

MAP DESIGN REQUIREMENTS HANDBOOK

Mitigation Assistance Program Design Requirements

The Mitigation Assistance Program (MAP), hereafter referred to as “Program”, is focused on existing homes that the Federal Emergency Management Agency (FEMA) has identified as National Flood Insurance Program (NFIP) insured structures having sustained Severe Repetitive Losses (SRL), Repetitive Losses (RL), or are in a Special Flood Hazard Area (SFHA). The Program is designed to elevate these homes so that their lowest Habitable floor is above the Design Flood Elevation (DFE). The program is funded by FEMA as a risk mitigation strategy for these properties against potential, future flood damage. This would result in lower Flood Insurance premiums for the elevated homes and the community as a whole, and the added resiliency measures could possibly result in increased property values.

Funding for the Program is limited to necessary costs associated with the elevation of the structure in a safe and code compliant manner. Elevation activities will involve the construction of a new foundation system with flood vents, and new stairs and landings for access to the elevated home. FEMA funding regulations prohibit the use of the federal funds for enhancements and improvements to a home. For a list of materials and construction activities that are ineligible for funding though the program, see the attached Exhibit E - Ineligible Elevation Costs.

The Program’s purpose is to undertake each elevation project in a workmanship like manner that maintains the integrity of each home’s existing interior and exterior finishes throughout construction activities. Prior to the execution of each home elevation project, a design process will be undertaken to determine the scope of the project, along with a comprehensive Existing Conditions Report. Each homeowner will have input on some Aesthetic decisions of their project based on the below Program guidelines. All design decisions shall be presented as a colored rendering of the finished home to each homeowner prior to Program approval of final design and start of elevation construction activities. A homeowner is not obligated to proceed with the project if they find the final design unsuitable to their needs.

Terminology:

Base Flood Elevation (BFE): Per FEMA - The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. The BFE is shown on the Flood Insurance Rate Map (FIRM) for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30 and VE.

Certificate of Elevation (COE) – A form developed by FEMA, and provided by the NFIP, which is prepared by a qualified engineer/surveyor to show compliance with the local floodplain management ordinance.

The COE specifies: elevation of a building relative to mean high tide; building type; flood map location and additional information used to determine the proper flood insurance premium rates for a property. An elevation certificate measures the difference in elevation between the home and the base flood elevation of the area

Design Flood Elevation (DFE): The required elevation above the Mean Sea Level (MSL) of the lowest habitable Finished Floor of a building. This elevation is determined by adding the required Free Board to the Base Flood Elevation. This elevation shall be used to design and execute all elevation construction projects in the MAP program. The elevation of the highest flood (generally the BFE including freeboard) that a retrofitting method is designed to protect against. Also referred to as the *Regulatory Flood Protection Elevation (RFPE)*.

Eligible: Construction activities or material that the Program has determined may be paid for using Program funds. The Program uses federal guidelines and regulations stipulated by the funding source to determine eligibility of construction activities or material.

Federal Emergency Management Agency (FEMA) — The Federal agency that, in addition to carrying out other activities, administers the National Flood Insurance Program (NFIP).

Freeboard: (Per FEMA) - An additional amount of height above the Base Flood Elevation (BFE) used as a factor of safety (e.g., 2 feet above the Base Flood) in determining the level at which a structure's lowest floor must be elevated or flood proofed to be in accordance with state or community floodplain management regulations.

Ineligible: Construction activities or material that the Program has determined cannot be paid for with Program funds. The Program determines ineligible costs based on the federally established guidelines for reasonable and necessary activities or materials to achieve the building elevation, and published lists of specific excluded activities or materials.

Mean sea level (MSL) – Average height of the sea for all stages of the tide, usually determined from hourly height observations over a 19-year period on an open coast or in adjacent waters having free access to the sea. See also *National Geodetic Vertical Datum*.

Repetitive Loss (RL) – A property that (a) has incurred flood-related damage on two occasions, in which the average cost of the repair has equaled or exceeded 25% of the market value of the structure at the time of each flood event and (b) at the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

Severe Repetitive Loss (SRL) – A property is covered under a contract for flood insurance available through the NFIP: (a) for which four or more separate claims payments (includes building and contents) have been made under flood insurance coverage with the amount of each such claim exceeding \$5000 and with the cumulative amount of payments exceeding \$20,000 or (b) for which at least two separate claims payments (includes building only) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

Special Flood Hazard Area (SFHA) – Under the National Flood Insurance Program, an area having special flood, mudslide (i.e., mudflow), or flood-related erosion hazards, and shown on a Flood Hazard Boundary Map or Flood Insurance Rate Map as Zone A, AO, A1-A30, AE, A99, AH, V, V1-V30, VE, M, or E. The area has a 1 percent chance, or greater, of flooding in any given year.

Foundations:

The new elevated foundation shall consist of masonry, steel reinforced foundation walls and concrete footings. Stainless steel engineered flood vents shall be positioned into the foundation walls such that: there is a minimum of one engineered inch for each square foot of enclosed area for an engineered opening; a minimum of two (2) flood vents per enclosed area, and each must be on at least two (2) different exterior walls. The bottom of the flood vent opening must not be higher than 12 inches above the adjacent grade; the top of the opening must be below the BFE, and the opening in the wall must be at least 3" in diameter (this requirement refers to the hole in the wall and not the flood vent).

The masonry walls shall be designed to meet building code, Flood Elevation height requirements and calculated structural loads. The exterior shall be parge coated with a thin coat of a cementitious or polymeric mortar applied for refinement of the masonry surface and added moisture protection. The parge coat may be painted (or tinted an) available color of the homeowners choosing.

Existing Basements and below grade crawl spaces shall be filled in to match the lowest adjacent grade (LAG). The interior of the foundation shall remain unfinished, and grade within the footprint shall be covered with six (6) inches of gravel . There shall be a 6-mil vapor barrier installed within the footprint to prevent condensation buildup.

Smart Vent brand dual function flood vents or equivalent (e.g., Smart Vent 1540-510) shall be installed to facilitate the flow of flood waters in and out of the new enclosed foundation area.

An access opening in the new foundation shall be designed to allow service entry to any enclosed foundation area. The opening shall be from grade to the underside of the sill plate; however, it shall not be required to exceed 6'10" in height if the sill plate is higher. The new opening shall be 34 inches wide as a minimum. The contractor shall secure any opening to the exterior with a removable plywood panel. New operable doors are not eligible for funding; however, a homeowner may install their own door in the opening after completion of the project.

Stairs / Landings:

Each of the existing egress / entry doors shall receive a new landing and stairs appropriately sized to meet residential building code egress requirements. The new stairs and landings shall be constructed of water-resistant low maintenance materials suitable for exposure to the ambient environment and able to sustain inundation by flood waters. The stairs and landings shall be supported on concrete pier footings engineered to meet the project soil conditions but shall be set to a minimum depth set by the building code. All structural lumber, including stringers, shall be pressure treated Number 1 or better and shall be free of warping, checking, splits, or excessive knots. All framing lumber shall be protected prior to installation and carpenter workmanship shall be plumb, level, and square. All stair treads and landing decking shall be pressure treated Grade number 1 or better or be of a composite material. All stair and landing railings shall be vinyl rail system, metal rail system, or Select Structural graded pressure treated lumber (PTL). All treated wood used on rails, treads, and trim shall be stained or painted, free of warping, checking, splits, or excessive knots. Wood shall be smoothed and sanded to prevent splinters where exposed to touch.

Existing Decks:

Existing Decks shall be evaluated for structural integrity and if possible, shall be elevated with the home.

Existing deck foundation system shall be re-designed to suit the elevated condition of the deck. Due to the limitations with Federal funding, the Program will not re-build existing decks that cannot be elevated with the home. All new deck framing materials required to properly elevate existing decks shall be Number 2 or better PTL and shall be free of warping, checking or splits. All framing lumber shall be protected prior to installation, and all associated carpenter workmanship shall be plumb, level, and square.

Landscaping:

To the extent possible, existing plant materials shall be either protected in place or relocated during the elevation process. Any salvageable plant material shall be repositioned or replanted after elevation activities are complete, and any plant materials that could not be preserved shall be replaced with new plant materials of a similar species. Any replacement plant material shall be replaced with immature specimens as readily available at the local nurseries in the vicinity of the project site. Plants shall be guaranteed to be alive at the time of homeowner returning to their home.

Property impacted by the elevation shall be positively graded with a designed slope that appropriately directs storm water away from the new foundation and seeded with a Rye grass blend for quick germination and erosion control. If additional soil is required, screened Topsoil or better will be used.

Pavers:

Existing pavers shall be protected in place where not directly adjacent to the building or within the work zone. Any pavers that will be impacted by the elevation process, including access to the building shall be removed and stored for reinstallation to be completed by the homeowner after completion of the elevation process. Re-installation of salvaged pavers shall not be included in the elevation project due to limitations in the Federal funding guidelines.

Fencing:

Any fencing that must be removed to facilitate elevation activities, including site access shall be preserved and re-installed upon completion of the project. Any fencing that cannot be preserved due to its pre-elevation condition shall be removed and disposed of by the contractor. New fencing shall not be provided by the Program due to limitations in the Federal funding guidelines.

Exterior Siding:

Exterior siding shall be removed and replaced where required to facilitate the home elevation. When the siding cannot be preserved, it shall be patched with material(s) that match the existing as closely as possible. Federal guidelines preclude full siding replacement even in the event an exact match cannot be made. The Program will seek to provide as close a match as possible and give the homeowner the option to select a color or style of their choice for the patch from the siding manufacturer's available color selections, when a close match cannot be determined.

Due to the limitations of providing new siding materials, extra care shall be taken to remove and protect existing siding so that it can be reinstalled after the elevation is complete.

Structural Elements:

All new structural elements shall be engineered to suit the requirements of the revised loading conditions and requirements of the elevation process. All dimensional lumber elements exposed to the elements

shall be pressure treated. All engineered lumber shall be suitable for exterior use and protected from moisture per manufacturer's standards. All structural steel elements (e.g., lintels) shall receive a weather resistant coating, and all fasteners shall be exterior rated and suitable for the material being joined.

Building Insulation:

All existing building insulation shall be maintained. Any insulation requiring replacement shall be of the same R-value as the existing or be compliant with current building code requirements, whichever is greater. Any new insulation as required by the building code shall be installed in new building elements created as result of the elevation project.

Utilities:

Any necessary existing water, gas, communications, electrical and sewer connections shall be disconnected and properly protected prior to commencement of construction activities. All services shall be restored and made fully operational upon completion of the elevation project.

Water services shall be disconnected and protected prior to commencement of the construction. The water line shall be extended to the elevated building in an insulated enclosed chase with heat tracing to protect from freezing.

Existing water lines below the finished floor and remaining in the elevated foundation area shall be heat traced and insulated to protect from freezing. To the greatest extent possible all water lines exposed in the elevated foundation, shall be relocated into conditioned space.

Interior Finishes:

All existing interior finishes shall be protected prior to and during elevation project activities. All stress cracks and damage resulting from elevation of the house shall be patched to match the pre-elevation, documented condition. Interior paint shall be limited to touch up painting of the patched areas and shall be color matched to the best possible extent to the existing finish.

All New finish elements created because of the elevation project such as new partitions or flooring required after a slab -separation shall be selected by the homeowner to match the pre-elevated material replacement cost.

Doors and Windows:

Windows: The condition and operation of all existing windows shall be evaluated and documented prior to the start of construction. Any windows that are inoperable, out of plumb, or otherwise defective shall be clearly noted. The expectation is that all existing windows shall be protected from damage and racking during the elevation process. Any windows not noted as inoperable prior to elevation shall be adjusted as required after construction to re-enable proper operation post elevation.

Replacement of existing windows shall not be included in the scope of work, however any windows damaged beyond repair during construction, shall be replaced at no additional cost to the program or owner.

Any existing windows in the below BFE exterior wall shall be removed and salvaged for the owner's use. If the owner elects not to retain them, they shall be disposed of as part of the construction scope of work. No new window openings shall be created as part of the program scope of work. Maintaining existing

below BFE window openings shall be determined on a project-by-project basis.

Doors: The condition and operation of all existing interior and exterior doors shall be evaluated and documented prior to the start of construction. Any doors that are out of plumb, or not closing properly shall be clearly noted. The expectation is that all existing doors shall be protected from racking and damage during the elevation process. Any doors not noted as inoperable, or out of plumb shall be adjusted as required after construction to re-enable proper operation post elevation.

Exterior doors requiring removal to facilitate elevation shall be salvaged and replaced to maintain proper egress and entry into the building post elevation. Replacement of existing doors shall not be included in the scope of work, however any doors damaged beyond repair during construction, shall be replaced at no additional cost to the program or owner.

Attached Garages:

Attached garages shall be elevated with the home. The garage foundation walls shall be extended using masonry and flood vents shall be installed in accordance with the building code. (See the foundation section for complete description of foundation work.) The garage doors shall be salvaged and lowered to grade within the newly extended foundation.

The concrete garage floor shall be removed, and a new concrete garage floor shall be poured within the footprint of the garage.

The openings left by the garage door shall be infilled with frame construction and exterior siding. (See Exterior Siding section for complete description of eligible siding.) The interior of the garage shall be dry walled to create a code compliant separation from the rest of the house, and all wall mounted electrical panels, switches, and other devices shall be lowered to allow for access from the inside or relocated as appropriate to comply with the building code.

The project scope does not include the construction of new interior floor platforms or bonus rooms above the garage footprint. Equipment platforms for relocated utilities will be considered for equipment relocation on a case-by-case basis.

Detached Garages, sheds, and outbuildings:

For the purposes of the Program, a detached garage is a permanent structure built on a foundation, of appropriate area and dimension to house one or more automobiles.

A shed or outbuilding is any structure not on a permanent foundation, or any structure that is too small in area or dimension to house an automobile, regardless of its foundation system.

Sheds and outbuildings that are within the project work area are to be relocated by homeowner prior to the commencement of the elevation project. Any outbuildings remaining within the work area and deemed an obstruction shall be removed / demolished by the contractor and disposed of as part of the project scope of work. Any utilities that extend from the main house to sheds or outbuildings shall be disconnected and terminated within the foundation of the elevated home in a code compliant fashion and in such a way as to permit the homeowner to reconnect the utilities after the project is completed.

Detached garages will not be elevated as part of the project scope of work. Any garage structure within the work area shall be protected and remain undisturbed during the project. Any utilities between the detached garage and the main structure shall be disconnected and reconnected after elevation is

complete. The project scope shall include the extension of existing utility wiring or piping as necessary to restore services to the detached garage.

Fuel Storage Tanks:

Active Propane and or Fuel Oil tanks and service lines shall be treated like other utilities in that they shall be disconnected prior to the elevation, and reconnected post elevation. Fuel storage tanks located within subterranean basements shall be relocated to a suitable location above grade if the condition of the tank is suitable for relocation.

Underground Fuel Storage Tanks (USTs) shall be identified with the other utility mark outs and shall be protected during the construction process. The testing and evaluation of Underground Storage tanks is not a part of the scope of work, and the homeowner shall be notified of any obvious or observed potential leaks. The contractor shall be responsible for any damage to underground storage tanks damaged during construction and required clean up resulting from the damage.

Above Ground Fuel Storage Tanks (ASTs) located on grade outside of the structure are permitted to remain below the BFE and are not required to be relocated above the BFE. Any existing above ground fuel storage tanks that are within the work area or that require relocation to facilitate elevation activities, shall be relocated per New Jersey Department of Environmental Protection (NJDEP), local and state requirements, and any other authorities having jurisdiction. Relocated tanks shall be properly anchored per applicable codes and standards for Fuel Storage Tanks in a flood zone.

If the existing fuel storage tank is in poor condition or requires replacement due to issues unrelated to the elevation project, it shall be the responsibility of the homeowner to remove and replace it upon completion of the elevation project. The removal and replacement of fuel storage tanks deemed to be a homeowner's responsibility shall not be included in the elevation project scope of work.

Lead Based Paint:

All homes constructed prior to 1978 shall be considered to have painted surfaces that contain lead-based paint. As such, all work undertaken in these properties that disturb painted surfaces shall be performed by persons that are certified to work with Lead Containing Materials, and the use of Lead Safe Work Practices shall be always deployed throughout the execution of the elevation project. Federal law requires that a certified renovator be assigned to each job, and that all involved individuals are trained in the use of lead-safe work practices. EPA's Lead Renovation, Repair and Painting (RRP) Rule Certified renovators are responsible for ensuring overall compliance with the RRP Program's requirements for lead-safe work practices.

Prior to the commencement of work on pre-1978 properties the contractor shall conduct a Lead Risk Assessment to identify any Lead Hazards present prior to the start of work. The risk assessment shall serve as a benchmark to ensure that no new lead hazards are created by the execution of the elevation project.

Upon completion of the project and prior to turning the house over to the homeowner, a final cleaning and a clearance report shall be performed to ensure that the house returned to the homeowner is lead safe.

Existing Conditions Report:

Prior to the commencement of any work, the contractor shall review the house with the DCA PM and homeowner, and then provide an existing conditions report that documents the condition of all structural elements and finishes. At a minimum the report shall contain:

- Levelness of all floors – identify any floors that are out of level prior to construction.
- Condition of base trim to floor joints.
- Condition of all interior and exterior doors and trim – identify any abnormalities in their operation and plumbness.
- Condition of all windows – verify operation of window and plumbness of frames.
- Condition of all door and window trim, existing crown molding, chair rails or other millwork.
- Condition of all kitchen cabinetry and bathroom vanities – identify any inoperable doors, or drawers, and squareness of frame.
- Condition of all floor finishes, particularly grouted tile and hardwood flooring – identify existing cracks or irregularities.
- Condition of exterior siding, J-channels, and trim including gutters and leaders. Identify any loose, uneven, or damaged components on the exterior surface.
- Condition of driveway, patios, and walks adjacent to or in close proximity to the work zone, including potential construction access points. Identify uneven or disturbed pavement surfaces, cracks in concrete walkways, or other existing hardscaping defects.
- Condition of landscaping and lawn.
- Condition of any fencing adjacent to the house, or likely to be affected by the elevation project.
- Condition of existing utility connection points, meters, and existing HVAC equipment affected by the elevation project.
- Identify any other irregular conditions that exist prior to the start of construction.

This report shall contain photographs and video of the existing structure, with emphasis on any existing conditions that could be misconstrued as being caused by the elevation project after the fact. In addition, the report shall contain measurements to document the amount that any element is damaged, un-level, out of plumb, uneven, or otherwise not true and square.

The report shall serve as a baseline for determining which elements will require repair or patching after the elevation project is complete. The expectation is that the home will be returned to its pre-elevation condition to the degree that is allowed by the building code. Any existing conditions that must be addressed for building code compliance for the obtainment of a Certificate of Occupancy shall be identified and incorporated into the scope of work for the project during the design phase.