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-RBT

MAY 27 2015

MEMORANDUM FOR Commander, New York District, (CENAN-EN / Mr. Connolly), 26 Federal Plaza, New York, NY 10278-0090

SUBJECT: Review Plan Approval for Long Beach Island Coastal Storm Risk Management Project, Long Beach, New York

1. References:

a. Email, CENAN-PP (R. Pinzon), 17 April 2015, Subject: RE: Long Beach Review Plan for Implementation Documents

b. EC 1165-2-214, Water Resources Policies and Authorities – Civil Works Review, 15 December 2012

2. The enclosed Review Plan for Long Beach Island Coastal Storm Risk Management Project, Long Beach, New York, was prepared in accordance with Reference 1.b. The plan outlines the review of implementation documents (design and construction) of all project features.

3. NAD Business Technical Division is the Review Management Organization for the Agency Technical Review. The Review Plan does not include Type II Independent External Peer Review (Safety Assurance Review) because the project does not include design or construction activities that involve potential hazards which pose a significant threat to human life.

4. The Review Plan for the Long Beach Island Coastal Storm Risk Management Project is approved. The Review Plan is subject to change as 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 this office.

5. In accordance with Reference 1.b, Appendix B, Paragraph 6, post this approved Review Plan on your district website for public review and comment. NAD will similarly post on the Division website.

6. The point of contact is Jeffrey Wisniewski, Sandy Lead Engineer, 347-370-4783 or jeffrey.wisniewski@usace.army.mil.

Encl

WILLIAM H. GRAHAM
Colonel, EN
Commanding

CF: (w/ encl)
CECW-NAD-RIT (M. Voich)
CENAN-EN (S. Mirza)
CENAN-PP (R. Pinzon)

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

CENAN-EN-MC

15 April 2015

MEMORANDUM FOR Commander, North Atlantic Division, ATTN: Sandy Coastal Management Division

SUBJECT: Review Plan for Long Beach Island Coastal Storm Risk Management Project in New York

1. In accordance with EC 1165-2-214 (Civil Works Review Policy) enclosed for your review and approval is the subject document.

2. The point of contact for the Review Plan is Sidrah Mirza of my staff at (917)-790-8346 or sidrah.h.mirza@usace.army.mil.

ARTHUR J. CONNOLLY, P.E.
Chief, Engineering Division

Encl: Review Plan

Review Plan

For

Long Beach Island
Coastal Storm Risk Management Project -
Implementation Documents

Submission Date: April 2015

MSC Approval Date:

US Army Corps
of Engineers
New York District

TABLE OF CONTENTS

1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of review for implementation documents. Implementation documents include plans and specifications (P&S) and a Design Documentation Report (DDR). This review plan defines the scope and level of review for the Long Beach Island Coastal Storm Risk Management Project.

b. References.

(1) EC 1165-2-214, Civil Works Review Policy, 15 Dec 2012
(2) ER 1110-1-12, Quality Management, 30 Sep 2006
(3) Public Law (PL) 113-2, the "DISASTER RELIEF APPROPRIATIONS ACT, 2013"
(4) ER 1110-1-12 – Engineering and Design Quality Management
(5) EC 1165-2-212 – Sea Level Change Considerations for Civil Works Programs
(6) ER 415-1-11 – Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews

c. Requirements. This review plan was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC) and BCOES (Biddability, Constructability, Operability, Environmental and Sustainability) review, Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review.

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 implementation documents is the Major Subordinate Command (MSC), (per EC 1165-2-214). Therefore, the RMO for the peer review effort described in this Review Plan is the North Atlantic Division.

3. PROJECT INFORMATION

a. Implementation Documents. This Review Plan has been prepared for the Design Documentation Report (DDR) and the plans and specifications (P&S) for the Long Beach Island Coastal Storm Risk Management project. The purpose of these documents is to provide a record of final design. Approval of the implementation documents is at the District Command level.

b. Project Description.

(1) The Long Beach Island project is a coastal storm risk management project which has been designed to provide risk reduction against wave attack, erosion, and inundation for homes and businesses along the 6.4 miles of ocean front of the barrier island. This project was authorized for construction by Section 101(a)(21) of the WRDA 1996, Public Law 104-303 and Chapter 4, Title X, Division A of the Disaster Relief Appropriations Act of 2013, Public Law 113-2, January 2013.

(2) The Hurricane Sandy Limited Reevaluation Report (HSLRR) for Long Beach Island is currently under review. The recommended plan provides for reduction of storm damages from coastal erosion and flooding by high surge events through a storm protective dune, berm, beach fill, dune planting, four new groins and the rehabilitation of the existing groin field throughout the length of the project area (6.4 miles).

(3) The recommended plan will be executed through 2 individual construction contracts.

(a) Contract 1 – rehabilitation of eighteen (18) existing groins (3 in Pt. Lookout, NY and 15 in Long Beach, NY) and the construction of four (4) new groins in Long Beach, NY.

(b) Contract 2 – 4.7 million cubic yards of beachfill, beach grass, and 65 pedestrian and vehicular walkovers/crossovers throughout the length of Long Beach, NY.

(4) This Review Plan will encompass both construction contracts and will be updated as each contract moves closer to a 100% submission. The schedule for the two contracts is as follows:

(a) Contract 1: 100% Submission: June 2015
RTA: July 2015
Award: August 2015

(c) Contract 2: DQC/ATR: May 2016
100% Submission: August 2016
RTA: September 2016
Award: November 2016

c. Factors Affecting the Scope and Level of Review.

(1) This review plan addresses all components of the recommended plan and will be updated accordingly. The implementation documents reflect post Hurricane Sandy conditions and take into account the latest regulation on Sea Level Rise.

(2) An assessment of the need for a Type II Independent External Peer Review, Safety Assurance Review, is documented in Section 6 of this Review Plan. This assessment by the New York District Chief of Engineering Division considered life

safety and other factors. This assessment was conducted for all components of the recommended plan.

4. DISTRICT QUALITY CONTROL (DQC) AND BCOES REVIEW

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 New York District will manage the DQC. The DQC process will be performed in two phases. The initial phase will be the day-to-day production reviews performed by the designers' supervisor, team leader, or senior engineer as the product is being developed. Qualified engineers/scientists not affiliated with the development of the product will be selected commensurate with the complexity of the product to be reviewed.

For Civil Works projects, the BCOES review will include evaluation of Plans and Specifications, Engineering Considerations and Instruction for Field Personnel (ECIFP) reports, the operations, maintenance, repair, replacement, and rehabilitation (OMRR&R) plan for the project and other required documents as mentioned in ER 415-1-11. The New York District will manage the BCOES review.

a. Documentation of DQC and BCOES. DQC (independent) and BCOES reviews will be documented through the use of DrChecks and a DQC/BCOES report/certificate.

b. Products to Undergo DQC and BCOES. All applicable documents will undergo DQC and BCOES reviews.

c. Required DQC and BCOES Expertise. DQC and BCOES review will be performed by staff in the home district that are not involved in the project design. The required disciplines for review are listed in Attachment 1. The DQC and BCOES review supplements the reviews provided by the project delivery team (PDT) during the course of completing the P&S.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all implementation documents. 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. 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 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. All implementation documents will undergo ATR.

b. Required ATR Team Expertise.

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works implementation documents and conducting 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 civil engineering).
Environmental Resources	Team member will have independently completed EA/EIS's and be well versed in the NEPA process, will have participated in partnerships with other environmental resource agencies, will have experience with identifying and resolving environmental issues in a coastal ecosystem, and will have experience with Section 106 actions and documentation.
Civil Engineering	Team member will be an expert in the field of civil engineering, especially in the review of coastal projects. The team member will be a licensed professional engineer.
Coastal Engineering	Team member will be an expert in the field of coastal processes and have a thorough understanding of sediment transport, application of wave forces and water levels over the likely range of storm return periods, and will have had experience designing groin structures. The team member will be a licensed professional engineer and a sea level rise expert.
Construction Manager	Team member will be a construction manager with 10 years of experience in the management of coastal projects. Team member will have experience as an Administrative Contracting Officer of both beach fill placement projects and construction of coastal structures. Team member will be a licensed professional engineer.

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 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 in order to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, PCX, 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 ER 1110-1-12. Unresolved concerns can be closed in DrChecks[sm] with a notation that the concern has been elevated to the vertical team for resolution.

d. Review Report. 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:

(1) Identify the document(s) reviewed and the purpose of the review;
(2) Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
(3) Include the charge to the reviewers;
(4) Describe the nature of their review and their findings and conclusions;
(5) Identify and summarize each unresolved issue (if any); and
(6) Include a copy of each ATR comment, the PDT response, a brief summary of the pertinent points in the follow on discussion, including any vertical coordination, and the agreed upon resolution.

e. ATR Certification: ATR will 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 for all the implementation documents. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

An IEPR may be required for implementation 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 an 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:

a. Type I IEPR. Type I IEPRs 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.

b. Type II IEPR. Type II IEPRs, or Safety Assurance Reviews (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.

c. Decision on IEPR.

(1) Type I IEPR's are conducted on project studies and reports. Since this review plan deals with implementation documents, a Type I IEPR is not applicable.

(2) Type II Independent External Peer Review, Safety Assurance Review, is required by EC 1165-2-214 for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life.

(3) Based on a risk informed assessment (attached memorandum dated August 2014 – Attachment 4), New York District Chief, Engineering Division determined that there is not a significant threat to human life associated with the Long Beach Island Coastal Storm Risk Management Project. Therefore a Type II IEPR is not required for this contract.

d. Products to Undergo IEPR. Not applicable.

e. Required IEPR Panel Expertise. Not applicable.

f. Documentation of IEPR. Not applicable.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All implementation documents will be reviewed for their compliance with law and policy. The DQC will facilitate the policy and legal compliance review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of results in implementation documents.

8. COST ENGINEERING DIRECTORATE OF EXPERTISE (DX) REVIEW AND CERTIFICATION

This is not applicable since this Review Plan is for implementation documents.

9. MODEL CERTIFICATION AND APPROVAL

This is not applicable since this project is in the Preconstruction, Engineering and Design phase and this relates to the use of certified or approved models for planning activities.

10. REVIEW SCHEDULES AND COSTS

a. ATR Schedule and Cost for Contract 1. The budget for the ATR is $35,000 and it is scheduled for April-May 2015.

b. ATR Schedule and Cost for Contract 2. The budget for the ATR is $50,000 and it is scheduled for May 2016.

11. PUBLIC PARTICIPATION

Public participation is not required in this review plan.

12. REVIEW PLAN APPROVAL AND UPDATES

The North Atlantic Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC (RMO), and HQUSACE members) as to the appropriate scope and level of review for the implementation documents. Like the PMP, the Review Plan is a living document and may change as the engineering and design progresses. The home district is responsible for keeping the Review Plan up to date. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, will be posted on the Home District's webpage.

13. REVIEW PLAN POINTS OF CONTACT

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

- Sidrah H. Mirza, NAN, EN Technical Manager, 917-790-8346
- Jeffrey Wisniewski, NAD, Sandy Lead Engineer, 347-370-4783

ATTACHMENT 1: TEAM ROSTERS

Project Delivery Team

Name	Role	Phone Number	E-mail Address
Ronald Pinzon	Project Manager	x-8627	Ronald.r.pinzon@usace.army.mil
Sidrah H. Mirza	EN Technical Manager	x-8346	Sidrah.h.mirza@usace.army.mil
Diane Rahoy	Coastal Engineer	x-8263	Diane.s.rahoy@usace.army.mil
David Yang, P.E.	Coastal Engineer	x-8270	David.w.yang@usace.army.mil
Taylor Canfield	Cost Engineer	(502)-315-6268	Stephen.t.canfield@usace.army.mil
Sam Cham	Civil Engineering Tech	x-8375	Sam.v.cham@usace.army.mil
Ross Hiner, P.E.	Structural Engineer	x-8379	Ross.d.hiner@usace.army.mil
Robert Smith	Environmental	x-8729	Robert.j.smith@usace.army.mil
Kate Alcoba	Biology/NEPA	x-8216	Catherine.j.alcoba@usace.army.mil
Dave Andersen	Real Estate	x-8456	David.c.andersen@usace.army.mil
Ellen Simon	Counsel	x-8158	Ellen.B.Simon@usace.army.mil

District Quality Control (DQC) Team

Name	Role	Phone Number	E-mail Address
Encer Shaffer, P.E.	EN Technical Manager	x-8360	Encer.r.shaffer@usace.army.mil
Shahid Shaikh, P.E.	EN Sandy Branch Design Team Leader	x-8066	Shahid.I.Shaikh@usace.army.mil
Anthony Schiano	Cost Engineer	x-8347	Anthony.schiano@usace.army.mil
Donald Cresitello	Planning	x-8608	Donald.E.Cresitello@usace.army.mil
Peter Weppler	Environmental	x-8634	Peter.M.Weppler @usace.army.mil
Christina Rasmussen	Coastal Engineer	x-8264	Christina.Rasmussen @usace.army.mil
Janice Lauletta	Structural Engineer	x-8283	Janice.A.Lauletta@usace.army.mil
Ellen Simon	Counsel	x-8158	Ellen.B.Simon@usace.army.mil

BCOES/VE Team

Name	Role	Phone Number	E-mail Address
Nancy Brighton	Environmental	x-8703	Nancy.j.brighton@usace.army.mil
Shewen Bian	Construction	x-6251	Shewen.W.Bian@usace.army.mil
Merissa Zuzulock	Construction	x-8313	Merissa.l.zuzulock@usace.army.mil
Ken Johnson	Construction	x-8484	Ken.W.Johnson@usace.army.mil
Ryan Ferguson	Construction	X-6156	Ryan.M.Ferguson@usace.army.mil
Alex Bachowski	Construction	x-8492	Alex.A.Bachowski@usace.army.mil
Jeff Gross	Value Engineering Officer	x-8296	Jeffrey.W.Gross@usace.army.mil
Randall Sprague, P.E.	Lead Value Engineer-Jacobs (A/E Firm)-	862.242.7258	Randall.sprague@jacobs.com

Agency Technical Review (ATR) Team

Name	Role	Review District
Daniel Chris Moore	ATR Lead	Wilmington District
Jennifer Owens	Environmental	Wilmington District
Kevin Conner	Civil & Coastal Engineer	Wilmington District
Michael Lyons	Construction	Jacksonville District

Vertical Team

Name	Role	Phone Number	E-mail Address
Jeffrey Wisniewski, P.E.	Lead Engineer, CENAD Sandy Coastal Management Division	347-370-4783	Jeffrey.wisniewski@usace.army.mil
Anthony Ciorra, P.E.	NAN PPMD Special Projects Coastal Restoration Chief	917-790-8208	Anthony.Ciorra@usace.army.mil
Peter Weppler	NAN-PL, Environmental Analysis Branch Chief	917-790-8634	Peter.M.Weppler@usace.army.mil
Frank Santangelo, P.E.	NAN-EN, Civil Resources Branch Chief	917-790-8266	Frank.A.Santangelo@usace.army.mil
Thomas Dannemann, P.E.	NAN-EN, Design Branch Chief	917-790-8363	Thomas.R.Dannemann@usace.army.mil
Mukesh Kumar, P.E.	NAN-EN, Cost Engineering Branch Chief	917-790-8421	Mukesh.Kumar@usace.army.mil
Robert Gerrits	NAN-EN, Engineering Management Chief	917-790-8288	Robert. gerrits@usace.army.mil
Lynn Bocamazo, P.E.	NAN-EN, EN Sandy Relief Branch Chief	917-790-8396	Lynn.M.Bocamazo@usace.army.mil
Ralph Tinari, P.E.	NAN-CO, Construction	917-790-8031	Ralph.F.Tinari@usace.army.mil
Steve Couch	NAN-PL, Section Chief, Coastal Section	917-790-8707	Stephen.Couch@usace.army.mil

ATTACHMENT 2: STATEMENT OF AGENCY TECHNICAL REVIEW

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the *<type of product>* for *<project name and location.>* The ATR was conducted as defined in the project's approved 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, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in DrChecks.

Signature & Date _____
Daniel Chris Moore
ATR Team Leader
Office Symbol

Signature & Date _____
Ronald Pinzon
Project Manager
Office Symbol

Signature & Date _____
NAME
Review Management Office (RMO) Representative
Office Symbol

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

Signature & Date _____
Arthur J. Connolly, P.E.
Chief, Engineering Division

CENAN-EN

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS

Term	Definition	Term	Definition
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
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	Engineering Regulation	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
HSLRR	Hurricane Sandy Limited Reevaluation Report	RMC	Risk Management Center
Home District/MSC	The District or MSC responsible for the preparation of 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
ITR	Independent Technical Review	USACE	U.S. Army Corps of Engineers
LRR	Limited Reevaluation Report	WRDA	Water Resources Development Act
MSC	Major Subordinate Command		

CENAN-EN-MC 24 March 2015

MEMORANDUM FOR RECORD

SUBJECT: Long Beach Island Coastal Storm Risk Management Project – Risk Informed Assessment of Significant Threat to Human Life

1. **Project Authorization.** This project was authorized for construction by Section 101(a)(21) of the WRDA 1996, Public Law 104-303 and Chapter 4, Title X, Division A of the Disaster Relief Appropriations Act of 2013, Public Law 113-2, January 2013.

2. **Project Description.** The Long Beach Island project is a coastal storm risk management project which has been designed to provide risk reduction against wave attack, erosion, and inundation for homes and businesses along the 6.4 miles of ocean front of the barrier island. The recommended plan from the 2013 HSLRR, which includes a groin field and a dune and berm cross-section, has been separated out into two construction contracts as follows:

- Contract 1: Rehabilitation of 18 existing groins and existing revetment and construction of 4 new groins

- Contract 2: Placement of 4.7 M cubic yards (dune and berm) on Long Beach, construction of 65 pedestrian and vehicular access structures, beach grass and sand fence installation

3. **Type II IEPR.** A Type II IEPR is required for any project that would pose a significant threat to human life (public safety).

The attached risk informed assessment matrix summarizes the low threat to life safety for the Long Beach Island Project. All of the risk factors have a "low" risk magnitude. The main purpose of this project is the construction of new groins, rehabilitation of several existing groins, and a dune and berm component. The new and rehabilitated groins will provide increased protection against erosion (for the beach). In the event of construction, flanking and/or structure failure, the groins will not alter the risk of flooding or wave attack over that of existing conditions. Construction or failure of the dune and berm elements will reduce the risk of flooding or wave attack over that of existing conditions. Failure of the dune line would reduce the dune crest elevation, but overwash of sand landward will result in higher remnant dune elevation than the existing without project elevation, which will provide some residual protection.

Other factors that were taken into consideration:

a. A Type II IEPR is required if the project involves the use of innovative materials or techniques where the engineering is based on novel methods, presents complex challenges for interpretations, contains precedent-setting methods or models, or presents conclusions that are likely to change prevailing practices.

The project does not involve use of any new or innovative methods. The design and rehab of the groins falls within prevailing practice and Corps of Engineers guidance (EM 110-2-1614: Design of Coastal Revetments, Seawalls, and Bulkheads).

b. A Type II IEPR is required if the project requires redundancy, resiliency, and robustness.

Redundancy: The project involves redundancy in the groin design and by the eighteen (18) rehabilitations increasing the length of the groin field. However the risk level is low because duplication of critical components of the protective system is required to increase the reliability of the system. The dune is continuous through the entire length of the project and reduces the risk to human life and property relative to the existing condition.

Resiliency: The risk level is low. The plan includes annual maintenance of the stone groins and monitoring of all shore protection systems. The dune and berm element of the project includes resiliency in the form of regular beach nourishment and post-storm emergency dune and berm rehabilitation.

Robustness: While natural events can occur that are greater than the optimized project design and could potentially lead to failure, the risk level is low. This is because the worst case wave and water level conditions for the groins occur when still water levels are at or near the structure crest elevation, which falls within the range of water levels considered during project design. The dune and berm design of the project considered storm events up to a 500-yr return interval and long-term erosion derived from the sediment budget which reflects sea-level rise over the period of analysis. Dune and berm designs are adaptable to changes in water level with opportunities to incorporate additional volume as part of regularly scheduled renourishment operations.

c. A Type II IEPR is required if the project has unique construction sequencing or a reduced or overlapping design construction schedule.

The project does not have unique construction sequencing or a reduced or overlapping design construction schedule.

Since the threat assessment is low or not applicable in the aforementioned categories, a type II IEPR is not required for the Long Beach Island Coastal Storm Risk Management Project.

4. **Determination**. A Type II IEPR is not warranted for both construction contracts for the Long Beach Island Coastal Storm Risk Management Project.

Encl.
Risk Assessment Matrix

for ARTHUR J. CONNOLLY, P.E.
C, Engineering Division

CONTRACT 1 – Groin Rehabilitation and New Groin Construction
CONTRACT 2 – Beach Fill, Pedestrian and Vehicle Accessways

Risk Informed Assessment

1. **References.**

a.) EC 1165-2-214 – Civil Works Review Policy

2. **Risk Assessment Matrix**. In accordance with EC 1165-2-214 (exp. 15 Dec 14) Civil Works Review, the Water Resources Development Act (WRDA) of 2007, Section 2035 requires a Safety Assurance Review (SAR) of "the design and construction activities for hurricane and storm damage reduction and flood damage reduction projects".

A risk informed assessment (ref. Civil Works Review Policy, Appendix E, Paragraph 2) was made to determine whether there is a significant threat to human life from construction of Contracts 1 and 2 of the Long Beach Coastal Storm Risk Management Project Recommended Plan. The risk assessment is presented in Tables 1 and 2 below.

Contract 1 will consist of:

- Construction of four (4) new stone groins in Point Lookout,
- Rehabilitation of three (3) existing stone groins in Pt. Lookout, and
- Rehabilitation of four (15) existing stone groins in Long Beach

Contract 2 will consist of:

- Placement of approximately 4.7 MCY of beach fill (dune & berm cross-section plus advanced nourishment fill) including dune grass planting and sand fence installation
- Construction of 65 pedestrian and vehicular access structures

Table 1: Risk Assessment for Significant Threat to Life Safety, Long Beach Coastal Storm Risk Management Project – New Groin Construction and Existing Groin Rehabilitation (Contract 1)

No.	Risk Factor (Significant Threat to Life Safety)	Risk Magnitude (H/M/L)	Basis of Concern	Risk Assessment
1	Land Use adjacent to the project		Long Beach is a fully developed barrier island approximately 10 miles long located in Nassau Co., New York. The Atlantic Ocean is to the south, Reynolds Channel to the north, and East Rockaway and Jones Inlets to the west and east respectively.	Land use adjacent to the project is primarily residential, and mixed commercial, plus park/recreational. Risk Assessment details are provided in 1a-c below.
1a	Population Density	Low	Population density in developed areas ranges from 15,500 persons/sq. mi. in the City of Long Beach to 6,100 persons/sq. mi. in Point Lookout (US Census survey 2010).	Population is dense over most of the Long Beach barrier island; so many people could be affected by flooding, wave attack, or project failure. However, construction or failure of Contract 1 elements (new groins and rehabilitation of existing groins) will not alter the risk of flooding or wave attack over that of existing conditions. The new and rehabilitated groins will provide increased protection against erosion, even in the event of flanking or structure failure.
1b	Critical Facilities Affected (e.g. schools, hospitals, assisted living/nursing homes, evacuation routes)	Low	Critical facilities on the Long Beach barrier island include but may not be limited to; seven public elementary through high schools; several private schools and post-secondary education facilities; police and fire facilities; and a sewage treatment plant. Vehicle evacuation to the mainland is via three bridges, the Atlantic Beach bridge in the western half of the island, Long Beach Blvd. in the center, and the Loop Parkway Bridge in the eastern half. Access/egress is also available via the Long Island Railroad.	Critical facilities exist in the project area and flooding or damage to these facilities could adversely affect the populous. However, construction or failure of Contract 1 elements (new groins and rehabilitation of existing groins) will not alter the risk of flooding or wave attack over that of existing conditions. The new and rehabilitated groins will provide increased protection against erosion, even in the event of flanking or structure failure. Multiple (redundant) evacuation routes are in place, and Nassau County has a record of successful past evacuations. Construction or failure of

				Contract 1 elements will not affect evacuation routes.
1c	Number or types of structures in floodplain	Low	The study area encompasses approximately 10,200 residential structures and 1,300 non-residential structures. There are approximately 3,000 homes within the FEMA 100-yr flood plain.	Many structures exist in the floodplain which could be affected by flooding and/or project failure. However, construction or failure of Contract 1 elements (new groins and rehabilitation of existing groins) will not alter the risk of flooding or wave attack over that of existing conditions. The new and rehabilitated groins will provide increased protection against erosion, even in the event of flanking or structure failure.
2	Inundation of protected side due to project failure	Low	The project will be subject to increased risk in the event of failure of the ocean side line of protection.	Failure of the project dune line as a result of overtopping and/or erosion will expose residents to the higher Atlantic Ocean water levels (e.g, Atlantic water levels will be higher than water levels in Reynolds Channel on the north side due to wave effects.) Overtopping of the dunes or breaches in the dune line will increase flooding. However, Contracts 1 does not include sand fill placement and will not alter the risk of flooding or wave attack over that of existing conditions. The new and rehabilitated groins will provide increased protection against erosion of existing sand beach & dunes, even in the event of flanking or structure failure.
3	Shoreline Storm Erosion	Low	Coastal storms often result in significant shore erosion over short time periods which can undermine structures	The new and rehabilitated groins are designed for stability without surrounding sand fill, so short term storm erosion is unlikely to result in structure failure. Failed groin structures will still provide residual protection from the remnant pile of armor and smaller stones.
4	Wave Attack	Low	Overtopping of the dune/berm by waves during high water level events can result in damage to structures from direct wave impact.	Worst-case wave and water level conditions for the groins occur when still water levels are at or near the structure crest elevation, which falls within the range of water levels considered during design. Wave attack is unlikely to result in structure failure.

5	Use of unique or non-traditional design methods	Low	Unique or non-traditional design methods may be poorly understood or inadequately designed and may be more subject to failure than proven design methods.	Engineering for the new and rehabilitated groins employed accepted methods in accordance with COE guidance. No innovative or precedent setting methods or models were used.
6	Use of unique or non-traditional design features	Low	Unique or non-traditional design features may be poorly understood or inadequately designed and may be more subject to failure than proven design features.	Design of the new and rehabilitated groins falls within prevailing practice and Corps of Engineers guidance.
7	Use of unique or non-traditional construction materials or methods	Low	Unique or non-traditional construction materials or methods may be poorly understood or executed inadequately resulting in a project feature that may be more subject to failure than those built with proven materials and methods.	All materials and construction techniques used for the new and rehabilitated groins are in common practice.
8	Does the project have unique construction sequencing or a reduced or overlapping design/ construction schedule?	Low	Unique or accelerated construction sequencing may lead to poor quality work, leading to greater possibility of future project failure.	Sufficient time is available for completion of construction including all environmental shut-down windows.
9	Inherent risk with construction methods	Low	Construction may be hazardous.	All construction techniques used for the new and rehabilitated groins are in common practice. Additionally, construction occurs on the beach, generally away from residences and development. Safety precautions such as temporary fencing, hard hat requirements, etc. are included in the Plans & Specifications.
10	Does the project design require:			
10a	Redundancy	Low	Failure of one critical project element would result in sudden, catastrophic damage. Duplication of critical components of the protective system is required to increase the reliability of the system.	Redundancy is present in the groin design via the use of low allowable damage in Hudson's Equation. Redundancy is also provided by rehabilitation of existing stone groins, which increases the length of the effective groin field.
10b	Resiliency	Low	Erodible structures are reduced in volume over time, providing	Contract 1 does not include any erodible features.

			less protective capacity.	The Recommended Plan includes annual maintenance of the stone groins, and monitoring of all shore protection elements.
10c	Robustness	Low	Natural events can occur that are greater than the optimized project design, and may lead to project failure.	Worst-case wave and water level conditions for the groins occur when still water levels are at or near the structure crest elevation, which falls within the range of water levels considered during project design. Water levels higher than worst-case groin design conditions will cushion the stone structures against damage. The overall project includes periodic beach nourishment, which will eliminate or reduce the risk of flanking.

Table 2: Risk Assessment for Significant Threat to Life Safety, Long Beach Coastal Storm Risk Management Project – Beach Fill, Pedestrian, and Vehicular Access ways (Contract 2)

No.	Risk Factor (Significant Threat to Life Safety)	Risk Magnitude (H/M/L)	Basis of Concern	Risk Assessment
1	Land Use adjacent to the project	---	Long Beach is a fully developed barrier island approximately 10 miles long located in Nassau Co., New York. The Atlantic Ocean is to the south, Reynolds Channel to the north, and East Rockaway and Jones Inlets to the west and east respectively.	Land use adjacent to the project is primarily residential, and mixed commercial, plus park/recreational. Risk Assessment details are provided in 1a-c below.
1a	Population Density	Low	Population density in developed areas ranges from 15,500 persons/sq. mi. in the City of Long Beach to 6,100 persons/sq. mi. in Point Lookout (US Census survey 2010).	Population is dense over most of the Long Beach barrier island; so many people could be affected by flooding; wave attack, or project failure. Construction of the beach and dune elements along the Atlantic shore will reduce the risk of flooding or wave attack over that of existing conditions. Failure of the dune line would reduce the dune crest elevation, but overwash of sand landward will result in higher remnant dune elevation than the existing

				without project elevation, which will provide some residual protection. Bayside flooding will remain the same under with- and without project conditions.
1b	Critical Facilities Affected (e.g. schools, hospitals, assisted living/nursing homes, evacuation routes)	Low	Critical facilities on the Long Beach barrier island include but may not be limited to; seven public elementary through high schools; several private schools and post-secondary education facilities; police and fire facilities; and a sewage treatment plant. Vehicle evacuation to the mainland is via three bridges, the Atlantic Beach bridge in the western half of the island, Long Beach Blvd. in the center, and the Loop Parkway Bridge in the eastern half. Access/egress is also available via the Long Island Railroad.	Critical facilities exist in the project area and flooding or damage to these facilities could adversely affect the populous. However, construction or failure of Contract 2 elements (berm and dune plus accessways) will reduce the risk of flooding or wave attack over that of existing conditions. Failure of the dune line would reduce the dune crest elevation, but overwash of sand landward will result in higher remnant dune elevation than the existing without project elevation, which will provide some residual protection. Bayside flooding will remain the same under with- and without project conditions. Multiple (redundant) evacuation routes are in place, and Nassau County has a record of successful past evacuations. Construction or failure of Contract 2 elements will reduce risk to evacuation routes.
1c	Number or types of structures in floodplain	Low	The study area encompasses approximately 10,200 residential structures and 1,300 non-residential structures. There are approximately 3,000 homes within the FEMA 100-yr flood plain.	Many structures exist in the floodplain which could be affected by flooding and/or project failure. However, construction or failure of Contract 2 elements (berm and dune plus accessways) will reduce the risk of flooding or wave attack over that of existing conditions. Failure of the dune line would reduce the dune crest elevation, but overwash of sand landward will result in higher remnant dune elevation than the existing without project elevation, which will provide some residual protection. Bayside flooding will remain the same under with- and without project conditions.

2	Inundation of protected side due to project failure	Low	The project will be subject to increased risk in the event of failure of the ocean side line of protection.	Failure of the project dune line as a result of overtopping and/or erosion will expose residents to the higher Atlantic Ocean water levels (e.g, Atlantic water levels will be higher than water levels in Reynolds Channel on the north side due to wave effects.) Overtopping of the dunes or breaches in the dune line will increase flooding. Failure of the dune line would reduce the dune crest elevation, but overwash of sand landward will result in higher remnant dune elevation than the existing without project elevation, which will provide some residual protection. Bayside flooding will remain the same under with- and without project conditions.
3	Shoreline Storm Erosion	Low	Coastal storms often result in significant shore erosion over short time periods which can undermine structures	Contract 2 structures consist of pedestrian and vehicular access structures which will provide passage over the dune line to the berm. These structures are not essential to the storm damage reduction function of the project. The accessways are pile supported structures which can tolerate short term undermining, or at-grade gravel surface passageways which are relatively low cost and simple to replace.
4	Wave Attack	Low	Overtopping of the dune/berm by waves during high water level events can result in damage to structures from direct wave impact.	Failure of the dune line would reduce the dune crest elevation, but overwash of sand landward will result in higher remnant dune elevation than the existing without project elevation, which will provide more protection against wave attack than existing conditions.
5	Use of unique or non-traditional design methods	Low	Unique or non-traditional design methods may be poorly understood or inadequately designed and may be more subject to failure than proven design methods.	Engineering for the beach fill and access structures employed accepted methods in accordance with COE guidance. No innovative or precedent setting methods or models were used.
6	Use of unique or non-traditional design	Low	Unique or non-traditional design features may be poorly understood or inadequately designed and may be more	Design of the beach fill and access structures falls within prevailing practice and Corps of Engineers guidance.

	features		subject to failure than proven design features.	
7	Use of unique or non-traditional construction materials or methods	Low	Unique or non-traditional construction materials or methods may be poorly understood or executed inadequately resulting in a project feature that may be more subject to failure than those built with proven materials and methods.	All materials and construction techniques used for the beach fill and access structures are in common practice.
8	Does the project have unique construction sequencing or a reduced or overlapping design/ construction schedule?	Low	Unique or accelerated construction sequencing may lead to poor quality work, leading to greater possibility of future project failure.	Sufficient time is available for completion of construction including all environmental shut-down windows.
9	Inherent risk with construction methods	Low	Construction may be hazardous.	All construction techniques used for the beach fill and access structures are in common practice. Additionally, construction occurs on the beach, generally away from residences and development. Safety precautions such as temporary fencing, hard hat requirements, etc. are included in the Plans & Specifications.
10	Does the project design require:			
10a	Redundancy	Low	Failure of one critical project element would result in sudden, catastrophic damage. Duplication of critical components of the protective system is required to increase the reliability of the system.	Construction of the dune and berm components greatly reduces the risk to human life and property relative to the existing condition. Nonperformance of the dune and berm system would result in flood levels, erosion, and/or wave forces less than or equal to those present under existing conditions.
10b	Resiliency	Low	Erodible structures are reduced in volume over time, providing less protective capacity.	The dune and berm elements of the project includes resiliency in the form of regular beach renourishment, and post-storm emergency dune and berm rehabilitation. Estimated annual costs also include allowance for maintenance of the stone groins, accessways, and monitoring of all shore protection elements.

10c	Robustness	Low	Natural events can occur that are greater than the optimized project design, and may lead to project failure.	The berm and dune design considered storm events up to a 500-year return interval, and long-term erosion derived from the sediment budget which reflects sea-level rise over the period of analysis. Dune and berm designs are adaptable to changes in water level due to climate change (sea level rise), with opportunities to incorporate additional volume and/or dune/berm elevation as part of regularly scheduled renourishment operations.