

The Costs & Benefits of Building Higher



Assn. of State Floodplain Managers

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Objective

Encourage adoption of freeboard by showing the immediate financial benefits in non-technical terms.

Audience:

- ✓ Decision makers
- ✓ Public
- ✓ Builders

The Costs & Benefits of Building Higher



Freeboard
BFE

Three versions planned:

- ✓ Slab foundation
- ✓ Crawlspace
- ✓ V Zone elevated

Slab/stem wall example
(only one so far)



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Tailor to state or local
building types

The Costs & Benefits of Building Higher

Don't use technical term
like "Freeboard"



Freeboard
BFE

Plain paper,
Cheap to make copies,
easy to update



ASFPM Logo
improves credibility

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Building in the Floodplain

Communities that participate in the National Flood Insurance Program must ensure all new residential buildings constructed in the floodplain are elevated to or above the base flood elevation (BFE). The base flood is the flood that has a 1% chance of occurring or being exceeded in any given year.

Many communities concluded the BFE is not a sufficient level of protection, saying:

- Floods higher than the base flood can and do occur.
- Most flood studies do not account for debris or obstructions during the base flood, thereby underestimating the BFE.
- NFIP flood studies do not account for the impacts of future development or sea level rise. Over time, the regulatory standard does not keep up with increases in flood elevations.
- In non-coastal areas, the protection level is measured at the top of the lowest floor, leaving the flooring, subfloor and floor joists exposed to the base flood.

To offset these shortcomings of building only to the BFE, over half of the communities in the country require new buildings to be protected to one or more feet *higher* than the BFE. Floodplain managers call this “freeboard.”

Why building at the base flood elevation does not prevent flood damage

Flood Damage Protection

A building built higher than the minimum level required by the NFIP is better protected from:

- Waves that are higher than the BFE,
- Unpredictable flooding conditions, such as debris at a bridge or culvert that creates a dam to stream flow,
- Increases in flood heights due to development and climate change, and
- Damage to the floor joists and other parts of the building lower than the top of the lowest floor.

Through a national consensus process, building higher has been part of the International Building and Residential Codes and the American Society of Civil Engineers' flood design and construction standard (ASCE 24).



Thousands of dollars in flood damage can be prevented by building higher.

Why building higher is better

← Adds credibility

← Shows the benefit of being one foot higher

Flood Insurance Premiums

While the BFE is the minimum standard for communities in the NFIP, the program encourages regulations that set a higher protection level (44 CFR 60.1(d)).

As seen in the table below, flood insurance premiums are significantly lower for buildings with 1, 2 or 3 feet of freeboard.

More than 40 years of insurance claims experience has proven these buildings suffer much less flood damage. Less potential for damage means lower premiums.

Flood Insurance Premium Comparison		
Zone	Freeboard	Premium
AE	At BFE (no freeboard)	\$2,147
AE	BFE + 1 foot	\$1,106
AE	BFE + 2 feet	\$734
AE	BFE + 3 feet	\$614

Premiums are for a single-family house, one floor, slab on grade, stem wall foundation, or crawlspace with proper flood openings, \$200,000 in building coverage, \$80,000 in contents coverage, \$1,000 deductible, no CRS discount, April 2017 *Flood Insurance Manual*

Lower insurance premiums are an immediate benefit to the property owner. Other benefits include less flood damage in the community, less suffering, less business interruption, quicker recovery, and higher property values.

Flood insurance premiums are based on >40 years of paying flood claims

Better protection
= fewer claims
= lower premiums

Specific structure,
amount of coverage,
April 2017 premium rates

Costs of Building Higher

Under the rules of the National Flood Insurance Program, buildings must be protected to the Base Flood Elevation (BFE). Therefore, the cost of freeboard is just the additional cost of building higher than the minimum NFIP standard.

A study conducted by ASFPM in February 2017 estimated the approximate cost of building higher for a 2,000-square foot house. The study assumed the house was constructed to NFIP standards and then estimated the additional cost of building higher than the BFE (see table below).

Foundation Type*	Cost per add'l foot
Concrete block piers	\$890
Crawlspace with concrete block walls	\$1,850
Crawlspace with poured concrete walls	\$2,155
Stem wall with fill	\$2,345
Fill only	\$4,470

Using a house on fill with a stem wall (as illustrated on the cover), here are the average construction costs for building higher:

- 1 foot: \$2,345
- 2 feet: $\$2,345 \times 2 = \$4,690$
- 3 feet: $\$2,345 \times 3 = \$7,035$

**Costs are lower for other foundations.*

Assume the building must be elevated to the BFE (minimum requirement)

The cost of freeboard is the cost of the extra 1, 2, or 3 feet of elevation

Can use more accurate local costs

Slab/stem wall example

Return on Investment

The owner of a building built higher will realize savings in two ways. The most important is when the area floods again and the building is not damaged. Also, the owner doesn't have to relocate, repair and rebuild.

Another form of savings is a reduced cost in flood insurance, which is required by most lenders. For example, using a 2,000-square foot home with a stem wall foundation with the floor 2 feet above the BFE (with fill underneath).

Additional cost of construction: \$4,690

Annual flood insurance premium
built to the BFE: \$2,147

Annual flood insurance premium
built 2 feet above the BFE: \$734

Annual flood premium savings: \$1,413

Number of years to pay off
\$4,690 via premium savings: 3.3 years

Added savings realized
during a 30-year mortgage: \$37,300*

Another benefit of building is higher is potentially increase in value at the time of sale due to lower risk and lower insurance costs.

**Savings are greater for other foundations.*

Show all the calculations

Return on investment

Show added savings
(big bucks)

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Write Your Own Flyer

Tailor to state or local
building types

Session D3 on using
information to support
higher standards