

WHEN TO USE BASE LEVEL ENGINEERING

Flood risk is always changing, and it's important for local officials to identify and consider all available flood hazard information as they plan and make decisions for their community. Part 60.3 in the Code of Federal Regulations indicates when FIRMs do not provide sufficient data, the community shall “obtain, review and reasonably utilize data available from Federal, State or other sources... pending receipt of data” from FEMA.

Zone A Floodplains and Base Level Engineering. More than half of flood zones shown on Flood Insurance Rate Maps (FIRMs) are designated as Zone A – depicting areas that are potentially flood prone during larger rain events with a shaded polygon, but not providing a published Base Flood Elevation (BFE) to assist local communities review of proposed development.

FEMA's minimum floodplain management regulations require:

- Communities use local knowledge and previous flood events to expand community understanding of floodprone areas
- Communities review and permit all development
- All floodplain development impacts on are assessed with a before/after analysis
- Base Flood Elevations are identified for all developments greater than five (5) acres or 50 lots
- Assure all building will be “reasonably safe” from flooding

While BLE flood information does not replace data shown on your community's current FIRM panels, the data complements current FIRM Zone A areas and provides additional coverage where streams have not yet been included in the FIRM data coverage, expanding the coverage of available data for community and industry use.

Implementing Local Use of Base Level Engineering.

Where Base Level Engineering is available it can be used as a data source to supplement effective FIRMs with the following review and use procedure. Base Level Engineering **may be used** as available information when:

- ✓ BLE coverage shows an area as flood prone that is NOT currently depicted on the FIRM
- ✓ BLE coverage is similar in width, shape and alignment to the Zone A depicted on FIRM
- ✓ BLE coverage is larger than Zone A areas shown on FIRM

Communities **should not** use Base Level Engineering information in the following instances:

- ✗ BLE coverage is smaller in width and shape than Zone A areas shown on FIRM

In areas where Zone AE is depicted and a BFE is available, communities should review both datasets and modeling to make a determination for use.

How does Base Level Engineering (BLE) assist local development review?

BLE and the Estimated Base Flood Elevation (EstBFE) Viewer provide a free interactive on-line portal to allow communities to identify site specific Base Flood Elevations and download engineering models that can be used by the development industry to assess the change in flood prone areas prior to the start of construction activity.

Users can look up Base Flood Elevations and flood depths with an address entry. A free report tool is available for printing, allowing residents to coordinate with community officials prior to any renovation, restoration or recovery efforts.



Check for availability of Base Level Engineering information in your vicinity at:

<https://webapps.usgs.gov/infrm/estBFE/>



Best Available = Most Conservative BFE/floodplain result



Reasonably Safe from Flooding. Community review and permitting is required for all development activity to assure building sites will be “**reasonably safe from flooding**”. If a community determines that a site is not reasonably safe from flooding, it must require mitigation actions to be undertaken to reduce the structure’s flood damage potential. Base Level Engineering (BLE) data provides additional floodplain coverage for local communities to identify areas across the nation that are floodprone. BLE assists in determining area that are expected to flood and therefore are **not reasonably safe from flooding**, ensuring that communities may require new development to employ mitigation tactics like freeboard and open space in their developments.

When permitted under applicable Federal, state, and local laws, ordinances, and regulations, earthen fill is sometimes placed in an SFHA to reduce flood risk to the filled area. FEMA’s Technical Bulletin 10-01, [Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding](#) provides additional information and resources to community development officials. This document can be found on FEMA’s Technical Bulletin website at: <https://go.usa.gov/xsGvK>.

What qualifies as “reasonable” use of available flood hazard information?

The concept of ‘**reasonable**’ ensures that use of the flood hazard data will not be detrimental to a proposed development or to the community’s standing within the NFIP. FEMA specifies that draft or preliminary information should be used in cases where it is more restrictive [i.e., where there are discharges, floodplain boundaries, or increasing Base Flood Elevations (BFEs)] when compared to the current effective information.

Additional Resources for Best Available Information. Communities may adopt best available datasets for use in local development decision making, community planning and emergency response planning. The table below shows other references to Best Available Information in floodplain management policies and guidance to assist local implementation and use of best available information:

<p style="text-align: center;">Executive Order 11988</p> <p style="text-align: center;">https://go.usa.gov/xsGvQ</p>	<p style="text-align: center;">44 CFR, Part 9.7</p> <p style="text-align: center;">https://www.govregs.com/regulations/title44_chapter1_part9_section9.7</p>
<ul style="list-style-type: none"> ● Intends to avoid long and short-term adverse impacts associated with the occupancy/modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative – at the local level these requirements extend to those utilizing federally undertaken, financed or assisted construction and improvements. ● Determination shall be made according to a (HUD) floodplain map or a more detailed map of an area, if available. ● If such maps are not available, the agency shall make a determination of the location of the floodplain based on best available data. 	<ul style="list-style-type: none"> ● Determine 1% water surface elevation (WSEL), 0.2% WSEL also required if critical facility ● Assume... a facility or structure that has been flooded is in the floodplain ● Additional flood factors like coastal, levee, velocity may also be identified ● Sequence for determination (is structure in floodplain): <ul style="list-style-type: none"> ○ FIRM, FBFM, FIS, then FHBM ○ Inquire with SCS, USACE, NOAA, FIA, USGS, BLM, BLR and States ○ Consult engineering services

Floodplain Management Bulletin (FPMB) 1-98
<https://go.usa.gov/xsGvm>

Where no BFEs have been established, communities will comply with 44 CFR 60.3(b)(4):

- Obtain, review and reasonably utilize any base flood elevation and floodway data available from Federal, State or other source
- Use criteria for new construction and substantial improvements to have lowest floor elevated to or above the BFE
- Data should be used as long as it reasonably reflects flooding conditions during the 1% annual chance event
- Draft or preliminary Flood Insurance Studies constitute available data

BLE Use Matrix. In order to assist communities in their use of Base Level Engineering in agreement with the When to Use Base Level Engineering factsheet, FEMA has prepared a **HOW2** document to assist the use of this data. The State of Arkansas Natural Resources Division prepared a use matrix outlining how to review the effective Flood Insurance Rate Map (FIRM) and the results available through the Estimated Base Flood Elevation (estBFE) Viewer. A snap shot of the tool is shown to the right.

Download the tool **HOW2 Use BLE Data for Local Permitting (BLE Use Matrix)** from the many BLE tools available at:
<https://www.fema.gov/media-collection/base-level-engineering-ble-tools-and-resources>

How can my community use this data? First, check the local codes and ordinances. Your community may have to go through a local adoption process before the data can be used to make planning, permitting, and development review decisions. Otherwise, you can use the new data starting immediately.

The ways in which this data can be applied are almost limitless. We encourage you to think of unique ways your community can put this data to work, and have provided a few examples below.

- Zoning district updates
- Land use code/ordinance updates
- Permitting
- Community Rating System points
- Mitigation project planning
- Grant applications
- Stormwater management and design
- Flood evacuation route planning
- Reverse 911 system updates
- Emergency shelter planning
- Capital Improvement Project planning
- Outreach applications
- Social Vulnerability analyses

Additional Resources. A number of resources and documents are available to assist local officials in local floodplain management options. These materials provide information to community officials and their residents: highlighting individual and community level opportunities to reduce long term flood risk.



Title	Overview	On-Line Resources
Floodplain Management	FEMA has tools and resources to help communities navigate NFIP requirements and implement higher standards available through FEMA.gov.	https://www.fema.gov/floodplain-management
Determination of a Proposed Action's Location (44 CFR 9.7)	Procedures for determining whether any action as proposed is located in or affects to floodplain or wetland, provides insight in the location of critical facilities.	https://ecfr.io/Title-44/se44.1.9_17
Use of Flood Insurance Study (FIS) Data as Available Data (FPM 1-98)	Guidance on the use of FEMA draft or preliminary Flood Insurance Study data as "available data" for regulating floodplain development.	https://www.fema.gov/media-library/assets/documents/7401
FEMA Technical Bulletin 10-01	Provides building techniques to ensure that structures built on fill in or near Special Flood Hazard Areas (SFHAs) are "reasonably safe from flooding"	https://www.fema.gov/media-library/assets/documents/3522
Mitigation Best Practices	Stories, articles or case studies about individuals, businesses or communities that undertook successful efforts to reduce or eliminate disaster risks.	https://www.fema.gov/emergency-managers/risk/hazard-mitigation-planning/best-practices



When to use Base Level Engineering

When a community has a FIRM identifying Special Flood Hazard Areas (SFHAs) and the availability of Base Level Engineering data, there are always questions. The table below provides insight to assist communities to apply the Base Level Engineering data based on the flood zones identified on the current FIRM.

Flood Zone on FIRM	The use of Base Level Engineering
Zones B, C, or X	<p>If a FIRM shows a project to be located in an area of low to moderate flood risk, there is no requirement for a community to leverage best available information for permitting review.</p> <p>Given the expansive coverage of Base Level Engineering (BLE), additional areas are identified as flood prone, expanding the understanding of potential flood risk across the nation. FEMA encourages communities to reasonably use the draft (BLE) or preliminary information to assist local floodplain management goals.</p> <p>BLE data may be used to update FIRMs in the future, adding the floodplain areas identified to the FIRMs. Local use of BLE information provides an opportunity for building with information prior to its incorporation on a FIRM.</p>
Zone A	<p>Local officials are required by minimum NFIP regulations to reasonably utilize draft or preliminary flood risk data AFHI to manage development in Zone A areas. Examples of ways BLE can inform development decisions in Zone A areas include:</p> <ol style="list-style-type: none">1. Use BLE to determine the required minimum elevation of the first floor, HVAC, electric, and plumbing fixtures for new residential construction/substantial improvements.2. Use BLE to identify floodway boundaries, which can impact permitting submittal requirements for proposed development projects (proposed projects in the floodway must, at a minimum, demonstrate through hydraulic modeling that they will not result in any increase greater than 0.00 feet in 1-percent-annual-chance (100-year) water-surface elevations.
Zone AE, A1-30, AH, or AO:	<p>FEMA encourages communities to reasonably utilize draft or preliminary flood risk data in instances where it provides more restrictive 100-year flood discharges, flood hazard zone boundaries, and water-surface elevations to ensure the floodplain management goals of the NFIP are met. The use of less restrictive draft or preliminary flood hazard information prior to the issuance of a LFD may result in significantly higher flood risk to people and property if the data changes before it is finalized and can result in higher flood insurance premiums. Additionally, the community could be in violation of their locally-adopted Flood Damage Prevention Ordinance with the use of less restrictive data.</p> <p>Use factors such as years of gage records, amount of development, and presence of new hydraulic structures. In areas where more detailed studies exist, these studies should be reviewed and assumed to take precedence over Base Level Engineering studies until the BLE studies are refined with the structure data to allow a more comprehensive review of the modeling results.</p>