



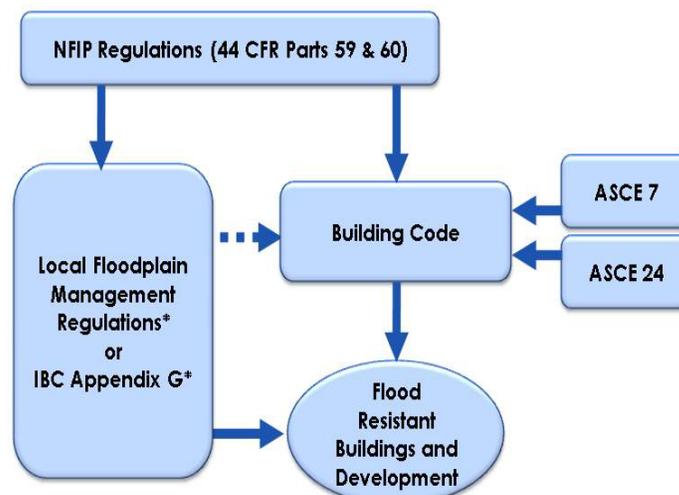
NFIP- 2018 I-Codes and ASCE 24 Checklist

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 [2018 edition](#) 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 24-14 *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 which are published by the International Association of Plumbing and Mechanical Officials (IAPMO).

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 provisions that meet or exceed the NFIP criteria for building in the International Codes® (I-Codes®), states and communities that enforce the 2009 and later I-Codes 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. FEMA's model code-coordinated ordinances are described in [Reducing Flood Losses Through the International Codes: Coordinating Building Codes and Floodplain Management Regulations](#) (4th edition). To obtain a model ordinance, send a request to FEMA-BuildingScienceHelp@fema.dhs.gov.



* 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 they meet or exceed the NFIP requirements. 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, 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 enforce the IEBC for existing buildings.
2. Adopt code-coordinated companion floodplain management regulations and adopt the IBC (without Appendix G) and IRC, and enforce the IEBC for existing buildings.
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. IBC Section 101.4.7 effectively adopts the IEBC by reference. 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). The checklist includes citations from the IEBC.

Relationship between the I-Codes and ASCE 24. ASCE 24 is a consensus standard that has been referenced by the I-Codes since 2000. The IRC requires dwellings in floodways to comply with ASCE 24 and design professionals may use ASCE 24 as an alternative to the specific IRC provisions for dwellings in all flood hazard areas. FEMA prepared “[Highlights of ASCE 24-14](#),” a summary of the provisions in the ASCE 24-14 standard, which is incorporated by reference into the 2018 I-Codes. ASCE 24 can be purchased from www.asce.org; it is not available in view-only form.

Rather than provide specific design and construction requirements for building and structures in flood hazard areas within the IBC Section 1612: Flood Loads, Section 1612.4 references ASCE 24 which includes detailed requirements.

In the IEBC, specific sections apply in flood hazard areas and state 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 of the 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: Flood-Resistant Construction.

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, and 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.

Higher Standards in the I-Codes and ASCE 24. 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.

A description of the differences between the NFIP and the I-Codes and ASCE 24 is included in Chapter 3 of the 4th edition of [Reducing Flood Losses Through the International Codes: Coordinating Building Codes and Floodplain Management Regulations](#).

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

- Flood Resistant Provisions of the 2018, 2015, 2012 and 2009 International Codes (excerpts of the flood provisions) and checklists that identify, for each NFIP requirement, sections of the codes and ASCE 24 that contain equivalent requirements.

- [Highlights of ASCE 24-14 and ASCE 24-05](#), *Flood Resistant Design and Construction*
- [Flood Resistant Provisions of the 2015 Uniform Codes](#) and [Flood Resistant Provisions of the 2012 Uniform Codes](#) by IAPMO
- [Reducing Flood Losses Through the International Codes: Coordinating Building Codes and Floodplain Management Regulations](#). The 4th edition includes descriptions of several I-Code provisions that exceed the NFIP minimum requirements (Chapter 3) and a series of questions to help States and communities coordinate local floodplain management regulations with the I-Codes (Chapter 4). In addition, model ordinances specifically written to coordinate with the I-Codes are available.

Organization of the Checklist: This checklist has two parts. Definitions start on page 15. 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 Parts 59 and 60).
- The middle column of the checklist shows the I-Code sections that include requirements that meet or exceed the NFIP requirements.
- The right column of the checklist shows the provisions of ASCE 24-14 that include requirements to meet or exceed the NFIP requirements for buildings and structures.

NFIP- 2018 I-Codes and ASCE 24 Checklist – NFIP Requirements

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

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
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

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
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]	Include in ordinance	ASCE 24 does not include administrative provisions
14. Variance section with evaluation criteria & insurance notice. [60.6(a)]	104.10.1 G105 R104.10.1 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: <u> </u> <i>Effective Date</i> <u> </u> <i>Ord. #</i> <u> </u>	<i>In community's adopting ordinance</i>	ASCE 24 does not include administrative provisions
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:	2018 I-Codes (IBC & Appendix G, IRC, and IEBC)	ASCE 24-14
16. Require permits for all proposed construction or other development including placement of manufactured homes. [60.3(a)(1)]	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, pools & 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

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
17. Assure that all other State and Federal permits are obtained. [60.3(a)(2)]	102.2 G103.2 R102.2	ASCE 24 does not include administrative provisions
18. Review permits to assure sites are reasonably safe from flooding and require performance for new construction and substantial improvements in flood-prone areas: [60.3(a)(3)]	107.2.5; 1612.1; 1804.4(1) G101.2; G101.3; G103.1; G103.8; G104.2 R106.1.3; R301.1; R301.2.4; R322 EB501.3; EB506.2.4; EB401.3; EB701.2; EB801.3; EB1003.5; EB1101.3.5; EB1202.6; EB1301.3.3 (all by reference to 1612 and R322)	ASCE 24 does not include administrative provisions
(a) Anchoring (including manufactured homes) to prevent floatation, collapse, or lateral movement. [60.3(a)(3)(i)]	1603.1; 1603.1.7; 1605.2.2; 1605.3.1.2; 16.2.1; 1612.4 (ASCE 24) G501.2; G701.1; 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 and R322 (see sections listed in Row 18)	1.5.1; 1.5.3; 1.5.5; 1.6; 2.4; 2.5; 4.5.1; 4.5; 6.2.2; 7.1; 7.4; 7.5; Chapter 9
(b) Use of flood-resistant materials. [60.3(a)(3)(ii)]	802.4; 1403.6; 1612.4 (ASCE 24) G103 R322.1.8 EB: by reference to 1612 and R322 (see sections listed in Row 18)	1.5.1; Chapter 5; 6.2; 6.3; 7.5; 8.1; 9.1
(c) Construction methods/practices that minimize flood damage. [60.3(a)(3)(iii)]	1612.1. 1612.4 (ASCE 24) R322.1.3 EB: by reference to 1612 and R322 (see sections listed in Row 18)	ASCE 24 as a whole

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
(d) Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service facilities designed and/or located to prevent water entry or accumulation. [60.3(a)(3)(iv)]	1612.4 (ASCE 24); 3001.2; also see IMC, IPC, IFGC G501.4; G701.1 R322.1.6; R322.3.5(1); R322.3.10; 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 and R322 (see sections listed in Row 18)	4.6.1; Chapter 7
19. Review subdivision proposals and development proposals to assure that: (a) Such proposals minimize flood damage. [60.3(a)(4)(i)]	G104.2; 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. [60.3(a)(4)(ii)]	G301.1 (subdivisions); G401 (site improvement)	Chapter 7
(c) Adequate drainage is provided. [60.3(a)(4)(iii)]	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. [60.3(a)(5) & (6)]	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. [60.3(a)(6)(ii)]	G301.1 (subdivisions); G401.3 R322.1.7; RP2602.2(2)	7.3.4
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:	2015 I-Codes (IBC & Appendix G, IRC, and IEBC)	ASCE 24-14
22. Require permits for all proposed construction and other development within SFHAs on the FIRM. [60.3(b)(1)]	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

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
23. Require base flood elevation data for subdivision proposals or other developments greater than 50 lots or 5 acres. [60.3(b)(3)]	G104.2; 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. [60.3(b)(4)]	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. [60.3(b)(5)]	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. [60.3(b)(6)]	G103.6	ASCE 24 does not include administrative provisions.
27. Maintain flood carrying capacity of altered or relocated watercourse. [60.3(b)(7)]	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. [60.3(b)(8)]	G501 R322.1.9	Permanent foundations are structures that may be subject to ASCE 24.
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) & 60.3(b) and the following are required:	2018 I-Codes (IBC & Appendix G, IRC, and IEBC)	ASCE 24-14
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. [60.3(c)(2)]	104.2.1; Dfn DFE; 1612.1; 1612.4 (ASCE 24); 1612.5(1.1); 1804.4(1) R105.1; R105.3.1.1; R301.2.4; R322.1.5; R322.1.10; R322.2.1; R322.2.1(3); R408.7	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. [60.3(c)(7)]	EB; EB104.2.1 and by reference to 1612 and R322 (see sections listed in Row 18)	

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
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. [60.3(c)(3)]	104.2.1; Dfn DFE; 1612.1; 1612.4 (ASCE 24); 1612.5(1.3) EB: EB104.2.1 and by reference to 1612 and R322 (see sections listed in Row 18)	1.5.2; 2.3; Section 6 (specification of flood depth in ordinance/code)
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. [60.3(c)(8)]		
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). [60.3(c)(4)]	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 60.3(c)(5) .	1612.4 (ASCE 24); 1612.5(1.2) (engineered openings) G501.5; G901.1; G1001.4 R309.3; R322.2.2; R322.2.2.1; R408.7 EB: EB104.2.1 and by reference to 1612 and R322 (see sections listed in Row 18)	1.5.2; 2.7
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. [60.3(c)(10)]	1612.3.2; 1804.4(4) G103.4 R106.1.3; R322.1.4.2	2.2
36. In Zones AO and AH, require drainage paths around structures on slopes to guide water away from structures. [60.3(c)(11)]	1804.4 G401.5 R401.3	Not within the scope of ASCE 24.

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
<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"> i. outside a manufactured home park or subdivision; ii. in a new manufactured home park or subdivision; iii. in an expansion to an existing manufactured home park or subdivision; iv. on a site in an existing park which a manufactured home has incurred substantial damage as a result of flood. [60.3(c)(6)] 	<p>G501 R322.1.9 AE101.1</p>	<p>If a foundation for MFH unit is subject to ASCE 24, it is 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"> i. the lowest floor is at or above the BFE <u>or</u> ii. the chassis is supported by reinforced piers no less than 36 inches above grade and securely anchored. [60.3(c)(12)] 	<p>G501 (36" option not provided) R322.1.9 (36" option not provided; per ASCE 24 if in floodway) AE101.1</p>	<p>If a foundation for MFH unit is subject to ASCE 24, it is 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 <u>or</u> be on the site for less than 180 consecutive days <u>or</u> be fully licensed and highway ready. [60.3(c)(14)]</p>	<p>G601.1 (not authorized in floodways)</p>	<p>Not within the scope of ASCE 24.</p>
<p>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) & 60.3(c) and the following are required:</p>	<p>2018 I-Codes (IBC & Appendix G, IRC, and IEBC)</p>	<p>ASCE 24-14</p>
<p>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. [60.3(d)(3)]</p>	<p>1612.4 (ASCE 24); 1804.4(2) G103.5; G103.5.1; G401.1; G801.2 (fences); G801.5 (pre-fab pools); G801.8 (roads and watercourse crossings); J101.2 (grading) R106.1.3; R301.2.4; R322.1 (per ASCE 24)</p>	<p>2.2</p>

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
60.3(e) When final flood elevations & 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) & 60.3(c) & the following are required: <u>NOTE</u>: If a community has both floodways & coastal high hazard areas, it must meet the requirements of both 60.3(d) & (e).	2018 I-Codes (IBC & Appendix G, IRC, and IEBC)	ASCE 24-14
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. [60.3(e)(2)]	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 and R322 (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. [60.3(e)(4)]	104.2.1; 1612.1; 1612.4 (ASCE 24) R322.3; R322.3.2; R322.3.3 EB: EB104.2.1 and by reference to 1612 and R322 (see sections listed in Row 18)	1.5.2; 1.5.3; 1.6; 4.2; 4.4; 4.5; Chapter 9
(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). [60.3(e)(4)]	1612.5(2.2) R322.3.3; R322.3.9 EB: by reference to 1612 and R322	ASCE 24 does not include administrative provisions.
(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. [60.3(e)(5)]	1403.6; 1612.4 (ASCE 24); 1612.5(2.3); 1804.4(3) G501.5 R322.3.2; R322.3.3; R322.3.4; R322.3.5; R322.3.6; R322.3.7; R322.3.8 EB: by reference to 1612 and R322 (see sections listed in Row 18)	4.5.1; 4.5.4; 4.6
(d) All new construction is landward of the reach of mean high tide. [60.3(e)(3)]	1612.4 (ASCE 24) G401.2 R322.3.1(1)	4.3(1)

Required provisions [NFIP citations]	2018 I-Codes (IBC & Appendix G, IMC, IPC, IFGC, IRC, and IEBC)	ASCE 24-14
(e) Prohibit use of fill for structural support. [60.3(e)(6)]	1612.4 (ASCE 24) G401.2 R322.3.2(3) EB: by reference to 1612 and R322	4.5.4
(f) Prohibit alteration of sand dunes and mangrove stands which would increase potential flood damage. [60.3(e)(7)]	1612.4 (ASCE 24) G103.7 R322.3.1(2)	4.3(3); 4.5.4
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): i. outside a manufactured home park or subdivision; ii. in a new manufactured home park or subdivision; iii. in an expansion to an existing manufactured home park or subdivision; iv. on a site in an existing park which a manufactured home has incurred substantial damage as a result of flood. [60.3(e)(8)]	G501 R322.1.9 AE101.1	If a foundation for MFH unit is subject to ASCE 24, it is subject to same elevation, foundation and enclosure requirements as any residential/Category II structure.
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: i. the lowest floor is at or above the BFE, <u>or</u> ii. the chassis is supported by reinforced piers no less than 36 inches above grade and securely anchored. [60.3(e)(8)(iv); 60.3(c)(12)]	G501 (36" option not provided) R322.1.9 (36" option not provided)	If a foundation for MFH unit is subject to ASCE 24, it is subject to same elevation, foundation and enclosure requirements as any residential/Category II structure.
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 & highway ready. [60.3(e)(9)]	G601.1 (not permitted in Zone V)	Recreational vehicles are not within the scope of ASCE 24.

NFIP- 2018 I-Codes and ASCE 24 Checklist - Definitions

IBC (and Appendix G), 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.” IBC Section 202 provides definitions, including definitions previously included in Section 1612.2.

The IRC “defines” many terms where they are used, rather than include separate definitions in Section R202. 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 ¹	IRC section	IEBC section ²	Notes
500-YEAR FLOOD ELEVATION	N	A1.2	N/A	N/A	See “Critical Facility.”
BASE FLOOD	Y	202 A1.2	R322.1.4	N/A	
BASE FLOOD ELEVATION (BFE)	N	202 A1.2	R322.1.4	N/A	
BASEMENT	Y	202 A1.2	R322.2.1(3)	N/A	IRC usage conveys definition IBC Section 202 has two definitions for basement – one is specifically for flood loads and is limited in application to Section 1612.
BREAKAWAY WALL	Y	A1.2	R322.3.5	N/A	
COASTAL A ZONE (CAZ)	N	202 A1.2	R322.2; R322.3	N/A	
COASTAL HIGH HAZARD AREA	Y	202 A1.2	R322.3	N/A	

¹ ASCE 24-14 definitions are in Sec. 1.2 (shown “A1.2”); this chart does not show all definitions in ASCE 24-14.

² 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 ¹	IRC section	IEBC section ²	Notes
CRITICAL FACILITY (and ESSENTIAL FACILITY)	N	A1.2	N/A	N/A	ASCE 24 requires critical facilities to be elevated or protect to or above BFE plus freeboard or the 500-year flood elevation, whichever is higher.
DESIGN FLOOD	N	202 A1.2	R322.1.4	N/A	
DESIGN FLOOD ELEVATION (DFE)	N	202 A1.2	R322.1.4	N/A	The DFE = BFE if the FIS and FIRM are used.
DEVELOPED AREA	Y	See note	See note	N/A	Used in NFIP only in A99 zones.
DEVELOPMENT	Y	App G201	N/A	N/A	
DRY FLOOD-PROOFING (see FLOODPROOFING)	N See note	202 A1.2	N/A	N/A	The definition for “dry floodproofing” (IBC and ASCE 24) is equivalent to NFIP definition “floodproofing.”
EXISTING CONSTRUCTION	Y	See note	N/A	See note	IBC and IEBC define “Existing structure/building.”
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	N	202 A1.2	R101.2 See note	EB202	IRC uses the term (R102.7, R104.10.1, R105.3.1.1, AJ102.5)
FLOOD or FLOODING	Y	202 A1.2	See note	N/A	IRC does not use the term “flood” as a noun.
FLOOD DAMAGE-RESISTANT MATERIALS	N	202 A1.2	R322.1.8	N/A	
FLOOD HAZARD AREA	N	202 A1.2	R106.1.4; Table R301.2(1)	EB202	IBC (synonymous with SFHA if DFE = BFE)

Definitions Pertinent to Regulating FHAs	In 44 CFR §59.1?	IBC/24 section ¹	IRC section	IEBC section ²	Notes
FLOOD HAZARD BOUNDARY MAP (FHBM)	Y	See note	See note	N/A	If applicable, through adoption of maps.
FLOOD INSURANCE RATE MAP (FIRM)	Y	202 A1.2	Table R301.2(1)	N/A	
FLOOD INSURANCE STUDY (FIS)	Y See note	202 A1.2	Table R301.2(1)	N/A	§59.1 defines “Flood elevation study” and Flood Insurance Study is equivalent.
FLOOD PROOFING (see DRY FLOOD-PROOFING)	Y See note	202 A1.2	N/A	N/A	The definition for “dry floodproofing” (IBC and ASCE 24) is equivalent to NFIP definition “floodproofing.”
FLOODWAY	Y	202 A1.2	R301.2.4; R322.1 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 in all flood hazard areas.
FUNCTIONALLY DEPENDENT FACILITY	Y See note	App G201 A1.2	N/A	N/A	§59.1 defines “functionally dependent use.” IRC scope includes only 1- and 2-family dwellings and certain townhomes.
HIGHEST ADJACENT GRADE	Y	A1.2	R322.2.1(2)	N/A	
HISTORIC STRUCTURES	Y	202 A1.2	R105.3.1.1	EB1201.4	
LIMIT OF MODERATE WAVE ACTION	N	202 A1.2	R322.2, R322.3	N/A	
LOWEST FLOOR	Y	202	R322.1.5	N/A	
MANUFACTURED HOME (MFH)	Y	App G201	R202, R322.1.9	N/A	

Definitions Pertinent to Regulating FHAs	In 44 CFR §59.1?	IBC/24 section ¹	IRC section	IEBC section ²	Notes
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 flood hazard areas on adopted maps; FEMA has not delineated mudslide areas.
NEW CONSTRUCTION	Y	See note A1.2	See note	N/A	Any building not already constructed.
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).
NONRESIDENTIAL	N	A1.2	N/A	N/A	
PROLONGED CONTACT WITH FLOODWATERS	N	A1.2	See note	N/A	IRC R322.1.8 refers to TB-2.
RECREATION VEHICLE	Y	App G201	N/A	N/A	IBC Appendix G definition expands on §59.1 definition.
RESIDENTIAL	N	A1.2	N/A	N/A	
SPECIAL FLOOD HAZARD AREA	Y	202 A1.2	Table R301.1(2)	N/A	Definition in 202 omits mudslide.
START OF CONSTRUCTION	Y	202 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	202 A1.2	R105.3.1.1	EB202	
SUBSTANTIAL IMPROVEMENT	Y	202 A1.2	R105.3.1.1	EB202	
VARIANCE	Y	App G201	See note	N/A	Used in R104.10.1
VIOLATION	Y	114 App G201	R113	EB113	