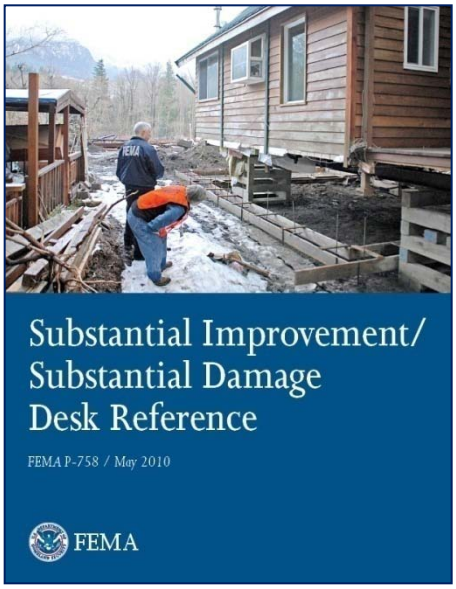
QUICK GUIDE for Handling Additions to Buildings in Special Flood Hazard Areas

This quick guide identifies floodplain management requirements when additions to buildings in special flood hazard areas are proposed to be constructed. It is based on FEMA P-758, FEMA's new *Substantial Improvement / Substantial Damage Desk Reference*.



Several factors must be considered, including:

- What is the flood zone?
- Is the base building pre-FIRM or post-FIRM?
- Is the building residential or nonresidential?
- Is other work being done in the base building?
- Is the addition structurally connected or not structurally connected to the base building?

Use the following charts as you answer those questions in order to identify when the proposed work is required to comply with the floodplain management requirements of your regulations (or building code). Pertinent terms and explanations are taken from the SI/SD Desk Reference (see pages 5 and 6). Also copied from the SI/SD Desk Reference are portions of "compliance matrices" on which the charges are based. Chapter 6 of the SI/SD Desk Reference has an explanation of what it means to "bring buildings into compliance" with all of the requirements.

Download the SI/SD Desk Reference at http://www.fema.gov/library/viewRecord.do?id=4160
Hardcopies should be available from the FEMA warehouse by the end of summer 2010.

Chart 1

Buildings in all Flood Zones

Lateral Addition <u>ONLY</u> (see Chart 3 for vertical additions)

NOTE:
Use the definition of "Substantial Improvement" in the applicable code or regulations (may be cumulative, may be based on percentage lower than 50%).

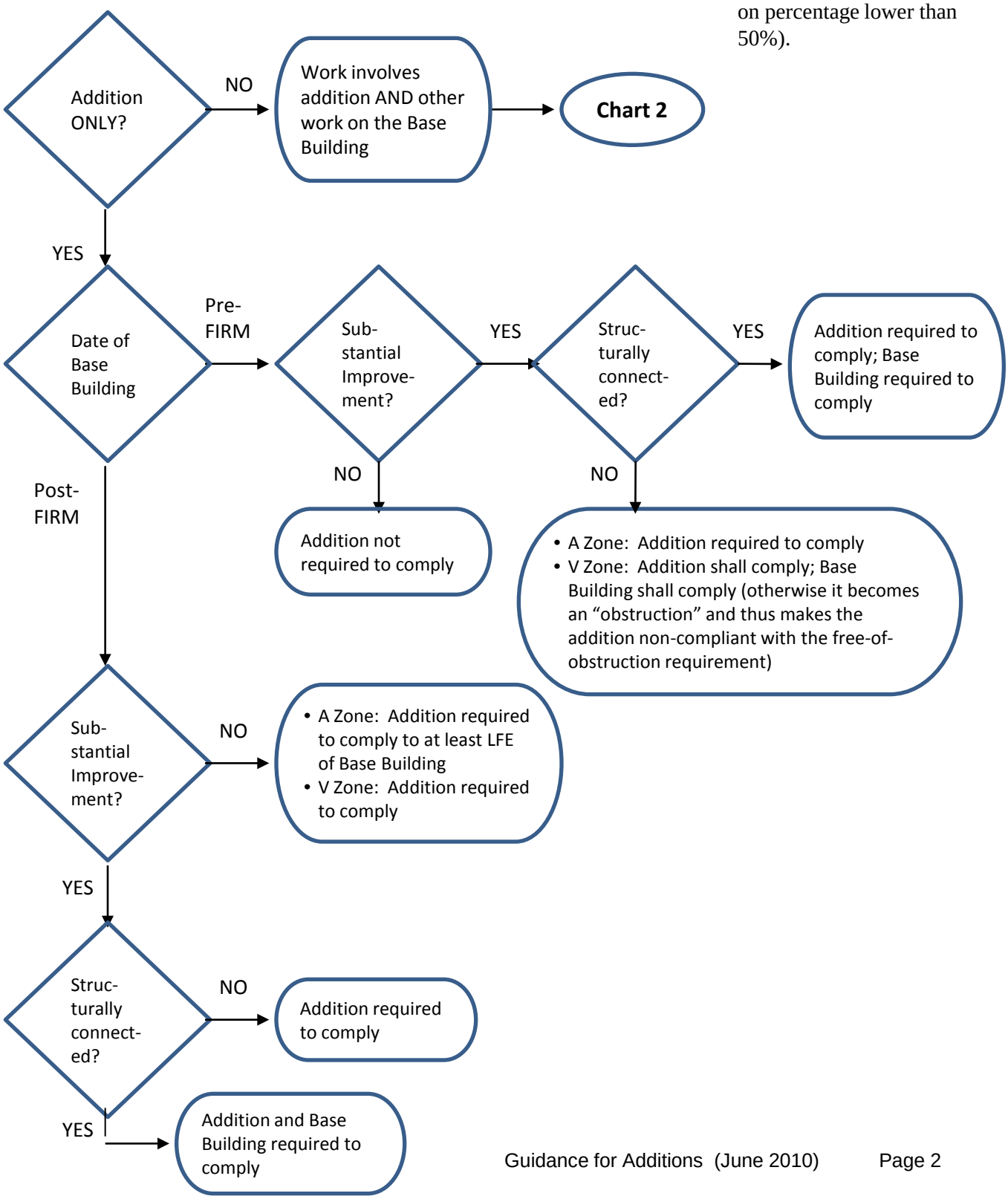


Chart 2

Buildings in All Flood Zones

Lateral Additions AND Other Improvement Work in Base Building (e.g., rehab, renovate, remodel)

NOTE:
Use the definition of "Substantial Improvement" in the applicable code or regulations (may be cumulative, may be based on percentage lower than 50%).

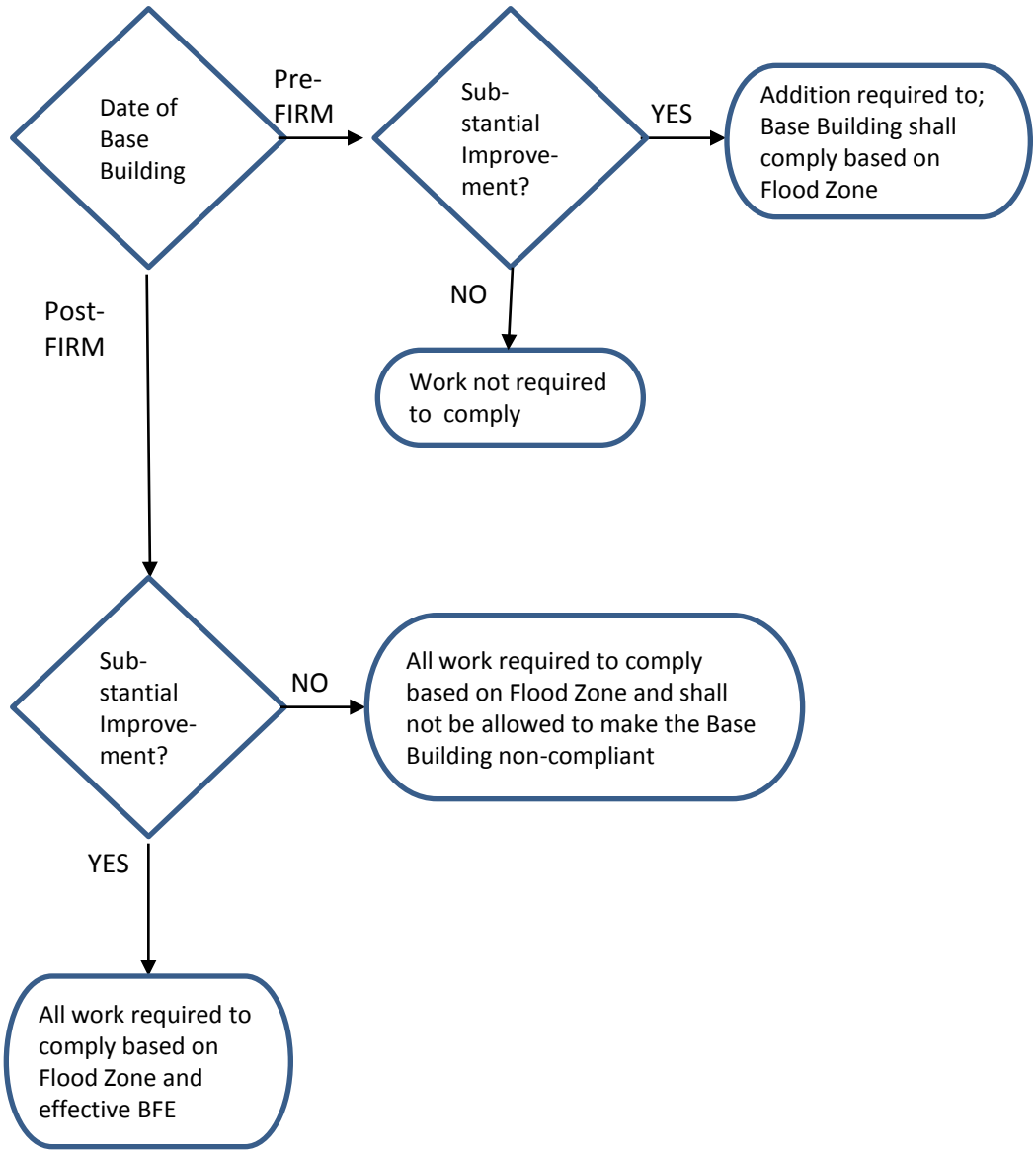
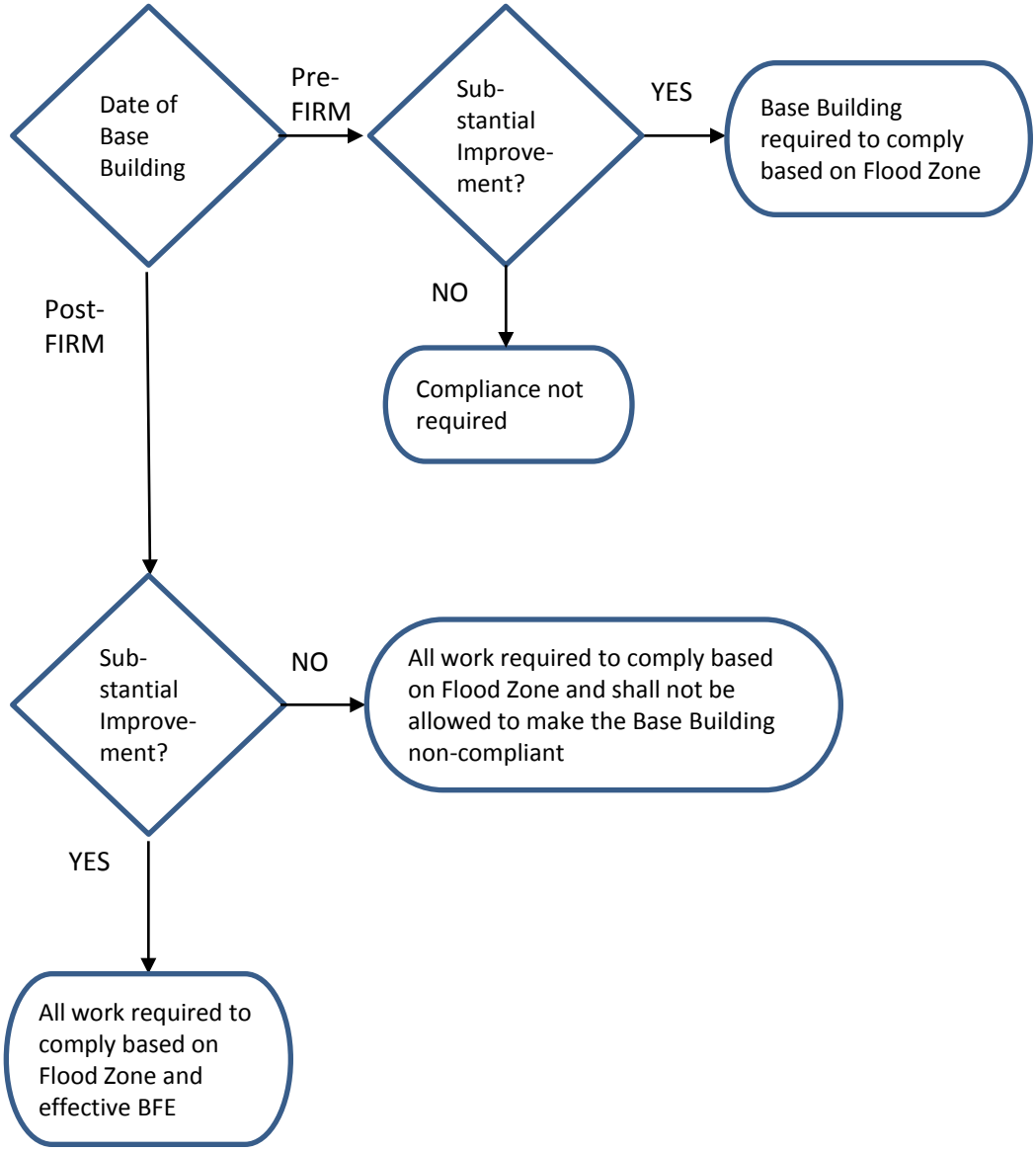


Chart 3

Buildings in All Flood Zones

Vertical Additions

NOTE:
Use the definition of "Substantial Improvement" in the applicable code or regulations (may be cumulative, may be based on percentage lower than 50%).



Decision Charts for Handling Additions to Buildings in Flood Hazard Areas

Based on FEMA P-758, *Substantial Improvement / Substantial Damage Desk Reference,* see Chapter 6, especially Section 6.2 and Section 6.3. Selected figures are shown on pages 8 through 12.

PERTINENT TERMS

Additions

- **Addition.** An extension or increase in floor area or height of a building (from Building Codes).
- **Horizontal Additions.** An extension that increases the footprint of a building.
- **Vertical Additions.** An increase in floor area without increasing the footprint of a building.

Date of Base Building

- **Pre-FIRM.** A building for which construction or substantial improvement occurred on or before December 31, 1974, or before the effective date of the initial FIRM.
- **Post-FIRM.** A building for which construction or substantial improvement occurred after December 31, 1974, or after the date of the initial FIRM, whichever is later.

Residential or Nonresidential

- **Residential.** Compliance solutions are only elevation-in-place (LFE or lowest horizontal structural member, based on Flood Zone).
- **Nonresidential.** Compliance solutions are elevation-in-place based on Flood Zone or retrofit floodproofing (A Zones only).

Structurally Connected or Not Structurally Connected

- **Not Structurally Connected.** A lateral addition is "non structurally connected" if it involves no alteration of the load-bearing structure of the building, is attached to the building with minimal connection, and has a doorway as the only modification to the common . An addition that is below the BFE and "not structurally connected" is expected to sustain damage, but should not transfer loads to the building. Long-standing FEMA guidance refers to "modification of the common wall by no more than a doorway," which is one way to describe not structurally connected.
- **Structurally Connected.** A lateral addition is "structurally connected" if it has its load-bearing structure connected to the load-bearing structure of the base building, which typically involves significant alternation of the common wall. An addition that is below the BFE and "structurally connected" would transfer flood loads imposed on it to the existing building.

PERTINENT TERMS (continued)

Flood Insurance Rate Map Changes

- **Flood Zone Changed.** If the FIRM has been revised and the SFHA has widened to include more area, that area is now subject to the NFIP requirements. For example, areas that were previously designated X zone may now be shown as A zone or V zone. Improvements and repairs to buildings that were previously outside of the SFHA but are now in the revised SFHA must be evaluated to determine if proposed work is SI/SD.
- **Flood Zone Changed or BFE Changed.** If the FIRM has been revised and the flood zone or BFE changed, a determination that work is a substantial improvement requires that the building meet NFIP requirements for new construction based on the revised flood zone and revised BFE.
- **New Floodway or Floodway Boundary Changed.** If the FIRM has been revised and either the floodway boundaries are changed or a floodway is newly delineated, a determination that improvements or repairs to a building are SI/SD may require an encroachment analysis.

FEMA'S COMPLIANCE MATRICES for A Zones and V Zones

[*Only rows pertinent to additions are shown.*]

Table 6-1a. Compliance Matrix (A Zones)

Types of Work	Building is Pre-FIRM	Building is Post-FIRM
Lateral addition and Rehabilitation, SI	Addition required to comply; building required to comply	Addition required to comply; building required to comply (see Note below table)
Lateral addition, not SI	Addition not required to comply	Addition required to be elevated to at least the elevation of the existing lowest floor
Lateral addition, SI, not structurally connected	Addition required to comply; building not required to comply	Addition required to comply
Lateral addition, SI, structurally connected	Addition required to comply; building required to comply	Addition required to comply; building required to comply (see Note below table)
Vertical addition above building, not SI	Compliance not required	Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance
Vertical addition above building, SI	Building required to comply	Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)

Note: If a map revision has resulted in a higher BFE, a post-FIRM building must comply based on the new BFE.

Table 6-1b. Compliance Matrix (V Zones)

Types of Work	Building is Pre-FIRM	Building is Post-FIRM
Lateral addition and Rehabilitation, SI	Addition required to comply; building required to comply	Addition required to comply, and rehabilitation work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)
Lateral addition, not SI	Addition not required to comply	Addition required to comply
Lateral addition, SI, not structurally connected	Addition required to comply; building required to comply	Addition required to comply (see Note below)
Lateral addition, SI, structurally connected	Addition required to comply; building required to comply	Addition required to comply; building required to comply (see Note below table)
Vertical addition above building, not SI	Compliance not required	Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance
Vertical addition above building, SI	Building required to comply	Work shall comply and shall not be allowed to make the building non-compliant with any aspect of the building that was required for compliance (see Note below table)

Note: If a map revision has resulted in a higher BFE, a post-FIRM building must comply based on the new BFE.

These figures are from FEMA P-758, *Substantial Improvement / Substantial Damage Desk Reference*.

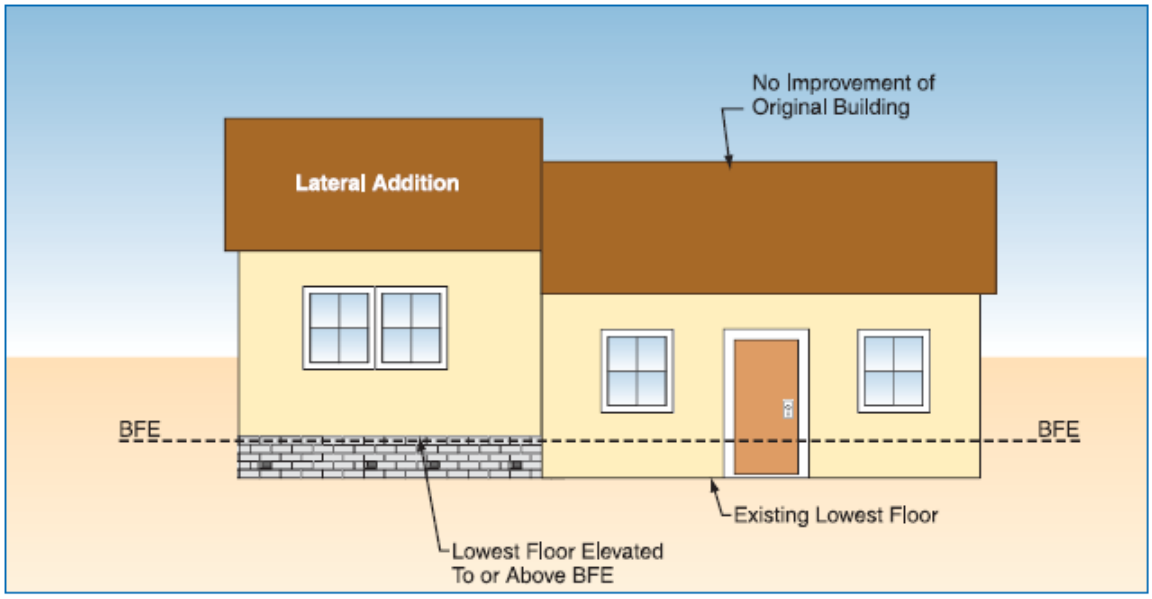


Figure 6-3. Lateral addition to a pre-FIRM building in an A zone – the proposed work is only the addition (no work was performed on the original building and no structural modification was made to the common wall or roof). The addition constitutes a substantial improvement and it complies with all NFIP requirements.

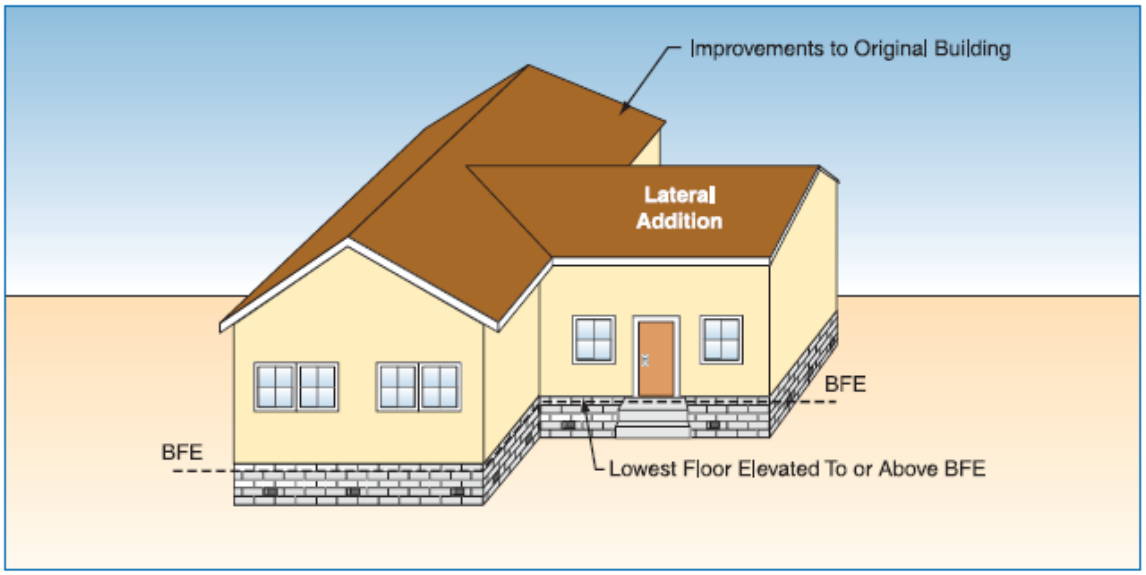


Figure 6-4. Lateral addition to a pre-FIRM building in an A zone – the proposed work includes an addition and work on the original building, including structural modification of the common wall or roof. The proposed work was determined to be a substantial improvement. The addition complies with all requirements and the building is brought into compliance by elevating it on a compliant foundation.

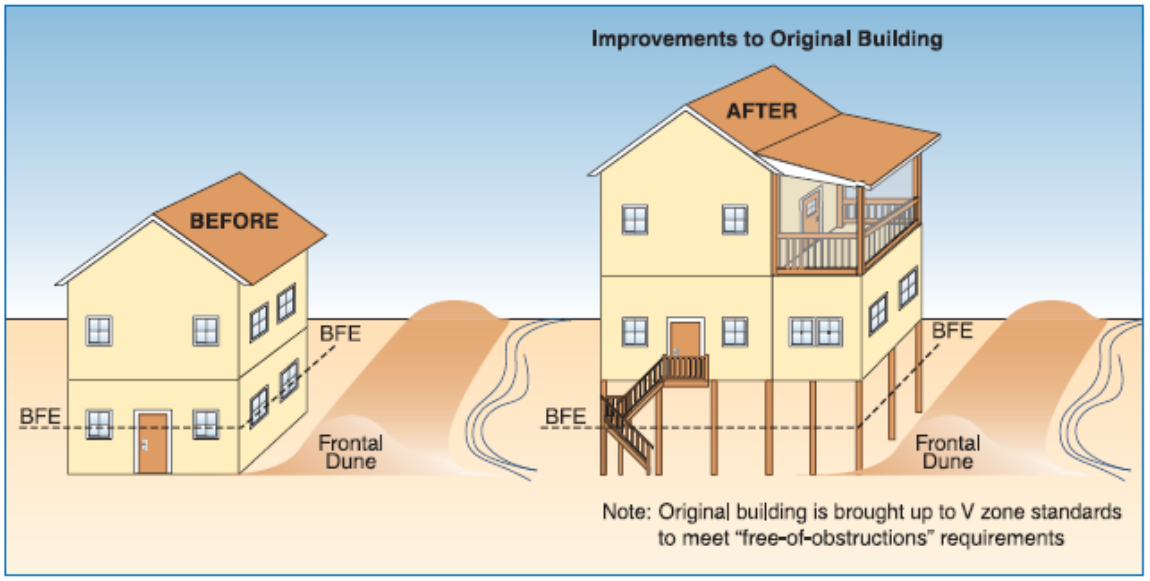


Figure 6-5. Lateral addition to a residential building in a V zone – the proposed work includes work on the original building. The lateral addition and improvements constitute substantial improvement. Both the addition and the original building are brought into compliance by elevating to or above the BFE on an open foundation.

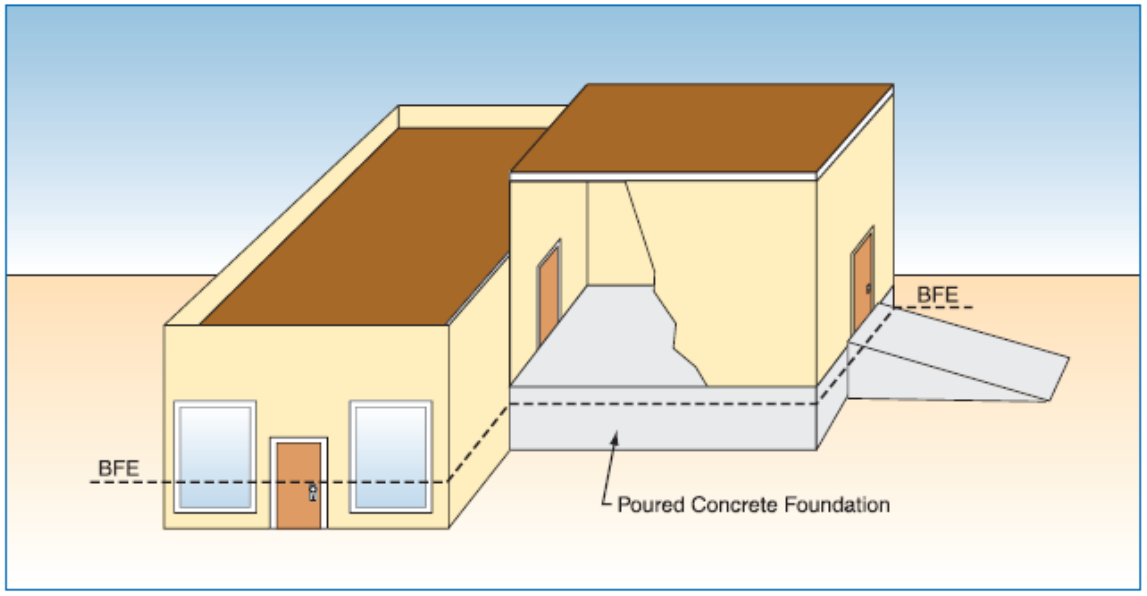


Figure 6-7. Lateral addition to a non-residential building in an A zone – the proposed work is only the addition (no work on the existing building and no structural modification of the common wall or roof). The work constitutes substantial improvement. The addition is elevated to or above the BFE (an alternative would be to dry floodproof only the addition, including the common wall).

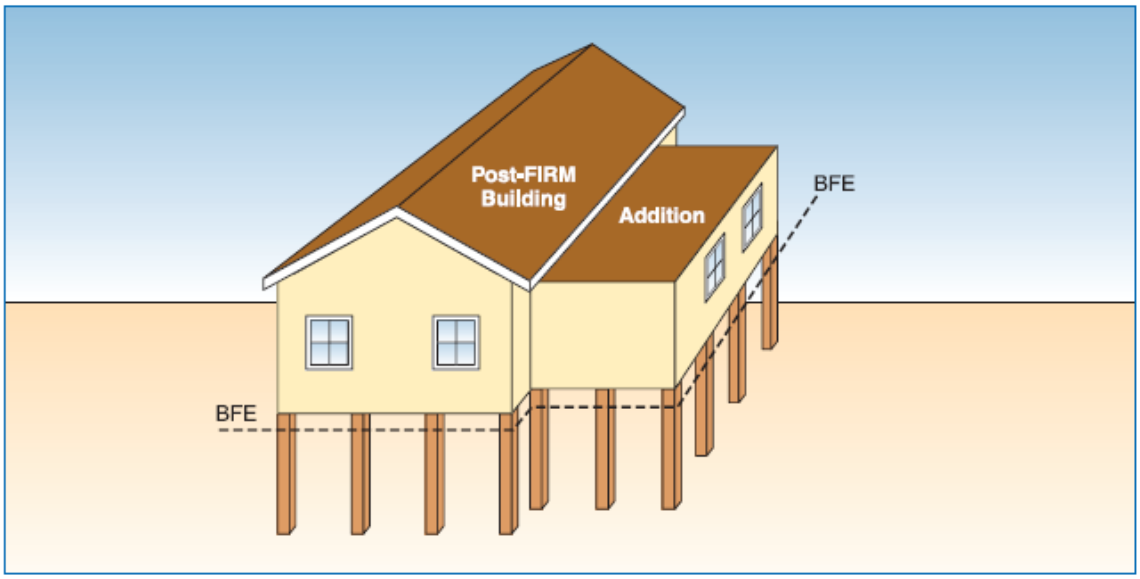


Figure 6-8. Lateral addition to a post-FIRM building in any flood zone (map revision has not changed the effective BFE). All improvements or repairs to a post-FIRM building must comply with the NFIP requirements regardless of the value of that work, and the work shall not compromise any of the NFIP requirements that the building was required to meet when it was initially built.

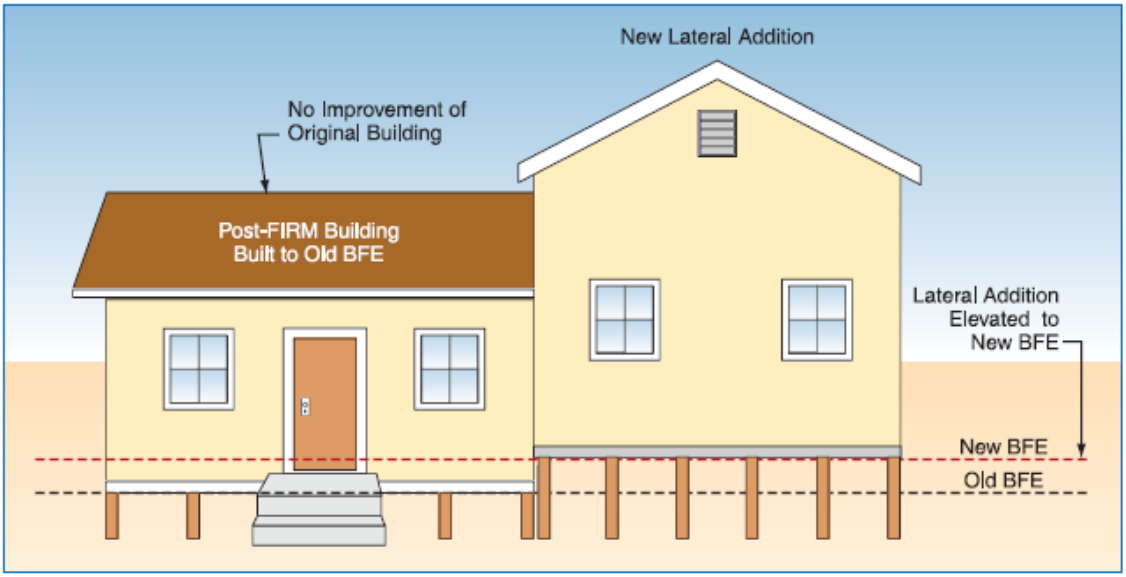


Figure 6-9. Lateral addition to a post-FIRM building in an A zone (a map revision has increased the BFE). The proposed work is a lateral addition with no work in the original building and no structural modification of the common wall or roof. The work constitutes a substantial improvement. Because there is no structural modification, only the addition must comply with the effective BFE which is higher than the BFE when the building was built. If instead the proposed work includes work in the original building or structural modification, the addition and the building must comply with the effective BFE.

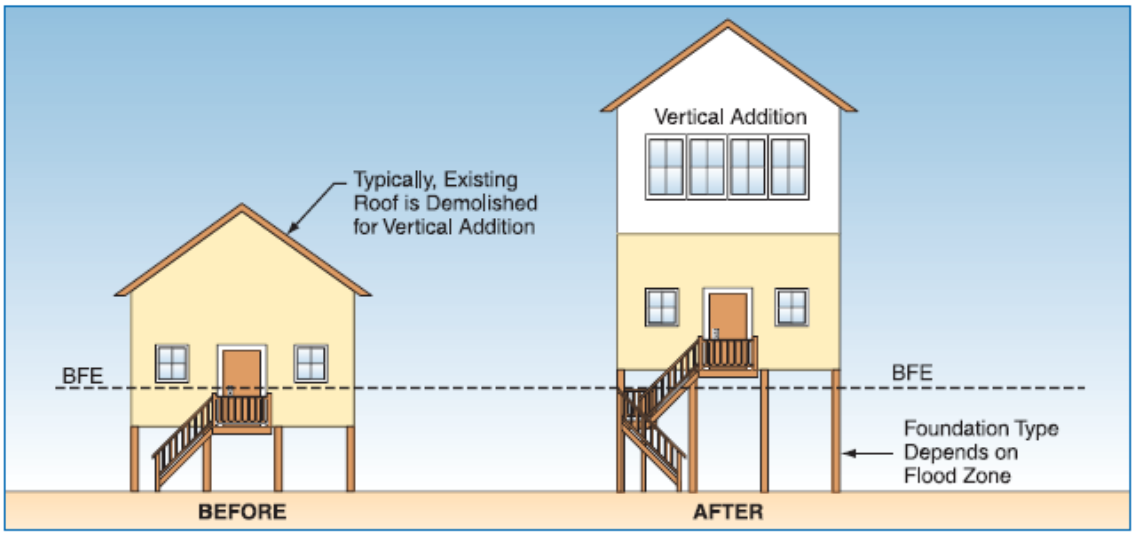


Figure 6-10. Vertical addition to a pre-FIRM residential building (in any zone) – the proposed work is a new upper story that involves structural modification. The work is a substantial improvement. The building is elevated to or above the BFE on a compliant foundation.

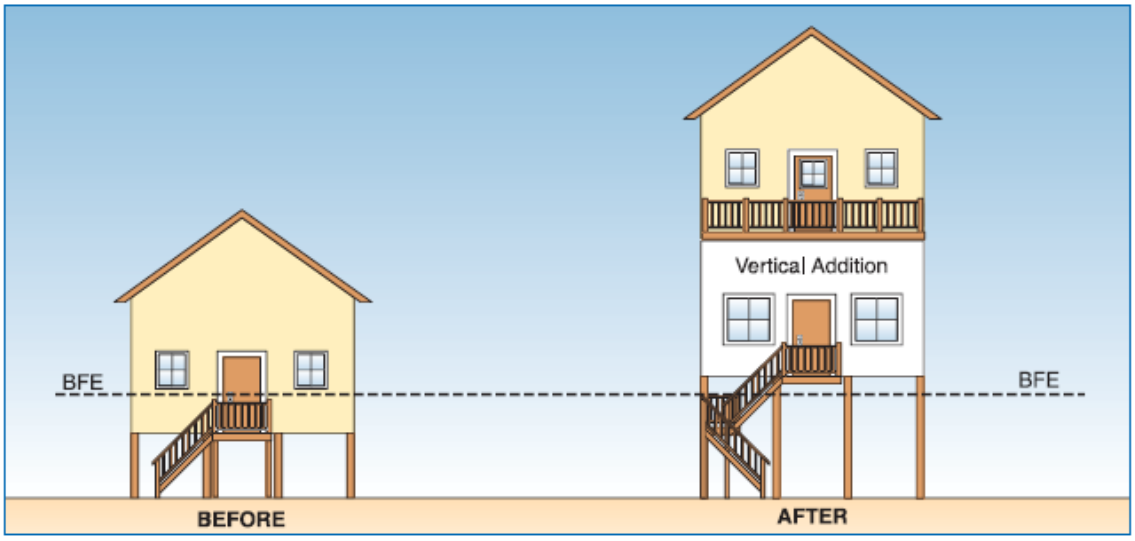


Figure 6-11. Vertical addition to a pre-FIRM residential building (in any zone) – the proposed work is a new lower story that involves structural modification. The work constitutes a substantial improvement. The building and the new lower story are elevated on a compliant foundation.

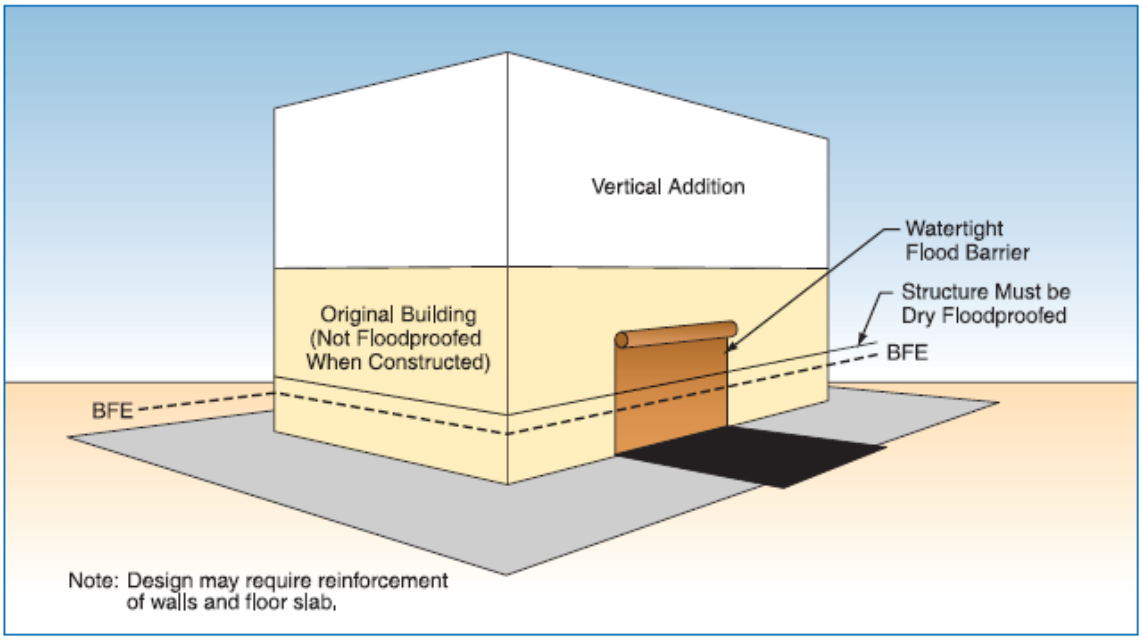


Figure 6-12. Vertical addition to a pre-FIRM, non-residential building in an A zone. The work constitutes a substantial improvement. The building is brought into compliance by retrofit dry-floodproofing measures (certification of design by registered design professional is required). Non-residential buildings can also be brought into compliance by elevation (not shown).