



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

CESAW-TS-E

15 February 2011

MEMORANDUM FOR Commander, South Atlantic Division (CESAD-RBT)

SUBJECT: Approval of Review Plan for Surf City and North Topsail Beach, North Carolina Coastal Storm Damage Reduction Project

1. References.

- a. EC 1165-2-209, Civil Works Review Policy, 31 Dec 09 draft
- b. WRDA 2007 H. R. 1495 Public Law 110-114, 08 Nov 07

2. I hereby request approval of the enclosed Review Plan and concurrence with the conclusion that Type II Independent External Peer Review, Safety Assurance Review of this project is not necessary because it does not trigger criteria in references above. Approval of this plan is for the PED Phase of this project. The Review Plan complies with applicable policy and includes our DQC and ATR plans for this project. It is my understanding that non-substantive changes to this Review Plan, should they become necessary, are authorized by CESAD.

3. CESAD-RBT comments from their review of the 12 August 2010 Review Plan have been incorporated in the 11 February 2011 Review Plan enclosed.

4. The District will post the CESAD approved Review Plan to its website and provide a link to the CESAD for its use. Names of Corps/Army employees are withheld from the posted version, in accordance with guidance.

FOR THE COMMANDER:

A handwritten signature in blue ink, appearing to read "Gregory L. Williams".

GREGORY L. WILLIAMS, Ph.D., P.E.
Chief, Engineering Branch

Encl



Review Plan

For

**Surf City and North Topsail Beach, North Carolina
Coastal Storm Damage Reduction Project**

Design Plans and Specifications and Design Documentation Report

**U.S. Army Corps of Engineers
Wilmington District
Wilmington, North Carolina**

11 February 2011

THE INFORMATION CONTAINED IN THIS REVIEW PLAN IS DISTRIBUTED SOLELY FOR THE PURPOSE OF PREDISSEMINATION REVIEW UNDER APPLICABLE INFORMATION QUALITY GUIDELINES. IT HAS NOT BEEN FORMALLY DISSEMINATED BY THE U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT. IT DOES NOT REPRESENT AND SHOULD NOT BE CONSTRUED TO REPRESENT ANY AGENCY DETERMINATION OR POLICY.

REVIEW PLAN

**Surf City and North Topsail Beach, North Carolina
Coastal Storm Damage Reduction Project**

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1. PURPOSE AND REQUIREMENTS

1.1 Purpose

This Review Plan defines the scope and level of review activities for design of the Coastal Storm Damage Reduction Project for Surf City and North Topsail Beach, North Carolina. The Quality Management review activities recommended for this project are District Quality Control (DQC) and Agency Technical Review (ATR). The related documents are Implementation Documents that consist of Plans and Specifications (P&S) and a Design Documentation Report (DDR). Upon approval, this review plan will be included into the Project Management Plan as an appendix to the Quality Management Plan.

1.2 References

- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug. 1999
- ER 1110-1-12, Engineering and Design Quality Management, 30 Sep. 2006
- EC 1165-2-209, Civil Works Review Policy, 31 Jan. 2010
- WRDA 2007 H.R. 1495 Public Law 110-114, 8 Nov. 2007
- National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003
- Quality Control Plan
- Project Management Plan

1.3 Requirements

This review plan was developed in accordance with EC 1165-2-209, which establish the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision, implementation documents and operations and maintenance documents and work products through an open, dynamic, and rigorous review process. The ECs outline three levels of review: District Quality Control, Agency Technical Review, and Independent External Peer Review.

- (1) District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). It is managed in the home district and may be conducted by staff in the home district as long as they are not doing the work involved in the study, or overseeing contracted work that is being reviewed. Basic quality control tools include a Quality Management Plan providing for seamless review, quality checks and reviews, peer and supervisory reviews, Project Delivery Team (PDT) reviews, etc. The Major Subordinate Command (MSC)/District quality management plans address the conduct and documentation of this fundamental level of review; DQC is not addressed further in this review plan.
- (2) Agency Technical Review (ATR). ATR is an in-depth review, managed within USACE, and conducted by a qualified team outside of the home district that is not involved in the day-to-day production of the project/product. The purpose of this

review is to ensure the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. The ATR team reviews the various work products and assures that all the parts fit together in a coherent whole. ATR teams will be comprised of senior USACE personnel (Regional Technical Specialists (RTS), etc.), and may be supplemented by outside experts as appropriate. To assure independence, the leader of the ATR team shall be from outside the parent MSC.

- (3) Independent External Peer Review (IEPR). 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. Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law (P.L.) 110-114) require two types of IEPR. Section 2034 addresses decision documents and Section 2035 is a Safety Assurance Review for the design and construction phase. EC 1165-2-209 defines these reviews as Type I IEPR and Type II IEPR, respectively.
 - (a) Type I IEPR. Type I IEPR is generally for feasibility and reevaluation studies and modification reports with Environmental Impact Statements (EISs). IEPR is managed by an outside eligible organization (OEO) that is described in Internal Revenue Code Section 501(c) (3), is exempt from Federal tax under section 501(a), of the Internal Revenue Code of 1986; is independent; is free from conflicts of interest; does not carry out or advocate for or against Federal water resources projects; and has experience in establishing and administering IEPR panels. The scope of review will address all the underlying planning, engineering, including safety assurance, economics, and environmental analyses performed, not just one aspect of the project.
 - (b) Type II IEPR, Safety Assurance Review (SAR). In accordance with Section 2035 of Water Resources Development Act (WRDA) of 2007 and EC 1165-2-209, a Type II IEPR Safety Assurance Review (SAR) shall be conducted on design and construction activities 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 prior to initiation of physical construction and periodically thereafter until construction activities are completed. A Type II IEPR should occur on a regular schedule sufficient to inform the Chief of Engineers on the adequacy, appropriateness, and acceptability of the design and construction activities for the purpose of assuring public health, safety, and welfare.

2. PROJECT INFORMATION AND BACKGROUND

2.1 Project Description

The purpose of this project is to produce a cost-effective and environmentally- and technically-sound design with plans and specifications that can be used for construction for reducing coastal storm damages to the Towns of Surf City and North Topsail Beach, NC for a 50 year period. The local sponsors' are therefore the Towns of Surf City and North Topsail Beach. The towns are located on Topsail Island in Pender and Onslow Counties on the central North Carolina coast.

Topsail Island is a 22-mile long and 0.5-mile wide barrier island located approximately 30 miles northeast of Wilmington, NC.

The sponsors' interest is in reducing storm damages to approximately 10 miles of the 17 miles of shoreline extending from the Topsail Beach/Surf City town limits to the northern end of Topsail Island. This area is uniformly developed with few undeveloped lots and a wide range of structures consisting mostly of single-family dwellings, some multi-unit apartment and condominium buildings, about 30 various commercial buildings, and a few hotels. Most of the developable land in the area is already occupied with structures. Roadway access to the mainland is provided via N.C. Highway 50 to Surf City and then by bridges on N.C. Highway 50/210 at Surf City and N.C. Highway 210 at North Topsail Beach. Public access to the beach is provided by numerous parking areas and dune walkovers.

Over the past 35 years this area has developed rapidly as a family ocean resort community for outdoor recreation. On summer weekends the population can be in the tens of thousands. In the off-season the population drops to about 2,200 residents. During the summer months a large portion of the homes within the study area are available as summer rentals to vacationers primarily from inland North Carolina and other locations around the Eastern United States. There are 2 fishing piers within the project.

The principal project purpose is coastal storm damage reduction. The primary damages reduced are those resulting from beach erosion. In addition, the project will enhance the beach strand available for recreation use and provide habitat for a variety of plants and animals.

3. AGENCY TECHNICAL REVIEW

Agency Technical Review (ATR) is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with EC 1165-2-209 and ER 1110-1-12. An ATR will be performed on the Plans and Specifications and 95% Design Documentation Report.

ATR will be conducted by individuals and organizations that are external to the Wilmington District (SAW). SAW recommends Jacksonville District (SAJ) as the primary source for the required ATR disciplines due to their extensive experience with projects of this type. The Review Management Organization (RMO), South Atlantic Division (SAD) in this case, assisted by the Wilmington District will identify the ATR members and the ATR Team Leader, who will be a Corps of Engineers employee outside the South Atlantic Division. The required disciplines and experience are described below.

3.1 ATR Team Expertise

As stipulated in ER 1110-1-12, ATR members will be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; appointed SME or senior level experts from the responsible district; experts from other U.S. Army Corps of Engineers Districts; contractors; academic or other technical experts; or a combination of the above. The ATR Team

will be comprised of the following disciplines; knowledge, skills and abilities; and experience levels.

ATR Team Leader. The ATR Team Leader should have experience with Navigation and/or Coastal Storm Damage Reduction Projects and have performed ATR Team Leader duties or have been a senior ATR reviewer on a similar type project within the past 5 years. ATR Team Leader can also serve as one of the review disciplines in addition to team leader duties.

Coastal Engineering. The team member(s) should be a registered professional with experience in conducting and evaluating hydrodynamic and hydraulic analyses for navigation and coastal storm damage reduction projects.

Geotechnical Engineering and Engineering Geology. The team member should be a registered professional with experience that includes geologic and geotechnical analyses that are used to support the development of Plans and Specifications for navigation and coastal storm damage reduction projects.

Civil Engineering. The team member should be a registered professional engineer with civil/site work project experience that includes dredging and disposal operations, embankments, channels, revetments and coastal storm damage reduction project features.

Cost Engineering. The team member should have demonstrated in the preparation of cost estimates, cost risk analyses and cost engineering, including specific experience with dredging activities associated with navigation and coastal storm damage reduction projects.

NEPA Compliance. The team member should have experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact Statements for navigation or coastal storm damage reduction projects.

3.2 Documentation of ATR

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

- (1) The review concern- identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- (2) The basis for the concern- cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
- (3) The significance of the concern- indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and

- (4) The probable specific action needed to resolve the concern- identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist. The ATR documentation in DrCheckssm will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical coordination, and lastly the agreed upon resolution. The ATR team will prepare a Review Report which includes a summary of each unresolved issue; each unresolved issue will be raised to the vertical team for resolution. Review Reports will be considered an integral part of the ATR documentation and shall:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include an overview for the project information in which the ATR members were charged to reviewer;
- Describe the nature of their review and their findings and conclusions; and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The ATR may be certified when all ATR concerns are either resolved or referred to U.S. Army Corps of Engineers South Atlantic Division (CESAD) for resolution and the ATR documentation is complete. Certification of ATR should be completed, based on work reviewed for the 95% submittal. A sample certification is included in this Review Plan (see attachment 2) and ER 1110-2-12.

4. INDEPENDENT EXTERNAL PEER REVIEW (WRDA 2007 Section 2035 Safety Assurance Review)

EC 1165-2-209 provides implementation guidance for both Sections 2034 and 2035 of the Water Resources Development Act (WRDA) of 2007 (Public Law (P.L.) 110-114). The EC addresses QM procedures for both the Planning and the Design and Construction phases and incorporates requirements for the conduct of a Type I and Type II IEPR. The EC defines that a Type I IEPR is generally for Feasibility Phase and Reevaluation Studies and modification reports with Environmental Impact Statements, while a Type II SAR is conducted during the Pre-construction, Engineering and Design Phase and is continued until the Construction Phase of the project has been completed. The EC also requires that all IEPRs be managed and conducted outside the Corps of Engineers.

4.1 Type I IEPR

A Type I IEPR was completed during the Feasibility Phase for the Coastal Storm Damage Reduction Project for Surf City and North Topsail Beach, North Carolina. The Type I IEPR also included a review of the study's Environmental Impact Statement.

The Type I IEPR was certified by the Coastal Storm Damage Reduction Planning Center of Expertise on June 28, 2010. The Type I IEPR will not be further discussed in this Review Plan.

4.2 Type II IEPR, Determination

A Type II IEPR SAR as stated by EC 1165-2-209 shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. The purpose for the Coastal Storm Damage Reduction Project for Surf City and North Topsail Beach, North Carolina is for storm damage reduction to residential and commercial structures and contiguous infrastructure. The project design provides for construction of a sand berm and dune along approximately 10 miles of shoreline from the Topsail Beach/Surf City town limits to the northern end of Topsail Island. The berm and dune is not designed to prevent loss of life.

To prevent loss of life within this project area from hurricane, severe storms, and flooding the public must be educated about the risks and warned of potential threats. The responsibility for educating the public about hurricane risks is an ongoing effort of multiple agencies and educational institutions and is not within the scope of this storm damage reduction project. Additionally, the system for determining and providing warnings for potential threats is not part of the Corps mission. Experts from the National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service evaluate meteorological conditions and will inform the national and local media of any developing conditions that may affect the United States of America. Through the media and local authorities, the public is informed about the conditions and ordered to evacuate if necessary. Loss of life is prevented by existing procedures to completely evacuate the barrier island well before expected hurricane landfall.

The project purpose of storm damage reduction is to prevent damages to structures (houses and businesses), infrastructure (roads, utilities, etc.), and land by absorbing and deflecting storm wave energy coming from the direction of the sea. As the design intends, the sand fill berm and dune constructed on the Surf City and North Topsail Beach will erode as it performs.

This shore protection project does not trigger WRDA 2007 Section 2035 factors for Safety Assurance Review (termed Type II IEPR in EC 1165-2-209) and therefore, a Type II IEPR is not required. The factors in determining whether a review of design and construction activities of a project is necessary as stated under Section 2035 and in EC 1165-2-209 along with this review plan's applicability statement follow.

- (1) The failure of the project would pose a significant threat to human life.

This project will perform a periodic nourishment that will establish a beach. The beach is designed to protect structures through its sacrificial nature and is continually monitored and renourished in accordance with program requirements and constraints. Failure or loss of the beach fill will not pose a significant threat to human life.

In addition, the prevention of loss of life within the project area from hurricanes and severe storms is via public education about the risks, warning of potential threats and evacuations before hurricane landfall as previously indicated.

(2) The project involves the use of innovative materials or techniques.

This project will utilize methods and procedures used by the Corps of Engineers on other similar works.

(3) The project design lacks redundancy.

The beach fill design is in accordance with the USACE Coastal Engineering Manual. The manual does not employ the concept of redundancy for beach fill design.

(4) The project has a unique construction sequencing or a reduced or overlapping design construction schedule.

This project's construction does not have unique sequencing or a reduced or overlapping design. The installation sequence and schedule has been used successfully by the Corps of Engineers on other similar works.

As indicated above, this Coastal Storm Damage Reduction Project does not pose a significant threat to human life, and does not trigger any of the EC 1165-2-209 factors for Type II IEPR. Therefore, a Type II IEPR of these implementation documents (P&S and DDR) will not be undertaken.

4.3 Type II IEPR, USACE Risk Management Center Operational Procedures

The USACE Risk Management Center (RMC) is designated as the Review Management Organization (RMO) for Type II IEPR. The South Atlantic Division has coordinated with the RMC and determined that a Type II IEPR is not currently warranted based on the scope of this project. If the project scope is changed, this determination will be reevaluated.

5. MODEL CERTIFICATION AND APPROVAL

Models are not necessary for the Plans and Specifications and the Design Documentation Report.

During the feasibility phase of the study, the Generalized Risk And Uncertainty Coastal (GRANDUC) model was used to measure project benefit. Use of the model was officially supported by the Coastal Storm Damage Reduction Planning Center of Expertise in a memo

dated July 12, 2010. This memo was transmitted to Headquarters (HQUSACE), in order to obtain HQUSACE "approval for use" of the model, which is currently pending.

6. ESTIMATED COSTS AND SCHEDULE

6.1 Project Milestones

District Quality Control	TBD
District BCOE	TBD
BCOE Certification	TBD
Issue Date	TBD
Bid Opening	TBD
Construction Contract Award	TBD

6.2 ATR Schedule and Cost

The ATR will be conducted TBD. It is envisioned that each reviewer will be afforded 40 hours review. The estimated cost is \$35,000. The ATR schedule follows. The dates are based on the draft plans and specs completion date of 04/17/12.

ATRT Selected and Resourced (ATR Start)	01/07/12
ATR Kickoff and ATR Start	04/18/12
ATRT Completes Comments	05/15/12
PDT Completes Evaluations	05/31/12
ATRT Completes Back Checks	06/08/12
ATR Certification	06/12/12

7. POINTS OF CONTACT

Per guidance, the names of the following individual will not be posted on the Internet with the Review Plan. Their titles and responsibilities are listed below.

Wilmington District POCs:

Project Manager (PM):

Jan P. Brodmerkel
910-251-4763
Jan.P.Brodmerkel@usace.army.mil

Chief of Engineering Branch:

Greg L. Williams
910 251-4767
Greg.L.Williams@usace.amry.mil

South Atlantic Division POC:

James C. Truelove
404-562-5121
James.C.Truelove@usace.army.mil

7.1 ATR Team Members

ATR members to be determined.

8. MSC APPROVAL

The MSC that oversees the home district is the South Atlantic Division and it is responsible for approving the review plan. The MSC approval should reflect vertical team input (involving district, MSC, and HQUSACE members) as to the appropriate scope and level of review for the pre-construction and engineering design phase. Like a PMP, the Review Plan (RP) is a living document and may change as work progresses. Changes to the RP should be approved by following the process used for initially approving the RP. In all cases the MSCs will review the decision on the level of review and any changes made in updates to the project.

Attachment 1

ACRONYMS AND ABBREVIATIONS

ATR – Agency Technical Review
BCOE – Biddability, Constructability, Operability and Environmental
CESAD – U.S. Army Corps of Engineers South Atlantic Division
DCP – District Control Plan
DDR – Design Documentation Report
DQC – District Quality Control
EC – Engineer Circular
EIS – Environmental Impact Statements
ER – Engineer Regulations
GRANDUC – Generalized Risk And Uncertainty Coastal
HQUSACE – Headquarters U.S. Army Corps of Engineers
IEPR – Independent External Peer Review
MSC – Major Subordinate Command
PDT – Project Delivery Team
PMP – Project Management Plan
P&S – Plans and Specifications
RMC – USACE Risk Management Center
RMO – Review Management Organization
RP – Review Plan
RTS – Regional Technical Specialists
SAD – South Atlantic Division
SAJ – Jacksonville District
SAW – Wilmington District
SAR – Safety Assurance Review
SME – Subject Matter Expert
USACE – U.S. Army Corps of Engineers
WRDA – Water Resources Development Act

Attachment 2

COMPLETION OF AGENCY TECHNICAL REVIEW

The _____ District has completed the *(type of product)* of *(project name and location)*. Notice is hereby given that an Agency Technical Review, appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the project's Review Plan. During the Agency Technical Review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, 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 Corps policy. The review also assessed the DQC documentation and made the determination that the DQC activities employed appear to be appropriate and effective. The Agency Technical Review was managed by *(RMO)*. All comments resulting from ATR have been resolved and the comments have been closed in DrCheckssm.

(Signature) _____ (Date) _____
RMO representative

(Signature) _____ (Date) _____
ATR Team Leader

(Signature) _____ (Date) _____
Project Manager

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

(Describe the major technical concerns, possible impact, and resolution)

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

(Signature) _____ (Date) _____
Chief, Technical Services Division

SURF CITY AND NORTH TOPSAIL BEACH LOCATION AND PLAN VIEW

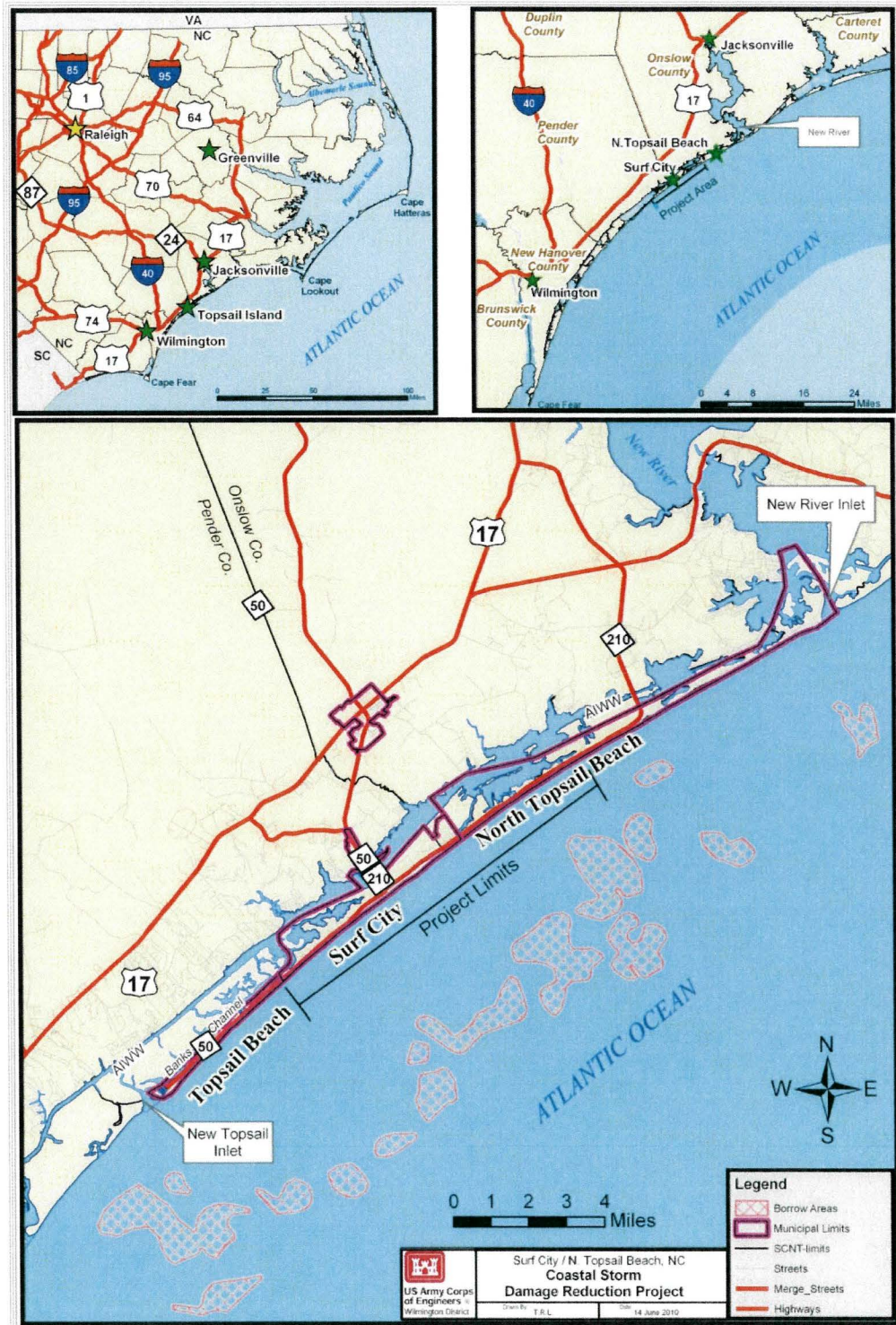
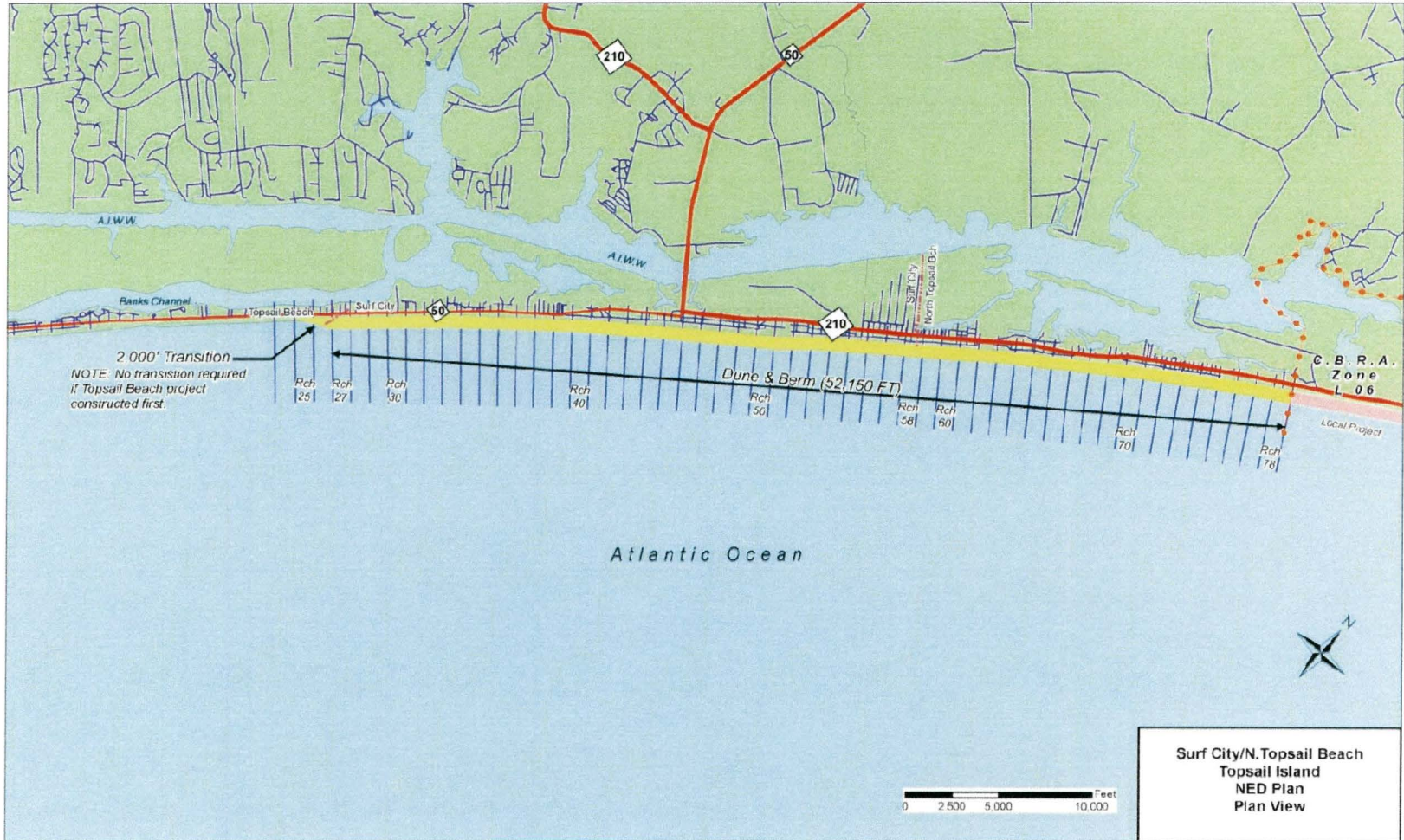


Figure 1. Location.

Figure 2. Plan View.



Surf City/N. Topsail Beach
Topsail Island
NED Plan
Plan View

Attachment 4

TYPICAL BEACH PROFILE

**NED Plan - Typical Profile
1550 Dune-and-Berm**

