

CENAN-EN-S

August 2014

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

SUBJECT: Revised Review Plan for Fire Island Inlet to Montauk Point, Fire Island Stabilization Project

1. Reference is made to the following:
  - a. CENAN-EN memorandum, dated 15 July 2014, subject as above, which transmitted the revised Review Plan to CENAD for review and approval.
  - b. CENAD review comment provided via e-mail on 16 July 2016 which requested that the construction discipline be added to the ATR team.
2. Enclosed for your review and approval is the subject document which incorporates the construction discipline.
3. 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**

**Fire Island Inlet to Montauk Point, NY**

**Fire Island Stabilization**

**Implementation Documents**

**Revision 1**



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

**August 2014**

MSC Approval Date: 18 November 2013



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## **1. PURPOSE AND REQUIREMENTS**

### **a. Purpose**

This Review Plan defines the scope and level of peer review for implementation documents for the Fire Island Stabilization Project, a component of the Fire Island Inlet to Montauk Point (FIMP) project.

### **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 three 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 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 AND BACKGROUND

**a. Implementation Documents.** This Review Plan has been prepared for the implementation documents for the Fire Island Stabilization 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.**

A Fire Island Stabilization Project Hurricane Sandy Limited Reevaluation Report 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 dune, berm, beach fill, and dune planting. The State of New York, acting through the Department of Environmental Conservation, is the non-Federal sponsor for this project.

The stabilization project consists of a sand dune and berm system. The implementation documents reflect post- Hurricane Sandy conditions. The stabilization project will be constructed in 3 separate reaches. Contract 1 covers the William Floyd Parkway to Moriches Inlet Reach, Contract 2 covers the Fire Island Inlet to Lonelyville Reach, and Contract 3 Town Beach to Davis Park. A previously approved review plan covered Contract 1. This updated review plan incorporates Contracts 2 and 3.

**c. Factors Affecting the Scope and Level of Review.**

The focus of this Review Plan is on the implementation documents for the Fire Island Stabilization Project, a component of the Fire Island Inlet to Montauk Point 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.

**4. DISTRICT QUALITY CONTROL (DQC)**

All implementations 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.** DQC will be documented through the use of DrChecks and DQC/ BCOES certificates.
- b. Products to Undergo DQC.** All applicable documents will undergo DQC and BCOES reviews.
- c. Required DQC Expertise.** DQC will be performed by Staff in the Home District that are not involved in the Design Documentation Report and P&S. The required disciplines for review are listed in page 6. The DQC supplements 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 Plans and Specifications and Design Documentation Report.
- 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 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.
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, beach fill design including renourishment, determination of risk due to sea level rise, and design of dune systems. The team member will be a licensed professional engineer.
Civil Engineering	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 dune systems. The team member will be a licensed professional engineer.
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.

- 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 policy issue 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.

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 beach berm and dune component Plans and Specifications. 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 XX July 2014- Attachment 4), New York District Chief, Engineering Division determined that there is not a significant threat to human life associated with the Fire Island Stabilization Project. Therefore, a Type II IEPR is not required for this contract.

**a. Products to Undergo IEPR.** Not applicable.

**b. Required IEPR Panel Expertise.** Not applicable.

**c. 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, DDR- April-July 2014- ongoing (\$15,000)  
Contract 2- 100% Plans and Specifications, DDR- August 2014- (\$15,000)  
Contract 3- 100% Plans and Specifications, DDR- TBD- (\$15,000)
- 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 NYSDEC 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**

<b>Responsibility</b>	<b>Name</b>	<b>Contact</b>
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	Gezahegne Assegid	917-790-8373
Environmental Resources	Robert Smith	917-790-8729
Construction	Kevin Merenda	917-790-6153

**ATR Team**

<b>Name</b>	<b>Role</b>	<b>Review District</b>
Greg Baer	ATR Lead	HQ
Greg Baer	Civil Engineer	HQ
Tom Martin	Coastal Engineer	SAJ
Ellie Covington	Environmental Resources	SAW
Michael Lyons	Construction Manager	SAJ

### 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	<a href="mailto:Anthony.Ciorra@usace.army.mil">Anthony.Ciorra@usace.army.mil</a>
Peter Wepler	NAN-PL, Environmental Analysis Branch Chief	917-790-8634	<a href="mailto:peter.m.wepler@usace.army.mil">peter.m.wepler@usace.army.mil</a>
Thomas Dannemann, P.E.	NAN-EN, Design Branch Chief	917-790-8363	<a href="mailto:Thomas.R.Dannemann@usace.army.mil">Thomas.R.Dannemann@usace.army.mil</a>
Mukesh Kumar, P.E.	NAN-EN, Cost Engineering Branch Chief	917-790-8421	<a href="mailto:Mukesh.Kumar@usace.army.mil">Mukesh.Kumar@usace.army.mil</a>
Lynn Bocamazo, P.E.	NAN-EN, Chief, Hurricane Sandy Brancy	917-790-8396	<a href="mailto:Lynn.M.Bocamazo@usace.army.mil">Lynn.M.Bocamazo@usace.army.mil</a>
Jeff Wisniewski, P.E.	NAD, Lead Engineer, Sandy Coastal Management Division	347-370-4783	<a href="mailto:Jeffrey.wisniewski@usace.army.mil">Jeffrey.wisniewski@usace.army.mil</a>

**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 DrChecks<sup>sm</sup>.

*SIGNATURE*

\_\_\_\_\_  
Name

\_\_\_\_\_  
Date

ATR Team Leader

Office Symbol/Company

*SIGNATURE*

\_\_\_\_\_  
Name

\_\_\_\_\_  
Date

Project Manager

Office Symbol

*SIGNATURE*

\_\_\_\_\_  
Name

\_\_\_\_\_  
Date

Architect Engineer Project Manager<sup>1</sup>

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

<sup>1</sup> Only needed if some portion of the ATR was contracted



**ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS**

<b>Term</b>	<b>Definition</b>	<b>Term</b>	<b>Definition</b>
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

<b><u>Term</u></b>	<b><u>Definition</u></b>	<b><u>Term</u></b>	<b><u>Definition</u></b>
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

CENAN-EN-S

MEMORANDUM For Record

15 JUL 14

**SUBJECT:** Fire Island Inlet to Montauk Point (FIMP), Fire Island Stabilization Project, Risk Informed Assessment of Significant Threat to Human Life

**1. Project Information.** The recommended plan resulting from the Fire Island Stabilization Project Hurricane Sandy Limited Reevaluation Report provides for reduction of storm damages from coastal erosion and flooding caused by high surge events through storm protective dune and berm. The State of New York, acting through the Department of Environmental Conservation, is the non-Federal sponsor for the project. A Review Plan is being prepared for the implementation documents for the project.

**2. Project Description.** The Fire Island Stabilization Project consists of a sand dune and berm system.

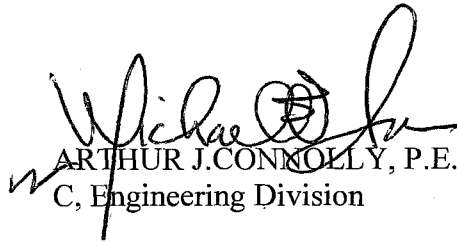
**3. Risk Informed Assessment.** In accordance with EC 1165-2-214, Civil Works Review Policy, 15 December 2012, a risk informed assessment was made as to whether there is a significant threat to human life from the berm and dune project component (Table 1). The key factors considered are:

- a. The Fire Island Inlet to Montauk Point (FIMP), Fire Island Stabilization Project berm and dune components provide reduction in storm damage by reducing wave-induced property damage and reducing shoreline storm erosion.
- b. The Fire Island Inlet to Montauk Point, Fire Island Stabilization Project, is not at risk of sudden, catastrophic failure. 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 York and Suffolk County have 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 and dune 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 Fire Island

Inlet to Montauk Point, Fire Island Stabilization Project. Accordingly, it is recommended that a Type II IEPR, Safety Assurance Review, is not warranted for the Fire Island Stabilization Project.

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, Fire Island Inlet to Montauk Point, Fire Island Stabilization Project.**

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	Fire Island is a predominantly seasonal community in Suffolk County, NY.	Land use is primary residential, single family homes. Risk Assessment details are provided in 1a-1c below.
1a	Population Density	Low	Fire Island's year round population is 491 people, split among communities that are part of the Towns of Babylon, Islip, and Brookhaven. These numbers are increased in the summer.	The area landward of the project area has a rural/ suburban population density that is seasonal. Construction of shore protection features, such as the beach berm and dune, will not increase the risk of flooding/ inundation over pre-project conditions. Construction of the berm and dune does not create a risk of sudden catastrophic failure.
1b	Critical Facilities Affected (e.g. schools, hospitals, assisted living/nursing homes, evacuation routes)	Low	William Floyd Parkway and Robert Moses Causeway provide evacuation from Fire Island.	Construction of the berm and dune will increase the protection of the evacuation routes. The construction of the berm and dune does not create a risk of sudden catastrophic failure.
1c	Number or types of structures in floodplain	Low	The entirety of Fire Island Lies within a floodplain	Many 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 and dune itself are not project elements at risk of catastrophic failure, and the existence of a beach berm will not change the conditions under which homes are evacuated.
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 and dune 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 project will increase dune and 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 and dune 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 dune height and 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 berm and dune 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 berm and dune do 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:	Low	The beach berm and dune will be constructed using established methods (hopper dredge, pumped on to beach via submerged pipeline).	These are established methods that are industry standards.
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 berm and dune 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 berm and dune includes resiliency in the form of 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 and dune 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.
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**ATTACHMENT 5: REVIEW PLAN REVISIONS**

<b>Revision Date</b>	<b>Description of Change</b>	<b>Page/ Paragraph Number</b>
15 July 2014	Document revised to include all three construction contracts.	Various
15 July 2014	Review Plan Points of Contact updated	13/ 8
15 July 2014	ATR Team revised to delete cost engineering	9/ Attachment 1
15 July 2014	Vertical Team roster updated	10/ Attachment 1
15 July 2014	Risk Informed Assessment of Significant Threat to Human Life revised to incorporate entire project area.	15-19/ Attachment 4
31 July 2014	Added construction reviewer to ATR team.	3/5, Attachment 1