

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
Sec. 59.1 Definitions	
BASE FLOOD. Base flood means the flood having a one percent chance of being equaled or exceeded in any given year.	BASE FLOOD. The flood having a 1-percent chance of being equaled or exceeded in any given year. BASE FLOOD ELEVATION. The elevation of the base flood, including wave height, relative to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD) or other datum specified on the Flood Insurance Rate Map (FIRM).
BASEMENT. Any area of the building having its floor subgrade (below ground level) on all sides.	BASEMENT (for other than flood loads). See Section 502.1. BASEMENT (for flood loads). See Section 1612.2. BASEMENT. The portion of a building having its floor subgrade (below ground level) on all sides. The definition of "Basement" is limited in application to the provisions of Section 1612 (see "Basement" in Section 502.1).
[Not defined in the NFIP regulations.]	DESIGN FLOOD. The flood associated with the greater of the following two areas: 1. Area with a floodplain subject to a 1-percent or greater chance of flooding in any year; or 2. Area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.
[Not defined in the NFIP regulations.]	DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the design flood elevation shall be the elevation of the highest existing grade of the building's perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where the depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610mm).
DEVELOPMENT. Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.	101.2 Scope. The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures. Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plane in height with a separate means of egress and their accessory structures shall comply with the <i>International Residential Code</i> . 105.1 [Permits] Required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the building official and obtain the required permit. 105.2 Work exempt from permit
continued on next page	

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
continued from previous page	<p>Appendix G101.3 [Administration] Scope. The provisions of this appendix shall apply to all proposed development in a flood hazard area established in Section1612 of this code, including certain building work exempt from permit under Section105.2.</p> <p>Appendix G104.1 [Permits] Required. Any person, owner or authorized agent who intends to conduct any development in a flood hazard area shall first make application to the building official and shall obtain the required permit.</p> <p>Appendix G. DEVELOPMENT. Any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, temporary structures, temporary or permanent storage of materials, mining, dredging, filling, grading, paving, excavations, operations and other land disturbing activities.</p>
See FLOODPROOFING.	DRY FLOOD PROOFING. A combination of design modifications that results in a building or structure, including the attendant utility and sanitary facilities, being water tight with walls substantially impermeable to the passage of water and with structural components having the capacity to resist loads as identified in ASCE 7.
EXISTING CONSTRUCTION (EXISTING STRUCTURES). For the purposes of determining rates, structures for which the “start of construction” commenced before the effective date of the FIRM or before January 1, 1975, for FIRMs effective before that date. “Existing construction” may also be referred to as “existing structures.”	<p>EXISTING CONSTRUCTION. Any buildings and structures for which the “start of construction” commenced before the effective date of the community’s first floodplain management code, ordinance, or standard. “Existing construction” is also referred to as “existing structures.”</p> <p>EXISTING STRUCTURES. See “Existing construction.”</p>
<p>FLOOD or FLOODING.</p> <p>(a) A general and temporary condition of partial or complete inundation of normally dry land areas from:</p> <p>(1) The overflow of inland or tidal waters.</p> <p>(2) The unusual and rapid accumulation or runoff of surface waters from any source.</p>	<p>FLOOD or FLOODING. A general and temporary condition of partial or complete inundation of normally dry land from:</p> <ol style="list-style-type: none"> 1. The overflow of inland or tidal waters. 2. The unusual and rapid accumulation or runoff of surface waters from any source.
[Not defined in the NFIP regulations.]	FLOOD DAMAGE-RESISTANT MATERIALS. Any construction material capable of withstanding direct and prolonged contact with floodwaters without sustaining any damage that requires more than cosmetic repair.
[Not defined in the NFIP regulations.]	<p>FLOOD HAZARD AREA. The greater of the following two areas:</p> <ol style="list-style-type: none"> 1. The area within a floodplain subject to a 1-percent or greater chance of flooding in any year. 2. The area designated as a flood hazard area on a community’s flood hazard map, or otherwise legally designated. <p>FLOOD HAZARD AREA SUBJECT TO HIGH VELOCITY WAVE ACTION. Area within the flood hazard area which is subject to high velocity wave action, and shown on a Flood Insurance Rate Map (FIRM) or other flood hazard map as Zone V, VO, VE or V1-30.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
FLOOD INSURANCE RATE MAP (FIRM). An official map of a community, on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.	FLOOD INSURANCE RATE MAP (FIRM). An official map of a community on which the Federal Emergency Management Agency (FEMA) has delineated both the special flood hazard areas and the risk premium zones applicable to the community.
FLOOD INSURANCE STUDY (see FLOOD ELEVATION STUDY). An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.	FLOOD INSURANCE STUDY. The official report provided by the Federal Emergency Management Agency containing the Flood Insurance Rate Map (FIRM), the Flood Boundary and Floodway Map (FBFM), the water surface elevation of the base flood and supporting technical data.
FLOODWAY – See REGULATORY FLOODWAY.	FLOODWAY. The channel of the river, creek, or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
FUNCTIONALLY DEPENDENT USE. A use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.	Appendix G. FUNCTIONALLY DEPENDENT FACILITY. A facility which cannot be used for its intended purpose unless it is located or carried out in close proximity to water, such as a docking or port facility necessary for the loading or unloading of cargo or passengers, shipbuilding, or ship repair. The term does not include long-term storage, manufacture, sales, or service facilities.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
<p>HISTORIC STRUCTURE.</p> <p>(a) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;</p> <p>(b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;</p> <p>(c) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or</p> <p>(d) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either.</p> <p style="margin-left: 20px;">(1) By an approved state program as determined by the Secretary of the Interior or</p> <p style="margin-left: 20px;">(2) Directly by the Secretary of the Interior in states without approved programs.</p>	<p>HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law (see Section 3409).</p> <p>3409.2 Flood hazard areas. Within flood hazard areas established in accordance with Section 1612.3, where the work proposed constitutes substantial improvement as defined in Section 1612.2, the building shall be brought into conformance with Section 1612.</p> <p>Exception: Historic buildings that are:</p> <ol style="list-style-type: none"> 1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or 2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or 3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.
<p>LOWEST FLOOR. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Sec. 60.3.</p>	<p>LOWEST FLOOR. The floor of the lowest enclosed area, including basement, but excluding any unfinished or flood-resistant enclosure, usable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the structure in violation of this section.</p>
<p>MANUFACTURED HOME. A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."</p>	<p>Appendix G. MANUFACTURED HOME. A structure that is transportable in one or more sections, built on a permanent chassis, designed for use with or without a permanent foundation when attached to the required utilities, and constructed to the Federal Mobile Home Construction and Safety Standards and rules and regulations promulgated by the U.S. Department of Housing and Urban Development. The term also includes mobile homes, park trailers, travel trailers and similar transportable structures that are placed on a site for 180 consecutive days or longer.</p>
<p>MANUFACTURED HOME PARK OR SUBDIVISION. A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.</p>	<p>Appendix G. MANUFACTURED HOME PARK OR SUBDIVISION. A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
<p>RECREATIONAL VEHICLE. A vehicle which is.</p> <ul style="list-style-type: none"> (a) built on a single chassis; (b) 400 square feet or less when measured at the largest horizontal projection; (c) designed to be self-propelled or permanently towable by a light duty truck; and (d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use. 	<p>Appendix G. RECREATIONAL VEHICLE. A vehicle that is built on a single chassis, 400 square feet (37.16 m²) or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light duty truck, and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel or seasonal use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions.</p>
<p>REGULATORY FLOODWAY. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.</p>	<p>See FLOODWAY.</p>
<p>REMEDY A VIOLATION. to bring the structure or other development into compliance with State or local flood plain management regulations, or, if this is not possible, to reduce the impacts of its noncompliance. Ways that impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of the ordinance or otherwise deterring future similar violations, or reducing Federal financial exposure with regard to the structure or other development.</p>	<p>113 Violations</p> <p>Appendix G101.4 Violations. Any violation of a provision of this appendix, or failure to comply with a permit or variance issued pursuant to this appendix or any requirement of this appendix, shall be handled in accordance with Section 113.</p>
<p>SPECIAL HAZARD AREA. Area of special flood hazard is the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. The area may be designated as Zone A on the FHBM. After detailed ratemaking has been completed in preparation for publication of the flood insurance rate map, Zone A usually is refined into Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, or V1-30, VE, or V. For purposes of these regulations, the term “special flood hazard area (SFHA)” is synonymous in meaning with the phrase “area of special flood hazard.”</p>	<p>SPECIAL FLOOD HAZARD AREA. The land area subject to flood hazards and shown on a Flood Insurance Rate Map or other flood hazard map as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE, or V1-30.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
<p>START OF CONSTRUCTION. Construction (for other than new construction or substantial improvements under the Coastal Barrier Resources Act (Pub. L. 97-348)), includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.</p>	<p>START OF CONSTRUCTION. The date of permit issuance for new construction and substantial improvements to existing structures, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement is within 180 days after the date of issuance. The actual start of construction means the first placement of permanent construction of a building (including a manufactured home) on a site, such as the pouring of a slab or footings, installation of pilings or construction of columns.</p> <p>Permanent construction does not include land preparation (such as clearing, excavation, grading or filling), or the installation of streets or walkways, excavation for a basement, footings, piers or foundations, the erection of temporary forms or the installation of accessory buildings such as garages or sheds not occupied as dwelling units or not part of the main building. For a substantial improvement, the actual "start of construction" means the first alteration of any wall, ceiling, floor or other structural part of a building, whether or not that alteration affects the external dimensions of the building.</p>
<p>STRUCTURE. For flood plain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. "Structure" for insurance coverage purposes, means a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.</p>	<p>101.2 Scope</p> <p>105.2 Work exempt from a permit</p>
<p>SUBSTANTIAL DAMAGE. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.</p>	<p>SUBSTANTIAL DAMAGE. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
<p>SUBSTANTIAL IMPROVEMENT. Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage”, regardless of the actual repair work performed. The term does not, however, include either.</p> <p>(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or</p> <p>(2) Any alteration of a “historic structure”, provided that the alteration will not preclude the structure's continued designation as a “historic structure.”</p>	<p>SUBSTANTIAL IMPROVEMENT. Any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:</p> <ol style="list-style-type: none"> 1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions. 2. Any alteration of a historic structure provided that the alteration will not preclude the structure's continued designation as a historic structure.
<p>VARIANCE. A grant of relief by a community from the terms of a flood plain management regulation.</p>	<p>104.10 Modifications</p> <p>104.11 Alternative materials, design and methods of construction and equipment.</p> <p>Appendix G. VARIANCE. A grant of relief from the requirements of this section which permits construction in a manner otherwise prohibited by this section where specific enforcement would result in unnecessary hardship.</p>
<p>VIOLATION. The failure of a structure or other development to be fully compliant with the community's flood plain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Sec. 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) is presumed to be in violation until such time as that documentation is provided.</p>	<p>113 Violations</p> <p>Appendix G. VIOLATION. A development that is not fully compliant with this appendix or Section 1612, as applicable.</p>
<p>59.22 [This section outlines actions to be taken by communities to be eligible for the National Flood Insurance Program, including application procedures, documentation requirements, and a commitment to fulfill certain functions and responsibilities.]</p>	
<p>1 (a)(9)(iii) Maintain for public inspection and furnish upon request certificates of elevation and certificates of floodproofing.</p>	<p>104.7 Department Records</p> <p>Appendix G 103.8 Records. The building official shall maintain a permanent record of all permits issued in flood hazard areas, including copies of inspection reports and certifications required in Section 1612.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
2	(b)(1) Appoint the agency or official with the responsibility, authority, and means to implement the commitments, including certain reporting requirements.	<p>103 Department of Building Safety</p> <p>104 Duties and Powers of the Building Official</p> <p>Appendix G104.3 Validity of permit. The issuance of a permit under this appendix shall not be construed to be a permit for, or approval of, any violation of this appendix or any other ordinance of the jurisdiction. The issuance of a permit based on submitted documents and information shall not prevent the building official from requiring the correction of errors. The building official is authorized to prevent occupancy or use of a structure or site which is in violation of this appendix or other ordinances of this jurisdiction.</p> <p>Appendix G104.4 Expiration. A permit shall become invalid if the proposed development is not commenced within 180 days after its issuance, or if the work authorized is suspended or abandoned for a period of 180 days after the work commences. Extensions shall be requested in writing and justifiable cause demonstrated. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each.</p> <p>Appendix G104.5 Suspension or revocation. The building official is authorized to suspend or revoke a permit issued under this appendix wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or code of this jurisdiction.</p>
	<p>Sec. 60.2 Minimum compliance with flood plain management criteria.</p> <p>[Sections (a) through (c) pertain to meeting specific criteria set forth herein, as a function of the type of flood-related hazard and the level of detail provided on the flood hazard map prepared by FEMA. Section (e) provides for coordination with State Coordinating Agencies with respect to submission of regulations for participation in the NFIP; Section (f) addresses the community function to submit reports periodically, when requested; and Section (g) directs communities to assure that their comprehensive plans are consistent with floodplain management objectives.]</p>	
3	(h) The community shall adopt and enforce floodplain management regulations based on data provided by the Administrator. Without prior approval of the Administrator, the community shall not adopt and enforce floodplain management regulations based upon modified data reflecting natural or man-made changes.	<p>1612.3 Establishment of flood hazard areas. To establish flood hazard areas, the governing body shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled "The Flood Insurance Study for [INSERT NAME OF JURISDICTION]," dated [INSERT DATE OF ISSUANCE], as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this Section.</p> <p>1612.3.1 Design flood elevations. Where design flood elevations are not included in the flood hazard areas established in Section 1612.3, or if floodways are not designated, the building official is authorized to require the applicant to:</p> <ol style="list-style-type: none"> Obtain and reasonably utilize any design flood elevation and floodway data available from a federal, state, or other source, or Determine the design flood elevation and/or floodway in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a registered design professional who shall document that the technical methods used reflect currently accepted engineering practice.
continued on next page		

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
3		Appendix G102.2 Establishment of flood hazard areas. Flood hazard areas are established in Section 1612.3 of the <i>International Building Code</i> , adopted by the applicable governing authority on [INSERT DATE].
	Sec. 60.3 Floodplain management criteria for flood-prone areas.	
	(a) When the Administrator has not defined the special flood hazard areas within a community, has not provided water surface elevation data, and has not provided sufficient data to identify the floodway or coastal high hazard area, but the community has indicated the presence of such hazards by submitting an application to participate in the Program, the community shall:	
4	(1) Require permits for all proposed construction or other development, including the placement of manufactured homes, to determine whether such development is proposed within flood hazard areas;	<p>101.2 Scope</p> <p>105.2 Work exempt from permit</p> <p>105.2.2 Repairs</p> <p>1612.1 [Flood Loads] General. Within flood hazard areas as established in Section 1612.3, all new construction of buildings, structures and portions of buildings and structures, including substantial improvement and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads. For buildings that are located in more than one flood hazard area, the provisions associated with the most restrictive flood hazard area shall apply.</p> <p>3403.1 Existing buildings or structures. Additions or alterations to any building or structure shall comply with the requirements of the code for new construction. Additions or alterations shall not be made to an existing building or structure which will cause the existing building or structure to be in violation of any provisions of this code. An existing building plus additions shall comply with the height and area provisions of Chapter 5. Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.</p> <p>3403.2 [Additions] Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any addition that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design. For buildings and structures in flood hazard areas established in Section 1612.3, any additions that do not constitute substantial improvement or substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.</p> <p>3404.2 [Alterations] Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any alteration that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design. For buildings and structures in flood hazard areas established in Section 1612.3, any alterations that do not constitute substantial improvement or substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G
<div style="text-align: center; font-size: 2em; font-weight: bold;">4</div> <div style="font-size: 0.8em;">continued from previous page</div> <div style="text-align: center; font-size: 0.8em; margin-top: 150px;">continued on next page</div>	<p>3405.5 [Repairs] Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design. For buildings and structures in flood hazard areas established in Section 1612.3, any repairs that do not constitute substantial improvement or substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.</p> <p>Appendix G101.1 Purpose. The purpose of this appendix is to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific flood hazard areas through the establishment of comprehensive regulations for management of flood hazard areas, designed to:</p> <ol style="list-style-type: none"> 1. Prevent unnecessary disruption of commerce, access and public service during times of flooding; 2. Manage the alteration of natural floodplains, stream channels and shorelines; 3. Manage filling, grading, dredging and other development which may increase flood damage or erosion potential; 4. Prevent or regulate the construction of flood barriers which will divert flood waters or which can increase flood hazards; and 5. Contribute to improved construction techniques in the floodplain. <p>Appendix G102.1 [Applicability] General. This appendix, in conjunction with the <i>International Building Code</i>, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage; temporary structures and temporary or permanent storage; utility and miscellaneous Group U buildings and structures; and certain building work exempt from permit under Section105.2.</p> <p>Appendix G103.1 [Powers and Duties] Permit applications. The building official shall review all permit applications to determine whether proposed development sites will be reasonably safe from flooding. If a proposed development site is in a flood hazard area, all site development activities, including grading, filling, utility installation and drainage modification), all new construction and substantial improvements (including the placement of prefabricated buildings and manufactured homes) and certain building work exempt from permit under Section105.2, shall be designed and constructed with methods, practices and materials that minimize flood damage and that are in accordance with this code and ASCE 24.</p> <p>Appendix G104.1 [Permits] Required. Any person, owner or authorized agent who intends to conduct any development in a flood hazard area shall first make application to the building official and shall obtain the required permit.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

	NFIP Regulations	2009 IBC® and Appendix G
4		<p>Appendix G801 Other Building Work</p> <p>G801.1 Detached accessory structures. Detached accessory structures shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design flood. Fully enclosed accessory structures shall have flood openings to allow for the automatic entry and exit of flood waters.</p> <p>G801.2 Fences. Fences in floodways that may block the passage of floodwaters, such as stockade fences and wire mesh fences, shall meet the requirement of Section G103.5.</p> <p>G801.3 Oil derricks. Oil derricks located in flood hazard areas shall be designed in conformance with the flood loads in Section 1603.1.6 and Section 1612</p> <p>G801.4 Retaining walls, sidewalks and driveways. Retaining walls, sidewalks and driveways shall meet the requirements of Section 1803.4.</p> <p>G801.5 Prefabricated Swimming pools. Prefabricated swimming pools in floodways shall meet the requirement of Section G103.5.</p> <p>Appendix G901 Temporary Structures and Temporary Storage</p> <p>G901.1 Temporary structures. Temporary structures shall be erected for a period of less than 180 days. Temporary structures shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design flood. Fully enclosed temporary structures shall have flood openings to allow for the automatic entry and exit of flood waters.</p> <p>G901.2 Temporary storage. Temporary storage includes storage of goods and materials for a period of less than 180 days. Stored materials shall not include hazardous materials.</p> <p>G901.3 Temporary structures and storage. Temporary structures and temporary storage in floodways shall meet the requirements of G103.5.</p> <p>Appendix G1001 Utility and Miscellaneous Group U</p> <p>G1001.1 Utility and Miscellaneous Group U. Utility and Miscellaneous Group U includes buildings that are accessory in character and miscellaneous structures not classified in any specific occupancy in the <i>International Building Code</i>, including, but not limited to, agricultural buildings, aircraft hangars (accessory to a one- or two-family residence), barns, carports, fences more than 6 feet (1829 mm) high, grain silos (accessory to a residential occupancy), greenhouses, livestock shelters, private garages, retaining walls, sheds, stables, and towers.</p> <p>G1001.1 Flood loads. Utility and miscellaneous Group U buildings and structures, including substantial improvement of such buildings and structures, shall be anchored to prevent flotation, collapse or lateral movement resulting from flood loads, including the effects of buoyancy, during conditions of the design flood.</p> <p>G1001.2 Elevation. Utility and miscellaneous Group U buildings and structures, including substantial improvement of such buildings and structures, shall be elevated such that the lowest floor, including basement, is elevated to or above the design flood elevation in accordance with Section 1612 of the <i>International Building Code</i>.</p>
continued from previous page		
continued on next page		

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
<p style="text-align: center; font-size: 24pt; font-weight: bold;">4</p> <p>continued from previous page</p> <p>continued on next page</p>		<p>G1001.4 Enclosures below design flood elevation. Fully enclosed areas below the design flood elevation shall be at or above grade on all sides and conform to the following:</p> <ol style="list-style-type: none"> 1. In flood hazard areas not subject to high velocity wave action, shall have flood openings to allow for the automatic inflow and outflow of floodwaters. 2. In flood hazard areas subject to high velocity wave action, shall have walls below the design flood elevation that are designed to break away or collapse from a water load less than that which would occur during the design flood, without causing collapse, displacement or other structural damage to the building or structure. <p>G1001.5 Flood-damage resistant materials. Flood-damage resistant materials shall be used below the design flood elevation.</p> <p>G1001.6 Protection of mechanical, plumbing and electrical systems. Mechanical, plumbing and electrical systems, including plumbing fixtures, shall be elevated to or above the design flood elevation.</p> <p>Exception: Electrical systems, equipment and components, and heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment are permitted to be located below the design flood elevation provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in compliance with the flood-resistant construction requirements of the <i>International Building Code</i>. Electrical wiring systems are permitted to be located below the design flood elevation provided they conform to the provisions of the electrical part of the <i>International Code Council Electrical Code Administrative Provisions</i> [for wet locations].</p>
<p style="text-align: center; font-size: 24pt; font-weight: bold;">5</p>	<p>(2) Review proposed development to assure that all necessary permits have been received from other governmental agencies from which approval is required by Federal or State law, including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334;</p>	<p>105.3.1 Action on application</p> <p>Appendix G103.2 Other permits. It shall be the responsibility of the building official to assure that approval of a proposed development shall not be given until proof that necessary permits have been granted by federal or state agencies having jurisdiction over such development.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

	NFIP Regulations	2009 IBC® and Appendix G
<p>6</p> <p>continued on next page</p>	<p>(3) Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall:</p> <ul style="list-style-type: none"> (i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, (ii) be constructed with materials resistant to flood damage, (iii) be constructed by methods and practices that minimize flood damages, and (iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. 	<p>106.2.5 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.</p> <p>106.2.5.1 Design flood elevations. Where design flood elevations are not specified, they shall be established in accordance with Section 1612.3.1.</p> <p>801.1.3 Applicability. For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials that extend below the design flood elevation shall be flood-damage-resistant materials.</p> <p>1403.5 Flood resistance. For buildings in flood hazard areas as established in Section 1612.3, exterior walls extending below the design flood elevation shall be resistant to water damage. Wood shall be pressure-preservative treated in accordance with AWPA U1 for the species, product and end use using a preservative listed in Section 4 in APWA Standard U1 or decay-resistant heartwood of redwood, black locust or cedar.</p> <p>1603.1.6 Flood design data. For buildings located in whole or in part in flood hazard areas as established in Section 1612.3, the documentation pertaining to design, if required in Section 1612.5, shall be included and the following information, referenced to the datum on the community's Flood Insurance Rate Map (FIRM), shall be shown, regardless of whether flood loads govern the design of the building:</p> <ol style="list-style-type: none"> 1. In flood hazard areas not subject to high-velocity wave action, the elevation of proposed lowest floor, including basement. 2. In flood hazard areas not subject to high-velocity wave action, the elevation to which any non-residential building will be dry floodproofed. In flood hazard areas subject to high-velocity wave action, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including basement. <p>1605.2 Load combinations using strength design or load and resistance factor design.</p> <p>1605.2.2 [Load combinations using strength design or load and resistance factor design] Flood loads. Where flood loads, F_a, are to be considered in the design, the load combinations of Section 2.3.3 of ASCE 7 shall be used.</p> <p>1605.3 Load combinations using allowable stress design.</p> <p>1605.3.1.2 [Load combinations using allowable stress design] Flood loads. Where flood loads, F_a, are to be considered in design, the load combinations of Section 2.4.2 of ASCE 7 shall be used.</p> <p>1612.4 Design and construction. The design and construction of buildings and structures located in flood hazard areas, including flood hazard areas subject to high velocity wave action, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
6 continued from previous page		<p>1801.1 Scope. The provisions of this chapter shall apply to building and foundation systems</p> <p>1803.4 Grading and fill in flood hazard areas. In flood hazard areas established in Section 1612.3, grading and/or fill shall not be approved:</p> <ol style="list-style-type: none"> 1. Unless fill is placed, compacted and sloped to minimize shifting, slumping and erosion during the rise and fall of flood water and, as applicable, wave action. 2. In floodways, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a registered design professional in accordance with standard engineering practice that the proposed grading or fill, or both, will not result in any increase in flood levels during the occurrence of the design flood. 3. In flood hazard areas subject to high-velocity wave action, unless such fill is conducted and/or placed to avoid diversion of water and waves toward any building or structure. 4. Where design flood elevations are specified but floodways have not been designated, unless it has been demonstrated that the cumulative effect of the proposed flood hazard area encroachment, when combined with all other existing and anticipated flood hazard area encroachment, will not increase the design flood elevation more than one foot (305mm) at any point. <p>3001.2 Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to ASME A17.1, ASME A90.1, ASME B20.1 and ALI B 153.1, and ASCE 24 for construction in flood hazard areas as established in Section 1612.3.</p> <p>3102.7 Engineering design. The structure shall be designed and constructed to sustain dead loads, loads due to tension or inflation, live loads including wind, snow, flood, and seismic loads and in accordance with Chapter 16.</p> <p>3403.1.1 [Existing buildings or structures] Flood hazard areas. SEE BLOCK 4</p> <p>[For electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities, see Appendix D for texts from IMC, IPC, IFGC and IPSSDC.]</p> <p>Appendix G101.1 [Flood Resistant Construction] Purpose. SEE BLOCK 4</p> <p>G101.2 Objectives. The objectives of this appendix are to protect human life, minimize the expenditure of public money for flood control projects, minimize the need for rescue and relief efforts associated with flooding, minimize prolonged business interruption, minimize damage to public facilities and utilities, help maintain a stable tax base by providing for the sound use and development of flood-prone areas, contribute to improved construction techniques in the floodplain, and ensure that potential owners and occupants are notified that property is within flood hazard areas.</p> <p>G101.3 Scope. The provisions of this appendix shall apply to all proposed development in a flood hazard area established in Section 1612 of this code, including certain building work exempt from permit under Section 105.2.</p>
		continued on next page

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

	NFIP Regulations	2009 IBC® and Appendix G
<p align="center">6</p> <p>continued from previous page</p> <p>continued on next page</p>		<p>Appendix G104.2 Application for permit. The applicant shall file an application in writing on a form furnished by the building official. Such application shall:</p> <ol style="list-style-type: none"> Identify and describe the development to be covered by the permit. Describe the land on which the proposed development is to be conducted by legal description, street address or similar description that will readily identify and definitely locate the site. Include a site plan showing the delineation of flood hazard areas, floodway boundaries, flood zones, design flood elevations, ground elevations, proposed fill and excavation and drainage patterns and facilities. Indicate the use and occupancy for which the proposed development is intended. Be accompanied by construction documents, grading and filling plans and other information deemed appropriate by the building official. State the valuation of the proposed work. Be signed by the applicant or the applicant's authorized agent. <p>Appendix G xx</p> <p>G401.5 Storm drainage. Storm drainage shall be designed to convey the flow of surface waters to minimize or eliminate damage to persons or property.</p> <p>G401.6 Streets and sidewalks. Streets and sidewalks shall be designed to minimize potential for increasing or aggravating flood levels.</p> <p>Appendix G XX</p> <p>G701.1 Underground tanks. Underground tanks in flood hazard areas shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.</p> <p>G701.2 Above-ground tanks. Above-ground tanks in flood hazard areas shall be elevated to or above the design flood elevation or shall be anchored or otherwise designed and constructed to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.</p> <p>G701.3 Tank inlets and vents. In flood hazard areas, tank inlets, fill openings, outlets and vents shall be:</p> <ol style="list-style-type: none"> At or above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the design flood. Anchored to prevent lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
6 continued from previous page		<p>Appendix xx</p> <p>G801.1 Detached accessory structures. Detached accessory structures shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design flood. Fully enclosed accessory structures shall have flood openings to allow for the automatic entry and exit of flood waters.</p> <p>G801.2 Fences. Fences in floodways that may block the passage of floodwaters, such as stockade fences and wire mesh fences, shall meet the requirement of Section G103.5.</p> <p>G801.3 Oil derricks. Oil derricks located in flood hazard areas shall be designed in conformance with the flood loads in Section 1603.1.6 and Section 1612.</p> <p>G801.4 Retaining walls, sidewalks and driveways. Retaining walls, sidewalks and driveways shall meet the requirements of Section 1803.4.</p> <p>G801.5 Prefabricated swimming pools. Prefabricated swimming pools in floodways shall meet the requirement of Section G103.5.</p>
	<p>7</p> <p>(1) Review subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding. If a subdivision proposal or other proposed new development is in a flood-prone area, any such proposals shall be reviewed to assure that:</p> <p>(i) all such proposals are consistent with the need to minimize flood damage within the flood-prone area,</p> <p>(ii) all public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage, and</p> <p>(iii) adequate drainage is provided to reduce exposure to flood hazards;</p>	<p>Appendix G301.1 [xx] General. Any subdivision proposal, including proposals for manufactured home parks and subdivisions, or other proposed new development in a flood hazard area shall be reviewed to assure that:</p> <ol style="list-style-type: none"> All such proposals are consistent with the need to minimize flood damage; All public utilities and facilities, such as sewer, gas, electric and water systems are located and constructed to minimize or eliminate flood damage; and Adequate drainage is provided to reduce exposure to flood hazards. <p>G301.2 Subdivision requirements. The following requirements shall apply in the case of any proposed subdivision, including proposals for manufactured home parks and subdivisions, any portion of which lies within a flood hazard area:</p> <ol style="list-style-type: none"> The flood hazard area, including floodways and areas subject to high velocity wave action, as appropriate, shall be delineated on tentative and final subdivision plats; Design flood elevations shall be shown on tentative and final subdivision plats; Residential building lots shall be provided with adequate buildable area outside the floodway; and The design criteria for utilities and facilities set forth in this appendix and appropriate <i>International Codes</i> shall be met. <p>Appendix G401.5 Storm drainage. SEE BLOCK 6</p>
8	<p>(5) Require within flood-prone areas new and replacement water supply systems to be designed to minimize or eliminate infiltration of flood waters into the systems; and</p>	<p>Appendix G401.4 Water facilities. All new or replacement water facilities shall be designed in accordance with the provisions of Chapter 7, ASCE 24, to minimize or eliminate infiltration of floodwaters into the systems.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
9	<p>(6) Require within flood-prone areas</p> <p>(i) new and replacement sanitary sewage systems to be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and</p> <p>(ii) onsite waste disposal systems to be located to avoid impairment to them or contamination from them during flooding.</p>	<p>Appendix G401.3 Sewer facilities. All new or replaced sanitary sewer facilities, private sewer treatment plants (including all pumping stations and collector systems) and on-site waste disposal systems shall be designed in accordance with Chapter 7, ASCE 24, to minimize or eliminate infiltration of flood waters into the facilities and discharge from the facilities into flood waters, or impairment of the facilities and systems.</p>
<p>(b) When the Administrator has designated areas of special flood hazards (A zones) by the publication of a community's FHBM or FIRM, but has neither produced water surface elevation data nor identified a floodway or coastal high hazard area, the community shall:</p>		
10	<p>(1) Require permits for all proposed construction and other developments including the placement of manufactured homes, within Zone A on the community's FHBM or FIRM;</p> <p>(2) Require the application of the standards in paragraphs (a) (2), (3), (4), (5) and (6) of this section to development within Zone A on the community's FHBM or FIRM;</p> <p>(3)</p>	<p>[Prior provisions cumulative]</p>
11	<p>(3) Require that all new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, include within such proposals base flood elevation data;</p>	<p>Appendix G103.3 Determination of design flood elevations. If design flood elevations are not specified, the building official is authorized to require the applicant to:</p> <ol style="list-style-type: none"> 1. Obtain, review and reasonably utilize data available from a federal, state or other source, or 2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic engineering techniques. Such analyses shall be performed and sealed by a registered design professional. Studies, analyses and computations shall be submitted in sufficient detail to allow review and approval by the building official. The accuracy of data submitted for such determination shall be the responsibility of the applicant.
12	<p>(4) Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source, including data developed pursuant to paragraph (b)(3) of this section, as criteria for requiring that new construction, substantial improvements, or other development in Zone A on the community's FHBM or FIRM meet the standards in paragraphs (c)(2), (c)(3), (c)(5), (c)(6), (c)(12), (c)(14), (d)(2) and (d)(3) of this section;</p>	<p>1612.3 Establishment of flood hazard areas. SEE BLOCK 3</p> <p>Appendix G103.3 Determination of design flood elevations. SEE BLOCK 11</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
13	<p>(5) Where base flood elevation data are utilized, within Zone A on the community's FHBM or FIRM.</p> <p>(i) Obtain the elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures, and</p> <p>(ii) Obtain, if the structure has been floodproofed in accordance with paragraph (c)(3)(ii) of this section, the elevation (in relation to mean sea level) to which the structure was floodproofed, and (iii) Maintain a record of all such information with the official designated by the community under Sec. 59.22 (a)(9)(iii);</p>	<p>104.7 Department records</p> <p>109.3.3 Lowest floor elevation. In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification required in Section 1612.5 shall be submitted to the building official.</p> <p>1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a registered design professional and shall be submitted to the building official:</p> <p>1. For construction in flood hazard areas not subject to high-velocity wave action:</p> <p>1.1. The elevation of the lowest floor, including basement, as required by the lowest floor elevation inspection in Section 109.3.3.</p> <p>1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1, ASCE 24, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24.</p> <p>1.3. For dry floodproofed nonresidential buildings, construction documents shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.</p>
14	<p>(6) Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Administrator;</p>	<p>Appendix G103.6 Watercourse alteration. Prior to issuing a permit for any alteration or relocation of any watercourse, the building official shall require the applicant to provide notification of the proposal to the appropriate authorities of all affected adjacent government jurisdictions, as well as appropriate state agencies. A copy of the notification shall be maintained in the permit records and submitted to FEMA.</p>
15	<p>(7) Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained;</p>	<p>Appendix G103.6.1 Engineering analysis. The building official shall require submission of an engineering analysis which demonstrates that the flood-carrying capacity of the altered or relocated portion of the watercourse will not be decreased. Such watercourses shall be maintained in a manner which preserves the channel's flood-carrying capacity.</p>
16	<p>(8) Require that all manufactured homes to be placed within Zone A on a community's FHBM or FIRM shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.</p>	<p>Appendix G501.1 [Manufactured Homes] Elevation. All new and replacement manufactured homes to be placed or substantially improved in a flood hazard area shall be elevated such that the lowest floor of the manufactured home is elevated to or above the design flood elevation.</p> <p>Appendix G501.2 Foundations. All new and replacement manufactured homes, including substantial improvement of existing manufactured homes, shall be placed on a permanent, reinforced foundation that is designed in accordance with Section 1612.</p> <p>Appendix G501.3 Anchoring. All new and replacement manufactured homes to be placed or substantially improved in a flood hazard area shall be installed using methods and practices which minimize flood damage. Manufactured homes shall be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement. Methods of anchoring are authorized to include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state and local anchoring requirements for resisting wind forces.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations	2009 IBC® and Appendix G	
<p>(c) When the Administrator has provided a notice of final flood elevations for one or more special flood hazard areas on the community's FIRM and, if appropriate, has designated other special flood hazard areas without base flood elevations on the community's FIRM, but has not identified a regulatory floodway or coastal high hazard area, the community shall.</p>		
17	<p>(1) Require the standards of paragraph (b) of this section within all A1-30 zones, AE zones, A zones, AH zones, and AO zones, on the community's FIRM;</p>	<p>[Prior provisions cumulative]</p>
18	<p>(2) Require that all new construction and substantial improvements of residential structures within Zones A1-30, AE and AH zones on the community's FIRM have the lowest floor (including basement) elevated to or above the base flood level, unless the community is granted an exception by the Administrator for the allowance of basements in accordance with Sec. 60.6 (b) or (c);</p>	<p>1603.1.6 Flood design data. SEE BLOCK 6 1612.1 General (Flood Loads). SEE BLOCK 4 1612.4 Design and construction. SEE BLOCK 6 1807.1.2.1 Flood hazard areas. For buildings and structures in flood hazard areas as established in Section 1612.3, the finished ground level of an under-floor space such as a crawl space shall be equal to or higher than the outside finished ground level on at least one side. Exception: Under-floor spaces of Group R-3 buildings that meet the requirements of FEMA/FIA TB 11. 3403.1.1 Flood hazard areas (Existing buildings or structures). SEE BLOCK 4</p>
19	<p>(3) Require that all new construction and substantial improvements of non-residential structures within Zones A1-30, AE and AH zones on the community's FIRM:</p> <ul style="list-style-type: none"> (i) have the lowest floor (including basement) elevated to or above the base flood level or, (ii) together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; 	<p>1603.1.6 Flood design data. SEE BLOCK 6 1612.1 General (Flood Loads). SEE BLOCK 4 1612.4 Design and construction. SEE BLOCK 6 3403.1.1 Flood hazard areas (Existing buildings or structures). SEE BLOCK 4</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

	NFIP Regulations	2009 IBC® and Appendix G
20	<p>(4) Provide that where a non-residential structure is intended to be made watertight below the base flood level,</p> <p>(i) a registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of paragraph (c)(3)(ii) or (c)(8)(ii) of this section, and</p> <p>(ii) a record of such certificates which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained with the official designated by the community under Sec. 59.22(a)(9)(iii);</p>	<p>104.7 Department records.</p> <p>1612.5.1 Flood hazard documentation. [Flood hazard areas not subject to high velocity wave action] SEE BLOCK 13</p> <p>Appendix G103.8 Records. SEE BLOCK 1</p>
21	<p>(5) 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 in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.</p>	<p>1203.3.2 [Under floor ventilation] Exceptions.</p> <p>5. For buildings in flood hazard areas as established in Section 1612.3, the openings for under-floor ventilation shall be deemed as meeting the flood opening requirements of ASCE 24 provided that the ventilation openings are designed and installed in accordance with ASCE 24. 1612.4 Design and construction. SEE BLOCK 6</p> <p>1612.5 Flood hazard documentation. [Flood hazard areas not subject to high velocity wave action] SEE BLOCK 13</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
22	(6) Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites (i) Outside of 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, or (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist floatation collapse and lateral movement.	Appendix G501 Manufactured Homes. SEE BLOCK 16
23	(7) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified);	DESIGN FLOOD ELEVATION SEE DEFINITIONS 1612.4 Design and construction. SEE BLOCK 6
24	(8) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of nonresidential structures (i) have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified), or (ii) together with attendant utility and sanitary facilities be completely floodproofed to that level to meet the floodproofing standard specified in Sec. 60.3(c)(3)(ii);	DESIGN FLOOD ELEVATION SEE DEFINITIONS 1603.1.6 Flood design data. SEE BLOCK 6 1612.4 Design and construction. SEE BLOCK 6 1807.1.2.1 Flood hazard areas. SEE BLOCK 18 3403.1.1 Flood hazard areas (Existing buildings or structures). SEE BLOCK 4
25	(9) Require within any A99 zones on a community's FIRM the standards of paragraphs (a)(1) through (a)(4)(i) and (b)(5) through (b)(9) of this section;	1603.1.6 Flood design data. SEE BLOCK 6 1612.4 Design and construction. SEE BLOCK 6 1807.1.2.1 Flood hazard areas. SEE BLOCK 18 3403.1.1 Flood hazard areas (Existing buildings or structures). SEE BLOCK 4

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
26	(10) Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.	<p>1612.3.2 Determination of impacts. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed work will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction of the applicable governing authority.</p> <p>1803.4 Grading and fill in flood hazard areas. SEE BLOCK 6</p> <p>Appendix G103.4 Activities in riverine flood hazard areas. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the building official shall not permit any new construction, substantial improvement or other development, including fill, unless the applicant demonstrates that the cumulative effect of the proposed development, when combined with all other existing and anticipated flood hazard area encroachment, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the community.</p>
27	(11) Require within Zones AH and AO, adequate drainage paths around structures on slopes, to guide floodwaters around and away from proposed structures.	Appendix G401.5 Storm drainage. SEE BLOCK 6
28	(12) Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A-1-30, AH, and AE on the community's FIRM that are not subject to the provisions of paragraph (c)(6) of this section be elevated so that either (i) The lowest floor of the manufactured home is at or above the base flood elevation, or (ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.	Appendix G501 Manufactured Homes. SEE BLOCK 16
29	(13) Notwithstanding any other provisions of Sec. 60.3, a community may approve certain development in Zones AI-30, AE, and AH, on the community's FIRM which increase the water surface elevation of the base flood by more than one foot, provided that the community first applies for a conditional FIRM revision, fulfills the requirements for such a revision as established under the provisions of Sec. 65.12, and receives the approval of the Administrator.	<p>Appendix G103.5 Floodway encroachment. Prior to issuing a permit for any floodway encroachment, including fill, new construction, substantial improvements and other development or land disturbing activity, the building official shall require submission of a certification, along with supporting technical data, that demonstrates that such development will not cause any increase of the level of the base flood.</p> <p>Appendix G103.5.1 Floodway revisions. A floodway encroachment that increases the level of the base flood is authorized if the applicant has applied for a conditional Flood Insurance Rate Map (FIRM) revision and has received the approval of the Federal Emergency Management Agency (FEMA).</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
30	(14) Require that recreational vehicles placed on sites within Zones A1-30, AH, and AE on the community's FIRM either(i) Be on the site for fewer than 180 consecutive days, (ii) Be fully licensed and ready for highway use, or (iii) Meet the permit requirements of paragraph (b)(1) of this section and the elevation and anchoring requirements for "manufactured homes" in paragraph (c)(6) of this section. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.	<p>Appendix G601.1 [Recreational Vehicles] Placement prohibited. The placement of recreational vehicles shall not be authorized in flood hazard areas subject to high velocity wave action and in floodways.</p> <p>Appendix G601.2 Temporary placement. Recreational vehicles in flood hazard areas shall be fully licensed and ready for highway use, and shall be placed on a site for less than 180 consecutive days.</p> <p>Appendix G601.3 Permanent placement. Recreational vehicles that are not fully licensed and ready for highway use, or that are to be placed on a site for more than 180 consecutive days shall meet the requirements of Section G501 for manufactured homes.</p>
(d) When the Administrator has provided a notice of final base flood elevations within Zones A1-30 and/or AE on the community's FIRM and, if appropriate, has designated AO zones, AH zones, A99 zones, and A zones on the community's FIRM, and has provided data from which the community shall designate its regulatory floodway, the community shall:		
31	(1) Meet the requirements of paragraphs (c) (1) through (14) of this section;	[Prior provisions cumulative]
32	(2) Select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one foot at any point;	<p>1612.3 Establishment of flood hazard areas. SEE BLOCK 3</p> <p>Appendix G103.4 Activities in riverine flood hazard areas. SEE BLOCK 26</p>
33	(3) Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge;	<p>1803.4 Grading and fill in flood hazard areas. SEE BLOCK 6</p> <p>Appendix G103.5 Floodway encroachment. SEE BLOCK 29</p> <p>Appendix G103.5.1 Floodway revision. SEE BLOCK 29</p> <p>Appendix G401.1 Development in floodways. Development or land disturbing activity shall not be authorized in the floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment will not result in any increase in the level of the base flood.</p> <p>Appendix J101.2 Flood hazard areas. The provisions of this chapter shall not apply to grading, excavation and earthwork construction, including fills and embankments, in floodways within flood hazard areas established in Section 1612.3, or in flood hazard areas where design flood elevations are specified but floodways have not been designated, unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed work will not result in any increase in the level of the base flood.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
34	(4) Notwithstanding any other provisions of Sec. 60.3, a community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the community first applies for a conditional FIRM and floodway revision, fulfills the requirements for such revisions as established under the provisions of Sec. 65.12, and receives the approval of the Administrator.	1803.4 Grading and fill in flood hazard areas. SEE BLOCK 6 Appendix G103.5.1 Floodway revision. SEE BLOCK 29
(e) When the Administrator has provided a notice of final base flood elevations within Zones A1-30 and/or AE on the community's FIRM and, if appropriate, has designated AH zones, AO zones, A99 zones, and A zones on the community's FIRM, and has identified on the community's FIRM coastal high hazard areas by designating Zones V1-30, VE, and/or V, the community shall.		
35	(1) Meet the requirements of paragraphs (c)(1) through (14) of this section;	[Prior provisions cumulative]
36	(2) Within Zones V1-30, VE, and V on a community's FIRM, (i) obtain the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures, and whether or not such structures contain a basement, and (ii) maintain a record of all such information with the official designated by the community under Sec. 59.22(a)(9)(iii);	104.7 Department records 1603.1.6 Flood design data. SEE BLOCK 6 1612.1 General (Flood Loads). SEE BLOCK 4 1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a registered design professional and shall be submitted to the building official: 2. For construction in flood hazard areas subject to high-velocity wave action: 2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 109.3.3. 2.2. Construction documents shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16. 2.3. For breakaway walls designed to resist a nominal load of less than 10 psf (0.48 kN/m ²) or more than 20 psf (0.96 kN/m ²), construction documents shall include a statement that the breakaway wall is designed in accordance with ASCE 24. Appendix G103.8 Records. SEE BLOCK 1 Appendix G501 Manufactured Homes. SEE BLOCK 16
37	(3) Provide that all new construction within Zones V1-30, VE, and V on the community's FIRM is located landward of the reach of mean high tide;	Appendix G401.2 Flood hazard areas subject to high velocity wave action. In flood hazard areas subject to high velocity wave action: 1. New buildings and buildings that are substantially improved shall only be authorized landward of the reach of mean high tide. 2. The use of fill for structural support of buildings is prohibited.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
38	<p>(4) Provide that all new construction and substantial improvements in Zones V1-30 and VE, and also Zone V if base flood elevation data is available, on the community's FIRM, are elevated on pilings and columns so that</p> <p>(i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and</p> <p>(ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of paragraphs (e)(4)(i) and (ii) of this section.</p>	<p>109.3.3 Lowest floor elevation. SEE BLOCK 13</p> <p>1603.1.6 Flood design data. SEE BLOCK 6</p> <p>1605.2.2 Other loads. SEE BLOCK 6</p> <p>1605.3.1.2 Other loads. SEE BLOCK 6</p> <p>1612.4 Design and construction. SEE BLOCK 6</p> <p>1612.5 Flood hazard documentation. [Flood hazard areas subject to high velocity wave action] SEE BLOCK 36</p>
	<p>39</p> <p>(5) Provide that all new construction and substantial improvements within Zones V1-30, VE, and V on the community's FIRM have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purposes of this section, a breakaway wall shall have a design safe loading resistance of not less than 10 and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so</p>	<p>1403.6 Flood resistance for high-velocity wave action areas. For buildings in flood hazard areas subject to high-velocity wave action as established in Section 1612.3, electrical, mechanical and plumbing system components shall not be mounted on or penetrate through exterior walls that are designed to break away under flood loads.</p> <p>1612.4 Design and construction. The design and construction of buildings and structures located in flood hazard areas, including flood hazard areas subject to high velocity wave action, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.</p> <p>1612.5.2 Flood hazard documentation. [Flood hazard areas subject to high velocity wave action] SEE BLOCK 36</p> <p>[For utility components, see Appendix D for texts from IMC and IPC.]</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
39 continued from previous page	required by local or State codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions: (i) Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and, (ii) The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and non-structural). Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. Such enclosed space shall be useable solely for parking of vehicles, building access, or storage.	
	(6) Prohibit the use of fill for structural support of buildings within Zones V1-30, VE, and V on the community's FIRM;	1803.4 Grading and fill in flood hazard areas. SEE BLOCK 6 Appendix G401.2 Flood hazard areas subject to high velocity wave action. SEE BLOCK 37
	(7) Prohibit man-made alteration of sand dunes and mangrove stands within Zones V1-30, VE, and V on the community's FIRM which would increase potential flood damage.	Appendix G103.7 Alterations in coastal areas. Prior to issuing a permit for any alteration of sand dunes and mangrove stands in flood hazard areas subject to high velocity wave action, the building official shall require submission of an engineering analysis which demonstrates that the proposed alteration will not increase the potential for flood damage.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
42	(8) Require that manufactured homes placed or substantially improved within Zones V1-30, V, and VE on the community's FIRM on sites (i) Outside of 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, or (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, meet the standards of paragraphs (e)(2) through (7) of this section and that manufactured homes placed or substantially improved on other sites in an existing manufactured home park or subdivision within Zones V1-30, V, and VE on the community's FIRM meet the requirements of paragraph (c)(12) of this section.	Appendix G501. Manufactured Homes. SEE BLOCK 16
43	(9) Require that recreational vehicles placed on sites within Zones V1-30, V, and VE on the community's FIRM either (i) Be on the site for fewer than 180 consecutive days, (ii) Be fully licensed and ready for highway use, or (iii) Meet the requirements in paragraphs (b)(1) and (e) (2) through (7) of this section. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.	Appendix G601. Recreational Vehicles. SEE BLOCK 30

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
Sec. 60.6 Variance and exceptions		
44	<p>(a) The Administrator does not set forth absolute criteria for granting variances from the criteria set forth in Secs. 60.3, 60.4, and 60.5. The issuance of a variance is for flood plain management purposes only. Insurance premium rates are determined by statute according to actuarial risk and will not be modified by the granting of a variance. The community, after examining the applicant's hardships, shall approve or disapprove a request. While the granting of variances generally is limited to a lot size less than one-half acre (as set forth in paragraph (a)(2) of this section), deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases. The Administrator may review a community's findings justifying the granting of variances, and if that review indicates a pattern inconsistent with the objectives of sound flood plain management, the Administrator may take appropriate action under Sec. 59.24(b) of this subchapter.</p>	<p>Appendix G105.1 [Variances] General. The board of appeals established pursuant to Section 112 shall hear and decide requests for variances. The board of appeals shall base its determination on technical justifications, and has the right to attach such conditions to variances as it deems necessary to further the purposes and objectives of this appendix and Section 1612.</p> <p>Appendix G105.6 Considerations. In reviewing applications for variances, the board of appeals shall consider all technical evaluations, all relevant factors, all other portions of this appendix, and the following:</p> <ol style="list-style-type: none"> 1. The danger that materials and debris may be swept onto other lands resulting in further injury or damage; 2. The danger to life and property due to flooding or erosion damage; 3. The susceptibility of the proposed development, including contents, to flood damage and the effect of such damage on current and future owners; 4. The importance of the services provided by the proposed development to the community; 5. The availability of alternate locations for the proposed development that are not subject to flooding or erosion; 6. The compatibility of the proposed development with existing and anticipated development; 7. The relationship of the proposed development to the comprehensive plan and floodplain management program for that area; 8. The safety of access to the property in times of flood for ordinary and emergency vehicles; 9. The expected heights, velocity, duration, rate of rise and debris and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site, and; 10. The costs of providing governmental services during and after flood conditions including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, streets and bridges.
45	<p>Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.</p>	<p>Appendix G105.3 Historic structures. A variance is authorized to be issued for the repair or rehabilitation of a historic structure upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure, and the variance is the minimum necessary to preserve the historic character and design of the structure.</p> <p>Exception: within flood hazard areas, historic structures that are not:</p> <ol style="list-style-type: none"> (a) Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or (b) Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or (c) Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
46	Procedures for the granting of variances by a community are as follows. (1) Variances shall not be issued by a community within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result;	Appendix G105.5 Restrictions. The board of appeals shall not issue a variance for any proposed development in a floodway if any increase in flood levels would result during the base flood discharge.
47	(2) Variances may be issued by a community for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the procedures of paragraphs (a) (3), (4), (5) and (6) of this section; (3)	Appendix G105.1 General (Variances). SEE BLOCK 44 Appendix G105.6 Considerations. SEE BLOCK 44
48	(5) Variances shall only be issued by a community upon (i) a showing of good and sufficient cause, (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances;	Appendix G105.7 Conditions for issuance. Variances shall only be issued by the board of appeals upon: 1. A technical showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site renders the elevation standards inappropriate; 2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable; 3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, nor create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances; 4. A determination that the variance is the minimum necessary, considering the flood hazard, to afford relief; and 5. Notification to the applicant in writing over the signature of the building official that the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage, and that such construction below the base flood level increases risks to life and property.
49	(4) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief;	Appendix G105.7 Conditions for issuance. BLOCK 48

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IBC®.

NFIP Regulations		2009 IBC® and Appendix G
50	<p>(5) A community shall notify the applicant in writing over the signature of a community official that</p> <ul style="list-style-type: none"> (i) the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage and (ii) such construction below the base flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions as required in paragraph (a)(6) of this section; and 	<p>Appendix G105.7 Conditions for issuance. SEE BLOCK 48</p>
51	<p>(6) A community shall (i) maintain a record of all variance actions, including justification for their issuance, and (ii) report such variances issued in its annual or biennial report submitted to the Administrator.</p>	<p>Appendix G105.2 Records. The building official shall maintain a permanent record of all variance actions, including justification for their issuance.</p>
52	<p>(7) Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that</p> <ul style="list-style-type: none"> (i) the criteria of paragraphs (a)(1) through (a)(4) of this section are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety. 	<p>Appendix G105.4 Functionally dependent facilities. A variance is authorized to be issued for the construction or substantial improvement of a functionally dependent facility provided the criteria in Section 1612.1 are met and the variance is the minimum necessary to allow the construction or substantial improvement, and that all due consideration has been given to methods and materials that minimize flood damages during the design flood and create no additional threats to public safety.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
Sec. 59.1 Definitions	
BASE FLOOD. Base flood means the flood having a one percent chance of being equaled or exceeded in any given year.	R301.2.4 Floodplain construction. SEE BLOCK 3 Table R301.2(1) Climatic and Geographic Design Criteria. Flood Hazards. SEE BLOCK 3 R322.1.3 Establishing the design flood elevation. SEE BLOCK 12
BASEMENT. Any area of the building having its floor subgrade (below ground level) on all sides.	R322.1.4 Lowest floor. SEE BLOCK 28 R322.2.1 [Flood hazard areas (including A Zones)] Elevation requirements. SEE BLOCK 18 R322.3.2 [Coastal flood hazard areas (including V Zones)] Elevation requirements. SEE BLOCK 36 R408.5 [Under-Floor Space] Finished grade. SEE BLOCK 18
DEVELOPMENT. Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.	R101.2 Scope. R105.1 Permits required. R105.2 Work exempt from permit. R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4
EXISTING CONSTRUCTION (EXISTING STRUCTURES). For the purposes of determining rates, structures for which the “start of construction” commenced before the effective date of the FIRM or before January 1, 1975, for FIRMs effective before that date. “Existing construction” may also be referred to as “existing structures.”	R102.7.2 [Existing Structures] Additions, alterations or repairs. SEE BLOCK 4 BUILDING, EXISTING in Chapter 2.
FLOOD OR FLOODING. (a) A general and temporary condition of partial or complete inundation of normally dry land areas from. (1) The overflow of inland or tidal waters. (2) The unusual and rapid accumulation or runoff of surface waters from any source.	[General usage throughout.]
FLOOD INSURANCE RATE MAP (FIRM). An official map of a community, on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.	R301.2.4 Floodplain construction. Exception. SEE BLOCK 3 Table R301.2(1) Climatic and Geographic Design Criteria. Flood Hazards. SEE BLOCK 3
FLOODWAY – See REGULATORY FLOODWAY.	R301.2.4 Floodplain construction. Exception. SEE BLOCK 3 Table R301.2(1) Climatic and Geographic Design Criteria. Flood Hazards. SEE BLOCK 3
HIGHEST ADJACENT GRADE. The highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.	R322.2.1 [Flood hazard areas (including A Zones)] Elevation requirements. SEE BLOCK 18

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p>HISTORIC STRUCTURE.</p> <p>(a) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;</p> <p>(b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;</p> <p>(c) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or</p> <p>(d) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either.</p> <p style="margin-left: 20px;">(1) By an approved state program as determined by the Secretary of the Interior or</p> <p style="margin-left: 20px;">(2) Directly by the Secretary of the Interior in states without approved programs.</p>	<p>[Not explicitly defined; refer to definition in IBC®.]</p>
<p>LOWEST FLOOR. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Sec. 60.3.</p>	<p>R309.5 [Garages and Carports] Flood hazard areas. SEE BLOCK 21</p> <p>R322.1.4 Lowest floor. SEE BLOCK 18</p>
<p>MANUFACTURED HOME. A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include a "recreational vehicle."</p>	<p>Chapter 2, MANUFACTURED HOME.</p> <p>Appendix E Manufactured Housing Used as Dwellings.</p>
<p>MANUFACTURED HOME PARK OR SUBDIVISION. A parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.</p>	<p>[Subdivision of land not addressed in IRC™; see IBC® Appendix G.]</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p>RECREATIONAL VEHICLE. A vehicle which is.</p> <ul style="list-style-type: none"> (a) built on a single chassis; (b) 400 square feet or less when measured at the largest horizontal projection; (c) designed to be self-propelled or permanently towable by a light duty truck; and (d) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use. 	<p>R107 Temporary structures and uses.</p>
<p>REGULATORY FLOODWAY. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.</p>	<p>See FLOODWAY.</p>
<p>REMEDY A VIOLATION. to bring the structure or other development into compliance with State or local flood plain management regulations, or, if this is not possible, to reduce the impacts of its noncompliance. Ways that impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of the ordinance or otherwise deterring future similar violations, or reducing Federal financial exposure with regard to the structure or other development.</p>	<p>R113 Violations.</p>
<p>STRUCTURE. For flood plain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. "Structure" for insurance coverage purposes, means a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair, unless such materials or supplies are within an enclosed building on the premises.</p>	<p>R102.1 Scope. R105.2 Work exempt from permit. Appendix E Manufactured Housing Used as Dwellings.</p>
<p>SUBSTANTIAL DAMAGE. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.</p>	<p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p>SUBSTANTIAL IMPROVEMENT. Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures which have incurred “substantial damage”, regardless of the actual repair work performed. The term does not, however, include either.</p> <p>(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or</p> <p>(2) Any alteration of a “historic structure”, provided that the alteration will not preclude the structure’s continued designation as a “historic structure.”</p>	<p>R102.7.1 [Existing structures] Additions, alterations or repairs. Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. Additions, alterations or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building.</p> <p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p> <p>R108.3 Building permit valuations.</p>
<p>VARIANCE. A grant of relief by a community from the terms of a flood plain management regulation.</p>	<p>R104.10.1 [Modifications] Areas prone to flooding. BLOCK 44</p> <p>R112.2.2 Criteria for issuance of a variance for flood hazard areas. SEE BLOCK 47</p>
<p>VIOLATION. The failure of a structure or other development to be fully compliant with the community’s flood plain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Sec. 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) is presumed to be in violation until such time as that documentation is provided.</p>	<p>R113 Violations.</p>
<p>Sec. 59.22 [This section outlines actions to be taken by communities to be eligible for the Program, including application procedures, documentation requirements, and a commitment to fulfill certain functions and responsibilities.]</p>	
1	<p>(a)(9)(iii) Maintain for public inspection and furnish upon request certificates of elevation and certificates of floodproofing.</p> <p>R104.7 Department records.</p>
2	<p>(b)(1) Appoint the agency or official with the responsibility, authority, and means to implement the commitments, including certain reporting requirements.</p> <p>R103 Department of Building Safety. R104 Duties and Powers of Code Official.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p>Sec. 60.2 Minimum compliance with flood plain management criteria. [Sections (a) through (c) pertain to meeting specific criteria set forth herein, as a function of the type of flood-related hazard and the level of detail provided on the flood hazard map prepared by FEMA. Section (e) provides for coordination with State Coordinating Agencies with respect to submission of regulations for participation in the NFIP; Section (f) addresses the community function to submit reports periodically, when requested; and Section (g) directs communities to assure that their comprehensive plans are consistent with floodplain management objectives.]</p>	
<p style="font-size: 24pt; font-weight: bold;">3</p>	<p>(h) The community shall adopt and enforce floodplain management regulations based on data provided by the Administrator. Without prior approval of the Administrator, the community shall not adopt and enforce floodplain management regulations based upon modified data reflecting natural or man-made changes.</p> <p>R301.2.4 Floodplain construction. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with Section R322.</p> <p>Exception: Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with <i>Flood Resistant Design and Construction</i> (ASCE 24).</p> <p>Table R301.2(1) Climatic and Geographic Design Criteria g. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of all currently effective FIRM and FBFM, or other flood hazard map adopted by the authority having jurisdiction, as amended.</p> <p>R322.1 General. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with the provisions contained in this section.</p> <p>Exception: Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.</p>
<p>Sec. 60.3 Floodplain management criteria for flood-prone areas. (a) When the Administrator has not defined the special flood hazard areas within a community, has not provided water surface elevation data, and has not provided sufficient data to identify the floodway or coastal high hazard area, but the community has indicated the presence of such hazards by submitting an application to participate in the Program, the community shall:</p>	
<p style="font-size: 24pt; font-weight: bold;">4</p> <p style="font-weight: bold;">continued on next page</p>	<p>(1) Require permits for all proposed construction or other development, including the placement of manufactured homes, to determine whether such development is proposed within flood hazard areas;</p> <p>R101.2 Scope.</p> <p>R102.7.1 [Existing structures] Additions, alterations or repairs. Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. Additions, alterations or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building.</p> <p>R105.2 Work exempt from permit.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
<p align="center">4</p> <p>continued from previous page</p>		<p>Appendix E, Manufactured Housing, Section AE101 Scope. Exception: In addition to these provisions, new and replacement manufactured homes to be located in flood hazard areas as established by Table R301.2(1) of the <i>International Residential Code</i> shall meet the applicable requirements of Section R322 of the <i>International Residential Code</i>.</p> <p>Appendix G, Swimming Pools, Spas and Hot Tubs AG101.2 Pools in flood hazard areas. Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools, and in-ground pools that involve placement of fill, shall comply with Sections AG101.2.1 or AG101.2.2. Exception: Pools located in riverine flood hazard areas which are outside of designated floodways. AG101.2.1 Pools located in designated floodways. Where pools are located in designated floodways, documentation shall be submitted to the building official, which demonstrates that the construction of the pool will not increase the design flood elevation at any point within the jurisdiction. AG101.2.2 Pools located where floodways have not been designated. Where pools are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction. AG103.3 Pools in flood hazard areas. In flood hazard areas established by Table R301.2(1), pools in coastal high-hazard areas shall be designed and constructed in conformance with ASCE 24. Appendix J Existing Buildings and Structures, 102.5 Flood hazard areas. Work performed in existing buildings located in a flood hazard area as established by Table 301.2(1) shall be subject to the provisions of R105.3.1.1.</p>
	<p>5</p> <p>(2) Review proposed development to assure that all necessary permits have been received from other governmental agencies from which approval is required by Federal or State law, including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334;</p>	<p>R105.3.1 (Permits) Action on application.</p>
<p align="center">6</p> <p>continued on next page</p>	<p>(3) Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall</p>	<p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4 R301.1 Application. Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed in this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by the code are deemed to comply with the requirements of this section.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p style="text-align: center; font-size: 24pt; font-weight: bold;">6</p> <p>continued from previous page</p>	<p>R301.2.4 Floodplain construction. SEE BLOCK 3</p> <p>R322.1 [Flood Resistant Construction] General. Exception. [Refers to ASC 24 for floodway construction.] SEE BLOCK 3</p> <p>R322.1.2 Structural systems. All structural systems of all buildings and structures shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation.</p> <p>R322.1.3 Flood-resistant construction. All buildings and structures erected in flood hazard areas shall be constructed by methods and practices that minimize flood damage.</p> <p>R322.1.6 Protection of mechanical and electrical systems. Electrical systems, equipment and components, and heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall be located at or above the elevation required in Section R322.3.1 (flood hazard areas including A Zones) or R322.3.2 (coastal high-hazard areas including V Zones). If replaced as part of a substantial improvement, electrical systems, equipment and components, and heating, ventilation, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall meet the requirements of this section. Systems, fixtures, and equipment and components shall not be mounted on or penetrate through walls intended to break away under flood loads.</p> <p>Exception: Electrical systems, equipment and components, and heating, ventilating, air conditioning and plumbing appliances, plumbing fixtures, duct systems, and other service equipment are permitted to be located below the elevation required in Section R322.3.1 (flood hazard areas including A Zones) or R322.3.2 (coastal high-hazard areas including V Zones) provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in accordance with ASCE 24. Electrical wiring systems are permitted to be located below the required elevation provided they conform to the provisions of the electrical part of this code for wet locations.</p> <p>R322.1.8 Flood-resistant materials. Building materials used below the elevation required in Section R322.2 (flood hazard areas including A Zones) or R322.3 (coastal high-hazard areas including V Zones) shall comply with the following:</p> <ol style="list-style-type: none"> 1. All wood, including floor sheathing, shall be pressure-preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use or be the decay-resistant heartwood of redwood, black locust or cedars. Preservatives shall conform to Section 4 of AWPA U1. 2. Materials and installation methods used for flooring and interior and exterior walls and wall coverings shall conform to the provisions of FEMA/FIA-TB-2.
<p>continued on next page</p>	

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
<p>6</p> <p>continued from previous page</p>	<p>(i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy,</p> <p>(ii) be constructed with materials resistant to flood damage,</p> <p>(iii) be constructed by methods and practices that minimize flood damages, and</p> <p>(iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.</p>	<p>R322.2.3 Foundation design and construction. Foundation walls for all buildings and structures erected in flood hazard areas shall meet the requirements of Chapter 4.</p> <p>Exception: Unless designed in accordance with Section 404:</p> <ol style="list-style-type: none"> 1. The unsupported height of 6-inches (152 mm) plain masonry walls shall be no more than 3 feet (914 mm). 2. The unsupported height of 8-inches (203 mm) plain masonry walls shall be no more than 4 feet (1219 mm). 3. The unsupported height of 8 inches (203 mm) reinforced masonry walls shall be no more than 8 feet (2438 mm). <p>For the purpose of this exception, unsupported height is the distance from the finished grade of the under-floor space to the top of the wall.</p> <p>R401.1 [Foundations] Application. The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AF&PA Report No. 7.</p> <p>M1301.1.1 [General Mechanical System Requirements] Flood-resistant installation. In areas prone to flooding as established by Table R301.2(1), mechanical appliances, equipment and systems shall be located or installed in accordance with Section R322.1.6</p> <p>M1401.5 [Heating and Cooling Equipment] Flood hazard. In areas prone to flooding as established by Table R301.2(1), heating and cooling equipment and appliances shall be located or installed in accordance with Section R322.1.6</p> <p>M1601.3.8 [Duct Construction] Flood hazard areas. In areas prone to flooding as established by Table R301.2(1), duct systems shall be located or installed in accordance with Section R322.1.6.</p> <p>M1701.6 [Combustion air] Opening location. In areas prone to flooding as established by Table R301.2(1), openings shall be located at or above the elevation required in Section R322.3.1 (flood hazard areas including A Zones) or R322.3.2 (coastal high-hazard areas including V Zones).</p> <p>M2001.4 [Boilers and Water Heaters] Flood-resistant installation. In areas prone to flooding as established in Table R301.2(1), boilers, water heaters and their control systems shall be located or installed in accordance with Section R322.1.6.</p> <p>M2201.6 [Special Piping and Storage Systems] Flood resistant installation. In areas prone to flooding as established by Table R301.2(1), tanks shall be installed at or above the elevation required in Section R322.3.1 (flood hazard areas including A Zones) or R322.3.2 (coastal high-hazard areas including V Zones) or shall be anchored to prevent flotation, collapse and lateral movement under conditions of the design flood.</p>
<p>continued on next page</p>		

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
<p align="center">6 continued from previous page</p>		<p>G2404.7 (301.11) [Fuel Gas] Flood hazard. For structures located in flood hazard areas, the appliance, equipment and system installations regulated by this code shall be located or installed at or above the design flood elevation and shall comply with the flood-resistant construction requirement of Section R322.</p> <p>Exception: The appliance, equipment and system installations regulated by this code are permitted to be located below the design flood elevation provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation and shall comply with the flood-resistant construction requirements of Section R322.</p> <p>P2601.3 [General Plumbing Requirements] Flood hazard area. In areas prone to flooding as established by Table R301.2(1), plumbing fixtures, drains, and appliances shall be located or installed in accordance with Section R322.1.6.</p> <p>P2705.1 [Plumbing Fixtures, Installation] General.</p> <p>7. In areas prone to flooding as established by Table R301.2(1), plumbing fixtures shall be located or installed in accordance with Section R322.1.6.</p> <p>P3001.3 [Sanitary Drainage] Flood resistant installation. In areas prone to flooding as established by Table R301.2(1), drainage, waste and vent systems shall be located and installed to prevent infiltration of floodwaters into the systems and discharges from the systems into floodwaters.</p> <p>P3101.5 [Vent Systems] Flood resistance. In areas prone to flooding as established by Table R301.2(1), vents shall be located at or above the elevation required in Section R322.3.1 (flood hazard areas including A Zones) or R322.3.2 (coastal high-hazard areas including V Zones).</p> <p>AE502.3 Footings and foundations. Footings and foundations, unless otherwise specifically provided, shall be constructed of materials specified by this code for the intended use and in all cases shall extend below the frost line. Footings of concrete and masonry shall be of solid material. Foundations supporting untreated wood shall extend at least 8 inches (203 mm) above the adjacent finish grade. Footings shall have a minimum depth below finished grade of 12 inches (305 mm) unless a greater depth is recommended by a foundation investigation.</p> <p>Piers and bearing walls shall be supported on masonry or concrete foundations or piles, or other approved foundation systems which shall be of sufficient capacity to support all loads.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p>7 (4) Review subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding. If a subdivision proposal or other proposed new development is in a flood-prone area, any such proposals shall be reviewed to assure that:</p> <ul style="list-style-type: none"> (i) all such proposals are consistent with the need to minimize flood damage within the flood-prone area, (ii) all public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage, and (iii) adequate drainage is provided to reduce exposure to flood hazards; 	<p>[Subdivision of land not addressed in IRC™; see IBC® Appendix G.]</p> <p>R322.1.7 Protection of water supply and sanitary sewage systems. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems in accordance with the plumbing provisions of this code. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters in accordance with the plumbing provisions of this code and Chapter 3 of the <i>International Private Sewage Disposal Code</i>.</p>
<p>8 (5) Require within flood-prone areas new and replacement water supply systems to be designed to minimize or eliminate infiltration of flood waters into the systems; and</p>	<p>R322.1.6 Protection of water supply and sanitary sewage systems. SEE BLOCK 7</p> <p>P2602.2 [Individual Water Supply and Sewage Disposal] Flood resistant installation. In areas prone to flooding as established by Table R301.2(1):</p> <ol style="list-style-type: none"> 1. Water-supply systems shall be designed and constructed to prevent infiltration of floodwaters. 2. Pipes for sewage disposal systems shall be designed and constructed to prevent infiltration of floodwaters into the systems and discharges from the systems into floodwaters.
<p>9 (6) Require within flood-prone areas</p> <ul style="list-style-type: none"> (i) new and replacement sanitary sewage systems to be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and (ii) onsite waste disposal systems to be located to avoid impairment to them or contamination from them during flooding. 	<p>R322.1.6 Protection of water supply and sanitary sewage systems. SEE BLOCK 7</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
<p>(b) When the Administrator has designated areas of special flood hazards (A zones) by the publication of a community's FHBM or FIRM, but has neither produced water surface elevation data nor identified a floodway or coastal high hazard area, the community shall:</p>		
10	<p>(1) Require permits for all proposed construction and other developments including the placement of manufactured homes, within Zone A on the community's FHBM or FIRM;</p> <p>(2) Require the application of the standards in paragraphs (a) (2), (3), (4), (5) and (6) of this section to development within Zone A on the community's FHBM or FIRM;</p>	[Prior provisions cumulative.]
11	<p>(3) Require that all new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, include within such proposals base flood elevation data;</p>	[Subdivision of land not addressed in IRC™; see IBC® Appendix G.]
12	<p>(4) Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source, including data developed pursuant to paragraph (b)(3) of this section, as criteria for requiring that new construction, substantial improvements, or other development in Zone A on the community's FHBM or FIRM meet the standards in paragraphs (c)(2), (c)(3), (c)(5), (c)(6), (c)(12), (c)(14), (d)(2) and (d)(3) of this section;</p>	<p>R106.1.3(3) Information for construction in areas prone to flooding. SEE BLOCK 4</p> <p>R322.1.4 Establishing the design flood elevation. The design flood elevation shall be used to define areas prone to flooding. At a minimum, the design flood elevation is the higher of:</p> <ol style="list-style-type: none"> 1. The base flood elevation at the depth of peak elevation of flooding (including wave height) which has a 1 percent (100-year flood) or greater chance of being equaled or exceeded in any given year; or 2. The elevation of the design flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated. <p>R322.1.4.1 Determination of design flood elevations. If design flood elevations are not specified, the building official is authorized to require the applicant to:</p> <ol style="list-style-type: none"> 1. Obtain and reasonably utilize data available from a federal, state or other source; or Determine the design flood elevation in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. 2. Determinations shall be undertaken by a registered design professional who shall document that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted in sufficient detail to allow thorough review and approval. <p>R322.1.4.2 Determination of impacts. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall demonstrate that the effect of the proposed buildings and structures on design flood elevations, including fill, when combined with all other existing and anticipated flood hazard area encroachments, will not increase the design flood elevation more than one foot (305 mm) at any point within the jurisdiction.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
<p>13 (5) Where base flood elevation data are utilized, within Zone A on the community's FHBM or FIRM:</p> <p>(i) Obtain the elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures, and</p> <p>(ii) Obtain, if the structure has been floodproofed in accordance with paragraph (c)(3)(ii) of this section, the elevation (in relation to mean sea level) to which the structure was floodproofed, and (iii) Maintain a record of all such information with the official designated by the community under Sec. 59.22 (a)(9)(iii);</p>	<p>R104.7 Department records</p> <p>R109.1.3 Floodplain inspections. For construction in areas prone to flooding as established by Table 301.2(1), upon placement of the lowest floor, including basement, and prior to further vertical construction, the building official shall require submission of documentation, prepared and sealed by a registered design professional, of the elevation of the lowest floor, including basement, required in Section R322.</p> <p>R322.1.10 As-built elevation documentation. A registered design professional shall prepare and seal documentation of the elevations specified in Section R322.2 or R322.3.</p> <p>[NFIP requirement 60.3(b)(5)(ii) applies to non-residential construction; see IBC®.]</p>
<p>14 (6) Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Administrator;</p>	<p>[Not addressed in IRC™, see IBC® Appendix G.]</p>
<p>15 (7) Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained;</p>	<p>[Not addressed in IRC™, see IBC® Appendix G.]</p>
<p>16 (8) Require that all manufactured homes to be placed within Zone A on a community's FHBM or FIRM shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.</p>	<p>R322.1.9 Manufactured homes. New or replacement manufactured homes shall be elevated in accordance with Section R322.2 (flood hazard areas including A Zones) or Section R322.3 in coastal high-hazard areas (V Zones). The anchor and tie-down requirements of Sections AE604 and AE605 of Appendix E shall apply. The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24.</p> <p>Appendix E Manufactured Housing, Section AE101 Exception SEE BLOCK 4</p>
<p>(c) When the Administrator has provided a notice of final flood elevations for one or more special flood hazard areas on the community's FIRM and, if appropriate, has designated other special flood hazard areas without base flood elevations on the community's FIRM, but has not identified a regulatory floodway or coastal high hazard area, the community shall:</p>	
<p>17 (1) Require the standards of paragraph (b) of this section within all A1-30 zones, AE zones, A zones, AH zones, and AO zones, on the community's FIRM;</p>	<p>[Prior provisions cumulative.]</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
18	<p>(2) Require that all new construction and substantial improvements of residential structures within Zones A1-30, AE and AH zones on the community's FIRM have the lowest floor (including basement) elevated to or above the base flood level, unless the community is granted an exception by the Administrator for the allowance of basements in accordance with Sec. 60.6 (b) or (c);</p>	<p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p> <p>R322.2.1 [Flood hazard areas (including A Zones)] Elevation requirements.</p> <ol style="list-style-type: none"> 1. Buildings and structures in flood hazard areas not designated as Coastal A Zones shall have the lowest floors elevated to or above the design flood elevation. 2. Buildings and structures in flood hazard areas designated as Coastal A Zones shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or to the design flood elevation, whichever is higher. 3. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basement) elevated at least as high above the highest adjacent grade as the depth number specified in feet (mm) on the FIRM, or at least 2 feet (610 mm) if a depth number is not specified. 4. Basement floors that are below grade on all sides shall be elevated to or above the design flood elevation. <p>Exception: Enclosed areas below the design flood elevation, including basements whose floors are not below grade on all sides, shall meet the requirements of Section R322.2.2.</p> <p>R322.1.5 Lowest floor. The lowest floor shall be the floor of the lowest enclosed area, including basement, but excluding any unfinished flood-resistant enclosure that is useable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the building or structure in violation of this section.</p> <p>R408.6 [Under-Floor Space] Finished grade. The finished grade of under-floor surface may be located at the bottom of the footings; however, where there is evidence that the groundwater table can rise to within 6 inches (152 mm) of the finished floor at the building perimeter or where there is evidence that the surface water does not readily drain from the building site, the grade in the under-floor space shall be as high as the outside finished grade, unless an approved drainage system is provided.</p> <p>Appendix J Existing Buildings and Structures, Section AJ102.5 Flood hazard areas. SEE BLOCK 4</p>
19	<p>(3) Require that all new construction and substantial improvements of non-residential structures within Zones A1-30, AE and AH zones on the community's firm:</p> <ol style="list-style-type: none"> (i) have the lowest floor (including basement) elevated to or above the base flood level or, (ii) together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; 	<p>[NFIP requirement 60.3(c)(3) applies to non-residential construction, see IBC®.]</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
20	<p>(4) Provide that where a non-residential structure is intended to be made watertight below the base flood level,</p> <p>(i) A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of paragraph (c)(3)(ii) or (c)(8)(ii) of this section, and</p> <p>(ii) A record of such certificates which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained with the official designated by the community under Sec. 59.22(a)(9)(iii);</p>	[NFIP requirement 60.3(c)(4) applies to non-residential construction, see IBC®.]
21 continued on next page	<p>(5) 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 in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria: A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.</p>	<p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p> <p>R309.5 [Garages] Flood hazard areas. For buildings located in flood hazard areas as established by Table 301.2(1), garage floors shall be:</p> <ol style="list-style-type: none"> 1. Elevated to or above the design flood elevation as determined in Section R322; or 2. Located below the design flood elevation provided they are at or above grade on at least one side, are used solely for parking, building access, or storage, meet the requirements of Section R322, and are otherwise constructed in accordance with this code.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
<p align="center">21</p> <p>continued from previous page</p>		<p>R322.2.2 Enclosed area below design flood elevation. Enclosed areas, including crawl spaces, that are below the design flood elevation shall:</p> <ol style="list-style-type: none"> 1. Be used solely for parking of vehicles, building access or storage. 2. Be provided with flood openings which shall meet the following criteria: <ol style="list-style-type: none"> 2.1. There shall be a minimum of two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings on exterior walls. 2.2. The total net area of all openings shall be at least 1 square inch (645 mm²) for each square foot (0.093 m²) of enclosed area, or the openings shall be designed and the construction documents shall include a statement by a registered design professional that the design of the openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.6.2.2 of ASCE 24. 2.3. The bottom of each opening shall be 1 foot (305 mm) or less above the adjacent ground level. 2.4. Openings shall be not less than 3 inches (76 mm) in any direction in the plane of the wall. 2.5. Any louvers, screens or other opening covers shall allow the automatic flow of floodwaters into and out of the enclosed area. 2.6. Openings installed in doors and windows, that meet requirements 2.1 through 2.5, are acceptable; however, doors and windows without installed openings do not meet the requirements of this section. <p>R408.7 [Under-Floor Space] Flood resistance. For buildings located in areas prone to flooding as established in Table R301.2(1):</p> <ol style="list-style-type: none"> 1. Walls enclosing the under-floor space shall be provided with flood openings in accordance with Section R322.2.2. 2. The finished ground level of the under-floor space shall be equal to or higher than the outside finished ground level on at least one side. <p>Exception: Underfloor spaces that meet the requirements of FEMA/FIA TB 11-01.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
22	(6) Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites (i) Outside of 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, or (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist floatation collapse and lateral movement.	R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4 R322.1.8 Manufactured housing. SEE BLOCK 16 Appendix E Manufactured Housing, Section AE101, Exception SEE BLOCK 4
23	(7) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified);	R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4 R322.2.1 [Flood hazard areas (including A Zones)] Elevation requirements. SEE BLOCK 18
24	(8) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of nonresidential structures (i) have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified), or (ii) together with attendant utility and sanitary facilities be completely floodproofed to that level to meet the floodproofing standard specified in Sec. 60.3(c)(3)(ii);	[NFIP requirement 60.3(c)(8) applies to non-residential construction, see IBC®.]
25	(9) Require within any A99 zones on a community's FIRM the standards of paragraphs (a)(1) through (a)(4)(i) and (b)(5) through (b)(9) of this section;	R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4 R322.2.1 [Flood hazard areas (including A Zones)] Elevation requirements. SEE BLOCK 18

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
26	(10) Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.	R106.1.3 Information for construction in areas prone to flooding. SEE BLOCK 4
27	(11) Require within Zones AH and AO, adequate drainage paths around structures on slopes, to guide floodwaters around and away from proposed structures.	R401.3 [Foundations] Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. . . .
28	(12) Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A-1-30, AH, and AE on the community's FIRM that are not subject to the provisions of paragraph (c)(6) of this section be elevated so that either (i) The lowest floor of the manufactured home is at or above the base flood elevation, or (ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.	R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4 R322.1.8 Manufactured housing. SEE BLOCK 16 Appendix E Manufactured Housing, Section AE101.1 General. Exception. SEE BLOCK 4
29	(13) Notwithstanding any other provisions of Sec. 60.3, a community may approve certain development in Zones A1-30, AE, and AH, on the community's FIRM which increase the water surface elevation of the base flood by more than one foot, provided that the community first applies for a conditional FIRM revision, fulfills the requirements for such a revision as established under the provisions of Sec. 65.12, and receives the approval of the Administrator.	[Not addressed in IRC™, see IBC® Appendix G.]

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
30	(14) Require that recreational vehicles placed on sites within Zones A1-30, AH, and AE on the community's FIRM either (i) Be on the site for fewer than 180 consecutive days, (ii) Be fully licensed and ready for highway use, or (iii) Meet the permit requirements of paragraph (b)(1) of this section and the elevation and anchoring requirements for "manufactured homes" in paragraph (c)(6) of this section. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.	R107 Temporary structures.
(d) When the Administrator has provided a notice of final base flood elevations within Zones A1-30 and/or AE on the community's FIRM and, if appropriate, has designated AO zones, AH zones, A99 zones, and A zones on the community's FIRM, and has provided data from which the community shall designate its regulatory floodway, the community shall:		
31	(1) Meet the requirements of paragraphs (c) (1) through (14) of this section;	[Prior provisions cumulative.]
32	(2) Select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one foot at any point;	Table R301.2(1) Climatic and Geographic Design Criteria. Flood Hazards. SEE BLOCK 3
33	(3) Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge;	R106.1.3 Information for construction in areas prone to flooding. SEE BLOCK 4 R301.2.4 Floodplain construction. Exception. SEE BLOCK 3

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
34	(5) Notwithstanding any other provisions of Sec. 60.3, a community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the community first applies for a conditional FIRM and floodway revision, fulfills the requirements for such revisions as established under the provisions of Sec. 65.12, and receives the approval of the Administrator.	[IRC™ not applicable to floodway construction; refer to IBC®.]
(e) When the Administrator has provided a notice of final base flood elevations within Zones A1-30 and/or AE on the community's FIRM and, if appropriate, has designated AH zones, AO zones, A99 zones, and A zones on the community's FIRM, and has identified on the community's FIRM coastal high hazard areas by designating Zones V1-30, VE, and/or V, the community shall:		
35	(1) Meet the requirements of paragraphs (c)(1) through (14) of this section;	<p>[Prior provisions cumulative.]</p> <p>R301.2.4.1 Alternative provisions. As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones), ASCE 24 is permitted subject to the limitations of this code and the limitations therein.</p> <p>R322.1.1 Alternative provisions. As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones), ASCE 24 is permitted subject to the limitations of this code and the limitations therein.</p>
36	<p>(2) Within Zones V1-30, VE, and V on a community's FIRM,</p> <p>(i) obtain the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures, and whether or not such structures contain a basement, and</p> <p>(ii) maintain a record of all such information with the official designated by the community under Sec. 59.22(a)(9)(iii);</p>	<p>R104.7 Department records.</p> <p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p> <p>R106.1.3 Information for construction in areas prone to flooding. SEE BLOCK 13</p> <p>R109.1.3 Floodplain inspections. SEE BLOCK 13</p> <p>R322.1.9 As-built elevation documentation. SEE BLOCK 13</p> <p>R322.3 Coastal high-hazard areas (including V Zones). Areas that have been determined to be subject to wave heights in excess of 3 feet (914 mm) or subject to high-velocity wave action or wave-induced erosion shall be designated as coastal high-hazard areas. All buildings and structures constructed in whole or in part in coastal high-hazard areas shall be designed and constructed in accordance with Sections R322.3.1 through R322.3.6.</p>
continued on next page		

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
<p align="center">36</p> <p>continued from previous page</p>		<p>R322.3.1 Location and site preparation.</p> <ol style="list-style-type: none"> 1. New buildings and buildings that are determined to be substantially improved pursuant to Section R105.3.1.1 shall be located landward of the reach of mean high tide. 2. For any alteration of sand dunes and mangrove stands the building official shall require submission of an engineering analysis which demonstrates that the proposed alteration will not increase the potential for flood damage. <p>R322.3.2 Elevation requirements.</p> <ol style="list-style-type: none"> 1. All buildings and structures erected within coastal high-hazard areas shall be elevated so that the lowest portion of all structural members supporting the lowest floor, with the exception of mat or raft foundations, piling, pile caps, columns, grade beams and bracing, is: <ol style="list-style-type: none"> 1.1. Located at or above the design flood elevation, if the lowest horizontal structural member is oriented parallel to the direction of wave approach, where parallel shall mean less than or equal to 20 degrees from the direction of approach, or 1.2. Located at the base flood elevation plus one foot (305 mm), or the design flood elevation, whichever is higher, if the lowest horizontal structural member is oriented perpendicular to the direction of wave approach, where perpendicular shall mean greater than 20 degrees from the direction of approach. 2. Basement floors that are below grade on all sides are prohibited. 3. The use of fill for structural support is prohibited. 4. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings, and for support of parking slabs, pool decks, patios, and walkways. <p>Exception: Walls and partitions enclosing areas below the design flood elevation shall meet the requirements of Sections R322.3.4 and R322.3.5.</p>
<p align="center">37</p>	<p>(3) Provide that all new construction within Zones V1-30, VE, and V on the community's FIRM is located landward of the reach of mean high tide;</p>	<p>R322.3.1 Location and site preparation.</p> <ol style="list-style-type: none"> 1. New buildings and buildings that are determined to be substantially improved pursuant to Section R105.3.1.1 shall be located landward of the reach of mean high tide. 2. For any alteration of sand dunes and mangrove stands the building official shall require submission of an engineering analysis which demonstrates that the proposed alteration will not increase the potential for flood damage.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
38	<p>(4) Provide that all new construction and substantial improvements in Zones V1-30 and VE, and also Zone V if base flood elevation data is available, on the community's FIRM, are elevated on pilings and columns so that</p> <p>(i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and</p> <p>(ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of paragraphs (e)(4)(i) and (ii) of this section.</p>	<p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p> <p>R322.3.2 [Coastal high hazard areas (including V Zones)] Elevation requirements. SEE BLOCK 36</p> <p>R322.3.3 Foundations. All buildings and structures erected in coastal high-hazard areas shall be supported on pilings or columns and shall be adequately anchored to such pilings or columns. Piling shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R322.3.6. Mat, raft or other foundations that support columns shall not be permitted where soil investigations that are required in accordance with Section R401.4 indicate that soil material under the mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions. Slabs, pools, pool decks and walkways shall be located and constructed to be structurally independent of buildings and structures and their foundations to prevent transfer of flood loads to the buildings and structures during conditions of flooding, scour or erosion from wave-velocity flow conditions, unless the buildings and structures and their foundation are designed to resist the additional flood load.</p> <p>R322.3.6 Construction documents. The construction documents shall include documentation that is prepared and sealed by a registered design professional that the design and methods of construction to be used meet the applicable criteria of this section.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
39	<p>(5) Provide that all new construction and substantial improvements within Zones V1-30, VE, and V on the community's FIRM have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purposes of this section, a breakaway wall shall have a design safe loading resistance of not less than 10 and no more than 20 pounds per square foot. Use of breakaway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local or State codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:</p> <p>(i) Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and,</p> <p>(ii) The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and non-structural). Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. Such enclosed space shall be useable solely for parking of vehicles, building access, or storage.</p>	<p>R105.3.1.1 Substantially improved or substantially damaged existing buildings and structures in areas prone to flooding. SEE BLOCK 4</p> <p>R322.3.4 Walls below design flood elevation. Walls and partitions are permitted below the elevated floor, provided that such walls and partitions are not part of the structural support of the building or structure and:</p> <ol style="list-style-type: none"> Electrical, mechanical, and plumbing system components are not to be mounted on or penetrate through walls that are designed to break away under flood loads; and Are constructed with insect screening or open lattice; or Are designed to break away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Such walls, framing and connections shall have a design safe loading resistance of not less than 10 (470 Pa) and no more than 20 pounds per square foot (958 Pa); or Where wind loading values of this code exceed 20 pounds per square foot (958 Pa), the construction documents shall include documentation prepared and sealed by a registered design professional that: <ol style="list-style-type: none"> The walls and partitions below the design flood elevation have been designed to collapse from a water load less than that which would occur during the design flood. The elevated portion of the building and supporting foundation system have been designed to withstand the effects of wind and flood loads acting simultaneously on all building components (structural and nonstructural). Water loading values used shall be those associated with the design flood. Wind loading values used shall be those required by this code. <p>R322.3.5 Enclosed areas below design flood elevation. Enclosed areas below the design flood elevation shall be used solely for parking of vehicles, building access or storage.</p>
	<p>40 (6) Prohibit the use of fill for structural support of buildings within Zones V1-30, VE, and V on the community's FIRM;</p>	<p>R322.3.2(3) and (4) [Coastal flood hazard areas (including V zones)] Elevation requirements. SEE BLOCK 36</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
41	(7) Prohibit man-made alteration of sand dunes and mangrove stands within Zones V1-30, VE, and V on the community's FIRM which would increase potential flood damage.	R322.3.1 Location and site preparation. SEE BLOCK 37
42	(8) Require that manufactured homes placed or substantially improved within Zones V1-30, V, and VE on the community's FIRM on sites (i) Outside of 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, or (iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, meet the standards of paragraphs (e)(2) through (7) of this section and that manufactured homes placed or substantially improved on other sites in an existing manufactured home park or subdivision within Zones VI-30, V, and VE on the community's FIRM meet the requirements of paragraph (c)(12) of this section.	R322.1.8 Manufactured housing. SEE BLOCK 16 Appendix E Manufactured Housing, AE101, Exception. SEE BLOCK 4
43	(9) Require that recreational vehicles placed on sites within Zones V1-30, V, and VE on the community's FIRM either (i) Be on the site for fewer than 180 consecutive days, (ii) Be fully licensed and ready for highway use, or (iii) Meet the requirements in paragraphs (b)(1) and (e) (2) through (7) of this section. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.	R107 Temporary structures.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations	2009 IRC®
Sec. 60.6 Variance and exceptions	
<p>44</p> <p>(a) The Administrator does not set forth absolute criteria for granting variances from the criteria set forth in Secs. 60.3, 60.4, and 60.5. The issuance of a variance is for flood plain management purposes only. Insurance premium rates are determined by statute according to actuarial risk and will not be modified by the granting of a variance. The community, after examining the applicant's hardships, shall approve or disapprove a request.</p> <p>While the granting of variances generally is limited to a lot size less than one-half acre (as set forth in paragraph (a)(2) of this section), deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases. The Administrator may review a community's findings justifying the granting of variances, and if that review indicates a pattern inconsistent with the objectives of sound flood plain management, the Administrator may take appropriate action under Sec. 59.24(b) of this subchapter.</p>	<p>R104.10.1 [Modifications] Areas prone to flooding. The building official shall not grant modifications to any provision related to flood hazard areas as established by Table R301.2(1) without the granting of a variance to such provisions by the board of appeals.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
45	<p>Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.</p>	<p>R112.2.1 Determination of substantial improvement in areas prone to flooding. When the building official provides a finding required in Section R105.3.1.1, the board of appeals shall determine whether the value of the proposed work constitutes a substantial improvement. A substantial improvement means any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the building or structure before the improvement or repair is started. If the building or structure has sustained substantial damage, all repairs are considered substantial improvement regardless of the actual repair work performed. The term does not include:</p> <ol style="list-style-type: none"> 1. Improvements of a building or structure required to correct existing health, sanitary or safety code violations identified by the building official and which are the minimum necessary to assure safe living conditions; or 2. Any alteration of a historic building or structure, provided that the alteration will not preclude the continued designation as a historic building or structure. For the purposes of this exclusion, a historic building is: <ol style="list-style-type: none"> 2.1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or 2.2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or 2.3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.
46	<p>Procedures for the granting of variances by a community are as follows: (1) Variances shall not be issued by a community within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result;</p>	<p>R301.2.4 Floodplain construction. Exception. [Floodway approvals not allowed, refer to ASCE 24.] SEE BLOCK 3</p>
47	<p>(2) Variances may be issued by a community for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the procedures of paragraphs (a) (3), (4), (5) and (6) of this section;</p>	<p>R112.2.2 Criteria for issuance of a variance for areas prone to flooding. A variance shall only be issued upon:</p> <ol style="list-style-type: none"> 1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 322 inappropriate. 2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable. 3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances. 4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard. 5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

NFIP Regulations		2009 IRC®
48	<p>(3) Variances shall only be issued by a community upon</p> <ul style="list-style-type: none"> (i) a showing of good and sufficient cause, (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances; 	R112.2.2(2) and (3) Criteria for issuance of a variance for areas prone to flooding. SEE BLOCK 47
49	<p>(4) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief;</p>	R112.2.2(4) Criteria for issuance of a variance for areas prone to flooding. SEE BLOCK 47
50	<p>(5) A community shall notify the applicant in writing over the signature of a community official that</p> <ul style="list-style-type: none"> (i) the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage and (ii) such construction below the base flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions as required in paragraph (a)(6) of this section; and 	<p>R104.7 Department Records. R112.2.2(5) Criteria for issuance of a variance for areas prone to flooding. SEE BLOCK 47</p>
51	<p>(6) A community shall (i) maintain a record of all variance actions, including justification for their issuance, and (ii) report such variances issued in its annual or biennial report submitted to the Administrator.</p>	<p>R104.7 Department Records. R112.1 [Board of Appeals] General.</p>

Crosswalk of the NFIP Regulations to the Flood Resistance Provisions of the IRC®.

	NFIP Regulations	2009 IRC®
52	<p>(7) Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that</p> <ul style="list-style-type: none"> (i) the criteria of paragraphs (a)(1) through (a)(4) of this section are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety. 	<p>[Functionally dependent uses are non-residential uses; refer to IBC®.]</p>

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Existing Building Code</i></p> <p style="text-align: left; margin-top: 20px;">continued on next page</p>	<p>101.2 Scope. The provisions of the <i>International Existing Building Code</i> shall apply to the repair, alteration, change of occupancy, addition, and relocation of existing buildings.</p> <p>101.3 Intent. The intent of this code is to provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition and relocation of existing buildings.</p> <p>101.5 Compliance method. The repair, alteration, change of occupancy, addition, or relocation of all existing buildings shall comply with one of the methods listed in Section 101.5.1 through 101.5.3 as selected by the applicant. Application of a method shall be the sole basis for assessing the compliance of work performed under a single permit unless otherwise approved by the code official. Sections 101.5.1 through 101.5.3 shall not be applied in combination with each other.</p> <p>Exception: Subject to the approval of the code official, alterations complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural alteration as defined in Section 807.5.3. New structural members added as part of the repair or alteration shall comply with the <i>International Building Code</i>. Repairs and alterations of existing buildings in flood hazard areas shall comply with Sections 501.4 and 601.3, respectively.</p> <p>104.10 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the code official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the Department of Building Safety.</p> <p>104.10.1 Flood hazard areas. For existing buildings located in flood hazard areas for which the repairs, alterations, and additions constitute substantial improvement, the code official shall not grant modifications to provisions related to flood resistance unless a determination is made that</p> <ol style="list-style-type: none"> 1. The applicant has presented good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render compliance with the flood-resistant construction provisions inappropriate. 2. Failure to grant the modification would result in exceptional hardship. 3. The granting of the modification will not result in increased flood heights, additional threats to public safety, extraordinary public expense nor create nuisances, cause fraud on or victimization of the public or conflict with existing laws or ordinances. 4. The modification is the minimum necessary to afford relief, considering the flood hazard. 5. A written notice will be provided to the applicant specifying, if applicable, the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation and that construction below the design flood elevation increases risks to life and property.

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Existing Building Code</i></p> <p>continued from previous page</p> <p>continued on next page</p>	<p>109.3.3 Lowest floor elevation. For additions and substantial improvements to existing buildings in flood hazard areas, upon placement of the lowest floor, including basement, and prior to further vertical construction, the elevation documentation required in the <i>International Building Code</i> shall be submitted to the code official.</p> <p>DEFINITIONS</p> <p>Flood Hazard Area. The greater of the following two areas:</p> <ol style="list-style-type: none"> The area within a flood plain subject to a 1-percent or greater chance of flooding in any year, or The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated. <p>Historic Building. Any building or structure that is listed in the State or National Register of Historic Places; designated as a historic property under local or state designation, law, or survey; certified as a contributing resource within a National Register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the National or State Registers of Historic Places either individually or as a contributing building to a historic district by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places.</p> <p>Substantial Damage. For the purpose of determining compliance with the flood provisions of this code, damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.</p> <p>Substantial Improvement. For the purpose of determining compliance with the flood provisions of this code, any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure, before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:</p> <ol style="list-style-type: none"> Any project for improvement of a building required to correct existing health, sanitary, or safety code violations identified by the code official and that is the minimum necessary to assure safe living conditions, or Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure. <p>Chapter 3 Prescriptive Compliance Method</p> <p>Section 302 Additions, Alterations or Repairs</p> <p>302.1.1 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3 of the <i>International Building Code</i>, any additions, alterations or repairs that constitute substantial improvement of the existing structure, as defined in Section 1612.2 of the <i>International Building Code</i>, shall comply with the flood design requirements for new construction and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.</p>

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Existing Building Code</i></p> <p>continued from previous page</p>	<p>Chapter 11 Historic Buildings</p> <p>1101.4 Flood hazard areas. In flood hazard areas, if all proposed work, including repairs, work required because of a change of occupancy, and alterations, constitutes substantial improvement, then the existing building shall comply with Section 1612 of the <i>International Building Code</i>.</p> <p>Exception: If a historic building will continue to be a historic building after the proposed work is completed, then the proposed work is not considered to be a substantial improvement. For the purposes of this exception, a historic building is:</p> <ol style="list-style-type: none"> 1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or 2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or 3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior. <p>Chapter 12 Relocated or Moved Buildings</p> <p>1202.6 Flood hazard areas. If relocated or moved into a flood hazard area, structures shall comply with Section 1612 of the <i>International Building Code</i>.</p> <p>Chapter 13 Compliance Alternatives</p> <p>1301.3 Acceptance. For repairs, alterations, additions, and changes of occupancy to existing buildings that are evaluated in accordance with this section, compliance with this section shall be accepted by the code official.</p> <p>1301.3.3 Compliance with flood hazard provisions. In flood hazard areas, buildings that are evaluated in accordance with this section shall comply with Section 1612 of the <i>International Building Code</i> if the work covered by this section constitutes substantial improvement.</p>
<p>2009 <i>International Mechanical Code</i></p> <p>continued on next page</p>	<p>DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard area map.</p> <p>M301.13 [General Regulations] Flood hazard. For structures located in flood hazard areas, mechanical systems, equipment and appliances shall be located at or above the design flood elevation.</p> <p>Exception: Mechanical systems, equipment and appliances are permitted to be located below the design flood elevation provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in compliance with the flood-resistant construction requirements of the <i>International Building Code</i>.</p> <p>M301.13.1 High-velocity wave action. In flood hazard areas subject to high velocity wave action, mechanical systems and equipment shall not be mounted on or penetrate walls intended to break away under flood loads.</p>

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Mechanical Code</i></p> <p>continued from previous page</p>	<p>M401.4 [Ventilation, General] Intake opening location. Air intake openings shall comply with all of the following:</p> <p>4. Intake openings on structures in flood hazard areas shall be at or above the design flood level.</p> <p>M501.2.1 [Exhaust Systems, General] Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:</p> <p>4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the design flood level.</p> <p>M602.4 [Duct Systems, General] Flood hazard. For structures located in flood hazard areas, plenum spaces shall be located above the design flood elevation or shall be designed and constructed to prevent water from entering or accumulating within the plenum spaces during floods up to the design flood elevation. If the plenum spaces are located below the design flood elevation, they shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.</p> <p>M603.13 [Duct Construction and Installation] Flood hazard areas. For structures in flood hazard areas, ducts shall be located above the design flood elevation or shall be designed and constructed to prevent water from entering or accumulating within the ducts during floods up to the design flood elevation. If the ducts are located below the design flood elevation, the ducts shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.</p> <p>M1206.9.1 [Hydronic Piping, Piping installation] Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.</p> <p>M1305.2.1 [Fuel Oil System Installation] Flood hazard. All fuel oil pipe, equipment and appliances located in flood hazard areas shall be located above the design flood elevation or shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.</p>
<p>2009 <i>International Plumbing Code</i></p> <p>continued on next page</p>	<p>DESIGN FLOOD ELEVATION. The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard map.</p> <p>FLOOD HAZARD AREA. The greater of the following two areas:</p> <ol style="list-style-type: none"> 1. The area within a flood plain subject to a 1-percent or greater chance of flooding in any given year. 2. The area designated as a flood hazard area on a community’s flood hazard map, or otherwise legally designated.

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Plumbing Code</i></p> <p>continued from previous page</p>	<p>P309.1 [Flood Hazard Resistance] General. Plumbing systems and equipment in structures erected in flood hazard areas shall be constructed in accordance with the requirements of this section and the <i>International Building Code</i>.</p> <p>P309.2 Flood hazard. For structures located in flood hazard areas, the following systems and equipment shall be located at or above the design flood elevation.</p> <p>Exception: The following systems are permitted to be located below the design flood elevation provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.</p> <ol style="list-style-type: none"> 1. All water service pipes. 2. Pump seals in individual water supply systems where the pump is located below the base flood elevation. 3. Covers on potable water wells shall be sealed, except where the top of the casing well or pipe sleeve is elevated to at least 1 foot (304.8 mm) above the design flood elevation. 4. All sanitary drainage piping. 5. All storm drainage piping. 6. Manhole covers shall be sealed, except where elevated to or above the design flood elevation. 7. All other plumbing fixtures, faucets, fixture fittings, piping systems and equipment. 8. Water heaters. 8. Vents and vent systems. <p>309.3 Flood hazard areas subject to high-velocity wave action. Structures located in flood hazard areas subject to high-velocity wave action shall meet the requirements of Section 309.2. The plumbing systems, pipes and fixtures shall not be mounted on or penetrate through walls intended to breakaway under flood loads.</p>
<p>2009 <i>International Fuel Gas Code</i></p>	<p>DESIGN FLOOD ELEVATION. The elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map.</p> <p>FLOOD HAZARD AREA. The greater of the following two areas:</p> <ol style="list-style-type: none"> 1. The area within a floodplain subject to a 1 percent or greater chance of flooding in any given year. 2. The area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated. <p>FG301.11 Flood hazard. For structures located in flood hazard areas, the appliance, equipment and system installations regulated by this code shall be located at or above the design flood elevation and shall comply with the flood-resistant construction requirements of the <i>International Building Code</i>.</p> <p>Exception: The appliance, equipment and system installations regulated by this code are permitted to be located below the design flood elevation provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation and shall comply with the flood-resistant construction requirements of the <i>International Building Code</i>.</p>

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Private Sewage Development Code</i></p> <p>continued on next page</p>	<p>106.2.3 Site plan. Site plans shall be filed showing to scale the location of all septic tanks, holding tanks or other treatment tanks, building sewers, wells, water mains, water service, streams and lakes, flood hazard areas, dosing or pumping chambers, distribution boxes, effluent systems, dual disposal systems, replacement system areas, and the location of all buildings or structures. All separating distances and dimensions shall be shown, including any distance to adjoining property. A vertical elevation reference point and a horizontal reference point shall be indicated. For other than single-family dwellings, grade slope with contours shall be shown for the grade elevation of the entire area of the soil absorption system and the area on all sides for a distance of 25 feet (7620 mm).</p> <p>108.7 Unsafe systems. Any private sewage disposal system regulated by this code that is unsafe or that constitutes a health hazard, insanitary condition or is otherwise dangerous to human life is hereby declared unsafe. Any use of private sewage disposal systems regulated by this code constituting a hazard to safety, health or public welfare by reason of inadequate maintenance, dilapidation, obsolescence, disaster, damage or abandonment is hereby declared an unsafe use. Any such unsafe equipment is hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal.</p> <p>DESIGN FLOOD ELEVATION. The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard map.</p> <p>FLOOD HAZARD AREA. The greater of the following two areas:</p> <ol style="list-style-type: none"> 1. The area within a floodplain subject to a 1-percent or greater chance of flooding in any given year. 2. The area designated as a flood hazard area on a community’s flood hazard map or as otherwise legally designated. <p>303.1 [Flood Hazard Areas] General. Soil absorption sites shall be located outside of flood hazard areas. Exception: Where suitable soil absorption sites outside of the flood hazard area are not available, the soil absorption site is permitted to be located within the flood hazard area. The soil absorption site shall be located to minimize the effects of inundation under conditions of the design flood.</p> <p>303.2 Tanks. In flood hazard areas, tanks shall be anchored to counter buoyant forces during conditions of the design flood. The vent termination and service manhole of the tank shall be a minimum of 2 feet (610 mm) above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the design flood.</p> <p>303.3 Mound systems. Mound systems in flood hazard areas shall be prohibited.</p>

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Private Sewage Development Code</i></p> <p>continued from previous page</p>	<p>401.2 [General] Site evaluation. Site evaluation shall include soil conditions, properties and permeability, depth to zones of soil saturation, depth to bedrock, slope, landscape positions, all setback requirements and the presence of flood hazard areas. Soil test data shall relate to the undisturbed elevations, and a vertical elevation reference point or benchmark shall be established. Evaluation data shall be reported on approved forms. Reports shall be filed within 30 days of the completion of testing for all sites investigated.</p> <p>403.4 [Soil Borings and Evaluation] Alluvial and colluvial deposits. Subsurface soil absorption systems shall not be placed in alluvial and colluvial deposits with shallow depths, extended periods of saturation or possible flooding.</p> <p>406.1 [Site Requirements] Soil absorption site locations. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any nearby water well or reservoir on the same or adjoining property. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table 406.1. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.</p> <p>406.1.1 Flood hazard areas. The site shall be located outside of flood hazard areas.</p> <p>Exception: Where suitable sites outside of the flood hazard area are not available it is permitted for the site to be located within the flood hazard area. The site shall be located to minimize the effects of inundation under conditions of the design flood. 902.2 Prohibited locations. A mound system shall be prohibited on sites not having the minimum depths of soil specified in Table 902.2. The installation of a mound in a filled area shall be prohibited. A mound shall not be installed in a compacted area or over a failing conventional system.</p>
<p>2009 <i>International Fire Code</i></p> <p>continued on next page</p>	<p>Chapter 30 Compressed Gasses</p> <p>3003.16 Vaults. Generation, compression, storage and dispensing equipment for compressed gases shall be allowed to be located in either above- or below-grade vaults complying with Sections 3003.16.1 through 3003.16.14.</p> <p>3003.16.1 Listing required. Vaults shall be listed by a nationally recognized testing laboratory.</p> <p>Exception: Where approved by the fire code official, below-grade vaults are allowed to be constructed on site, provided that the design is in accordance with the <i>International Building Code</i> and that special inspections are conducted to verify structural strength and compliance of the installation with the approved design in accordance with Section 1707 of the <i>International Building Code</i>. Installation plans for below-grade vaults that are constructed on site shall be prepared by, and the design shall bear the stamp of, a professional engineer. Consideration shall be given to soil and hydrostatic loading on the floors, walls and lid; anticipated seismic forces; uplifting by ground water or flooding; and to loads imposed from above, such as traffic and equipment loading on the vault lid.</p> <p>3003.16.5 Anchoring. Vaults and equipment contained therein shall be suitably anchored to withstand uplifting by groundwater or flooding. The design shall verify that uplifting is prevented even when equipment within the vault is empty.</p>

Flood Resistance Provisions of the IEBC, IMC, IPC, IFGC, IPSDC and IFC.

Code	Excerpts From 2009 editions of IEBC, IMC, IPC, IFGC IPSDC and IFC
<p>2009 <i>International Fire Code</i></p> <p>continued from previous page</p>	<p>Section 3804 Location of Containers [LPG]</p> <p>3804.3 Container location. Containers shall be located with respect to buildings, public ways, and lot lines of adjoining property that can be built upon, in accordance with Table 3804.3.</p> <p>3804.3.1 Special hazards. Containers shall also be located with respect to special hazards such as above-ground flammable or combustible liquid tanks, oxygen or gaseous hydrogen containers, flooding or electric power lines as specified in NFPA 58, Section 6.4.5.</p>