



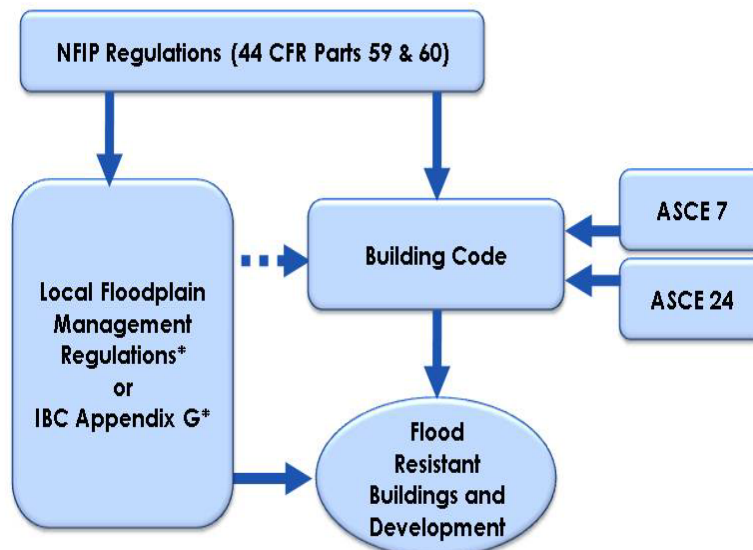
# NFIP- 2012 I-Codes and ASCE 24 Checklist

## IBC (and Appendix G), IMC, IPC, IFGC, IRC, and IEBC

**Purpose of this Checklist.** This checklist will guide floodplain managers, building officials and designers as they compare the requirements of the National Flood Insurance Program (NFIP) to the flood provisions of the *International Building Code (IBC)*, the *International Mechanical Code (IMC)*, the *International Plumbing Code (IPC)*, the *International Fuel Gas Code (IFGC)*, the *International Residential Code (IRC)*, the *International Existing Building Code (IEBC)*, and the referenced standard, *ASCE 24-05 Flood Resistant Design and Construction*. Most states adopt the IMC, IPC, and IFGC either separately or by reference in the IBC; some states adopt the Uniform Mechanical Code and the Uniform Plumbing Code (published by IAPMO). Although the model codes are not available in view-only form online, many states make their building codes available online.

This checklist is based on the standard checklist used by FEMA and states to review local floodplain management regulations/ordinances to determine whether such regulations and ordinances are complete for the purpose of participating in the NFIP. Pertinent Federal regulations are in [44 CFR Part 60](#) (criteria for land management and use) and [44 CFR Section 59.1](#) (definitions).

**Floodplain Management and Building Codes.** With the inclusion of NFIP-consistent provisions in the International Code Series® (I-Codes®), states and communities have two primary tools to regulate development in flood hazard areas: (1) building codes that govern the design and construction of buildings and structures; and (2) either IBC Appendix G or separate, but coordinated, local floodplain management regulations. These tools are designed to work together to result in buildings and structures, and all other development, that are resistant to flood loads and flood damage.



\* NFIP-consistent administrative provisions, community-specific adoption of FIS and maps, and technical requirements for development outside the scope of the building code (and higher standards, in some communities).

**Relationship between the I-Codes and Local Floodplain Management Regulations or IBC Appendix G.**

When states and communities adopt and enforce the flood provisions of the I-Codes, they must ensure full consistency with the NFIP requirements for buildings and structures. Of particular note, care must be taken to ensure that:

1. Work on existing buildings and structures is regulated (see notes below);
2. Buildings, structures and facilities that a state may specify are exempt from the requirements of the code (most common are agricultural structures) and work that is explicitly exempt from the requirement to obtain a permit (see IBC 105.2 and IRC 105.2) are still required to be regulated in accordance with the NFIP if located in flood hazard areas. Buildings, structures, and facilities exempt from the requirements of the code must either be addressed by local regulations or by amending Appendix G. One way to effectively address this shortfall is to specify in local regulations or in Appendix G that buildings and structures in flood hazard areas that are exempt from the code shall comply with ASCE 24;
3. State or local amendments, if any, do not weaken the flood provisions of the model codes;
4. If Chapter 1 of IBC and Chapter 1 of IRC are not adopted by the state or local jurisdiction, then the administrative provisions related to flood hazard areas contained therein must be incorporated in locally-adopted administrative provisions or by ensuring that all necessary administrative provisions are contained in IBC Appendix G; and
5. If IBC Appendix G is not adopted, requirements comparable to those in Appendix G are adopted in local floodplain management regulations.

With the caveat that the above-listed items need to be examined to ensure full consistency with the NFIP, there are three ways that the I-Codes are used to meet the requirements for participation in the NFIP:

1. Adopt the IBC with Appendix G and IRC, and for existing buildings, either retain IBC Chapter 34 or adopt the IEBC.
2. Adopt code-coordinated companion floodplain management regulations and adopt the IBC (without Appendix G) and IRC, and for existing buildings, either retain IBC Chapter 34 or adopt the IEBC.
3. Adopt one or more of the I-Codes and continue to use NFIP-compliant, locally-adopted "stand-alone" floodplain management regulations, allowing the "more restrictive prevails" concept to apply. The caution is that having two regulatory instruments govern the same activities can result in conflicting provisions and perpetuate confusion. States need to determine if this is acceptable, especially those states that specify that only the building code governs the design and construction of buildings which may effectively void building requirements in local floodplain management regulations. Communities with higher standards, especially communities that participate in the NFIP Community Rating System, should determine if a conflict between the requirements of the building codes would effectively void locally-adopted higher standards. In general, allowing known conflicts to remain unresolved is discouraged because it could result in regulations that are unenforceable.

**Notes on Existing Buildings.** The IBC includes Chapter 34, Existing Buildings. Some states and communities rely on this chapter to regulate work on existing buildings and do not adopt the IEBC. Some states and communities adopt IEBC while also retaining IBC Chapter 34, and other states and communities adopt IEBC and delete IBC Chapter 34. The IRC applies to the construction of new dwellings as well as work on existing dwellings, including “alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition” (R101.2 Scope). For completeness, the checklist includes citations from both IBC Chapter 34 and IEBC.

**Relationship between the I-Codes and ASCE 24.** ASCE 24-05 is a consensus standard that has been referenced by the I-Codes since 2006 (an earlier edition of ASCE 24 was referenced by the 2000 and 2003 I-Codes). ASCE 24 is referenced by the IRC. Dwellings in floodways are required to comply with ASCE 24 and design professionals may use ASCE 24 as an alternative to the specific IRC provisions for dwellings in coastal high hazard areas. FEMA prepared “[Highlights of ASCE 24-05](#),” a summary of the provisions in the standard. The next edition of ASCE 24 is due in late 2013 and will be referenced by the 2015 I-Codes. ASCE 24 is not available in view-only form.

Revisions of ASCE 24 are developed by a balanced committee that includes design professionals, building professionals, manufacturers, government officials, and academic representatives. The committee is not required to mimic NFIP requirements for buildings and structures and thus has incorporated a number of provisions that are “higher standards.” Many provisions are more detailed and specific than NFIP requirements, while some exceed the minimum NFIP requirements to achieve the desired building performance when exposed to flooding. The committee takes care not to reduce the requirements below the NFIP minimums.

The IBC Section 1612 does not contain the specific requirements for buildings and structures in flood hazard area. Rather, Section 1612.4 references ASCE 24 and ASCE 24 contains the specific design and construction requirements for buildings and structures in flood hazard areas.

Some states and communities use IBC Chapter 34 to regulate work on existing buildings, including alteration, repair, addition, and change of occupancy. Other states and communities adopt IEBC to regulate work on existing buildings. In both IEBC and Chapter 34, specific sections apply in flood hazard areas and specify that if the work constitutes substantial improvement or repair of substantial damage, the work shall comply with the flood design requirements for new construction and all aspects of existing buildings shall be brought into compliance with the requirements for new construction. The scope IRC includes work that can only be performed on existing dwellings (i.e., additions, alterations, repairs). The IBC flood design requirements for new construction are in Section 1612, which refers to ASCE 24 for the specific requirements; in the IRC, the requirements for new construction are primarily in Section R322..

ASCE 24 does not contain administrative provisions. Such provisions are found in IBC Chapter 1 (and IBC Appendix G, if adopted), IRC Chapter 1 and locally-adopted floodplain management regulations (especially if IBC Appendix G is not adopted). Administrative provisions include such matters as duties and powers of the floodplain administrator/code official, determination of substantial improvement/substantial damage, adoption of maps and studies, variances, contents of site plans and construction documents, inspections, identification of flood hazard areas and design flood elevations, evaluations related to encroachment in floodways and flood hazard areas with BFEs but without floodways. IBC Appendix G or the local floodplain management regulations will specify requirements for development that is not within the scope of the codes, such as subdivisions, site improvements, manufactured homes, recreational vehicles, tanks, other building work, temporary structures and storage, and utility and miscellaneous structures.

**Other Information Sources.** The following resource documents were prepared by FEMA and are available at <http://www.fema.gov/building-science/building-code-resources>:

- Flood Resistant Provisions of the 2009 and 2012 International Code Series (excerpts of the flood provisions)
- Highlights of ASCE 24-05, Flood Resistant Design and Construction
- Provisions of the 2009 I-Codes and ASCE 24 Compared to the NFIP (summarizes where the codes/ASCE 24 have higher and more specific requirements)
- Higher Standards and More Specific Requirements than the Minimum Requirements of the NFIP, a paper that summarizes the provisions of the I-Codes that are more detailed or that exceed the NFIP minimums
- [Reducing Flood Losses Through the International Code Series](#). The 4<sup>th</sup> edition (in development) will include detailed description of the step-by-step process to coordinate local floodplain management regulations with the I-Codes.

**Organization of the Checklist:** The checklist has two parts. Definitions start on page 16. With respect to the NFIP Requirements:

- The left column of the checklist shows short statements of the NFIP requirements, with the specific citations (for complete provisions, refer to the actual language in 44 CFR 59 and 60).
- The middle column of the checklist shows the I-Code sections that include requirements to meet or exceed the NFIP requirements.
- The right column of the checklist shows the provisions of ASCE 24-05 that include requirements to meet or exceed the NFIP requirements for buildings and structures.
- The note “See ordinance/code” means the provision needs to be included in local floodplain management regulations, in the administrative provisions of the codes, and/or in IBC Appendix G (if adopted).

# NFIP- 2012 I-Codes and ASCE 24 Checklist – NFIP Requirements

## IBC (and Appendix G), IMC, IPC, IFGC, IRC, and IEBC

Required provisions [NFIP citations]	2012 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-05
1. Citation of Statutory Authorization. [59.22(a)(2)]	<i>In state authorizing/adoption or community's adopting ordinance</i>	ASCE 24 does not include administrative provisions
2. Purpose section citing health, safety, and welfare reasons for adoption. [59.22(a)(1)]	101.3 G101.2 R101.3 EB101.3	ASCE 24 does not include administrative provisions
3. Definitions [59.1]	See page 15, below	See page 15, below
4. Adopt or reference correct Flood Insurance Rate Map (and where applicable, Flood Boundary Floodway Map) and date. [60.2(h)]	1612.3 Table R301.2(1)  Note: both reference revisions of FIS and FIRMs; this provision does not override individual state limitations on "auto-adoption" of maps.	ASCE 24 does not include administrative provisions
5. Adopt or reference correct Flood Insurance Study and date. [60.2(h)]	1612.3 G102.2 Table R301.2(1)	ASCE 24 does not include administrative provisions
7. Adequate enforcement provisions including a violations/penalty section specifying community actions to assure compliance. [60.2(e)]	114 G101.4 R113	ASCE 24 does not include administrative provisions
8. Abrogation and Greater Restriction section (provide that floodplain management regulations take precedence over any less restrictive conflicting local laws, ordinances or codes). [60.1(b)]	<i>In community's adopting ordinance</i>	ASCE 24 does not include administrative provisions
9. Disclaimer of Liability (Degree of flood protection required by the ordinance is considered reasonable but does not imply total flood protection.)	<i>In community's adopting ordinance</i>	ASCE 24 does not include administrative provisions

10. Severability section. (If any section, provision or portion of the ordinance is deemed unconstitutional or invalid by a court, the remainder of the ordinance shall be effective.)	<i>In community's adopting ordinance</i>	ASCE 24 does not include administrative provisions
11. Framework for administering the ordinance (permit system, establish office for administering the ordinance, <i>recordkeeping</i> , etc.) [59.22(b)(1)]	IBC Chapter 1 G103; G104 IRC Chapter 1; R104 IEBC Chapter 1; EB104	ASCE 24 does not include administrative provisions
12. Designate title of community Floodplain Administrator [59.22 (b)]	104.1 G103.1 R104.1 <i>In community's adopting ordinance if other than the Building Official</i>	ASCE 24 does not include administrative provisions
13. Requirement to submit new technical data: within 6 months, notify FEMA of changes in the base flood elevation by submitting technical or scientific data so insurance & floodplain management can be based on current data. [65.3]	See ordinance	ASCE 24 does not include administrative provisions
14. Variance section with evaluation criteria & insurance notice. [60.6(a)]	104.10.1 G105 R104.10; R112.2.2 EB104.10.1	ASCE 24 does not include administrative provisions
15. For adopted ordinance: Signature of Appropriate Official & Certification. [59.22(3)] Date ordinance adopted: __ <i>Effective Date</i> __ Ord. # _____	<i>In community's adopting ordinance</i>	ASCE 24 does not include administrative provisions

<b>60.3(a) When no SFHA's have been identified, no water surface elevation data has been provided, and floodways and coastal high hazards areas have not been identified and the community applies for participation in the NFIP, the following are required:</b>	<b>2012 I-Codes (IBC &amp; Appendix G, IRC, and IEBC)</b>	<b>ASCE 24-05</b>
16. Require permits for all proposed construction or other development including placement of manufactured homes. <b>[60.3(a)(1)]</b>	101.2; 105.1; 105.2 G101.3; G104.1; G301 (subdivisions); G401 (site improvement); G501 (manufactured homes); G601 (recreational vehicles); G701 (tanks); G801 (accessory strs & other); G901 (temp strs/storage); G1001 (utility & misc use group U) R101.2; R102.7; R105.1; R105.2; R105.3.1.1; R106.1.3; R301.2.4; R322 EB101.2; EB105.1	ASCE 24 does not include administrative provisions
17. Assure that all other State and Federal permits are obtained. <b>[60.3(a)(2)]</b>	102.2 G103.2 R102.2	ASCE 24 does not include administrative provisions

<p>18. Review permits to assure sites are reasonably safe from flooding and require performance for new construction and substantial improvements in flood-prone areas: <b>[60.3(a)(3)]</b></p>	<p>107.2.5; 1612.1; 1804.4(1); 3403.1; 3403.2; 3404.2; 3404.5; 3409.2 G101.2; G101.3; G103.1; G104.2 R106.1.3; R301.1; R301.2.4; R322 EB501.3; EB506.2.4; EB601.3; EB701.2; EB801.3; EB1003.5; EB1101.3.5; EB1202.6; EB1301.3.3 (all by reference to 1612)</p>	<p>ASCE 24 does not include administrative provisions</p>
<p>(a) Anchoring (including manufactured homes) to prevent floatation, collapse, or lateral movement. <b>[60.3(a)(3)(i)]</b></p>	<p>1603.1; 1603.1.7; 1605.2.2; 1605.3.1.2; 16.2.1; 1612.4 (ASCE 24) G501.2; G701.2; G801.1; G901; G1001.2 R301.1; R301.2.4; R322.1.2; R322.1.9; R322.2; R322.3 EB: by reference to 1612 (see sections listed in Row 18)</p>	<p>1.5.1; 1.5.3; 1.5.5; 1.6; 2.4; 2.5; 4.5.1; 4.5.7; 4.8; 7.4.1; 9.6</p>
<p>(b) Use of flood-resistant materials. <b>[60.3(a)(3)(ii)]</b></p>	<p>801.5; 1403.5; 1612.4 (ASCE 24) G103 R322.1.8 EB: by reference to 1612 (see sections listed in Row 18)</p>	<p>Section 5; 6.2; 6.3; 7.5; 8.1; 9.1</p>
<p>(c) Construction methods/practices that minimize flood damage. <b>[60.3(a)(3)(iii)]</b></p>	<p>1612.1. 1612.4 (ASCE 24) R322.1.3 EB: by reference to 1612 (see sections listed in Row 18)</p>	<p>ASCE 24 as a whole</p>



(d) Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities designed and/or located to prevent water entry or accumulation. <b>[60.3(a)(3)(iv)]</b>	1612.4 (ASCE 24); 3001.2; also see IMC, IPC, IFGC  R322.1.6; RM1301.1.1; RM1401.5; RM1601.4.9; RM1701.2; RM2001.4; RM2201.6; RG2404.7; RP2601.3; RP2705.1; RP3001.3; RP3101.5  EB: by reference to 1612 (see sections listed in Row 18)	4.6.1; Section 7
19. Review subdivision proposals and development proposals to assure that: (a) Such proposals minimize flood damage. <b>[60.3(a)(4)(i)]</b>	G301.1; G301.2 (subdivisions)	Not within the scope of ASCE 24.
(b) Public utilities and facilities are located & constructed so as to minimize flood damage. <b>[60.3(a)(4)(ii)]</b>	G301.1 (subdivisions); G401 (site improvement)	Chapter 7
(c) Adequate drainage is provided. <b>[60.3(a)(4)(iii)]</b>	1804.3  G301.1 (subdivisions); G401.5  R401.3	1.4.2; 4.5.4
20. Require new and replacement water supply and sanitary sewer systems to be designed to minimize or eliminate infiltration. <b>[60.3(a)(5) &amp; (6)]</b>	G301.1 (subdivisions); G401.3; G401.4  R322.1.7; RP2602.2(1)	7.3
21. Require on-site waste disposal systems be located to avoid impairment or contamination. <b>[60.3(a)(6)(ii)]</b>	G301.1 (subdivisions); G401.3  R322.1.7; RP2602.2(2)	7.3.4

<b>60.3(b) When SFHA's are identified by the publication of a community's FHBM or FIRM, but water surface elevation data have not been provided or a floodway or coastal high hazard area has not been identified, then all the above ordinance provisions for 60.3(a) and the following are required:</b>	<b>2012 I-Codes (IBC &amp; Appendix G, IRC, and IEBC)</b>	<b>ASCE 24-05</b>
22. Require permits for all proposed construction and other development within SFHAs on the FIRM. <b>[60.3(b)(1)]</b>	Buildings only: 101.2 (see exemptions); 105.1; 1612.1  Other Development: G101.3; G104.1  1- & 2-family homes and townhomes only: R101.2; R322.1  EB101.2	ASCE 24 does not include administrative provisions
23. Require base flood elevation data for subdivision proposals or other developments greater than 50 lots or 5 acres. <b>[60.3(b)(3)]</b>	G301.2 (subdivisions regardless of size)	ASCE 24 does not include administrative provisions.
24. In A Zones, in the absence of FEMA BFE data and floodway data, obtain, review and reasonably utilize base flood elevation and floodway data available from available from a Federal, State, or other source as criteria for requiring new construction, substantial improvements, or other development in Zone A as the basis for elevating residential structures to or above base flood level, for floodproofing or elevating nonresidential structures to or above base flood level, and for prohibiting encroachments in floodways. <b>[60.3(b)(4)]</b>	1612.3.1; 1612.3.2  G103.3  R106.3.1.1; R322.1.4.1	ASCE 24 does not include administrative provisions.
25. Where BFE data are utilized, obtain and maintain records of lowest floor and floodproofing elevations for new construction and substantial improvements. <b>[60.3(b)(5)]</b>	104.7; 110.3.3; 110.3.10.1; 1612.5(1.1), (1.3) and (2.1)  G103.3; G103.8  R104.7; R106.1.3(4); R109.1.3; R109.1.6.1; R322.1.10  EB104.7; EB109.3.3	ASCE 24 does not include administrative provisions.
26. <i>In riverine areas</i> , notify neighboring communities of watercourse alterations or relocations. <b>[60.3(b)(6)]</b>	G103.6	ASCE 24 does not include administrative provisions.
27. Maintain <b>flood</b> carrying capacity of altered or relocated watercourse. <b>[60.3(b)(7)]</b>	G103.6.1	ASCE 24 does not include administrative provisions.

28. Require all manufactured homes to be elevated and anchored to resist flotation, collapse, or lateral movement. <b>[60.3(b)(8)]</b>	G501 R322.1.9	Permanent foundations are structures that may be subject to ASCE 24.
<b>60.3(c) When final flood elevations, but no floodways or coastal high hazard areas have been provided on a community's FIRM, then all the above ordinance provisions for 60.3(a) &amp; 60.3(b) and the following are required:</b>	<b>2012 I-Codes (IBC &amp; Appendix G, IRC, and IEBC)</b>	<b>ASCE 24-05</b>
29. Require all new and substantially improved <u>residential</u> structures within A1-30, AE, and AH Zones have their lowest floor (including basement) elevated to or above the BFE. <b>[60.3(c)(2)]</b>	Dfn DFE; 1612.1; 1612.4 (ASCE 24); 1612.5(1.1); 1804.4(1); 3403.1; 3403.2; 3404.2; 3405.5; 3409.2	1.5.2; 2.3 (specification of flood depth in ordinance/code)
30. In AO Zones, require that new and substantially improved <u>residential</u> structures have their lowest floor (including basement) at or above the highest adjacent grade at least as high as the FIRM's depth number. <b>[60.3(c)(7)]</b>	R105.3.1.1; R301.2.4; R322.1.5; R322.1.10; R322.2.1; R322.2.1(3); R408.7  EB: by reference to 1612 (see sections listed in Row 18)	
31. Require that new and substantially improved <u>nonresidential</u> structures within A1-30, AE, and AH Zones have their lowest floor elevated or floodproofed to or above the base flood elevation. <b>[60.3(c)(3)]</b>	Dfn DFE; 1612.1; 1612.4 (ASCE 24); 1612.5(1.3); 3403.1; 3403.2; 3404.2; 3404.5; 3409.2	1.5.2; 2.3; Section 6 (specification of flood depth is done in administrative provisions)
32. In AO Zones, require new and substantially improved <u>nonresidential</u> structures have their lowest floor elevated or completely floodproofed above the highest adjacent grade to at least as high as the depth number on the FIRM. <b>[60.3(c)(8)]</b>	EB: by reference to 1612 (see sections listed in Row 18)	
33. Require that, for floodproofed <u>nonresidential structures</u> , a registered professional/architect certify that the design and methods of construction meet requirements at (c) (3) (ii) or (c)(8)(ii). <b>[60.3(c)(4)]</b>	1612.5(1.3)  EB: by reference to 1612	ASCE 24 does not include administrative provisions.
34. Require, for all new construction and substantial improvements, that fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage have permanent openings designed to allow the entry and exit of flood waters in accordance with specifications of <b>60.3(c)(5)</b> .	1612.4 (ASCE 24); 1612.5(1.2) (engineered openings)  R309.3; R322.2.2; R408.7  EB: by reference to 1612 (see sections listed in Row 18)	1.5.2; 2.6

<p>35. Within Zones A1-30 and AE without a designated floodway, new development shall not be permitted unless it is demonstrated that the cumulative effect of all past and projected development will not increase the BFE by more than 1 foot. <b>[60.3(c)(10)]</b></p>	<p>1612.3.2; 1804.4(4) G103.4 R106.1.3; R322.1.4.2</p>	<p>2.2</p>
<p>36. In Zones AO and AH, require drainage paths around structures on slopes to guide water away from structures. <b>[60.3(c)(11)]</b></p>	<p>1804.4 G401.5 R401.3</p>	<p>Not within the scope of ASCE 24.</p>
<p>37. Require that manufactured homes placed or substantially improved within A1-30, AH, and AE Zones, which meet one of the following location criteria, to be elevated such that the lowest floor is at or above the BFE and be securely anchored:</p> <ul style="list-style-type: none"> <li>i. outside a manufactured home park or subdivision;</li> <li>ii. in a new manufactured home park or subdivision;</li> <li>iii. in an expansion to an existing manufactured home park or subdivision;</li> <li>iv. on a site in an existing park which a manufactured home has incurred substantial damage as a result of flood. <b>[60.3(c)(6)]</b></li> </ul>	<p>G501 R322.1.9</p>	<p>If the foundation for MFH unit is subject to ASCE 24, it would be subject to same elevation, foundation and enclosure requirements as any residential/Category II structure.</p>
<p>38. In A1-30, AH, and AE Zones, require that manufactured homes to be placed or substantially improved in an <u>existing</u> manufactured home park to be elevated so that:</p> <ul style="list-style-type: none"> <li>i. the lowest floor is at or above the BFE <b><u>or</u></b></li> <li>ii. the chassis is supported by reinforced piers no less than 36 inches above grade and securely anchored. <b>[60.3(c)(12)]</b></li> </ul>	<p>G501 (36" option not provided) R322.1.9 (36" option not provided; per ASCE 24 if in floodway)</p>	<p>If the foundation for MFH unit is subject to ASCE 24, it would be subject to same elevation, foundation and enclosure requirements as any residential/Category II structure.</p>
<p>39. In A1-30, AH, and AE Zones, all recreational vehicles to be placed on a site must be elevated and anchored <b><u>or</u></b> be on the site for less than 180 consecutive days <b><u>or</u></b> be fully licensed and highway ready. <b>[60.3(c)(14)]</b></p>	<p>G601.1 (not authorized in floodways)</p>	<p>Not within the scope of ASCE 24.</p>

<b>60.3(d) When final flood elevations and floodway delineations have been provided on a community's FIRM, then all the above ordinance provisions for 60.3(a), 60.3(b) &amp; 60.3(c) and the following are required:</b>	<b>2012 I-Codes (IBC &amp; Appendix G, IRC, and IEBC)</b>	<b>ASCE 24-05</b>
40. In a regulatory floodway, prohibit any encroachment which would cause any increase in the base flood level unless hydrologic and hydraulic analyses prove that the proposed encroachment would not increase flood levels during the base flood discharge. <b>[60.3(d)(3)]</b>	1612.4 (ASCE 24); 1804.4(2) G103.5; G103.5.1; G401.1; G801.2 (fences); G801.5 (pre-fab pools); J101.2 (grading) R106.1.3; R301.2.4; R322.1 (per ASCE 24)	2.2
<b>60.3(e) When final flood elevations &amp; coastal high hazard areas have been provided on a community's FIRM, then all the above ordinance provisions for 60.3(a), 60.3(b) &amp; 60.3(c) &amp; the following are required:            NOTE: If a community has both floodways &amp; coastal high hazard areas, it must meet the requirements of both 60.3(d) &amp; (e).</b>	<b>2012 I-Codes (IBC &amp; Appendix G, IRC, and IEBC)</b>	<b>ASCE 24-05</b>
41. In V1-30, VE, and V Zones, obtain and maintain the elevation of the bottom of the lowest <i>horizontal</i> structural member of the lowest floor of all new and substantially improved structures. <b>[60.3(e)(2)]</b>	110.3.3; 110.3.10.1; 104.7; 1612.5(2.1) R104.7; R109.1.3; R109.1.6.1; R322.1.10 EB: by reference to 1612 (see sections listed in Row 18)	ASCE 24 does not include administrative provisions.
42. In V1-30, VE, and V Zones, require that all new construction and substantial improvements: (a) Are elevated on pilings/columns so that the bottom of the lowest horizontal structural member is at or above the BFE and the piles/column foundation/structure are anchored to resist flotation, collapse & lateral movement due to the effects of wind and water loads acting simultaneously. <b>[60.3(e)(4)]</b>	1612.1; 1612.4 (ASCE 24) R322.3; R322.3.2; R322.3.3 EB: by reference to 1612 (see sections listed in Row 18)	1.5.1; 1.5.2; 1.5.3; 1.6; 4.2; 4.4; 4.5; 4.8
(b) A registered professional engineer/architect shall develop/ review structural design, specs & plans; and shall certify that the design and methods of construction meet elevation and anchoring requirements at (e)(4)(i) and (ii). <b>[60.3(e)(4)]</b>	1612.5(2.2) R322.3.3; R322.3.6 EB: by reference to 1612	ASCE 24 does not include administrative provisions.

<p>(c) Have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls. Such enclosed space shall be useable solely for parking, building access, or storage. <b>[60.3(e)(5)]</b></p>	<p>1403.6; 1612.4 (ASCE 24); 1612.5(2.3); 1804.4(3) R322.3.2; R322.3.4; R322.3.5 EB: by reference to 1612 (see sections listed in Row 18)</p>	<p>4.5.1; 4.5.4; 4.6</p>
<p>(d) All new construction is landward of the reach of mean high tide. <b>[60.3(e)(3)]</b></p>	<p>1612.4 (ASCE 24) G401.2 R322.3.1(1)</p>	<p>4.3(1)</p>
<p>(e) Prohibit use of fill for structural support. <b>[60.3(e)(6)]</b></p>	<p>1612.4 (ASCE 24) G401.2 R322.3.2(3) EB: by reference to 1612</p>	<p>4.5.4</p>
<p>(f) Prohibit alteration of sand dunes and mangrove stands which would increase potential flood damage. <b>[60.3(e)(7)]</b></p>	<p>1612.4 (ASCE 24) G103.7 R322.3.1(2)</p>	<p>4.3(3); 4.5.4</p>
<p>43. Require that manufactured homes placed or substantially improved within V1-30, VE, and V Zones, which meet one of the following location criteria, meet the V Zone standards in 60.3(e)(2) through (e)(7):</p> <ul style="list-style-type: none"> <li>i. outside a manufactured home park or subdivision;</li> <li>ii. in a new manufactured home park or subdivision;</li> <li>iii. in an expansion to an existing manufactured home park or subdivision;</li> <li>iv. on a site in an existing park which a manufactured home has incurred substantial damage as a result of flood. <b>[60.3(e)(8)]</b></li> </ul>	<p>G501 R322.1.9</p>	<p>If the foundation for MFH unit is subject to ASCE 24, it would be subject to same elevation, foundation and enclosure requirements as any residential/Category II structure.</p>

<p>44. In V1-30, VE and V Zones, require that manufactured homes to be placed or substantially improved in an <u>existing</u> manufactured home park to be elevated so that:</p> <ul style="list-style-type: none"> <li>i. the lowest floor is at or above the BFE, <u>or</u></li> <li>ii. the chassis is supported by reinforced piers no less than 36 inches above grade and securely anchored. <b>[60.3(e)(8)(iv); 60.3(c)(12)]</b></li> </ul>	<p>G501 (36" option not provided) R322.1.9 (36" option not provided)</p>	<p>If the foundation for MFH unit is subject to ASCE 24, it would be subject to same elevation, foundation and enclosure requirements as any residential/Category II structure.</p>
<p>45. In V1-30, VE, and V Zones, all recreational vehicles to be placed on a site must be elevated and anchored <u>or</u> be on the site for less than 180 consecutive days <u>or</u> be fully licensed &amp; highway ready. [60.3(e)(9)]</p>	<p>G601.1 (not permitted in Zone V)</p>	<p>Recreational vehicles are not within the scope of ASCE 24.</p>

## NFIP- 2012 I-Codes and ASCE 24 Checklist - Definitions

### IBC (and Appendix G), IMC, IPC, IFGC, IRC, and IEBC

IBC 201.3 states that terms not defined in the IBC may be defined in the IFGC, IFC, IMC, or IPC; and IBC 201.4 states that terms not defined “shall have ordinarily accepted meanings such as the context implies.”

The IRC “defines” many terms where they are used, rather than separate definitions in Section 202. Also, IRC R201.3 specifies that terms not defined in IRC have meaning in other codes (i.e., IBC); and IRC R201.4 which repeats that terms not defined in IRC or other codes “shall have ordinarily accepted meanings such as the context implies.”

The IEBC also defines addition, alteration, change of occupancy, rehabilitation, repair—some of those terms (and others) are used in the definition of substantial improvement.

Definitions Pertinent to Regulating FHAs	In 44 CFR §59.1?	IBC/24 section <sup>1</sup>	IRC section	IEBC section <sup>2</sup>	Notes
BASE FLOOD	Y	1612.2 A1.2	N/A	N/A	
BASE FLOOD ELEVATION	N	1612.2 A1.2	R322.1.4	N/A	
BASEMENT	Y	1612.2 A1.2	R322.2.1	N/A	IRC usage conveys definition
COASTAL HIGH HAZARD AREA (see note)	Y	1612.2 A1.2	R322.3	N/A	IBC (see Flood Hazard Area Subject to High Velocity Wave Action)
DESIGN FLOOD	N	1612.2 A1.2	R322.1.4	N/A	
DESIGN FLOOD ELEVATION	N	1612.2 A1.2	R322.1.4	N/A	
DEVELOPED AREA	Y	See note	See note	N/A	used in NFIP only in A99 zones

<sup>1</sup> ASCE 24-05 definitions are in Sec. 1.2 (shown “A1.2”); this chart does not show all definitions in ASCE 24-05.

<sup>2</sup> The IEBC refers generally to IBC for flood resistant provisions for compliance; thus, this checklist includes only definitions used to make that reference.



Definitions Pertinent to Regulating FHAs	In 44 CFR §59.1?	IBC/24 section <sup>1</sup>	IRC section	IEBC section <sup>2</sup>	Notes
DEVELOPMENT	Y	App G201	N/A	N/A	
DRY FLOOD-PROOFING (see FLOODPROOFING)	N See note	1612.2 A1.2	N/A	N/A	The definition for “dry floodproofing” (IBC and ASCE 24) is equivalent to NFIP definition “floodproofing.”
EXISTING CONSTRUCTION (see EXISTING STRUCTURE)	Y	202; 1612.2	See note	See note	IBC and IEBC define “Existing Building. A building erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.” IRC uses the term (R102.7, R105.3.1.1, R112.2.1, AJ102.5)
EXISTING MANUFACTURED HOME PARK OR SUBDIVISION	Y	See note	See note	N/A	IBC Appendix G and IRC treat all MFH the same, regardless of location (does not have the 36” option)
EXPANSION TO AN EXISTING MANUFACTURED HOME PARK OR SUBDIVISION	Y	See note	See note	N/A	IBC Appendix G and IRC treat all MFH the same, regardless of location (does not have the 36” option)
EXISTING STRUCTURE (see EXISTING CONSTRUCTION)	N	1612.2	R101.2 See note	EB202	IBC definition does not mean “pre-FIRM.” See notes for “Existing Construction.” IRC scope includes work on existing buildings.
FLOOD or FLOODING	Y	1612.2 A1.2	See note	N/A	IRC does not use the term “flood” as a noun.
FLOOD DAMAGE-RESISTANT MATERIALS	N	1612.2 A1.2	R322.1.8	N/A	
FLOOD HAZARD AREA	N	1612.2 A1.2	R106.1.3; Table R301.2(1)	EB202	IBC (synonymous with SFHA if DFE = BFE)
FLOOD HAZARD AREA SUBJECT TO HIGH-VELOCITY WAVE ACTION (see CHHA)	N	1612.2 See note	R322.3 (Coastal High Hazard Area)	N/A	IBC (synonymous with “Coastal High Hazard Area”)

Definitions Pertinent to Regulating FHAs	In 44 CFR §59.1?	IBC/24 section <sup>1</sup>	IRC section	IEBC section <sup>2</sup>	Notes
FLOOD HAZARD BOUNDARY MAP (FHBM)	Y	See note	See note	N/A	Through adoption of maps.
FLOOD INSURANCE RATE MAP (FIRM)	Y	1612.2 A1.2	Table R301.2(1)	N/A	
FLOOD INSURANCE STUDY	Y See note	1612.2 A1.2	Table R301.2(1)	N/A	44 CFR 59.1 defines “Flood elevation study” and Flood Insurance Study is equivalent.
FLOOD PROOFING (see DRY FLOOD-PROOFING)	Y See note	1612.2 A1.2	N/A	N/A	The definition for “dry floodproofing” (IBC and ASCE 24) is equivalent to NFIP definition “floodproofing.”
FLOODWAY	Y	1612.2 A1.2	See note	N/A	IRC uses the term and requires compliance with ASCE 24.
FREEBOARD	Y See note	See note	See note	N/A	As used in NFIP regulations, this term is related to protection level of levees. IBC and ASCE 24 do not use the term, although additional height above minimum is built into the elevation tables. IRC does not use the term; calls for additional 1-ft if CAZ designated and in Zone V depending orientation of LHSM.
FUNCTIONALLY DEPENDENT FACILITY	N	App G201	See note	N/A	IRC scope includes only 1- and 2-family dwellings and certain townhomes.
HIGHEST ADJACENT GRADE	Y	A1.2	R322.2.1	N/A	
HISTORIC STRUCTURES	Y	202 A1.2	R112.2.1	N/A	The IBC general definition in 202 refers to 3409 and 3411.9; and 3409.2 Flood hazard areas, has language similar to 59.1.
LOWEST FLOOR	Y	1612.2	R322.1.5	N/A	
MANUFACTURED HOME	Y	App G201	R202, R322.1.9	N/A	See IBC Appendix G. 59.1 states “not a ‘recreational vehicle’ which is not in IBC Appendix G.
MANUFACTURED HOME PARK OR SUBDIVISION	Y	App G201	See note	N/A	IBC Appendix G and IRC treat all MFH the same, regardless of location (does not have the 36” option
MUDSLIDE (mud flood, mudflow)	Y	A1.2	See note	N/A	I-Code flood provisions apply in FHAs on adopted maps; FEMA has not delineated mudslide areas.

Definitions Pertinent to Regulating FHAs	In 44 CFR §59.1?	IBC/24 section <sup>1</sup>	IRC section	IEBC section <sup>2</sup>	Notes
NEW MANUFACTURED HOME PARK	Y	See note	See note	N/A	IBC Appendix G and IRC treat all MFH the same, regardless of location (does not have the 36" option).
PROLONGED CONTACT WITH FLOODWATERS	N	A1.2	See note	N/A	IRC R322.1.8 refers to specific species of wood and TB-2.
RECREATION VEHICLE	Y	App G201	N/A	N/A	IBC Appendix G definition expands on 59.1 definition.
SPECIAL FLOOD HAZARD AREA	Y	1612.2 A1.2	Table R301.1(2)	N/A	Definition in 1612.2 omits mudslide.
START OF CONSTRUCTION	Y	1612.2 A1.2	N/A	N/A	Premise of the codes is that work on an existing building shall not alter any aspect of the building that was required to comply with the requirements at the time it was built.
STRUCTURE	Y	202 A1.2	R202	N/A	Definition in 59.1 defines it for flood purposes whereas IBC has very simple generic definition.
SUBSTANTIAL DAMAGE	Y	1612.2 A1.2	R105.3.1.1	EB202	
SUBSTANTIAL IMPROVEMENT	Y	1612 A1.2	R105.3.1.1	EB202	
VARIANCE	Y	App G201	See note	N/A	Used in R112.2.2
VIOLATION	Y	114 App G201	R113	EB113	