

City of St. Augustine

Floodplain Management Higher Standards Information

There are different regulations that communities can use to help protect existing and future development and natural floodplain functions that exceed the minimum criteria of the National Flood Insurance Program (NFIP) and the Florida Building Code (FBC).

Although the NFIP and FBC minimum standards provide a great deal of flood protection, damage can still result for many reasons:

- Estimates of flood heights are subject to various errors and may be low, especially in areas without long-term flood and rainfall records;
- Buildings may be damaged by floods that exceed the predicted 100-year flood;
- Urbanization and other changes in the watershed can increase the flood hazard and flood frequency;
- Filling and other development in the floodplain can reduce storage and conveyance capacity; and
- Filling and construction practices can damage or destroy valuable natural floodplain functions.

For these reasons, and the fact that local situations vary, many communities adopt development standards that are higher than or supplement the minimum NFIP criteria.

This document is intended to identify the higher standards that are available to the City of St. Augustine and to focus on the areas that would be reasonable requirements for the City.

These higher standards are:

1. Cumulative Substantial Improvement
2. Freeboard
3. Foundation protection
4. Local drainage protection

Cumulative Substantial Improvement (CSI)

The National Flood Insurance Program (NFIP) allows improvements valued at up to 50% of the building's pre-improvement value to be permitted without meeting the flood protection requirements for buildings located in the Special Flood Hazard Area (SFHA). Over the years, a community may issue a succession of permits for different repairs or improvements to the same structure. This can greatly increase the overall flood damage potential to that building as well as the insurance liability to FEMA.

CSI provides credit to a community that ensures that the total value of all improvements or repairs permitted OVER TIME does not exceed 50% of the value of the structure. When the total value does exceed 50%, the original building must be protected according to the ordinance requirements for new buildings.

Under some circumstances the NFIP flood insurance policy may pay a portion of the cost of bringing a substantially flood-damaged building into compliance with the community's floodplain management ordinance. If the community has a more restrictive definition of substantial damage, the provision may still apply. This is the Increased Cost of Compliance coverage.

The City of St. Augustine initially adopted the 5-year CSI on April 12, 2010. Every time that a permit for anything except a new structure was applied for, a search of the last five years is conducted. If the total cost of construction for all of those permits is equal to or greater than 50%, the structure will be required to meet the floodplain management ordinance for new construction.

These requirements for residential houses are to have the finished floor elevation, electrical and mechanical devices, and ducts above the base flood elevation. For non-residential structures, the finished floor can be elevated or the structure can be dry flood-proofed to one foot above the base flood elevation. The electrical and mechanical devices, including ducts, must be elevated to one foot above the base flood elevation. For both residential and non-residential structures, water supply and sanitary sewer systems have to minimize or eliminate the infiltration of flood waters into the system. Storage and vehicle parking is allowed below the base flood elevation, but flood vents are required in walls to allow for the passage of flood waters.

A real world example of CSI as a result of Hurricane Matthew. This house is in Davis Shores:

The house has an estimated market value of \$207,632.16. This is calculated from a depreciated replacement cost. The substantial improvement mark is \$103,816.08. *(We used the depreciated replacement cost because for this property: St. Johns County Property Appraisal for 2016: \$115,887 +10% increase = \$127,475.70. This is not a true reflection of the market value.)*

Hurricane Matthew damage repair \$78,825.00 or 37.9% of the estimated market value.

Five years of permits:

January 2017	Hurricane repairs	\$72,600.00	
January 2017	A/C replacement	\$6,225.00	
August 2013	Re-roof	\$11,240.00	
April 2013	A/C replacement	<u>\$5,870.00</u>	
	Total	\$95,935.00	or 46.2% of est. market value

Any other permit with a direct cost of \$7,881.08 or more in the next year will be considered substantial improvement *(The 2013 permits will drop off next year)*.

If there is a natural or man-made disaster that is not a flooding event, and the repairs are more than the \$7,881.08, it would constitute a substantial improvement. Increased Cost of Compliance money would not be available due to it not being a flooding event.

Property owners do have the option to get an appraisal of the structure by a Florida licensed appraiser. When an appraisal accompanies a permit application, the market value used is the one from the appraisal.

Freeboard (FRB)

The NFIP requires that the lowest floor of residential structures be elevated to or above the base flood elevation and that non-residential structures be elevated or floodproofed to or above the base flood elevation. Attached garages and utilities (including electrical, heating, ductwork, ventilating, plumbing, and air conditioning equipment) must also be protected to this elevation. This can be done by elevating them or using flood-resistant materials during construction. *(The Florida Building Code requires that non-residential structures be elevated or floodproofed to or above **one foot** above the base flood elevation.)*

A freeboard requirement adds height above the base flood elevation to provide an extra margin of protection to account for waves, debris, miscalculations, or lack of data. A freeboard requirement of one foot means that the level of protection for the lowest floor, machinery and equipment, etc. is one foot above the base flood elevation.

The freeboard element adds additional points for compensatory storage and prohibiting fill. Compensatory storage is the requirement to create flood water storage elsewhere to compensate for the fill that is brought in (see picture on next page). The compensatory storage will keep the flood waters from rising due to the fill being added to the flood zone. Prohibiting fill would not allow the developer or contractor to bring fill into the floodplain to raise a house. The existing ground level could not change and the house would have to be built on piers or have a crawlspace. Another option to prohibit fill is to allow for stem walls with fill on the inside so that the floor can be a concrete slab.

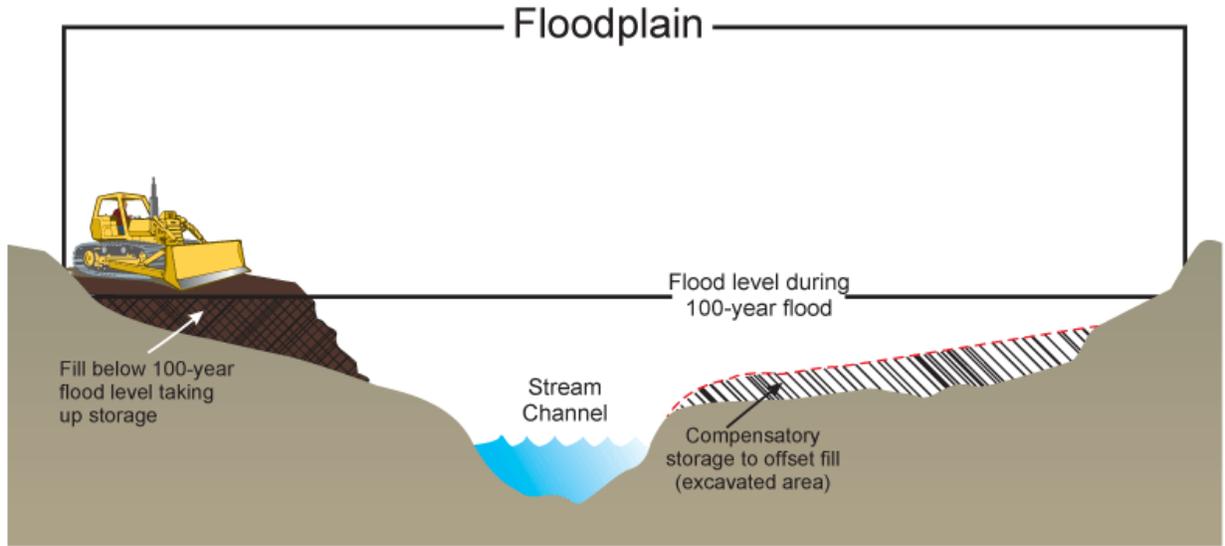
The updated Florida Building Code, expected effective date of December 31, 2017, will require all structures to have one foot of freeboard. By adopting this earlier, the City can gain points on the CRS rating. Additionally, owners of new buildings would see a savings on their flood insurance because they are a minimum of one foot above the base flood elevation (see chart on next page).

Almost every house that is being raised due to Hurricane Matthew is being raised at least one foot above the base flood elevation. Some have gone even higher.

Compensatory storage would require the owner of the property to provide the storage on a property that they own. Most lots in St. Augustine would not allow for this. This option is not one that St. Augustine could use.

Parts of the city experiences shallow flooding all of the time. When property owners bring in fill to build a house, the flood waters cannot cross that property anymore. In many instances, the water is retained on the neighboring property because it has nowhere to go. This has caused deeper flooding for those neighboring properties.

If fill is prohibited in the SFHA, the flood waters will still be able to flow through the places that they have always gone. If fill is only limited to inside stem wall construction, the flood waters would still be diverted, but would be allowed to go around the building.



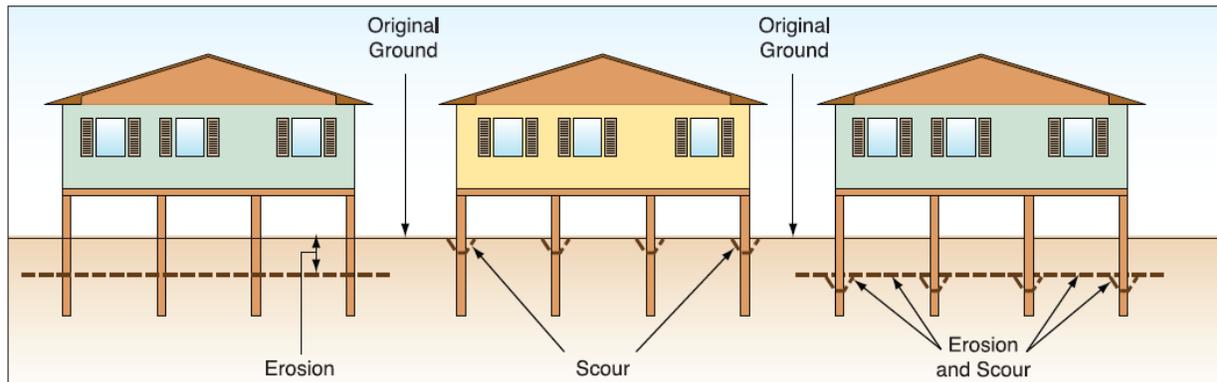
Below is a chart that show the **relative** savings on insurance policies when freeboard is added.



Note: Annual premiums calculated using the *NFIP Flood Insurance Manual*, April 1, 2017, for a one-story single-family home with no basement and no enclosure. Premiums (including fees) are based on the maximum available building coverage of \$250,000 and contents coverage of \$100,000, with \$2,000 deductibles for both building and contents coverages. Zone V building is assumed to be free of obstructions with a building replacement cost ratio of 0.75 or more.

Foundation protection (FDN)

Foundation protection allows protection against differential settling as well as scour and erosion. Differential or uneven settlement occurs when the soil beneath a structure cannot bear the weights imposed. The settlement of a structure is the amount that the structure will “sink” during and after construction. Differential settlements become a big problem when the foundation settles unevenly. Erosion refers to a general lowering of the ground surface over a wide area. Scour refers to a localized loss of soil, often around a foundation element.



There are three options for this.

1. Buildings must be constructed on properly designed and compacted fill that has appropriate protection from erosion and scour. This is a higher standard already in the Florida Building Code.
2. Building must be constructed on properly designed and compacted fill that has appropriate protection from erosion and scour. It also has to meet the compensatory requirement. This one is not an option for St. Augustine because of the compensatory requirement.
3. Buildings must be designed on foundations that are designed and sealed by a registered design professional as complying with the requirements of the Florida Building Code and it cannot be constructed on fill. Currently, almost all plans are designed by a registered design professional. This option can be added if fill is prohibited under freeboard's higher standard.



Differential settlement of buildings thought to be a result of inadequate foundation embedment coupled with erosion, scour, and/or soil liquefaction (Surfside Beach, TX, Hurricane Ike).



Local scour around foundation piles (Holly Beach, LA, Hurricane Ike).

Local drainage protection (LDP)

Approximately 20% of NFIP claims are for properties located outside the SFHA. Some of these claims are from flooding caused by local drainage problems. LDP credit is for ensuring that new buildings are well above the street level or otherwise protected from shallow drainage flooding. This higher standard would be for all properties within the city limits, whether they are in the SFHA or not.

There are a few options for this higher standard.

1. All new buildings have to provide positive drainage away from the building site to an approved point of collection that does not create a hazard or problem on neighboring properties. This is a higher standard already in the Florida Building Code.
2. As a condition of receiving a building permit, the applicant must prepare a site plan that (a) accounts for street flooding and local drainage from and onto adjoining properties, and (b) protects the building from local drainage flows.
3. All new buildings must be a minimum height above the crown of the street (i.e. – 12 inches, 18 inches, etc.). Properties in the SFHA will have to be the higher of this or the base flood elevation, plus freeboard if required.