

Voluntary Increase in Freeboard

Despite the recommendation from Planning and Zoning to decrease the required freeboard to 3 feet, Commissioners voted at the October 18 meeting to increase freeboard to 2 feet assuming that an increase to three feet could be made in the future if it seemed warranted. However, another increase in required freeboard within the next few years seems unlikely. The amount of freeboard should be viewed as a long-term standard. While catastrophic losses are unlikely, they do occur, even to new properties. Substantial damage to a property designed to the standard just enacted could become a complete rebuild to satisfy a higher new freeboard standard.

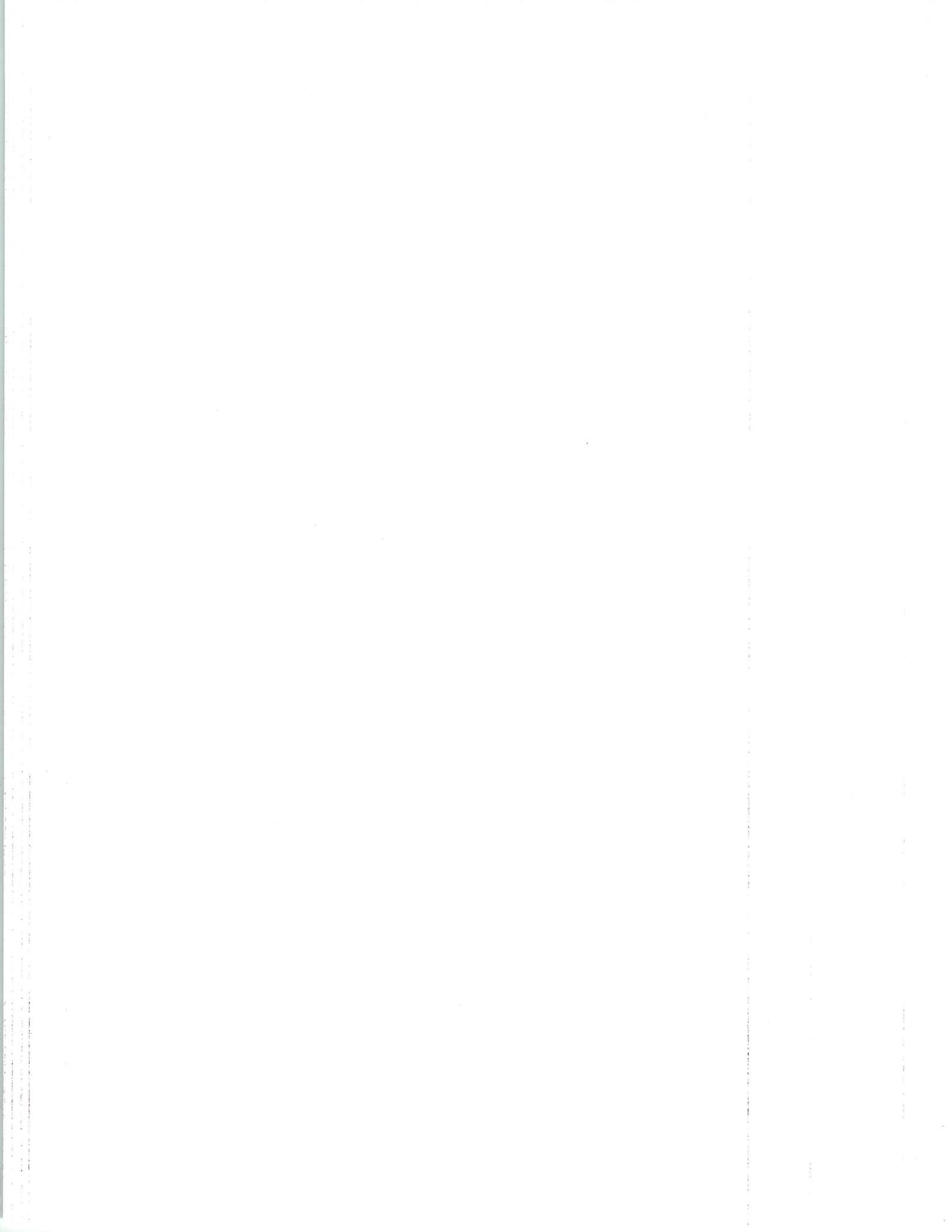
An additional freeboard option is proposed for consideration. Owners could be offered a voluntary option to increase freeboard with a corresponding increase in maximum height so that owners can choose to increase flood protection for their properties and take advantage of any additional reduction in insurance premiums.

New, substantially damaged, or substantially improved properties would require elevation to base flood elevation plus 2 feet of freeboard but could be elevated up to 1 additional foot. Maximum height for such properties would be increased by the amount of optional freeboard chosen.

The Charter and Code Committee would be asked to consider and make recommendations on this proposed option.

Background

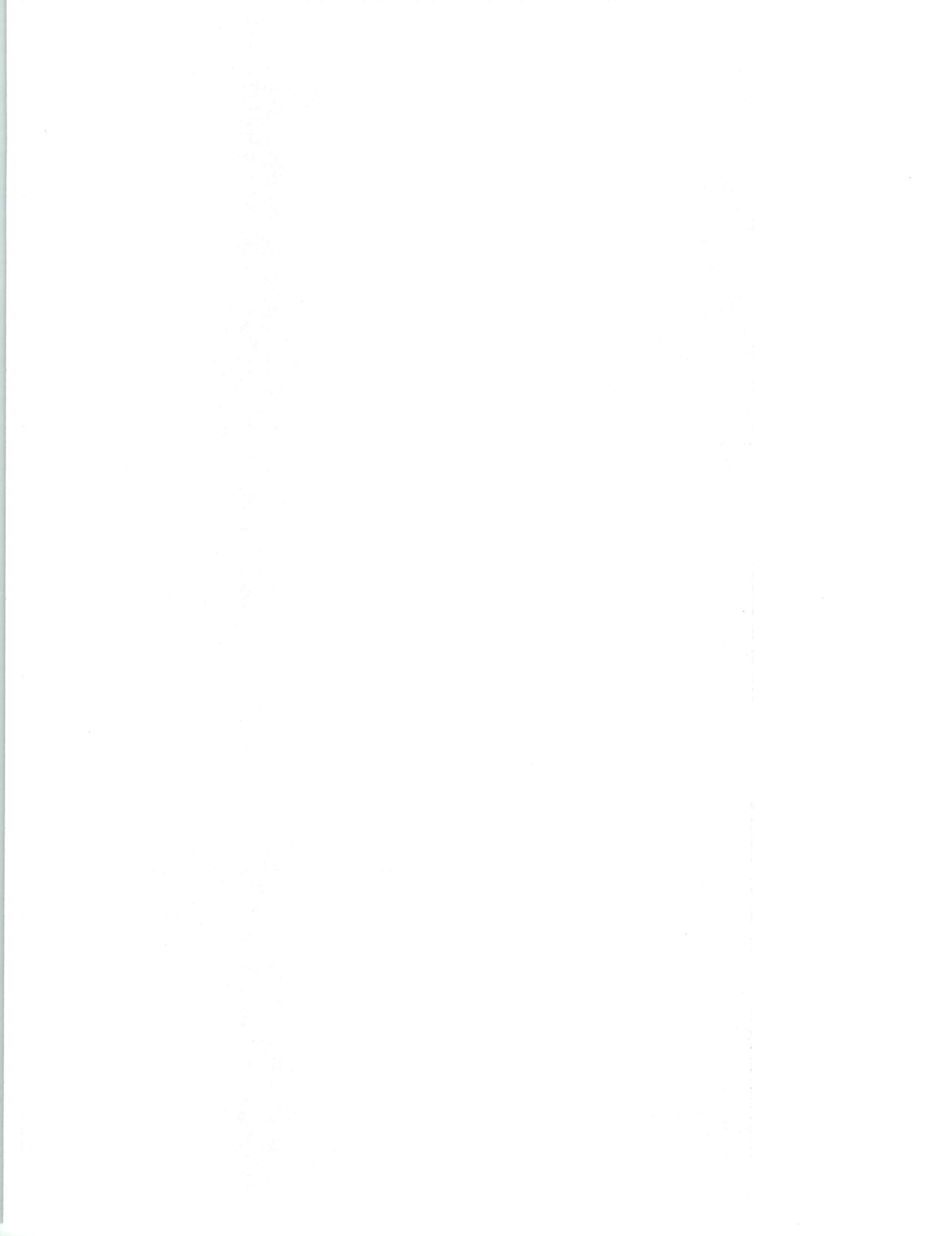
- The National Flood Insurance Program (NFIP) was established in 1968 through the National Flood Insurance Act. [It aims to reduce the socio-economic impact of floods by providing affordable insurance to property owners and encouraging communities to adopt and enforce floodplain management regulations](#)
- FEMA administers the NFIP by overseeing flood insurance provision, producing flood maps, enforcing floodplain management regulations, and offering technical assistance to reduce flood risks.
- FEMA has identified [special flood hazard areas \(SFHAs\)](#) within the boundaries of Dewey beach (roughly all areas below Clayton St)
 - High risk of flooding; 1% chance of flood events (100 year flood event)
 - Owners of federally backed mortgages are required to carry flood insurance
- Dewey Beach entered into the National Flood Insurance Program on 6/18/1982;
 - Flood Damage Reduction Ordinance can be found in section 101 of town code adopted in 2014
- Town also participates in the CRS (Community Reporting System); Complimentary to NFIP
 - Provides for discounts for flood insurance promoting better flood plain management practices
- Climate Change committee has recommended increasing town's freeboard;
- 2018 Comprehensive Plan includes recommendation to consider higher freeboard;
- Town commissioners unanimously voted that the first finished floor of the new town hall should not be below BFE +3 feet
- Current town code requires Freeboard is +1 feet above BFE (base flood Elevation);



What is BFE – Base Flood Elevation?

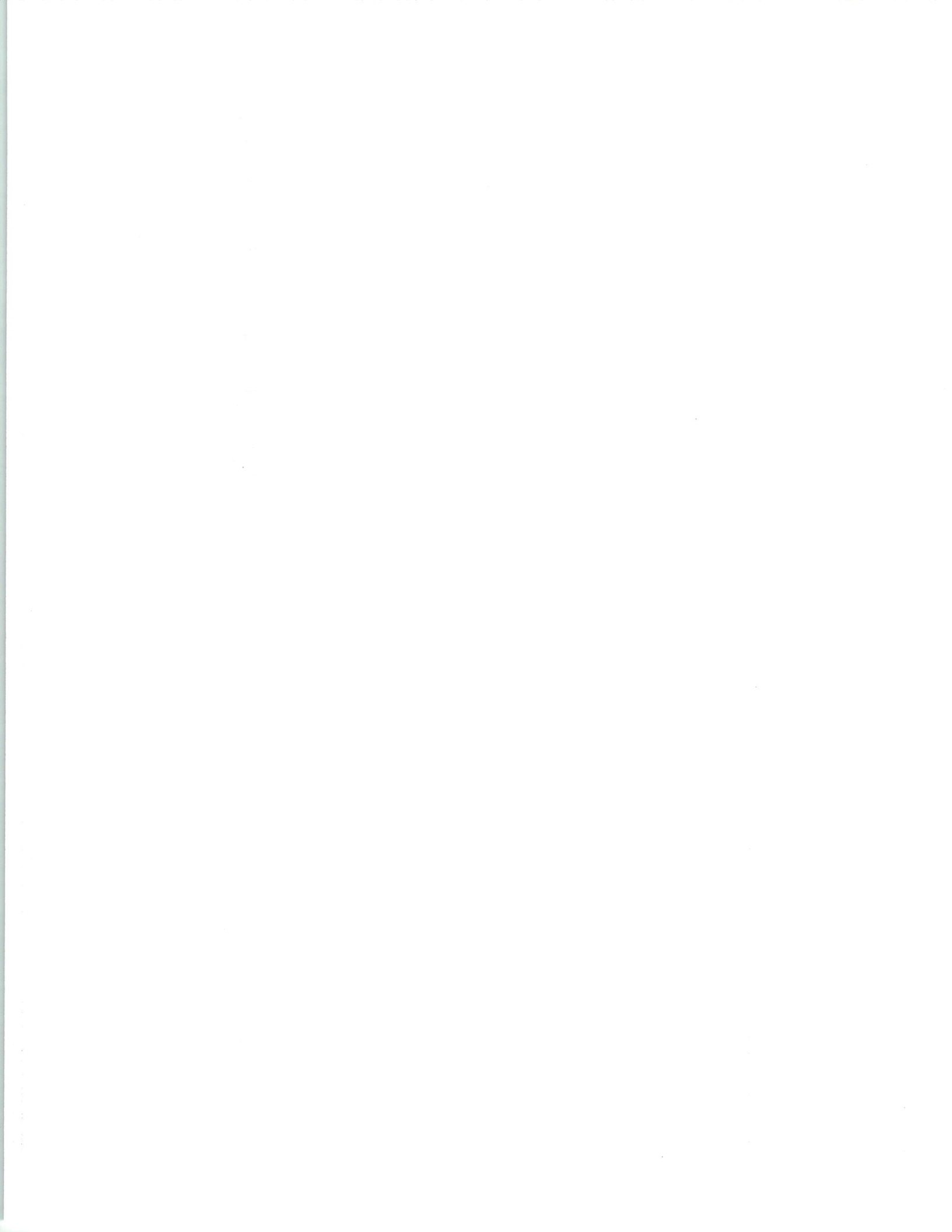
- The **Base Flood Elevation (BFE)** is the elevation above mean sea level to which floodwaters are expected to rise during a base flood. Essentially, BFE represents the height that floodwaters are projected to reach during a significant flood event.
- The **Base Flood Elevation (BFE)** is the computed elevation to which floodwater is anticipated to rise during a base flood. A base flood is defined as a flood that has a 1% chance of occurring in any given year, also known as a 100-year flood¹². The BFE is crucial for floodplain management and insurance purposes, as it helps determine the necessary elevation for buildings to minimize flood risk¹.
- Floor Insurance Rate Maps created by FEMA (FIRM) detail areas at risk of flooding; are defined by 'zones'; **geographic areas that further define flood risk**
 - **Zone AE:** Areas with a BFE determined. These are high-risk flood zones where detailed hydraulic analyses have been conducted.
 - **Zone AH:** Areas with shallow flooding (usually ponding) where average depths are between 1 and 3 feet. BFEs are determined.
 - **Zones A1-A30:** Similar to Zone AE, these are areas with BFEs determined through detailed analyses.
 - **Zone AR:** Areas that are being restored to provide flood protection. BFEs are determined.
 - **Zone AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO:** Combination zones where areas are being restored and have additional flood risks.
 - **Zones V1-V30 and VE:** Coastal areas with a BFE determined and additional hazards due to storm waves.
- Base Flood Elevation (BFE) does take wave actions into account, especially in coastal areas. FEMA's flood hazard analysis includes factors such as storm surge, wave setup, and overland wave propagation when determining BFEs¹². This means that the BFE reflects not only the stillwater elevation but also the additional height contributed by wave action





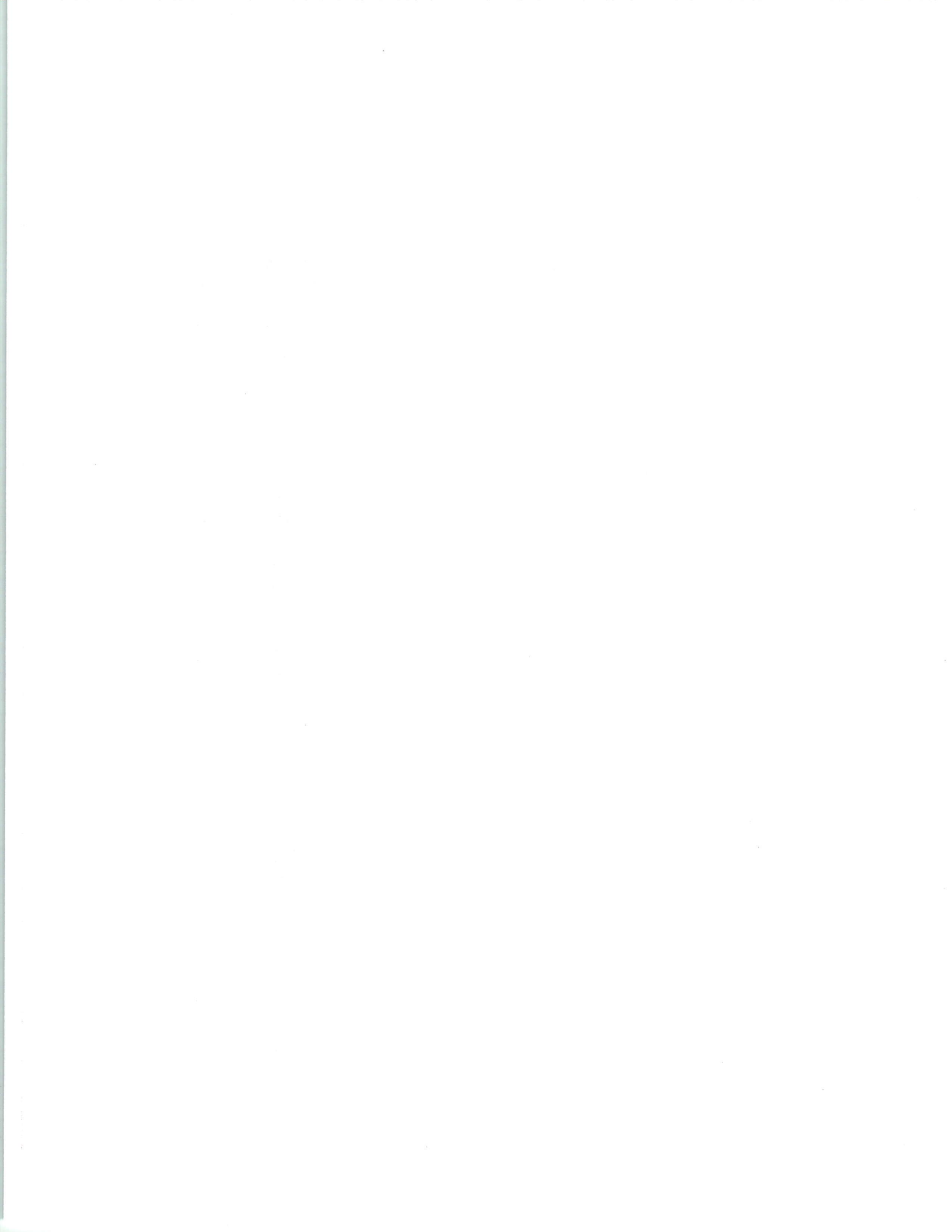
What is Freeboard?

- Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.



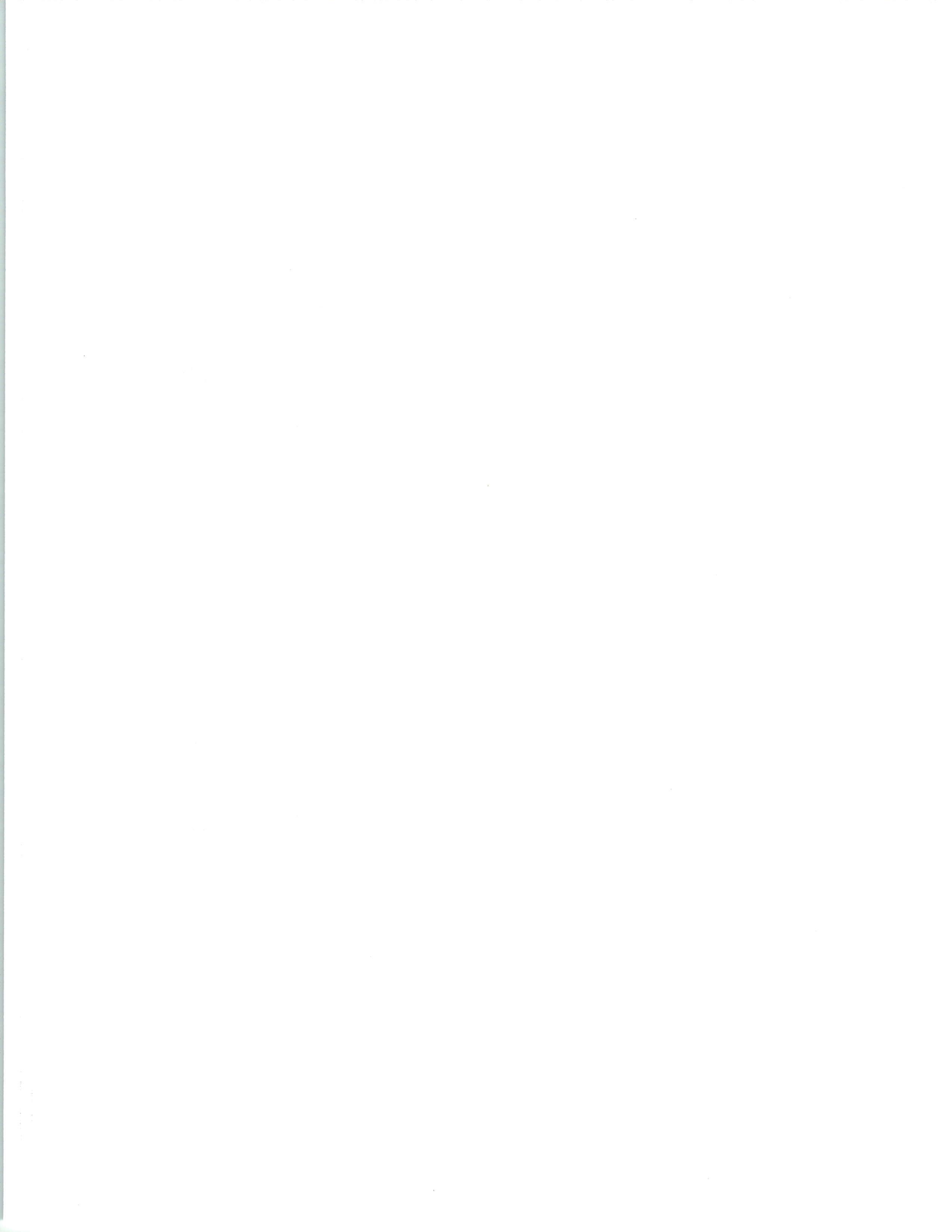
Local Municipalities Freeboard Requirements:

- Rehoboth +1 freeboard (most of the town is not in a SFHA)
- Lewes raised their freeboard to +3 feet from 18 inches; (expected sea level rise by 2100)
- Bethany Beach freeboard is 18 inches since 2018
- South Bethany has no freeboard requirement; voluntary 2 feet allows for an increase of 2 feet for the peak of the roof;
- Fenwick is 18 – 24 inches;
- Henlopen Acres is +3 Feet



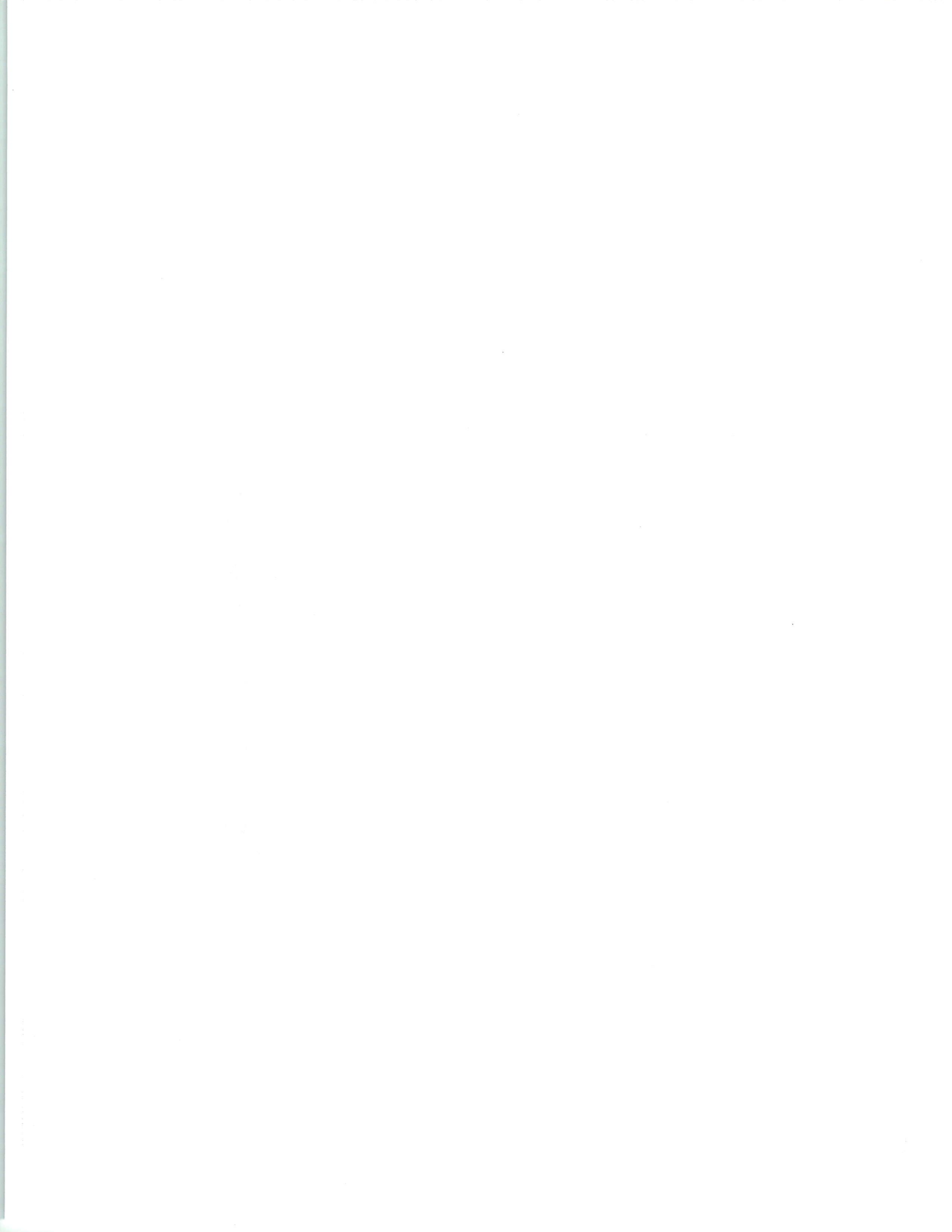
Why Increase Freeboard?

- **Reduced Flood Risk**
 - Enhanced Protection – risk of flood waters reaching living space and causing damage is reduced
 - Increased Safety – higher freeboards levels provide additional safety margins against storm surges; however, than expected rainfall can exceed SFE
- **Lower Flood Insurance Premiums**
 - Insurance Savings
 - Long Term Cost Savings; initial cost is outweighed by lower insurance premiums and lower cost of flood damage repairs
- **Increased Property Value & Marketability**
- **Compliance & Incentives**
 - Higher points in CRS = insurance discounts
- **Environmental & Community Benefits**
 - Reduced Flood plain development – preserve national flood plains
 - Community Resilience – eliminate economic and social impacts



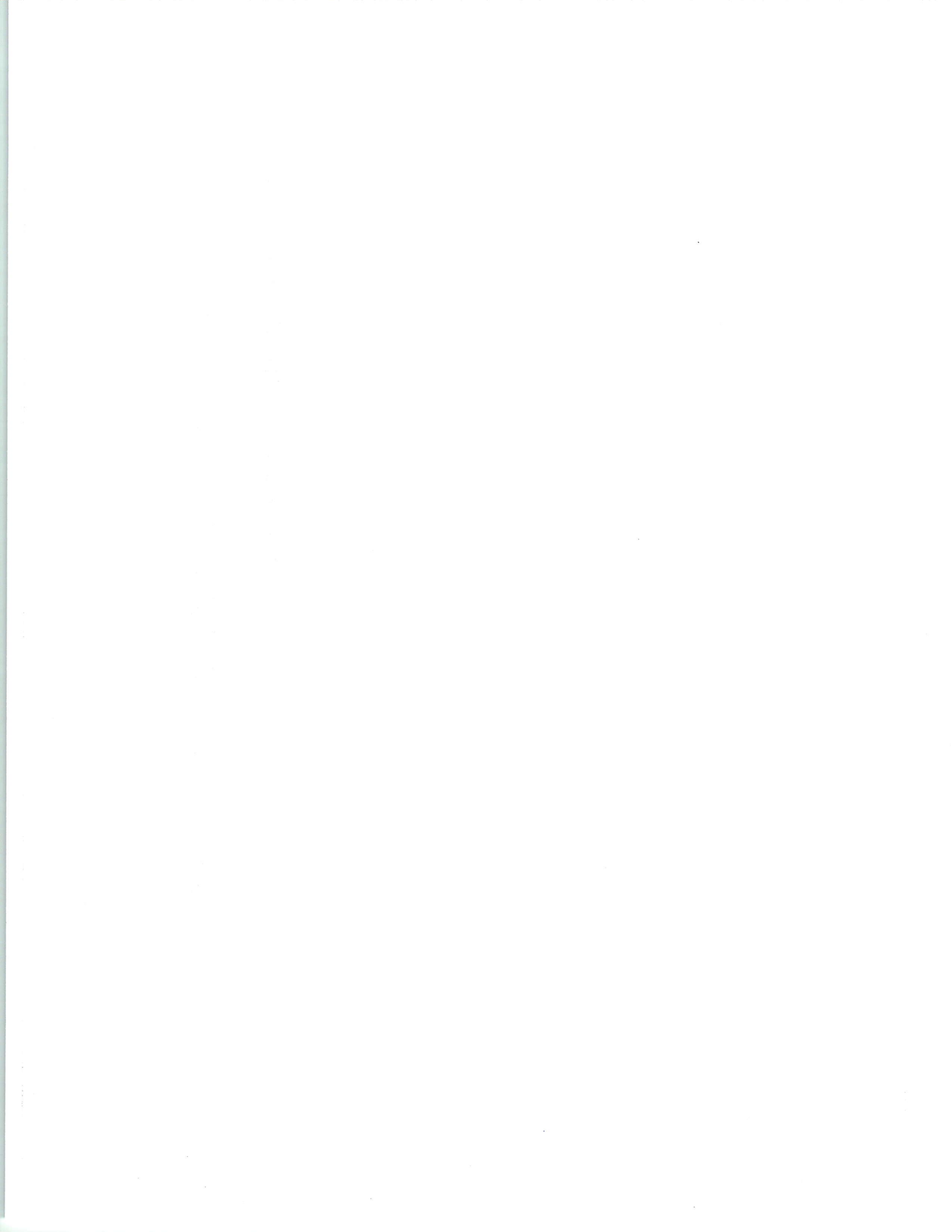
Benefit of increased freeboard:

- There was a recent report published by the U.S. Chamber of Commerce that indicates that there is a **\$13 return on investment for each \$1 invested in implementation of resilience strategies**. This report can be found at this link: [New report finds investing in resilience saves jobs and incomes | U.S. Chamber of Commerce \(uschamber.com\)](#)
- <https://www.uschamber.com/climate-change/new-report-finds-investing-in-resilience-saves-jobs-and-income#:~:text=%E2%80%9393%20Every%20%241%20spent%20on%20climate%20resilience%20and,Commerce%20and%20the%20U.S.%20Chamber%20of%20Commerce%20Foundation>



Why increase FBE to three feet?

- Enhanced Flood Protection
 - Reduces risk of flood damage by providing a safety margin
- Cost Effectiveness
 - *Balance safety and affordability*
 - Additional height (four or five feet) increases cost with limited benefit
 - Substantial savings on flood insurance; better ROI
- Regulatory Compliance and Community Standards
 - IBC requires freeboard of 1 – 2 BFE (residential; 3 ft critical facilities)
 - Earns more points in the CRS; reduced flood premiums
- Practical Considerations
 - Structural Integrity – too high may pose structural challenges and increased damage from wind
 - *Enhances flood resilience without compromising the building structural integrity or requiring extensive engineering modifications*
- Accessibility – too high complicates entry with mobility issues;

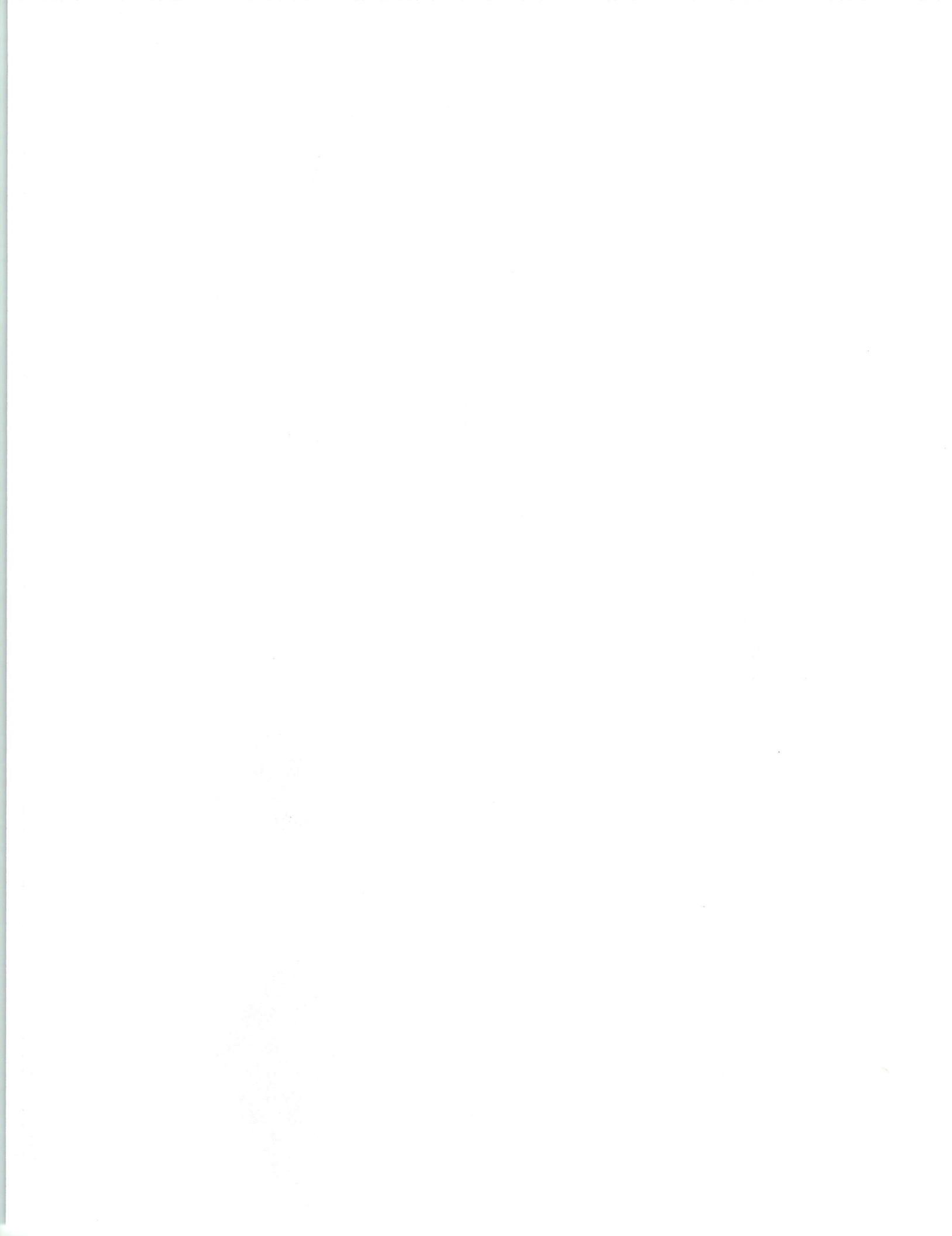


Reduction in Annual Flood Premium*



Floor Elevation Above BFE

* Example: V-Zone building with an open foundation, \$250,000 building coverage, \$100,000 contents coverage. Reductions compared to lowest flood at BFE. Note: This does not include recent rate increases. (FEMA Home Builder's Guide to Coastal Construction)



Considerations for Freeboard

Increasing Freeboard will not impact building height; but Height is different from Elevation!

Building height measured from ground level

Requires FEMA and DNREC approval; once we increase, we will not be able to decrease

Applies to only new construction and 'substantial improvement' of property:

The 50% substantial improvement rule is a key regulation under the National Flood Insurance Program (NFIP). It states that if the cost of reconstruction, rehabilitation, addition, or other improvements to a structure equals or exceeds 50% of the market value of the structure before the start of construction, the entire structure must be brought into compliance with current NFIP standards.

Here are some important points about this rule:

- Applicability: This rule applies to structures located in Special Flood Hazard Areas (SFHAs), which are typically designated as flood zones beginning with the letters A or V₂.
- Substantial Improvement: Any work that meets or exceeds the 50% threshold is considered a substantial improvement. This includes not only renovations but also additions and repairs.
- Compliance Requirements: Structures undergoing substantial improvement must comply with current floodplain management regulations. This often means elevating the building to or above the Base Flood Elevation (BFE) and meeting other local building codes.

Consider eliminating additional foot granted to Buildings in VE Zone: Currently allow one additional foot for these buildings:

Height and Elevation have distinct meaning

Height

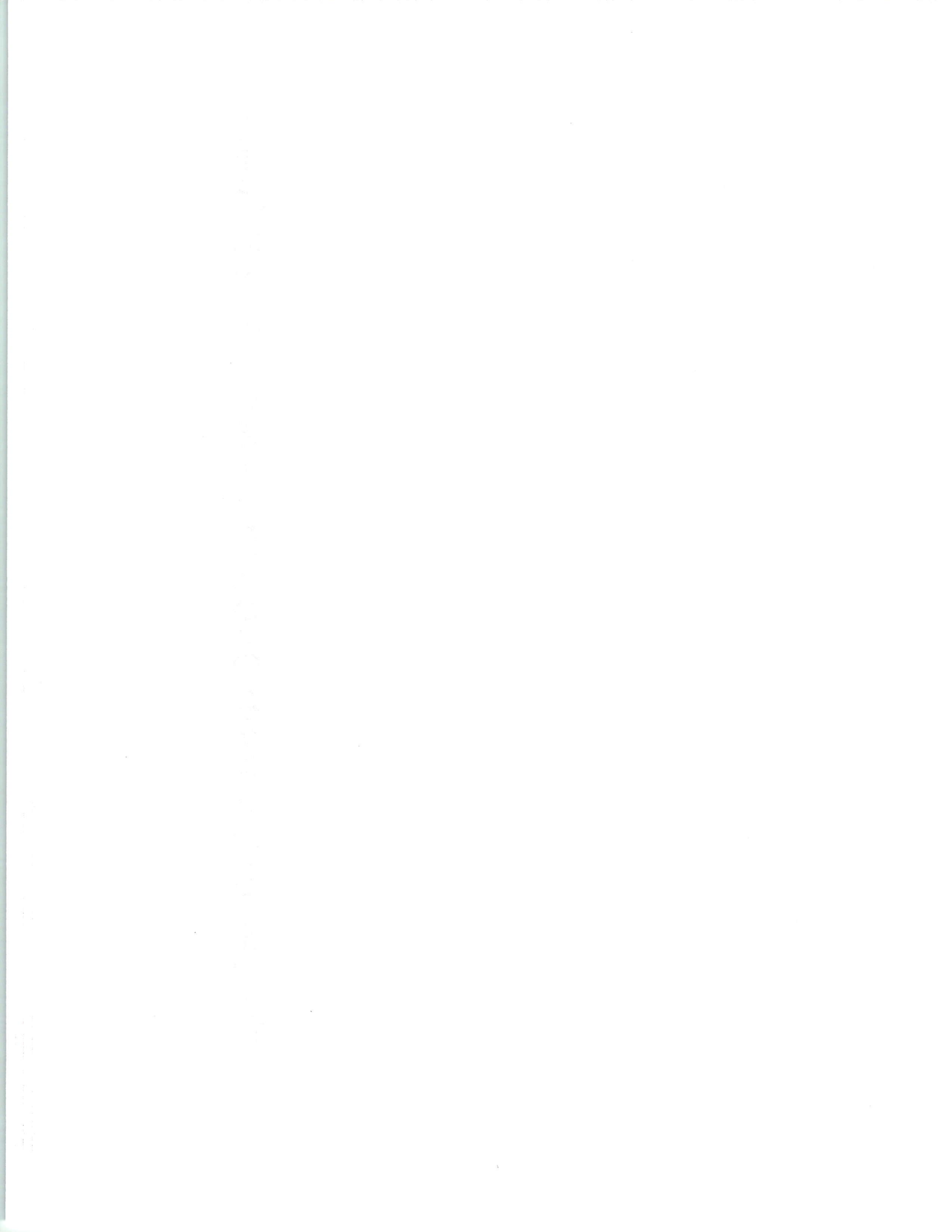
- **Definition:** Height refers to the vertical distance from the base of an object to its top.
- **Context:** It is commonly used to describe the size of buildings, trees, mountains, and other objects. For example, the height of a building might be 50 feet from the ground to the roof.

Elevation

- **Definition:** Elevation refers to the vertical distance of a point or object above a reference level, usually *sea level*.
- **Context:** It is often used in mapping and geography to describe the altitude of landforms. For example, the elevation of a mountain peak might be 2,000 feet above sea level.

Key Differences

- **Reference Point:** Height is measured from the base of the object to its top, while elevation is measured from sea level to a specific point.
- **Usage:** Height is typically used for objects and structures, whereas elevation is used for geographic locations and landforms.



Building Height is not the same as Elevation

IN A SPECIAL FLOOD HAZARD AREA (SFHA) THE BUILDING HEIGHT IS:

- the measured / vertical distance between the Base Flood Elevation (BFE) point and the highest point on the building.
- measured in feet and inches.
- must be drawn on construction plans / drawings.
- to be shown on all final as-built surveys.

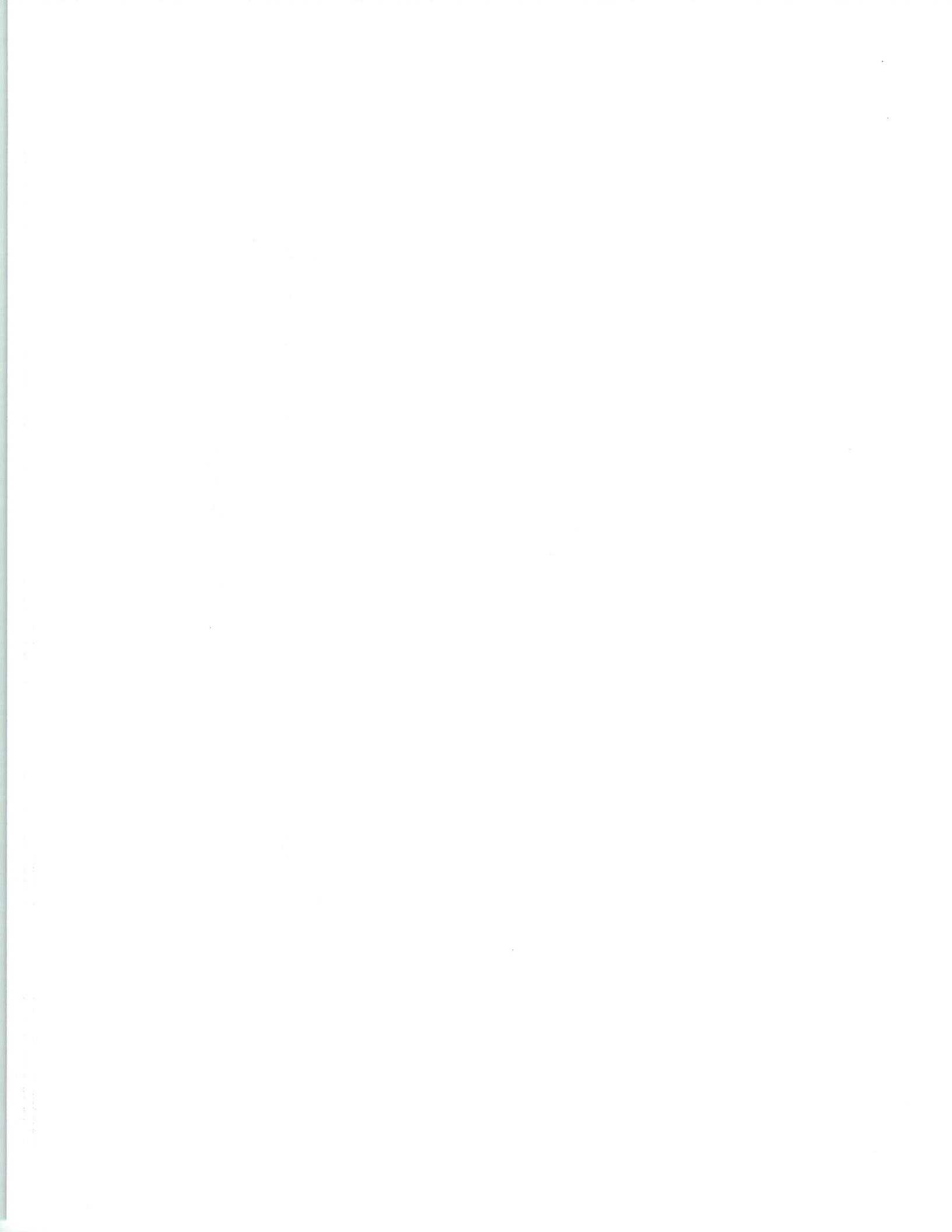
Maximum Building Height Allowed in SFHA Flood Zones AE and AO:

- **32 feet** measured **FROM** the height of BFE – (FEMA's flood water prediction) **PLUS** the Town mandatory Freeboard*

Maximum Building Height Allowed in SFHA Flood zone VE:

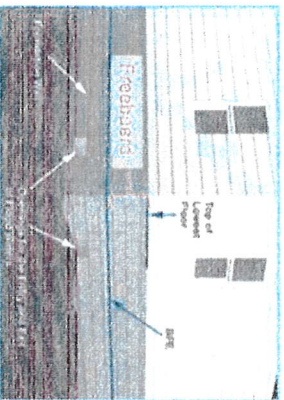
- **32 feet** measured **FROM** the height of BFE – (FEMA's flood water prediction) **PLUS** the Town mandatory Freeboard* **PLUS** one additional foot is permitted.

* Current mandatory Freeboard is one foot.

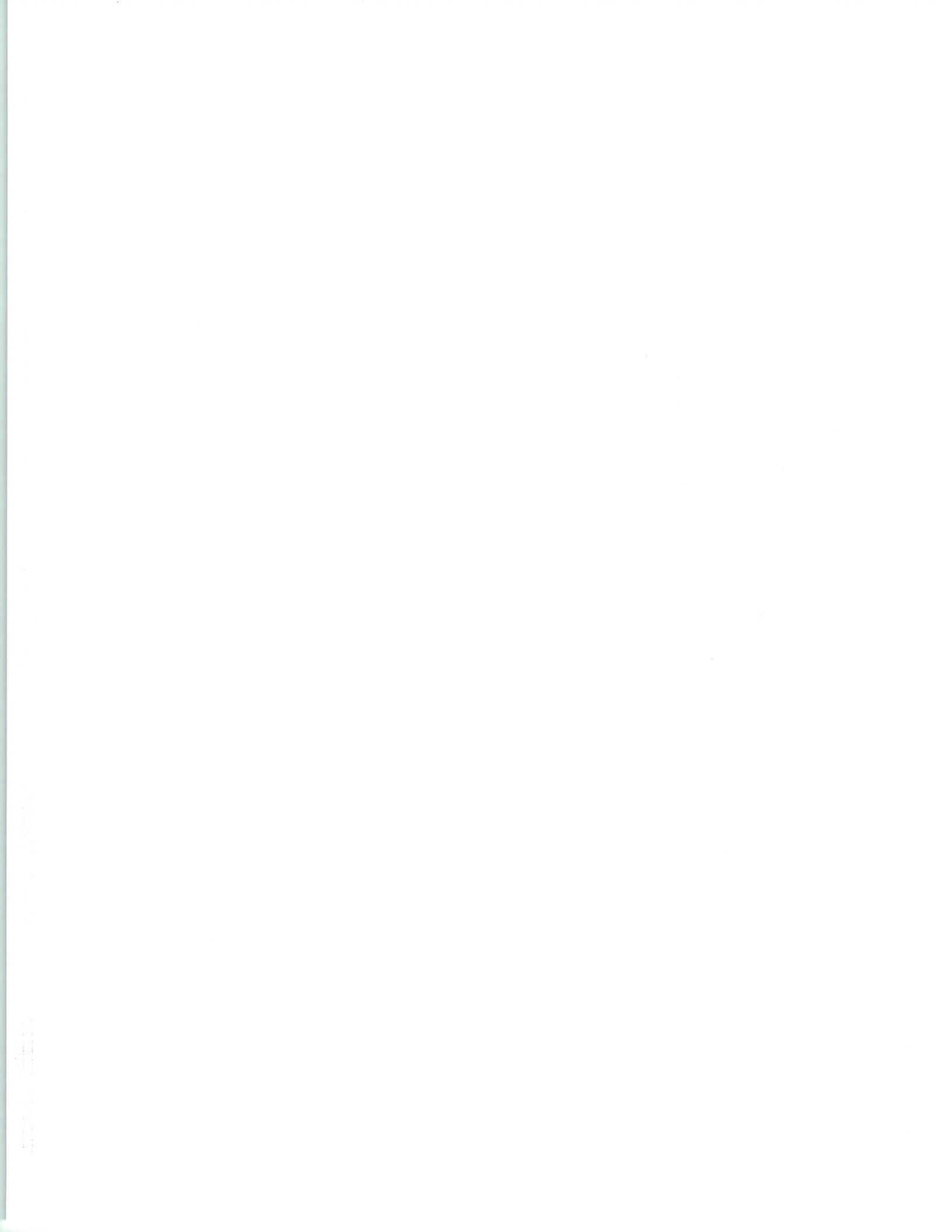


Grade or Grade Elevation Level is not BFE

- **Base Flood Elevation (BFE)** is the calculated level that flood waters will rise to during a Base Flood.
- **Design Flood Elevation (DFE)** is the elevation of the highest flood (generally the BFE including freeboard). Also, referred to as Flood Protection Elevation.
- **Special Flood Hazard Area (SFHA)**
 - **A zones** have low impact from waves.
 - **Coastal A zones** are expected to receive 1.5-foot or greater breaking waves.
 - **V zones** have high impact from waves.
- Both A and V zones subject to experiencing a 1% annual chance flood event. This translates to a 26% chance of flooding over the life of a 30-year mortgage.

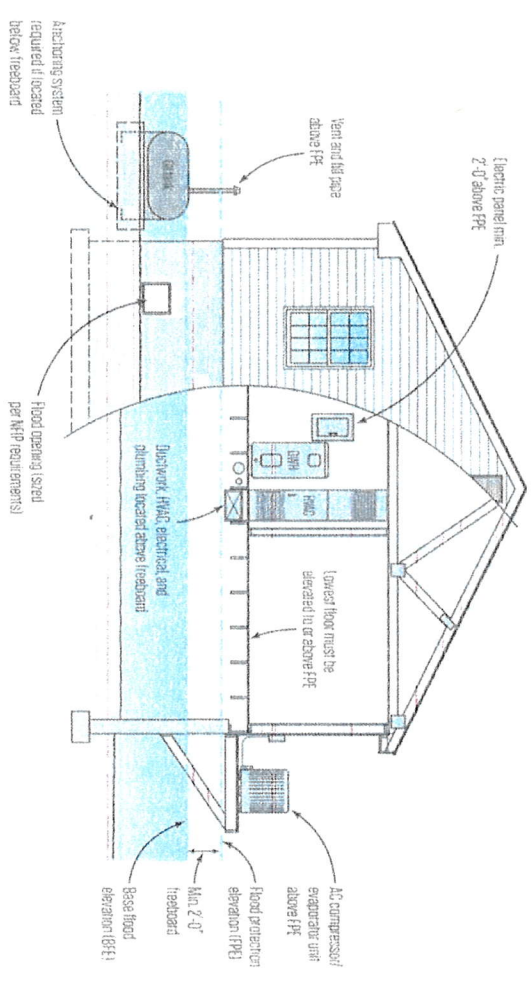


Freeboard: Elevating a building's lowest floor above and beyond BFE. This is a built-in safety factor resulting in lower flood insurance premiums. Freeboard ordinance regulations are popular in CRS communities.



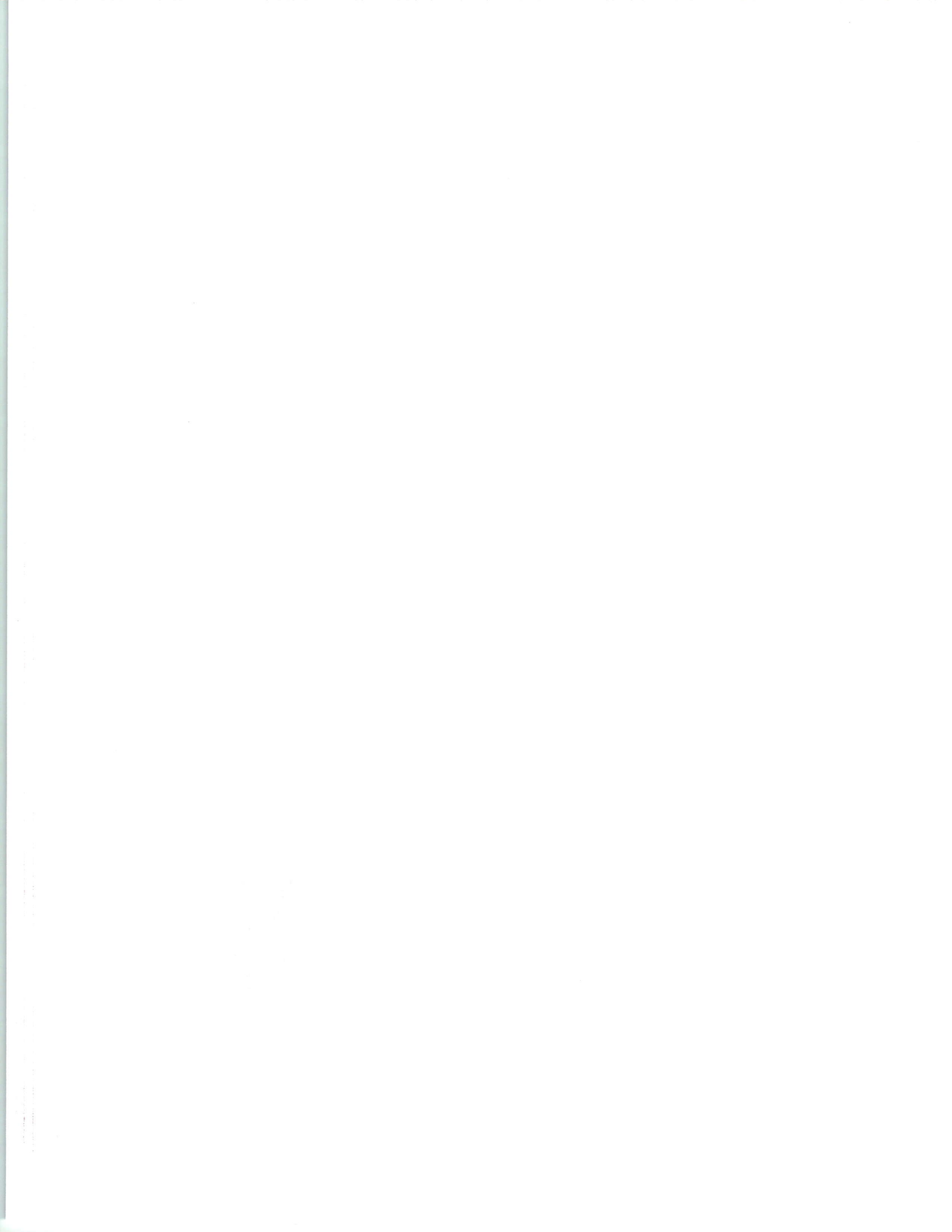
Utilities Protection with 2 ft Freeboard

Flood Protection for Utilities (A-Zone)



In A-zone flood regions, heating and cooling equipment, water heaters, fuel tanks, electrical panels and well head should all be positioned the flood protection elevation (FFE) specified by local code jurisdictions. (Illustration adapted from Accomack County (Virginia) Flood Program)

JLC Online:
https://www.jlconline.com/projects/disaster-resistant-building/flood-resilient-buildings_0



Unintended Consequences

- Increased Construction Costs: Elevating a building higher than the BFE can increase construction costs, particularly for foundations and structural supports².
- Accessibility Issues: Higher elevations can create challenges for accessibility, requiring additional design considerations for ramps, stairs, and elevators¹.
- Aesthetic and Design Constraints: Higher freeboard can affect the aesthetic appeal and design of buildings, potentially leading to conflicts with local architectural styles or homeowner preferences¹.

