

Massachusetts State Building
Code
Substantial Improvement
9th Edition Residential Volume



department of Conservation and Recreation

Residential Volume

- Chapter 1, Scope and Administration
- Chapter 2, Definitions
- Chapter 3, Building Planning
 - Section R322 Flood-Resistant Construction
- Chapter 4, Foundations

Substantial Improvement

Residential Volume

- R105.3.1.1 Determination of Substantially Improved or Substantially Damaged Existing Buildings in Flood Hazard Areas.

Substantial Improvement

- If the building official finds that the value of proposed work equals or exceeds 50% of the market value of the building or structure before the damage has occurred or the improvement is started, the proposed work is a substantial improvement or restoration of substantial damage...

Substantial Improvement

- and the building official shall require existing portions of the entire building or structure to meet the requirements of section R322.

Substantial Improvement

- For the purpose of this determination, a substantial improvement shall mean any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50% of the market value of the building or structure before the improvement or repair is started.

Substantial Repair of a Foundation

- R105.3.1.1.1 Determination of Substantial Repair of a Foundation.
- When work to repair or replace a foundation results in the repair or replacement of a portion of the foundation with a perimeter along the base of the foundation that equals or exceeds 50% of the perimeter of the base of the foundation measured in linear feet,

Substantial Repair of a Foundation

- or repair or replacement of 50% of the piles, columns or piers of a pile, column or pier supported foundation, the building official shall determine it to be substantial repair of a foundation.

Substantial Repair of a Foundation

- Applications determined by the building official to constitute substantial repair of a foundation shall require all existing portions of the entire building or structure to meet the requirements of section R322.

FEMA Guidance on Substantial Improvements



Substantial Improvement/ Substantial Damage Desk Reference

FEMA P-758 / May 2010

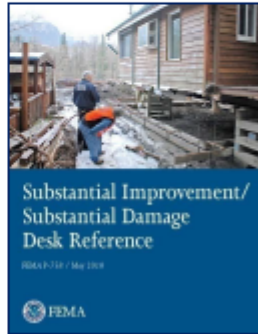


FEMA

FEMA Guidance on Additions

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.

FAQs Approved by the BBRS in June, 2018

SECTION R322 FLOOD RESISTANT CONSTRUCTION (Residential Code Only)

Background. 780 CMR Section R322.1 as revised in the ninth edition states that "Buildings and structures constructed in whole or in part in flood hazard areas and coastal dunes, and substantial improvement and restoration of substantial damage of buildings and structures in those areas shall be designed and constructed in accordance with the provisions contained in this section. Buildings and structures located in more than one flood hazard area and coastal dunes shall comply with the most restrictive provisions. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24. See section R105.3.1.1 for substantial improvements and damage and see section R309 for garage requirements. Flood hazard areas include the following:

1. A O zones, where shallow flooding exists without waves;
2. A zones; and
3. V zones, where high velocity wave action exists and wave heights are greater than or equal to three feet

Question. When are lateral or horizontal additions to structures in floodplains required to be elevated?

Answer. This depends on many variables. Each situation is addressed individually below. This FAQ addresses lateral additions only. It does not address improvements that consist of additions and other work to the existing structure. In all cases, substantial improvements that consist of a combination of additions and other work to the existing structure require that the entire structure be elevated to the standards for the applicable flood zone.

A1. A zones. Lateral additions to pre-FIRM structures that are not substantial improvements are not required to be elevated. Lateral additions to post-FIRM structures that are not substantial improvements are required to be elevated to at least the elevation of the existing lowest floor.

A2. A zones. Lateral additions that are substantial improvements and are not structurally connected to pre-FIRM or post-FIRM structures require only the addition to be elevated to the standards of R322.2.

A3. A zones. Lateral additions that are substantial improvements and are structurally connected to pre-FIRM or post-FIRM structures require the existing structure and the addition to be elevated to the standards of R322.2.

A4. V zones. Lateral additions to existing structures in V zones that are not substantial improvements are required to meet the standards of R322.3 (6).

A5. V zones. Lateral additions that are substantial improvements require the existing structure and the addition to be elevated to the standards of R322.3. This is true for all lateral additions regardless of whether they are structurally connected to the existing structure. It applies to pre-FIRM and post-FIRM structures. In situations where the base flood elevation has changed, the structure must comply with the new base flood elevation.

FAQs Approved by the BBRS in January, 2019

Proposed FGD for Residential Code, Sections R1023.1.1, R302, 02/10/19

Q: When determining whether proposed work constitutes a substantial improvement as described in R1023.1.1, do costs for multiple permits need to be considered cumulatively or time?

A: Sometimes they do, it depends on the specifics of each individual situation. Different situations are addressed below.

Q1: Multiple permits issued for one work project: When multiple permits are issued for a work project (e.g., separate permits for excavation, foundation, electrical, etc.) the costs associated with each permit must be considered together when determining substantial improvement.

Q2: Permits issued simultaneously for different work projects: When permits are issued for separate work projects taking place at the same time on the same building, the cost for the projects must be considered together when determining substantial improvement. This includes permits that overlap (i.e., one permit is issued while a previous permit is still open).

Q3: Permits issued within a 12-month period: Related work permitted within a 12-month period shall be considered to be a single work project. The costs must be considered together when determining substantial improvement.

Clarification

Sections 01 and 02 are consistent with FEMA guidance (FEMA P-776, Substantial Improvement/Substantial Damage Desk Reference) and are consistent with current practice in Massachusetts.

Section 03 is based on this statement in Appendix J of the Residential Code, 02/10/19:

Related work permitted within a 12-month period shall be considered to be a single work project.

Considering costs cumulatively for permits issued within a 12-month period will allow communities to prevent mitigation (losses from demanding Code requirements for substantial improvements.

Substantial Code Section:

R1023.1.1 Determination of Substantially Improved or Substantially Damaged Existing Buildings in Flood Hazard Areas. For applications for reconstruction, rehabilitation, addition, alteration, repair or other improvement of existing building or structure located in a flood hazard area as established by section 222.1.1, the building official shall examine or cause to be examined the construction documents and shall make a determination with regard to the value of the proposed work. For buildings that have sustained damage of any origin, the value of the proposed work shall include the costs to repair the building or structure to its pre-damaged condition. If the building official finds that the value of proposed work equals or exceeds 20% of the market value of the building or structure before the damage has occurred or the improvements started, the proposed work is a substantial improvement or restoration of substantial damage, and the building official shall require existing portions of the building or structure to meet the requirements of section R302. For the purpose of this determination, a substantial improvement shall mean any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 20% of the market value of the building or structure before the improvement or repair is started. Where the building or structure has sustained substantial damage, repairs necessary to restore the building or structure to its pre-damaged condition shall be considered substantial improvements, regardless of the actual repair work performed. The term shall not include either of the following:

1. Improvements to a building or structure that are required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to ensure safe living conditions.
2. Any alteration of historic building or structure, provided that the alteration will not preclude the continued designation as a historic building or structure. For the purpose of this section, a historic building shall be any of the following:

2.1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places.

2.2. Determined by the Secretary of the U.S. Department of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district.

2.3. Designated as historic under state or local historic preservation program that is approved by the U.S. Department of the Interior.

A101.3 Multiple categories of work: Work of more than one category shall be part of a single work project. Related work permitted within a 12-month period shall be considered to be a single work project. Where a project includes one category of work in one building area and another category of work in a separate and unrelated area of the building, each project area shall comply with the requirements of the respective category of work. Where a project in more than one category of work is performed in the same area or in related areas of the building, the project shall comply with the requirements of the more stringent category of work.

FEMA Guidance



<https://www.fema.gov/media-library/assets/documents/15292>

Cost of Improvement

- What costs must be included
- What costs can be excluded

Costs Included

- Materials and labor, including value of donated or discounted materials and owner or volunteer labor
- Site preparation related to the improvement or repair (e.g., foundation excavation or filling in basements)
- Demolition and construction debris disposal

Costs Included

- Structural elements and exterior finishes
- Interior finish elements
- Utility and service equipment

Costs Excluded

- Clean-up and trash removal (Section 4.4.)
- Costs to temporarily stabilize a building
- Costs to obtain or prepare plans
- Land survey costs
- Permit fees and inspection fees
- Carpeting installed over finished
- Plug-in appliances

Value of Structure

- Assessed value
- Appraised value
- Actual cash value

Phased Improvements

- Incomplete work
- Multiple permits
- Consecutive permits

Additions



Terminology

- PreFIRM A building for which construction or substantial improvement occurred on or before December 31, 1974, or before the effective date of the initial FIRM.

Terminology

- PostFIRM A building for which construction or substantial improvement occurred after December 31, 1974, or after the date of the initial FIRM, whichever is later.

Terminology

- **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 alteration 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.

Terminology

- **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 .

Terminology

- **Not Structurally Connected. (continued)**
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.

Additions (FAQ)

- **Question.** When are lateral or horizontal additions to structures in floodplains required to be elevated?

Additions (FAQ)

- **A1. A zones.** Lateral additions to pre-FIRM structures that are not substantial improvements are not required to be elevated. Lateral additions to post-FIRM structures that are not substantial improvements are required to be elevated to at least the elevation of the existing lowest floor.

Additions (FAQ)

- **A2. A zones.** Lateral additions that are substantial improvements and are not structurally connected to pre-FIRM or post-FIRM structures require only the addition to be elevated to the standards of R322.2.

Additions (FAQ)

- **A3. A zones.** Lateral additions that are substantial improvements and are structurally connected to pre-FIRM or post-FIRM structures require the existing structure and the addition to be elevated to the standards of R322.2.

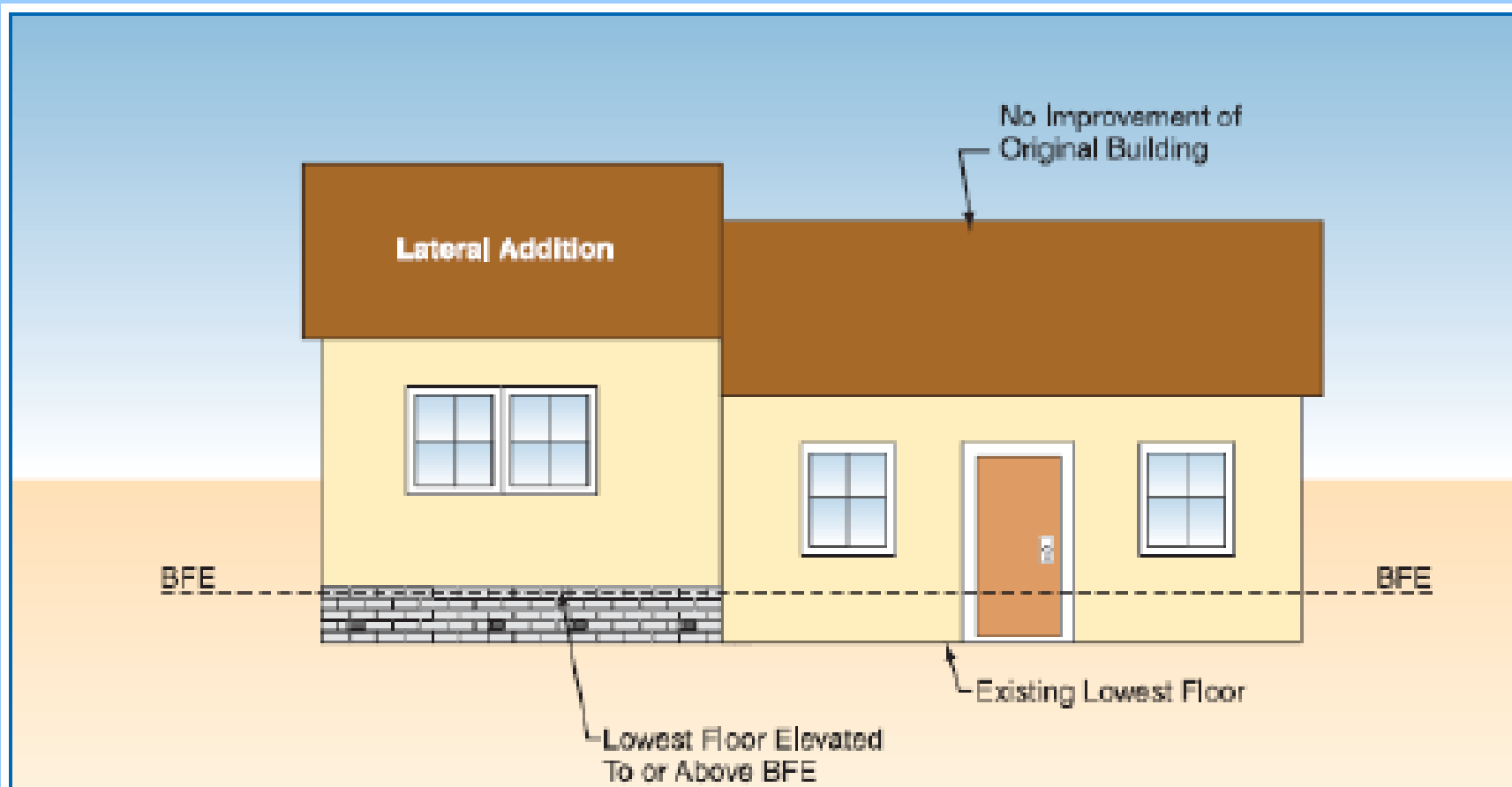


Figure 6-3. Lateral addition to a pre-FIRM building in an A zone – the proposed work is only the addition (no work was performed on the original building and no structural modification was made to the common wall or roof). The addition constitutes a substantial improvement and it complies with all NFIP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

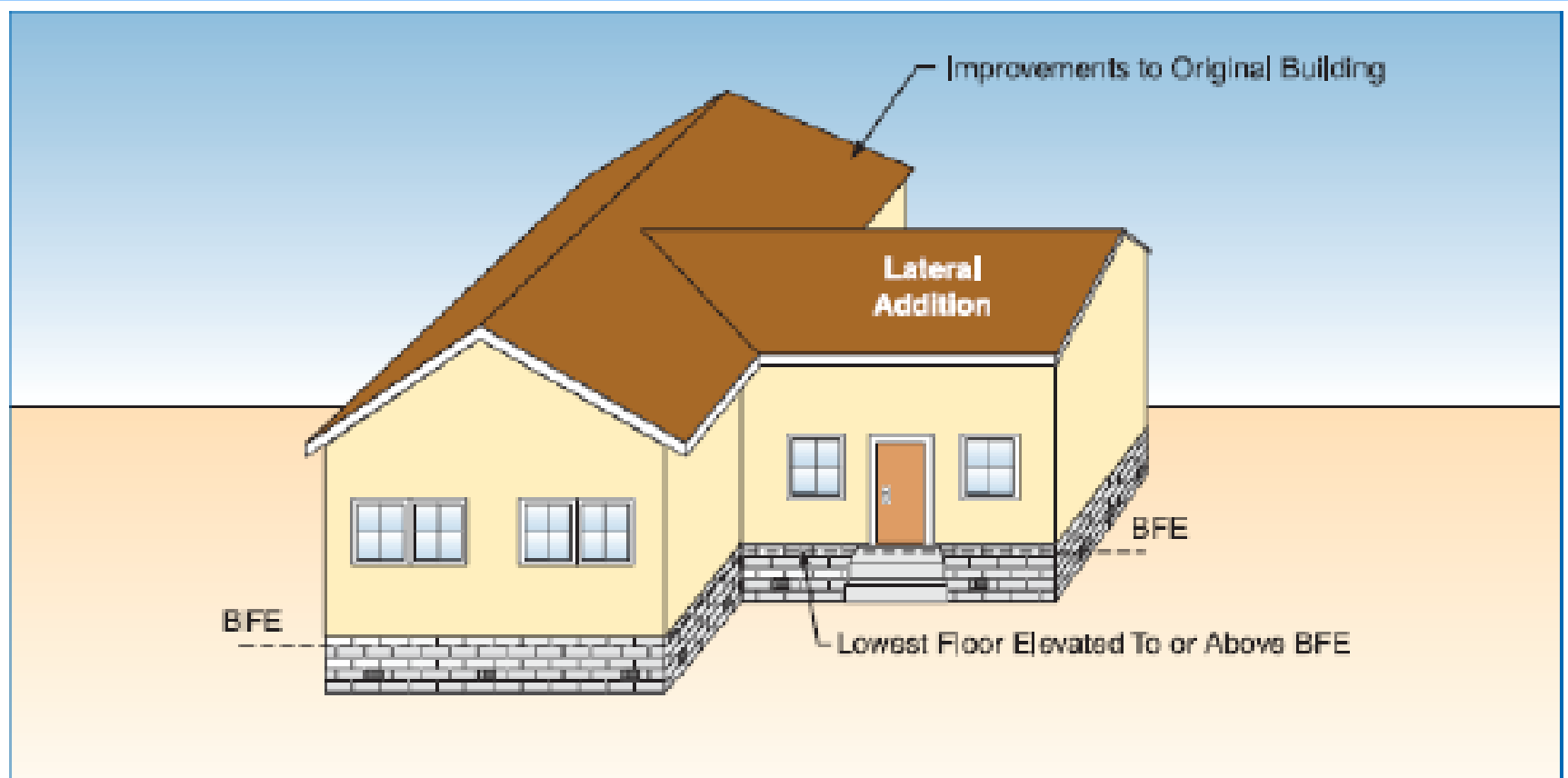


Figure 6-4. Lateral addition to a pre-FIRM building in an A zone – the proposed work includes an addition and work on the original building, including structural modification of the common wall or roof. The proposed work was determined to be a substantial improvement. The addition complies with all requirements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

Additions (FAQ)

- **A4. V zones.** Lateral additions to existing structures in V zones that are not substantial improvements are required to meet the standards of R322.3 (6). (MA amendment)

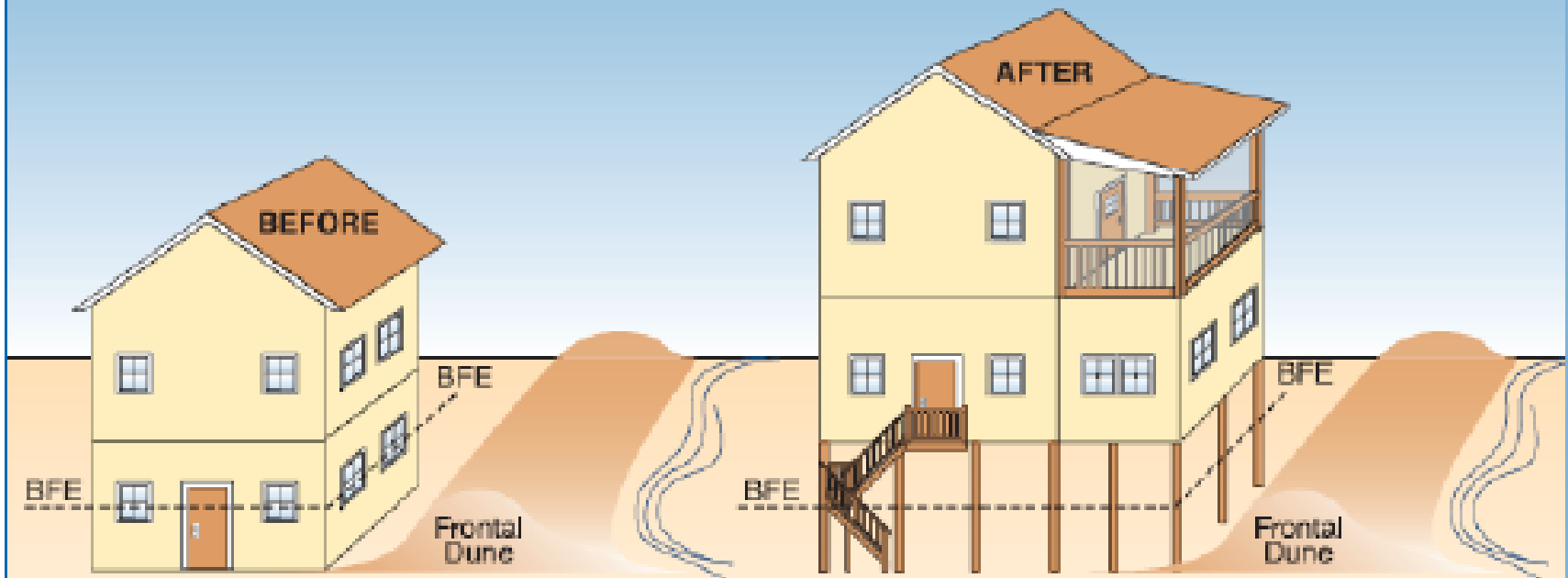
Additions (FAQ)

- **A5. V zones.** Lateral additions that are substantial improvements require the existing structure and the addition to be elevated to the standards of R322.3. This is true for all lateral additions regardless of whether they are structurally connected to the existing structure.

Additions (FAQ)

- **A5. V zones. (continued)** It applies to pre-FIRM and post-FIRM structures. In situations where the base flood elevation has changed, the structure must comply with the new base flood elevation.

Improvements to Original Building



Note: Original building is brought up to V zone standards to meet "free-of-obstructions" requirements

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.

Multiple Permits (FAQ)

- Q. When determining whether proposed work constitutes a substantial improvement as described in R105.3.1.1, do costs for multiple permits need to be considered cumulatively over time?

Multiple Permits (FAQ)

- A. Sometimes they do; it depends on the specifics of each individual situation. Different situations are addressed below.

Multiple Permits (FAQ)

- A1. Multiple permits issued for one work project. When multiple permits are issued for a work project (e.g., separate permits for excavation, foundation, electrical, etc.) the costs associated with each permit must be considered together when determining substantial improvement.

Multiple Permits (FAQ)

- A2. Permits issued simultaneously for different work projects. When permits are issued for separate work projects taking place at the same time on the same building, the cost for the projects must be considered together when determining substantial improvement. This includes permits that overlap; i.e., one permit is issued while a previous permit is still open.

Multiple Permits (FAQ)

- A3. Permits issued within a 12-month period. Related work permitted within a 12-month period shall be considered to be a single work project. The costs must be considered together when determining substantial improvement.

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