Base Level Engineering for Local Floodplain Administrators

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What Is Floodplain Management?

Floodplain management is a community-based effort to prevent or reduce the risk of flooding, resulting in a more resilient community. Floodplain management spans many local responsibilities, including planning and zoning, building codes, enforcement, education, and other tasks. Communities participating in the National Flood Insurance Program (NFIP) agree to adopt and enforce minimum floodplain management standards outlined in the Code of Federal Regulations, and to identify a floodplain administrator to help a community carry out these duties.

Can Floodplain Administrators Use BLE To Manage Development?

Minimum NFIP requirements state that communities should use the best available data in areas mapped as Zone A or Zone V on the Flood Insurance Rate Map (FIRM). In many cases, specifically in Zone A, there is no model developed or available to support the information shown on the FIRM. In these situations, Base Level Engineering (BLE) represents the best available information for obtaining water surface elevations and making development and permitting decisions. A community's rulemaking processes and standards may require that BLE data first be adopted into the community's flood damage reduction ordinance and/or another ordinance or code before the data can be used for regulating and managing development. A community may also use BLE to regulate higher water surface elevations or wider floodplains than those available from the effective FIRM in Zone AE areas.

Duties of the floodplain administrator include:

- Reviewing proposed development projects to ensure they are reasonably safe from flooding.
- Requiring permits for all proposed development within flood-prone areas.
- Requiring residential structures to have their lowest floors (including basements) elevated to or above the Base Flood Elevation.

How Does BLE Support A Floodplain Administrator's Duties?

One of the most beneficial aspects of BLE for floodplain administrators is its ability to provide Base Flood Elevations (BFEs) in areas where a community's effective FIRM does not. Elevations from a BLE assessment can be used on elevation certificates, floodplain development permits, Letters of Map Amendment, and any other function where 1%-annual-chance water surface elevations are necessary. A floodplain administrator's approach to floodplain management may differ from community to community based on available data,

hazard type, development type, and minimum versus higher standards in a community's flood damage reduction ordinance. There are, however, a few basic steps that all floodplain administrators can and should be performing to ensure proper adherence to their ordinances and other local criteria. Here's how BLE can be used for each of those steps:

1. **Review a project's location to determine the applicable flood risk zone.** If a community's FIRM does not show flood hazard areas in the vicinity of the project, consult BLE to determine if the location is at risk of flooding.

2. **Consider if the project can be modified to avoid flood-prone areas and reduce downstream impacts.** Use flood depth grids and/or floodplain boundaries to determine if the whole project or portions of it can be relocated to a less hazardous location, or if there are areas on the property that may be reasonably safe from flooding.

3. **Determine if bridges or other hydraulic structures will be constructed or modified as part of the project.** Where BLE is available, provide the applicant with BLE models that show existing or pre-project conditions for the project area.

4. **Determine if buildings will be constructed or improved as a part of the project.** Ensure the lowest floor of each new building, as well as any external facilities and/or equipment (HVAC, electrical), is elevated to the community's flood protection elevation. (This elevation will be the BFE plus any freeboard specified in a community's ordinance.) In approximate study areas on the FIRM (Zone A), use BLE to obtain a BFE to compute the flood protection elevation.

Using BLE for Determining BFEs

One use of BLE is to obtain a BFE for a Letter of Map Amendment (LOMA) application. If a building's Lowest Adjacent Grade (LAG) is above the BFE, a LOMA can be issued to remove the structure from the Special Flood Hazard Area (SFHA).

The different products available from a BLE assessment allow floodplain administrators to understand hazards and risk in areas of their community where a thorough assessment has not been performed before. Here are a few specific examples:

- Flood depth grids allow floodplain administrators to review proposed development projects and provide feedback that could result in more resilient design and construction. For example, they could suggest siting buildings and other features and infrastructure in shallow flooding areas when they cannot avoid the floodplain altogether.

- BFEs derived from BLE are instrumental in defining a height requirement for new construction and substantial improvements in Zone A areas. BLE can also provide a source

for water surface elevations in areas that are not mapped on the community's effective FIRM.

- Engineering models can be provided to developers and other applicants to demonstrate the impacts of proposed projects. Models can also be used in Conditional Letter of Map Revision/Letter of Map Revision submittals as a representation of existing conditions in many cases.

- Community flood damage reduction ordinances can be updated to reference BLE maps and data to provide more transparent use of flood hazard information for community floodplain management. This step can also help communities meet certain local requirements for adoption of data used to regulate development.

Typical BLE Assessments include:

- Modeling for multiple return periods (10%, 4%, 2%, 1%, 1%+, 1%-, and 0.2%)
- Floodplain boundaries (1% and 0.2%; others by request)
- Flood Depth Grids (1% and 0.2%; others by request)
- Water Surface Grids (1% and 0.2%; others by request)
- Reports and other input/output data available as needed

Where Can My Community Obtain Base Level Engineering Data?

The availability of BLE information varies by state. Check with your state NFIP Coordinator, state Risk MAP Coordinator, or FEMA Regional Office for more information on availability of BLE in your community. Most times, BLE can be made available online for ease of viewing and use, or it can be downloaded for use with other local datasets such as parcels, building footprints, or zoning overlays.

Resources

Managing Floodplain Development Through the National Flood Insurance Program: https://go.usa.gov/x6dDd

Floodplain Management Criteria for Floodprone Areas (44 CFR 60.3): https://go.usa.gov/x6dDM

Use of Flood Insurance Study (FIS) Data as Available Data (FPM 1-98): https://go.usa.gov/x6dWd

Guidance on the Use of Available Flood Hazard Information (FEMA Policy # 104-008-02): https://go.usa.gov/x6dWs

FEMA Technical Bulletin 10-01: https://go.usa.gov/x6dZR