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# **IMPLEMENTATION PLAN FOR NON-STRUCTURAL APPENDIX D**

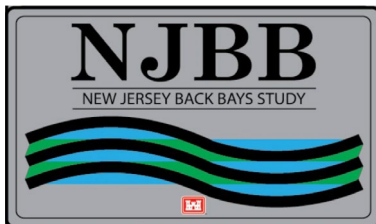
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## **NEW JERSEY BACK BAYS COASTAL STORM RISK MANAGEMENT FEASIBILITY STUDY**

**PHILADELPHIA, PENNSYLVANIA**

### **APPENDIX D**

**December 2024**



## TABLE OF CONTENTS

SECTION 1.0 NON-STRUCTURAL PROJECT DESCRIPTION	1
SECTION 2.0 ELEVATION OF ELIGIBLE RESIDENTIAL STRUCTURES	3
SECTION 3.0 PROJECT DELIVERY STRATEGY/IMPLEMENTATION METHOD	4
SECTION 4.0 ELIGIBILITY DETERMINATION PROCESS	5
SECTION 5.0 ELIGIBLE AND INELIGIBLE PROJECT COSTS	7
SECTION 6.0 STRATEGY FOR PRIORITIZATION OF IMPLEMENTATION	9
SECTION 7.0 REAL ESTATE	10
SECTION 8.0 OPERATION & MAINTENANCE	14
SECTION 9.0 FLOODPROOFING OF ELIGIBLE NON-RESIDENTIAL STRUCTURES	14
APPENDIX A - DEFINITIONS	17
APPENDIX B - LITERATURE REVIEW	19
APPENDIX C - ELIGIBILITY DETERMINATION METHODOLOGY	21

## FIGURES

FIGURE 1. LOCATIONS OF STRUCTURE ELEVATION AND FLOOD PROOFING NON-STRUCTURAL MEASURES.	2
FIGURE 2. REAL ESTATE ACQUISITION PROCESS FORM NON-STRUCTURAL GUIDANCE.	11

## TABLES

TABLE 1. STRUCTURE TYPE BY REGION.	1
TABLE 2. RESIDENTIAL STRUCTURE ELEVATION TIMELINE.	5

## SECTION 1.0 NON-STRUCTURAL PROJECT DESCRIPTION

This Non-Structural Implementation Plan describes the general process for the implementation of Non-Structural measures, as described in the Integrated Feasibility Report/Environmental Impact Statement, designed to reduce the risk of damages caused by coastal storms in the study area. The primary goal of the Tentatively Selected Plan is to manage the risk of damage from storm surge for structures that have a First Floor Elevation (FFE) at or below the 20% annual exceedance probability (AEP) (predicted to occur at the end of the 50-year period of analysis (2090) and that have been shown to be economically justified or are included in the plan.

This Non-Structural Implementation Plan outlines the implementation of physical Non-Structural measures related to elevation and dry flood proofing. Wet flood proofing will be considered in future versions of this Implementation Plan. There are currently no recommendations for relocations or acquisitions as part of the Non-Structural implementation plan. However, these measures will be considered in future phases of the Study or Project which may subsequently require an additional authorization.

The Tentatively Selected Plan consists of the following measures:

- (1) The elevation of 6,421 residential structures with the 20% AEP (5-year) floodplain to the 1% base elevation in 2090 accounting for an intermediate rate of sea level rise (Figure 1);
- (2) The dry floodproofing of ~279 Critical Infrastructure (CI) elements (Police, Fire, Ambulance, Hospital, Pharmacy) up to +3 feet above existing ground elevation (Figure 1); and
- (3) The use of dredged material to enact Nature Based Solutions (NBS) by restoring approximately 7 degraded salt marsh habitats with dredged material in the back bay area. The NBS plan consists of augmenting sediment supply to 7 strategic and future degraded saltmarshes. Sources of material for marsh augmentation include the beneficial use of dredged shoals and the removal of material from existing Dredged Material Placement Facilities (DMPFs).

The locations of the elevated and floodproofed structures are further divided by region in the below table.

*Table 1. Structure type by region.*

<b>Region</b>	<b>Residential Elevations</b>	<b>Critical Infrastructure</b>
Shark River	9	9
North	3,598	102
Central	1,378	105
South	1,436	63
<b>Total</b>	<b>6,421</b>	<b>279</b>

Due to large study area, project elevations and dry floodproofing will take place in phases/by municipalities, the order of which will be determined after project authorization during the Pre-Construction Engineering and Design (PED) Phase with further detailed investigation not possible during the feasibility stage due to time and expense constraints. All participation in the residential elevations or commercial floodproofing is voluntary, but a 100% participation rate will be used for project planning report purposes.

Non-Structural elevations will be constructed over an 11-year period starting in 2030. This schedule includes the elevation of 300 structures in Year 1, 612 structures/year in Years 2-10 and 613 structures in Year 11. Additionally, the construction timeframe of the project is highly dependent upon the participation rate and the amount of funding allocated in any given year.

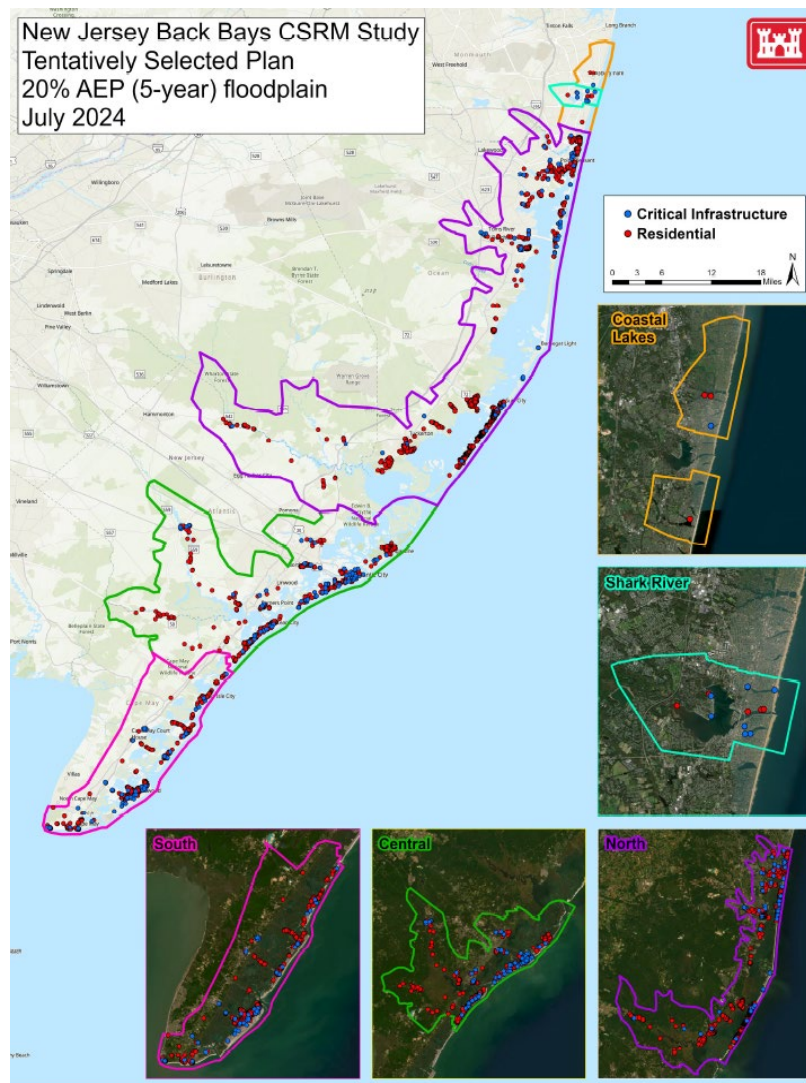


Figure 1. Locations of structure elevation and flood proofing Non-Structural measures.

This Non-Structural implementation plan has been developed in reference to Section 73 of the Water Resources Development Act (WRDA) of 1974, as amended (33 United States Code [U.S.C.] 701b-11). This authority requires US Army Corps of Engineers (USACE) to consider Non-Structural measures to reduce flood damages, and Sections 103(b) and 103(c)(5) of WRDA 1986 (33 U.S.C. 2213(b) and 2213(c)(5), respectively) provide specific cost-sharing for Non-

Structural FRM and CSRM projects. Due to a number of factors, including climate change and associated sea level rise, an emphasis on community flood resilience, and a greater recognition of the economic, social, and environmental impacts of flood events, the number of Non-Structural projects approved and authorized in flood risk management (FRM) and coastal storm risk management (CSRM) studies has significantly increased.

According to the USACE National Non-Structural Committee, Non-Structural measures are permanent or contingent measures applied to a structure and/or its contents that prevent or provide resistance to damage from flooding. Non-Structural measures differ from structural measures in that they focus on reducing the consequences of flooding instead of focusing on reducing the probability of flooding. They can include physical and non-physical measures to prevent flooding.

This Non-Structural implementation plan considers only structure elevation and flood proofing measures at this time. Additional measures as discussed below will be considered in future phases of the study. Implementation guidelines for these additional measures will be developed where applicable.

Physical Non-Structural measures include:

- Residential structure elevation
- Relocation of structure
- Acquisition of property
- Dry flood proofing of critical infrastructure
- Wet flood proofing critical infrastructure

Non-physical Non-Structural measures include:

- Flood warning systems
- Flood insurance
- Floodplain mapping accuracy improvements
- Flood emergency preparedness plans
- Land use regulation to manage flooding risk
- Zoning
- Evacuation plan development/improvements
- Risk communication including public engagement

## SECTION 2.0 ELEVATION OF ELIGIBLE RESIDENTIAL STRUCTURES

Owners of eligible residential structures may participate by having their structure elevated to the modeled 1% AEP Non-Structural design Water Surface Elevation (which includes intermediate RSLC projected to 2090) described in Section 1.0 above. Specific elevations have not been determined for individual structures. An elevation of 15 feet NAVD88 is currently being applied for all structures. If the required elevation is greater than 12 feet above ground level, the structure would be ineligible to participate due to engineering and risk related factors.

The Government reserves the right to determine which measure(s) will be implemented at each eligible structure. The total construction time for implementation of the structure elevations is estimated to be eleven years. However, the timing and scale of the project is dependent on foundation type, participation rate, funding, and environmental conditions.

Major factors the Project Delivery Team (PDT) considered in this determination include:

- IEBC allows additional wind loads that do not increase stresses in the affected structural

elements by more than 10 percent and does not mandate that the structure need to be evaluated for this increased in the wind load. For example, structures with the original height of 15' and 16', raising it by 12' will result in an increased in wind load of 10.0% and 10.3% respectively.

- International Revenue Code (IRC) governs the design of detached one- and multiple-family dwelling units. When the unit is elevated, however, provisions of International Existing Building Code (IEBC) will govern the evaluation on structural integrity of the unit to withstand the wind load.
- Occupants who shelter in place become trapped in an extremely unsafe environment. First responders are placed into an extremely unsafe environment if required to conduct rescue operations.
- Wind speed increases significantly, particularly in coastal areas, and damages to exterior siding / roofing also increases when a structure is elevated greater than 12ft.
- Extended and open foundations (piers, posts, columns, and piles) are subject to undermining, movement, and impact failures.

### SECTION 3.0 PROJECT DELIVERY STRATEGY/IMPLEMENTATION METHOD

The New Jersey Back Bays (NJBB) Project will utilize a traditional USACE-led traditional project delivery method, by performing design in house and contracting out construction of the nonstructural measures. This Design-bid-build (D-B-B) project delivery includes the combination of in-house design and use of a separate contract, or contracts, for construction.

The Government will procure contracts that will allow a contractor to perform work on multiple structures through a series of one or more design-build task orders. The Contractor will also be responsible for eligible work associated with the elevation including the final design of the non-structural measure, obtaining the required local, state, and federal permits, and all necessary elements to complete construction to desired intent.

The contracting vehicle that would allow the construction to proceed at the required pace would likely be a Multiple Award Task Order Contract (MATOC). In a MATOC agencies issue a Request for Proposals (RFP) and typically select contractors-based qualifications. Multiple awardees may be chosen to provide services to the government within a pre-defined dollar amount.

MATOCs allow agencies to set up a master contract through which individual task orders can be issued. There is normally a limit to the number of contract holders, which limits competition for each task order to a pre-qualified set of vendors. Selection of the contractor for each task order can be made based on price alone or based on a best value process. MATOCs can include Design-Build capabilities, though some agencies require a two-step selection process in alignment with the Brooks act when Design services are incorporated.

There is likely to be section 8(a) small business contractor involvement either directly by the Prime, or as a condition that a certain percentage of subcontracted work meets section 8(a) concerns. Competition will be limited due to section 8(a) objectives, using small groups of preapproved contractors, or with the intent of improving overall quality of construction (best-value procurements). There is additional risk that the exact implementation plan could cause increased levels of tiered subcontracting, and/or limit the pool of contractors.

Table 2 presents offers an estimated projection of the residential structure elevation timeline. This timeline assumes 100% participation of the ultimate recommended plan involving the elevation of

6,421 residential structures. Additional details on specific tasks, work break down structure and activity-specific costs will be developed by the PDT early in the PED phase as part of the scoping and Project Management Plan (PMP) development (this will occur in conjunction with execution of the Design Agreement or Project Partnership Agreement). Tasks and cost estimates are subject to significant change during the period between the signing of the Chief's Report and Congressional authorization and appropriation required to begin the project.

*Table 2. Residential Structure Elevation Timeline.*

<b>Residential Structure Elevation Timeline</b>	
<b>Event</b>	<b>Schedule</b>
PPA - Execution by All Parties	August 2026
Determination of Initial Phase Area and Housing Cluster	August 2026
Notice to Proceed to NFS (Once Phase Area and Housing Cluster Determined)	September 2026
NFS Notifies Owners of Preliminary Eligibility (Incl. Ownership Research Time)	March 2027
Owner Application/ROE for Investigations	March 2028
Environmental and Structural Investigations and Title Searches	March 2029
Owner Notified of Final Eligibility	April 2029
NTP for Design/Design Period	October 2029
Owner and NFS Sign Participation Agreement/Easement Deed	April 2030
NFS Issues Authorization for Entry to USACE	May 2030
USACE Real Estate Issues Certification of Availability	June 2030
Ready to Advertise Contract	December 2030
Notice To Proceed (2nd) for Construction Contract	June 2031

Property owners located in the study area will be informed of the details of implementation of the coastal storm risk management feature of the project, including eligibility criteria, the eligibility process, and the related duties and obligations of USACE, the Non-Federal Interest (NFI), and the property owner. However, some of this information may be modified as the Non-Structural Implementation Plan is finalized as part of the PED phase.

There is a moderate risk to the schedule caused by the unknown time on average needed for an owner to complete the requirements included in the Participation Agreement. While every owner's situation will be different, there will eventually be an "average" or a required (set by the NFS and PDT) length of time to completion of tasks for future residential elevations projects.

## SECTION 4.0 ELIGIBILITY DETERMINATION PROCESS

This section describes the preliminary eligibility process that was conducted during the feasibility phase, the refinement of the criteria during PED, and the final eligibility process that will be conducted during the construction phase. The eligibility process will be refined occur during the PED phase as detailed structure survey data are collected and analyzed by the design team. The process will then be finalized during the Construction phase.

The eligibility process will commence following the strategy for prioritization of implementation discussed in Section 6 below.

## Feasibility

The first step in determining structure elevation eligibility is identifying structures that have a FFE at or below the 1% AEP flood elevation, based on hydrologic conditions predicted to occur in 2090 (the end of the 50-year period of analysis). Flood plain mapping was used to identify structures located in the 1% AEP flood plain modeled to exist in 2090. The National Structure Inventory (NSI) database was used to determine physical features (foundation, stories, construction) of each structure. A validation of the NSI database for the study area will be performed as the project progresses. At the time of the development of this Implementation Plan, 6,421 structures have been deemed to be preliminarily eligible for implementation. These structures will require additional structure-specific analysis during PED to determine final eligibility.

## PED

New Jersey, particularly in the time after Hurricane Sandy in 2012, has implemented structure elevations across the study area through both public and private programs. Elevated structures will have foundation heights significantly higher than the “typical” structure and are considerably less vulnerable to coastal storm events. While these elevations are somewhat addressed by the average foundation height (elevated structures were not screened from the sampling), the next project phase (PED) will pursue identifying individual structures in the study area that are (or will be) elevated before the Base Year in 2040. This includes tracking elevation certificates and other documentation to compile a comprehensive list of elevated structures in the asset inventory.

Once preliminary eligibility is determined, property owners will be asked to submit an application and will also be required to grant a temporary right-of-entry for survey and exploration to USACE and the NFI to enter upon the property to conduct any property and structural investigations deemed necessary to determine final eligibility for participation in the project. If the owner refuses to execute a right of entry, this will negate participation in the project.

After the owner submits an application and right of entry, USACE and the NFI will conduct investigations to determine final eligibility. These investigations may include: structural inspections, surveys, limited environmental testing and site assessments, verifying current elevation and determining elevation requirements, and conducting such other activities deemed necessary by USACE and the NFI to make a final determination of eligibility. A property owner may elect not to participate at any time prior to execution of an easement for the performance of the Non-Structural measure upon the property. Refusal to grant temporary right-of-entry will constitute an election not to participate.

Additional requirements and considerations for determination of eligibility include the following:

- Engineering feasibility to elevate the structure.
- Condition of structure and need for repair or rehabilitation, which is solely the responsibility of the property owner.
- Temporary right of entry for property and structure investigations, including refusal of right of entry negating participation in a project.
- Title search and any other proof of ownership required.
- The structure will be evaluated by USACE to ensure that the following eligibility requirements are satisfied at a minimum:
  - The structure can be elevated to meet or exceed the required design base flood elevation (BFE). However, in no event will a structure be raised greater than 12 feet



- above the ground level.
- Based on a visual assessment, the structure is in a condition that is suitable for elevation without the need for repair or rehabilitation. Any repair or rehabilitation necessary to achieve that condition will be at the sole cost and expense of the property owner. If substantial, the time and cost required to repair/rehab a structure could lead to it not being included in the project (see Section 2.6 “Eligible and Ineligible Improvement Costs” below).
- Implementation of Non-Structural measures does not impact threatened or endangered species (T&E).
- For potential T&E species and waters of the U.S. adverse impact issues, the New York District, Regulatory Program and Planning Division needs to be contacted.
- Any contaminated soils, hazardous, toxic, or radioactive materials (e.g., lead paint, asbestos etc.) or other environmental conditions of concern must be removed and/or mitigated from the study area by the property owner to the level of satisfaction of the Government, prior to contract solicitation and at no cost to the Government.
- Any remediation, removal and disposal of environmental contaminants including but not limited to Hazardous, Toxic, or Radioactive Waste (HTRW), asbestos, and asbestos- containing materials in damaged or friable form have been satisfactorily completed.

**Commencement of Non-Structural Improvements.** Following the eligibility determination and receipt of the required documentation, elevation of the structure will commence. For residential elevations, the entire structure will be lifted and placed on a new foundation (i.e., columns, piers, posted or raised foundation walls) so that the FFE is at the design elevation described in Section 2.0, above. Utilities and mechanical equipment, including air conditioners, furnaces, and water heaters, will also be raised to the required elevation. Property owners may choose to elevate the structure, utilities, and/or mechanical equipment in excess of the design elevation; however, costs attributable to elevations in excess of the minimum requirements set forth herein, or any other work on the home, are not deemed eligible costs (described below) and would be performed at the sole cost, risk, and expense of the property owner. In no way will this additional work be allowed to impact the overall schedule of the project if government contracts are the basis of the process.

**Notice of Construction Completion.** Upon completion of the improvements, an inspection will be performed by USACE and upon final approval by the District Engineer, or his designee, a Notice of Construction Completion (NCC) will be issued to the NFI, and the individual elevation project will be closed out as complete.

## SECTION 5.0 ELIGIBLE AND INELIGIBLE PROJECT COSTS

**Eligible Project Costs.** All elevation will require local permits prior to any onsite construction. Only the costs of elevation and foundation retrofitting are eligible costs. No Federal funds will be used to restore, replace, or repair the structure (note the homeowner can make improvements to their structure prior to eligibility determination). No additions to the habitable spaces of the structure will be permitted in the performance of the elevation work. Eligible project costs include: design costs; costs of obtaining required permits (i.e., zoning or land use approvals, environmental permits or required certifications, historic preservation approvals, and building permits), unless identified as an ineligible project cost. Additional eligible costs include:

- costs of title searches (and review of title information submitted by the property owner),

- and surveys;
- raising the roof and extending the walls of a side structure attached to the main structure (i.e., garage);
- raising mechanical equipment (i.e., air conditioner, furnace, water heater, electrical panel, fuel storage, valves, or meters);
- connecting, disconnecting, and extending utility connections for electrical power, fuel, incoming potable water, wastewater discharge;
- compliance with access requirements of applicable building codes (i.e., stairs with landings, guardrails);
- creating vent openings in the foundation and walls to meet requirements for flood water entry and exit;
- in instances where special access improvements (i.e., elevators, lifts, ramps, etc.) may be required (i.e., in the case of physically handicapped or elderly homeowners or occupants), special handicapped access can be considered an eligible improvement cost when documented by the medical certificate of a licensed physician. Multiple special access points may also be eligible for funding where necessary to meet state or local building code compliance;
- removal of any trees which restrict the elevation of a structure;
- site grading and site restoration including restoring landscaping to its preconstruction condition;
- measures necessary to avoid, minimize, or mitigate for adverse effects to historic properties or on National Historic Landmarks located in the project's areas of potential effect, as detailed in the executed Programmatic Agreement in coordination and consultation with the NY SHPO, interested parties and federally recognized Tribes, and preparation of National Register nomination forms.
- temporary site protection measures during site work; and
- allowable relocation assistance funds for displaced tenants in accordance with Uniform Relocation Assistance and Real Property Acquisition Policies for Federal and Federally Assisted Programs of 1970, Public Law 91-646, 84 Stat. 1894 ([42 U.S.C. 4601](#)) (URA), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987, Title IV of Public Law 100- 17, 101 Stat. 246-256. Relocation assistance for tenants may include, among other things, advisory services, and reimbursement of costs of moving personal property, rental assistance to supplement the costs of leasing a comparable replacement dwelling, (See Appendix ## – Real Estate Plan for more detailed information). Note that as the NJBB Study was specifically included in the Section 8154, WRDA 2022, landowners whose properties are voluntarily elevated will not be eligible for benefits; however, tenants of these structures may be eligible for these benefits.

**Ineligible Project Costs.** The costs exceeding that which is necessary to safely elevate an eligible structure are deemed ineligible costs and any such costs remain the sole responsibility of the property owner. These costs may include, among others, costs associated with:

- any structural and system repair due to existing deficiencies;
- modifications or improvements to a septic system except for extension of lines from the raised structure to the existing system;
- cost for elevation above the target design level;
- modifications to structures that are not attached to the eligible structure;
- modifications to tubs, pools, spas, hot tubs, and related structures or accessories;
- modifications to decks and patios not connected to or immediately adjacent to the structure except for modifications that are expressly required by building codes (i.e.,

stairways and landing modifications);

- costs associated with bringing a non-conforming structure into compliance with current building code, housing code, and/or other applicable codes;
- costs associated with special access improvements (i.e., elevators, lifts, ramps, etc.) that are deemed ineligible; and
- improvements to structures not considered the primary residence (i.e., detached garage, shed and/or barns).

## SECTION 6.0 STRATEGY FOR PRIORITIZATION OF IMPLEMENTATION

The strategy for implementation will be prioritized for seven different categories, including:

- Clustering or grouping to increase construction effectiveness and efficiency;
- Support of underserved communities;
- Contractor capacity and availability;
- Local building permitting;
- Environmental conditions;
- Level of risk; and,
- First come, first served.

Elevation of structures will likely happen in three phases: grouping, prioritizing and final scheduling. Grouping will organize the selected properties into manageable portions while subsequent prioritization will be performed using the above criteria. Schedules will then be developed to allow for parallel phases of implementation.

Risk level grouping could be accomplished by mapping the 1% to 20% floodplains within the study area against the Non-Structural locations for the number of properties that will be elevated or flood proofed. Each flood risk level from the 1% to 20% floodplain will be mapped with each Non-Structural element in that area identified, and further aggregated by natural groupings of structures. The combination of floodplain within the structure inventory would generate a list of properties to be surveyed, inspected and eligibility determinations to be made based on the structure condition. The positives of grouping at this level would allow breaking up of the project into potentially manageable portions that are predictable and can be anticipated early on to anticipate where efforts to staff up would be required.

Clusters of eligible structures that represent the highest risk and vulnerability would be identified and prioritized for construction. Individual structures would be addressed based on a ranking of risk from highest to lowest within the cluster. The ranking of individual structures would be revisited as elevation work is completed, as additional funding is distributed, and as new clusters are identified. Addressing groups of structures within a small geographic area would be more cost-effective, efficient, and would also allow for a more strategic methodology for applying non-structural measures to at-risk structures. Additional work on this process will occur during the design phase of the project.

The eligible property owners in a contiguous neighborhood or subdivision (i.e., small scale area) would be targeted for priority in Non-Structural plan implementation. A focus on clustered properties would create a ranking hierarchy of which properties to address first. The size of a cluster would need to be defined but would consist of an area where multiple eligible structures would be constructed simultaneously. This approach would rank efficiency as the main factor in determining which eligible properties should be prioritized. Contractor capacity and availability,

local building permitting, environmental conditions, and social vulnerability/environmental justice are other factors that may influence construction sequencing.

Prioritization is the order in which groups and clusters will be elevated or flood proofed. Prioritization will identify the order in which the groups will be constructed based on the seven factors at the top of this section.

Any structure scheduling or prioritization will be subject to the availability of Federal funds. The locations for scheduling or prioritizing the implementation of Non-Structural work will be determined during PED but will be fully assessed for implementing the Non-Structural plan in an efficient and cost-effective manner. Some of the methods for scheduling or prioritizing Non-Structural work that will be considered as part of the prioritization process as described below; however, additional methods will also be considered for the priority locations to implement the Non-Structural plan.

## SECTION 7.0 REAL ESTATE

This Real Estate Section of the NJBB Non-Structural Implementation Plan adheres to real estate requirements for Non-Structural elevation measures provided in the 22 July 2024 CECW Guidance Memo and incorporates information provided in the NJBB Draft Real Estate Plan Appendix. This plan addresses Non-Structural residential elevations measures only as commercial floodproofing guidance is still in progress.

The NFI will officially initiate real estate acquisition activities after final execution of the Project Partnership Agreement (PPA) and once the final list of Structures for Inspection and Inclusion under the initial phase of the TSP is complete (Figure 2). The list of structures for inclusion in Non-Structural project measures, any additional LER activities required, and associated real estate mapping will be provided to the NFI along with a Notice to Proceed with real estate acquisition activities. At this time, there is an estimated PPA execution is estimated to take place in 2026, but no location/phase plan has been developed. The residential elevations acquisition schedule below has been coordinated with the NFS and is a best-guess estimate based on the process provided in the NS Guidance. The acquisition of storage and laydown TWAEs will occur concurrently with the residential elevation acquisition process and commercial floodproofing acquisition process. Since the NS Guidance for commercial floodproofing activities is not yet available, the process and timeline used for current planning purposes will be the same as residential elevations.

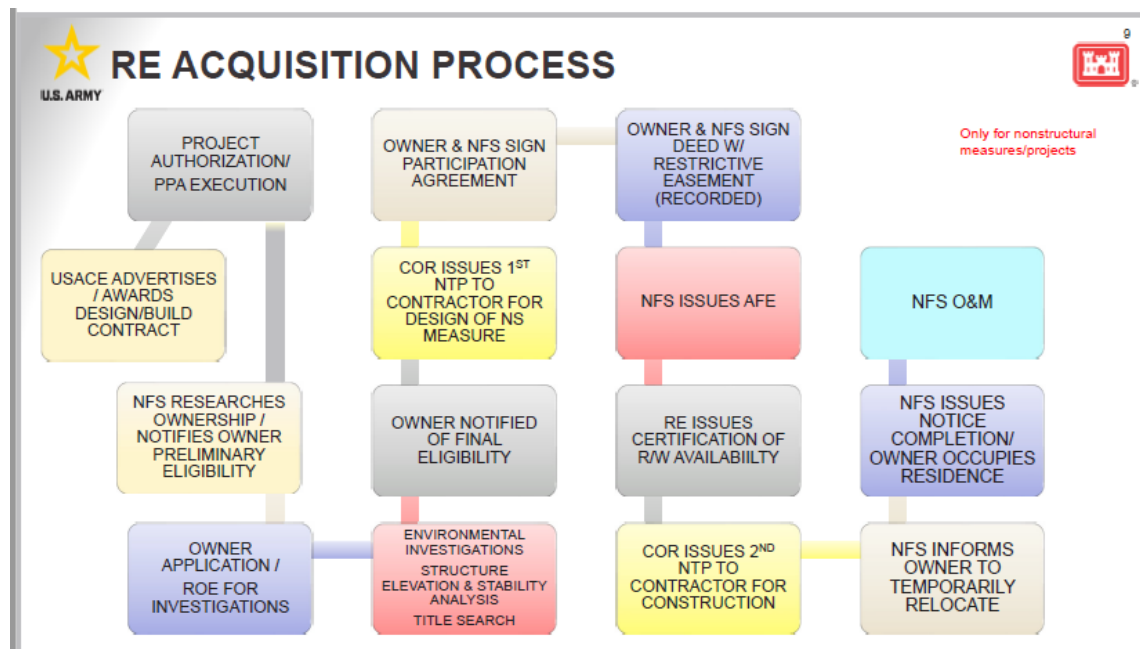


Figure 2. Real Estate acquisition process form Non-Structural guidance.

**Landowner and public meetings.** Public meetings conducted in 2016 and 2018 revealed public opinion to be mixed regarding the use of policy, structural and Non-Structural measures. Support and opposition regarding all proposed and discussed measures exist regarding this study. Additional public input and review as the study measures are selected will provide a more focused public discussion. Due to the number of municipalities that may be subject to the implementation of Non-Structural measures, it is estimated that a large number of landowner and public meetings will be held.

**Acquisition management.** The Non-Federal Sponsor's in-house staff has ample real estate acquisition experience for more conventionally sized Federal and non-Federal construction projects. However, for a project of this size and scale the Sponsor would need to scale up a much larger program in order to handle acquisition efforts.

As of this assessment, the Sponsor may require assistance from USACE in acquiring real estate. No written request has been received by USACE at this time. However, it is unlikely USACE would acquire the real estate on behalf of the Sponsor because the Sponsor: (1) possesses that professional capability to acquire the real estate needed for the project; (2) can reasonably obtain, if necessary, real estate acquisition contracting services from sources other than the Federal Government; (3) have sufficient general and legal acquisition authority to acquire all the real estate required for the project; and (4) may intend on entering into a partnership agreement with the local municipality to assist with real estate acquisition activities. However, since the standard project partnership agreement offers the Sponsor the opportunity to request USACE assistance with real estate acquisition, the options remains open to the Sponsor. Additionally, the Sponsor may request that USACE Real Estate Division take the lead or assist with real estate acquisition to ensure enough resources are dedicated to the real estate process.

A determination will be made regarding entity responsibility to maintain the acquisition database and software program identification to track the information. USACE will enter mandatory data fields in REMIS.

**Owner application.** A final number of eligible structures out of the total of 6,421 structures for elevation will be determined based on eligibility criteria discussed above, as will the percentage of structures that are owner-occupied. For the purposes of this planning report, all residential properties are considered either owner-occupied or long-term rentals until a more-detailed design/property review is available. As discussed previously, participation in this project is strictly voluntary.

While the Sponsor has the power of eminent domain under the authority of the Eminent Domain Act, N.J.S.A. § 20:3-1 et seq., condemnation will not be utilized for the Non-Structural component of this project given that participation in the TSP is voluntary on the part of landowners.

Additionally, the owner applicant will be required to grant a temporary right-of-entry to USACE and the NFI to enter upon the property to conduct investigations during PED to determine final eligibility of the property for inclusion in the project.

Should the investigations reveal HTRW on the property, the owner will need to remediate such contamination in order for the property to be approved for final eligibility.

**Participation agreement.** Once a structure has met final eligibility requirements and the Government has discussed the Non-Structural measure design with the owner, the owner will sign a participation agreement which documents the Non-Structural measure to be constructed and the cost associated with such; delineates the obligations of each party; documents property owner agreement to voluntarily participate in the Non-Structural project; requires the owner to grant a temporary right of entry to the NFI, the USACE, and its assigns for the construction of the Non-Structural measure; requires the owner to release the NFI from the obligation of informing him of the value of the perpetual restrictive easement; requires the owner to hold harmless the NFI for any damages arising from the Non-Structural work; and requires the owner to attest to his/her willingness to expend costs that may be necessary in connection with the construction of the Non-Structural measure which are not eligible project costs such as betterments and costs associated with temporary relocation of residents of an owner- occupied residential structure.

The CECW Non-Structural Guidance provides a Model Participation Agreement for Non-Structural Projects. For the purposes of this report, it is assumed that commercial dry floodproofing activities will also require some form of participation agreement outlining responsibilities and requirements.

**Perpetual restrictive easement.** The NFI will acquire a perpetual restrictive easement over that portion of the property wherein the residence is located. This easement will be recorded in the county clerk of court and will run with the land. The intent of the acquisition of the easement is to protect the project benefits for as long as the project is authorized or as long as the structure exists. The easement shall prohibit the conversion of any part of the structure, located below the lowest habitable finished floor for human habitation and the alteration of the structure in any way that impedes the movement of flood waters under the structure or negates the intent of the Non-Structural measure implementation. The ground floor of an elevated residential structure can only be utilized for parking, storage, and access. It is recognized that property laws vary by state and that in some states a covenant running with the land has equal or greater enforcement capacity than an easement. If that is the case in the jurisdiction wherein the project is located, the implementation plan may indicate that the NFI will impose a restrictive covenant over the property rather than acquire a restrictive easement and will explain why this deviation is necessary.

A standard Perpetual Easement for Residential Elevations is provided for use in the NS Guidance.

This easement will cover the portion of the property where the residence to be raised is located and will include a perpetual right of ingress and egress for Operation & Maintenance (O&M) activities once construction is complete.

At this time, guidance for conducting commercial floodproofing activities is still in progress. Any guidance issued is anticipated to include a standard estate for floodproofing activities. If no such guidance is completed before project construction authorization, a nonstandard estate will be required. If a nonstandard estate is required, the required nonstandard estate approval process will be followed for the provision of any required nonstandard estate needed for the commercial dry floodproofing activities in the TSP.

### **Relocation assistance.**

Public Law 91-646 (Uniform Act) provides uniform equitable treatment of eligible persons and businesses displaced by a Federal or Federally assisted project. Along with the PPA, it requires the NFS to provide assistance and to pay certain benefits to all eligible persons and businesses that are displaced from their residence or place of business due to a Federally funded project. The cost incurred by the NFS to provide relocation assistance is part of its LERRD responsibilities. At this time, only residential elevations will require occupants to temporarily vacate the premises for project work. No relocations are currently anticipated for critical infrastructure dry floodproofing activities.

Under the Uniform Act, tenants may qualify for temporary relocations if the owner of the residence elects to participate in the residential elevations program under this project. However, since the residential elevation option is entirely voluntary, owner-occupants are not eligible for temporary relocation benefits as a displaced person under the Uniform Act if they choose to participate in the program. There are approximately 4,913 tenants who are eligible for relocation assistance under the Uniform Act.

Section 8154 of the Water Resources Development Act (WRDA) of 2022 directs the Secretary of the Army to establish a pilot program to evaluate the extent to which the provision of temporary relocation assistance to voluntary participants not otherwise eligible for relocation assistance ("temporarily displaced persons") enhances the completeness, effectiveness, efficiency, acceptability, and equitable implementation of covered water resource development projects. Under the Uniform Act, owner-occupants are not eligible for temporary relocation benefits as voluntary participants of a residential elevation action, often placing an undue burden on economically disadvantaged population that would benefit most from such non-structural measures. The pilot program enables a non-Federal interest for a covered water resources development project to provide temporary relocation assistance to a temporarily displaced person and for the non-Federal interest to be credited toward its project costs. This project is specifically included in the pilot program legislation.

Section 8154 limits the crediting of benefits paid to temporarily displaced persons to \$20,000 per household plus administrative costs. For the purposes of this REP, the statutory crediting limit of \$20,000 is used for Section 8154 Pilot Program benefits payment estimates. Per Section 8154, the NFS must request its use for project prosecution. At this time, the NFS is undecided on requesting the use of Section 8154 for this project. However, if the pilot program is implemented there are approximately 1,507 temporarily displaced persons.

**Non-Federal Interest Authorization for Entry and Certification of Real Estate Availability.** Contrary to policy requirements in ER 405-1-12, Chapter 12, Certification of Real Estate Availability cannot occur prior to contract award for Non-Structural design- build and design-bid-build contracts because the design specific to each structure will not be developed until after award of these contracts. In accordance with this guidance, the Government will proceed with solicitation, evaluation of proposals, and award of contract for the Non-Structural measures without Certification of Real Estate Availability. After acquisition and recordation of the Perpetual Restrictive Easement by the NFI, a notice or letter to proceed with elevation of each specific property may be issued to the contractor. In no case shall a contractor be permitted to initiate any construction activities on a structure until after the District Real Estate has certified non-Federal sponsor acquisition of the Perpetual Restrictive Easement for that property.

## SECTION 8.0 OPERATION & MAINTENANCE

Operations, Maintenance, Repair and Rehabilitation responsibilities for the NFI would begin after the initial raising and Notice of Completion (NCC) of the first structures in the study area. Per the 22 July 2024 CECW Guidance for Non-Structural Project Planning and Implementation, for all structure types, the restrictive easements of the NJBB Non-Structural action (elevation and/or flood proofing) will protect the Federal interest. The enforcement of restrictive easements is the sole responsibility of the NFI. The NFI will prepare mass mailings to project participants every ten years providing notice that the structure on the property was elevated by USACE and providing a copy of the perpetual restrictive easement that was acquired. On a rotating schedule, every five years, the NFI will conduct physical inspections from the street of 10% of the structures that have participated in the project.

A draft OMRR&R Manual shall be provided to the NFI as early as possible in the period of implementation because USACE will issue a NCC for each flood proofed structure once the flood proofing is complete. At the time of the issuance of an NCC, the NFI's obligations for operation and maintenance for the subject structure or lands commences. Flood proofed structures shall be considered a separable element and functional portion of the Project. The NFI is responsible for the enforcement of the terms of the perpetual easement executed by the owners of property benefiting from the Non-Structural measures. The NFI shall conduct periodic inspections at the intervals specified in the OMRR&R Manual to ensure that the owners, their heirs, and assigns are in compliance with the terms and conditions of the perpetual restrictive easement and shall provide written certifications to USACE that the structures and lands have been inspected and that no violations have been found. Regarding the elevated residential structures, the inspections will determine among other things, that no part of the structure located below the level of the lowest habitable finished floor has been converted to living area for human habitation, or otherwise altered in any manner which would impede the movement of waters beneath the structure; that the area below the predicted BFE is being used solely for the parking of vehicles, limited storage, or access to the structure and not for human habitation; that mechanical, electrical or plumbing devices have not been installed below the BFE; that the property is in compliance with all applicable floodplain ordinances and regulations. USACE shall have the right, but not the obligation, to perform its own inspections of the flood proofed structures pursuant to the Project.

## SECTION 9.0 FLOODPROOFING OF ELIGIBLE NON-RESIDENTIAL STRUCTURES

The NJBB Non-Structural implementation plan includes flood proofing at risk industrial and commercial structures that cannot be elevated like municipal buildings, hospitals, schools and churches. The feasibility-level analysis has not definitely determined if dry or wet flood proofing is the most appropriate at specific structures. While each individual eligible structure will be



evaluated for the most cost-effective Non-Structural measure, the government reserves the right to determine which measure shall be implemented at each structure location. Note that this section will be expanded upon during additional study conduct to differentiate between dry and wet flood proofing measures as well as incorporate updated USACE Non-Structural guidance/templates.

Some common flood proofing measures include:

- Backflow valves;
- Closures on doors, windows, stairwells, and vents--either temporary or permanent;
- Rearranging or protecting damageable property--e.g., relocate or raise utilities;
- Sump pumps and sub-drains; and
- Water resistant material; metal windows, doors and jambs; waterproof adhesives; sealants and floor drains.

Flood proofing of critical infrastructure could employ dry or wet flood proofing as explained in more detail below.

**Dry Flood Proofing.** In dry flood proofing, the portion of a structure that is below the BFE (walls and other exterior components) is sealed to make it watertight and substantially impermeable to floodwaters. Such watertight impervious membrane sealant systems can include wall coatings, waterproofing compounds, impermeable sheeting, and supplemental impermeable wall systems, such as cast-in-place concrete. Doors, windows, sewer and water lines, and vents are closed with permanent or removable shields or valves. The expected duration of flooding is critical when deciding which sealant systems to use because seepage can increase over time, rendering the flood proofing ineffective. Waterproofing compounds, sheeting, or sheathing may fail or deteriorate if exposed to floodwaters for extended periods. Sealant systems are also subject to damage (puncture) in areas that experience water flow of significant velocity, or ice or debris flow. The USACE National Flood Proofing Committee has investigated the effect of various depths of water on masonry walls. The results of their work show that, as a general rule, no more than 3 feet of water should be allowed on a non-reinforced concrete block wall that has not previously been designed and constructed to withstand flood loads. Therefore, application of sealants and shields should involve a determination of the structural soundness of a building and its corresponding ability to resist flood and flood-related loads.

Dry flood proofing is also not recommended for structures with a basement. These types of structures can be susceptible to significant lateral and uplift (buoyancy) forces. Dry flood proofing may not be appropriate for a wood-frame superstructure; however, in some instances, buildings constructed of concrete block or faced with brick veneer may be considered for dry flood proofing retrofits. Weaker construction materials, such as wood-frame superstructure with siding, will often fail at much lower water depths from hydrostatic forces.

**Wet Flood Proofing.** Wet flood proofing involves retrofitting/modifying a structure to allow floodwaters to enter it in such a way that damage to the structure and its contents is minimized. Wet flood proofing is often used when all other mitigation techniques are technically infeasible or are too costly. Wet flood proofing is generally appropriate if a structure has available space where damageable items can be stored temporarily. Wet flood proofing may turn out to be more applicable for specific structures based on water surface elevations (possibly greater than 3 feet above ground surface) at such structures. Compared with the more extensive Non-Structural FRM measures, wet flood proofing is generally the least expensive.

**Determination of Eligibility.** The process of determining eligibility for floodproofing of critical infrastructure will be similar in large part to the process followed above for the elevation of residential structures as the 22 July 2024 CECW NS Guidance only covers residential elevations with commercial floodproofing guidance still in progress. At the time of this Draft Report, a structure inventory has been compiled which identifies 279 preliminarily eligible structures for dry flood proofing. Identification of final eligibility criteria and details concerning the process will be developed during PED and provided prior to project implementation. Eligible property owners who request application of the dry flood proofing measures to their structures must execute an application/participation agreement, must provide temporary rights-of-entry for survey and exploration (not construction), and undergo similar site and structural assessments, and undergo a structure-specific analysis performed during PED that is substantially similar to that which is described above in connection with the structure elevation.

**Commencement of Improvements and Notice of Construction Completion.** Upon final determination that a structure is eligible for dry flood proofing, a scope of work will be developed. Each structure must have an approved sanitary disposal system and be in compliance with local and state health and building codes. Upon project approval, the property owners and the NFI will be required to execute a temporary right of entry for project construction, as well as a permanent restrictive easement, which will be binding upon the owners, their heirs, assigns, transferees, and any other successors in interest. After the easement is recorded in the public records of the county in which the property is located, the dry flood proofing work will be commenced, completed, inspected by USACE, and after final approval by the District Engineer, or his designee, a notice of construction completion will be issued to the NFI, and the individual dry flood proofing project will be closed out as complete.

## APPENDIX A - DEFINITIONS

Term	Definition
Base Flood	Defined by the National Flood Insurance Program (NFIP) as the “flood having a 1% chance of being exceeded in any given year and is also called the 100-year flood”.
Base Flood Elevation (BFE)	The computed elevation to which floodwater is anticipated to rise during the base flood. The BFE is shown on community’s Flood Insurance Rate Map (FIRM).
Building Retrofit	Any combination of Non-Structural additions, changes, or adjustments to structures which reduce the risk of hurricane storm surge damage to improved real property, water and sanitary facilities, structures, and their contents.
Dry Flood Proofing	Dry flood proofing makes the structure watertight below the level for which hurricane storm surge risk reduction is provided by preventing flood waters that derive from storm surge from entering the structure. Dry flood proofing may include one or more of the following methods: using waterproof membranes or sealants to reduce seepage of floodwater through walls and wall penetrations; use of watertight shields for doors and windows; and/or installing measures to prevent sewer backup.
Economically Justified	The cost to elevate/flood proof the structure does not exceed the total monetary cost of the coastal storm flood damages that are anticipated to be avoided over the 50-year period of analysis (years 2040 to 2090).
Eligible Structures	Structures that are determined by the USACE to be eligible for elevation and/or flood proofing after the completion of the investigations and analyses as described herein.
First Floor Elevation (FFE)	The sum of the Ground Elevation and Foundation Height to measure the absolute elevation of the main floor of the structure.
Ground Elevation	The height of the land at the inventory marker location, typically at the central point of the structure.
Historic Property	As defined in 36 CFR 800.16(l)(1), <i>Historic property</i> means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places

	maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.
Hazardous, Toxic or Radioactive Waste (HTRW)	HTRW means hazardous, toxic, and radioactive waste as more specifically defined in Engineer Regulation (ER) 1165-2-132, "Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects".
Non-Federal Sponsor	The NFS is the cost-sharing partner for the study, design, construction of the project, as well as for the Operation, Maintenance, Repair, Rehabilitation and Replacement (OMRR&R) of the project.
Non-Structural Measures	Non-Structural Measures are permanent or contingent measures applied to a structure and/or its contents that reduces the risk of damages that could result from hurricane storm surge. Non-Structural measures differ from Structural measures (i.e., levees, floodwalls, etc.) in that they focus on reducing the consequences of damages from hurricane storm surge instead of focusing on reducing the probability of damages from hurricane storm surge.

## APPENDIX B - LITERATURE REVIEW

As part of the analysis for Non-Structural, the PDT evaluated Non-Structural implementation plans from other USACE studies including the Southwest Coastal Louisiana (April 2016), Southern Central Coastal Louisiana (November 2019), The Fire Island to Montauk Final General Re-Evaluation Report (GRR) and the Florida Keys CSRM Feasibility Study, Monroe County. The PDT also evaluated general report implementation guidance contained in Corp of Engineers Literature including, USACE National Flood Proofing Committee, “Non-Structural Flood Damage Risk Reduction within the Corps of Engineers- What Districts are Doing” (October 2001), National Flood Proofing Committee, “Implementation of Non- structural Projects” (August 2013), Non-Structural Flood Damage Risk Reduction within the Corps of Engineers, (Oct. 2003), FEMA, “Procedures for Developing Scopes of Work for the Elevation of Flood Prone Structures” (Jan. 2005), FEMA P-347 “Above the Flood: Elevating Your Flood-Prone House”; City of Lake Charles, Louisiana Floodplain Management Regulations; Calcasieu Parish Police Jury, Code of Ordinances, Article IX, Flood Plain Management; 44 CFR Parts 59 and 60, Non-Structural Guidance Memo-PB2016 and a Q&A: on Non-Structural Policy Clarification (PB 2016-01) Planning Community of Practice Webinar March 17, 2016. Two Planning Bulletins with recent direction on implementing NS solutions (PB 2016-3, PB 2019-1) were also evaluated as part of this implementation plan.

USACE PB 2016-01 “Clarification of Existing Policy for USACE Participation in Non-Structural Flood Risk Management and Coastal Storm Damage Reduction Measures” (December 22, 2015), provides guidance on voluntary vs. non-voluntary participation based on the type of Non-Structural improvement. The structure elevations and flood proofing will be implemented on a voluntary basis. Property owners may choose to participate in the plan.

PB 2019-1 “Further Clarification of Existing Policy for USACE Participation in Non-Structural Flood Risk Management and Coastal Storm Risk Management Measures” provided guidance on participation rates, structure grouping, and Interest During Construction (IDC). This PB clarified that existing policy requires that USACE analyses formulate, evaluate, and present a plan that reasonably maximizes net National Economic Development (NED) benefits. Prior interpretation of this requirement with respect to non- structural measures and plans was to formulate and evaluate plans at the individual structure level. There are numerous problems with that approach, which include but are not limited to: fidelity of depth damage function, uncertainty with individual structure data, overall risk management, and other social effects. For these and other reasons, the policy going forward is that ‘reasonably maximizing’ does not require individual structure benefit-cost analysis. All future Non-Structural analyses will formulate and then evaluate measures and plans using a logical aggregation method. Examples include but are not limited to grouping by structures’ main floor elevation; census block or tract boundaries; neighborhoods or communities sharing common infrastructure; neighborhoods or communities sharing common floodplains; and structures within other geophysical boundaries or sharing other flood characteristics. PDTs shall describe the logic and methodology for such aggregation in the decision document and supporting appendices. When calculating IDC for Non-Structural measures or plans, the length of time will be based on construction duration for a specific measure and/or structure, and not the overall duration of construction for the entire project. Standard or minimum participation rate does not exist, as the characteristics of a community influence its potential participation rate in a USACE Non-Structural plan. PDTs shall consider participation rates that are appropriate for a community and utilize sensitivity analyses of different participation rates to clearly communicate to decision makers the inherent uncertainty of benefits exceeding costs and plan selection.

The specific Non-Structural measures to be implemented at each property will be reviewed and refined in the PED phase to ensure that the proposed measures, and the applicable population is appropriately identified. Property owners located in the study area will be informed of the details of project implementation, including eligibility criteria, the eligibility process, and the related duties and obligations of USACE, the NFI, and the property owner. Based upon present information, the anticipated duties and obligations are generally outlined below; however, some of this information may be modified as the non- structural Implementation Plan is finalized as part of PED.

If the structure owner does not want to participate in the project, USACE and the NFI would defer any further action on that structure until such time as the structure owner elects to participate or until the period of construction ends. However, the Government reserves, at its sole discretion, the right to determine whether a structure may participate in the RP after a structure owner has declined participation, and if allowed to participate, the timing and scheduling of such participation in the project. Each of the Non-Structural measures has the potential to cause adverse effects to historic properties. The Programmatic Agreement (PA) executed for the project identifies the process by which USACE will determine which of the participating buildings and structures are historic properties. This process also includes conducting archaeological investigations associated with building and structures determined to be historic properties and for area in which ring walls are proposed for construction. The investigations, coordination and consultation required by the PA and any resulting mitigation will be conducted after participating buildings and structures are identified but before any of the Non-Structural measures identified below are carried out.

## APPENDIX C - ELIGIBILITY DETERMINATION METHODOLOGY

The plan for the NJBB feasibility study involves elevating and flood proofing “at-risk” structures that have a first floor elevation (FFE) at or below the 20% AEP (predicted to occur at the end of the 50-year period of analysis – 2090). This involves over X number of home elevations and X number of critical infrastructure repairs.

First Floor elevation is the addition of existing ground elevation and foundation height to measure the absolute elevation of the main floor of the structure. In addition, each structure occupancy type is assigned a begin damage point to account to vulnerable entry points above (or below) the FFE. HEC-FDA will begin to assign damage to structures only when flood stage heights reach the first floor +/- the begin damage point value.

Ground elevation is the height of the land at the inventory marker location, typically at the central point of the structure. Ground elevation is calculated at a population level with the availability of a National NOAA Digital Coast Bare Earth Light Detection and Ranging (LiDAR)-derived Digital Elevation Model (DEM). As the LiDAR-derived DEM is available for the entire study area, each individual structure is provided a unique, calculated ground elevation with a high degree of certainty.

Foundation height is more difficult to measure and attribute for each individual structure. While techniques such as field surveys or mobile LiDAR can theoretically calculate foundation height for every structure with a high degree of certainty, the size of the inventory makes these methods prohibitively time and resource consuming. To individually measure all 100,900 structures would require years of intense resource allocation. Additionally, population level data such as Nassau County tax records do not offer a measurement for foundation height, nor can available aerial imagery provide insight on main floor height above ground elevation.

To calculate the FFE for structures within the model inventory, a stratified random sample is collected of structures within each occupancy type (residential and non-residential) to assign a typical foundation height per structure type. As “typical” occupancy type characteristics can vary across the study area, location was added as an additional stratum. The average foundation height for a given occupancy type in each region is then added to the structure’s unique ground elevation to calculate final FFE. During the next project phase, foundation height estimates will be re-evaluated to increase sample size and resolution of estimates.

Damage Points for each structure occupancy type are also occupancy type dependent. For residential structures, assets with basements were assigned a begin damage point of -3ft to address the additional vulnerability and inundation access points. For residential structure without basements, begin damage points were set to -0.5ft. For all non-residential structures, begin damage points were also set to -0.5ft despite the likelihood that non-residential structures have basements for storage and utilities. It is assumed that non-residential structures have properly addressed inundation vulnerabilities below the FFE.

While the described methodology of assigning average foundation height by occupancy type provides reasonable accuracy for estimating FFE across a large population and complies with SMART Planning Policy, it does not allow for knowing the true FFE for each individual structure within the inventory. This has some impact on later plan formulation and evaluation, particularly for Non-Structural measures.