



DEPARTMENT OF THE ARMY  
NORTH ATLANTIC DIVISION, CORPS OF ENGINEERS  
FORT HAMILTON MILITARY COMMUNITY  
GENERAL LEE AVENUE, BLDG 301  
BROOKLYN, NY 11252

REPLY TO  
ATTENTION OF:

CENAD-RBT

30 Jun 2012

MEMORANDUM FOR Commander, New York District, ATTN: CENAN-EN (Mr. Connolly),  
26 Federal Plaza, Room 2039A, New York, NY 10278-0090

SUBJECT: Review Plan Approval for PN 109042, The Atlantic Coast of New York City,  
Rockaway Inlet to Norton Point (Coney Island), New York

1. References:

a. Memorandum, CENAN-EN-MC-F, 01 Jun 2012, Subject: Review Plan for The Atlantic Coast of New York City Rockaway Inlet to Norton Point (Coney Island) Project

b. Memorandum, CENAN-EN-MC-F, 29 May 2012, Subject: The Atlantic Coast of New York City Rockaway Inlet to Norton Point (Coney Island) – Risk Informed Assessment of Significant Threat to Human Life

c. EC 1165-2-209 Change 1, Water Resources Policies and Authorities – Civil Works Review Policy, 31 Jan 2012

2. The enclosed Review Plan for Coney Island Flood and Coastal Storm Damage Reduction project has been prepared in accordance with Reference 1.c. The project is in addition to another completed in 1994, and is based on recommendations from a 2005 Limited Reevaluation Report. The current project consists of construction of T-Groins and beach fill (with re-nourishment every 10-years for 50-years).

3. NAD Business Technical Division is the Review Management Organization (RMO) for this Review Plan. The Review Plan does not include Independent External Peer Review since the project does not involve potential hazards which pose a significant threat to human life (Ref. 1.b).

4. The Review Plan for the Coney Island Flood and Coastal Storm Damage Reduction 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 will require new written approval from this office.

5. In accordance with Reference 1.c, Appendix B, Paragraph 5, this approved Review Plan shall be posted on your district website for public review and comment.

CENAD-RBT

SUBJECT: Review Plan Approval for PN 109042, The Atlantic Coast of New York City,  
Rockaway Inlet to Norton Point (Coney Island), New York

6. The Point of Contact for this action in Business Technical Division is Alan Huntley,  
347-370-4664 or Alan.Huntley@usace.army.mil.

Encl  
as



CHRISTOPHER S. LARSEN  
Colonel, EN  
Commanding

CF (w/ encl):  
CEMP-NAD (C. Shuman)  
CENAD-PDC (L. Monte)



REPLY TO  
ATTENTION OF

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

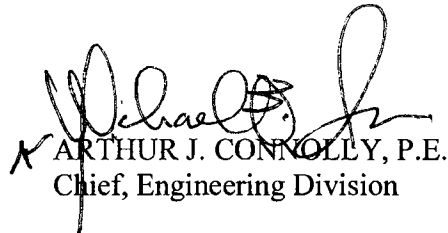
CENAN-EN-MC-F

1 June 2012

MEMORANDUM FOR Commander, North Atlantic Division, ATTN: Business Technical  
Division

SUBJECT: Review Plan for the Atlantic Coast of New York City Rockaway Inlet to Norton  
Point (Coney Island) Project

1. In accordance with EC 1165-2-209 (Civil Works Review Policy), enclosed for your review  
and approval is the subject document.
2. The point of contact for the Review Plan is Milton Ricks of my staff at (917)790-8252.

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

Encl.  
Review Plan

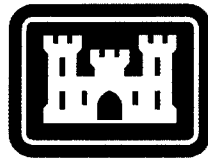
CF:  
C, CENAN-PL  
C, CENAN-PP

**Review Plan**

**For**

**The Atlantic Coast of New York City,**

**Rockaway Inlet to Norton Point (Coney Island)**



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

**May 2012**

# Table of Contents

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- 1. **Engineering Document Report, Purpose and Requirements**..... 1
  - Purpose..... 1
  - References..... 1
  - Requirements..... 1
  - Review management Organization..... 1
- 2. **Project Information and Background** ..... 1
- 3. **District Quality Control** ..... 4
- 4. **Agency Technical Review** ..... 4
- 5. **Independent External Peer Review** ..... 7
- 6. **Policy and Legal Compliance Review** ..... 9
- 7. **Cost Engineering DX Review** ..... 9
- 8. **Model Certification and Approval** ..... 9
- 9. **Budget and Schedule**..... 9
- 10. **Project Milestone** ..... 10
- 11. **Points of Contact** ..... 10
  
- Attachments**..... 11

## 1. PURPOSE AND REQUIREMENTS

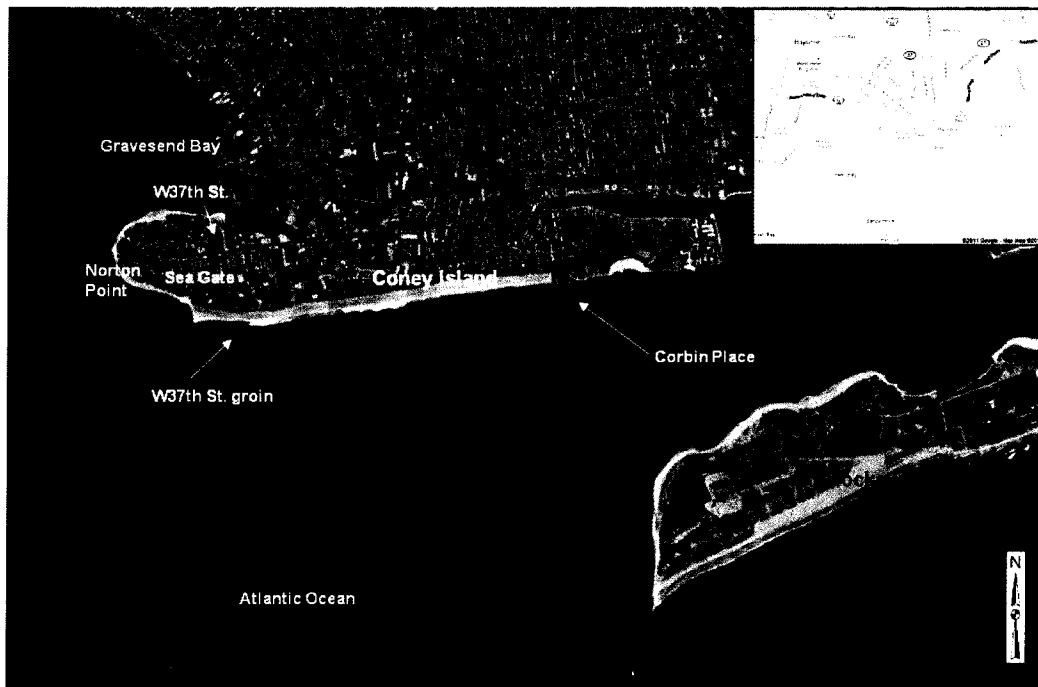
- a. **Purpose:** The purpose of this Review Plan is to identify the requirements and plan of action for the review of the products for the Atlantic Coast of New York City Rockaway Inlet to Norton Point (Coney Island) Project. Since the project is in construction, the products being generated are implementation documents necessary for continuing construction. These implementation documents include 1) an Engineering Documentation Report (EDR), 2) Plans and Specifications, and 3) the Cost Estimate.
- b. **References**
- EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
  - ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
  - ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006 as revised through 31 March 2011
  - WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- c. **Requirements.** This Review Plan was developed in accordance with EC 1165-2-209, 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’s outline includes three levels of review: District Quality Control/ Quality Assurance(DQC), Agency Technical Review (ATR) and Independent External Peer Review(IEPR), and Policy and Legal Compliance Review.
- d. **Review Management Organization (RMO).** The RMO responsible for managing the overall peer review effort described in this Review Plan is North Atlantic Division (MSC), (per EC 1165-2-209), Mr. Alan Huntley, P.E., Business Technical Division, Regional Technical Directorate, Telephone number 347-370-4664.

## 2. PROJECT INFORMATION

- a. **Project Description.** The purpose of the Coney Island project is to reduce property damages due to storm surges and waves from the Atlantic Ocean. Initially constructed project elements within the public beach area (W37th Street to Corbin

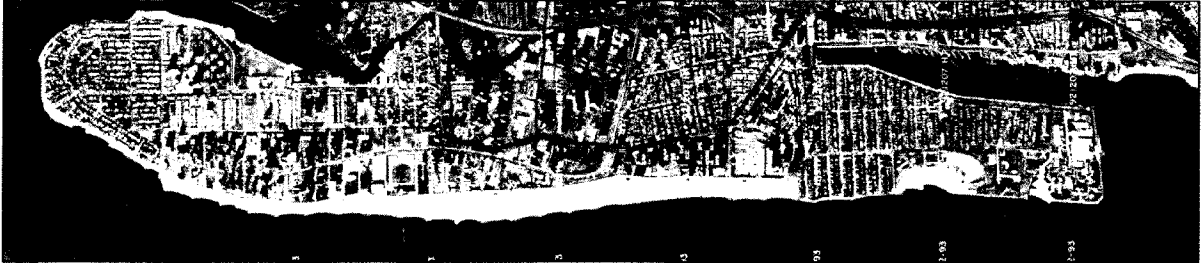
Place) include a sand berm, one terminal groin at W37th Street, and required extensions of existing outfalls. A sand fillet was placed in Sea Gate during initial construction of the Project to protect the terminal groin from flanking and to maintain shore conditions at the pre-project level for that reach. The construction in Sea Gate is not designed to increase protection in that area. The Coney Island Project was constructed in late 1994. The project location is shown in Figure 1. Figure 2 shows aerial composites of the project area before construction, immediately following construction, and 10 years post-construction.

A Limited Reevaluation Report (LRR), finalized in 2005, was undertaken to develop a more permanent solution which not only addressed the continuous erosion of the sand fillet and the potential flanking of the groin but also addressed the sand accumulation issues at Gravesend Bay. The Approved LRR identified a plan that recommended the construction of T-Groins and beach fill in Sea Gate.

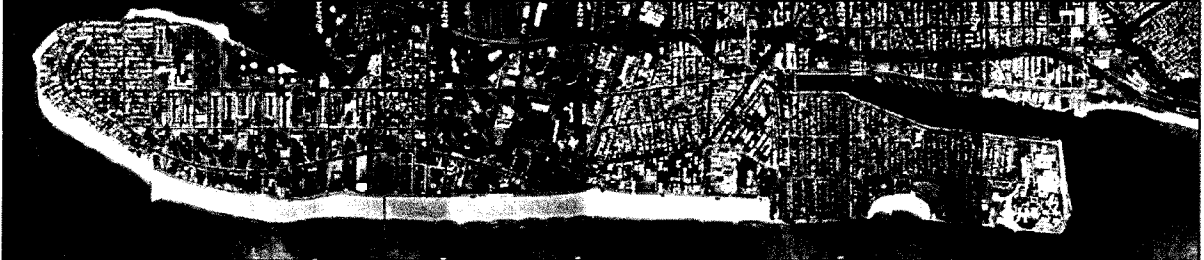


**Figure 1: Project Location**

**1993 PRE-CONSTRUCTION**



**1995 POST-CONSTRUCTION**



**2005 10-YEARS POST-CONSTRUCTION**



**Figure 2: Area Composite before Construction**

- b. Implementation Documents.** This Review Plan has been prepared for the Engineering Documentation Report (EDR), plans and specifications (P&S) for construction of elements in Sea Gate, and the Cost Estimate in support of the P&S.



### 3. DISTRICT QUALITY CONTROL (DQC)

All implementations documents shall undergo DQC fulfilling the project quality requirements defined in the Project Management Plan (PMP) and ER 1110-2-1150.

- a. **Documentation of DQC.** DQC will be documented through the use of DrChecks and a DQC report, which will be signed by all reviewers.
- b. **Products to Undergo DQC.** Products that will undergo DQC include the EDR, Plans and Specs and Cost Estimate.
- c. **Required DQC Expertise.** DQC will be performed by Staff in the Home District that are not involved in the study. The required disciplines for review will vary by product. The DQC supplements the reviews provided by the Project Delivery Team during the course of completing these products.

### 4. 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.

- **Purpose:** Ensure the quality and credibility of the government's scientific information and verify compliance with National Environmental Policy Act (NEPA) and other environmental compliance documents
- **Managed by:** ATR Leader
- **Performed by:** Senior Technical Team Members, preferably recognized subject matter experts (Outside New York District)
- **Required for:** Engineering Documentation Reports, Plans & Specifications and Cost Estimate
- **Documentation:** DrChecks and Review Report
- **Review Management Organization:** North Atlantic Division MSC

## Identification of Teams

### District Project Delivery Team

Responsibility	Name	Contact
Technical Manager	Milton N. Ricks	917-790-8252
Project Manager	David Gentile	917-790-8483
Plan Formulation	Stephen Couch	917-790-8707
Economics	Naomi Fraenkel	917-790-8615
Environmental	Pete Weppler	917-790-8634
Coastal Engineer	Diane Rahoy	917-790-8263
Civil Engineer	Gezahegne Assegid	917-790-8373
Cost Engineer	Anthony Schiano	917-790-8347
Structural Engineer	Mike Chen	917-790-8749

### District Quality Control Team

Responsibility	Name	EDR	P&S	COST	Contact
Technical Manager	Milton N. Ricks	X	X	X	917-790-8252
Project Manager	David Gentile	X	X	X	917-790-8483
Plan Formulation	Roman Rakoczy	X			518-273-2678
Economics	Tom Hodson	X			917-790-8602
Coastal Engineer	David Yang / Lynn Bocamazo	X	X	X	917-790-8270 917-790-8396
Civil / Structural Engineer	John Wong / TBD		X	X	917-790-8372
Cost Engineer	Mukesh Kumar	X	X	X	917-790-8421

### Agency Technical Review Requirements

Responsibility	Name	EDR	P&S	COST	Contact
Review Lead	Varies	X	X	X	
Coastal Engineer	Varies	X	X	X	
Design / Civil Engineer	TBD		X	X	
Cost Engineer	Varies	X	X	X	

<b>ATR Team Members/Disciplines</b>	<b>Expertise Required</b>
ATR Lead	The ATR lead should be a senior professional with 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. The ATR lead may also serve as a reviewer for a specific discipline.
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, appurtenant structures for beach fill design, design of rubblemound structures, and determination of risk due to sea level rise.
Civil Engineering	Team member will be an expert in the field of civil engineering, especially in review of coastal projects.
Cost Engineering	Team member will be an expert in cost estimating for similar projects in MII. Review includes construction schedules and contingencies. The team member will be a Certified Cost Technician, a Certified Cost Consultant, or a Certified Cost Engineer

**Agency Technical Review Team, EDR**

<b>Responsibility</b>	<b>Name</b>	<b>Contact</b>
Review Lead	Gregory Baer	770-296-8738
Coastal Engineer/Co-Lead	Jeffrey Gebert	215-656-6573
Cost Engineering	Gary Szymanski	757-201-7615

**Agency Technical Review Team, P&S and Cost Estimate**

<b>Responsibility</b>	<b>Name</b>	<b>Contact</b>
Review Lead	Gregory Baer	770-296-8738
Coastal Engineer	TBD	
Design / Civil Engineer	TBD	
Cost Engineer	TBD	

## **5. INDEPENDENT TECHNICAL 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 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- **Type I IEPR.** Type I 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 1165-2-209.
- **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.

### **a. Decision on IEPR.**

Type I IEPR is not applicable as per EC 1165-2-209, Civil Works Review Policy, since the Coney Island project is in the Construction Phase.

Type II Independent External Peer Review, Safety Assurance Review, is required by EC 1165-2-209 for any hurricane and storm risk management projects where issues of life safety are present. As documented in Memorandum for Record dated 29 May 2012, New York District Chief, Engineering Division made a risk informed assessment of whether there is a significant threat to human life as a result of the Atlantic Coast of New York City Rockaway Inlet to Norton Point (Coney Island) Project. Based on a risk informed assessment which considered life safety factors, New York District Chief, Engineering Division determined that there is not a significant threat to human life associated with this project. Accordingly, a Type II IEPR, Safety Assurance Review, is not required for the shore protection component.

The Key Factors considered in this assessment were as follow:

1. The Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island) project provides storm damage protection to the densely populated urban communities and infrastructure located in the public beach reach along the Atlantic shoreline of Coney Island. Shore protection was provided by constructing a 100-foot wide beach berm at an elevation of 13 feet above sea level, which places a large volume of sand and limits the possibility of catastrophic failure of that berm.
2. The construction in Sea Gate is not designed to increase protection in that area. Rather, Sea Gate construction provides a more permanent solution to the original design which not only addressed the continuous erosion of the sand fillet and the potential flanking of the groin but also addresses related sand accumulation issues at Gravesend Bay. The plan recommends the construction of T-Groins and beach fill.
3. Furthermore, traditional and proven design features and traditional and proven construction materials and methodologies will be used. All elements in construction, including regulatory requirements, USACE EM 385-1-1 compliance, and the appropriate federal, state and local laws, ordinances, criteria, rules and regulations are in place to reduce the human life safety risk to low.

## 6. POLICY AND LEGAL COMPLIANCE REVIEW

All implementation documents will be reviewed for their compliance with law and policy. DQC and ATR 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.

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

The EDR shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and in the development of the review charge(s). The DX will also provide the Cost Engineering DX certification. The RMO is responsible for coordination with the Cost Engineering DX.

## 8. MODEL CERTIFICATION AND APPROVAL

Not applicable since the project is in the Construction Phase and this relates to the use of certified or approved models for planning activities.

## 9. BUDGET AND SCHEDULE

The schedule and costs budgeted for ATR reviews are as follows:

Review Discipline	Activity	Deliverable	Review type	Review Cost	Review Duration
Technical Mgmt	Eng. Mgmt	QCR /ATR/Drchecks review	Quality Control	\$2000	Apr - May 2012
ATR Lead	ATR	Statement Review Completion	Quality Control	\$1000	Apr - May 2012
Cost	DQC of EDR	Certification Document/DrChecks	Quality Control	\$1000	Apr- May 2012
Cost	ATR	Statement Review Completion/DrChecks	Quality Control	\$1000	Apr- May 2012
Coastal	DQC of EDR	Statement Review Completion/DrChecks	Quality Control	\$1000	Apr- May 2012
Hydraulics	DQC of EDR	Statement Review Completion/DrChecks	Quality Control	\$1000	Apr- May 2012
Planning	DQC of EDR	Statement Review Completion/DrChecks	Quality Control	\$10,000	Apr- May 2012
Project Mgmt	DQC of EDR	Statement Review Completion/DrChecks	Quality Control	\$5,000	Apr- May 2012
<b>TOTAL REVIEW COST</b>				<b>\$22,000</b>	

## 10. PROJECT MILESTONE

TASK	SCHEDULE DATE
90% P&S	June - July 2012
BCOE	June - July 2012
100% P&S	June - July 2012

## 11. POINT OF CONTACTS, NY DISTRICT

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

David Gentile, Project Manager  
CENAN-PP-C  
917-790-8483  
[David.t.gentile@usace.army.mil](mailto:David.t.gentile@usace.army.mil)

Milton N. Ricks, Technical Manager  
CENAN-EN-MC  
917-790-8252  
[Milton.n.ricks@usace.army.mil](mailto:Milton.n.ricks@usace.army.mil)

Stephen Couch, Chief Coastal Section  
CENAN-PL-FC  
917-790-8707  
[Stephen.couch@usace.army.mil](mailto:Stephen.couch@usace.army.mil)

# **Attachments**



## COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Plans & Specification and Cost Estimate for the Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island) New York. 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>.

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Gregory R. Baer  
ATR Team Leader  
CECO-C-RAO

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Date

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David T. Gentile  
Project Manager  
CENAN-PP-C

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Date

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John P. Bianco, P.E.  
Review Management Office Representative  
CENAD-RBT

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Date

## CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows: There were no significant concerns and documentation of the comments and responses in Dr. Checks is attached. As noted above, all concerns resulting from the ATR of the project have been fully resolved.

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Arthur J. Connolly, P.E.  
Chief, Engineering Division  
CENAN-EN

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Date

**ATTACHMENT: 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 MSC responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
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:** The Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island)- Risk Informed Assessment of Significant Threat to Human Life

**1. Project Information.** The purpose of the Coney Island project is to reduce property damages due to storm surges and waves from the Atlantic Ocean. Initially constructed project elements within the public beach area (W37th Street to Corbin Place) include a sand berm, one terminal groin at W37th Street, and required extensions of existing outfalls. A sand fillet was placed in Sea Gate during initial construction of the Project to protect the terminal groin from flanking and to maintain shore conditions at the pre-project level for that reach. The Coney Island Project was constructed in late 1994.

A Limited Reevaluation Report (LRR), finalized in 2005, was undertaken to develop a more permanent solution which not only addressed the continuous erosion of the sand fillet in Sea Gate and the potential flanking of the groin but also addressed the sand accumulation issues at Gravesend Bay. The Approved LRR identified a plan that recommended the construction of T-Groins and beach fill.

**2. Project Description.** The Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island) project provides storm damage reduction to the infrastructure located along the shoreline of Coney Island. Shore protection was provided by constructing a 100-foot wide beach berm at an elevation of 13 feet above sea level. The project included the construction of an 850-foot long terminal groin on the westernmost end of the project at West 37th Street. A fillet of sand was placed in the private community of Sea Gate to protect the groin against flanking and to prevent down drift conditions from deteriorating beyond those that existed before construction of the project. The project also includes periodic nourishment of the restored beaches on 10-year cycle for a period of 50 years.

**3. Risk Informed Assessment.** In accordance with EC 1165-2-209 (31 Jan 10), Civil Works Review Policy, a risk informed assessment was made as to whether there is a significant threat to human life from the Storm damage reduction project component (Table 1). The key factors considered are:

- a. The Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island) project provides storm damage reduction to the infrastructure located along the

shoreline of Coney Island. Shore protection was provided by constructing a 100-foot wide beach berm at an elevation of 13 feet above sea level

- b. The construction in Sea Gate is not designed to increase storm damage reduction in that area. Recommended construction of T-groins and beach fill provides a more permanent solution which not only addresses the continuous erosion of the sand fillet and the potential flanking of the groin but also addresses the sand accumulation issues at Gravesend Bay.
  
- c. Furthermore, traditional and proven design features and traditional and proven construction materials and methodologies will be used. All elements in construction, including regulatory requirements, USACE EM 385-1-1 compliance, and the appropriate federal, state and local laws, ordinances, criteria, rules and regulations 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 Atlantic Coast of New York City, Rockaway Inlet to Norton Point (Coney Island) project. Accordingly, it is recommended that a Type II IEPR, Safety Assurance Review, is not warranted for the storm damage reduction component.

Encl



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

**Table 1: Risk Assessment for Possible Threat to Life Safety, Sea Gate reach of the Coney Island storm damage reduction Project**

No.	Risk Factor (Possible Threat to Life Safety)	Risk Magnitude (H/M/L)	Basis of Concern	Risk Assessment
1	Land Use adjacent to the project	Medium	Sea Gate is part of the urban community of Coney Island, located in Brooklyn, NY. The project fronts the Atlantic Ocean shore on a low-lying island.	Land use in Sea Gate is primarily residential, with mixed residential/commercial land use in adjacent Coney Island.
1a	<ul style="list-style-type: none"> <li>Population Density</li> </ul>	low	Coney Island zip code 11224 which includes Sea Gate has a population density of approximately 32,249 persons/sq. mi. based on 2007 census data.	Failure of T-groin project will not affect the inundation. The project reduces likelihood of damage due to erosion and or wave attack.
1b	<ul style="list-style-type: none"> <li>Number/types of structures in floodplain</li> </ul>	low	There are numerous residential structures and numerous nonresidential structures within the project area.	Failure of T-groin project will not affect the inundation. The project reduces likelihood of damage due to erosion and or wave attack.
2	Inundation of protected side due to project failure	Low	Project design does not provide storm protection for the Sea Gate Reach. Rather, it prevents negative down drift impacts due to shoreline erosion within Sea Gate, and flanking protection for the main project east of W37th Street.	Catastrophic failure of the sand fill and T-groin retention structures is unlikely due to the rubble mound structure design and the independence of the separate sand retention structures. The sand fill and retention structures have low crest elevations, which allows for sediment retention but does result in structure submergence at fairly modest storm return intervals. These structures will not prevent or exacerbate inundation of upland infrastructure.
3	Shoreline Storm Erosion	Low	Coastal storms often result in significant shore erosion over short time periods which can undermine structures	Construction of the T-groins with beach fill will increase berm width and beach volume which will lessen the risk of storm erosion relative to existing conditions

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.	Construction of the shore protection component will increase berm width and beach volume which will lessen the risk of damage to structures due to wave impact by causing waves to break further seaward and reduce in size.
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 T-groin and beach fill features falls within prevailing practice and includes only time-tested design features (e.g. berm, rubble mound groins).
7	Use of unique or non-traditional construction materials or methodologies	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 T-groin and beach fill features 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 T-groin and beach fill features do not have any accelerated design or construction scheduling. Sufficient time is available for completion of construction. No environmental shut-down windows apply, and construction will be continuous.
9	Inherent risk with construction methodologies.	Low	Unique or accelerated construction methodologies may lead to poor quality work, leading to greater	All materials and construction techniques used for the T-groin and beach fill features are in

			possibility of future project failure.	common practice.
10	Does the project design require:			
10a	<ul style="list-style-type: none"> <li>Redundancy</li> </ul>	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 T-groin and beach fill features 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	<ul style="list-style-type: none"> <li>Resiliency</li> </ul>	Low	Erodible structures are reduced in volume over time, providing less protective capacity.	The T-groin and beach fill features of the project include resiliency in the form of regular beach renourishment. Estimated annual costs also include allowance for maintenance of the stone structures, and monitoring of all shore protection elements.
10c	<ul style="list-style-type: none"> <li>Robustness</li> </ul>	Low to Medium	Natural events can occur that are greater than the optimized project design, and may lead to project failure.	Critical design conditions for the stone structures occur when still water levels are at or near the crest elevation. Higher water levels (submergence) soften the impact of waves on the structures, while the structures continue to protect upland infrastructure by breaking large waves. Beach fill 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.

**ATTACHMENT: 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
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