



DEPARTMENT OF THE ARMY  
NORTH ATLANTIC DIVISION, CORPS OF ENGINEERS  
FORT HAMILTON MILITARY COMMUNITY  
GENERAL LEE AVENUE, BLDG 301  
BROOKLYN, NY 11252-6700

REPLY TO  
ATTENTION OF:

CENAD-RBT

12 FEB 2013

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 Green Brook Basin Flood Risk Management (FRM)  
Project, Segments U, T and B

1. References:

a. Memorandum, CENAN-EN-MC, 06 Dec 2012, subject: Review Plan for Green Brook Basin, New Jersey, Flood Risk Management Project, Segments U, T and B

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

2. The enclosed Review Plan for Green Brook Basin Flood Risk Management (FRM) Project, Segments U, T and B has been prepared in accordance with Reference 1.c.

3. NAD Business Technical Division is the Review Management Organization (RMO) for the Agency Technical Review (ATR). The Review Plan does not include Type II Independent External Peer Review (IEPR) for Segments U and T since the modification to existing structures is not considered major. The Review Plan includes Type II IEPR for Segment B since it has been determined there is significant threat to human life. The USACE Risk Management Center is the RMO for the Type II IEPR.

4. The Review Plan for the Green Brook Basin Flood Risk Management (FRM) Project, Segments U, T and B 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.

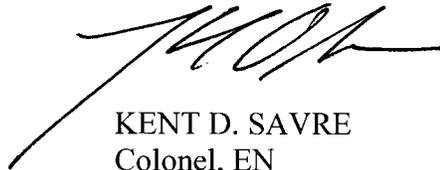
5. In accordance with Reference 1.c, Appendix B, Paragraph 5, this approved Review Plan shall be posted on your district website for public review and comment.

CENAD-RBT

SUBJECT: Review Plan Approval for Green Brook Basin Flood Risk Management (FRM)  
Project, Segments U, T and B

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

Encl  
as



KENT D. SAVRE  
Colonel, EN  
Commanding

CF (w/ encl):  
CEIWR-RMC (T. Bishop/C. Hogan)

**Review Plan for  
Green Brook Basin, New Jersey  
Flood Risk Management Project  
Segments U, T, and B**

New York District  
U.S. Army Corps of Engineers

MSC Approval Date: 11 2 FEB 2013  
Last Revision Date:

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## 1. PURPOSE AND REQUIREMENTS

**a. Purpose.** This Review Plan defines the scope and level of peer review for Segments U, T, and B of the overall Green Brook, NJ Flood Risk Management Project.

### **b. References**

- (1) EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (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, 31 Jul 2006, as revised through 31 Mar 2011
- (4) WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- (5) ER 1105-2-100, Planning Guidance Notebook, Appendix G, 30 June 2004

**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 outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review.

## 2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for implementation documents is the Major Subordinate Command (MSC), while for decision documents it is the appropriate Planning Center of Expertise (per EC 1165-2-209). Therefore, the RMO for the peer review of the Design Documentation Report (DDR), Engineering Documentation Report (EDR), and plans and specifications (P&S) described in this Review Plan is the North Atlantic Division.

## 3. PROJECT INFORMATION

**a. Implementation Documents.** This Review Plan has been prepared for the DDR, EDR as applicable, and P&S for Segments U, T and B of the overall Green Brook, NJ Flood Risk Management Project. The purpose of these documents is to provide a record of final design for these segments. Approval of these documents is at the District Command level.

**b. Project Description.** The Green Brook Sub Basin is located within the Raritan River Basin in north-central New Jersey in the counties of Middlesex, Somerset and Union. It encompasses 13 municipalities and drains approximately 65 square miles of primarily urban and industrialized area. The Final General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS), dated May 1997,

recommended flood protection for the Lower Basin and Stony Brook Basin, and is supported by the project sponsor, the New Jersey Department of Environmental Protection. Based on this report and input obtained during the public review period, the State of New Jersey requested that the upper portion of the project be deferred, pending additional consideration of alternatives. This project was authorized for construction in Section 401a of the Water Resources Development Act of 1986.

A Project Cooperation Agreement was signed on 24 June 1999 with the State of New Jersey. Construction of the project features in the Lower Basin's Borough of Bound Brook is nearing completion. However, based on recent site investigations and surveys, additional work is needed at the Segment U and Segment T areas. In addition, design and construction of Segment B project components, located upstream of the Borough of Bound Brook, have been initiated.

Construction of the Segment U levees and floodwall was completed in 2006. The implementation documents for Segment U reflect an emergency streambank restoration due to erosion occurring at the project site of the previously constructed floodwall.

Construction of the Segment T levee, pump station and closure gate was completed in 2006, with repair and reactivation of the pump station completed in 2012. The implementation documents for Segment T reflect raising the height of the line of protection, in general, to the original design height and, possibly, slightly higher in some areas.

Construction of Segment B will be accomplished under multiple contracts. The first of these construction contracts, Segment B1 which includes Sebrings Mills Bridge raising, levee, pump station and floodwall in Middlesex County, is underway. The second contract, Segment B2, is under design and the design of additional contracts will follow. The implementation documents for Segment B reflect final design of the remaining levees, floodwalls, pump stations, and closure structure.

c. **Factors Affecting the Scope and Level of Review.** 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 involves the use of innovative materials or techniques; whether project design includes redundancy, resiliency, and robustness; and whether the project has unique construction sequencing.

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

All implementation documents will undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality

recommended flood protection for the Lower Basin and Stony Brook Basin, and is supported by the project sponsor, the New Jersey Department of Environmental Protection. Based on this report and input obtained during the public review period, the State of New Jersey requested that the upper portion of the project be deferred, pending additional consideration of alternatives. This project was authorized for construction in Section 401a of the Water Resources Development Act of 1986.

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Construction of the Segment T levee, pump station and closure gate was completed in 2006, with repair and reactivation of the pump station completed in 2012. The implementation documents for Segment T reflect raising the height of the line of protection, in general, to the original design height and, possibly, slightly higher in some areas.

Construction of Segment B will be accomplished under multiple contracts. The first of these construction contracts, Segment B1 which includes Sebrings Mills Bridge raising, levee, pump station and floodwall in Middlesex County, is underway. The second contract, Segment B2, is under design and the design of additional contracts will follow. The implementation documents for Segment B reflect final design of the remaining levees, floodwalls, pump stations, and closure structure.

**c. Factors Affecting the Scope and Level of Review.** 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 involves the use of innovative materials or techniques; whether project design includes redundancy, resiliency, and robustness; and whether the project has unique construction sequencing.

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

All implementation documents will 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 home district will manage the DQC.

- a. Documentation of DQC.** DQC will be documented through the use of DrChecks<sup>sm</sup> and a DQC report, which will be signed by all reviewers.
- b. Products to Undergo DQC.** Products that will undergo DQC include DDR, EDR as applicable, Plans and Specifications and Cost Estimate for Segments U, T, and remaining portions of B.
- c. Required DQC Expertise.** DQC will be performed by staff in the home district that are not involved in the study. Additional Quality Control will be performed by the Project Delivery Team during the course of completing the design.

**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 include the DDR, EDR as applicable, Plans and Specifications and Cost Estimates for Segments U, T, and remaining portions of B.
- 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.
Civil Engineering	Team member should have expertise in the field of civil engineering, especially in design and review of levees, floodwalls, and streambank restoration projects. A registered professional engineer is required.
Cost Engineering	Team member should have expertise 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.
Electrical Engineering	Team member should have expertise in design and review of electrical components of pumps stations, closure gates, and sluice gates. A registered professional engineer is required.
Geotechnical Engineering	Team member should have expertise in geotechnical engineering and levee construction and experience with bendway weirs. A registered professional engineer is required.
Hydraulic Engineering	Team member should have expertise in the field of urban hydraulics, including levee systems, interior drainage and have a thorough understanding of the use of HEC computer modeling systems, and experience with bendway weirs. A registered professional engineer is required.
Hydrologic Engineering	Team member should have expertise in the field of urban hydrology , including interior drainage, and have a thorough understanding the use of HEC computer modeling systems. A registered professional engineer is required.
Mechanical Engineering	Team member should have expertise in design and review of mechanical components of pumps stations and sluice gates. A registered professional engineer is required.
Structural Engineering	Team member should have expertise in the field of structural engineering, especially in design and review of floodwalls and closure gates. A registered professional engineer is required.

**c. Documentation of ATR.** DrChecks<sup>sm</sup> review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

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

In some situations, especially addressing incomplete or unclear information, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks<sup>sm</sup> 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, 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<sup>sm</sup> with a notation that the concern has been elevated to the vertical team for resolution.

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:

- Identify the document(s) reviewed and the purpose of the review;
- 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 the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a copy of each ATR comment, the PDT response, a brief summary of the pertinent points in the follow on discussion, including any vertical coordination, and the agreed upon resolution.

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 shore protection component DDR, EDR, and 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 1165-2-209, 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 Green Brook, NJ Flood Risk Management Project is in the Construction Phase.

Type II Independent External Peer Review, Safety Assurance Review, is required by EC 1165-2-209 for design and construction activities for flood risk management projects where issues of life safety are present. This requirement applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities.

- Segment U- Type II IEPR is not applicable since the modification to the existing project is not considered major.
- Segment T- Type II IEPR is not applicable since the modification to the existing project is not considered major.
- Segment B- As documented in Memorandum for Record dated 6 December 2012 (Attachment 4), based on a risk informed assessment which considered life safety factors, New York District Chief, Engineering Division, determined that there is a significant threat to human life. Accordingly, a Type II IEPR, Safety Assurance Review, is required for the remaining levee, floodwall, pump station, and closure gate components of Segment B.

**b. Products to Undergo IEPR.** The Segment B products that will undergo IEPR include the DDR, EDR as applicable, plans and specifications, and construction activities for remaining levees, floodwalls, pump station, and closure structure.

**c. Required IEPR Panel Expertise.** The disciplines required for the IEPR are as follows:

Civil Engineering	The reviewer should have extensive experience in evaluation of levees and floodwalls.
Electrical Engineering	The reviewer should have extensive experience with electrical components of pump stations, closure gates, and sluice gates.
Geotechnical Engineering	The reviewer should have extensive experience in geotechnical evaluation of levees such as slope stability evaluation, evaluation of the seepage through levees, and underseepage through the foundation of floodwalls, closure structures and other pertinent features, and in settlement evaluation of the structures.
Hydraulic Engineering	The reviewer should have extensive experience in the field of urban hydraulics, including levee systems and interior drainage and have a thorough understanding of the use of HEC computer modeling systems.
Mechanical Engineering	The reviewer should have extensive experience with mechanical components of pump stations and sluice gates.
Structural Engineering	The reviewer should have extensive experience in structural evaluation of floodwalls and closure gates.

**d. Documentation of IEPR.** The RMO for Type II IEPR reviews is the USACE Risk Management Center per EC 1165-2-209, Appendix E. Panel comments should address the adequacy and acceptability of the engineering design and construction activities. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.c above. The IEPR panel will prepare a Review Report that 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 the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions for both the design review and construction review;
- Describe any lessons learned in the process and/or the design and construction;
- Identify and summarize each unresolved issue (if any); and
- Include a copy of each review comment, the PDT response, a brief summary of pertinent points in the follow-on discussion including any vertical coordination, and the agreed upon resolution.

The USACE shall consider all comments contained in the Review Report and prepare a written response for all comments and note concurrence and subsequent action or non-concurrence with an explanation. The Review Report and USACE responses will be made available to the public, including through electronic means on the internet.

## **7. POLICY AND LEGAL COMPLIANCE REVIEW**

All implementation documents will be reviewed for their compliance with law and policy. These reviews culminate in determinations that the designs and the supporting analyses and coordination comply 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.

## **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. The project has already been authorized for construction. Therefore, cost certification is not required per ER 1110-2-1302.

## **9. MODEL CERTIFICATION AND APPROVAL**

Not applicable since the Green Brook project is in the Construction Phase, with ongoing engineering and design, 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:

Segment U:

90% DDR, EDR, Plans & Specifications, Cost Estimate-Jan 2013 (\$30,000)

100% DDR, EDR, Plans & Specifications, Cost Estimate-Mar 2013 (\$10,000)

Segment T:

90% DDR, EDR, Plans & Specifications, Cost Estimate-Jan 2013 (\$30,000)

100% DDR, EDR, Plans & Specifications, Cost Estimate-Mar 2013 (\$10,000)

Segment B2:

90% DDR, EDR, Plans & Specifications, Cost Estimate-Sep 2013 (\$30,000)

100% DDR, EDR, Plans & Specifications, Cost Estimate-Nov 2013 (\$10,000)

Remainder of Segment B:

Schedule/Cost to be determined

**b. IEPR Schedule and Cost.**

Segment B2:

100% DDR, EDR, Plans & Specifications-Dec 2013 (\$60,000)

Construction Activities-May 2014 (\$60,000)

Remainder of Segment B:  
Schedule/Cost to be determined

**c. Model Certification/Approval Schedule and Cost.** Not applicable.

## **11. PUBLIC PARTICIPATION**

There will be public meetings prior to the start of each construction contract. Also, as significant changes or developments occur, the District will present this information to the NJDEP, the county and local municipality. 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 design and construction progresses. The home district is responsible for keeping the Review Plan up to date. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the New York District's webpage. The latest Review Plan will also be provided to the RMO.

## **13. REVIEW PLAN POINTS OF CONTACT**

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

- Sheila Rice McDonnell, NAN, EN Technical Manager, 917-790-8297
- Alan Huntley, NAD Technical Business Division, 347-370-4586

**ATTACHMENT 1: TEAM ROSTERS**

**PDT**

<b>Name</b>	<b>Role</b>	<b>Phone Number</b>	<b>E-mail Address</b>
Frank Verga	Project Manager	917-790-8212	<a href="mailto:Frank.Verga@usace.army.mil">Frank.Verga@usace.army.mil</a>
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Nuree Sarkar	Civil Engineer	x-8378	<a href="mailto:Nuree.A.Sarkar@usace.army.mil">Nuree.A.Sarkar@usace.army.mil</a>
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Lynn Rakos	Cultural Resources	x-8629	<a href="mailto:Lynn.Rakos@usace.army.mil">Lynn.Rakos@usace.army.mil</a>
Thomas Sessa	Electrical Engineering	x-8272	<a href="mailto:Thomas.E.Sessa@usace.army.mil">Thomas.E.Sessa@usace.army.mil</a>
Kimberly Rightler	Environmental/NEPA	x-8722	<a href="mailto:Kimberly.Rightler@usace.army.mil">Kimberly.Rightler@usace.army.mil</a>
Stanley Sedwick	Geotechnical Engineering	x-8370	<a href="mailto:Stanley.J.Sedwick@usace.army.mil">Stanley.J.Sedwick@usace.army.mil</a>
Roy Messaros	Hydraulics	x-8247	<a href="mailto:Roy.C.Messaros@usace.army.mil">Roy.C.Messaros@usace.army.mil</a>
Peter Koch	Hydrology	x-8359	<a href="mailto:Peter.M.Koch@usace.army.mil">Peter.M.Koch@usace.army.mil</a>
Elena Manno	Mechanical Engineering	x-8371	<a href="mailto:Elena.Manno@usace.army.mil">Elena.Manno@usace.army.mil</a>
David Andersen	Real Estate	x-8456	<a href="mailto:David.C.Andersen@usace.army.mil">David.C.Andersen@usace.army.mil</a>
Sean O'Donnell	Structural Engineering	x-8286	<a href="mailto:Sean.B.O'Donnell@usace.army.mil">Sean.B.O'Donnell@usace.army.mil</a>

**ATR Team\***

<b>Name</b>	<b>Role</b>	<b>Review District</b>
TBD	ATR Lead	TBD
TBD	Civil Engineering	TBD
TBD	Cost Engineering	TBD
TBD	Electrical Engineering	TBD
TBD	Geotechnical Engineering	TBD
TBD	Hydraulic Engineering	TBD
TBD	Hydrologic Engineering	TBD
TBD	Mechanical Engineering	TBD
TBD	Structural Engineering	TBD

\*All resumes will be reviewed and approved by the MSC prior to initiating any ATR.

**IEPR Team**

<b>Name</b>	<b>Role</b>	<b>Organization</b>
TBD	Civil Engineering	TBD
TBD	Electrical Engineering	TBD
TBD	Geotechnical Engineering	TBD
TBD	Hydraulic Engineering	TBD
TBD	Mechanical Engineering	TBD
TBD	Structural Engineering	TBD

**Vertical Team**

<b>Name</b>	<b>Role</b>	<b>Phone Number</b>	<b>E-mail Address</b>
Anthony Ciorra	NAN PPMD Civil Works Branch Chief	917-790-8208	<a href="mailto:Anthony.Ciorra@usace.army.mil">Anthony.Ciorra@usace.army.mil</a>
Leonard J. Houston	NAN-PL, Environmental Analysis Branch Chief	917-790-8702	<a href="mailto:Leonard.Houston@usace.army.mil">Leonard.Houston@usace.army.mil</a>
Frank Santangelo	NAN-EN, Civil Resources Branch Chief	917-790-8266	<a href="mailto:Frank.A.Santangelo@usace.army.mil">Frank.A.Santangelo@usace.army.mil</a>
Thomas Dannemann	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	NAN-EN, Cost Engineering Branch Chief	917-790-8421	<a href="mailto:Mukesh.Kumar@usace.army.mil">Mukesh.Kumar@usace.army.mil</a>
Angelo Trotto	NAN-EN, Engineering Management, Civil Works Section Chief	917-790-8296	<a href="mailto:Angelo.R.Trotto@usace.army.mil">Angelo.R.Trotto@usace.army.mil</a>
Alan Huntley	NAD BTD	347-370-4664	<a href="mailto:Alan.Huntley@usace.army.mil">Alan.Huntley@usace.army.mil</a>
TBD	RMC		

**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  
ATR Team Leader  
Office Symbol/Company

Date

SIGNATURE

Name  
Project Manager  
Office Symbol

Date

SIGNATURE

Name  
Architect Engineer Project Manager<sup>1</sup>  
Company, location

Date

SIGNATURE

Name  
Review Management Office Representative  
Office Symbol

Date

**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  
Chief, Engineering Division  
Office Symbol

Date

SIGNATURE

Name  
Architect Engineer Principal  
Office Symbol

Date

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

**ATTACHMENT 3: ACRONYMS AND ABBREVIATIONS**

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
Home District/MSD	The District or MSD responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
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

**Attachment 4: Risk Informed Assessment**

CENAN-EN-MC-F

6 December 2012

MEMORANDUM For Record

SUBJECT: Segment B, Green Brook, NJ Flood Risk Management Project- Risk Informed Assessment of Significant Threat to Human Life

**1. Project Information.** The Green Brook Sub Basin is located within the Raritan River Basin in north-central New Jersey in the counties of Middlesex, Somerset and Union. It encompasses 13 municipalities and drains approximately 65 square miles of primarily urban and industrialized area. The Final General Reevaluation Report (GRR) and Supplemental Environmental Impact Statement (SEIS), dated May 1997, recommended flood protection for the Lower Basin and Stony Brook Basin, and is supported by the project sponsor, the New Jersey Department of Environmental Protection. Based on this report and input obtained during the public review period, the State of New Jersey requested that the upper portion of the project be deferred, pending additional consideration of alternatives. This project was authorized for construction in Section 401a of the Water Resources Development Act of 1986. The project components have been broken into various segments. Construction of Segment B will be accomplished under multiple contracts. The first of these construction contracts, Segment B1 which includes Sebrings Mills Bridge raising, levee, pump station and floodwall in Middlesex County, is underway. The second contract, Segment B2, is under design and the design of additional contracts will follow.

**2. Project Description.** The remaining components of Segment B include levees, floodwalls, a pump station, and a closure structure.

**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 remaining components of Segment B (Table 1).

**4. Determination.** Based on a risk informed assessment which considered life safety factors, I have determined that there is a significant threat to human life associated with the remaining components of Segment B, Green Brook, NJ Flood Risk Management Project. Accordingly, a Type II IEPR, Safety Assurance Review, is warranted for the remaining components of Segment B.

Encl

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

No.	Risk Factor (Possible Threat to Life Safety)	Risk Magnitude	Basis of Concern	Risk Assessment
1	Land Use adjacent to the project:	Low	The land use adjacent to the project is generally residential and comprised of single-family homes.	See 1a – 1c, below.
1a	<ul style="list-style-type: none"> <li>• Population Density</li> </ul>	Medium	The project area is densely populated suburban township.	Due to population density, many people could be affected by flooding or project failure.
1b	<ul style="list-style-type: none"> <li>• Critical Facilities Affected (e.g. schools, hospitals, assisted living/nursing homes, evacuation routes)</li> </ul>	Low	There are no schools, hospitals, or known assisted living facilities in this area to be protected by Segment B, however, the Sebrings Mills Road Bridge which crosses Green Brook and would allow northward movement from the area could be compromised in a storm event.	Although Sebrings Mills Road could be compromised, there are alternative evacuation routes available.
1c	<ul style="list-style-type: none"> <li>• Numbers/ types of structures in flood plain</li> </ul>	Low	There are approximately 90 structures within the 150-year floodplain. These are generally two-story, single-family homes, with some commercial and municipal structures.	Project structures within the floodplain could be adversely affected by flooding or project failure.
2	Structural failure of project components	Medium	Weather event that creates discharge on Green Brook that would cause significant damage to levee/floodwall system thereby leading to loss of functional integrity.	For the completed project, structural failure of a project component up to the design event is unlikely due to the use of proven design and construction techniques. However, larger events which can lead to failure would result in significant flood damages and impact a large

				number of people. Risk will be inherent with all levee/floodwall projects.
3	Overtopping of Hydraulic Structure	High	Weather event that creates discharge on Green Brook that would exceed the design elevation or cause debris jam at Sebrings Mills Rd bridge that restricts flow resulting in overtopping of levee/floodwalls.	Interim conditions include risk reduction for only lower level flood events varying from a 10-year event to a 40-year to a 100- year as a phased approach until the entire Segment B is complete, at which time there would be the 150-year level of protection.
4.	Use of 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	The design of this project will be performed by accepted methods in accordance with COE guidance. No innovative or precedent setting methods or models are anticipated.
5.	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.	The design of this project will fall within prevailing practice and include only time-tested design features (levees, floodwalls, and pump stations).
6.	Use of unique non-traditional construction materials or methodologies	High	Unique or non-traditional 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 used will be within common practice. However, due to phased construction and the need to prevent an unacceptable increase in water

				surface elevations behind the line of protection, sections of floodwall will be constructed at a lower than design elevation as an interim condition.
7.	Does this project have unique sequencing or a reduced or overlapping design/ construction schedule?	High	Unique or accelerated construction sequencing may lead to poor quality work, leading to a greater possibility of project failure.	Due to the construction sequencing, the authorized level of protection will not be achieved until all portions of Segment B are constructed.
8.	<i>Does the project Require:</i>			
8a.	Redundancy	Low	Failure of one critical project element would result in sudden, catastrophic damage. Duplication of critical components of the protective system is required to increase the reliability of the system.	The levees, floodwalls, and pumps stations greatly reduce the risk to human life and property relative to the without project condition. The outfall structures have sluice gate/flap valve as a redundant feature.
8b.	Resiliency	Medium	Level of protection may be reduced over time.	Adherence to OMRR&R requirements will ensure that the project remains at full operating efficiency. However, over time the hydrology may change thereby reducing the level of protection.
8c.	Robustness	Medium	Natural events can occur that are greater than the design level and may lead to project failure.	This project is designed to provide protection against a 150 year event. Should more severe

				events occur, inundation damages to structures may exceed the without-project condition.
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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

6 December 2012

MEMORANDUM FOR Chief, Business Technical Division, North Atlantic Division

SUBJECT: Review Plan for Green Brook Basin, New Jersey, Flood Risk Management Project,  
Segments U, T, and B

1. In accordance with Civil Works Review Policy (EC 1165-2-209), enclosed for your review and approval is the subject document.
2. Should you have any questions or concerns regarding this review plan, please do not hesitate to contact Sheila Rice McDonnell at 917-790-8297.

ENCL  
Review Plan

CF: C, CENAN-PP

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