



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

NOV 14 2014

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

SUBJECT: Review Plan Approval for Atlantic Coast of New Jersey, Sandy Hook to
Barnegat Inlet Beach Erosion Control Project (Section I: Sea Bright to Ocean Township,
Elberon to Loch Arbour Reach)

1. References:

a. Email, CENAN-EN (A. Zuzulock), 29 May 2014, Subject: RE: Review Plan:
Elberon to Loch Arbour Implementation Documents

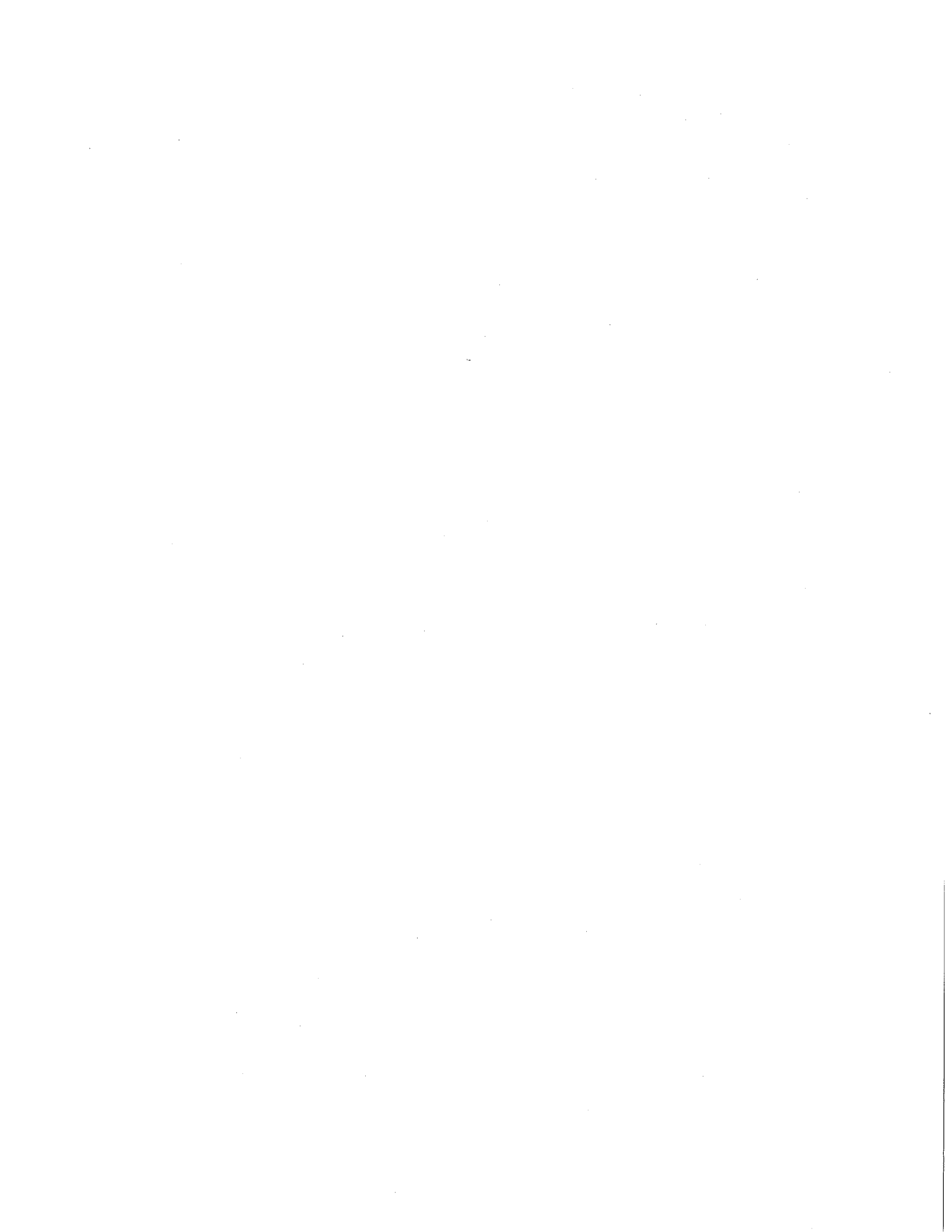
b. EC 1165-2-214, Water Resources Policies and Authorities – Civil Works Review,
15 December 2012

2. The enclosed Review Plan for Atlantic Coast of New Jersey, Sandy Hook to
Barnegat Inlet Beach Erosion Control Project (Section I: Sea Bright to Ocean Township,
Elberon to Loch Arbour Reach) 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 Elberon to Loch Arbour Reach of the Barnegat Inlet Beach
Erosion Control 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.

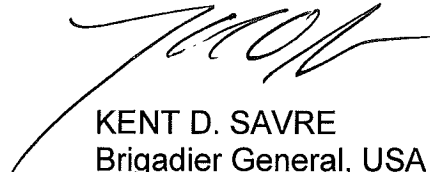


CENAD-RBT

SUBJECT: Review Plan Approval for Atlantic Coast of New Jersey, Sandy Hook to Barnegat Inlet Beach Erosion Control Project (Section I: Sea Bright to Ocean Township, Elberon to Loch Arbour Reach)

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

Encl



KENT D. SAVRE
Brigadier General, USA
Commanding

CF: (w/ encl)
CECW-NAD-RIT (M. Voich)
CENAN-EN (A. Zuzulock)

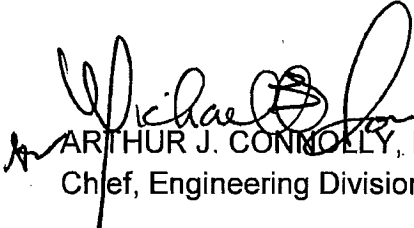
CENAN-EN

5 May 2014

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

SUBJECT: Review Plan for Sandy Hook to Barnegat Beach Erosion Control Project, Loch Arbour to Elberon Reach

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 Andrew Zuzulock of my staff at (917) 790-8241.


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

Encl
Review Plan

CF:
C, CENAN-PL
C, CENAN-PP

Review Plan

For

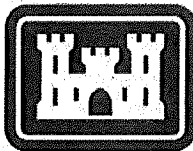
Atlantic Coast of New Jersey, Sandy Hook to

Barnegat Inlet Beach Erosion Control Project,

Section I: Sea Bright to Ocean Township,

Elberon to Loch Arbour Reach

Implementation Documents



**US ARMY CORPS
OF ENGINEERS
NEW YORK DISTRICT**

May 2014

29 May 2014

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1. PURPOSE AND REQUIREMENTS

a. Purpose

This Review Plan defines the scope and level of review for the implementation documents for the Elberon to Loch Arbour Reach of Section I of the Sandy Hook to Barnegat Inlet, NJ Beach Erosion Control Project. 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 Elberon to Loch Arbour Reach of Section I of the Sandy Hook to Barnegat Inlet Beach Erosion Control Project, construction contracts 1 and 2.

b. References

1. EC 1165-2-214, Civil Works Review Policy, 15 December 2012
2. ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
3. ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006 as revised through 31 March 2011
4. Public Law (PL) 113-2, "Disaster Relief Appropriations Act, 2013"
5. ER 1100-2-8162, Incorporating Sea Level Change in Civil Works Programs, 31 Dec 2013
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 projects by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review, and Policy and Legal Compliance Review.

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall 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 review effort described in this Review Plan is the North Atlantic Division.

3. PROJECT INFORMATION AND BACKGROUND

a. Implementation Documents. This Review Plan has been prepared for the implementation documents for the Elberon to Loch Arbour reach of Section I of the Sandy Hook to Barnegat Inlet, NJ Beach Erosion Control Project. The purpose of these documents is to provide a record of final design for the beach berm, groin modifications, and storm water system changes. Approval of the implementation documents is at the District Command level. The plans and specifications for the implementation documents will be developed in two phases (Contract 1 and Contract 2) to support the overall project construction schedule. Each construction contract will consist of beach berm, groin modifications, and storm water system changes. Contract 1 will cover Loch Arbour through Deal, NJ, and Contract 2 will cover Deal through Elberon, NJ.

b. Project Description.

This project is authorized in Section 102r of WRDA 1992. A Hurricane Sandy Limited Reevaluation Report for the Elberon to Loch Arbour reach of Section I of the Sandy Hook to Barnegat Inlet Beach Erosion Control Project is currently under review by the North Atlantic Division. The recommended plan provides for reduction of storm damages from coastal erosion and flooding caused by high surge events through storm protective berm, beach fill, groin modifications, and storm water outfall extensions. The State of New Jersey, acting through the Department of Environmental Protection, is the non-Federal sponsor for this project. The implementation documents reflect post- Hurricane Sandy conditions.

c. Factors Affecting the Scope and Level of Review.

The focus of this Review Plan is on the implementation documents (DDR, plans, and specifications) for the Elberon to Loch Arbour Reach of the Sandy Hook to Barnegat Inlet, NJ Beach Erosion Control Project.

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 including whether the project includes redundancy, resiliency, and robustness; and whether the project has unique construction sequencing. This assessment was conducted for the entirety of the Elberon to Loch Arbour reach and includes all components of the selected plan.

4. DISTRICT QUALITY CONTROL (DQC) AND BCOES Review

All implementation documents 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 New York District will manage the DQC and BCOES reviews.

- a. **Documentation of DQC and BCOES Reviews.** DQC and BCOES will be documented through the use of DrChecks, a DQC report, and DQC/ BCOES certificates.
- 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 development of implementation documents. The required disciplines for review are listed in page 6. The DQC and BCOES reviews supplement the reviews provided by the Project Delivery Team during the course of completing the DDR and 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.** The products that will undergo ATR are the DDR and the Plans and Specifications.
- 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.
Environmental Resources	Team member will have independently completed EA/EIS's and be well versed in

	<p>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.</p>
Coastal Engineering	<p>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, beach fill design including renourishment, determination of risk due to sea level rise, and design of coastal structures, such as groins. The team member will be a licensed professional engineer.</p>
Civil Engineering	<p>Team member will be an expert in the field of civil engineering, especially in the review of coastal projects. Team member will have experience in the design of storm water utility systems and retention systems. The team member will be a licensed professional engineer.</p>
Structural Engineering	<p>Team member will be an expert in the field of structural engineering, especially in review of coastal structures. Team member will have experience in the design of pile supported structures and structures that are subject to wave force loading. The team member will be a licensed professional engineer.</p>
Geotechnical Engineering	<p>Team member will be an expert in the field of geotechnical engineering, especially in the review of coastal projects. The team member should have experience with pile foundations and foundation behavior in the surf zone. Team member should have an understanding of beach fill placement projects. The team member will be a licensed professional engineer.</p>

Construction Manager	Team member will be a construction manager with 10 years 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.
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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:

- i. The review concern- identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
- ii. The basis for the concern- cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- iii. The significance of the concern- indicate the importance of the concern with regard to its potential impact on the plan components, efficiency, effectiveness, implementation responsibilities, safety, Federal interest, or public acceptability; and
- iv. The probable specific action needed to resolve the concern-identify the actions 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, 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 comment resolution process described in ER 1110-1-12. Unresolved concerns can be closed in DrChecks 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 documents 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. Identify and summarize 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 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 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 existing and potential hazards pose a significant threat to human life.
- (3) Based on a risk informed assessment (attached memorandum dated 29 May 2014- Attachment 4), New York District Chief, Engineering Division determined that there is not a significant threat to human life associated with the Sandy Hook to Barnegat Inlet Beach Erosion Control Project, Section I: Sea Bright to Ocean Township, Elberon to Loch Arbour Reach. 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. DQC facilitate the policy 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 a decision document requiring Congressional authorization is not being prepared.

9. MODEL CERTIFICATION AND APPROVAL

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.** The schedule and costs budgeted for ATR reviews are as follows:
Contract 1- 100% Plans and Specifications- August 2014 (\$20,000)
Contract 2- 100% Plans and Specifications- November 2014 (\$20,000)
- b. IEPR Schedule and Cost.** Not applicable
- c. Model Certification/ Approval Schedule and Cost.** Not applicable

11. PUBLIC PARTICIPATION

As significant changes or developments occur, the District will present this information to the NJDEP and the applicable municipal entities. Any significant comments or concerns raised by the Project Delivery Team that will include our non-Federal sponsors and stakeholders will be brought to the attention of the ATR panel. In addition, the review plan and updated fact sheets will be posted on the New York District's web site.

12. REVIEW PLAN APPROVAL AND UPDATES

The North Atlantic Division Commander, or his representative, 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 Commander's approval memorandum, will be posted on the Home District's web page.

13. REVIEW PLAN POINTS OF CONTACT

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

- Andrew Zuzulock, NAN, EN Technical Manager, 917-790-8241
- Jeffrey Wisniewski, Lead Engineer, NAD Sandy Coastal Management Division, 347-370-4783

Attachment 1- Team Rosters

District Project Delivery Team

Responsibility	Name	Contact
Technical Manager	Andrew Zuzulock	917-790-8241
Project Manager	Frank Verga	917-790-8212
Project Planner	Stephen Couch	917-790-8707
Coastal Engineer	Lynn Bocamazo	917-790-8396
Civil Engineer	Suzana Saric	917-790-8374
Environmental Resources	Howard Ruben	917-790-8723
Structural Engineer	Jeffrey Gross	917-790-8285
Geotechnical Engineer	Stanley Sedwick	917-790-8370

ATR Team

Name	Role	Review District
	ATR Lead	
	Civil Engineer	
	Coastal Engineer	
	Environmental Resources	
	Structural Engineer	
	Geotechnical Engineer	
	Construction Manager	

Vertical Team

Name	Role	Phone Number	E-mail Address
Anthony Ciorra, P.E.	NAN PPMD; Chief, Coastal Restoration and Special Projects Branch	917-790-8208	Anthony.Ciorra@usace.army.mil
Nancy Brighton	NAN-PL, Acting Environmental Analysis Branch Chief	917-790-8703	Nancy.J.Brighton@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
Lynn Bocamazo, P.E.	NAN-EN, Chief, Hurricane Sandy Branch	917-790-8396	Lynn.M.Bocamazo@usace.army.mil
Jeff Wisniewski, P.E.	NAD, Lead Engineer, Sandy Coastal Management Division	347-370-4783	Jeffrey.wisniewski@usace.army.mil

ATTACHMENT 2: SAMPLE STATEMENT OF 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 Review Plan to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, alternatives evaluated, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing 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 DrCheckssm.

SIGNATURE

Name

Date

ATR Team Leader

Office Symbol/Company

SIGNATURE

Name

Date

Project Manager

Office Symbol

SIGNATURE

Name

Date

Architect Engineer Project Manager¹

Company, location

SIGNATURE

Name

Date

Review Management Office Representative

Office Symbol

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: Describe the major technical concerns and their resolution.

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

SIGNATURE

Name

Date

Chief, Engineering Division

Office Symbol

SIGNATURE

Name

Date

Architect Engineer Principal

Office Symbol

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
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	Ecosystem Restoration	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
Home District/MSD	The District or MSD responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical 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

MEMORANDUM For Record

SUBJECT: Sandy Hook to Barnegat Inlet Beach Erosion Control Project, Section I (Sea Bright to Ocean Township), Loch Arbour to Elberon Reach- Risk Informed Assessment of Significant Threat to Human Life

1. Project Information. The recommended plan resulting from the Hurricane Sandy Limited Reevaluation Report provides for reduction of storm damages from coastal erosion and flooding caused by high surge events through construction of a beach berm. The State of New Jersey, acting through the Department of Environmental Protection, is the non-Federal sponsor for the project. A Review Plan is being prepared for the implementation documents.

2. Project Description. This project consists of construction of a beach berm, extension of existing storm water outfalls, and groin modifications along the Atlantic Coast of New Jersey, from Loch Arbour to Elberon.


3. Risk Informed Assessment. In accordance with EC 1165-2-214, Civil Works Review, 15 December 2012, a risk informed assessment was made as to whether there is a significant threat to human life from the project components (Table 1). The key factors considered are:

- a. The Sandy Hook to Barnegat Inlet, Loch Arbour to Elberon Reach project components provide reduction in storm damage by reducing wave-induced property damage and reducing shoreline storm erosion.
- b. Failure of the shore protection component of the project would most likely be from gradual erosion followed by a significant coastal storm event. The State of New Jersey has the resources to monitor the shore protection component of the project if there is erosion that reduces the features of the project (berm width and height). The Corps and the State have capabilities to maintain the shore protection project features over the life of the project.
- c. Furthermore, traditional and proven design features and traditional and proven construction materials and methodologies will be used. All elements in construction that may pose a risk are identified and methodologies are in place to reduce the human life safety risk to low.

4. Determination. Based on a risk informed assessment which considered life safety factors, I have determined that there is not a significant threat to human life associated with the Sandy Hook to Barnegat Inlet Beach Erosion Control Project, Section I (Sea Bright to Ocean

Township), Loch Arbour to Elberon Reach. Accordingly, it is recommended that a Type II IEPR, Safety Assurance Review, is not warranted.

Encl


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

Risk Informed Assessment. In accordance with EC 1165-2-214, Civil Works Review Policy, Appendix E, Paragraph 2, a risk informed assessment was made as to whether there is a significant threat to human life from the shore protection project component, which would thereby require a Safety Assurance Review.

Table 1: Risk Assessment for Significant Threat to Life Safety, Sandy Hook to Barnegat Inlet Beach Erosion Control Project, Loch Arbour to Elberon Reach.

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	Low	Elberon, Deal, Allenhurst, and Loch Arbour are suburban communities located within Monmouth County, New Jersey. The northern border of this reach is 1,100 feet north of Lake Takanassee and the southern border is the Deal Lake outfall, on the border between Loch Abour and Asbury Park.	Land use is primary residential, single family homes. Risk Assessment details are provided in 1c below.
1a	Population Density	Low	Elberon, Deal, Allenhurst, and Loch Arbour are suburban areas that are largely second home communities. Deal's population is 750, Allenhurst's population is 496, and Loch Arbour's population is 194. These numbers are increased in the summer.	The area landward of the project area has a suburban population density that is seasonal. Construction of shore protection features, such as the beach berm, will not increase the risk of flooding/ inundation over pre-project conditions. Construction of the beach berm does not create a risk of sudden catastrophic failure.
1b	Critical Facilities Affected (e.g. schools, hospitals, assisted living/nursing homes, evacuation routes)	Low	Ocean Avenue provides primary north-south evacuation route from the project area and is the only state level evacuation route landward of the project area. Each street end provides westerly egress from the project area.	Construction of the berm as part of the beach erosion control project will increase the protection of the evacuation route. The construction of the beach berm does not create a risk of sudden catastrophic failure.
1c	Number or types of structures in floodplain	Low	Within the entire project area, there are 26 structures within the floodplain.	Most of the structures within the floodplain are currently in a VE zone. These structures will be at a lower risk to damage by waves after the construction of the beach berm. The beach berm itself is not a project element that is at risk of catastrophic failure, and the existence of a beach berm will not change the conditions under which

				homes are evacuated. The other residential structures in the project area that are in the floodplain are in the floodplain of Deal Lake. The Deal Lake Outfall will be modified as part of this project and an interim operational plan will be implemented to prevent impoundment at the outfall.
2	Inundation of protected side due to project failure	Low	Following completion of the line of protection, the project will be subject to risk due to catastrophic failure of any portion of the berm.	Completion of the berm component alone does not have a risk of inundation due to sudden catastrophic failure.
3	Shoreline Storm Erosion	Low	Coastal storms often result in significant shore erosion over short time periods which can undermine structures	Construction of the shore protection component will increase berm width, height, and volume which will lessen the risk of storm erosion because of increased berm width.
4	Wave Attack	Low	Overtopping of the berm by waves during high water level events can result in damage to structures from direct wave impact.	Construction of the shore protection component will increase berm width, which will lessen the risk of damage due to wave attack.
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 project elements 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 shore protection component features fall within prevailing practice and include only time-tested design features (e.g. berm).
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 shore protection component 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.	The shore protection component does not have any accelerated design or construction scheduling. Sufficient time is available for completion of construction including all environmental shut-down windows.
9	Inherent risk with construction methods; MEC in borrow sites	Low	The offshore borrow site for beach fill is known to contain munitions and explosives of concern (MEC). MEC may be taken up into the dredge and possibly be placed on the beach within the sand fill, and may explode at some future time.	Methods have been developed to eliminate the danger of picking up MEC from the borrow site into the dredge, and/ or pumping MEC onto the project site. These controls consist of screens placed on the drag head and on the pump-out to prevent uptake of MEC and/ or placement of

				MEC on the beach. This technology has been used successfully since the mid-1990s in the designated borrow site, and is fully incorporated into project specifications and costs. Remaining risk would result from failure of the screens (which are monitored by state and Federal inspectors), or presence of MEC smaller than the screen opening size.
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 are required to increase the reliability of the system.	Construction of the shore protection components greatly reduces the risk to human life and property relative to the existing condition, which is seriously eroded. Nonperformance of the shore protection segment 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 shore protection segment of the project includes resiliency in the form of regular beach renourishment, and post-storm emergency berm rehabilitation.
10c	Robustness	Low	Natural events can occur that are greater than the optimized project design, and may lead to project failure.	The berm design considered storm events up to a 100-year return interval, and long-term erosion derived from the sediment budget which reflects sea-level rise over the period of analysis. Berm designs are adaptable to changes in water level due to climate change (sea level rise), with opportunities to incorporate additional volume and/or berm elevation as part of regularly scheduled renourishment operations.