

Acronyms

A

AAMA	American Architectural Manufacturers Association
ACI	American Concrete Institute
AF&PA	American Forest & Paper Association
AHJ	Authority Having Jurisdiction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASD	Allowable Stress Design
ASTM	American Society for Testing and Materials
AWPA	American Wood Protection Association

B

BCA	Benefit-Cost Analysis
BCEGS	Building Code Effectiveness Grading Schedule
BFE	base flood elevation
BUR	built-up roof

C

C&C	components and cladding
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CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resource System
CCM	Coastal Construction Manual
CEA	California Earthquake Authority
CMU	concrete masonry unit
CRS	Community Rating System

D

DASMA	Door & Access Systems Manufacturers Association
DFE	design flood elevation

E

EIFS	exterior insulating finishing system
ELF	Equivalent Lateral Force

F

FBC	Florida Building Code
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FM	Factory Mutual
FRP	fiber-reinforced polymer
FS	factor of safety

G

GSA	General Services Administration
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H

HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program

I

IBC	International Building Code
IBHS	Institute for Business and Home Safety
ICC	International Code Council
IRC	International Residential Code
ISO	Insurance Services Office

L

lb	pound(s)
LEED	Leadership in Energy and Environmental Design
LimWA	Limit of Moderate Wave Action
LPS	lightning protection system
LRFD	Load and Resistance Factor Design

M

MEPS	molded expanded polystyrene
mph	miles per hour
MWFRS	main wind force-resisting system

N

NAHB	National Association of Home Builders
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NAVD	North American Vertical Datum
NDS	National Design Specification
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NGVD	National Geodetic Vertical Datum
NRCA	National Roofing Contractors Association
NRCS	Natural Resources Conservation Service

O

o.c.	on center
OH	overhang
OSB	oriented strand board

P

PDM	Pre-Disaster Mitigation (Program)
plf	pound(s) per linear foot
psf	pound(s) per square foot
psi	pound(s) per square inch

S

SBC	Standard Building Code
SBS	styrene-butadiene-styrene
S-DRY	surface-dry lumber with ≤ 19 percent moisture content
SFHA	Special Flood Hazard Area
SFIP	Standard Flood Insurance Policy
SPRI	Single-Ply Roofing Institute

T

TMS The Masonry Society

U

UBC Uniform Building Code

UL Underwriters Laboratories

USACE U.S. Army Corps of Engineers

USDN U.S. Department of the Navy

USGBC U.S. Green Buildings Council

USGS U.S. Geological Survey

UV ultraviolet

W

WFCM Wood Frame Construction Manual

Wind-MAP Windstorm Market Assistance Program (New Jersey)

WPPC Wood Products Promotion Council

Y

yr year(s)

Glossary

0-9

100-year flood – See *Base flood*.

500-year flood – Flood that has as 0.2-percent probability of being equaled or exceeded in any given year.

A

Acceptable level of risk – The level of risk judged by the building owner and designer to be appropriate for a particular building.

Adjacent grade – Elevation of the natural or graded ground surface, or structural fill, abutting the walls of a building. See also *Highest adjacent grade* and *Lowest adjacent grade*.

Angle of internal friction (soil) – A measure of the soil’s ability to resist shear forces without failure.

Appurtenant structure – Under the National Flood Insurance Program, an “appurtenant structure” is “a structure which is on the same parcel of property as the principal structure to be insured and the use of which is incidental to the use of the principal structure.”

B

Barrier island – A long, narrow sand island parallel to the mainland that protects the coast from erosion.

Base flood – Flood that has as 1-percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.

Base Flood Elevation (BFE) – The water surface elevation resulting from a flood that has a 1 percent chance of equaling or exceeding that level in any given year. Elevation of the base flood in relation to a specified datum, such as the National Geodetic Vertical Datum or the North American Vertical Datum. The Base Flood Elevation is the basis of the insurance and floodplain management requirements of the National Flood Insurance Program.

Basement – Under the National Flood Insurance Program, any area of a building having its floor subgrade on all sides. (Note: What is typically referred to as a “walkout basement,” which has a floor that is at or above grade on at least one side, is not considered a basement under the National Flood Insurance Program.)

Beach nourishment – A project type that typically involve dredging or excavating hundreds of thousands to millions of cubic yards of sediment, and placing it along the shoreline.

Bearing capacity (soils) – A measure of the ability of soil to support gravity loads without soil failure or excessive settlement.

Berm – Horizontal portion of the backshore beach formed by sediments deposited by waves.

Best Practices – Techniques that exceed the minimum requirements of model building codes; design and construction standards; or Federal, State, and local regulations.

Breakaway wall – Under the National Flood Insurance Program, a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or supporting foundation system. Breakaway walls are required by the National Flood Insurance Program regulations for any enclosures constructed below the Base Flood Elevation beneath elevated buildings in Coastal High Hazard Areas (also referred to as Zone V). In addition, breakaway walls are recommended in areas where flood waters flow at high velocities or contain ice or other debris.

Building code – Regulations adopted by local governments that establish standards for construction, modification, and repair of buildings and other structures.

Building use – What occupants will do in the building. The intended use of the building will affect its layout, form, and function.

Building envelope – Cladding, roofing, exterior walls, glazing, door assemblies, window assemblies, skylight assemblies, and other components enclosing the building.

Building systems – Exposed structural, window, or roof systems.

Built-up roof covering – Two or more layers of felt cemented together and surfaced with a cap sheet, mineral aggregate, smooth coating, or similar surfacing material.

Bulkhead – Wall or other structure, often of wood, steel, stone, or concrete, designed to retain or prevent sliding or erosion of the land. Occasionally, bulkheads are used to protect against wave action.

C

Cladding – Exterior surface of the building envelope that is directly loaded by the wind.

Closed foundation – A foundation that does not allow water to pass easily through the foundation elements below an elevated building. Examples of closed foundations include crawlspace foundations and stem wall foundations, which are usually filled with compacted soil, slab-on-grade foundations, and continuous perimeter foundation walls.

Coastal A Zone – The portion of the coastal SFHA referenced by building codes and standards, where base flood wave heights are between 1.5 and 3 feet, and where wave characteristics are deemed sufficient to damage many NFIP-compliant structures on shallow or solid wall foundations.

Coastal barrier – Depositional geologic feature such as a bay barrier, tombolo, barrier spit, or barrier island that consists of unconsolidated sedimentary materials; is subject to wave, tidal, and wind energies; and protects landward aquatic habitats from direct wave attack.

Coastal Barrier Resources Act of 1982 (CBRA) – Act (Public Law 97-348) that established the Coastal Barrier Resources System (CBRS). The act prohibits the provision of new flood insurance coverage on or after October 1, 1983, for any new construction or substantial improvements of structures located on any designated undeveloped coastal barrier within the CBRS. The CBRS was expanded by the Coastal Barrier Improvement Act of 1991. The date on which an area is added to the CBRS is the date of CBRS designation for that area.

Coastal flood hazard area – An area subject to inundation by storm surge and, in some instances, wave action caused by storms or seismic forces. Usually along an open coast, bay, or inlet.

Coastal geology – The origin, structure, and characteristics of the rocks and sediments that make up the coastal region.

Coastal High Hazard Area – Under the National Flood Insurance Program, an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high-velocity wave action from storms or seismic sources. On a Flood Insurance Rate Map, the Coastal High Hazard Area is designated Zone V, VE, or V1-V30. These zones designate areas subject to inundation by the base flood, where wave heights or wave runup depths are 3.0 feet or higher.

Coastal processes – The physical processes that act upon and shape the coastline. These processes, which influence the configuration, orientation, and movement of the coast, include tides and fluctuating water levels, waves, currents, and winds.

Coastal sediment budget – The quantification of the amounts and rates of sediment transport, erosion, and deposition within a defined region.

Coastal Special Flood Hazard Area – The portion of the Special Flood Hazard Area where the source of flooding is coastal surge or inundation. It includes Zone VE and Coastal A Zone.

Code official – Officer or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative, such as a building, zoning, planning, or floodplain management official.

Column foundation – Foundation consisting of vertical support members with a height-to-least-lateral-dimension ratio greater than three. Columns are set in holes and backfilled with compacted material. They are usually made of concrete or masonry and often must be braced. Columns are sometimes known as posts, particularly if they are made of wood.

Components and Cladding (C&C) – American Society of Civil Engineers (ASCE) 7-10 defines C&C as “... elements of the building envelope that do not qualify as part of the MWFRS [Main Wind Force Resisting System].” These elements include roof sheathing, roof coverings, exterior siding, windows, doors, soffits, fascia, and chimneys.

Conditions Greater than Design Conditions – Design loads and conditions are based on some probability of exceedance, and it is always possible that design loads and conditions can be exceeded. Designers can anticipate this and modify their initial design to better accommodate higher forces and more extreme conditions. The benefits of doing so often exceed the costs of building higher and stronger.

Connector – Mechanical device for securing two or more pieces, parts, or members together, including anchors, wall ties, and fasteners.

Consequence – Both the short- and long-term effects of an event for the building. See *Risk*.

Constructability – Ultimately, designs will only be successful if they can be implemented by contractors. Complex designs with many custom details may be difficult to construct and could lead to a variety of problems, both during construction and once the building is occupied.

Continuous load paths – The structural condition required to resist loads acting on a building. The continuous load path starts at the point or surface where loads are applied, moves through the building, continues through the foundation, and terminates where the loads are transferred to the soils that support the building.

Corrosion-resistant metal – Any nonferrous metal or any metal having an unbroken surfacing of nonferrous metal, or steel with not less than 10 percent chromium or with not less than 0.20 percent copper.

D

Dead load – Weight of all materials of construction incorporated into the building, including but not limited to walls, floors, roofs, ceilings, stairways, built-in partitions, finishes, cladding, and other similarly incorporated architectural and structural items and fixed service equipment. See also *Loads*.

Debris – Solid objects or masses carried by or floating on the surface of moving water.

Debris impact loads – Loads imposed on a structure by the impact of floodborne debris. These loads are often sudden and large. Though difficult to predict, debris impact loads must be considered when structures are designed and constructed. See also *Loads*.

Deck – Exterior floor supported on at least two opposing sides by an adjacent structure and/or posts, piers, or other independent supports.

Design event – The minimum code-required event (for natural hazards, such as flood, wind, and earthquake) and associated loads that the structure must be designed to resist.

Design flood – The greater of either (1) the base flood or (2) the flood associated with the flood hazard area depicted on a community's flood hazard map, or otherwise legally designated.

Design Flood Elevation (DFE) – Elevation of the design flood, or the flood protection elevation required by a community, including wave effects, relative to the National Geodetic Vertical Datum, North American Vertical Datum, or other datum. The DFE is the locally adopted regulatory flood elevation. If a community regulates to minimum National Flood Insurance Program (NFIP) requirements, the

DFE is identical to the Base Flood Elevation (BFE). If a community chooses to exceed minimum NFIP requirements, the DFE exceeds the BFE.

Design flood protection depth – Vertical distance between the eroded ground elevation and the Design Flood Elevation.

Design stillwater flood depth – Vertical distance between the eroded ground elevation and the design stillwater flood elevation.

Design stillwater flood elevation – Stillwater elevation associated with the design flood, excluding wave effects, relative to the National Geodetic Vertical Datum, North American Vertical Datum, or other datum.

Development – Under the National Flood Insurance Program, any manmade 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.

Dry floodproofing – A flood retrofitting technique in which the portion of a structure below the flood protection level (walls and other exterior components) is sealed to be impermeable to the passage of floodwaters.

Dune – See *Frontal dune* and *Primary frontal dune*.

Dune toe – Junction of the gentle slope seaward of the dune and the dune face, which is marked by a slope of 1 on 10 or steeper.

E

Effective Flood Insurance Rate Map – See *Flood Insurance Rate Map*.

Elevation – Raising a structure to prevent floodwaters from reaching damageable portions.

Enclosure – The portion of an elevated building below the lowest floor that is partially or fully shut in by rigid walls.

Encroachment – The placement of an object in a floodplain that hinders the passage of water or otherwise affects the flood flows.

Erodible soil – Soil subject to wearing away and movement due to the effects of wind, water, or other geological processes during a flood or storm or over a period of years.

Erosion – Under the National Flood Insurance Program, the process of the gradual wearing away of land masses.

Erosion analysis – Analysis of the short- and long-term erosion potential of soil or strata, including the effects of flooding or storm surge, moving water, wave action, and the interaction of water and structural components.

Exterior-mounted mechanical equipment – Includes, but is not limited to, exhaust fans, vent hoods, air conditioning units, duct work, pool motors, and well pumps.

F

Federal Emergency Management Agency (FEMA) – Independent agency created in 1979 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response, and recovery. FEMA administers the National Flood Insurance Program.

Federal Insurance and Mitigation Administration (FIMA) – The component of the Federal Emergency Management Agency directly responsible for administering the flood insurance aspects of the National Flood Insurance Program as well as a range of programs designed to reduce future losses to homes, businesses, schools, public buildings, and critical facilities from floods, earthquakes, tornadoes, and other natural disasters.

Fill – Material such as soil, gravel, or crushed stone placed in an area to increase ground elevations or change soil properties. See also *Structural fill*.

Flood – Under the National Flood Insurance Program, either a general and temporary condition or 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;
- (3) mudslides (i.e., mudflows) that are proximately caused by flooding as defined in (2) and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when the earth is carried by a current of water and deposited along the path of the current; or
- (4) the collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in (1), above.

Flood-damage-resistant material – Any construction material capable of withstanding direct and prolonged contact (i.e., at least 72 hours) with flood waters without suffering significant damage (i.e., damage that requires more than cleanup or low-cost cosmetic repair, such as painting).

Flood elevation – Height of the water surface above an established elevation datum such as the National Geodetic Vertical Datum, North American Vertical Datum, or mean sea level.

Flood hazard area – The greater of the following: (1) the area of special flood hazard, as defined under the National Flood Insurance Program, or (2) the area designated as a flood hazard area on a community's legally adopted flood hazard map, or otherwise legally designated.

Flood insurance – Insurance coverage provided under the National Flood Insurance Program.

Flood Insurance Rate Map (FIRM) – Under the National Flood Insurance Program, an official map of a community, on which the Federal Emergency Management Agency has delineated both the special hazard areas and the risk premium zones applicable to the community. (Note: The latest FIRM issued for a community is referred to as the “effective FIRM” for that community.)

Flood Insurance Study (FIS) – Under the National Flood Insurance Program, 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 flood-related erosion hazards in a community or communities. (Note: The National Flood Insurance Program regulations refer to Flood Insurance Studies as “flood elevation studies.”)

Flood-related erosion area or flood-related erosion prone area – A land area adjoining the shore of a lake or other body of water, which due to the composition of the shoreline or bank and high water levels or wind-driven currents, is likely to suffer flood-related erosion.

Flooding – See *Flood*.

Floodplain – Under the National Flood Insurance Program, any land area susceptible to being inundated by water from any source. See also *Flood*.

Floodplain management – Operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

Floodplain management regulations – Under the National Flood Insurance Program, zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain ordinance, grading ordinance, and erosion control ordinance), and other applications of police power. The term describes State or local regulations, in any combination thereof, that promulgate standards for the purpose of flood damage prevention and reduction.

Floodwall – A flood retrofitting technique that consists of engineered barriers designed to keep floodwaters from coming into contact with the structure.

Footing – Enlarged base of a foundation wall, pier, post, or column designed to spread the load of the structure so that it does not exceed the soil bearing capacity.

Footprint – Land area occupied by a structure.

Freeboard – Under the National Flood Insurance Program, a factor of safety, usually expressed in feet above a flood level, for the purposes of floodplain management. Freeboard is intended to compensate for the many unknown factors that could contribute to flood heights greater than the heights calculated for a selected size flood and floodway conditions, such as the hydrological effect of urbanization of the watershed. Freeboard is additional height incorporated into the Design Flood Elevation, and may be required by State or local regulations or be desired by a property owner.

Frontal dune – Ridge or mound of unconsolidated sandy soil extending continuously alongshore landward of the sand beach and defined by relatively steep slopes abutting markedly flatter and lower regions on each side.

Frontal dune reservoir – Dune cross-section above 100-year stillwater level and seaward of dune peak.

G

Gabion – Rock-filled cage made of wire or metal that is placed on slopes or embankments to protect them from erosion caused by flowing or fast-moving water.

Geomorphology – The origin, structure, and characteristics of the rocks and sediments that make up the coastal region.

Glazing – Glass or transparent or translucent plastic sheet in windows, doors, skylights, and shutters.

Grade beam – Section of a concrete slab that is thicker than the slab and acts as a footing to provide stability, often under load-bearing or critical structural walls. Grade beams are occasionally installed to provide lateral support for vertical foundation members where they enter the ground.

H

High-velocity wave action – Condition in which wave heights or wave runup depths are 3.0 feet or higher.

Highest adjacent grade – Elevation of the highest natural or regraded ground surface, or structural fill, that abuts the walls of a building.

Hurricane – Tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or “eye.” Hurricane circulation is counter-clockwise in the northern hemisphere and clockwise in the southern hemisphere.

Hurricane clip or strap – Structural connector, usually metal, used to tie roof, wall, floor, and foundation members together so that they resist wind forces.

Hurricane-prone region – In the United States and its territories, hurricane-prone regions are defined by The American Society of Civil Engineers (ASCE) 7-10 as: (1) The U.S. Atlantic Ocean and Gulf of Mexico coasts where the basic wind speed for Risk Category II buildings is greater than 115 mph, and (2) Hawaii, Puerto Rico, Guam, the Virgin Islands, and American Samoa.

Hydrodynamic loads – Loads imposed on an object, such as a building, by water flowing against and around it. Among these loads are positive frontal pressure against the structure, drag effect along the sides, and negative pressure on the downstream side.

Hydrostatic loads – Loads imposed on a surface, such as a wall or floor slab, by a standing mass of water. The water pressure increases with the square of the water depth.

I

Initial costs – Include property evaluation, acquisition, permitting, design, and construction.

Interior mechanical equipment – Includes, but is not limited to, furnaces, boilers, water heaters, and distribution ductwork.

J

Jetting (of piles) – Use of a high-pressure stream of water to embed a pile in sandy soil. See also *Pile foundation*.

Jetty – Wall built from the shore out into the water to restrain currents or protect a structure.

Joist – Any of the parallel structural members of a floor system that support, and are usually immediately beneath, the floor.

L

Lacustrine flood hazard area – Area subject to inundation from lakes.

Landslide – Occurs when slopes become unstable and loose material slides or flows under the influence of gravity. Often, landslides are triggered by other events such as erosion at the toe of a steep slope, earthquakes, floods, or heavy rains, but can be worsened by human actions such as destruction of vegetation or uncontrolled pedestrian access on steep slopes.

Levee – Typically a compacted earthen structure that blocks floodwaters from coming into contact with the structure, a levee is a manmade structure built parallel to a waterway to contain, control, or divert the flow of water. A levee system may also include concrete or steel floodwalls, fixed or operable floodgates and other closure structures, pump stations for rainwater drainage, and other elements, all of which must perform as designed to prevent failure.

Limit of Moderate Wave Action (LiMWA) – A line indicating the limit of the 1.5-foot wave height during the base flood. FEMA requires new flood studies in coastal areas to delineate the LiMWA.

Littoral drift – Movement of sand by littoral (longshore) currents in a direction parallel to the beach along the shore.

Live loads – Loads produced by the use and occupancy of the building or other structure. Live loads do not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load, or dead load. See also *Loads*.

Load-bearing wall – Wall that supports any vertical load in addition to its own weight. See also *Non-load-bearing wall*.

Loads – Forces or other actions that result from the weight of all building materials, occupants and their possessions, environmental effects, differential movement, and restrained dimensional changes. Loads can be either permanent or variable. Permanent loads rarely vary over time or are of small magnitude. All other loads are variable loads.

Location – The location of the building determines the nature and intensity of hazards to which the building will be exposed, loads and conditions that the building must withstand, and building regulations that must be satisfied. See also *Siting*.

Long-term costs – Include preventive maintenance and repair and replacement of deteriorated or damaged building components. A hazard-resistant design can result in lower long-term costs by preventing or reducing losses from natural hazards events.

Lowest adjacent grade (LAG) – Elevation of the lowest natural or regraded ground surface, or structural fill, that abuts the walls of a building. See also *Highest adjacent grade*.

Lowest floor – Under the National Flood Insurance Program (NFIP), “lowest floor” of a building includes the floor of a basement. The NFIP regulations define a basement as “... any area of a building having its floor subgrade (below ground level) on all sides.” For insurance rating purposes, this definition applies even when the subgrade floor is not enclosed by full-height walls.

Lowest horizontal structural member – In an elevated building, the lowest beam, joist, or other horizontal member that supports the building. Grade beams installed to support vertical foundation members where they enter the ground are not considered lowest horizontal structural members.

M

Main Wind Force Resisting System (MWFRS) – Consists of the foundation; floor supports (e.g., joists, beams); columns; roof raters or trusses; and bracing, walls, and diaphragms that assist in transferring loads. The American Society of Civil Engineers (ASCE) 7-10 defines the MWFRS as “... an assemblage of structural elements assigned to provide support and stability for the overall structure.”

Manufactured home – Under the National Flood Insurance Program, a structure, transportable in one or more sections, built on a permanent chassis and designed for use with or without a permanent foundation when attached to the required utilities. Does not include recreational vehicles.

Marsh – Wetland dominated by herbaceous or non-woody plants often developing in shallow ponds or depressions, river margins, tidal areas, and estuaries.

Masonry – Built-up construction of building units made of clay, shale, concrete, glass, gypsum, stone, or other approved units bonded together with or without mortar or grout or other accepted methods of joining.

Mean return period – The average time (in years) between landfall or nearby passage of a tropical storm or hurricane.

Mean water elevation – The surface across which waves propagate. The mean water elevation is calculated as the stillwater elevation plus the wave setup.

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

Metal roof panel – Interlocking metal sheet having a minimum installed weather exposure of 3 square feet per sheet.

Minimal Wave Action area (MiWA) – The portion of the coastal Special Flood Hazard Area where base flood wave heights are less than 1.5 feet.

Mitigation – Any action taken to reduce or permanently eliminate the long-term risk to life and property from natural hazards.

Mitigation Directorate – Component of the Federal Emergency Management Agency directly responsible for administering the flood hazard identification and floodplain management aspects of the National Flood Insurance Program.

Moderate Wave Action area (MoWA) – See *Coastal A Zone*.

N

National Flood Insurance Program (NFIP) – Federal program created by Congress in 1968 that makes flood insurance available in communities that enact and enforce satisfactory floodplain management regulations.

National Geodetic Vertical Datum (NGVD) – Datum established in 1929 and used as a basis for measuring flood, ground, and structural elevations, previously referred to as Sea Level Datum or Mean Sea Level. The Base Flood Elevations shown on most of the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency are referenced to NGVD or, more recently, to the *North American Vertical Datum*.

Naturally decay-resistant wood – Wood whose composition provides it with some measure of resistance to decay and attack by insects, without preservative treatment (e.g., heartwood of cedar, black locust, black walnut, and redwood).

New construction – *For the purpose of determining flood insurance rates* under the National Flood Insurance Program, structures for which the start of construction commenced on or after the effective date of the initial Flood Insurance Rate Map or after December 31, 1974, whichever is later, including any subsequent improvements to such structures. (See also *Post-FIRM structure*.) *For floodplain management purposes*, new construction means structures for which the start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

Non-load-bearing wall – Wall that does not support vertical loads other than its own weight. See also *Load-bearing wall*.

Nor'easter – A type of storm that occurs along the East Coast of the United States where the wind comes from the northeast. Nor'easters can cause coastal flooding, coastal erosion, hurricane-force winds, and heavy snow.

North American Vertical Datum (NAVD) – Datum established in 1988 and used as a basis for measuring flood, ground, and structural elevations. NAVD is used in many recent Flood Insurance Studies rather than the National Geodetic Vertical Datum.

O

Open foundation – A foundation that allows water to pass through the foundation of an elevated building, which reduces the lateral flood loads the foundation must resist. Examples of open foundations are pile, pier, and column foundations.

Operational costs – Costs associated with the use of the building, such as the cost of utilities and insurance. Optimizing energy efficiency may result in a higher initial cost but save in operational costs.

Oriented strand board (OSB) – Mat-formed wood structural panel product composed of thin rectangular wood strands or wafers arranged in oriented layers and bonded with waterproof adhesive.

Overwash – Occurs when low-lying coastal lands are overtopped and eroded by storm surge and waves such that the eroded sediments are carried landward by floodwaters, burying uplands, roads, and at-grade structures.

P

Pier foundation – Foundation consisting of isolated masonry or cast-in-place concrete structural elements extending into firm materials. Piers are relatively short in comparison to their width, which is usually greater than or equal to 12 times their vertical dimension. Piers derive their load-carrying capacity through skin friction, end bearing, or a combination of both.

Pile foundation – Foundation consisting of concrete, wood, or steel structural elements driven or jetted into the ground or cast-in-place. Piles are relatively slender in comparison to their length, which usually exceeds 12 times their horizontal dimension. Piles derive their load-carrying capacity through skin friction, end bearing, or a combination of both.

Platform framing – A floor assembly consisting of beams, joists, and a subfloor that creates a platform that supports the exterior and interior walls.

Plywood – Wood structural panel composed of plies of wood veneer arranged in cross-aligned layers. The plies are bonded with an adhesive that cures when heat and pressure are applied.

Post-FIRM structure – For purposes of determining insurance rates under the National Flood Insurance Program, structures for which the start of construction commenced on or after the effective date of an initial Flood Insurance Rate Map or after December 31, 1974, whichever is later, including any subsequent improvements to such structures. This term should not be confused with the term new construction as it is used in floodplain management.

Post foundation – Foundation consisting of vertical support members set in holes and backfilled with compacted material. Posts are usually made of wood and usually must be braced. Posts are also known as columns, but columns are usually made of concrete or masonry.

Precast concrete – Structural concrete element cast elsewhere than its final position in the structure. See also *Cast-in-place concrete*.

Pressure-treated wood – Wood impregnated under pressure with compounds that reduce the susceptibility of the wood to flame spread or to deterioration caused by fungi, insects, or marine borers.

Premium – Amount of insurance coverage.

Primary frontal dune – Under the National Flood Insurance Program, a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

R

Rating factor (insurance) – A factor used to determine the amount to be charged for a certain amount of insurance coverage (premium).

Recurrence interval – The frequency of occurrence of a natural hazard as referred to in most design codes and standards.

Reinforced concrete – Structural concrete reinforced with steel bars.

Relocation – The moving of a structure to a location that is less prone to flooding and flood-related hazards such as erosion.

Residual risk – The level of risk that is not offset by hazard-resistant design or insurance, and that must be accepted by the property owner.

Retrofit – Any change or combination of adjustments made to an existing structure intended to reduce or eliminate damage to that structure from flooding, erosion, high winds, earthquakes, or other hazards.

Revetment – Facing of stone, cement, sandbags, or other materials placed on an earthen wall or embankment to protect it from erosion or scour caused by flood waters or wave action.

Riprap – Broken stone, cut stone blocks, or rubble that is placed on slopes to protect them from erosion or scour caused by flood waters or wave action.

Risk – Potential losses associated with a hazard, defined in terms of expected probability and frequency, exposure, and consequences. Risk is associated with three factors: threat, vulnerability, and consequence.

Risk assessment – Process of quantifying the total risk to a coastal building (i.e., the risk associated with all the significant natural hazards that may impact the building).

Risk category – As defined in American Society of Civil Engineers (ASCE) 7-10 and the 2012 International Building Code, a building's risk category is based on the risk to human life, health, and welfare associated with potential damage or failure of the building. These risk categories dictate which design event is used when calculating performance expectations of the building, specifically the loads the building is expected to resist.

Risk reduction – The process of reducing or offsetting risks. Risk reduction is comprised of two aspects: physical risk reduction and risk management through insurance.

Risk tolerance – Some owners are willing and able to assume a high degree of financial and other risks, while other owners are very conservative and seek to minimize potential building damage and future costs.

Riverine SFHA – The portion of the Special Flood Hazard Area mapped as Zone AE and where the source of flooding is riverine, not coastal.

Roof deck – Flat or sloped roof surface not including its supporting members or vertical supports.

S

Sand dunes – Under the National Flood Insurance Program, natural or artificial ridges or mounds of sand landward of the beach.

Scour – Removal of soil or fill material by the flow of flood waters. Flow moving past a fixed object accelerates, often forming eddies or vortices and scouring loose sediment from the immediate vicinity of the object. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports, where the obstruction of flow increases turbulence. See also *Erosion*.

Seawall – Solid barricade built at the water's edge to protect the shore and prevent inland flooding.

Setback – For the purpose of this Manual, a State or local requirement that prohibits new construction and certain improvements and repairs to existing coastal buildings in areas expected to be lost to shoreline retreat.

Shearwall – Load-bearing wall or non-load-bearing wall that transfers in-plane lateral forces from lateral loads acting on a structure to its foundation.

Shoreline retreat – Progressive movement of the shoreline in a landward direction; caused by the composite effect of all storms over decades and centuries and expressed as an annual average erosion rate. Shoreline retreat is essentially the horizontal component of erosion and is relevant to long-term land use decisions and the siting of buildings.

Single-ply membrane – Roofing membrane that is field-applied with one layer of membrane material (either homogeneous or composite) rather than multiple layers. The four primary types of single-ply membranes are chlorosulfonated polyethylene (CSPE) (Hypalon), ethylene propylene diene monomer (EPDM), polyvinyl chloride (PVC), and thermoplastic polyolefin (TPO).

Siting – Choosing the location for the development or redevelopment of a structure.

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

Start of construction (for other than new construction or substantial improvements under the Coastal Barrier Resources Act) – Under the National Flood Insurance Program, 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 the installation of streets or walkways; excavation for a basement, footings, piers, or foundations or the erection of temporary forms; or the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling 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.

State Coordinating Agency – Under the National Flood Insurance Program, the agency of the State government, or other office designated by the Governor of the State or by State statute to assist in the implementation of the National Flood Insurance Program in that State.

Stillwater elevation – The elevations of the water surface resulting solely from storm surge (i.e., the rise in the surface of the ocean due to the action of wind and the drop in atmospheric pressure association with hurricanes and other storms).

Storm surge – Water pushed toward the shore by the force of the winds swirling around a storm. It is the greatest cause of loss of life due to hurricanes.

Storm tide – Combined effect of storm surge, existing astronomical tide conditions, and breaking wave setup.

Structural concrete – All concrete used for structural purposes, including plain concrete and reinforced concrete.

Structural fill – Fill compacted to a specified density to provide structural support or protection to a structure. See also *Fill*.

Structure – *For floodplain management purposes* under the National Flood Insurance Program (NFIP), a walled and roofed building, gas or liquid storage tank, or manufactured home that is principally above ground. *For insurance coverage purposes* under the NFIP, structure 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 undergoing 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.

Substantial damage – Under the National Flood Insurance Program, damage to a building (regardless of the cause) is considered substantial damage if the cost of restoring the building to its before-damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial improvement – Under the National Flood Insurance Program, improvement of a building (such as reconstruction, rehabilitation, or addition) is considered a substantial improvement if its cost equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. This term includes structures that have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either (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 ensure

safe living conditions, or (2) any alteration of a “historic structure,” provided that the alteration will not preclude the structure’s continued designation as a “historic structure.”

Super typhoons – Storms with sustained winds equal to or greater than 150 mph.

T

Threat – The probability that an event of a given recurrence interval will affect the building within a specified period. See *Risk*.

Tornado – A rapidly rotating vortex or funnel of air extending groundward from a cumulonimbus cloud

Tributary area – The area of the floor, wall, roof, or other surface that is supported by the element. The tributary area is generally a rectangle formed by one-half the distance to the adjacent element in each applicable direction.

Tropical cyclone – A low-pressure system that generally forms in the tropics, and is often accompanied by thunderstorms.

Tropical depression – Tropical cyclone with some rotary circulation at the water surface. With maximum sustained wind speeds of up to 39 miles per hour, it is the second phase in the development of a hurricane.

Tropical disturbance – Tropical cyclone that maintains its identity for at least 24 hours and is marked by moving thunderstorms and with slight or no rotary circulation at the water surface. Winds are not strong. It is a common phenomenon in the tropics and is the first discernable stage in the development of a hurricane.

Tropical storm – Tropical cyclone that has 1-minute sustained wind speeds averaging 39 to 74 miles per hour (mph).

Tsunami – Long-period water waves generated by undersea shallow-focus earthquakes, undersea crustal displacements (subduction of tectonic plates), landslides, or volcanic activity.

Typhoon – Name given to a hurricane in the area of the western Pacific Ocean west of 180 degrees longitude.

U

Underlayment – One or more layers of felt, sheathing paper, non-bituminous saturated felt, or other approved material over which a steep-sloped roof covering is applied.

Undermining – Process whereby the vertical component of erosion or scour exceeds the depth of the base of a building foundation or the level below which the bearing strength of the foundation is compromised.

Uplift – Hydrostatic pressure caused by water under a building. It can be strong enough lift a building off its foundation, especially when the building is not properly anchored to its foundation.

V

Variance – Under the National Flood Insurance Program, grant of relief by a community from the terms of a floodplain management regulation.

Violation – Under the National Flood Insurance Program (NFIP), the failure of a structure or other development to be fully compliant with the community’s floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Sections 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) of the NFIP regulations is presumed to be in violation until such time as that documentation is provided.

Vulnerability – Weaknesses in the building or site location that may result in damage. See *Risk*.

W

Water surface elevation – Under the National Flood Insurance Program, the height, in relation to the National Geodetic Vertical Datum of 1929 (or other datum, where specified), of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

Wave – Ridge, deformation, or undulation of the water surface.

Wave height – Vertical distance between the wave crest and wave trough. Wave crest elevation is the elevation of the crest of a wave, referenced to the National Geodetic Vertical Datum, North American Vertical Datum, or other datum.

Wave overtopping – Occurs when waves run up and over a dune or barrier.

Wave runup – Is the rush of water up a slope or structure. Wave runup occurs as waves break and run up beaches, sloping surfaces, and vertical surfaces.

Wave runup depth – At any point is equal to the maximum wave runup elevation minus the lowest eroded ground elevation at that point.

Wave runup elevation – Is the elevation reached by wave runup, referenced to the National Geodetic Vertical Datum or other datum.

Wave setup – Increase in the stillwater surface near the shoreline due to the presence of breaking waves. Wave setup typically adds 1.5 to 2.5 feet to the 100-year stillwater flood elevation and should be discussed in the Flood Insurance Study.

Wave slam – The action of wave crests striking the elevated portion of a structure.

Wet floodproofing – A flood retrofitting technique that involves modifying a structure to allow floodwaters to enter it in such a way that damage to a structure and its contents is minimized.

Z

Zone A – Under the National Flood Insurance Program, area subject to inundation by the 100-year flood where wave action does not occur or where waves are less than 3 feet high, designated Zone A, AE, A1-A30, A0, AH, or AR on a Flood Insurance Rate Map.

Zone AE – The portion of the Special Flood Hazard Area (SFHA) not mapped as Zone VE. It includes the Moderate Wave Action area, the Minimal Wave Action area, and the riverine SFHA.

Zone B – Areas subject to inundation by the flood that has a 0.2-percent chance of being equaled or exceeded during any given year, often referred to the as 500-year flood. Zone B is provided on older flood maps, on newer maps this is referred to as “shaded Zone X.”

Zone C – Designates areas where the annual probability of flooding is less than 0.2 percent. Zone C is provided on older flood maps, on newer maps this is referred to as “unshaded Zone X.”

Zone V – See *Coastal High Hazard Area*.

Zone VE – The portion of the coastal Special Flood Hazard Area where base flood wave heights are 3 feet or greater, or where other damaging base flood wave effects have been identified, or where the primary frontal dune has been identified.

Zone X – Under the National Flood Insurance Program, areas where the flood hazard is lower than that in the Special Flood Hazard Area. Shaded Zone X shown on recent Flood Insurance Rate Maps (Zone B on older maps) designate areas subject to inundation by the 500-year flood. Unshaded Zone X (Zone C on older Flood Insurance Rate Maps) designate areas where the annual probability of flooding is less than 0.2 percent.

Zone X (Shaded) – Areas subject to inundation by the flood that has a 0.2-percent chance of being equaled or exceeded during any given year, often referred to the as 500-year flood.

Zone X (Unshaded) – Designates areas where the annual probability of flooding is less than 0.2 percent.

Index, Volume II

Bold text indicates chapter titles or major headings. Italicized page numbers indicates a figure or table.

A

Acceptable level of risk, 7-4
 Access to elevated buildings, 7-7, 8-6, 9-34, 9-38, 9-39
 Allowable Stress Design (ASD), 8-2, 8-17, 8-48, 8-55,
 Example 8.5, 8-74, 10-9, 10-13
 Anchor
 air-conditioning condenser, 12-4
 bolts, 9-11
 building envelope, 13-29
 concrete and masonry walls, 9-27, 15-5, 15-7
 corrosion of, 11-7, 11-13, 11-17, 12-3
 **exterior-mounted mechanical equipment in high
 winds, 12-2**
 hillside house bracing, 15-7
 hold-down, 15-6
 masonry chimney, 15-5, 15-7
 sill plate anchor bolts in foundations, 15-6
 split-level floor, 15-7
 stainless steel frame, 11-7, 11-13
 spacing, 9-11
 truss, 9-27
 Anchorage system, 7-17, 11-6
 Angle of internal friction, 10-9, 10-10, 10-15
Appurtenances, 9-38
 access to elevated buildings, 9-39
 decks and covered porches, 9-38
 handrails, 9-39
 pools and hot tubs, 9-40, 9-41
 stairways, 9-39
Attic vents, 11-50, 12-3, 14-5

B

Base flood, 7-10, 8-5, 8-6
 breakaway walls, 11-20
 erosion and subsidence as a result of, 8-8

 stillwater elevation of, 8-8
 Base flood elevation (BFE)
 building elements allowed below, 9-38
 buildings elevated above, 7-10, 7-19, 7-20, 9-30
 deck, 9-38
 designing for flood levels above, 7-10
 elevators, 9-40, 12-1
 flood-damage-resistant materials below, 9-34
 flood insurance rates for buildings above the, 7-16
 foundation, below the, 10-2
 freeboard above, 8-6, 8-10
 items below, covered by NFIP, 7-17
 FIRMS, BFEs on, 8-6
 wave setup included in, 8-15
 Basement, 7-14, 7-17, 7-19, 13-12, 15-6, 15-12, 15-13
 NFIP definition of, 7-13
 Beach nourishment, 7-7, 7-20, 8-11, Example 8.1
 Bearing capacity (*see* Soils)
 Benefit-cost model, 7-12
 BFE (*see* Base flood elevation)
 Blockage coefficient, 8-33
Breakaway walls, 7-8, 7-16, 9-1, 9-30, 11-20
 areas with no earthquake hazard, breakaway walls in,
 13-9
 collapse of, 11-21
 designing, 8-24
 enclosures, 7-16, 9-30, 11-20
 failure, 9-32
 flood and wind mitigation, 7-8
 flood openings in, 11-20
 foundation issues, 13-18
 garage doors in, 11-4
 high winds, 11-20
 inspection, 7-25
 not covered by NFIP, 7-18
 solid, 7-21
 utilities and wiring on, 12-7
 wave loads, 8-21

Building envelope, 13-29, 15-3

breach, 9-2

designing, 11-1

inspection points, 13-31

maintaining, 14-1

substitution of materials, 13-30

top building envelope issues for builders, 13-31

Buildings

Coastal A Zones, buildings in, 7-8, 8-24

coastal, with large number of windows and doors, 7-7

coastal residential, proper siting, design, and construction of, 7-1

costs, 7-6

elevated foundation, buildings on, 7-6

elevating, 7-7, 7-10

elevating, insurance discount points for, 7-20

envelope, 11-1 (*see also* Building envelope)

footprint, 7-12, 10-7

hazard insurance, 7-12, 7-13, 7-21, 7-24

height restrictions, 7-8, 7-13

inspection of, 7-25

L-shaped, 9-27

maintaining, 14-1**materials, 9-33**

materials, selection of, 9-33

performance and roof system, 11-24

residential, 7-1

SFHAs, buildings in, 7-13

site, 7-1, 7-2, 7-7, 7-11

site, inspection of, 7-25

slab-on-grade, 7-25

sustainable design of, 7-24

substantially damaged, 7-15

substantially improved, 7-16

use of, 7-2

Zone A, buildings in, 7-7, 7-15, 7-16, 7-19

Zone V, buildings in, 7-7, 7-10, 7-14, 7-16, 7-19

Zones B, C, and X, buildings in, 7-15

Building Code Effectiveness Grading Schedule (BCEGS), 7-22

Building materials, 9-33

above the DFE, 9-35

below the DFE, 9-34

combinations, 9-35

corrosion, 9-37

fire safety, 9-36

piles, 10-12

selection of, 9-33

Bulkhead, 7-17, 9-38

C

California Earthquake Authority (CEA), 7-24

Cast-in-place concrete, 13-10, 15-11

CBRA (*see* Coastal Barrier Resources Act of 1982)CBRS (*see* Coastal Barrier Resource System)CEA (*see* California Earthquake Authority)Cladding (*see also* Components and cladding), 7-9**Closed/shallow foundation, 10-35**

breakaway wall enclosures in, 9-30

buildings in, 7-8, 8-24

Coastal A Zone, 7-8, 10-2

flood loads in, 8-17, 8-37, 8-38, 8-44

flood openings in breakaway walls in, 11-20

foundation styles in, 7-8, 10-2, 10-3, 10-4, 10-5, 10-10,

10-34, 10-35, 10-36, 13-2, 13-5, 13-9, 13-12, 15-9

load combinations in, 8-38, 8-74, 8-75, Example 8.10, 8-77

masonry frames in, 9-27

septic systems in, 12-11

warning box, buildings in Coastal A Zones, 8-24

Coastal Barrier Resource System (CBRS), 7-15

Coastal Barrier Resources Act of 1982 (CBRA), 7-15

Coastal flood hazard areas, 7-15, 8-15, 13-9, 13-12 (*see also* Zone A)

Coastal flood zones, 8-17

Coastal hazards, 7-4, 9-2, 9-37, 10-45, 13-1

Coastal high hazard flooding, 7-14 (*see also* Zone V)

Coastal residential buildings

design, 8-1, 9-1, 10-1, 11-1Column foundation (*see* Foundation)

Community Rating System (CRS), 7-18

Components and cladding (C&C), 8-48, 8-51, 8-52, 8-61

calculating pressures, 8-50

definition from ASCE 7-10, 8-61

wind pressures of, 8-62

Concrete

bond beam, 9-12

cold weather, concrete in, 13-12

columns, 8-68, 10-31, 10-32, 10-33, 10-34

concrete/masonry construction, 9-27

cover, 13-11

damage-resistant to flooding, 13-19

decks, 11-37, 11-38

deterioration, 13-2

embedment of connectors, 9-35

fire-resistant, 7-22

floodwalls, 15-1

footings, 10-36, 10-37, 10-38

foundation, 9-30, 10-32, 10-33, 10-34, 13-2, 13-3,

13-10, 13-11, 13-19, 14-5, 14-12

house, 13-11

mat, 10-37

minimum cover, 13-11

- piers**, 9-34, **10-36**
- pile caps, 9-35
- piles**, 9-34, 10-4, **10-11**, 10-12, 10-15, 10-24, 13-7
- pool deck, 9-41
- pools, 9-40
- reinforced, 9-33
- roof decks, 11-37, 11-39
- roofs, 7-23, 11-50
- tile roofs, 11-38, 11-39
- walls, 9-11, 9-34, 11-7, 11-13, 11-16, 11-20, 11-24, 13-30, 15-5, 15-7, 15-12
- weight of, 8-17
- Connectors
 - column, 10-24
 - corrosion of metal connectors, 9-37
 - corrosion protection for metal connectors, 13-23
 - corrosion-resistant, 9-24
 - design event, connectors in, 13-19
 - failure of, 13-20
 - floor framing to support beam, 9-17
 - floor support beam to foundation, 9-19
 - metal, maintenance of, 14-10
 - roof framing to exterior wall, 9-8
 - roof sheathing to roof framing, 9-4, 9-6
 - roof to exterior wall, 9-8, 9-9, Example 9.2
 - roof-to-wall uplift, 8-54, Example 8.5
 - roof truss-to-masonry wall connection, 9-11
 - roof uplift connector loads, 8-52, 8-54, Example 8.5
 - structural, 13-19
 - wall sheathing to window header, 9-12, 9-13
 - wall to floor framing, 9-15
 - wall-to-floor, 8-66, Example 8.8
 - wall top plate-to-wall stud, 9-10
 - wall-to-roof, 8-66, Example 8.8
 - warning box, connections, 13-9
 - warning box, corrosion-prone sheet metal connectors, 14-11
 - warning box, nail selection and installation, 13-20
 - window header to exterior wall, 9-12, 9-13
 - wood pile-to-beam, 10-26
- Constructability, 13-17
- Construction, categories of
 - frame, 7-23
 - masonry 7-23
 - masonry veneer, 7-23
 - superior, 7-23
- Continuous load paths (*see* Loads)
- Contraction joint layout for slab-on-grade below elevated building, 9-42
- Corrosion, 14-2, 10-12, 11-7, 11-13, 11-18, 11-24, 11-38, 11-43
 - corrosion-prone sheet metal, 14-11
 - corrosion protection for metal connectors, 12-3, 13-23
 - deck connectors, 14-11
 - metal connectors, corrosion of, 9-37
 - nails in plywood panels, corrosion of, 11-5
- Corrosion-resistant, 9-25, 9-37
 - connectors, 9-24, 9-25, 11-48, 13-20
 - cost implications of, 7-9
 - materials, 9-33, 9-37
 - recommendations on connectors, 9-25
 - solid wood blocking, 13-23
- Costs
 - construction decisions, cost of, 7-8, 7-11
 - design decisions, cost of, 7-7, 7-11
 - erosion-control measures, cost of, 7-7
 - initial**, 7-6
 - long term**, 7-6
 - maintenance and repair, cost of, 14-2
 - natural hazards in coastal areas, cost of, 7-5
 - siting decisions, cost of, 7-7, 7-11
 - operational**, 7-6
- CRS (*see* Community Rating System)
- D**
 - Dead loads**, 8-3 (*see also* Loads)
 - Debris (*see also* Floodborne debris; Waterborne debris; Wind-borne debris)
 - floodborne debris, 8-3, 12-5, 12-7, 12-10
 - impact load calculation, 8-32, Equation 8.9
 - impact loads, 8-15, 8-31 (*see also* Loads)
 - velocity, 8-32
 - waterborne, 8-32
 - Decks
 - covered porches and, 9-38
 - maintenance, 14-9
 - warning box, decks, 9-38
 - Defensible space, 15-2
 - Depth coefficient, 8-32, 8-33
 - Design
 - breaking wave height, 8-15
 - building**, 9-1
 - building envelope**, 11-1
 - coastal environment, 7-2
 - flood, 8-5
 - flood conditions, 10-5
 - flood elevation (DFE), 7-11, 8-6
 - flood protection depth, 8-9
 - flood velocity, 8-15, 8-16, Equation 8.2
 - flood velocity vs. design stillwater flood depth, 8-17
 - foundation design criteria**, 10-2
 - framework, 7-3
 - process**, 7-2
 - requirements**, 7-3

- stillwater flood depth, 8-7, 8-9, 8-10, Equation 8.1
- stillwater flood depth calculations, 8-11, Example 8.1
- stillwater flood elevation, 8-10, 8-11, Equation 8.1
- sustainable building, 7-24**
- wind pressure, 8-58, Example 8.6, 8-66, Example 8.8
- wind pressure for low-rise buildings, 8-50, Equation 8.14
- Design flood
- relationship to base flood, 8-5, 8-6
- Design flood elevation (DFE), 7-11, 8-6
- building, elevating to, 15-8
 - community without, 7-25
 - design flood protection depth, 8-9
 - electric utility, telephone, and cable TV systems, placement of, 12-6, 13-1
 - elevating a building above, cost of, 7-11
 - exterior-mounted mechanical equipment, placement of, 12-5
 - flood damage-resistant materials below, 9-34
 - foundation, 10-5
 - freeboard, 8-5
 - generator, placement of, 12-9
 - inspection, 7-25
 - interior mechanical equipment, placement of, 12-6
 - materials above, 9-32, 9-35
 - materials below, 9-32, 9-34
 - non-100-year frequency-based, 8-10
 - non-submersible well pumps, placement of, 12-10
 - perimeter walls below, 10-3
 - piles, 13-5
 - pools, 9-40
 - utilities, 12-6
 - utilities and furnaces below, 15-12
- Design stillwater flood elevation, 8-10, Equation 8.1, 10-10
- DFE (*see* Design flood elevation)
- Diaphragm, 13-24
- floor framing, 13-24, 13-25
 - lateral diaphragm loads, 8-57, Example 8.6
 - loads, 8-52, 8-53
 - nailing schedule, 13-20
 - roof, 13-28, 13-29
 - shear, 13-18, 13-20
 - stiffening, 9-20
 - wall, 13-27
- Doors
- durability, 11-7
 - exterior, 11-4**
 - flashing, 11-8
 - frame attachment, 11-6
 - gap between threshold and door, 11-8
 - garage, 11-6
 - high winds, 11-6
 - loads and resistance, 11-6
 - sliding glass, 11-5
 - swing, 11-8
 - wall integration and, 11-8
 - water infiltration, 11-7
 - weatherstripping, 11-8
 - wind-borne debris and, 11-7
- Drag coefficients, 8-29
- Dry floodproofing, 15-11
- advantages and disadvantages of, 15-12
 - warning box, dry floodproofing, 15-11
- Dune
- frontal, 8-12, Example 8.1, 8-15, 8-38, Example 8.4
 - primary frontal, regulations for, 9-40
 - reservoir, 8-12, Example 8.1, 8-38, Example 8.4
 - toe, 8-14, Example 8.1, 8-38, Example 8.4
- Dynamic pressure coefficient, 8-23
- ## E
- EarthAdvantage, 7-24
- Earthquake (*see also* Seismic hazard; Seismic hazard area; Seismic mitigation)
- base shear, 8-69, Equation 8.15
 - building envelope, 11-3, 13-30
 - dead load, 8-3
 - elevating a building and damage from, 7-7
 - insurance, 7-13, 7-24
 - live load, 8-3, 8-73
 - load, 8-68, 8-70, Example 8.9
 - low-sloped roofs, 11-49
 - mitigation, 15-5
 - multihazard mitigation, 15-14
 - non-load-bearing walls, wall coverings, and soffits, 11-24
 - open masonry foundation, 13-8
 - piles, 14-12
 - reinforced masonry foundation, 13-10
 - roof framing, 13-27
 - roof tiles, 11-45
 - vertical distribution of seismic forces, 8-70, Equation 8.16
- Eaves, 11-31, 11-32, 11-38
- pressures, 8-48
 - top building envelope issues for builders, 13-31
 - wildfire mitigation, 15-4
- EIFS (*see* Exterior insulating finishing system)
- Electric utility, telephone, and cable TV systems, 12-6**
- design, 12-7
 - electric service meters, damaged, 12-7
 - emergency power, 12-9
 - routing and installation, 12-7, 12-8
 - wiring methods, 12-7

- Elevation, 15-8
 advantages and disadvantages of, *15-9*
 above BFE, 7-10, *7-19*, *7-20*
 design flood, 8-6
 required, 7-8
- Elevators, 9-39, 12-1**
 accessory equipment, 12-2
 enclosure, 12-2
 installation, 9-40
 negative discount points, below the BFE, 7-21
 NFIP coverage, 7-18
 one- to four-family residential structures, 9-40
 safety, 12-2
 shaft, 12-2
- Embedment, 7-8
 connectors, 9-35
 piles, 7-8, 7-21, 7-25, 8-3, 10-12, *10-13*, 10-20, *10-21*,
10-23, 13-6, 14-12
 treated timber piles, 10-25
 wood piles, 10-15, *10-18*
- Emergency generator, size of, 12-9
 warning box, backfeeding emergency power, 12-10
- Enclosure
 below the BFE, 7-14
 below the lowest floor, 7-14, 7-16
 breakaway walls, 7-8
 breaking wave load on vertical walls, 8-23
 flood and wind mitigation, 7-8
 inspection points, 7-25
 localized scour around, 8-36, 8-37, Equation 8.12
 NFIP requirements, 7-16, 7-17, 7-180
- EnergyStar, 7-24
- Erosion, 7-1, 7-7, 7-8, 7-10, *10-4*
 control device, 7-20
 depth, 10-5
 during base flood, 8-8
 during design flood, 8-10
 effect on flood hazard, 8-7
 effect on ground elevation, 8-8
 flood and wind mitigation, 7-8
 flood loads and, 8-5
 hazard areas, 7-7
 long-term, 7-7, 8-7, 8-11, Example 8.1
 primary frontal dune, 8-15
 short-term
 warning box, erosion, long-term and storm-induced,
 13-6
 wind-induced, 7-7
- Exterior doors, 11-4**
 Exterior insulating finishing system (EIFS), 11-16, 11-19
- Exterior-mounted mechanical equipment, 12-2**
 air-conditioning condenser, damaged, *12-4*
 air-conditioning condenser, elevation of, *12-4*
 flooding, 12-3
 high winds, 12-2
 maintenance, 14-9
 seismic events, 12-6
- F**
- 500-year flood
 elevation, 8-6
 safe rooms, 8-67
- FAIR Plan, 7-21
- Fasteners, 7-9, 8-64, 9-6, 9-11, 9-24, 13-10
 corrosion, 11-4, *11-48*, 14-2, *14-5*, 14-6
 corrosion resistant, 9-38
 felt, 11-28
 flood and wind mitigation, 7-9
 frame, 11-6, 11-10
 galvanized, 9-35
 heads, *11-43*
 laminated, *11-35*
 mechanical, 11-19
 metal, 7-9, 9-25, 9-37, 14-9
 shingle, 11-25, 11-30, *11-35*, 11-37
 siding, 11-17
 slate, 11-47
 spacing, 9-4
 stainless steel, 11-23, 11-47, 11-48, 12-3
 substitution, 13-28
 tie, 11-18, 11-19
 tile, 11-43
 vertical, 13-14
 wood frame building, 13-20
- Fill (*see* Structural fill), 7-8
- Fire sprinkler systems, 12-12
- FIRM (*see* Flood Insurance Rate Map)
- Flashing, 7-8, 11-21
 door and window, 11-22
 roof-to-wall, 11-22
 deck-to-wall, 11-22
- Flood
 depth parameters, 8-9
 depth, wave setup contribution to, 8-15
 design, 8-5
 design flood elevation, 8-6
 insurance, 7-10, 7-13 (*see also* National Flood Insurance
 Program)
 load calculation, 8-44, Worksheets 1, 2
 load combinations, 8-37, 8-38, Example 8.4
 loads, 8-5
mitigation measures, 7-8, 15-8 (*see also* Flood
 mitigation)
 velocities during tsunamis, 8-15

- Floodborne debris
 dead load, 8-3
 electric service, 12-7
 piles, 12-5
 water supply line riser, 12-10
- Flood damage-resistant material, 9-36, 10-2, 12-2, 13-18
 inspection considerations, 7-26
flood mitigation, 15-8, 15-13
- Flood elevation, 8-5
 advisory, 8-7
 design stillwater, 8-10
 regulatory, 8-6
- Flood hazard area
 elevators, 9-40
 safe rooms, 8-68
- Flood insurance (*see also* National Flood Insurance Program)
- Flood Insurance Rate Map (FIRM), 7-4, 7-10, 7-14, 7-15
 BFE, 8-6
 NFIP, 7-15, 7-19
 pre-FIRM, 7-15
 post-FIRM, 7-15, 7-16, 7-17, 7-19
 use of, 8-6, 8-10
- Flood Insurance Study (FIS) (*see also* National Flood Insurance Program), 7-4, 8-10
 500-year flood elevation, 8-6
Flood mitigation, 7-8, 15-8
 dry floodproofing, 15-11, 15-12
 elevation, 15-8, 15-9
 floodwalls and levees, 15-13, 15-14
 multihazard mitigation, 15-16
 relocation, 15-10
 wet floodproofing, 15-12, 15-13
- Floodproofing (*see* Dry floodproofing; Wet floodproofing)
- Flooding (*see* Flood)
- Floodplain
 100-year (*see* Base flood), 7-15, 8-5, 8-6, 8-10
 500-year, 8-67
 administrator, 7-16
 crawlspaces, 14-4
 elevators, 12-2
 inspection, 7-25
 management program, 7-18
 management regulations, 7-16, 7-17, 12-6
 managers, 7-25, 9-40
 NFIP regulations, 7-15
 ordinances, 8-18, 9-40
 relocation out of, 15-10
 septic systems, 12-11
- Flood retrofitting (*see* flood mitigation)
- Floodwalls, 15-13
 advantages and disadvantages of, 15-14
 warning box, floodwalls and levees, 15-14
- Flood zones, 7-19, 10-5
- Floor framing, 13-23
 horizontal beams and girders, 13-24
 inspection points, 13-25
 substitution of materials, 13-25
- Floors
elevated buildings, floors in, 11-4
 framing, 13-23 (*see also* Floor framing)
 framing to support beam connection, 9-17
 lowest floor below the BFE, 9-34
 support beam to foundation connection, 9-18, 9-19
- Footings
 continuous, 9-27, 10-37, 10-45, 14-12
- Force
 hydrostatic, 8-18, Equation 8.3, 8-19
 vertical hydrostatic, 8-19, Equation 8.4, 8-20
- Foundations** (*see also* Foundation construction), **10-1**
 column, 7-8
 closed, 10-3
 closed, failure of, 10-4
closed/shallow, 10-35
construction, 13-2 (*see also* Foundation construction)
design, 10-1
design criteria, 10-2
design process, 10-10
design requirements and recommendations, 10-4
 deep, 10-4
 erosion, long- and short-term, 10-5
 open, 7-8, 10-3
open/deep, 10-25 (*see also* Open/deep foundation)
open/shallow, 10-34 (*see also* Open/shallow foundation)
 perimeter wall, 7-8
pile, 7-8, 10-11 (*see also* Pile foundation; Foundation construction)
pier, 7-8, 10-36 (*see also* Pier foundation)
 shallow, 10-4
 site considerations, 10-5
 site elevation, 10-5
 site soils, 10-5
 soils data, 10-5
 style selection, 10-5
styles, 10-2
 styles in coastal areas, 10-3
- Foundation construction, 13-2**
 concrete, 13-10, 13-11
 field preservative treatment, 13-17
 inspection points, 13-18
 layout, 13-2, 13-3
 masonry, 13-8, 13-9, 13-10
 material durability, 13-13
 pile driving resistance, 13-8
 piles, 13-3, 13-4, 13-5, 13-6

substitutions, 13-17
 top foundation issues for builders, 13-18
 wood, 13-12

Framing system
 floor, 13-23
 townhouse, 9-37
 steel frame on wood piles, 9-36

Freeboard
 100-year flood, 8-10
 design flood elevation, 8-6, 8-11, Example 8.1
 NFIP requirements, 8-6
 required by community, 8-6
 terminology box, 8-5
 wave slam, 8-25

G

Gable
 braced gable frames, 9-28
 end bracing, 9-26, 13-29
 end failure, 9-2, 9-25, 9-31
 gable edge, 13-27, 13-31
 gable end overhangs, 13-27, 15-18, 15-19
 gable end vents, 11-52
 gable end walls, 15-20
 masonry, 9-28
 roof, 8-52, 8-61, 9-30
 wall support, 9-21, 9-24

Garage doors
 attachment to frame, 11-6
 blown out of tracks, 11-6
 breakaway walls, garage doors in, 11-4
 exterior doors, 11-4
 open-front bracing, 15-7
 wind mitigation, 8-61, 15-19

Glazing (*see also* Windows), 11-9
 impact-resistant, 7-7, 7-24, 8-49, 9-39
 maintenance of, 14-7
 protection from debris, 7-8, 11-10, 11-12, 15-19
 wind-driven rain and, 7-7, 11-14

Grade beam, 8-35, 10-11, 10-12, 10-18
 concrete column and grade beam foundation, 10-32
 continuous, 10-34
 open/deep pile foundations, 10-31
 pier foundations, 10-36
 pile foundations, 10-23
 scour around, 8-35, 8-36, Equation 8.11a, 10-26
 timber pile treatment, 10-31
 treated timber pile foundation, 10-25, 10-32

Green building programs, 7-24

Groundwater
 septic tanks, 12-11

Gutter
 blow-off, 11-25

H

100-year stillwater flood elevation, 8-8, 8-15

Hail, 7-13, 7-21, 11-15, 11-36, 11-37, 11-38, 11-45, 11-46, 11-48, 11-49, 11-50

Handrails, 9-39

Hazard insurance, 7-12
 earthquake, 7-24
 flood, 7-13
 wind, 7-21

High-Velocity Hurricane Zone, 11-7

High-wind mitigation, 15-15
 Advanced Mitigation Package, 15-19
 Basic Mitigation Package, 15-17
 evaluating existing homes, 15-16
 FEMA wind retrofit grant programs, 15-19
 Intermediate Mitigation Package, 15-19
 wind retrofit mitigation packages, 15-16

Hurricane-prone region
 terminology box, 8-49

Hurricanes, 15-16
 Andrew, 7-5, 9-2, 9-25, 11-1, 11-38
 Bertha, 11-48
 Charley, 7-5, 9-3, 9-4, 11-1, 11-3, 11-5, 11-6, 11-9, 11-13, 11-23, 11-25, 11-26, 11-39, 11-40, 11-41, 11-42
 Eloise, 7-4
 Fran, 9-2
 Frances, 7-5
 Georges, 11-1, 11-9, 11-37, 12-4
 Hugo, 9-32, 11-1
 Ike, 7-5, 8-35, 11-1
 Iniki, 11-1
 Ivan, 7-5, 11-1, 11-43
 Jeanne, 7-5
 Katrina, 7-5, 8-6, 9-4, 10-2, 10-13, 10-24, 10-36, 10-37, 11-1, 11-46, 11-47
 Marilyn, 9-30, 9-31, 11-1, 12-9
 Opal, 9-32, 12-7
 Rita, 7-5
 Wilma, 7-5

Hydrodynamic load, 8-5, 8-15, 8-28, 8-29, Equation 8.8
 piles vs. breaking wave load on piles, 8-30, Example 8.3

Hydrostatic load, 8-17
 lateral, 8-18, Equation 8.3a

Hydrostatic force
 lateral, 8-18, Equation 8.3b
 vertical, 8-19, Equation 8.4

I

IBHS (*see* Insurance Institute for Business and Home Safety)

Ice

- loads, 11-25
- sealant systems, 15-11
- waterborne, 15-14

Initial costs, 7-6

Insurance (*see* Hazard insurance)

Insurance Institute for Business and Home Safety (IBHS), 7-5, 7-21, 15-2, 15-16

Insurance Services Office (ISO), 7-22, 7-23

Interior mechanical equipment, 12-6

Inspection, 7-25

- building envelope, 13-31
- floor framing, 13-25
- roof framing, 13-28, 13-29
- wall framing, 13-27

ISO (*see* Insurance Services Office)

J

Jalousie louvers, 11-13, 11-14

Jetting, of piles, 10-20, 10-21, 13-7

Joints

- tooled concave and V-joints, 13-9

Joists

- floor, 13-23, 13-24, 14-5

L

Landslide, 10-6

Lateral wave slam, 8-25, 8-26, Equation 8.7

Lattice, 9-33

Leadership in Energy and Environmental Design (LEED), 7-11, 7-24

LEED (*see* Leadership in Energy and Environmental Design)

Levees, 15-13

- advantages and disadvantages of, 15-14
- warning box, floodwalls and levees, 15-14

Limit of Moderate Wave Action (LiMWA), 8-37, 8-74, 8-77, Example 8.10

- terminology box, 10-2

LiMWA (*see* Limit of Moderate Wave Action)

Liquid-applied membranes, 11-37

Live loads, 8-3 (*see also* Loads)

Load-bearing wall

- exterior, 9-36

Load combinations, 8-73

Load and Resistance Factor Design (LRFD), 8-2

Loads

- breaking wave loads on vertical piles, 8-21, Equation 8.5
- breaking wave loads on vertical walls, 8-22,

Equation 8.6

combinations, 8-73, 8-75, Example 8.10

combination computation worksheet, 8-80

concrete/masonry framing system, 9-27, 9-29

continuous load path, 9-1, 15-20

dead, 8-3

debris impact, 8-31, 8-32, Equation 8.9

determining for flood, wind, and seismic events, 8-2

diaphragm, 8-52

flood, 8-5, 8-15

flood load combinations, 8-37, 8-38, Example 8.4

floor load computation worksheet, 8-44, 8-46

floor diaphragm, 8-60, Example 8.6

floor support beam to pile, uplift load path, 9-19,

Example 9.6

floor to support beam framing, uplift load path, 9-18,

Example 9.5

gable wall support, 9-24

hydrodynamic, 8-28, 8-29, Equation 8.8

hydrostatic, 8-17

ice, 11-25

L-shaped building, 9-27

lateral connector loads from wind and building end zones, 8-62, 8-63

lateral connector loads for wall-to-roof and wall-to-floor connections, 8-66, Example 8.8

lateral hydrostatic, 8-18, Equation 8.3

live, 8-3

moment-resisting frames, 9-28, 9-29

path, 9-5, 9-21

path failure, 9-2, 9-3

platform framing, 9-28

roof shape, 9-30

roof sheathing suction, 8-64, Example 8.7

roof-to-wall uplift connection, 8-54, Example 8.5

roof uplift connector, 8-52, 8-53, 8-54, Example 8.5

seismic, 8-68, 8-70, Example 8.9

site-specific, 8-1

snow, 8-5

tornado, 8-67

tsunami, 8-47

tributary area, 8-4, 8-53, 9-14, Example 9.3

uplift, 7-24, 8-5, 8-61, 9-1, 9-10, 10-1, 10-15, 10-42, 11-33, 11-37, 13-7

uplift due to shear wall overturning, 9-21, Example 9.7, 9-24

wall sheathing suction, 8-64, Example 8.7

wall-to-floor framing, uplift and lateral load path, 9-15, Example 9.4

- wave, 8-20
 - wave slam, 8-25
 - wind, 8-47**
 - wind, determining, 8-49
 - window header, uplift and lateral load path, 9-14, Example 9.3
 - Localized scour, 8-34
 - Losses from natural hazards in coastal areas, 7-5
 - Lowest floor
 - below the BFE, 9-34
 - corrosion below, 14-2
 - DFE, 15-8
 - elevation of, 7-8, 7-10, 7-14, 7-15, 7-16, 7-20, 8-6, 8-28, 15-8
 - elevator, 9-40, 10-5
 - enclosures below, 7-16, 7-17
 - flood damage above, 7-10
 - inspection, 7-25
 - penalties related to areas below the lowest floor, 7-16
 - piles, 10-25
 - pool, 9-40
 - Zone A, lowest floor in, 7-15
 - Zone V, lowest floor in, 7-15
 - Lowest horizontal structural member, 7-8,, 7-14, 7-15, 7-16, 10-23, 13-5
- M**
- Main wind force resisting system (MWFRS), 8-48, 8-52
 - determining pressures, 8-49, 8-51
 - elements of shear walls and roof diaphragms, 8-61
 - Maintenance, 14-1, 14-5**
 - decks and exterior wood, 14-9
 - exterior-mounted mechanical and electrical equipment, 14-9
 - glazing, 14-7
 - inspection checklist, 14-5
 - metal connectors, 14-10
 - roofs, 14-8
 - siding, 14-7
 - techniques, 14-11** (*see also* Maintenance techniques)
 - Maintenance techniques, 14-11**
 - flooding, 14-12
 - seismic and wind, 14-12
 - Manufactured home, 7-14
 - Masonry
 - building material, 9-33
 - buildings, 7-22
 - chimneys, 15-5, 15-7
 - concrete masonry unit (CMU), 11-16, 11-20
 - construction, 9-12, 9-27, 9-32
 - deterioration, 13-2
 - exterior walls, 7-23, 9-27
 - foundation, 9-30, 13-3, 13-8, 13-18, 14-5
 - frames, 9-27
 - gables, 9-28
 - grouted masonry cell, 9-11
 - joints, 13-8
 - materials, 9-35, 10-36, 15-14
 - piers, 9-34
 - termites, 11-13
 - unreinforced masonry walls, 8-24
 - vener, 7-23, 14-6
 - walls, 9-11, 11-7, 13-30, 15-5
 - MEPS (*see* Molded expanded polystyrene)
 - Metal connectors (*see also* Fasteners), 7-9
 - maintenance, 14-10
 - Metal roof panel, 11-45
 - Mitigation
 - elevation, 15-8, 15-9
 - flood, 7-8, 15-8** (*see also* Flood mitigation)
 - floodwalls and levees, 15-13
 - high wind, 15-15** (*see also* High wind mitigation)
 - multihazard, 15-14
 - relocation, 15-10
 - retrofitting, 15-2
 - seismic, 15-5** (*see also* Seismic mitigation)
 - wildfire, 15-2**
 - wind, 7-8
 - Moisture, 9-35, 11-28, 12-11
 - barrier, 11-16, 11-22, 13-9
 - corrosion, 14-2
 - exterior, 14-3
 - framing construction, 13-14
 - inspection, 13-18, 13-27, 13-29, 14-6
 - interior, 14-3
 - intrusion, 9-33, 11-20, 13-1, 13-8
 - penetration or retention, 13-9
 - stairs, 13-16
 - sustainable design considerations, 7-24
 - termites, 14-4
 - Molded expanded polystyrene (MEPS), 11-19
 - Municipal water connections, 12-12
 - MWFRS (*see* Main wind force resisting system)
- N**
- NAHB (*see* National Association of Home Builders)
 - National Association of Home Builders (NAHB), 7-24
 - National Flood Insurance Program (NFIP), 7-13
 - building occupancy, 7-14
 - building type, 7-14
 - contents, 7-17
 - covered items, 7-17

date of construction, 7-15
 discount points, 7-20
 elevation of lowest floor or bottom, 7-16
 enclosures below lowest floor, 7-16
 flood insurance zone, 7-14
 flood rating factors, 7-13
 foundations, 10-4
 lowering premiums, 7-20
 lowest horizontal structural member of lowest floor, 7-16
 non-covered items, 7-18
 premiums, 7-19, 7-20
 regulations, 7-8
 replacement value, 7-17
 warning box, differences between floodplain management regulations and NFIP flood insurance, 7-16

Natural hazard risk in coastal areas, 7-3

losses from natural hazards in coastal areas, 7-5

New construction, 9-34, 10-11, 11-52, 12-1
 NFIP (*see* National Flood Insurance Program)
 Non-coastal flood zone
 flood loads in, 8-17

Non-load-bearing walls, wall coverings, and soffits, 11-15

breakaway walls, 11-20, 11-21
 brick veneer, 11-18
 concrete and CMU, 11-20
 durability, 11-23
 exterior walls, 11-16
 exterior insulating finish system (EIFS), 11-19
 exterior insulating finish system (EIFS), blown off, 11-20
 fiber-cement siding, blown off, 11-18
 flashings, 11-21
 high winds, 11-16
 seismic, effects of, 11-24
 siding, 11-17
 soffits, 11-22
 vinyl siding, blown off, 11-17
 Nor'easter, 7-6, 15-15

O

100-year flood (*see* Base flood), 8-5, 8-6, 8-10

Open/deep foundation, 10-25

diagonal bracing, 10-27, 10-28, 10-29, Example 10.2
 knee bracing, 10-30
 pile bracing, 10-27
 reinforced concrete beams and columns, 10-33
 steel pipe pile and grade beam, 10-32
 timber pile treatment, 10-25, 10-26, 10-30
 treated timber piles and grade beams, 10-32

wood pile-to-beam connections, 10-26

Open/shallow foundation, 10-34

Operational costs, 7-2, 7-6, 7-7

OSB (*see* Oriented strand board)

Oriented strand board (OSB)

factory-applied wax, 11-27

rotted, 11-22

sheathing, 11-16

Overwash, 7-7

P

Panels

plywood, 11-4, 11-5

Pier foundation, 7-8, 10-36, 10-38

footing under gravity load, 10-41, Example 10.3

footing under uplift and lateral loads, 10-44, Example 10.5

footing under uplift load, 10-42, Example 10.4

soil pressure, 10-43, Equation 10.6

spread footing and, 10-38, 10-39

square footing size for gravity loads, 10-40, Equation 10.5

Pile foundation, 10-11

augering, 10-20, 13-7

bearing capacity, 10-14

compression capacity of, 10-12, 10-14, Equation 10.2

column connection failure, 10-24

concrete, 10-12

driving, 10-20

earth pressure coefficient, 10-14

effects of scour and erosion on, 10-21, 10-23

embedment, insufficient, 10-13

grade beams for, 10-23

installation, 10-20

installation methods, 10-20, 10-21

jetting, 10-20

lateral capacity, 10-18, 10-19, Equation 10.4, 10-19

modulus of subgrade reaction, 10-19

scouring around grade beams, 10-25

steel, 10-12

tension capacity, 10-15, Equation 10.3

wood, 10-12, 10-16, Example 10.1, 10-18

Pile notching, 7-21, 10-26, 10-31, 13-4, 13-5, 13-15, 13-18, 13-21, 13-22, 13-23

Platform framing, 9-27, 9-28

Plywood, 11-4, 11-16, 11-23, 13-12, 13-14, 13-23

decks, 11-37

inspection, 13-18, 13-27, 13-29

sheathing, 11-44, 13-26

untreated, 14-12

UV degradation, 14-7

- Pneumatic nail guns, 13-20
- Pools
- coastal high hazard areas, pools in, 9-40
 - hot tubs and, 9-40, 9-41, 9-42
 - insurance coverage, 7-17, 7-18
 - Zone V, pools in, 9-40
- Precast concrete, 13-7
- Pre-design considerations**, 7-1
- Pressure-treated wood, 13-13, 13-19
- Primary frontal dune, 9-40
- erosion, 8-15
- Protective devices, 7-23
- ## R
- Rating factor (insurance), 7-13, 7-18
- Recurrence interval, 7-4, 8-52
- Reinforced concrete
- building material, 9-34
- Relocation, 15-10
- advantages and disadvantages of, 15-12
- Reroofing
- in high-wind areas, 11-24
- Residual risk, 7-11
- Retaining wall, 7-17, 7-18
- Retrofitting, 7-7, 7-21
- flood mitigation**, 15-8 (*see also* Flood mitigation)
 - high wind mitigation**, 15-15 (*see also* High wind mitigation)
 - seismic mitigation**, 15-5 (*see also* Seismic mitigation)
 - terminology box, 15-2
 - wildfire mitigation**, 15-2
- Revetment, 7-7, 7-18
- Risk, 7-1
- acceptable level of, 7-4
 - category, 8-48
 - coastal flooding, 13-1
 - flood, 15-9, 15-10, 12-7
 - high winds, 13-1
 - Homeowner's Wildfire Assessment, 15-5
 - long-term, 15-19
 - natural hazard risk in coastal areas**, 7-3
 - tolerance of owner, 7-2
 - wildfire, 11-3
 - wind-related damage, 15-19
- Roof (*see also* Roof framing)
- aggregate roof surfacing, 11-49
 - asphalt shingles, 11-25, 11-30
 - asphalt shingles, wind resistance of, 11-31
 - bleeder strips, 11-33, 11-34
 - decking, blown off, 11-22
 - eave, 11-32
 - exterior wall connection, 9-8, 9-9, Example 9.2
 - fiber-cement shingles, 11-37
 - fire-resistant, 11-3
 - framing to exterior wall connection, 9-8
 - hail, 11-36
 - high winds, 11-25
 - hip, 9-31
 - liquid-applied membranes, 11-37
 - low-slope, 11-49
 - maintenance, 14-8
 - metal panels, 11-46
 - metal shingles, 11-46
 - pressures, 8-62, 8-63
 - rake, 11-32, 11-33
 - roof-to-wall uplift connection load, 8-54, Example 8.5
 - shakes, 11-48
 - sheathing nail spacing for wind uplift, 9-6, Example 9.1
 - sheathing suction loads, 8-64, Example 8.7
 - sheathing to roof framing connection, 9-4, 9-6
 - shingles, 11-30 (*see also* Shingles)
 - slate, 11-47
 - systems**, 11-24
 - tiles, blown off, 11-39, 11-40, 11-41, 11-42, 11-43, 11-44
 - tiles, clay and extruded concrete, 11-38
 - truss connection to wood-frame wall, 9-10
 - truss-to-masonry wall connection, 9-11
 - underlayment, 11-26 (*see also* Underlayment)
 - uplift connector load, 8-52, 8-53, 8-54, Example 8.5
 - wall top plate-to-wall stud connection, 9-10, 9-11
 - warning box, roof structure failure, 13-27
 - wood shingles, 11-48
- Roof deck, 9-3, 11-10, 11-24, 11-38, 11-46
- blown off, 11-22
 - concrete, 11-38
 - panels, 15-18
- Roof framing, 13-27
- inspection points, 13-28, 13-29
 - substitution of materials, 13-28
- ## S
- Salt spray, 9-25, 13-23
- Sanitary systems, 12-11
- Scour, 7-7, 7-8, 7-10, 8-34, 10-4
- deep around foundation piles, 8-35
 - localized around a vertical pile, 8-34, 8-35, Equation 8.10, 8-36, Equation 8.11
 - localized around vertical walls and enclosures, 8-37, Equation 8.12
- Sea level rise, 7-10
- Sea spray, 7-7

- Seawall, 7-7, 7-17, 7-18
- Seismic hazard
- base shear, 8-69, Equation 8.15
 - effect of seismic forces on supporting piles, 8-69
 - load, 8-68**, 8-70, Example 8.9
 - mitigation, 15-5** (*see also* Seismic mitigation)
 - vertical distribution of seismic forces, 8-70, Equation 8.16
- Seismic hazard area
- building elevation, 15-9
 - diagonal bracing, 9-37
 - floor surfaces, 13-24
 - reinforced and grouted masonry, 9-27
 - roof sheathing, 11-50
 - warning box, open masonry foundations in earthquake hazard area, 13-8
- Seismic mitigation, 15-5**
- anchorage of concrete and masonry walls, 15-7
 - anchorage of masonry chimneys, 15-7
 - cripple wall bracing, 15-5
 - foundation bolting, 15-5
 - hillside house bracing, 15-5
 - open-front bracing, 15-5
 - split-level floor interconnection, 15-5
 - weak- and soft-story bracing, 15-5
- Septic systems, 12-10
- warning box, septic tanks below expected level of erosion and scour, 12-11
- SFHA (*see* Special Flood Hazard Area)
- SFIP (*see* Standard Flood Insurance Policy)
- Shakes, 11-48
- Shearwall, 8-70, Example 8.9, 13-21, 13-26, 14-7, 14-12
- sill plates, 14-12
- Shingles, 11-30
- asphalt, 11-25
 - asphalt, wind resistance of, 11-31
 - fasteners, 11-35
 - fiber-cement, 11-37
 - loss of underlayment and, 11-31
 - metal, 11-46
 - unzipped, 11-36
 - wood, 11-48
- Shutters, 7-9, 7-23, 8-49, 11-10, 11-12, 11-13
- Skylights, 11-1, 11-15
- windows and, 11-9**
- Siding, 11-17
- fiber-cement, blown off, 11-18
 - maintenance of, 14-7
 - vinyl, blown off, 11-17
- Single-ply membrane, 11-50
- Site-specific loads, 8-1**
- Siting, 7-7
- benefits and cost implications, 7-11
- Slate, 11-47
- Snow
- loads, 8-5**
- Soffits, 11-15**, 11-22, 11-23, 13-29
- Soils
- angle of internal friction/soil friction angle, 10-9, 10-10, 10-15
 - bearing capacity, 10-7, 10-14
 - classifications, 10-7, 10-8
 - compressive strength, 10-7, 10-8
 - data from site investigations, 10-6
 - modulus of subgrade reaction, 10-10, 10-19
 - pressure, determining, 10-43, Equation 10.6
 - sliding resistance, 10-10, Equation 10.1
 - subgrade modulus, 10-10
- Special Flood Hazard Area (SFHA)
- acquisition of buildings in, 7-13
 - fills allowed in, 7-25
 - foundation in, 10-42
 - residential structures in, 15-11, 15-12
 - substantially damaged or improved structures in, 15-11, 15-12
 - zones outside, 7-15
- Stairways, 9-39
- Standard Flood Insurance Policy (SFIP), 7-17 (*see also* National Flood Insurance Program)
- Steel
- building material, 9-33
- Stillwater flood depth, 8-9
- calculations, 8-9, 8-10, Example 8.1
- Stillwater elevation, 8-7, 8-15, 8-21, 10-10
- 100-year, 8-8, 8-15
- Storm surge, 7-4, 7-11, 10-1, 10-22
- depths, 8-6
 - elevation, 8-6
 - evacuation maps, 8-6
- Straps, 12-3, 13-27, 14-10
- cast-in, 9-11
 - connector, 13-19
 - metal, 15-7
 - stainless steel, 11-37, 11-43, 11-45, 11-47
 - tiedown, 14-10
 - twist, 13-23
- Structural frame, 13-19**
- connections, 13-19
 - connector failure, 13-20
 - durability, 13-15
 - floor framing, 13-23 (*see also* Floor framing)
 - maintenance, 14-5
 - roof framing, 13-27 (*see also* Roof framing)
 - top structural frame issues for buildings, 13-28
 - wall framing, 13-25 (*see also* Wall framing)
- Structure, maintaining, 14-1**

Subsidence, 8-7, 8-8
 Substantial damage
 dry floodproofing, 15-11
 tsunami, 8-47
 Substantial improvement, 9-34
 dry floodproofing, 15-11
Sustainable building design, 7-24
Substitutions, 13-17
 warning box, 13-17, 13-28

T

Termites, 9-33, 11-7, 11-13, 13-30, 14-2, 14-4
 Tiles, 11-38 (*see also* Roof)
 Topography, 8-16
 Tornado, 8-47, 11-10, 15-15
 loads, 8-67
 warning box, safe room location, 8-67
Tributary area and application of loads to a building, 8-4
 Tropical cyclones, 8-47
 Tropical storms, 7-5, 15-15
 Allison, 7-5
 Tsunamis, 7-6
 load, 8-47
 warning box, flood velocity during tsunamis, 8-15
 Typhoon, 8-24, 11-37, 15-15
 Paka, 11-1

U

Underlayment, 7-9, 11-26
 attachment, 11-26
 enhanced Option 1, 11-26, 11-27
 enhanced Option 2, 11-28
 enhanced Option 3, 11-29
 loss of shingles and, 11-31
 not lapped over hip, 11-30
 Uplift, 8-17, 8-21, 8-37, 8-61, 9-21, 14-9, 15-20
 capacity, 13-19
 force, 8-3, 9-1, 9-4, 9-6, Examples 9.1 through 9.9, 9-8, 9-10, 9-12, 9-17, 9-18, 10-34, 10-42, Example 10.4, 10-44, Example 10.5, 10-45, 12-3, 13-23, 13-27
 inspection, 13-29
 loads (*see* Loads)
 resistance, 10-15, 10-34, 10-38, 11-47, 13-19
 roof uplift connector load, 8-52, 8-53, 8-54, Example 8.5
 shear wall overturning, 9-21
 solar panel system, 7-24
 wind, 9-8, 9-15, 10-22

V

Vents
 attic, 11-50, 12-3, 14-5
 continuous ridge, 11-50, 11-52
 V Zone Risk Factor Rating Form, 7-20

W

Wall (*see also* Wall framing)
 coverings, 11-15, 11-16
 fire-resistant, 11-3
 floor framing connection, 9-15
 non-load-bearing, 11-15
 sheathing to window header connection, 9-12, 9-13
 suction pressures, 8-62, 8-63
 Wall framing, 13-25
 inspection points, 13-27
 substitution of materials, 13-27
Water and wastewater systems, 12-10
 fire sprinkler systems, 12-11
 municipal water connections, 12-12
 sanitary systems, 12-11
 septic systems, 12-11
 wells, 12-10
 Waterborne debris, 8-32, 9-33
 Wave
 action, 7-7
 crest, 8-24
 height, 8-25
 load, 8-20
 setup, 8-15
 slam, 7-10, 8-25, 8-26
 slam calculation, 8-27, Example 8.2
 Weatherstripping, 7-8, 11-8
Wet floodproofing, 15-12, 15-13
 advantages and disadvantages of, 15-13
 warning box, under NFIP, 15-12
 Wildfire
 fire-resistant walls and roof, 11-3
 mitigation, 15-2
 Wind
 design wind pressure for low-rise buildings, 8-50, Equation 8.14
 determining loads, 8-49
 effect on enclosed building vs. building with an opening, 8-48
 high-wind mitigation, 15-15
 insurance, 7-21
 load, 8-47
 mapped speeds, 8-48
 mitigation measures, 7-8

- velocity pressure, 8-50, Equation 8.13
 - Wind-borne debris, 11-7
 - doors and, 11-7
 - exterior wall assemblies, 11-16
 - glazing and, 11-22
 - scars on exterior wall, *11-3*
 - Wind-driven rain, 7-7, 11-52
 - building envelope, 11-4, 11-52, 13-31
 - concrete and concrete masonry unit, 11-20
 - deck connections to structure, 14-10
 - deck surface, 9-38
 - door/wall integration, 11-8
 - exterior door assemblies, 11-7
 - exterior non-load-bearing walls, wall coverings, and soffits, 11-16
 - flood mitigation, 7-8
 - foundations, 13-13
 - glazing, 7-7
 - high winds, 11-7
 - rain screen on fiber-cement siding, 11-17
 - resistance in windows, 11-15
 - sealant joints protected by a stop, 11-15
 - soffit blow-off, 11-15, 11-22, *11-23*
 - threshold/door gap, *11-8*
 - vents and fans, *13-31*
 - wall coverings, 11-16
 - windows and skylights, 11-9
 - Wind-driven saltwater spray, 9-33
 - Wind-driven water infiltration, 11-2, 11-7, 11-14
 - Wind-MAP, 7-21
 - Windows (*see also* Glazing)
 - design pressure and impact-resistant ratings, 11-10, 11-11, *11-12*
 - durability, 11-13
 - frame, inadequate attachment of, *11-9*
 - hail, 11-15
 - header to exterior wall connection, 9-12, *9-13*
 - high winds, 11-9
 - installation, 11-14
 - jalousie louvers, 11-13, *11-14*
 - loads and resistance, 11-9
 - seismic effects on, 11-15
 - skylights and, 11-9**
 - uplift and lateral load path at window header, 9-14, Example 9.3
 - water infiltration, 11-14
 - wind-borne debris, 11-10
 - Wood
 - building material, *9-33*
- ## Z
- Zone A, 7-7, 7-15, 7-16, 7-19
 - recommended foundation styles in, *10-3*
 - Zone AE, 7-15
 - Zone B, 7-15
 - Zone C, 7-15
 - Zones V1–V30, 7-14
 - Zone V, 7-14, 7-16
 - recommended foundation styles in, *10-3*
 - Risk Factor Rating Form, 7-20
 - warning box, solid foundation walls in Zone V, 8-24
 - Zone VE, 7-14
 - Zone X, 7-15



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