

Maryland Model Floodplain Management Ordinance: NOTES

(Final September, 2010 REV)

The model floodplain management ordinance that most Maryland communities have used as the basis for their regulations since the early 1990s has been found to be inadequate in many respects. MDE is not revising that ordinance because of the scope of inadequacies. Rather, MDE has developed a completely new ordinance that satisfies both Federal requirements and Maryland’s regulatory requirements for nontidal waterways.

The most significant changes between this model and the previous Maryland Model (1991, revised in 1992, 1995, and 2004) include:

1. The new model is written in regulatory language, eliminating permissive and unenforceable language.
2. It is consistent with the State regulatory requirements in nontidal waters of the State.
3. It retains most of the long-standing recommendations from the previous model ordinance. The provisions that exceed the NFIP minimum requirements are identified in these notes.
4. It eliminates the provision requiring variances for fill quantities in excess of 600 cubic yards.
5. It does not include a “cumulative” substantial improvement (or “repetitive loss”) provision. MDE will work with communities that elect to adopt this higher standard to develop language to add to this model ordinance.
6. It combines two previously recommended forms into a single form, the *Declaration of Land Restriction (Nonconversion Agreement)* to assure that both current owner and future owners are informed of flood-resistant aspects of enclosures, crawlspaces, and accessory structures.
7. It streamlines how enclosures below elevated buildings and accessory structures are handled (see table) and eliminates the provision requiring variances for accessory structures larger than 600 sq ft.

Previous Model Ordinance →	<300 sq ft: NCA ¹ - not recorded on deed	300-600 sq ft: DLR ² – recorded on deed	>600 sq ft: By variance, DLR – recorded on deed
New Model Ordinance →	DLR(NCA) ³ – recorded for: <ul style="list-style-type: none"> ▪ Enclosures below elevated buildings (parking, storage, access) ▪ Crawl/underfloor spaces more than 4 feet in height ▪ Accessory structures 300 sq ft and larger 		

1. Nonconversion Agreement (previously recommended)
2. Declaration of Land Restriction (previously recommended)
3. New combined form: Declaration of Land Restriction (Nonconversion Agreement)

8. It can easily be modified by replacing certain provisions with references to comparable provisions in the Maryland Building Performance Code (especially Sec. 1612 and R322), thus coordinating the ordinance with the code to minimize conflicts.

Attached is a series of flow charts that may be helpful when determining which sections apply.

See Note: The notes below explain certain provisions in the Model Ordinance. The Resource version of the model ordinance is annotated with “See Note” to refer to these explanations.

1.1. The “date of regular program entry” is the date the community adopted the Flood Insurance Rate Map (FIRM) and ordinance for participation in the NFIP. Some communities joined the NFIP under the “emergency” program prior to the availability of the FIRM. MDE will provide the date of entry into the regular program that is available in FEMA’s records.

1.5(A).

- Insert the title and date of the FIS. When a “countywide” map is available, the FIS and FIRMs include the unincorporated areas of the county and incorporated areas (e.g., “Harford County, Maryland and Incorporated Areas”). For towns, reference to the countywide FIS and FIRMs means only the FIRMs (or portions of FIRMs) that show the area within the boundaries of the towns.
- Communities may adopt a flood hazard map other than the FIRM if that map shows flood hazard areas that are larger than the SFHA. This section will need to be modified for communities that use another map, even if the other flood hazard map is for only a portion of the community (e.g., for only one watershed or a part of a waterway).
- Communities that have annexed areas outside the municipal boundaries shown on the current FIRM must notify FEMA (see Section 3.2(P)). Annexation may prompt a requirement to adopt a FIRM for the annexed area, if that area is not already shown on a panel adopted by the community.

1.5(B). This provision recognizes that topography developed for site plans or available from community GIS layers, for example, may be at a finer scale than the base maps used by FEMA to draw the landward boundary of special flood hazard areas. The best available data should be used, including the best available topographic data.

1.5(C). This provision clarifies that if base flood elevation data are not available from other sources, the Floodplain Administrator may require the applicant to develop data using acceptable methods. The building code gives the code official the same authority. Because it is permissive, the Floodplain Administrator can exercise discretion as to whether to require the analyses, for example based on location in the SFHA and the nature of the proposed development activity. However, Sec. 4.2(A)(4) requires development of base flood elevation data for certain subdivision proposals and *development* proposals containing at least 5 lots or at least 5 acres if the FIRM does not show BFEs.

Accessory Structure: See Sec. 3.5(A)(10) which specifies that a *Declaration of Land Restriction (Nonconversion Agreement)* will be recorded on the property deed prior to issuance of the Certificate of Occupancy for accessory structures that are 300 sq ft or larger in area (footprint). Also see notes for Sec. 5.7(A) and Sec. 6.5(A) where communities have the option to specify limits on size and value.

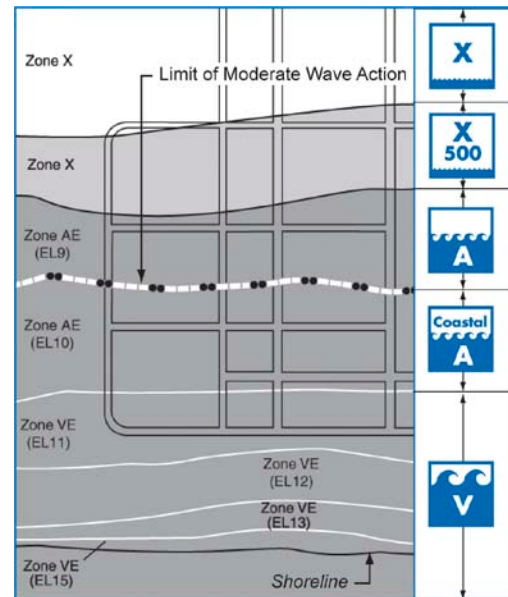
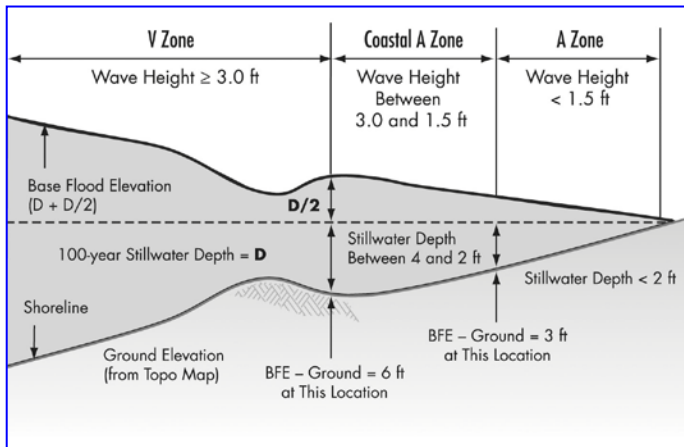
Agreement to Submit an Elevation Certificate: Maryland has recommended use of this form for more than 20 years. MDE has modified and clarified the agreement form for 2010. The Model Ordinance requires the Elevation Certificate to be submitted at two different times. The building code also requires submission of documentation of elevations. Also see note for Sec. 3.7(B) & (E). Download the agreement form at <http://www.mde.state.md.us> (under Water Programs, use the dropdown menu to select Flood Hazard). The NFIP Elevation Certificate (FEMA Form 81-31) is available at <http://www.fema.gov/business/nfip/elvinst.shtm>.

Base Flood Elevation: For areas of shallow flooding, the height above grade specified (4 feet) is consistent with the 2 feet of freeboard that is recommended in the definition of “Flood Protection Elevation.”

Basement: The NFIP definition of “Basement” is consistent with the building code definition in Sec. 1612.2 (the building code also defines “basement” in Sec. 502.1). In addition, this definition is consistent with its usage in the residential code provisions that apply in flood hazard areas (see R322.1.5, R322.2.1 and R322.3.2).

Building Code: The Maryland Building Performance Standards (MBPS), which include flood provisions that FEMA has determined to be consistent with the NFIP requirements for buildings and structures; see especially Sec. 1612 (building) and R322 (residential). The term “building code” is used to refer to all of the MBPS codes and the specific code that applies to all buildings and structures that are not within the scope of the residential code. Where appropriate, the model ordinance also refers to the existing building code and the residential code.

Coastal A Zone: FEMA announced that all new detailed coastal studies started after October 1, 2008 will include determination of the landward limit of waves 1.5 feet in height (see graphic on next page). This limit, called the “Limit of Moderate Wave Action” (LiMWA, see graphic on next page) will be delineated on the FIRMs (but the area will not be labeled as a Coastal A Zone) and included in the DFIRM database as an informational layer. The minimum NFIP regulations do not have provisions for Coastal A Zones. For more than 10 years FEMA has documented wave-related damage in areas where wave heights are between 1.5 and 3 feet high. FEMA uses the 3-foot wave height to delineate the boundary between V zones and A zones. Two standards referenced in the building code also cite the Coastal A Zone and have design and construction provisions: ASCE 7 and ASCE 24. Communities in the CRS are eligible for additional points for regulating the Coastal A Zone.



Critical and Essential Facilities: FEMA does not explicitly define what types of facilities should be considered “critical” and “essential” and the NFIP minimum regulations do not require that such facilities be protected to a higher level than other nonresidential buildings. However, the building code does require a higher level of protection (Occupancy Category III and IV). Communities should also be aware that if Federal funds are being used to build critical facilities in special flood hazard areas, the granting agency is required to undertake a multi-step deliberative process to determine that investment in the facility is appropriate. Importantly, if the agency approves investing in a critical facility in a SFHA, it must specify that the facility will be protected to at least the 500-year flood level.

Declaration of Land Restriction (Nonconversion Agreement): This form combines two forms previously recommended by Maryland (the “Nonconversion Agreement” and the “Declaration of Land Restriction”). Only one form is necessary because the model ordinance streamlines how enclosures below elevated buildings (including crawl/underfloor spaces) and accessory structures are handled. Download this form at <http://www.mde.state.md.us> (under Water Programs, use the dropdown menu to select Flood Hazard).

Flood Insurance Rate Map (FIRM): Revised FIRMs that have been prepared in digital format or converted to digital format are referred to as Digital FIRMs (DFIRM). The term “Flood Insurance Rate Map (FIRM)” refers to flood hazard data provided by FEMA, regardless of whether the data are shown on printed products or in digital format.

Flood Opening: Flood openings sometimes are referred to as “flood vents,” although the term “vent” is more correctly used to refer to air ventilation. The term “flood opening” is used in the building code, ASCE 24, FEMA’s revised Elevation Certificate, and the 2008 revision of Technical Bulletin #1, *Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings*.

Flood Protection Elevation: This provision continues Maryland’s long-standing practice of defining the level of protection for buildings and structures to be the base flood elevation plus freeboard. This model recommends two (2) feet of freeboard (the previous model recommended one (1) foot of freeboard). Communities may elect to modify the recommended freeboard. The building code uses and defines the term “design flood elevation” which is the elevation of the base flood or the elevation of the flood corresponding to the area designated as the flood hazard area on a community’s flood hazard map or otherwise legally designated. The NFIP minimum requirement calls for lowest floors to be at or above the BFE. In nontidal waters of the State, State law and regulation requires MDE to use the water surface elevation of the ultimate development discharge for the 100-year flood, plus one foot. In SFHAs along tidally-influenced bodies of water, the addition of at least one or two feet of freeboard to the BFE accounts for uncertainty in the models and provides some allowance for potential sea level rise. An independent economic analysis funded by FEMA determined that small additional up-front cost of adding up to four feet of height to foundations that must already be elevated is off-set by both avoided future damage and lower flood insurance premiums (the “pay-back” period varies depending on amount of freeboard and the type of foundation).

Flood Protection Setback: This provision continues Maryland’s long-standing recommendation to delineate areas within which development and disturbance are discouraged. This setback is not intended to replace Critical Area buffers; therefore, it is specified to be applied only along *nontidal waters of the State*. The 50-foot setback along streams that do not have SFHAs is consistent with the State’s nontidal wetlands and waterways regulatory authority.

Historic Structure: Delete item (4) if the community’s program has not been certified.

Lowest Floor: The NFIP regulations do not distinguish the lowest floor of *manufactured homes*. FEMA has revised its manufactured home installation guidance document (which includes a number of pre-engineered foundation solutions) to refer to the bottom of the lowest horizontal supporting member (longitudinal chassis frame beam) as the reference level. As of mid-2010, FEMA is planning to request that HUD modify its installation standards (issued in 2007).

Market Value: The full phased-in assessment value is defined and determined by the Maryland Department of Assessments and Taxation, which provides both land value and improvement (building) value. Only the improvement (building) value is used in substantial improvement/substantial damage determinations. The full phased-in assessment value is considered equivalent to market value, although it may be lower than the market value determined by a licensed real estate appraiser. Use of assessed value for market value is explained in FEMA’s new *Substantial Improvement/Substantial Damage Desk Reference* (FEMA P-758). This guidance document also explains how replacement value can be used to estimate market value when many buildings have been damaged and it is important to screen all damaged buildings to identify those for which additional information is necessary in order to make the substantial improvement/damage determination.

Substantial Improvement: One of the two alternative definitions shown must be selected (and the companion alternative selected in Sec. 4.6). The difference between the definitions is related only to how a community elects to handle historic structures.

- Using “variance method” means that improvements that would otherwise be determined to be substantial improvement of a historic structure (by comparing cost of the work to the market value of the building) must be processed as a variance. The benefit of this approach is that it allows consideration of some flood damage-reduction measures without requiring full compliance. The “variance method” is considered the best approach because it does not entirely ignore the potential of future flood damage.
- Using the “definition method” means that any and all improvements to historic structures (provided the improvements do not preclude a structure’s continued listing as a historic structure) are, by definition, not subject to the requirements of the ordinance. This approach means that the owner is not required to even consider any measures that would reduce future flood damage to protect identified historic resources.

3.1(B). When communities initially decided to participate in the NFIP they entered into an agreement with the Federal government. That agreement includes certain responsibilities which are set forth in this ordinance. A number of Maryland communities cooperate with another community, and some use third-party services, to implement portions of their floodplain management regulations and/or building codes. This section clarifies that such agreements or contracts must be in writing and do not relieve the community of its commitments to the NFIP.

3.2(N)(2) and 3.2(O). These responsibilities are not new to Maryland’s Floodplain Administrators, but are enumerated here to draw attention to the need for communicating with owners of damaged buildings, especially after events that damage large numbers of buildings. By formalizing these duties, governing bodies are more aware of the need to plan for them, rather than expect that all building owners are aware of the requirement to obtain permits for repairs (in both the building code and the floodplain management regulations)

3.3(A). Especially with older FIRMs that were developed using topographic maps with a wide contour interval, land that is lower than the BFE may not be shown as in the SFHA. This provision requires use of the best available information (in this case better topography) to delineate the SFHA boundary. Note also that some land that is higher than the BFE may be shown as in the SFHA. Communities are required to regulate the SFHA shown on the FIRMs until and unless FEMA issues an amendment or revision to the map (see Section 2.0, definition of “Letter of Map Change”).

3.3(E). FEMA provides a Preliminary *Flood Insurance Rate Map* and/or a Preliminary *Flood Insurance Study* when it revises a community’s FIRM (other than through the CLOMR process). Map revisions of this scale do not occur frequently, although virtually all of the FIRMs in Maryland will be revised over the next few years.

- This section requires the preliminary data to be used in areas that the effective map shows do not have BFEs or do not have floodways – the reason is the preliminary data are the best available data and the NFIP minimum requirement is that the best available data shall be used.
- If the preliminary data show a lower BFE or smaller SFHA, the effective FIRM must be used because it is the legally-adopted map.

- If the preliminary data show a higher BFE, wider SFHA, wider floodway, or change in zone, communities are encouraged (but not required) to use the preliminary data as the best available data because there is evidence of a higher risk than is shown on the effective FIRM.

3.5(A)(2). Elevation of the natural ground could be shown on the site plan or by submission of an Elevation Certificate (marked “based on construction drawings”).

3.5(A)(4). See note for Sec. 1.5(C).

3.5(A)(5). This provision continues Maryland’s long-standing recommendation that BFEs be delineated if a proposal (including subdivision proposals) has at least 5 lots or 5 acres. The NFIP minimum threshold is at least 50 lots or 5 acres.

3.5(A)(6). FEMA delineates floodways by limiting the increase associated with potential floodway fringe to no more than 1 foot. When an SFHA is shown with BFEs but without floodways, the NFIP regulations require that a comparable analysis be performed when applications are submitted. However, regulations administered by MDE for proposals to change the course, current, or cross-section of nontidal waters of the State are more restrictive.

3.5(A)(8). Requiring the applicant to explain the intended purpose of fill allows communities to better control instances where the applicant places fill and subsequently obtains a Letter of Map Revision based on Fill (LOMR-F), which “removes” the filled area from the mapped SFHA. If the intended purpose is to support a building in the future, the community can require that the fill be designed for that purpose. Once removed from the SFHA, construction on the fill is no longer regulated as SFHA, thus basements could be excavated into the fill and extend below the BFE. Saturation of filled soils may result in hydrostatic pressure on basement walls, leading to structural damage.

3.5(A)(9). See note for definition of *Declaration of Land Restriction (Nonconversion Agreement)*. Refer to table above for a summary of when the DLR(NCA) is required. Item (c) is consistent with the State’s regulatory authority in nontidal waters of the State, which requires engineering evaluations prior to approval of placement of fill (COMAR 26.17.04).

3.5(A)(10). See notes for definitions of “Accessory Structure” and *Declaration of Land Restriction (Nonconversion Agreement)*.

3.5(A)(12). This provision details the information that is needed to evaluate whether proposed work on existing buildings constitutes substantial improvement and, if a horizontal addition is proposed, a description of the addition that is necessary to determine whether the base (existing) building will be required to be brought into compliance. In item (a), enter the same date specified in Sec. 1.1.

3.5(A)(13). Note that the certifications and technical analyses specified here are required to be submitted with the application – they are not “as-built” documents. Using available forms for

these certifications (rather than accepting sealed statement on plans) will facilitate maintaining permanent records and providing access to those records during Community Assistance Visits.

- (b) MDE recommends using FEMA’s Floodproofing Certificate form which is available online at <http://www.fema.gov/library/viewRecord.do?id=1600>.
- (c) As noted in Sec. 5.4(C)(13), the certification requirement for engineered flood openings may be satisfied by submission of an individual certification or an Evaluation Report issued by the ICC Evaluation Service, Inc. For more guidance, see Technical Bulletin #1, *Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings*.
- (d) MDE recommends use of a V Zone Design Certificate, which is available online at <http://www.mde.state.md.us> (under Water Programs, use the dropdown menu to select Flood Hazard).

3.7(B) & (E). Sec. 3.7 indicates several inspections that may be conducted. One inspection is required by the building code “upon placement of the *lowest floor* and prior to further vertical construction” at which time the permittee is required to submit elevation documentation (the Elevation Certificate). These provisions also require permittees to submit a final “as-built” Elevation Certificate prior to the final inspection. The MBPS (residential) specifically requires “as-built” elevation documentation. The 2012 edition of the International Code Series, which will serve as the basis for the next edition of the Maryland, will require submission of elevation documentation prior to the final inspection. Having the Elevation Certificate in hand allows the inspector to verify compliance, or to have the data necessary to determine if mechanical/electrical equipment or flood openings are not compliant. Also see note for the definition of *Agreement to Submit an Elevation Certificate*, which is revised so that the applicant agrees to submit the Elevation Certificate twice.

3.8. See note for Sec. 3.7(B) & (E) which explains why the Elevation Certificate is to be submitted prior to the final inspection.

4.2(A)(4). See note for Sec. 3.5(A)(5) regarding threshold of at least 5 lots.

4.2(A)(5) and (B)(2). This provision continues the Maryland recommendation that subdivision access roads be at or above the BFE to facilitate evacuation and, if necessary, access by emergency personnel. Alternative ordinance wording is offered for communities that prefer to require this only in riverine SFHAs, where State Nontidal Wetlands & Waterways permits are required. This provision exceeds the NFIP minimums.

4.2(B)(1). This requirement encourages subdivision layouts that avoid placing homes in SFHAs along nontidal waterways that are regulated by the State. Applicants who seek a variance to allow homes in SFHAs in new subdivisions should be advised that a State Nontidal Wetlands & Waterways permit will be required. This provision exceeds the NFIP minimums.

4.4(E). This section is identified as an alternative to the elevation requirements in paragraph (D). This alternative is included in the NFIP minimum regulations and the building code, but has not been in previous Maryland model ordinances. It is important to realize that this provision

requires the applicant to demonstrate that proposed installations below the lowest floor will meet the stated performance.

4.4(F). Panelboards (inside buildings) must be elevated; Maryland recommends that they be elevated at least three feet above the BFE. This provision exceeds the NFIP requirement that electrical systems and components be at/above BFE.

4.4(G), (H) & (I). The introductory text of Sec. 4.4 states that it applies to new buildings and structures (including placement and replacement of manufactured homes) and substantial improvement of existing structures (including manufactured homes). These three sections specify the additional requirements that apply based on zone, illustrated in this table:

	Development, new buildings; new manufactured home	Substantial Improvement/Damage & replacement manufactured home
A Zone (not V, not Coastal A Zone)	Sec 5.0	Sec 5.0
Coastal A Zone	Sec 6.0	Sec 5.0
V Zone	Sec 6.0	Sec 6.0

See notes for the definition for “Coastal A Zone.” By recognizing Coastal A Zones and requiring new construction and placement of new manufactured homes to comply with the requirements of Sec. 6.0 (V Zone), the model exceeds the NFIP requirements and conforms to FEMA’s recommendations. However, this model stops short of requiring compliance with V Zone requirements for substantial improvement (and repair of substantial damage) of existing buildings and replacement manufactured homes. This will limit the amount of CRS credit provided for applying V Zone requirements in Coastal A Zones.

4.5(A). This provision discourages the disposal of materials in floodplains. Such disposal may increase flooding on adjacent properties and alter local drainage. The NFIP minimum requirements allow “filling” outside of floodways (although encroachment analyses are required if placed in SFHAs with BFEs but no floodways, or in SFHAs without BFEs). A permit from MDE is required for placement of fill in nontidal waters of the State.

4.5(B). By pointing to the limitations on fill that are found in Sec. 6.2, this provision recognizes that fill placed in areas subject to wave action is exposed to erosion and scour (including waves between 1.5 and 3-feet in height in Coastal A Zones).

4.6. See note for the definition of “Substantial Improvement.” Only one of the alternatives should be selected, and the companion definition for “Substantial Improvement” should be selected.

4.7(A). This provision continues the long-standing Maryland recommendation that manufactured homes not be placed in floodways and V Zones to recognize that these units are the most vulnerable to flood damage. This provision exceeds the NFIP requirements.

4.7(B). See note for definition the “Lowest Floor.”

4.7(C)(1). This provision continues the Maryland requirement (in nontidal waters of the State) and recommendation (in tidally-influenced SFHAs) that all manufactured homes, including replacement units, be on permanent, reinforced foundations that are elevated based on the flood zone. The NFIP minimum requirement allows certain replacement units in existing manufactured home subdivisions and parks (but not those replacing units that have been substantially damaged by flood) to be elevated on foundations that are at least 36” above grade.

4.9. See note for the definition of “Critical and Essential Facilities.” The building code, by reference to ASCE 24, specifies lowest floor elevations based on occupancy category (structures generally considered to be “critical and essential facilities” are designated Occupancy Category III and Occupancy Category IV). The NFIP minimum requirements do not have provisions that are specific to these facilities.

5.1. The effect of this section is that the reader will go to Section 6.0 if any activity is proposed within a V Zone or a delineated Coastal A Zone. However, as explained and illustrated in the table in the note for Sec. 4.4(G), (H) & (I), Section 6.0 sends the reader back to Section 5.0 if the activity is substantial improvement of existing structures or replacement manufactured homes.

5.2. This provision continues the Maryland practice of requiring a flood protection setback, but limits it only to nontidal waterways. Other State regulations require buffers or setbacks from tidal waters. The NFIP minimum requirements do not include setbacks.

5.3(A). Note that an MDE permit must be issued before a community considers a proposal for development in a floodway shown on the FIRM. The NFIP definition of “development” is broad, and thus implicitly includes fences. The last sentence in this paragraph continues the Maryland provision that specified the only fences allowed in floodways are “two-wire fences.” However, rather than specify certain types of fences that are allowed, the provision is now phrased such that a floodway analysis is not required for fences that do not block flow or trap debris, which could increase flood depths (in practice, such fences include stockade fences and woven wire fences).

5.3(B). This provision is often called “compensatory storage.” It requires any filling (other than that associated with roads, bridges, culverts and in-stream ponds, see paragraph (D)) in the floodplain of nontidal waters of the State to be offset by a comparable volume of excavation. Although this provision exceeds the minimum requirements of the NFIP, it is consistent with State regulations which impose limits on proposed activities that increase flood elevations.

5.3(C)(2). By definition, floodways are areas where obstructions may divert flow or increase BFEs. If the FIRM shows BFEs but does not designate a floodway, then the potential impact of encroachments has not been evaluated and the NFIP requires that encroachment analyses be provided. MDE requires applicants to provide engineering analyses of the impact of filling and other encroachments in the nontidal waters of the State (not just the floodway). This section specifies that an MDE permit must be issued before the community issues a permit, and also picks up the NFIP requirement that no encroachment shall be allowed if it would increase the

BFE more than 1.0 foot at any point.

5.4(A)(1). See the note for the definition of “flood protection elevation,” which is defined as the base flood elevation plus two feet of freeboard.

5.4(B). These provisions for fill placed to elevate buildings come from ASCE 24, a standard that is referenced in the building code. The building code also includes requirements in 1803.5.8 and R401 (fill soils) and R506 (concrete floors on ground). The ASTM Standard D-698 *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort* may be referenced.

5.4(C)(3)(b). See the note for Sec. 3.5(A)(13) regarding acceptable certifications for engineered openings.

5.5(A)(1). See the note for the definition of “flood protection elevation,” which is defined as the base flood elevation plus two feet of freeboard.

5.5(B). These provisions note that State regulations at COMAR 26.17.04.11(B)(7) do not allow new nonresidential buildings in nontidal waters of the State to be floodproofed. Retrofit floodproofing of existing buildings is allowed, for example to bring them into compliance when proposed to be substantially improved or repaired after substantial damage. The limitation on floodproofing in the Coastal A Zone exceeds the NFIP minimums, but is consistent with ASCE 24, a standard that is referenced in the building code. The requirements in Sec. 5.5(B)(3) come from limitations outlined in ASCE 24. Note that the NFIP minimum requirement for floodproofing requires the measures to protect to at least the BFE; these requirements call for floodproofing to the flood protection elevation plus 1 foot to capture both the freeboard and the fact that flood insurance does not recognize floodproofing unless it extends at least one foot above the BFE. This level of protection is appropriate given the potentially catastrophic consequences of floodwaters rising higher than the BFE.

5.6. FEMA guidance addresses additions and explains the requirements that apply when an addition (or an addition combined with other work within the existing building) triggers the requirement for compliance of the base (existing) building. See FEMA P-758, *Substantial Improvement/Substantial Damage Desk Reference*.

5.6(A). This requirement for additions is not explicitly stated in the NFIP regulations, but is embedded in the concept of “new construction” which the NFIP defines as any structure that was built after the date the community joined the NFIP (or the date of the first FIRM). Now that many of those buildings are +30 years old, it is clearer to have an explicit statement that any work on these buildings (commonly referred to as “post-FIRM”) shall comply, including any addition (regardless of cost) which shall be elevated.

5.6(B). State regulations require permits for any encroachment in nontidal waters of the State (COMAR 26.17.04.07), including additions that increase the footprint of existing buildings. All additions, regardless of size, are required to be elevated (or dry floodproofed, if nonresidential). Both State regulations and NFIP regulations require that existing buildings be brought into

compliance if they are proposed to be substantially improved. FEMA guidance addresses additions and explains when an addition (or an addition combined with other work within the existing building) triggers the requirement for compliance of the base (existing) building.

5.7(A). See notes for the definition of “Accessory Structure.” FEMA encourages communities to specify a size limit and dollar value to, in part, discourage large accessory structures that may be modified for uses other than those specifically allowed (parking of vehicles and storage). A size limit that is reasonable for a two-car garage may be appropriate. Selecting a size limit of 300 sq ft would be consistent with the requirement in Sec. 3.5(A)(10) regarding a *Declaration of Land Restriction (Nonconversion Agreement)*. Specifying limits on size and value exceeds NFIP minimum requirements.

6.1. Section 6.0 includes the NFIP’s V Zone requirements. Also see notes for Sec. 4.4(G), (H) & (I) and Sec. 5.1, which explain that if located in the Coastal A Zone, new buildings and structures (and new placement of manufactured homes) shall comply with the requirements for V Zones. However, the exception to Sec. 6.1(B) specifies that in Coastal A Zones, the V Zone requirements to not apply to buildings and structures that are substantially improved (or repaired after sustaining substantial damage) or replacement manufactured homes.

6.2(C). The description of the uses and “minor” quantities of fill are the same as specified in the residential code. Although a specific volume is not defined, the nature of purposes for which minor grading and quantities of fill may be used are sufficient to place bounds on proposals. The placement of fill (and structures such as retaining walls) can deflect waves and divert flood flows which may damage buildings.

6.3(C). Sec. 3.5(A)(13)(d) notes that MDE recommends use of a V Zone Design Certificate, rather than relying on sealed plans, to satisfy this requirement. The design professional’s certification is required to be submitted with the application – it is not an “as-built” certification. Download this form at <http://www.mde.state.md.us> (under Water Programs, use the dropdown menu to select Flood Hazard).

6.3(D)(2). The model ordinance recommends limiting the size of enclosures for two reasons: (1) in V Zones, NFIP flood insurance assesses a “loading factor” when buildings have enclosures, and the loading factor is significant when enclosures are 300 sf and larger, even if the enclosures comply with the design and construction requirements; and (2) large enclosures are more likely to be illegally modified to habitable space. Another option is to prohibit all enclosures. Both a limitation on size and a prohibition on all enclosures exceed the NFIP minimum requirements.

6.3(D)(6)(a). Some owners elect to put openings in breakaway walls in V Zones because the openings prevent the walls from failing too soon (i.e., under flood depths and waves considerably lower than base flood conditions). Owners may do this because flood insurance does not pay for damage to breakaway walls and if the walls fail under frequent, shallow flooding, the owners bear the entire cost to repair.

6.3(D)(6)(c). The Maryland model ordinance requires conformance with coastal high hazard area (V Zone) requirements for new structures and placement of new manufactured homes in Coastal A Zones (see Sec. Sec. 4.4(G), (H) & (I) and Sec. 5.1). Both field investigations and laboratory research support requiring open foundations in CAZ because of the potential damage associated with wave heights between 1.5 and 3 feet. However, Coastal A Zones still appear as “A Zones” on FIRMs and, as such, breakaway walls must still have openings in order to satisfy the NFIP minimum requirements in A Zones.

6.4. FEMA guidance addresses additions and explains the requirements that apply when an addition (or an addition combined with other work within the existing building) triggers the requirement for compliance of the base (existing) building. See FEMA P-758, *Substantial Improvement/Substantial Damage Desk Reference*.

6.4(A). This requirement for additions is not explicitly stated in the NFIP regulations, but is embedded in the concept of “new construction” which the NFIP defines as any structure that was built after the date the community joined the NFIP (or the date of the first FIRM). Now that many of those buildings are +30 years old, it is clearer to have an explicit statement that any work on these buildings (commonly referred to as “post-FIRM”) shall comply, including any addition (regardless of cost) which shall be elevated.

6.5(A). See note for the definition of “Accessory Structure” and the note for Sec. 5.7(A). FEMA encourages communities to specify a size limit and dollar value to, in part, discourage large accessory structures that may be modified for uses other than those specifically allowed (parking of vehicles and storage). In V Zones, FEMA’s recommendation is to limit accessory structures to those that are “small” (100 sq ft or less) and “low cost” (less than \$1,000); see Technical Bulletin 5, *Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas*. Selecting a size limit of 300 sq ft would be consistent with the requirement in Sec. 3.4(A)(10) regarding a *Declaration of Land Restriction (Nonconversion Agreement)*. Specifying limits on size and value exceeds NFIP minimum requirements.

6.5(B)(6). See note for Sec. 6.5(A). The 100 sq ft size limit allows small sheds (e.g., pre-manufactured sheds) consistent with FEMA’s Technical Bulletin 5, while allowing larger accessory structures if they have breakaway walls (i.e., stick-built). Communities should keep in mind that walls designed to breakaway contribute debris to floodwaters. This section also specifies that if an accessory structure larger than 100 sf, with breakaway walls, is located in a Coastal A Zone, it must also have flood openings. This requirement is necessary because areas delineated as Coastal A Zone are designated as A Zones on FIRMs, and compliance in A Zones requires openings in walls below elevated buildings.

6.6(A). The NFIP minimum requirements do not have explicit provisions for decks and patios in coastal high hazard areas (V Zones) and Coastal A Zones, although they are captured in the broad definitions of “Development” and “Structures.” FEMA guidance addresses decks and patios because under flood conditions, they can either transfer loads to buildings or they break up and become debris that batters adjacent buildings, contributing to increased damage. The building code refers to ASCE 24, which contains provisions regarding transfer of loads, as do the flood provisions of the residential code.

7.3. This provision continues Maryland’s long-standing recommendation that communities obtain and consider comments on requests for variances from MDE (NFIP State Coordinator). Because this model does not require variances for fill in excess of 600 cubic yards or for accessory structures larger than 600 sq ft, fewer variances are expected to be processed than in the past.