



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION
FORT HAMILTON MILITARY COMMUNITY
302 GENERAL LEE AVENUE
BROOKLYN NY 11252-6700

CENAD-PD-P


SEP 18 2017

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, New York District,
26 Federal Plaza, New York, NY 10278-0090

SUBJECT: Request for Approval of the Nassau County Back Bays, New York Coastal
Storm Risk Management Feasibility Study Review Plan

1. Reference Memorandum, CENAN-DE, dated 12 Sept 2017, subject as above.
2. The Coastal Storm Risk Management Planning Center of Expertise of the North Atlantic Division (NAD) is the lead office to execute the referenced Review Plan. The Review Plan includes Independent External Peer Review.
3. The enclosed Review Plan is approved for execution and is subject to change as study circumstances require, consistent with study development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution require new written approval from the NAD Commander.
4. The point of contact is Mr. Larry Cocchieri, NAD Planning Program Manager at 347-370-4571 or Lawrence.J.Cocchieri@usace.army.mil.

Encl


LEON F. PARROTT
Colonel, EN
Deputy Commander



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278-0090

SEP 12 2017

CENAN-DE

MEMORANDUM FOR: BG Graham, Commander, North Atlantic Division, 301 General Lee Avenue, Fort Hamilton Community, Brooklyn, New York 11252 (Attn: Cocchieri)

SUBJECT: Request for Approval of the Nassau County Back Bays, New York Coastal Storm Risk Management Feasibility Study Review Plan


1. References

- a. Engineer Circular (EC) 1165-2-214, Civil Works Review, 15 DEC 12
- b. EC 1105-2-412, Planning, Assuring Quality of Planning Models, 31 MAR 11
- c. Engineer Regulation (ER) 1110-2-12, Quality Management, 30 SEP 06

2. The subject Review Plan is enclosed for your approval in accordance with Appendix B of Reference 1 (Enclosure 1). The Review Plan complies with all applicable policies and provides an adequate approach to District Quality Control and Agency Technical Review of the plan formulation, engineering and environmental analyses, as well as other required planning considerations.

3. If you should require more information, my point of contact is Ms. Danielle Tommaso, Project Planner, at danielle.m.tommaso@usace.army.mil or 917-790-8527.

Encl


THOMAS D. ASBERY
COL, EN
Commanding

CF:

Chief, CENAD Planning Division Programs Directorate (Vietri)
Deputy Chief, CENAD Planning Division Programs Directorate (Gruber)



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION
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302 GENERAL LEE AVENUE
BROOKLYN NY 11252-6700

CEPCX-CSRМ

24 Aug 2017

MEMORANDUM FOR: Commander, U.S. Army Corps of Engineers, New York District
(CENAN-PP-C/ Mark Lulka), 26 Federal Plaza, New York, NY 10278

SUBJECT: Nassau County Back Bays, New York, Coastal Storm Risk Management
Feasibility Study

1. The National Planning Center for Coastal Storm Risk Management (PCX-CSRМ) has reviewed the Review Plan (RP) for the subject study and concurs that the RP complies with current peer review policy requirements contained in EC 1165-2-214, entitled "Civil Works Review."
2. The review was performed by Mr. Dave Robbins, CENAB-PLP.
3. PCX-CSRМ has no objection to RP approval by the Commander, North Atlantic Division.
4. Thank you for the opportunity to assist in the preparation of the RP. PCX-CSRМ is prepared to lead the Agency Technical Review for the subject study and will continue to coordinate with the project delivery team. For further information, please contact me at 347-370-4571.

A handwritten signature in black ink, appearing to read "Larry Cocchieri", is positioned above the printed name.

LARRY COCCHIERI
Deputy, National Planning Center of
Expertise for Coastal Storm Risk
Management

REVIEW PLAN

**Nassau County Back Bays, New York
Coastal Storm Risk Management Feasibility Study
Feasibility Report**

New York District

**MSC Approval Date: Pending
Last Revision Date: 12 September 2017**



**US Army Corps
of Engineers ®**

REVIEW PLAN

Nassau County Back Bays, New York Coastal Storm Risk Management Feasibility Study Feasibility Report

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1. PURPOSE AND REQUIREMENTS

- a. **Purpose.** This plan defines the scope and level of peer review for the Nassau County Back Bays, New York coastal storm risk management feasibility study (Study) feasibility report.

b. **References**

- (1) Planning Bulletin (PB) 2016-02, Civil Works Review, 4 Mar 2016
- (2) Engineer Circular (EC) 1165-2-214, Civil Works Review Policy, 15 Dec 2012
- (3) EC 1105-2-412, Assuring Quality of Planning Models, 31 Mar 2011
- (4) Engineer Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
- (5) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
- (6) New York District Guide, District Quality Control (DQC) of Civil Works Planning Decision Documents, Sep 2015

- c. **Requirements.** This plan was developed under EC 1165-2-214 (with interim guidance provided under PB 2016-02), which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products. It provides 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: DQC, Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these reviews, 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).

2. REVIEW MANAGEMENT ORGANIZATION COORDINATION

The Review Management Organization (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 USACE National Planning Center for Coastal Storm Risk Management (CSRMC PCX).

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

- a. **Decision Document.** A feasibility report prepared by the New York District and its sponsors will serve as the basis for a Chief of Engineers' Report (Chief's Report) that includes a recommendation for construction authorization of a coastal storm risk management project. An environmental impact statement (EIS) will be prepared and integrated into the Study's feasibility report.
- b. **Study/Project Description.** Nassau County, NY is located on Long Island, just east of New York City. The study area encompasses the areas that are impacted by back bay flooding on the Atlantic Coast (south shore) of Nassau County, and those areas to the west (Jamaica Bay) and east (Suffolk County) that contribute to this flooding (Figure 1). Communities in the study area include villages and unincorporated municipalities in the Town of Hempstead and Town of Oyster Bay that front Hewlett Bay, Middle Bay, Jones Bay, South Oyster Bay, and connected creeks, channels, and minor waterbodies (the "Nassau County Back Bays"), as well as the City of Long Beach.

These communities are represented by Senator Charles Schumer (NY), Senator Kirsten Gillibrand (NY), Representative Peter King (NY-2), Representative Steve Israel (NY-3), and Representative Kathleen Rice (NY-4).

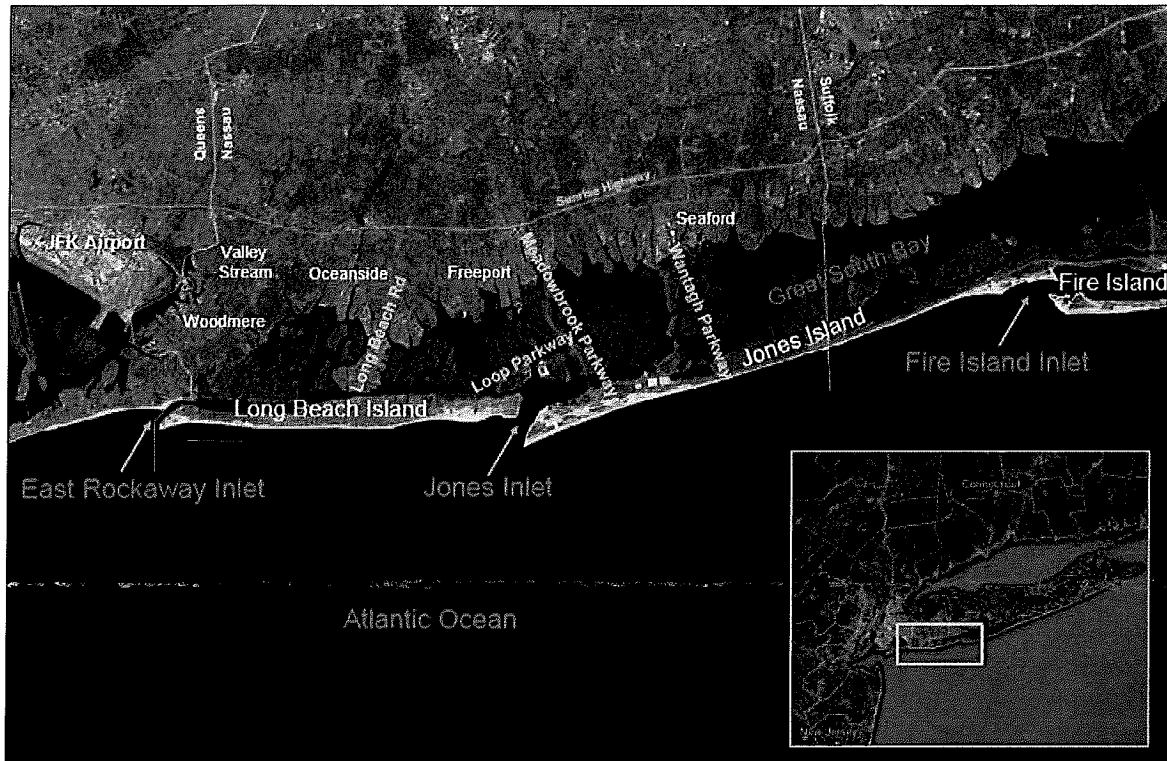


Figure 1. Study Area.

The study is authorized by Chapter 140 of Public Law 71 (15 June 1955). The non-Federal study sponsor is the New York State Department of Environmental Conservation (NYSDEC), in partnership with Nassau County. A Feasibility Cost Sharing Agreement (FCSA) was executed on 30 September 2016. The study purpose is to determine the feasibility of a project to manage coastal storm risk in the back bays of southern Nassau County, and to recommend a plan that will contribute to community and environmental resilience. The study team will investigate the feasibility of structural and nonstructural flood risk management measures, including natural and nature-based features.

- c. **Factors Affecting the Scope and Level of Review.** The peer reviews described in this plan will include a review of the economic and environmental assumptions and projections, project evaluation data, economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in evaluation of economic or environmental impacts of proposed projects, and any biological opinions of the project study. Type I IEPR may be required if one or more of the following criteria are triggered:

- Planning and design challenges
- Risks and uncertainties
- Life and safety assurance
- Governor's request for IEPR
- Reviewer's request for IEPR
- Anticipated public dispute

Based on the scale, complexity, and high visibility of the study, completion of a IEPR Type I review is anticipated.

- d. **In-Kind Contributions.** Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. Currently, there are no in-kind products and analyses anticipated to be provided by the non-Federal sponsor. Any products provided by the sponsor will undergo DQC, ATR, and IEPR, as appropriate.

4. DISTRICT QUALITY CONTROL

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 Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC. Documentation of completed DQC should be provided to the MSC, PCX and ATR Team leader prior to initiating ATR.

- a. **Documentation of DQC.** DQC will be documented through the use of a DQC Report, which is managed in the New York District and signed by those members performing the DQC and Division Chiefs of the major technical offices responsible for producing the feasibility report.
- b. **Products to Undergo DQC.** The draft and final feasibility reports, including the draft and final EIS, will undergo DQC. Additional DQC of key technical and interim products, MSC-specific milestone documentation, and In-Progress Review (IPR) documentation should occur depending on the study needs and the requirements of MSC/District Quality Management Plans. Where practicable, technical products that support subsequent analyses should be reviewed prior to being used in the study and may include: surveys and mapping, hydrology and hydraulics, geotechnical work, economic, environmental, cultural, and social inventories, annual damages and benefits estimates, cost estimates, etc.
- c. **Required DQC Expertise.** The DQC team will consist of Section Chiefs, subject matter experts, and/or regional technical specialists in the fields of plan formulation, NEPA compliance, engineering design and analysis, and real estate. The plan formulation review will serve at the DQC team lead.

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, 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 designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams will be comprised of certified senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

- a. **Products to Undergo ATR.** The draft and final feasibility reports, including the draft and final EIS, will undergo ATR. Additional ATR of key technical and interim products, MSC-specific milestone documentation, and In-Progress Review (IPR) documentation should occur depending on the study needs and the requirements of MSC/District Quality Management Plans. Where practicable, technical products that support subsequent analyses should be reviewed prior to being used in the study and may include: surveys and mapping, hydrology and hydraulics, geotechnical work, economic, environmental, cultural, and social inventories, annual damages and benefits estimates, cost estimates, etc.

- b. **Required ATR Team Expertise.** The following table provides the types of disciplines that should be included on the ATR team and their expertise. The names, organizations, contact information, credentials, and years of experience of the ATR members will be included in Attachment 1 once the ATR team is established.

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 ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. Typically, the ATR lead will also serve as a reviewer for a specific discipline (planning, economics, environmental resources, etc).
Plan Formulation	The planning reviewer should be a senior water resources planner with experience in the plan formulation process. The reviewer should be familiar with evaluation of alternative plans for coastal storm risk management projects.
Economics	The economics reviewer should be a senior water resource economist with experience in coastal storm risk management projects, including the use of HEC-FDA and BeachFX software.
Environmental Resources	The environmental resources reviewer should be a senior NEPA compliance specialist with experience in coastal storms risk management projects, particularly projects in urbanized coastal areas.
Coastal Engineering	The coastal engineering reviewer should be a senior engineer with experience with coastal storm risk management projects, particularly projects in urbanized coastal areas. Team member will be an expert in the field of coastal processes and have a thorough understanding of coastal modeling, sediment transport, application of wave forces and water levels over the likely range of storm return periods, beach fill design including renourishment, appurtenant structures for beach fill design, design of flood barriers, rubblemound and other coastal structures, and determination of risk due to sea level rise. The coastal engineer should also be an expert in the field of coastal storm modeling, specifically SBEACH, STWAVE, and ADCIRC.
Structural Engineering	The structural engineering reviewer should have expertise in the field of structural engineering, especially in design and review of floodwalls and closure gates. A registered professional engineer is required.
Geotechnical Engineering	The Geotechnical Engineering reviewer should be a senior geotechnical engineer familiar with the geotechnical requirements of structural and nonstructural CSRM measures.
Cost Engineering	The cost engineering reviewer should have expertise in the field of cost engineering with experience in coastal storm risk management projects. Review includes MII, ARA/CSRA, Project First Cost, TPCS, annualized cost, construction schedules and cost appendix. The team member will be a Certified Cost Technician, a Certified Cost Consultant, or a Certified Cost Engineer. As the Cost Engineering Center of Expertise, Walla Walla District will assign this team member as part of a separate effort coordinated by the ATR team lead.

Real Estate	The real estate reviewer will have experience in development of Real Estate Plans for SMART Planning feasibility studies.
Risk Reviewer	The risk reviewer should have knowledge and experience in accordance with ER 1105-2-101.
International Coastal Engineer	All focus area feasibility study investigations will include an international coastal engineer participating as an external peer reviewer.

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

- (1) The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- (3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
- (4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1165-2-214, ER 1110-1-12, or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team will prepare a Review Report summarizing the review. Review Reports will be considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a 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 AFB, draft report, and final report. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW

Independent External Peer Review (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 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- **Type I IEPR.** Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type 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) 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 Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.
- a. **Decision on IEPR.** Based on the scale, complexity, and high visibility of the study, completion of a IEPR Type I review is anticipated.
- b. **Products to Undergo Type I IEPR.** The draft feasibility report will undergo a IEPR Type I review. Because of likely complexity and magnitude of the study, IEPR may be performed for key interim technical products and major milestone documents; this Review Plan will be updated if a review of these products is needed.
- b. **Required Type I IEPR Panel Expertise.** The expertise represented on the IEPR Type I review panel will be similar to that of the ATR team. At minimum, the panel should include the necessary expertise to assess the engineering, environmental, and economic adequacy of the decision document as required by EC 1165-2-214, Appendix D. All members should be well versed in the conduct of coastal storms risk management studies. Reviewers will be a panel from an Outside Eligible Organization (OEO). The following table provides the types of disciplines that might be included on the IEPR team and a description of the expertise required.

IEPR Panel Member Disciplines	Expertise Required
Plan Formulation	The Panel Member should be from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum of 10 years demonstrated experience in public works planning with a Master's Degree in a relevant field. Direct experience working for or with USACE is highly preferred but not required. The panel member shall have a minimum of five

	years' experience directly dealing with the USACE six-step planning process, which is governed by ER 1105-2-100, Planning Guidance Notebook. Panel Member must be very familiar with USACE plan formulation process, procedures, and standards as it relates to hurricane and coastal storm risk management projects.
Economics	The panel member should be from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum of 10 years demonstrated experience in public works planning, with a minimum MS degree or higher in economics. Five years' experience related to the use of HEC-FDA software is required. Familiarity with BeachFX software is desired. Two years' experience in reviewing federal water resource economic documents justifying construction efforts is required. In addition, the panel member should have experience related to regional economic development, and be capable of evaluating traditional National Economic Development plan benefits associated with hurricane and coastal storm risk management projects.
Biology/Ecology	The panel member should be a scientist from academia, a public agency, a non-governmental entity, or an Architect-Engineer or Consulting Firm with a minimum 10 years demonstrated experience in evaluation and conducting National Environmental Policy Act (NEPA) impact assessments, including cumulative effects analyses. The panel member should also be familiar with all NEPA Environmental Assessment requirements as well as have experience with the Endangered Species Act, essential fish habitat, and the Marine Mammals Protection Act. The panel member should have particular knowledge of construction impacts on marine and terrestrial ecology of coastal regions of the mid-Atlantic coast of North America. The panel member should have a minimum of a Master's Degree or higher in an appropriate field of study. Active participation in related professional societies is encouraged.
Coastal Engineering	The panel member should be a registered professional engineer with a minimum of 10 years' experience in coastal and hydraulic engineering, or a professor from academia with extensive background in coastal processes and hydraulic theory and practice, with a minimum Master's Degree or higher in engineering. Active participation in related professional societies is encouraged. The panel member should be familiar with USACE application of risk and uncertainty analyses in hurricane and coastal storm risk management projects. The panel member should also be familiar with standard USACE coastal, hydrologic, hydraulic computer models. In addition, familiarity with the SBEACH, GENESIS, STWAVE, and ADCIRC computer applications/model is desired. The panel member should be capable of addressing the USACE Safety Assurance Review (SAR) requirements.
Structural Engineering	The panel member must be a registered professional engineer from academia, a public agency whose mission includes flood risk management, or an Architect-Engineer or consulting firm, with a minimum of 10 years of experience in structural engineering with an emphasis on storm risk management structural projects. In

	addition, the panel member should be an expert in structural analysis of solutions for storm risk management, including levees and floodwalls.
Geotechnical Engineering	The panel member should be a registered professional engineer with a minimum of 10 years' experience in geotechnical engineering with an emphasis on design of large civil works projects as well as non-structural flood risk management measures, or a professor from academia with extensive background in geotechnical engineering, with a minimum of MS degree or higher in engineering. The panel member should have expertise in the geotechnical engineering and foundations associated with levees and floodwalls. A registered professional engineer is required.

c. **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. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d 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 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 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 home MSC 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 REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering Directory of Expertise (DX), located in the Walla Walla District. The DX 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 DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water 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.

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 (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR.

- a. **Planning Models.** The following planning models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Certification / Approval Status
HEC-FDA (Flood Damage Analysis), version 1.4	The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program will be used to evaluate and compare the future without- and with-project plans in the study area to aid in the selection of a recommended plan to manage flood risk.	Certified
Environmental Habitat Model	TBD. Coordination with ECO-PCX is necessary.	TBD
Water Quality Modeling	TBD. Coordination with ECO-PCX is necessary.	TBD

- b. **Engineering Models.** The following engineering models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Model Description and How It Will Be Used in the Study	Approval Status
ADCIRC (Advanced CIRculation Model)	This finite element, numerical model is used to simulate depth averaged hydrodynamics of coastal water bodies. ADCIRC can be forced with astronomical tidal constituents, atmospheric wind and pressure fields, wave induced radiation stresses, and river discharge. It will be used to compute the flow fields associated with tides and storm conditions for with and without project conditions. The ADCIRC modeling effort represents the primary forcing for all subsequent modeling applications and builds off of the NACCS.	Certified

CMS-Flow (Coastal Modeling System - Flow)	This finite difference, numerical model is used to simulate hydrodynamics and sediment transport inside the littoral zone, through inlet and bay systems, and around engineering structures. This model works in conjunction with ADCIRC, STWave and CMS-WAVE.	Certified
STWave (STeady State Spectral Wave)	This steady state wave model will be used to simulate regional wave conditions. Forced with wind fields and/or an offshore wave spectrum, the model will compute wave transmission to the project site accounting for processes like directional spreading, refraction and breaking. STWave output at selected locations are used to force higher resolution wave models such as CMS-Wave or MIKE21.	Certified
CMS-Wave (Coastal Modeling System - Wave)	This finite difference, numerical wave model is used to simulate nearshore wave transformations. The model accounts for most wave shoaling processes including refraction, reflection, diffraction, breaking and infragravity wave propagation. This model may be forced by STWave computed spectrum and run iteratively with CMS-Flow. Wave radiation stresses are provided to the hydrodynamics calculation and CMS-Flow produced water levels and bathymetry are returned to the wave model modifying the transformations.	Certified
MIKE	The MIKE Suite of models can be used as an alternative to CMS-Flow, STWave and CMS-Wave. Available modules simulate wave propagation and transformation processes, nearshore hydrodynamics and sediment transport around structures. In addition the MIKE suite offers modules capable of simulating erosion and transport of cohesive and cohesive/granular sediment mixtures. Similarly, the MIKE suite of models work in conjunction with ADCIRC (the primary forcing of water levels to the system).	Certified
MII	MII is the second generation of the Micro-Computer Aided Cost Estimating System. It is a detailed cost estimating software application.	Cost Engineering Approved
Crystal Ball	Per ECB No. 2007-17, cost risk analysis methods will be used for the development of contingency for the total project cost estimate. Crystal Ball software is approved for use to conduct the total project cost and schedule risk analysis	Cost Engineering Approved

10. REVIEW SCHEDULES AND COSTS

- a. **ATR Schedule and Cost.** The estimated start for ATR of the draft feasibility report is May 2019. Review of the draft feasibility report will be concurrent with public, IEPR, and policy review, and will commence after the TSP Milestone. Review of the final feasibility report will commence after the Agency Decision Milestone. The ATR budget is \$110,000 for review of the draft feasibility report, and an additional \$60,000 for review of the final feasibility report.
- b. **Type I IEPR Schedule and Cost.** The estimated schedule for IEPR of the draft feasibility report is May 2019. Review of the draft feasibility report will be concurrent with public, ATR, and policy review, and will commence after the TSP Milestone. The IEPR budget is \$150,000.
- c. **Model Certification/Approval Schedule and Cost.** To be determined upon coordination with the CSRM PCX and ECO-PCX.

11. PUBLIC PARTICIPATION

The public will have an opportunity to comment on the draft feasibility report and EIS when it is made publically available after the TSP Milestone. Public comments and questions will be made available in the final feasibility report.

12. REVIEW PLAN APPROVAL AND UPDATES

The New York District Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (district, MSC, RMO, and HQUSACE) as to the appropriate scope and level of review for the decision document. The Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the plan up to date. Minor changes to the Review Plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as scope and/or level of review changes) should be re-approved by the MSC Commander following the process used to initially approve the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

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

- Stephen Couch, New York District, 917-790-8707
- Christopher Ricciardi, MSC, 347-370-4534
- Lawrence Cocchieri, RMO, 347-370-4571

ATTACHMENT 1: TEAM ROSTERS

Project Manager	Mark Lulka	Mark.F.Lulka@usace.army.mil	(917) 790-8205
Lead Planner	Danielle Tommaso	Danielle.M.Tommaso@usace.army.mil	(917) 790-8927
Technical Manager	Steve Weinberg	Steven.R.Weinberg@usace.army.mil	(917) 790-8391
Biologist	Rob Smith	Robert.J.Smith@usace.army.mil	(917) 790-8729

ATR team members to be designated by the CSRM PCX.

ATTACHMENT 2: STATEMENT OF TECHNICAL REVIEW FOR DECISION DOCUMENTS COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the <type of product> for <project name and location>. The ATR was conducted as defined in the project Review Plan to comply with the requirements of EC 1165-2-214. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and 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

Revision Date	Description of Change	Page / Paragraph Number

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

Acronym	Definition	Acronym	Definition
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
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	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
ER	Engineer Regulation	PL	Public Law
FDR	Flood Damage Reduction	QMP	Quality Management Plan
FEMA	Federal Emergency Management Agency	QA	Quality Assurance
FRM	Flood Risk Management	QC	Quality Control
FSM	Feasibility Scoping Meeting	RED	Regional Economic Development
GRR	General Reevaluation Report	RMC	Risk Management Center
Home District/MSD	The District or MSD responsible for preparing the decision document	RMO	Review Management Organization
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RTS	Regional Technical Specialist
IEPR	Independent External Peer Review	SAR	Safety Assurance Review
LRR	Limited Reevaluation Report	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act
NED	National Economic Development	WRRDA	Water Resources Reform and Development Act