

# City of Charleston, South Carolina

## Building Flood Design Compliance Matrix

*Based from FEMA P-758, Substantial Improvement/Substantial Damage Desk Reference May 1, 2010*

**Special Flood Hazard Area (SFHA)** - An area delineated on a Flood Insurance Rate Map (FIRM) as being subject to inundation by the base flood and designated as Zones AE and VE.<sup>1</sup>

**Base Flood Elevation (BFE)** - The elevation of the flood having a one (1) percent chance of being equaled or exceeded in any given year flood in reference to the applicable FIRM vertical datum. The BFE is found on Flood Insurance Rate Map (FIRM) – The official map of a community on which FEMA has delineated the Special Flood Hazard Area (SFHA).<sup>2</sup>

**Design Flood Elevation (DFE)** – For the purposes relating to flood zone requirements, the Design Flood Elevation (DFE) equals the Base Flood Elevation (BFE) plus Freeboard. Freeboard means a factor of safety usually expressed in feet above a base flood level for purposes of floodplain management.<sup>2</sup>

**Pre-FIRM Buildings** - Any proposed building improvements or repairs must be evaluated to determine whether the work is a Substantial Improvement or repair of Substantial Damage. City of Charleston initial FIRM was 4/9/1971 and all buildings constructed before this date are considered Pre-FIRM.<sup>1</sup>

**Post-FIRM Buildings** - Any proposed building improvements or repairs must be evaluated to ensure that the improvements or repairs comply with the applicable NFIP floodplain management requirements and to ensure that the improvements or repairs do not alter any aspect of the building that would make it non-compliant. In other words, all subsequent work must be performed in a manner that ensures the building's continued compliance. Work shall not be allowed if it would make the building non-compliant with the floodplain management requirements that had to be met when the building was constructed.<sup>1</sup>

**New Construction** - New construction signifies entirely new residential and non-residential structures. New construction does not include alterations, additions, or repairs to existing structures.<sup>2</sup>

**Substantial Improvement (SI)** - Any reconstruction, rehabilitation, addition, or other improvement of a structure, in which the cost of improvements equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed.<sup>1</sup>

**Structurally Connected**- A lateral addition that involves no alteration of the load-bearing structure of the existing building, is attached to the building with minimal connection, and that has a doorway as the only modification to the common wall is considered to be "not structurally connected." A lateral addition that has its load-bearing structure connected to the load-bearing structure of the base building, which typically involves significant alteration of the common wall, is considered "structurally connected." If a lateral addition is proposed along with other work on the original building, all the work must be considered in the SI/SD determination, regardless of the size or cost of the addition by itself and the cost of improvements to the original building.<sup>1</sup>

**MEPG** - *Mechanical, Electrical, Plumbing, Gas* - Electrical systems, equipment and components; heating, ventilating, air-conditioning; plumbing appliances and plumbing fixtures; duct systems; and other service equipment shall be located at or above the DFE. If replaced as part of a substantial improvement, electrical systems, *equipment* and components; heating, ventilating, air-conditioning and plumbing *appliances* and plumbing fixtures; *duct systems*; and other service *equipment* shall meet the requirements of current flood design requirements.<sup>3</sup>

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<sup>1</sup> [FEMA P-758, Substantial Improvement/Substantial Damage Desk Reference \(May 1, 2010\)](#)

<sup>2</sup> [City of Charleston Code of Ordinance §27-116 and 117](#), Ratification Number 2020-032

<sup>3</sup> [2021 South Carolina Residential Code §R322.1.6](#) and [2021 International Existing Building Code §503.2](#)

## Applicable to Buildings in the SFHA

Types of Work	Pre-FIRM Buildings City of Charleston initial FIRM was 4/9/1971	Post-FIRM Buildings City of Charleston initial FIRM was 4/9/1971
<b>New Construction</b>		<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
<i>New Under Construction AND Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i>		
<b>Rehabilitation* <u>Not a Substantial Improvement</u></b>  <i>* Renovations, alterations or remodels neither affecting the external dimensions nor expanding the total area of the building</i>	<ul style="list-style-type: none"> <li>The existing building and new permitted work are <u>not</u> required to comply with current flood design requirements, but shall <u>not</u> further non-compliance (i.e. closing existing flood openings).</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>All new permitted work shall <u>not</u> make the existing building less compliant based on the NFIP flood design requirements, including DFE, at the time of original permitted construction.</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>
<i>Elevation Certificate(s) not required</i>		
<b>Rehabilitation* <u>Substantial Improvement</u></b>  <i>* Renovations, alterations or remodels neither affecting the external dimensions nor expands the total area of the building</i>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. The DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
<i>New Under Construction AND Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i>		

## Applicable to Buildings in the SFHA

Types of Work	Pre-FIRM Buildings		Post-FIRM Buildings	
	City of Charleston initial FIRM was 4/9/1971		City of Charleston initial FIRM was 4/9/1971	
	Existing Structure	Addition	Existing Structure	Addition
<b>Lateral Addition</b> <b>(regardless of structural connectedness) AND</b> <b>Rehabilitation*</b> <b>Substantial Improvement**</b> <i>* Renovations, alterations or remodels neither affecting the external dimensions nor expands the total area of the building</i> <i>** If this type of work does not constitute a SI refer to individual sections on Rehabilitation and Lateral Additions</i>	<ul style="list-style-type: none"> <li>A residential existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
<i>New Under Construction AND Finished Construction Elevation Certificates required. Include information on both the addition and existing building. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i>				
<b>Lateral Addition</b> <b>NOT a Substantial Improvement</b>	<ul style="list-style-type: none"> <li>Existing building <u>not</u> required to comply with current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Addition <u>not</u> required to comply with current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Existing building <u>not</u> required to comply with current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>For AE Zones, the addition's top of bottom floor elevation (habitable space) must be at or above the existing building's habitable lowest floor. For VE Zones, the addition must comply with all current flood design requirements, including current DFE.</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>
	<i>Elevation Certificate(s) <u>not</u> required.</i>		<i>New Finished Construction Elevation Certificate (FCEC) and Dry Floodproofing Certificate (if applicable for non-residential areas of commercial buildings) are required for the addition only; however, for comparison purposes the FCEC should provide both the existing and addition elevations in the comments of Section D for the certificate.</i>	

## Applicable to Buildings in the SFHA

Types of Work	Pre-FIRM Buildings		Post-FIRM Buildings	
	City of Charleston initial FIRM was 4/9/1971	Existing Structure	City of Charleston initial FIRM was 4/9/1971	Existing Structure
Lateral Addition Substantial Improvement <u>NOT</u> Structurally Connected	<ul style="list-style-type: none"> <li>Existing building <u>not</u> required to comply with meet current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>A residential addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>Existing building <u>not</u> required to comply to meet current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>A residential addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial addition is required to comply with all current flood design requirements. DFE is equal to the BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
Lateral Addition Substantial Improvement Structurally Connected	<ul style="list-style-type: none"> <li>A residential existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial existing building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial addition is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
	<i>New Under Construction AND Finished Construction Elevation Certificates (UCEC &amp; FCEC) required.</i> <i>New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i>			

## Applicable to Buildings in the SFHA

Types of Work	Pre-FIRM Buildings City of Charleston initial FIRM was 4/9/1971	Post-FIRM Buildings City of Charleston initial FIRM was 4/9/1971
<b>Vertical Addition</b> (above existing building) <b><u>NOT</u> a Substantial Improvement</b>	<ul style="list-style-type: none"> <li>The existing building and new permitted work are not required to comply with current flood design requirements, but shall not further non-compliance (i.e. closing existing flood openings).</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>All new permitted work shall not make the existing building less compliant based on the NFIP flood design requirements, including DFE, at the time of original permitted construction.</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>
	<i>Elevation Certificate(s) not required.</i>	
<b>Vertical Addition</b> (above existing building) <b>Substantial Improvement</b>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
	<i>New Under Construction <u>AND</u> Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i>	
<b>Foundation Repairs</b> <b><u>NOT</u> a Substantial Improvement</b>	<ul style="list-style-type: none"> <li>The existing building and repairs are not required to comply with current flood design requirements, but shall not further non-compliance (i.e. closing existing flood openings).</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Foundation repairs shall comply with current flood design requirements and not make the existing building less compliant based on the NFIP flood design requirements, including DFE, at the time of original permitted construction.</li> <li>All new MEPG equipment installed (not existing equipment being replaced with similar new equipment) is required to meet current flood design requirements.</li> </ul>
	<i>Elevation Certificate(s) not required.</i>	
<b>Foundation Repairs</b> <b>Substantial Improvement</b>	<ul style="list-style-type: none"> <li>A residential building and repairs are required to comply with all current flood design requirements. The DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building and repairs are required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>	<ul style="list-style-type: none"> <li>A residential building and repairs are required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building and repairs are required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
	<i>New Under Construction <u>AND</u> Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i>	

## Applicable to Buildings in the SFHA

Types of Work	Pre-FIRM Buildings City of Charleston initial FIRM was 4/9/1971	Post-FIRM Buildings City of Charleston initial FIRM was 4/9/1971
<b>Replace/Extend Foundation (including "elevate-in-place") Substantial Improvement</b>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to the BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. The Design Flood Elevation (DFE) is equal to the BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul> <p style="text-align: center;"><i>New Under Construction <u>AND</u> Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i></p>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
<b>Repair Building Damage Substantial Damage</b>	<ul style="list-style-type: none"> <li>A residential building and repairs are required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building and repairs are required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul> <p style="text-align: center;"><i>New Under Construction <u>AND</u> Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i></p>	<ul style="list-style-type: none"> <li>A residential building and repairs are required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building and repairs required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>
<b>Reconstruct New Building on Existing or New Foundation Substantial Improvement</b>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul> <p style="text-align: center;"><i>New Under Construction <u>AND</u> Finished Construction Elevation Certificates required. New Dry Floodproofing Certificate required (if applicable for non-residential areas of commercial buildings).</i></p>	<ul style="list-style-type: none"> <li>A residential building is required to comply with all current flood design requirements. DFE is equal to BFE plus 1ft freeboard.</li> <li>A commercial building is required to comply with all current flood design requirements. DFE is equal to BFE plus 2ft freeboard. Non-residential areas in AE Zones are allowed to be Dry Floodproofed to DFE.</li> </ul>