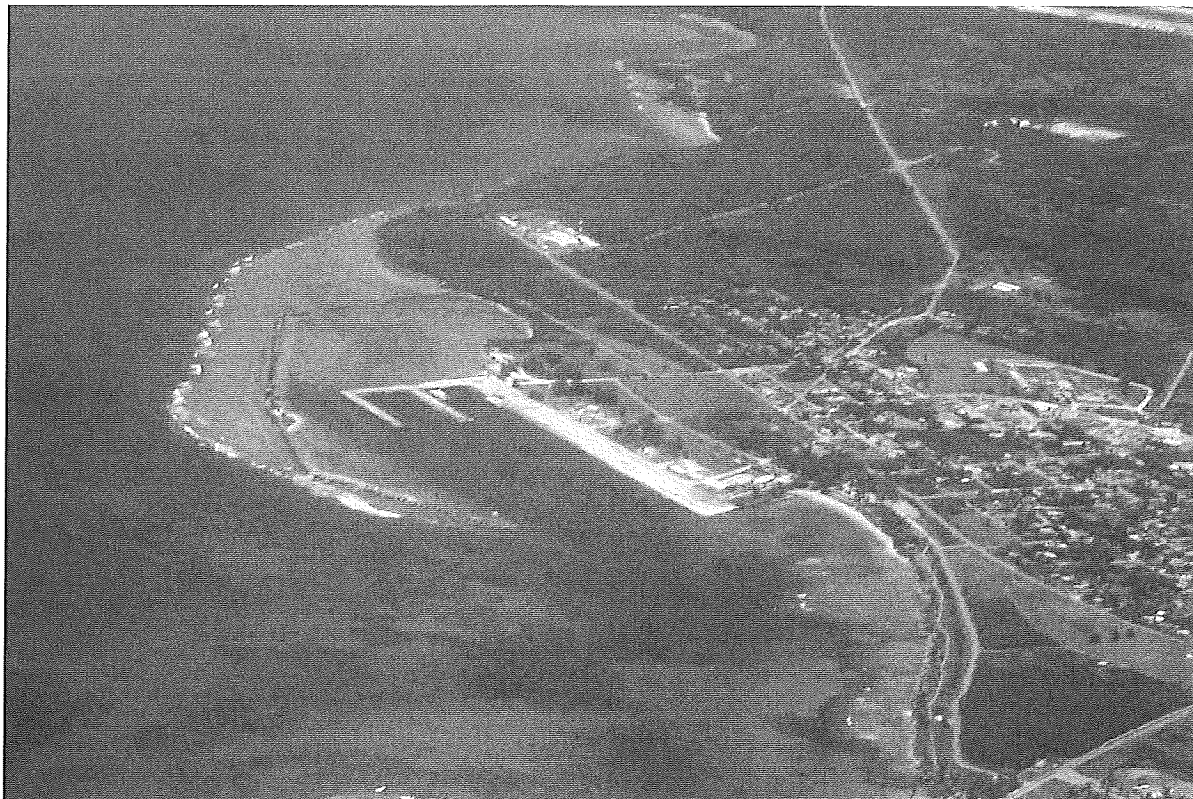

JEFFREY L. MILHORN, P.E.
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REVIEW PLAN

Tinian Harbor Navigation Improvements Project Island of Tinian, Commonwealth of Northern Mariana Islands Feasibility Report

U.S. Army Corps of Engineers, Honolulu District



**MSC Approval Date: 30 June 2015
Last Revision Date: None**



**US Army Corps
of Engineers ®**

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REVIEW PLAN

Tinian Harbor Navigation Improvements
Island of Tinian, Commonwealth of Northern Mariana Islands
Feasibility Study

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1. PURPOSE AND REQUIREMENTS

Purpose. This Review Plan defines the scope and level of peer review for the Tinian Harbor Navigation Improvements, Island of Tinian, Commonwealth of Northern Mariana Islands, Feasibility Report.

This Review Plan was developed using the National Planning Center of Expertise (PCX) Review Plan template dated 1 Oct 14.

a. References

- (1) Engineer Circular (EC) 1165-2-214 (Civil Works Review), 15 Dec 12.
- (2) EC 1105-2-412 (Assuring Quality of Planning Models), 31 Mar 11.
- (3) Engineer Regulation (ER) 1110-1-12 (Quality Management), 30 Sep 06.
- (4) ER 1105-2-100 (Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1), 20 Nov 07.
- (5) Tinian Harbor Navigation Improvements Project Management Plan (PMP), Draft Sep 2014.
- (6) Pacific Ocean Division (POD), U.S. Army Corps of Engineers (USACE) Quality Management Plan, Nov 14.
- (7) USACE Honolulu District (POH) Civil Works Review Policy (ISO CEPOH-C_12203), 1 Nov 10.

b. 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, 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 and certification (per EC 1165-2-214), and planning model certification/approval (per EC 1105-2-412) and the Value Management Plan requirements in the Project Management Business Process 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 Planning Center of

Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the Deep Draft Navigation Planning Center of Expertise (DDNPCX).

The DDNPCX 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. The feasibility study for the Tinian Harbor project is a single-purpose study; no life safety issues are anticipated.

3. STUDY INFORMATION

a. Authority. This study is authorized under Section 444 of the Water Resources and Development Act of 1996 (P.L. 104-303).

b. Decision Document. The purpose of the feasibility study is to identify and formulate potential alternatives that improve navigation conditions at Tinian Harbor and determine whether a Federal interest exists for financial participation in development of navigation improvements at Tinian Harbor. The Tinian Harbor Navigation Improvements, Island of Tinian, Commonwealth of Northern Mariana Islands, Feasibility Report will be an integrated feasibility report with Environmental Impact Statement (EIS) that recommends a plan for modification of the existing project. The Chief of Engineers' approval of the project recommendation and Congressional authorization will be needed before a project may proceed to construction.

c. Project Sponsor. The non-Federal sponsor is the Commonwealth Port Authority (CPA), Commonwealth of Northern Mariana Islands (CNMI).

d. Study Location. Tinian Harbor is located on the southeast coast of Tinian, at San Jose, the primary urban center. (see Figure 1).



Figure 1. Tinian Harbor Location Map

e. Study/Project Description. The existing harbor at Tinian was constructed in 1944-1945 during World War II. The entrance channel is about one-half mile long, approximately 525 feet wide and has been dredged to a depth of about 30 feet. The wharves and harbor turning basin were dredged to depths of 28 to 30 feet. The total length of the breakwater is 4,805 feet long and the crest elevation is about 14 feet above mean sea level. The inner breakwater, with a length of 1,210 feet from the shore to the outer breakwater was constructed of a single row sheet piling. Much of the sheet pile on the inner breakwater has deteriorated and collapsed. The outer breakwater, with a length of 3,595 feet, was constructed of interlocking, half-inch thick steel sheet piling in circular cell configuration. The interior of the cells was filled with quarried limestone. A 10-inch thick, unreinforced concrete slab was constructed flush with the top of the sheet piles. The steel sheet pile breakwater is almost completely deteriorated. The concrete cap is broken into pieces of varying sizes and most of the coral fill has been washed out of the structure.

Problem: The existing breakwater has not been maintained and is severely deteriorated, allowing wave energy from average storms and typhoons to penetrate into the harbor, disrupting navigation, operations, and exposing shoreside facilities to damage.

Alternatives: The Tinian Harbor Navigation Improvements, Island of Tinian, Commonwealth of Northern Mariana Islands, 905(b) Analysis, Reconnaissance Report was approved by the POD Commander in October 2001. The potential alternatives will be developed based on the Tinian Harbor Master Plan, dated June 1997 and compared to the No Action alternative. There are expected to be approximately five alternatives, including: (1) Master Plan Design: This alternative would include breakwater reconstruction in accordance with the design in the 1997 Master Plan including reconstruction of 3,500 feet of breakwater (along existing alignment) with a full design

cross-section suitable for typhoon wave stability and a reconstruction of an additional 1,300 feet of breakwater (on existing alignment) with a low-crested, segmented breakwater, (2) Alternative Plan Designs: In addition to the alternatives from the 905(b) report, viable alternatives that are identified during the feasibility phase will also be analyzed. Additional alternatives will be formulated to evaluate various modifications to the existing breakwater alignment, length, and may include additional items such as spurs. An alternative will also be formulated to evaluate a full design cross-section along the entire existing breakwater alignment of 4,800 feet.

Estimated Construction Cost: The estimated range of cost is between \$30 and \$50 million plus the costs that would be associated with any compensatory mitigation.

Factors Affecting the Scope and Level of Review. The primary issue for the proposed study is likely significant adverse environmental impacts from harbor construction, including adverse impacts to marine habitat and coral reefs. POH has determined that a proposed study will require an EIS to comply with National Environmental Policy Act (NEPA) requirements. As outlined in EC 1165-2-214, the following project characteristics will determine the level of review for the study.

- The estimated cost of construction is between \$30 and \$50 million.
- Because of the potential unavoidable impacts to coral reefs and the risk and uncertainty with effectively mitigating for coral reef impacts, Federal and Commonwealth agencies have noted that the project is likely to have a significant adverse impact on environmental resources under the jurisdiction of the agency after implementation of proposed mitigation plans.
- The scope of the project is on modifications to the existing harbor. There are no project features that are associated with hazard reduction and likely to involve significant threats to human life (safety assurance). Consistent with EC 1165-2-214, the POH Chief of Engineering and Construction concurs with the assessment that potential life safety issues are unlikely to be associated with the project features.
- The project is anticipated to have substantial adverse impacts on fish and wildlife species and their habitat prior to the implementation of mitigation measures.
- While there is ample experience within USACE and industry for the harbor construction to treat the activity as being routine, there is not ample experience within USACE or the industry to treat the implementation of potential mitigation measures as being routine.
- The project has significant interagency interest by U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration.

- While the project is not expected to incorporate challenging technical solutions for the harbor construction, the potential mitigation options incorporate challenging technical solutions.

- While the project design for the harbor construction is not likely to be based on novel methods, the information in the decision document for potential mitigation options is likely to be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practice.

- The project could potentially have an adverse impact, before implementation of mitigation measures, on a species listed as endangered or threatened under the Endangered Species Act (ESA) of 1973 or the critical habitat of such species designated under ESA. Two species present in the CNMI have recently been added to the threatened list under ESA.

- There has been no request nor expected to have a request by the Governor of CNMI for peer review by independent experts.

- No significant public dispute has been voiced over any aspect of the proposed project, including the size, nature, or effects of either the project or the economic or environmental cost or benefit of the project.

- The study is not likely to contain influential scientific information or be a highly influential scientific assessment.

- There has been no request by a head of a Federal or territory agency for peer review by independent experts.

- The project is not controversial.

- The project is anticipated to have negligible adverse impacts on scarce or unique tribal, cultural or historic resources.

- The project study does not involve the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates within the same footprint and for the same purpose as an existing water resources project.

- The project design is not anticipated to require redundancy, resiliency, and/or robustness, unique construction sequencing, or a reduced or overlapping design and construction schedule.

g. In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. There are no expected in-kind products and analyses to be provided by the non-Federal sponsor.

1. 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 shall manage the DQC process. Documentation of DQC activities is required and should be in accordance with the quality manuals of the POH and POD.

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:

- Draft and final integrated feasibility report/EIS.
- All technical reports and appendices developed in support of the integrated feasibility report/EIS.
- The draft and final Record of Decision (ROD).

c. Required DQC Expertise. The following expertise in Table 1 is needed for DQC. An individual reviewer may meet the requirements for multiple disciplines.

Table 1: DQC Required Expertise

DQC Team Members/Disciplines	Expertise Required
DQC Lead	The DQC lead should be a senior professional with experience in preparing Civil Works decision documents and conducting DQC.
Planning	The Planning reviewer should be a senior water resources planner with experience in the development of feasibility studies and navigation projects.
Economics	The economics reviewer should have experience in civil works navigation projects.

DQC Team Members/Disciplines	Expertise Required
Environmental Resources	The environmental reviewer should have environmental regulatory expertise in NEPA, Clean Water Act (CWA) Section 404(b)(1) analysis and Section 401 Water Quality Certification, Fish and Wildlife Coordination Act (FWCA), and ESA. The environmental expert should be familiar with requirements for dredging and disposal of harbors, tropical marine ecology and impacts on ecological function and processes due to implementation of navigation projects.
Marine Ecology Output Model	The marine ecology output model reviewer should have experience and familiarity with tropical coral reef and marine habitats and familiarity with the Habitat Equivalency Analysis (HEA).
Coastal Engineering	The coastal engineering reviewer will be an expert in the field of coastal engineering with experience with navigation projects.
Geotechnical Engineering	The geotechnical engineering reviewer should have experience in geotechnical evaluation of navigation structures including jetties and breakwaters.
Civil/Structural Engineering	The civil/structural engineering reviewer should have experience in navigation structures, including jetties and breakwaters.
Cost Engineering	Reviewer must be experienced in design requirements for navigation projects.
Real Estate	Reviewer must be experienced in civil works real estate laws, policies and guidance and experience working with sponsor real estate issues.

2. 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, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the DDNPCX, as the designated RMO, 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, and POH will not nominate ATR team members.

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

- Draft feasibility report/EIS.
- The draft and final Record of Decision (ROD).
- Targeted ATR of the final feasibility report/EIS.
- All technical reports and appendices developed in support of the draft and final feasibility study/EIS.
- The ATR team will also be informally engaged throughout the feasibility phase and will complete interim reviews on specific products as necessary.

b. Required ATR Team Expertise. The following ATR expertise in Table 2 is required for this project. Where possible ATR team members will address multiple disciplines and emphasis. The DDNPCX will select the ATR team and identify the ATR team leader in consultation with the Project Manager (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 2: 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 specific discipline (such as planning, economics, environmental resources, etc).
Planning	The Planning reviewer should be a senior water resources planner with experience in the development of feasibility studies and navigation projects.
Economics	The economics reviewer should have experience with civil works deep draft navigation projects and HarborSym modeling.
Environmental Resources	The environmental reviewer should have environmental regulatory expertise in NEPA, CWA Section 404(b)(1) analysis and Section 401 Water Quality Certification, FWCA, and ESA. The environmental expert should be familiar with requirements for dredging and disposal of harbors, tropical marine ecology and impacts on ecological function and processes due to implementation of navigation projects.

ATR Team Members/Disciplines	Expertise Required
Marine Ecology Output Model	The marine ecology output model reviewer should have experience and familiarity with tropical coral reef and marine habitats and familiarity with the HEA.
Coastal (Hydraulic) Engineering	The coastal engineering reviewer will be an expert in the field of coastal engineering(channel design, etc.) with experience with navigation projects.
Coastal/Civil Engineering	The Coastal/Civil reviewer will be familiar with dredging practice (construction and O&M) as well as dredged material placement and management.
Geotechnical Engineering	The geotechnical engineering reviewer should have experience in geotechnical evaluation of dredging operations and navigation structures including jetties and breakwaters.
Civil/Structural Engineering	The civil/structural engineering reviewer should have experience in navigation structures and port facilities such as wharves, piers, etc.
Cost Engineering	Reviewer will be identified by the Cost MCX and must be experienced in design requirements for navigation projects.
Real Estate	Reviewer must be experienced in civil works real estate laws, policies and guidance and experience working with sponsor real estate issues.

c. Documentation of ATR. DrCheckssm review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. The cost review will be set up as a separate DrChecks project when ATR begins. 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:

- The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- 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
- 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 then assess whether further specific concerns may exist.

The ATR documentation in DrCheckssm will include the text of each ATR concern, the Project Delivery Team (PDT) response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes POH, DDNPCX, POD, 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 DrCheckssm with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR Lead 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 draft report and final report. A sample Statement of Technical Review is included in Attachment 2.

3. 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 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 1165-2-214, 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 IEPR panel will represent 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 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 planning, 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 1165-2-214.

- **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 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 IEPR. Based on the assumed need for an EIS, the estimated construction costs, and the other factors described in Section 3.f., POH has determined that a Type I IEPR is required. Type II IEPR is not required, based on the assessment of the same factors.

b. Products to Undergo Type I IEPR. Draft Feasibility report/EIS. Public comments will also be reviewed by the Panel for information purposes. The intent is to ensure that the Panel is aware of the public's concerns and determine whether there are any technical issues that were raised by the public that they had not previously considered.

c. Required Type I IEPR Panel Expertise. The following IEPR expertise in Table 3 is required for this project. Where possible IEPR panel members will address multiple disciplines and emphasis. The DDNPCX will identify the final make-up of expertise required for the IEPR team in consultation with the PM, vertical team and other appropriate centers of expertise. The OEO will determine the final participants on the panel; no candidates will be nominated by the Corps and the public will not be asked for

nominations. Once identified, the IEPR team members for this study and a brief description of their credentials will be added in Attachment 1.

Table 3: IEPR Required Expertise

IEPR Panel Members/Disciplines	Expertise Required
Plan Formulation	The panel member should also be an expert in the USACE plan formulation process, procedures, and standards with experience in the evaluation of alternative plans for deep draft navigation studies.
Economics	The economics panel member should have experience with civil works navigation projects.
Environmental	The environmental panel member(s) should have environmental regulatory expertise in NEPA, CWA Section 404(b)(1) analysis and Section 401 Water Quality Certification, FWCA, and ESA. The environmental panel member should be familiar with requirements for dredging and disposal of harbors, tropical marine ecology and impacts on ecological function and processes due to implementation of navigation projects. The environmental panel member should also have experience and familiarity with tropical coral reef and marine habitats and familiarity with the HEA.
Engineering	The engineering panel member(s) should have experience in coastal, geotechnical, civil and structural engineering as it relates to navigation projects, including dredging and construction of jetties and breakwaters.

d. Documentation of Type I IEPR. The IEPR panel will be selected and managed by an OEO per EC 1165-2-214, 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. Final Panel comments and PDT responses will be documented in DrChecks. IEPR comments will 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.

4. 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.

5. 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. The DDNPCX is responsible for coordination with the Cost Engineering MCX.

6. MODEL CERTIFICATION AND APPROVAL

a. Planning Models. 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 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 use of a 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 is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

In accordance with EC 1105-2-412 Paragraph 5.c, models that are single-use or study-specific require approval that the model is technically and theoretically sound and functional tool that can be applied during the planning process by knowledgeable and trained staff for purposes consistent with the model's purpose and limitations. For this project, the PM will coordinate with the DDNPCX and Ecosystem Planning Center of Expertise (ECO-PCX) in determining the appropriate level of review for model approval. At this time, an additional ATR reviewer has been added to specifically approve models for site specific use.

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

Table 4: 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
Institute of Water Resources (IWR) Planning Suite	This model assists with formulating plans, Cost-Effectiveness, and Incremental Cost Analysis (CE/ICA), 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. The IWR Planning Suite will be used to conduct the CE/ICA necessary to identify the appropriate compensatory mitigation for the project in conjunction with the Tinian Harbor site specific mitigation model. The IWR Plan Annualizer in the IWR Planning Suite will be used in conjunction with the Tinian Harbor HarborSym economic model to compute average annual values of cost and revenue streams, discount future values to present values, compute interest during construction and perform other basic arithmetic functions.	Certified
HarborSym Simulation Model for Coastal	HarborSym is a planning-level simulation model designed to assist in economic analyses of coastal harbors. With user provided input data, such as the port layout, vessel calls, and transit rules, the model	Certified

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Certification / Approval Status
Harbors	calculates vessel interactions within the harbor. Unproductive wait times result when vessels are forced to delay sailing due to transit restrictions within the channel; HarborSym captures these delays. Using the model, analysts can calculate the cost of these delays and any changes in overall transportation costs resulting from proposed modifications to the channel's physical dimensions or sailing restrictions. Developed as a data driven model, HarborSym allows users to analyze changes without modifying complex computer code. This approach also enables analysts to apply the model to many different ports by altering the network representation of the harbor.	
Tinian Harbor Site Specific Spreadsheet Mitigation Model	An ecosystem output model is required to assess the mitigation requirements for this study. In the absence of any regionalized ecosystem output model that quantifies habitat benefits for coral reef habitats in CNMI, a customized spreadsheet model will be developed specifically for use on the Tinian Harbor Project. This is considered to be an appropriate approach, as 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 HEA approach will be used. The National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Service (USFWS) regularly use this method for coral reef mitigation assessment in the Pacific. The ECO-PCX recommended the HEA model for national approval on 16 April 2014. Single use approval will be sought unless national approval is issued.	Approval to be coordinated with the ECO-PCX

b. Engineering Models. EC 1105-2-412 does not cover engineering models used in planning. 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 is still the responsibility of the users and is 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 5: 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
CMS-FLOW(v3.75)	Coastal Modeling System – Flow (CMS-Flow) is a coupled hydrodynamic and sediment transport model capable of simulating depth-averaged circulation, salinity and sediment transport due to tides, wind and waves. The hydrodynamic model solves the conservative form of the shallow water equations and includes terms for the Coriolis force, wind stress, wave stress, bottom stress, vegetation flow drag, bottom and friction, and turbulent diffusion. CMS-FLOW will be applied in this study to develop currents for input into ship simulations and to evaluate harbor currents/circulation.	HH&C CoP Preferred Model
CMS-WAVE (v3.2)	Coastal Modeling System – Wave (CMS-Wave) is a spectral wave transformation model and solves the steady-state wave-action balance equation on a non-uniform Cartesian grid. It considers wind wave generation and growth, diffraction, reflection, dissipation due to bottom friction, whitecapping and breaking, wave-wave and wave-current interactions, wave runup, wave setup, and wave transmission through structures. This model will be used to transform deep water wave conditions from Wave Information Study (WIS) to the nearshore vicinity of the harbor and as input to the Boussinesq (BOUSS2D) wave model.	HH&C CoP Preferred Model
BOUSS2D	BOUSS2D wave model is a comprehensive numerical model for simulating the propagation and transformation of waves in coastal regions and harbors based on a time-domain solution of Boussinesq-type equations. The model can simulate most of the phenomena of interest in harbor basins including shoaling/refraction over variable topography, reflection/diffraction near structures,	Allowed for Use

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
	energy dissipation due to wave breaking and bottom friction, cross-spectral energy transfer due to nonlinear wave-wave interactions, breaking-induced longshore and rip currents, wave-current interaction and wave interaction with porous structures. This model will be used to evaluate harbor surge and oscillations, reflection and results of proposed structural measures within the harbor.	
WIS	WIS is a wave hindcast that generates consistent, hourly, long-term (20+ years) wave climatologies along all U.S. coastlines. A wave hindcast predicts past wave conditions using a computer model and observed wind fields. This data will be used to develop wave climate for the project area and determine offshore conditions appropriate for input to the wave transformation models.	HH&C CoP Preferred Model
MCACES MII	The Microcomputer Aided Cost Engineering System 2 nd Generation (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
Crystal Ball	Used to account for risk and uncertainty of alternatives and the recommended plan.	Enterprise
@Risk	Used to account for risk and uncertainty of alternatives and the recommended plan.	Enterprise
CEDEP	Corps-proprietary, Excel add-on for Cost Engineering; used to estimate costs of alternatives and the recommended plan.	Enterprise
ProUCL Version 4.00.04	Statistical software used to estimate costs of alternatives and the Tentatively Selected Plan (TSP).	Enterprise
MiniTab	Statistical software used to estimate costs of alternatives and the TSP.	Enterprise
ArcGIS	Used to visually represent alternatives and the TSP.	Enterprise
Automated Risk Assessment Modeling System	Used to visually represent risks of alternatives and the TSP.	Enterprise

7. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost. Consistent with USACE SMART Planning guidance, ATR will be conducted concurrently with the IEPR. The ATR for this study will be accomplished in accordance with the cost and schedule in the PMP, of which this Review Plan is a component. As of the approval date of this Review Plan, the ATR of the various documents are scheduled as follows:

- Draft Feasibility Report/EIS: Feb 17 (complete).
- Targeted ATR of the Final Feasibility Report/EIS: Sep 17 (complete).
- Estimated Total ATR Costs: \$100,000.

This assumes \$65,000 for the ATR of the draft report and \$35,000 for the ATR of the final report. It is anticipated that the ATR Lead will be required to participate in milestone teleconferences and the Civil Works Review Board meeting (if required for the study) to address the ATR process and any significant and/or unresolved ATR concerns. Estimated funding required for ATR Lead to participate in milestone meetings is \$3500. The tentative schedule for milestones is as follows:

- Decision Point 1 - Concurrence on Final Array of Alternatives: Nov 15.
- Decision Point 2 - Concurrence on Tentatively Selected Plan: Oct 16.
- Decision Point 3 - Agency Decision Milestone: May 17.
- Decision Point 4 - Final Report Milestone: Nov 17.
- Civil Works Review Board: Jan 18.

b. Type I IEPR Schedule and Cost. Consistent with SMART Planning, the IEPR will be conducted concurrently with the public review. As of the approval date of this Review Plan, the IEPR is scheduled as follows:

- Draft Feasibility Report/EIS: Apr 17 (complete).
- Estimated Contract Cost: \$150,000.

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

- Estimated cost for POH and DDNPCX coordination of the IEPR: \$60,000.

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. Tinian Harbor Site Specific Ecosystem Output Model will be used on a one-time basis. Consistent with EC 1105-2-412, the model will require approval for use. The approval review of the single use site specific model will be coordinated with the DDNPCX and ECO-PCX to receive model approval no later than the TSP Milestone (Estimated TSP Milestone date is October 2016). In the event that the ECO-PCX requires a separate or regional approval, schedule and costs will be adjusted accordingly.

8. PUBLIC PARTICIPATION

A Public Involvement Plan (PIP) will be developed for the feasibility study to guide the public participation process. 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. The public, including scientific or professional societies, will not be asked to nominate potential peer reviewers.

9. REVIEW PLAN APPROVAL AND UPDATES

The POD Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving POH, POD, DDNPCX, and HQUSACE members) 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 Commander's approval memorandum, will be posted on the POH webpage. The latest Review Plan will also be provided to the POD and the DDNPCX.

10. 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
Mr. Milton Yoshimoto
Civil and Public Works Branch
Programs and Project Management Division
U.S. Army Corps of Engineers, Honolulu District

Building 230, CEPOH-PP-C
Ft. Shafter, HI 96858
Telephone: (808) 835-4034

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

Review Management Organization
Ms. Kimberly Otto
Deep Draft Navigation Planning Center of Expertise
U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, AL 36602
Telephone: (251) 694-3842

ATTACHMENT 1: TEAM ROSTERS

Table 6: Project Delivery Team

TASK	NAME	OFFICE	EMAIL
Project Manager	Mr. Milton Yoshimoto	CEPOH-PP-C	Milton.T.Yoshimoto@usace.army.mil
Project Sponsor (non-Federal)	Ms. Kim Kido Mr. Arnold Liu	Hawaii DOT, Harbors Div.	Kimberly.A.Kido@hawaii.gov Arnold.Liu@hawaii.gov
Plan Formulator	Ms. Jessica Podoski	CEPOH-EC-T	Jessica.H.Podoski@usace.army.mil
Coastal Engineer	Mr. Thomas Smith	CEPOH-EC-T	Thomas.D.Smith@usace.army.mil
Economist	Mr. Bob Finch	CEPOH-EC-T	Robert.A.Finch@usace.army.mil
Environmental	Ms. Dawn Lleces	CEPOH-PP-E	Dawn.A.Lleces@usace.army.mil
Cultural Resources	Mr. Kanalei Shun	CEPOH-PP-E	Kanalei.Shun@usace.army.mil
Cost Engineer	Ms. Tracy Kazunaga	CEPOH-EC-S	Tracy.Y.Kazunaga@usace.army.mil
Value Engineer	Mr. Elton Choy	CEPOH-EC-S	Elton.C.Choy@usace.army.mil
Real Estate	Mr. Keith McDonald	CEPOH-PP-R	Keith.A.McDonald@usace.army.mil
Program Analyst	Ms. Joanne Hasegawa	CEPOH-PP-PC	Joanne.M.Hasegawa@usace.army.mil
Geotechnical Engineer	Mr. Ray Kong	CECO-C-RAO	Raymond.W.Kong@usace.army.mil
GIS Specialist	Ms. Sarah Falzarano	CEPOH-EC-G	Sarah.R.Falzarano@usace.army.mil
Public Affairs	Mr. Joseph Bonfiglio	CEPOH-PA	Joseph.Bonfiglio@usace.army.mil
Contracting	Mr. Ed Chambers	CEPOH-CT	Edward.A.Chambers@usace.army.mil
Small Business	Ms. Cathy Yoza	CEPOH-DB	Catherine.L.Yoza@usace.army.mil
Office of Counsel	Ms. Lindsey Kasperowicz	CEPOH-OC	Lindsey.Kasperowicz@usace.army.mil

Table 7: DQC Team

TASK	ORGANIZATION	DESCRIPTION OF CREDENTIALS
DQC Team Lead	POH	To Be Determined (TBD)
Planning	POH	TBD
Economics	POH	TBD
Environmental Resources	POH	TBD
Coastal Engineering	POH	TBD
Geotechnical Engineering	POH	TBD
Civil/Structural Engineering	POH	TBD
Cost Engineering	POH	TBD
Real Estate	POH	TBD

Table 8. ATR Team

TASK	ORGANIZATION	DESCRIPTION OF CREDENTIALS
ATR Team Lead	TBD	TBD
Planning	TBD	TBD
Economics	TBD	TBD
Environmental Resources	TBD	TBD
Marine Ecology	TBD	TBD
Coastal Engineering	TBD	TBD
Coastal/Civil Engineering	TBD	TBD
Geotechnical Engineering	TBD	TBD
Civil/Structural Engineering	TBD	TBD
Cost Engineering	TBD	TBD
Real Estate	TBD	TBD

Table 9: IEPR Team

TASK	ORGANIZATION	DESCRIPTION OF CREDENTIALS
Plan Formulation	TBD	TBD
Economics	TBD	TBD
Environmental	TBD	TBD
Engineering	TBD	TBD

ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *Feasibility Study for Tinian Harbor Navigation Improvements, Island of Tinian, Commonwealth of Northern Mariana Islands*. 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 U.S. 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 DrCheckssm.

SIGNATURE

Name

ATR Team Leader

Office Symbol/Company

Date

SIGNATURE

Name

Project Manager

Office Symbol

Date

SIGNATURE

Name

Architect Engineer Project Manager¹

Company, location

Date

SIGNATURE

Name

Review Management Office

Representative

Office Symbol

Date

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

Chief, Engineering Division

Office Symbol

Date

SIGNATURE

Name

Chief, Planning Division

Office Symbol

Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Table 9: Review Plan Revisions

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Table 10: Standard Acronyms and Abbreviations

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy 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	PMP	Project Management Plan
ER	Engineer Regulation	PL	Public Law
FDR	Flood Damage Reduction	POD	U.S. Army Corps of Engineers, Pacific Ocean Division
FEMA	Federal Emergency Management Agency	POH	U.S. Army Corps of Engineers, Honolulu District
FRM	Flood Risk Management	QMP	Quality Management Plan
GRR	General Reevaluation Report	QA	Quality Assurance
HQUSACE	Headquarters, U.S. Army Corps of Engineers	QC	Quality Control
IEPR	Independent External Peer Review	RED	Regional Economic Development
ITR	Independent Technical Review	RMC	Risk Management Center
LRR	Limited Reevaluation Report	RMO	Review Management Organization
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