

DSF- 255

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FLOODPLAIN PERMIT – BUILDING STANDARDS FOR RESIDENTIAL AND NON-RESIDENTIAL DEVELOPMENT

January 9, 2007
(REVISED – August 21, 2007)

Development & Inspection Services
Floodplain Manager – Brian J. Trushinski, BES, MA, CFM

The following pages present a summary of the primary building performance standards for development proposals within Special Flood Hazard Areas (100-year floodplain) in Unincorporated Ventura County. These requirements represent the minimum standards that have been set out in the Federal Management Emergency Agency's "National Flood Insurance Program" (Title 44 Code of Federal Regulations, Parts 59, 60, 65, and 70). Building standards are also set out in the County of Ventura's "Floodplain Management Ordinance 3841. Please review these documents before you prepare your building construction plans.

Compliance ensures that the risk of potential loss of life, and damage to new and substantially improved/ repaired/ remodeled buildings and the natural environment from the effects of flooding can be minimized. Compliance also helps to ensure that the County's flood insurance program remains in good standing with FEMA, thereby benefiting affected property owners to annually obtain as low an insurance coverage premium as possible.

Please use this document as a guideline and refer to Title 44 CFR Parts 59, 60, 65, and 70, FEMA's technical bulletins found at www.fema.gov, [use the drop-down menu "How Do I Find" and click on "Publications". Scroll down the list to "Technical Bulletins"]. Also, please review the County of Ventura Floodplain Ordinance 3841 when preparing your building construction plans. Incorporating all applicable building standards in your initial plan submission to both Development & Inspection Services and the Building and Safety Department will help expedite the review process and avoid possible costly design revisions later on in the process.



DSF- 255

DATE: _____

RECEIVED BY: _____

PROPERTY APN: _____

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FLOODPLAIN PERMIT – BUILDING PERFORMANCE STANDARDS FOR RESIDENTIAL AND NON-RESIDENTIAL DEVELOPMENT IN THE 100-YEAR FLOODPLAIN

Floodplain Permit Number: F 2007 - _____

The following is a summary of building performance standards required by the National Flood Insurance Program (NFIP) and County of Ventura Floodplain Management Ordinance 3841, for proposed residential and non-residential development within the 1% annual chance base flood area (100-year floodplain). Not all of these standards may be applicable to your particular development, therefore, it is the responsibility of your California-registered Civil Engineer or Architect to ensure that your building plans, site grading, and the constructed building/ structure are in compliance with all applicable NFIP regulations as set out in Title 44 Code of Federal Regulations, Parts 59, 60, 65, and 70, as well as the County's Ordinance.

NOTE 1: "Development" in the 100-year floodplain, as defined by the NFIP includes buildings, structures, swimming pool / spa equipment, fill placement, grading, dredging, paving, excavation, mining, drilling, and temporary and permanent storage of equipment and materials.

NOTE 2: "Building" or "Structure" as defined by the NFIP is any development having at least two rigid walls and a roof. An open picnic pavilion, gazebo, bleacher, or carport, for example, are not considered to be buildings or structures.

NOTE 3: All elevations must be based on the 1929 NGVD, only. Please be aware that FEMA released new FIRM (floodplain) mapping for Ventura County in October 2005 using 1988 NAVD. Although these maps remain 'preliminary' at this time, they represent the best available data and need to be included in the calculation of the 100-year Base Flood Elevation for your proposed development.



Building Standards for Residential Structures
Proposed within the 100-Year Floodplain
(Proposed Residential Development in the Floodway is Prohibited)

SUBMITTAL PACKAGE

The following items need to be submitted to Development & Inspection Services in order to plan check your building plans for compliance with FEMA regulations and the County's Floodplain Ordinance:

- i. Completion of a Floodplain Permit Application (attached) and submission of a Permit processing fixed fee of \$2,000.00 (check to be made payable to 'The County of Ventura').
- ii. Submission of a FEMA Elevation Certificate processing fee deposit of \$1,685.00 (check to be made payable to 'The County of Ventura').
- iii. One (1) complete set of building construction plans (you also need to provide three sets to the Building & Safety Department for their plan check process).
- iv. On the building construction plan set submitted, the Site Plan needs to clearly and accurately delineate the boundary(ies) of the FEMA-determined floodplain zones.
- v. The FEMA 100-Year floodplain Base Flood Elevation needs to be determined by your consultant using both the NGVD 1929 and the NAVD 1988 datums. The NAVD 1988 elevation needs to be converted to the NGVD 1929 elevation, by the project's California-registered Civil Engineer, Architect, or Land Surveyor. The most restrictive elevation (i.e. the NGVD 1929 elevation or the NAVD 1988 converted to NGVD 1929) needs to be applied to the project.
- vi. The "top of lowest floor elevation" (which is the FEMA-determined Base Flood Elevation plus the County's one foot freeboard requirement) needs to be clearly illustrated and called-out on all elevation drawings, applicable wall sections, and floor framing plan.
- vii. The location of all flood vents need to be clearly illustrated on all elevation drawings and the foundation plan.
- viii. Submission of all necessary Federal and State permits (e.g., US Army Corp of Engineers, Dept. of Fish & Game), Ventura County Watershed Protection District, and County Planning Department Zoning Clearance.

The following building standards need to be met for:

- **all new residential construction.**
- **all substantial improvements / repairs / remodeling to existing residential structures (i.e., where the cost of all construction materials, labor, overhead and profit, and built-in appliances total 50% or greater than the current market value of the existing residential structure).**

□ The “top of lowest floor” of the structure, as defined in Title 44 CFR Part 60.3, needs to be elevated to a minimum height of the Base Flood Elevation plus the County’s requirement of an additional one-foot freeboard. This minimum elevation may be achieved by raising the structure on structural/engineered fill (may require a Grading Permit), on piles, posts, piers, columns, walls, or through a crawlspace design.

□ All structural walls situated below the Base Flood Elevation plus a one-foot freeboard need to be constructed to be watertight (substantially impermeable to the passage of water), and have the capability of resisting hydrodynamic and hydrostatic loads. Further, all structural components and building materials, including insulation, floor beams and joists that are situated at or below the Base Flood Elevation plus one-foot freeboard must be resistant to flood water damage, as per FEMA Technical Bulletins 2-93, 7-93, and FEMA 348 standards. “Flood Resistant Material” means products that are capable of withstanding direct and prolonged contact (minimum of 72 hours) with floodwaters without sustaining significant damage (i.e., damage that requires more than low-cost cosmetic repair such as painting). Your California-registered Civil Engineer or Architect needs to review all your building designs, specifications, and plans and certify at the completion of construction and prior to the issuance of an Occupancy Permit that the building meets all applicable FEMA specifications (the Civil Engineer or Architect needs to submit FEMA’s Floodproofing Certificate: FEMA 81-65, attached). Technical guidance is available in FEMA Technical Bulletins 2-93, 3-93, 7-93, and FEMA 348.

□ The **bottom** of all electrical (including receptacles, switches, panels, fans, boxes, wiring), mechanical (including washers and dryers), heating (including furnaces, heat pumps, propane tanks), ventilation, plumbing (including hot water tanks, water softeners), air conditioning units, and other such equipment and servicing (located on the outside and inside of the structure) must be installed to a minimum height of the Base Flood Elevation plus one-foot freeboard.

□ Flood vent openings need to be installed in foundation walls in order to satisfactorily address hydrodynamic and hydrostatic loads of floodwaters on both the inside and outside the structure. Flood vent openings shall meet the all of the following minimum standards, as set out in FEMA Technical Bulletin 1-93.

- i. a minimum of two flood vent openings are required, each being on opposite walls from each other. Walls should, if possible, be perpendicular to the direction of floodwater flow.
- ii. the total net area of flood vent openings shall be one square inch for every square foot of building enclosure area (example: if the building enclosure area / footprint is 1,750 square feet, the minimum total net flood vent opening requirement shall be 1,750 square inches). (Net: excluding obstructions to the flow of water such as vent framing, grills, etc.).
- iii. the **bottom** of all vent openings shall not be higher than one foot above the adjacent grade.

- iv. vent openings must be designed and perform in a manner that allows free movement of floodwaters both entering and exiting the structure. Vents must not operate by mechanical means or by any means of human intervention.
- v. vent openings must not operate to lock or latch closed.
- vi. garage doors, service doors, and windows are not considered to be vent openings and may not be included in the total net area of vent opening calculation.
- vii. vegetation or other obstruction should not be placed in front of vent openings.

☐ Crawlspace and basements need to be designed and constructed to equalize hydrostatic and hydrodynamic flood forces on exterior and interior walls (refer to FEMA Technical Bulletin 11-01 standards).

☐ Crawlspace may be used for the storage of residential-related items, and access to the building, only.

☐ Garages may be used for the parking of vehicles, storage of garage-related items, and access to the residential building, only.

☐ All new and “50% Substantially Improved / Repair” structures must be adequately anchored to the foundation to stabilize the structure against flood forces and to prevent floatation, collapse, or lateral movement (refer to the FEMA – 85 publication). This is required to be certified by the project’s California-registered Civil Engineer or Architect.

☐ Exterior stairs must be constructed of flood resistant materials below the Base Flood Elevation plus one-foot freeboard. Stairs need to be adequately anchored to prevent potential lateral movement, floatation, and collapse as a result of hydrodynamic and hydrostatic loads. This is required to be certified by the project’s California-registered Civil Engineer or Architect.

☐ New and replacement water supply systems need to be designed to minimize or eliminate infiltration of floodwaters into the system. This is required to be certified by the project’s California-registered Civil Engineer.

☐ New and replacement sanitary sewage systems need to be designed to minimize or eliminate infiltration of floodwaters into the system, and minimize or eliminate discharge of the sanitary sewage system into floodwaters. Where there is a high groundwater table, the system needs to be adequately anchored in order to prevent buoyancy. These items are required to be certified by the project’s California-registered Civil Engineer.

- ☐ On-site waste disposal systems need to be located so as to avoid contact with floodwaters. This is required to be certified by the project's California-registered Engineer. At a minimum, an automatic backflow valve should be installed to prevent sewage from backing up into the building during flooding.
- ☐ When structural/engineered fill is proposed to be used, and where flood water velocities of flood flow exceed five (5) feet per second, fill material needs to be armored to prevent the loss of the fill material.
- ☐ When structural/engineered fill is not used and flood water velocities are less than five (5) feet per second, structural components such as piers used to support the structure need to be designed to resist hydrostatic and hydrodynamic loads.
- ☐ When structural/engineered fill is not used and flood water velocities are equal to five (5) feet per second and equal to or less than ten (10) feet per second, the structural support components of the structure are required to be designed to resist hydrostatic and hydrodynamic loads.
- ☐ When structural / engineered fill is not used and flood water velocities exceed ten (10) feet per second, the use of structural components to support the structure is prohibited.
- ☐ When depths of flood waters exceed three (3) feet, structural support components for the structure need to be designed for impact loads.
- ☐ For projects involving renovations / remodeling and repairs to existing structures, as well as building additions, a Floodplain Permit will be required. However, if the total cost of all works to be performed (including building materials, labor, overhead, profit, and built-in appliances) equal or exceed 50% of the **current** market value of the existing building and all 'attached' components to the building such as an attached garage, deck, porch, etc., the project will be required to comply with all applicable flood protection design requirements. This process is referred by FEMA as the **"50% Substantial Improvement / Repair"** determination. In determining the project cost, do not include costs associated specifically with improvements to the land / property: for example-landscaping, grading. Also, in the market appraisal, do not include the cost of the land/property or any 'detached' structure. The project cost estimate needs to be completed (signed, dated, stamped) by a California-licensed contractor. The market appraisal needs to be prepared by a California-licensed Real Estate Appraiser (signed, dated, stamped). The appraisal must be less than six (6) months old. The appraisal must not use the "income capitalization approach" which bases value on the use of the property rather than the use of the structure.

□ **For residential structures proposed in Alluvial Fan Floodplain areas, and other 'Areas of Special Flood Hazard' designated by FEMA as 'AO Zones' and 'AH Zones', the following additional building standards are required:**

□ New construction and "50% Substantial Improvement / Repair" to existing structures shall have the lowest floor (including the basement), and the bottom of all utility equipment and servicing (electrical, heating, plumbing, ventilation, mechanical, air conditioning), elevated at or above the Highest Adjacent Grade (HAG) to the *Depth Number* specified on the FIRM plus an additional one-foot freeboard. In the absence of a specified *Depth Number* on the FIRM, the minimum elevated height of the lowest floor above the highest adjacent grade shall be two feet plus a one-foot freeboard (i.e., a minimum of three (3) feet).

This determined elevation shall remain the same for the entire proposed structure (i.e., the elevation of the top of the finished floor must be the same for the entire building; a "step-down" floor height design is not permitted).

As a design alternative, the building may be designed in 'structurally autonomous' sections (i.e., each having its own separate roofline, foundation wall, footings, etc.) and connected by a breezeway or other similar façade design.

Another design alternative is to elevate the entire structure on structural / engineered fill, as per specific County and FEMA design requirements. These requirements are available in Development & Inspection Services of the County Public Works Agency.

□ Where a structure is proposed to be constructed on a slope, there needs to be adequate drainage paths provided to guide floodwaters around and away from the structure. Flows may not be diverted to adjacent properties.

□ Structures need to be securely anchored to minimize the impact of floodwater velocities, and potential damage from erosion and deposition.

OCCUPANCY PERMIT

The following requirements need to be achieved before an Occupancy permit can be issued:

- i. There shall be a minimum of three (3) site inspections during construction (1.-verification of the total net area and elevation of foundation/vent openings (2.-verification of the elevation of "top of lowest floor" (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Contact the County Floodplain Manager at (805) 477-1967.

- ii. One (1) FEMA Elevation Certificate - FEMA Form 81-31, (see attachment) completed by the project's California-registered Civil Engineer, Architect, or Land Surveyor. (1.-verification of the total net area and elevation of foundation/vent openings (2.-verification of the elevation of "top of lowest floor" (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Photographs of all building elevations are required.
- iii. A Floodproofing Certificate: FEMA 81-65, completed by your project Civil Engineer or Architect.
- iv. Payment of any outstanding Floodplain Permit project account balance.

**Building Standards for Non-Residential Structures
Proposed within the 100-Year Floodplain**

(Examples: garage, barn, shed, swimming pool/spa equipment, bridge,
industrial building)

(Proposed Non-Residential Development in the Floodway is Prohibited)

SUBMITTAL PACKAGE

The following items need to be submitted to Development & Inspection Services in order to plan check your building plans for compliance with FEMA regulations and the County's Floodplain Ordinance:

- i. Completion of a Floodplain Permit Application (attached) and submission of a Permit processing fixed fee of \$2,000.00 (check to be made payable to 'The County of Ventura').
- ii. Submission of a FEMA Elevation Certificate processing fee deposit of \$1,685.00 (check to be made payable to 'The County of Ventura').
- iii. One (1) complete set of building construction plans (you also need to provide three sets to the Building & Safety Department for their plan check process).
- iv. On the building construction plan set submitted, the Site Plan needs to clearly and accurately delineate the boundary(ies) of the FEMA-determined floodplain zones.
- v. The FEMA 100-Year floodplain Base Flood Elevation needs to be determined by your consultant using both the NGVD 1929 and the NAVD 1988 datums. The NAVD 1988 elevation needs to be converted to the NGVD 1929 elevation, by the project's California-registered Civil Engineer, Architect or Land Surveyor. The most restrictive elevation (i.e. the NGVD 1929 elevation or the NAVD 1988 converted to NGVD 1929) needs to be applied to the project.
- vi. The "top of lowest floor elevation" (which is the FEMA-determined Base Flood Elevation plus the County's one-foot freeboard requirement) needs to be clearly illustrated and called-out on all elevation drawings, applicable wall sections, and floor framing plan.
- vii. The location of all flood vents need to be clearly illustrated on all elevation drawings and the foundation plan.
- viii. Submission of all necessary Federal and State permits (e.g., US Army Corp of Engineers, Dept. of Fish & Game), Ventura County Watershed Protection District, and County Planning Department Zoning Clearance.

The following building standards need to be met for:

- all new non-residential construction.
- all substantial improvements / repairs / remodeling to existing non-residential structures (i.e., where the cost of all construction materials, labor, overhead and profit, and built-in appliances total 50% or greater than the current market value of the existing non-residential structure).

FOR NON-RESIDENTIAL STRUCTURES PROPOSED TO BE PHYSICALLY SEPARATED / DETACHED FROM A SINGLE FAMILY DWELLING

□ The “top of lowest floor” of the structure, as defined in Title 44 CFR Part 60.3, (i.e., top of concrete slab), needs to be elevated to a minimum height of the Base Flood Elevation plus the County’s requirement of an additional one-foot freeboard. This minimum elevation may be achieved by raising the structure on structural / engineered fill (may require a Grading Permit).

□ All structural walls situated below the Base Flood Elevation plus a one-foot freeboard need to be constructed to be watertight (substantially impermeable to the passage of water), and have the capability of resisting hydrodynamic and hydrostatic loads. Further, all structural components and building materials that are situated at or below the Base Flood Elevation plus one-foot must be resistant to flood water damage, as per FEMA Technical Bulletins 2-93, 7-93, and FEMA 348 standards. “Flood Resistant Material” means products that are capable of withstanding direct and prolonged contact (minimum of 72 hours) with floodwaters without sustaining significant damage (damage that requires more than low-cost cosmetic repair such as painting). Your California-registered Civil Engineer or Architect needs to review all your building designs, specifications, and plans and certify that the building meets all applicable FEMA specifications. The Civil Engineer or Architect also needs to submit FEMA’s Floodproofing Certificate: FEMA 81-65, attached) at the completion of construction and prior to the issuance of an Occupancy Permit. Technical guidance is available in FEMA Technical Bulletins 2-93, 3-93, 7-93, and FEMA 348.

□ The **bottom** of all electrical (including receptacles, switches, panels, fans, boxes, wiring), mechanical (including washers and dryers), heating (including furnaces, heat pumps, propane tanks), ventilation, plumbing (including hot water tanks, water softeners), air conditioning units, and other such equipment and servicing (located both inside and outside the structure) must be installed to a minimum height of the Base Flood Elevation plus one-foot freeboard.

FOR NON-RESIDENTIAL STRUCTURES PROPOSED TO BE PHYSICALLY ATTACHED TO A SINGLE FAMILY DWELLING

The “top of lowest floor” (e.g., top of concrete slab) may be situated below the Base Flood Elevation plus the one-foot freeboard, however, all of the following design criteria must be met:

□ Flood vent openings need to be installed in foundation walls in order to satisfactorily address hydrodynamic and hydrostatic loads of floodwaters on both the inside and outside the structure. Flood vent openings shall meet the all of the following minimum standards, as set out in FEMA Technical Bulletin 1-93.

- i. a minimum of two flood vent openings are required, each being on opposite walls from each other. Walls should, if possible, be perpendicular to the direction of floodwater flow.
- ii. the total net area of flood vent openings shall be one square inch for every square foot of building enclosure area (example: if the building enclosure area / footprint is 1,750 square feet, the minimum total net flood vent opening requirement shall be 1,750 square inches). (Net: excluding obstructions to the flow of water such as vent framing, grills, etc.).
- iii. the **bottom** of all vent openings shall not be higher than one foot above the adjacent grade.
- iv. vent openings must be designed and perform in a manner that allows free movement of floodwaters both entering and exiting the structure. Vents must not operate by mechanical means or by any means of human intervention.
- v. vent openings must not operate to lock or latch closed.
- vi. garage doors, service doors, and windows are not considered to be vent openings and may not be included in the total net area of vent opening calculation.
- vii. vegetation or other obstruction should not be placed in front of vent openings.

□ All structural walls situated below the Base Flood Elevation plus a one-foot freeboard need to be constructed to be watertight (substantially impermeable to the passage of water), and have the capability of resisting hydrodynamic and hydrostatic loads. Further, all structural components and building materials that are situated at or below the Base Flood Elevation plus one-foot freeboard must be resistant to flood water damage, as per FEMA Technical Bulletins 2-93, 7-93, and FEMA 348 standards. “Flood Resistant Material” means products that are capable of withstanding direct and prolonged contact (minimum of 72 hours) with floodwaters without sustaining significant damage (i.e., damage that requires more than low-cost cosmetic repair such as painting). Your California-registered Civil Engineer or Architect needs to review all your building designs, specifications, and plans and certify that the building meets all applicable FEMA

specifications. The Engineer or Architect also needs to submit FEMA's Floodproofing Certificate: FEMA 81-65, attached) at the completion of construction and prior to the issuance of an Occupancy Permit. Technical guidance is available in FEMA Technical Bulletins 2-93, 3-93, 7-93, and FEMA 348.

☐ The **bottom** of all electrical (including receptacles, switches, panels, fans, boxes, wiring), mechanical (including washers and dryers), heating (including furnaces, heat pumps), ventilation, plumbing (including hot water tanks), air conditioning units, and other such equipment and servicing (located both inside and outside the structure) must be installed to a minimum height of the Base Flood Elevation plus one-foot freeboard.

FOR NON-RESIDENTIAL STRUCTURES PROPOSED TO BE EITHER ATTACHED OR DETACHED FROM A SINGLE FAMILY DWELLING, the following additional design requirements need to be achieved:

☐ Garages may be used for the parking of vehicles, storage of garage-related items, and access to the residential building, only.

☐ All new and "50% Substantially Improvement / Repair" structures must be adequately anchored to the foundation to stabilize the structure against flood forces and to prevent floatation, collapse, or lateral movement (refer to the FEMA – 85 publication). This is required to be certified by the project's California-registered Civil Engineer.

☐ Exterior stairs must be constructed of flood resistant materials below the Base Flood Elevation plus one-foot freeboard. Stairs need to be adequately anchored to prevent potential lateral movement, floatation, and collapse as a result of hydrodynamic and hydrostatic loads. This is required to be certified by the project's California-registered Civil Engineer or Architect.

☐ New and replacement water supply systems need to be designed to minimize or eliminate infiltration of floodwaters into the system. This is required to be certified by the project's California-registered Civil Engineer.

☐ New and replacement sanitary sewage systems need to be designed to minimize or eliminate infiltration of floodwaters into the system, and minimize or eliminate discharge of the sanitary sewage system into floodwaters. Where there is a high groundwater table, the system needs to be adequately anchored in order to prevent buoyancy. These items are required to be certified by the project's California-registered Civil Engineer.

□ On-site waste disposal systems need to be located so as to avoid contact with floodwaters. This is required to be certified by the project's California-registered Engineer. At a minimum, an automatic backflow valve should be installed to prevent sewage from backing up into the building during flooding.

□ Where floodwater velocities are less than five (5) feet per second, structural components of the structure need to be designed to resist hydrostatic loads.

□ Where floodwater velocities are equal to five (5) feet per second and equal to or less than ten (10) feet per second, the structural support components of the structure are required to be designed to resist hydrostatic and hydrodynamic loads.

□ Where floodwater velocities exceed ten (10) feet per second, structures with floors below water surface elevations are prohibited and the use of structural components to support the structure are prohibited.

□ When depths of floodwater exceed three (3) feet, structural support components for the structure need to be designed for impact loads.

□ **For non-residential structures proposed in Alluvial Fan Floodplain areas, and other 'Areas of Special Flood Hazard' designated by FEMA as 'AO Zones' and 'AH Zones'**, the following additional building standards are required:

□ New construction and "50% Substantial Improvement / Repair" to existing structures shall have the lowest floor (including the basement), and the bottom of all utility equipment and servicing (electrical, heating, plumbing, ventilation, mechanical, air conditioning), elevated at or above the Highest Adjacent Grade (HAG) to the *Depth Number* specified on the FIRM plus an additional one-foot freeboard. In the absence of a specified *Depth Number* on the FIRM, the minimum elevated height of the lowest floor above the highest adjacent grade shall be two feet plus a one-foot freeboard (i.e., a minimum of three (3) feet).

This determined elevation shall remain the same for the entire proposed structure (i.e., the elevation of the top of the finished floor must be the same for the entire building; a "step-down" floor height design is not permitted).

As a design alternative, the building may be designed in 'structurally autonomous' sections (i.e., each having its own separate roofline, foundation wall, footings, etc.) and connected by a breezeway or other similar façade design.

Another design alternative is to elevate the entire structure on structural / engineered fill, as per specific County and FEMA design requirements. These requirements are available in Development & Inspection Services of the County Public Works Agency.

- ☐ Where a structure is proposed to be constructed on a slope, there needs to be adequate drainage paths provided to guide floodwaters around and away from the structure. Flows may not be diverted to adjacent properties.
- ☐ Structures need to be securely anchored to minimize the impact of floodwater velocities, and potential damage from erosion and deposition.
- ☐ For projects involving renovations / remodeling and repairs to existing structures, as well as building additions, a Floodplain Permit will be required. However, if the total cost of all works to be performed (including building materials, labor, overhead, profit, and built-in appliances) equal or exceed 50% of the **current** market value of the existing building and all 'attached' components to the building such as an attached garage, deck, porch, etc., the project will be required to comply with all applicable flood protection design requirements. This process is referred by FEMA as the **"50% Substantial Improvement / Repair"** determination. In determining the project cost, do not include costs associated specifically with improvements to the land/property: for example-landscaping, grading. Also, in the market appraisal, do not include the cost of the land/property or any 'detached' structure. The project cost estimate needs to be completed (signed, dated, stamped) by a California-licensed contractor. The market appraisal needs to be prepared by a California-licensed Real Estate Appraiser (signed, dated, stamped). The appraisal must be less than six (6) months old. The appraisal must not use the "income capitalization approach" which bases value on the use of the property rather than the use of the structure.

OCCUPANCY PERMIT

The following requirements need to be achieved before an Occupancy permit can be issued:

- i. There shall be a minimum of three (3) site inspections during construction (1.- verification of the total net area and elevation of foundation/vent openings (2.- verification of the elevation of "top of lowest floor" (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Contact the County Floodplain Manager at (805) 477-1967.
- ii. One (1) FEMA Elevation Certificate - FEMA Form 81-31, (see attachment) completed by the project's California-registered Engineer, Architect, or Land Surveyor. (1.- verification of the total net area and elevation of foundation / vent openings (2.-verification of the elevation of "top of lowest floor" (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Photographs of all building elevations are required.
- iii. A Floodproofing Certificate: FEMA 81-65 completed by your project Civil Engineer or Architect.
- iv. Payment of any outstanding Floodplain Permit project account balance.

Building Standards for Structures Proposed within Coastal 'V' Zones

'V' zone properties are properties located along the coastline that have been designated by FEMA as being subject to high velocity waters, including coastal and tidal inundation or tsunamis. They are located in 'Coastal High Hazard Areas'. These areas tend to flood from storm surge and wave impacts during coastal storms and hurricanes, as well as undercutting of building foundations from erosion and scour.

SUBMITTAL PACKAGE

If a new or a "50% Substantially Improvement / Repair" structure is proposed to be located in a "V" Zone, the following items need to be submitted to Development & Inspection Services in order to plan check your building plans for compliance with FEMA regulations and the County's Floodplain Ordinance:

- i. Completion of a Floodplain Permit Application (attached) and submission of a Permit processing fixed fee of \$2,000.00 (check to be made payable to 'The County of Ventura').
- ii. Submission of a FEMA Elevation Certificate processing fee deposit of \$1,685.00 (check to be made payable to 'The County of Ventura').
- iii. One (1) complete set of building construction plans (you also need to provide three sets to the Building & Safety Department for their plan check process).
- iv. On the building construction plan set submitted, the Site Plan needs to clearly and accurately delineate the boundary(ies) of the FEMA-determined floodplain zones.
- v. The FEMA 100-Year floodplain Base Flood Elevation needs to be determined by your consultant using both the NGVD 1929 and the NAVD 1988 datums. The NAVD 1988 elevation needs to be converted to the NGVD 1929 elevation, by the project's California-registered Civil Engineer, Architect or Land Surveyor. The most restrictive elevation (i.e. the NGVD 1929 elevation or the NAVD 1988 converted to NGVD 1929) needs to be applied to the project.
- vi. The **bottom** of the lowest horizontal support member of the building needs to be elevated a minimum of the 'V Zone Depth Number' (identified on the FIRM) plus the County's one-foot freeboard requirement. This Base Flood elevation needs to be clearly illustrated and called-out on all elevation drawings, applicable wall sections, and floor framing plan.
- vii. Submission of all necessary Federal and State permits (e.g., US Army Corp of Engineers, Dept. of Fish & Game), Ventura County Watershed Protection District, and County Planning Department Zoning Clearance.

The following building standards need to be met for:

- all new residential construction.
 - all substantial improvements / repairs / remodeling to existing residential structures (i.e., where the cost of all construction materials, labor, overhead and profit, built-in appliances, total 50% or greater than the current market value of the existing residential structure).
- ☐ The proposed structure shall meet all building standards for Residential Development in FEMA-designated 'A' Zones (refer to pages 2-6 in this handout package). Coastal development standards are presented in the FEMA-55 publication (www.fema.gov [use the drop-down menu "How Do I Find" and click on "Publications". Scroll down the list to "Technical Bulletins"]).
- ☐ The structure must be located landward of the mean high tide line, it may not be built over water. The structure may not remove sand dunes.
- ☐ The proposed structure must be elevated on support pilings, posts, piers, or columns only.
- ☐ The placement of fill to elevate existing grades and the construction of solid walls, crawlspaces or any other form of obstruction is not permitted. However, the use of flood resistant breakaway walls (e.g., latticework, insect screening) may be permitted provided that these walls are not designed or used as support foundation walls. Breakaway walls are intended to collapse under wave action without jeopardizing the structural support of the building. If breakaway walls are proposed, the created enclosed area may not exceed three hundred (300) square feet. Also, the enclosed area created may be used for parking of vehicles, building access, and storage only.
- ☐ For projects involving renovations/remodeling and repairs to existing structures, as well as building additions, a Floodplain Permit will be required. However, if the total cost of all works to be performed (including building materials, labor, overhead, profit, and built-in appliances) equal or exceed 50% of the **current** market value of the existing building and all 'attached' components to the building such as an attached garage, deck, porch, etc., the project will be required to comply with all applicable flood protection design requirements. This process is referred by FEMA as the **"50% Substantial Improvement / Repair"** determination. In determining the project cost, do not include costs associated specifically with improvements to the land/property: for example-landscaping, grading. Also, in the market appraisal, do not include the cost of the land/property or any 'detached' structure. The project cost estimate needs to be completed (signed, dated, stamped) by a California-licensed contractor. The market appraisal needs to be prepared by a California-licensed Real Estate Appraiser (signed, dated, stamped). The appraisal must be less than six (6) months old. The appraisal must not use the "income capitalization approach" which bases value on the use of the property rather than the use of the structure.

□ All new and “50% Substantially Improvement / Repair” structures must be adequately anchored to stabilize the structure against flood forces and to prevent floatation, collapse, or lateral movement of the structure (refer to the FEMA – 85 publication). This is required to be certified by the project’s California-registered Civil Engineer.

OCCUPANCY PERMIT

The following requirements need to be achieved before an Occupancy permit can be issued:

- i. There shall be a minimum of three (3) site inspections during construction (1.- verification of the total net area and elevation of foundation/vent openings (2.- verification of the elevation of “top of lowest floor” (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Contact the County Floodplain Manager at (805) 477-1967.
- ii. One (1) FEMA Elevation Certificate - FEMA Form 81-31, (see attachment) completed by the project’s California-registered Engineer, Architect, or Land Surveyor. (1.- verification of the total net area and elevation of foundation / vent openings (2.-verification of the elevation of “top of lowest floor” (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Photographs of all building elevations are required.
- iii. A Floodproofing Certificate: FEMA 81-65, completed by your project Civil Engineer or Architect.
- iv. Payment of any outstanding Floodplain Permit project account balance.

Building Standards for Manufactured Homes Proposed within the 100- Year Floodplain

A Manufactured Home, as defined in the National Floodplain Insurance Program (NFIP), is a structure that is transportable in one or more sections, is built on a permanent chassis, and is designed for use with or without a permanent foundation when attached to the required utilities. This definition includes park trailers, travel trailers, and other similar vehicles.

SUBMITTAL PACKAGE

If a manufactured home is proposed to be located within a 100-year floodplain, the following items need to be submitted to Development & Inspection Services in order to plan check your building plans for compliance with FEMA regulations and the County's Floodplain Ordinance:

- i. Completion of a Floodplain Permit Application (attached) and submission of a Permit processing fixed fee of \$2,000.00 (check to be made payable to 'The County of Ventura').
- ii. Submission of a FEMA Elevation Certificate processing fee deposit of \$1,685.00 (check to be made payable to 'The County of Ventura').
- iii. One (1) complete set of building construction plans (you also need to provide three sets to the Building & Safety Department for their plan check process).
- iv. On the building construction plan set submitted, the Site Plan needs to clearly and accurately delineate the boundary(ies) of the FEMA-determined floodplain zones.
- v. The FEMA 100-Year floodplain Base Flood Elevation needs to be determined by your consultant using both the NGVD 1929 and the NAVD 1988 datums. The NAVD 1988 elevation needs to be converted to the NGVD 1929 elevation, by the project's California-registered Civil Engineer, Architect or Land Surveyor. The most restrictive elevation (i.e. the NGVD 1929 elevation or the NAVD 1988 converted to NGVD 1929) needs to be applied to the project.
- vi. The "top of lowest floor elevation" (which is the FEMA-determined Base Flood Elevation plus the County's one-foot freeboard requirement) needs to be clearly illustrated and called-out on all elevation drawings, applicable wall sections, and floor framing plan.
- vii. The location of all flood vents need to be clearly illustrated on all elevation drawings and the foundation plan.
- viii. Submission of all necessary Federal and State permits (e.g., US Army Corp of Engineers, Dept. of Fish & Game), Ventura County Watershed Protection District, and County Planning Department Zoning Clearance, by the Applicant).

The following building standards need to be met for:

- **all new residential construction.**
- **all substantial improvements / repairs / remodeling to existing residential structures (i.e., where the cost of all construction materials, labor, overhead and profit, built-in appliances, total 50% or greater than the current market value of the existing residential structure).**

□ The proposed manufactured home development must meet the same flood protection requirements as wood frame / conventional housing as outlined on pages 2 through 7 of this information package, including “top of lowest floor elevation”, flood vent openings, location and elevation of utilities, flood resistant materials, anchoring, and FEMA Elevation Certification documentation.

□ Notwithstanding anything to the above, new manufactured homes or existing homes that are “50% Substantially Improved / Repaired” that are already located or are proposed to be located in an existing manufactured home park or subdivision are exempt from the requirements pertaining to floodwater velocities and associated hydrostatic and hydrodynamic loads.

OCCUPANCY PERMIT

The following requirements need to be achieved before an Occupancy permit can be issued:

- i. There shall be a minimum of three (3) site inspections during construction (1.- verification of the total net area and elevation of foundation/vent openings (2.- verification of the elevation of “top of lowest floor” (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Contact the County Floodplain Manager at (805) 477-1967.
- ii. One (1) FEMA Elevation Certificate - FEMA Form 81-31, (see attachment) completed by the project’s California-registered Engineer, Architect, or Land Surveyor. (1.- verification of the total net area and elevation of foundation/vent openings (2.-verification of the elevation of “top of lowest floor” (3.-verification of the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Photographs of all building elevations are required.
- iii. A Floodproofing Certificate: FEMA 81-65, completed by your project Civil Engineer or Architect.
- iv. Payment of any outstanding Floodplain Permit project account balance.

Building Standards for Recreational Vehicles **Proposed within the Floodplain**

A Recreational Vehicle, as defined in the National Insurance Floodplain Program (NFIP), is a structure that is built on a single chassis, is 400 square feet or less in size when measured at the largest horizontal projection, is designed to be self-propelled or permanently towed by a light truck and is not for use as a permanent dwelling but as a temporary living quarters for recreational, camping, travel, or seasonal use.

Recreational vehicles are not permitted to be permanently located in a 100-year floodplain area unless they are well protected from flooding. If a recreational vehicle is proposed to be located within a 100-year floodplain, the following shall be required of the Applicant:

SUBMITTAL PACKAGE

The following items need to be submitted to Development & Inspection Services in order to plan check your building plans for compliance with FEMA regulations and the County's Floodplain Ordinance:

- i. Completion of a Floodplain Permit Application (attached) and submission of a Permit processing fixed fee of \$2,000.00 (check to be made payable to 'The County of Ventura').
- ii. Submission of a FEMA Elevation Certificate processing fee deposit of \$1,685.00 (check to be made payable to 'The County of Ventura').
- iii. One (1) complete set of building construction plans (you also need to provide three sets to submit to the Building & Safety Department for their plan check process).
- iv. On the building construction plan set submitted, the Site Plan needs to clearly and accurately delineate the boundary(ies) of the FEMA-determined floodplain zones.
- v. The FEMA 100-Year floodplain Base Flood Elevation needs to be determined by your consultant using both the NGVD 1929 and the NAVD 1988 datums. The NAVD 1988 elevation needs to be converted to the NGVD 1929 elevation, by the project's California-registered Civil Engineer, Architect or Land Surveyor. The most restrictive elevation (i.e. the NGVD 1929 elevation or the NAVD 1988 converted to NGVD 1929) needs to be applied to the project.
- vi. The "top of lowest floor elevation" (which is the FEMA-determined Base Flood Elevation plus the County's one foot freeboard requirement) needs to be clearly illustrated and called-out on all elevation drawings, applicable wall sections, and floor framing plan.

- vii. Submission of all necessary Federal and State permits (e.g., US Army Corp of Engineers, Dept. of Fish & Game), Ventura County Watershed Protection District, and County Planning Department Zoning Clearance, by the Applicant).

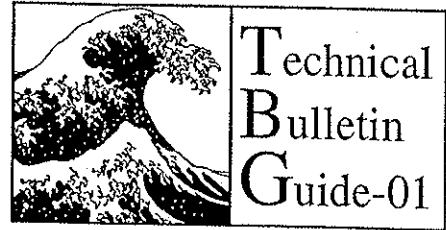
The following building standards need to be met:

- ☐ The recreational vehicle must be elevated to the FEMA-determined Base Flood Elevation plus a one-foot freeboard, as well as meet the anchoring requirements for manufactured homes (refer to FEMA-85 publication at www.fema.gov); **OR**
- ☐ Be located on the site for less than one hundred and eighty (180) consecutive days;
OR
- ☐ Be fully licensed and ready for highway use, that is, the structure is on wheels or its jacking system is attached to the site only by quick disconnect type utilities, and it has no permanently attached additions.

The following requirements need to be achieved before an Occupancy permit can be issued:

OCCUPANCY PERMIT

- i. There shall be a minimum of one (1) site inspection to verify the elevation of “top of lowest floor” and the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services. Contact the County Floodplain Manager at (805) 477-1967.
- ii. One (1) FEMA Elevation Certificate - FEMA Form 81-31, (see attachment) completed by the project’s California-registered Civil Engineer, Architect, or Land Surveyor to verify the elevation of “top of lowest floor” and the elevation of installed electrical, mechanical, plumbing, heating, ventilation, and air conditioning equipment and services). Photographs of all project elevations must accompany the Certificate.
- iii. A Floodproofing Certificate: FEMA 81-65, completed by your project Civil Engineer or Architect.
- iv. Payment of any outstanding Floodplain Permit project account balance.



User's Guide to Technical Bulletins

Including Key Word/Subject Index



FEDERAL EMERGENCY MANAGEMENT AGENCY
MITIGATION DIRECTORATE

FIA-TB-0
(5/01)



FEMA

Available Technical Bulletins

As of March 1998, the following Technical Bulletins are available:

- **Guide-01 User's Guide to Technical Bulletins (FIA-TB-0)**
Provides a list of available technical bulletins, a key word/subject reference index for all the bulletins, and information about how to obtain copies of the bulletins.
- **1-93 Openings in Foundation Walls (FIA-TB-1)**
Provides guidance on the NFIP regulations concerning the requirement for openings in below-Base Flood Elevation foundation walls for buildings located in Zones A, AE, A1-A30, AR, AO, and AH.
- **2-93 Flood-Resistant Materials Requirements (FIA-TB-2)**
Provides guidance on the NFIP regulations concerning the required use of flood-damage resistant construction materials for building components located below the Base Flood Elevation in Special Flood Hazard Areas (both A and V zones).
- **3-93 Non-Residential Floodproofing -- Requirements and Certification -- (FIA-TB-3)**
Provides guidance on the NFIP regulations concerning watertight construction and the required certification for floodproofed non-residential buildings in Zones A, AE, A1-A30, AR, AO, and AH whose lowest floors are below the Base Flood Elevation.
- **4-93 Elevator Installation (FIA-TB-4)**
Provides guidance on the NFIP regulations concerning the installation of elevators below the Base Flood Elevation in Special Flood Hazard Areas (both A and V zones).
- **5-93 Free-of-Obstruction Requirements (FIA-TB-5)**
Provides guidance on the NFIP regulations concerning obstructions to flood waters below elevated buildings and on building sites in Coastal High Hazard Areas (Zones V, VE, and V1-V30).
- **6-93 Below-Grade Parking Requirements -- (FIA-TB-6)**
Provides guidance on the NFIP regulations concerning the design of below-grade parking garages beneath buildings located in Zones A, AE, A1-A30, AR, AO, and AH.
- **7-93 Wet Floodproofing Requirements (FIA-TB-7)**
Provides guidance on the NFIP regulations concerning wet floodproofing of certain types of structures located in Zones A, AE, A1-A30, AR, AO, and AH.
- **8-96 Corrosion Protection for Metal Connectors in Coastal Areas (FIA-TB-8)**
Provides guidance on the need for, selection of, and use of corrosion-resistant metal connectors for the construction of buildings in coastal areas.
- **9-99 Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings (FIA-TB-9)**

Provides guidance on the NFIP regulations concerning the design and construction of breakaway walls beneath elevated buildings in Coastal High Hazard Areas (Zones V, VE, and VI-V30).

- **10-01 Ensuring that Structures Built on Fill In or Near Special Flood Hazard Areas are Reasonably Safe From Flooding (FIA-TB-10)**
This technical bulletin discusses building techniques, including the use of fill, that can be used to ensure structures are reasonably safe from flooding.
- **11-01 Crawlspace Construction for Buildings Located in Special Flood Hazard Areas (FIA-TB-11)**
Provides interim guidance on minimum NFIP requirements as well as best practices for crawlspace construction in the Special Flood Hazard Area.



FEMA

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

NATIONAL FLOOD INSURANCE PROGRAM ELEVATION CERTIFICATE

PAPERWORK REDUCTION ACT NOTICE

Public reporting burden for the Elevation Certificate is estimated to average 3.5 hours per response. Burden means the time, effort, or financial resources expended by persons to generate, maintain, retain, disclose, or provide information to the Federal Emergency Management Agency (FEMA). You are not required to respond to the collection of information unless a valid OMB control number is displayed in the upper right corner of the form. You may send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: U.S. Department of Homeland Security, Federal Emergency Management Agency, Mitigation Division, 500 C Street SW, Washington DC 20472, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.** To obtain or retain benefits under the National Flood Insurance Program (NFIP), you must respond to this collection of information.

PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance that specifies minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in the FEMA Floodplain Management Bulletin about using the Elevation Certificate, available on FEMA's website at www.fema.gov/fima/fpmbul.shtml. Click on "FEMA 467-1 Elevation Certificate Cover and Bulletin."

okay Date

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expires February 28, 2009

Important: Read the instructions on pages 1-8.

SECTION A - PROPERTY INFORMATION			For Insurance Company Use:
A1. Building Owner's Name			Policy Number
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Company NAIC Number
City	State	ZIP Code	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)			
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)			
A5. Latitude/Longitude: Lat. _____ Long. _____		Horizontal Datum: <input type="checkbox"/> NAD 1927 <input type="checkbox"/> NAD 1983	
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.			
A7. Building Diagram Number _____			
A8. For a building with a crawl space or enclosure(s), provide:		A9. For a building with an attached garage, provide:	
a) Square footage of crawl space or enclosure(s) _____ sq ft		a) Square footage of attached garage _____ sq ft	
b) No. of permanent flood openings in the crawl space or enclosure(s) walls within 1.0 foot above adjacent grade _____		b) No. of permanent flood openings in the attached garage walls within 1.0 foot above adjacent grade _____	
c) Total net area of flood openings in A8.b _____ sq in		c) Total net area of flood openings in A9.b _____ sq in	

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number		B2. County Name		B3. State	
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth)
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9. <input type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other (Describe) _____					
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other (Describe) _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input type="checkbox"/> No Designation Date _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)	
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input type="checkbox"/> Finished Construction *A new Elevation Certificate will be required when construction of the building is complete.	
C2. Elevations -- Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7.	
Benchmark Utilized _____	Vertical Datum _____
Conversion/Comments _____	
Check the measurement used.	
a) Top of bottom floor (including basement, crawl space, or enclosure floor) _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)
b) Top of the next higher floor _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)
c) Bottom of the lowest horizontal structural member (V Zones only) _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)
d) Attached garage (top of slab) _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments) _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)
f) Lowest adjacent (finished) grade (LAG) _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)
g) Highest adjacent (finished) grade (HAG) _____	<input type="checkbox"/> feet <input type="checkbox"/> meters (Puerto Rico only)

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION			
This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.			
<input type="checkbox"/> Check here if comments are provided on back of form.			
Certifier's Name		License Number	
Title		Company Name	
Address	City	State	ZIP Code
Signature	Date	Telephone	

PLACE
SEAL
HERE

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number	
City	State	ZIP Code	Company NAIC Number	

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments

Signature

Date

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1-E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1-E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawl space, or enclosure) is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- b) Top of bottom floor (including basement, crawl space, or enclosure) is _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.
- E2. For Building Diagrams 6-8 with permanent flood openings provided in Section A Items 8 and/or 9 (see page 8 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E3. Attached garage (top of slab) is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge.*

Property Owner's or Owner's Authorized Representative's Name

Address

City

State

ZIP Code

Signature

Date

Telephone

Comments

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8. and G9.

- G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3. ☐ The following information (Items G4.-G9.) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued
-------------------	------------------------	---

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: _____ ☐ feet ☐ meters (PR) Datum _____

G9. BFE or (in Zone AO) depth of flooding at the building site: _____ ☐ feet ☐ meters (PR) Datum _____

Local Official's Name

Title

Community Name

Telephone

Signature

Date

Comments

☐ Check here if attachments

Building Photographs

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use:
			Policy Number
City	State	ZIP Code	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page, following.

Building Photographs

Continuation Page

For Insurance Company Use:

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.

Policy Number

City

State

ZIP Code

Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."

INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

SECTION A – PROPERTY INFORMATION

Items A1.-A4. This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

Item A5. Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

Item A6. If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least two photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. If the building has split-level or multi-level areas, provide at least two additional photographs showing side views of the building. All photographs must be in color and measure at least 3"x3". Digital photographs are acceptable.

Item A7. Select the diagram on pages 7-8 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a-g. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

Item A8.a Provide the square footage of the crawl space or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawl space or enclosure(s). Examples of elevated buildings constructed with crawl space and enclosure(s) are shown in Diagrams 6-8 on page 8. Diagram 2 or 4 should be used for a building constructed with a crawl space floor that is below the exterior grade on all sides.

Items A8.b-c Enter in Item A8.b the number of permanent flood openings in the crawl space or enclosure(s) walls that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net

area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. If the crawl space or enclosure(s) walls have no permanent openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

Item A9.a Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

Items A9.b-c Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the adjacent grade. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the garage has no permanent flood openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A9.b-c.

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building's location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community's FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the new county in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

Item B1. NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the *NFIP Community Status Book*, available on FEMA's web site at <http://www.fema.gov/fema/csb.shtm>, or call 1-800-358-9616.

Item B2. County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter "unincorporated area." For an independent city, enter "independent city."

Item B3. State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

Items B4.-B5. Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a four-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

Item B6. FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

Item B7. FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

Item B8. Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1-A30, V, VE, V1-V30, AH, AO, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

Item B9. Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1-A30, AE, AH, V1-V30, VE, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Item B10. Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

Item B11. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

Item B12. Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. An information sheet explaining CBRS areas and OPAs may be obtained on FEMA's web site at http://www.fema.gov/fhm/fmc_cbcrs.shtm.

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

Complete Section C if the building is located in any of Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawl spaces to shoot the elevation of the crawl space floor. If access to the crawl space is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawl space to the "next higher floor," and then subtract the crawl space height from the elevation of the "next higher floor." If there is no access to the crawl space, use the exterior grade next to the structure to measure the height of the crawl space to the "next higher floor."
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawl space floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawl space floor to the next higher floor, try to verify this by looking inside the crawl space through any openings or vents.

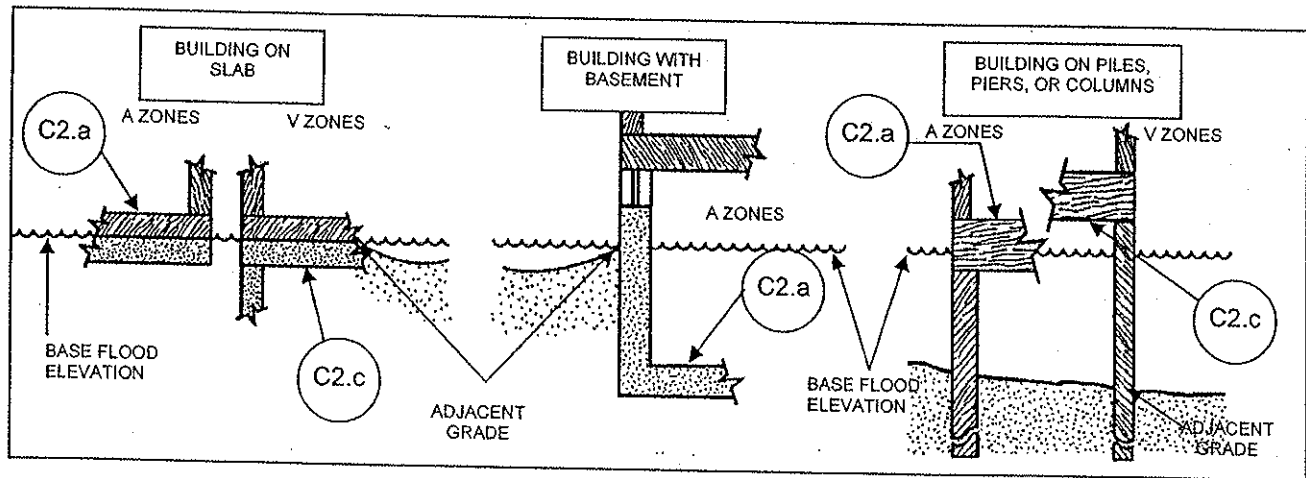
In all three cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

Item C1. Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a-g. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Item C2. A field survey is required for Items C2.a-g. Provide the benchmark utilized, the vertical datum for that benchmark, and any datum conversion necessary. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other

unique identifier assigned by the maintainer of the benchmark. Also provide the vertical datum for the benchmark elevation. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. All elevations for the certificate, including the elevations for Items C2.a-g, must be referenced to the datum on which the BFE is based. Show the datum conversion, if applicable, in this section or in the Comments area of Section D. For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a-g to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items C2.a-d Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7.) in Items C2.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a-g. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawl space, Diagram 8, enter the elevation of the top of the crawl space floor in Item C2.a, whether or not the crawl space has permanent flood openings (flood vents). If any item does not apply to the building, enter "N/A" for not applicable.



Item C2.e Enter the lowest platform elevation of at least one of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type in the Comments area of Section D or Section G, as appropriate. If this item does not apply to the building, enter "N/A" for not applicable.

Items C2.f-g Adjacent grade is defined as the elevation of the ground, sidewalk, patio slab, or deck support immediately next to the building. If the certificate is to be used to support a request for a LOMA or LOMR-F, provide in the Comments area the lowest adjacent grade elevation measured at the deck support or stairs if that elevation is lower than the building's lowest adjacent grade. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable

by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, or other relevant information not specified on the front.

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO & ZONE A (WITHOUT BFE)

Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1.- E4. is based on the "natural grade."

Items E1.a and b Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

Item E2. For Building Diagrams 6-8 with permanent flood openings (see page 8), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

Item E3. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E4. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E5. For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community's floodplain management ordinance.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner's representative who provided the information on the certificate.

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1.** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/A1-A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2.** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3**, if the information in Items G4.-G9. has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4.-G9. provide a way to document these determinations.

Item G4. Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

Item G5. Date Permit Issued. Enter the date the permit was issued for the building.

Item G6. Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

Item G7. New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

Item G8. As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

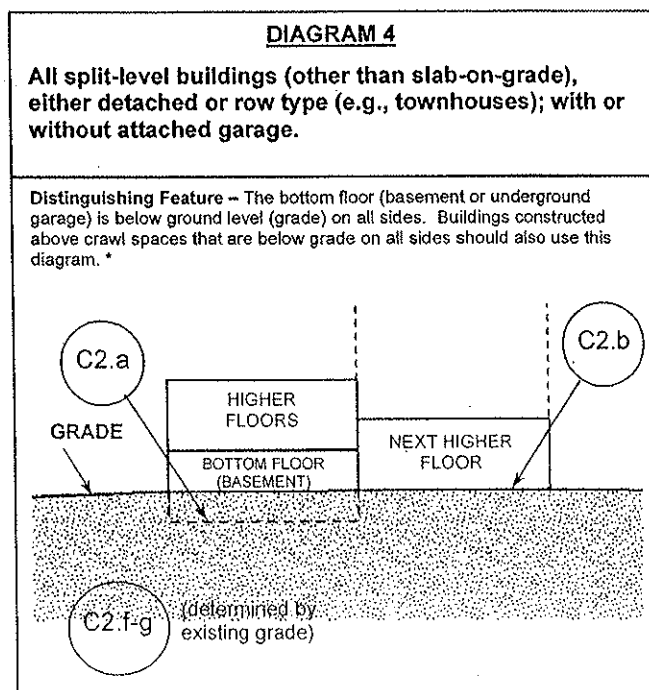
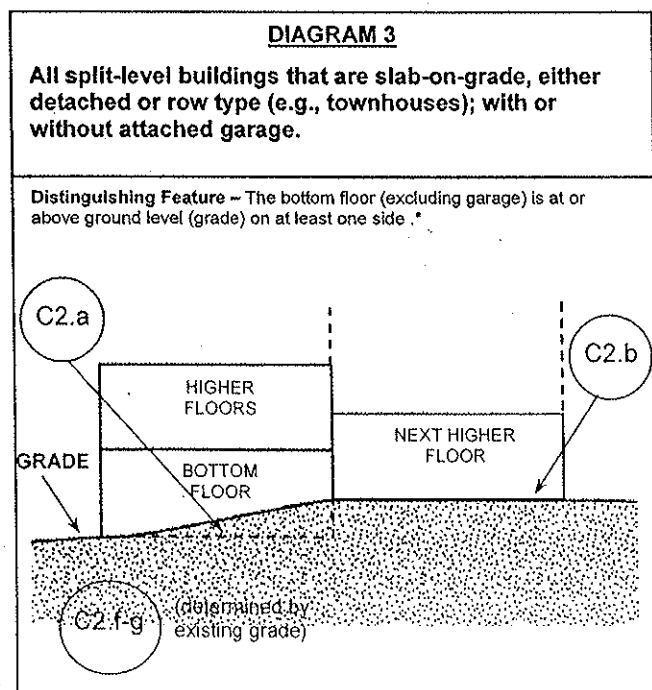
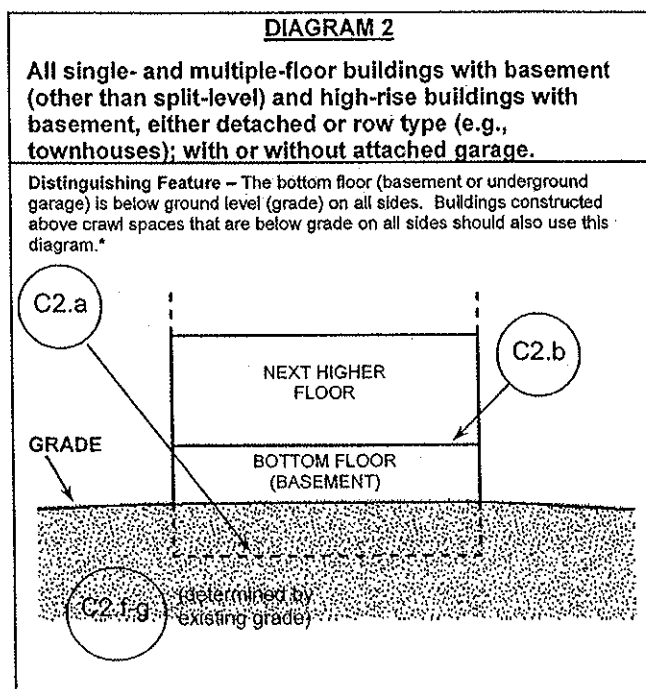
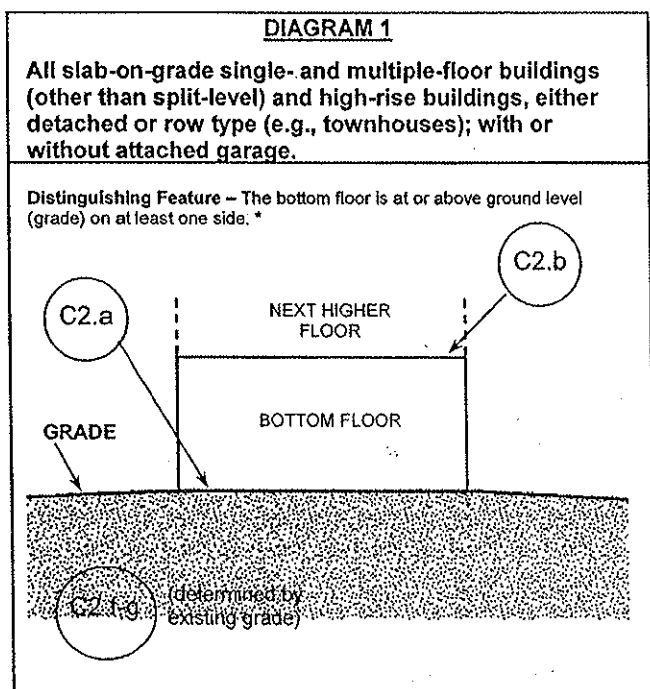
Item G9. BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

BUILDING DIAGRAMS

The following eight diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7., the square footage of crawl space or enclosure(s) and the area of flood openings in square inches in Items A8.a-c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a-c, and the elevations in Items C2.a-g.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

DIAGRAM 5

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is open, with no obstruction to flow of flood waters (open lattice work and/or readily removable insect screening is permissible).

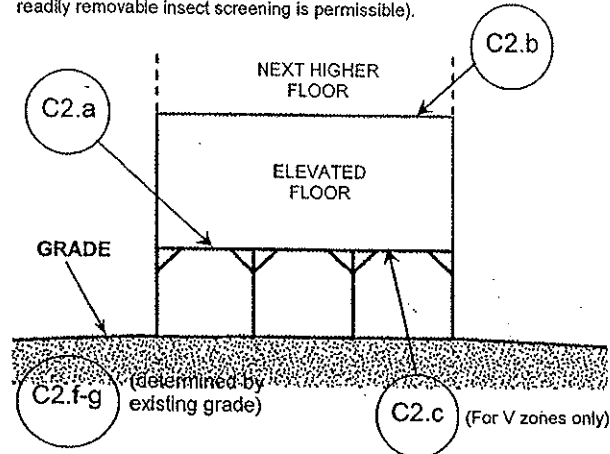


DIAGRAM 6

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

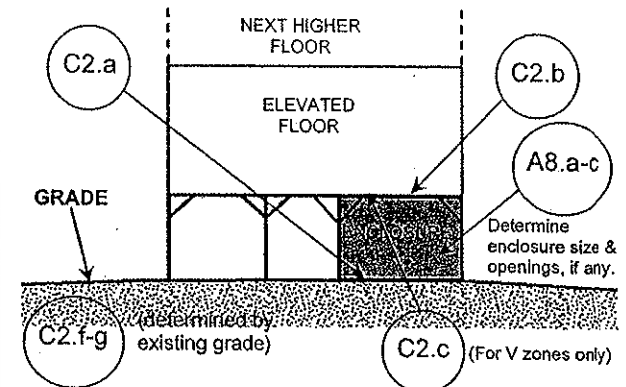


DIAGRAM 7

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

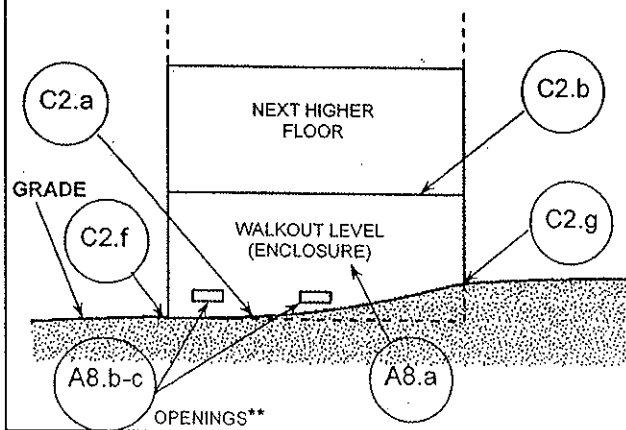
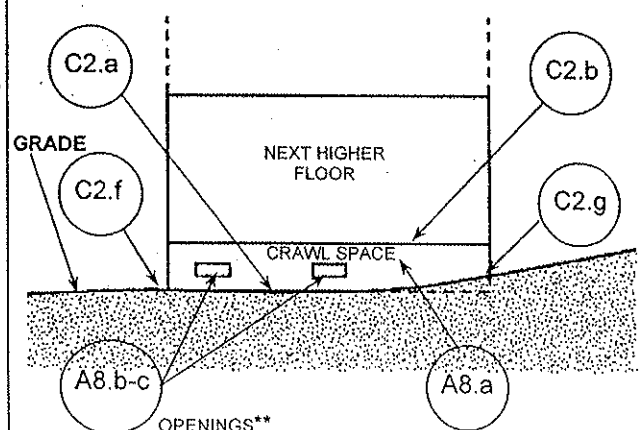


DIAGRAM 8

All buildings elevated on a crawl space with the floor of the crawl space at or above grade on at least one side, with or without an attached garage.

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawl space is with or without openings** present in the walls of the crawl space. Indicate information about crawl space size and openings in Section A – Property Information.

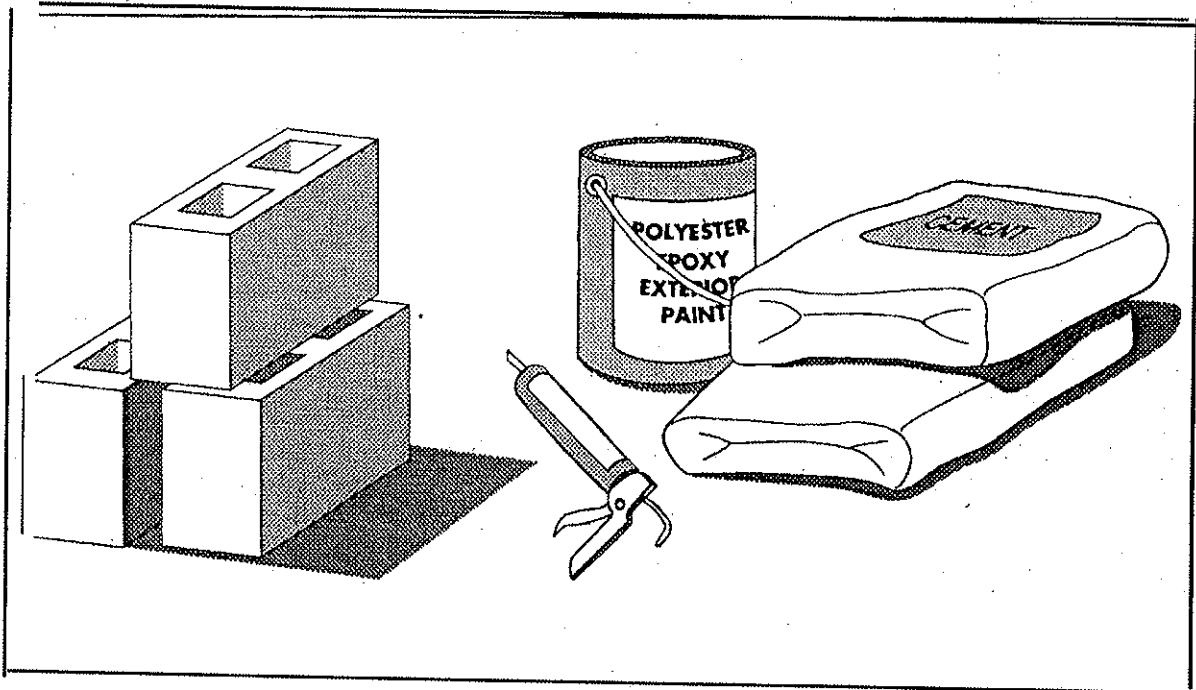


** An "opening" is defined as a permanent opening in a wall that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawl spaces with a total net area of not less than one square inch for every square foot of area enclosed. Each opening must be on different sides of the enclosed area. If a building has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to directly enter. The bottom of the openings must be no higher than one foot above the grade underneath the flood vents. Alternatively, you may submit a certification by a registered professional engineer or architect that the design will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening.



Technical
Bulletin
2-93

Flood-Resistant Materials Requirements
for Buildings Located in Special Flood Hazard Areas
in accordance with the
National Flood Insurance Program



FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION

FIA-TB-2
4/93

TECHNICAL BULLETIN 2-93

Flood-Resistant Materials Requirements for Buildings Located In Special Flood Hazard Areas in accordance with the National Flood Insurance Program

Introduction

The requirement to use construction and finishing materials that are resistant to flood damage in all new and substantially improved buildings in identified Special Flood Hazard Areas (SFHAs) is an important part of the National Flood Insurance Program's (NFIP's) flood-damage-resistant design and construction standards. A residential building's lowest floor is required to be elevated to or above the base flood elevation (BFE). All construction below the lowest floor is susceptible to flooding and must consist of flood-resistant materials. Uses of enclosed areas below the lowest floor in a residential building are limited to parking, building access, and limited storage—areas that can withstand inundation by floodwater without sustaining significant structural damage.

The purpose of this Technical Bulletin is to provide data and guidance on what constitute "materials resistant to flood damage" and how and when these materials must be used to improve a building's ability to withstand flooding.

NFIP Regulations

Section 60.3(a)(3) of the NFIP regulations requires that the community:

"Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a floodprone area, all new construction and substantial improvements shall... be constructed with materials resistant to flood damage..."

It should be noted that Technical Bulletins provide guidance on the minimum requirements of the NFIP regulations. Community or State requirements that exceed those of the NFIP take precedence. Design professionals should contact the community to determine whether more restrictive local or State regulations apply to the building or site in question. All applicable standards of the State or local building code must also be met for any building in a flood hazard area.

Required Use of Flood-Resistant Materials

Flood-Resistant Material

"Flood-resistant material" is defined as any building material capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage. The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than low-cost cosmetic repair (such as painting).

Table 1 Flood-Resistant Classification of Materials		
N F I P	Class	Class Description
A c c e p t a b l e	5	Highly resistant to floodwater damage. Materials within this class are permitted for partially enclosed or outside uses with essentially unmitigated flood exposure.
	4	Resistant to floodwater damage. Materials within this class may be exposed to and/or submerged in floodwaters in interior spaces and do not require special waterproofing protection.
U N A c c e p t a b l e	3	Resistant to clean water damage. Materials within this class may be submerged in clean water during periods of intentional flooding.
	2	Not resistant to water damage. Materials within this class require essentially dry spaces that may be subject to water vapor and slight seepage.
	1	Not resistant to water damage. Materials within this class require conditions of dryness.

Source: COE 1992 "Floodproofing Regulations"

Table 2 Flooring Materials Classifications for Flood Resistance					
Types of Flooring Materials	Classes of Flooring				
	Acceptable		Unacceptable		
	5	4	3	2	1
Asphalt Tile ¹					●
With asphaltic adhesives			●		
Carpeting (glued down type)					●
Cement/bituminous, formed-in-place		●			
Cement/latex, formed-in-place		●			
Ceramic tile ¹					●
With acid-and alkali-resistant grout			●		
Chipboard					●
Clay tile	●				
Concrete, precast or in-situ	●				
Concrete tile	●				
Cork					●
Enamel felt-base floor coverings					●
Epoxy, formed-in-place	●				
Linoleum					●
Magnesite (magnesium oxychloride)					●
Mastic felt-base floor covering					●
Mastic flooring, formed-in-place	●				
Polyurethane, formed-in-place	●				
PVA emulsion cement					●
Rubber sheets ¹					●
With chemical-set adhesives ^{2,3}	●				
Rubber tile ¹					●
With chemical-set adhesives		●			
Silicone floor, formed-in-place	●				

Wall and Ceiling Materials

Table 3 lists wall and ceiling materials commonly used in construction that fall within the five classes described in Table 1. Not all available construction and finishing materials are listed. For products not listed herein, manufacturers' literature should be reviewed for recommended uses. Such recommendations must be complied with fully. All masonry and wood products used in floodprone buildings must comply with the applicable materials standards of the nationally recognized standards organizations, such as the American Society for Testing and Materials (ASTM), the American Concrete Institute (ACI), and the American Wood Products Association (AWPA).

Basis for Classification of Wall and Ceiling Materials

The classification of wall and ceiling materials is based on their vulnerability to damage from inundation by floodwaters. Class 1, 2, and 3 wall and ceiling materials are not acceptable for below-BFE applications for one or more of the following reasons:

- Normal adhesives specified for above-grade use are water soluble or are not resistant to alkali or acid in water, including ground seepage and vapor.
- Wall and ceiling material contains wood, wood products, gypsum products, or other material that dissolves or deteriorates, loses structural integrity, or is adversely affected by water.
- Wall or ceiling material is not resistant to alkali or acid in water.
- Wall or ceiling material is impervious but is dimensionally unstable.
- Wall or ceiling materials absorb or retain water excessively after submergence.

Table 3 Walls and Ceiling Materials Classifications for Flood Resistance

Types of Wall and Ceiling Materials	Classes of Walls and Ceilings				
	Acceptable		Unacceptable;		
	5	4	3	2	1
Fiberboard panels, vegetable types					
Sheathing grade (asphalt coated or impregnated)				•	
Otherwise					•
Gypsum products					
Gypsum board (including greenboard')				•	
Keene's cement of plaster				•	
Plaster, otherwise, including acoustical				•	
Sheathing panels, exterior grade				•	
Glass (sheets, colored tiles, panels)		•			
Glass blocks	•				
Hardboard					
Tempered, enamel or plastic coated				•	
All other types				•	
Insulation					
Foam or closed-cell types		•			
Batt or blanket types					•
All other types				•	
Metals, non-ferrous (aluminum, copper, or zinc tiles)			•		
Metals, Ferrous	•				
Mineral fiberboard					•
Plastic wall tile (polystyrene, urea formaldehyde, etc.)					
Set in waterproof adhesives, pointed with waterproof grout			•		
Set in water-soluble adhesives				•	

Table 3 Walls and Ceiling Materials Classifications for Flood Resistance

Types of Wall and Ceiling Materials	Classes of Walls and Ceilings				
	Acceptable		unacceptable		
	5	4	3	2	1
Strawboard					
Exterior grade (asphalt-impregnated kraft paper)				•	
All other types				•	
Wall covering					
Paper, burlap, cloth types					•
Wood					
Solid, standard				•	
Solid, naturally decay-resistant ^{1,2}	•				
Solid pressure treated, .40 CCA minimum ¹	•				
Plywood					
Marine Grade ¹	•				
Pressure treated, .40 CCA minimum ¹	•				
Exterior grade				•	
Otherwise					•
<p>Note: 1 Not on the COE list; added by FEMA 2 Refer to local building code for guidance</p>					

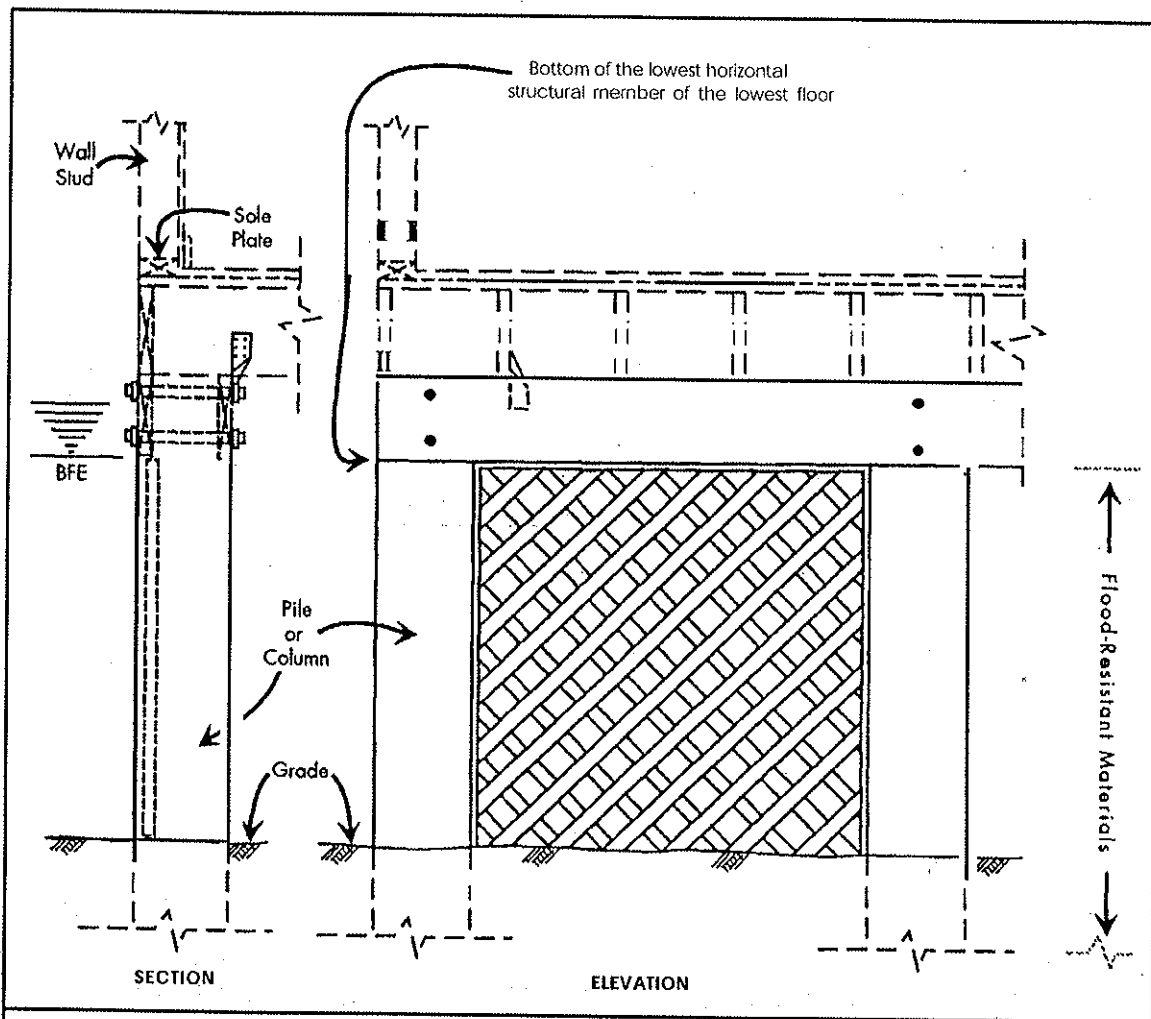


Figure 2. Flood-Resistant Material Requirements for Buildings Elevated in Accordance with NFIP Requirements for Zones V, VE, and V1-V30

Accessory Buildings

Some communities permit the construction of low-cost, small detached accessory buildings (e.g., garages, storage sheds) with a lowest floor elevation below the BFE (Technical Bulletin 5, "Free-of-Obstruction Requirements," provides definitions of "low-cost" and "small"). The below-BFE portions of such buildings must be constructed of flood-resistant materials so that flood damage will be minimized. Additional construction requirements for these buildings, such as the need to anchor the building to resist flotation, collapse, and lateral movement, also must be met before the building is permitted and built. For additional information about these requirements, contact the community that has permitting jurisdiction.

Wet Floodproofing

Wet floodproofing is designing a building to allow floodwaters to enter in order to equalize hydrostatic forces. The NFIP does not allow wet floodproofing in lieu of meeting the lowest

Further Information

The following publications provide further information concerning the use of flood-resistant materials:

1. "Answers to Questions About Substantially Damaged Buildings," FEMA, May 1991, FEMA-213.
2. "Floodproofing Non-Residential Structures," FEMA, May 1986, FEMA- 102.
3. "Flood Proofing Regulations", Chapters 9 and 10, U.S. Army Corps of Engineers, March 1992, EP 1165-2-314.
4. "Flood Proofing Systems and Techniques," U.S. Army Corps of Engineers, December, 1984.
5. "Repairing Your Flooded Home," FEMA and the American Red Cross, August 1992, FEMA-234, ARC 4477.
6. "Technical Notes for Brick Construction," Brick Institute of America, McLean, Virginia, n.d.

Glossary

Base flood — The flood that has a 1-percent probability of being equaled or exceeded in any given year (also referred to as the 100-year flood).

Base Flood Elevation (BFE) — The height of the base flood, usually in feet, in relation to the National Geodetic Vertical Datum of 1929 or other datum as specified.

Basement — Any area of a building having its floor subgrade (below ground level) on all sides.

Coastal High Hazard Area — 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.

Federal Emergency Management Agency (FEMA) — The independent federal agency that, in addition to carrying out other activities, oversees the administration of the National Flood Insurance Program.

Federal Insurance Administration (FIA) — The component of FEMA directly responsible for administering the National Flood Insurance Program.

Flood Insurance Rate Map (FIRM) — The insurance and floodplain management map issued by FEMA that identifies, on the basis of detailed or approximate analyses, areas of 100- year flood hazard in a community.

Floodprone area — Any land area susceptible to being inundated by floodwater from any source.